

INSTALLATION AND OPERATING INSTRUCTIONS

Zero-point clamping system
SPN

DDOC00836

THE KNOW-HOW FACTORY

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1 Introduction

1.1 Supporting documents

NOTICE



Read through the instructions before installing or working with the product.

The 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.

- 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 instructions, "product" refers to the product designation on the title page!

1.2 Notices and graphics in the 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

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.

WARNING



Risk of injury due to uncontrolled movements

There is a risk that parts will continue to move after a failure or after the power supply has been switched off (e.g., emergency stop) due to residual energy.

- ▶ Do not reach into the operational range of the product.
- ▶ Do not reach between the clamping surfaces.
- ▶ Wait for the system to come to a complete standstill.

WARNING



Risk of injury and material damage if loaded improperly

If the clamping pins are forcibly inserted into a clamped product, the product may be damaged.

If the clamping pins are placed on a clamped product, the falling movement of the workpiece or pallet can cause crushing when the product is opened.

- ▶ Do not reach between the contact surfaces.
- ▶ Only insert the clamping pins into an open product.

WARNING



Risk of injury due to objects being ejected

Certain components are under constant spring tension. When removing certain components, springs can spring out uncontrollably and cause serious injuries.

- ▶ Do not loosen the screws on the cover of the zero-point clamping system.
- ▶ Do not remove the cover.

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

The product is state-of-the-art.

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 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 Group 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.
- ▶ Note that, due to the spring tension, you should exercise increased caution when uninstalling products with integrated springs.
- ▶ 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.
- ▶ Check the completeness and tightening torques of all mounting screws.

3 Proper use

NOTICE



Material damage and malfunction in case of non-compliance

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

- The product is designed for use in commercial or industrial applications.
- The product is used exclusively for positioning and clamping workpieces, clamping pallets or other clamping devices on tooling machines or other suitable technical equipment.
- The product is designed exclusively for pneumatic operation.

INFORMATION



The permitted position deviation of center axes is \varnothing 0.03 mm for the simultaneous use of multiple products and clamping pins.

Improper use occurs when the product is used in rotary applications without consulting Zimmer Group GmbH and the following parameters are exceeded:

- Speed: 1,500 rpm
- Peripheral speed, relative to the center axis of the product: 35 m/s

4 Personnel qualification

WARNING



Inadequate qualification can cause injury and material damage

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 is designed for clamping workpieces and pallets with extremely high repeat accuracy.

The product is available in different versions.

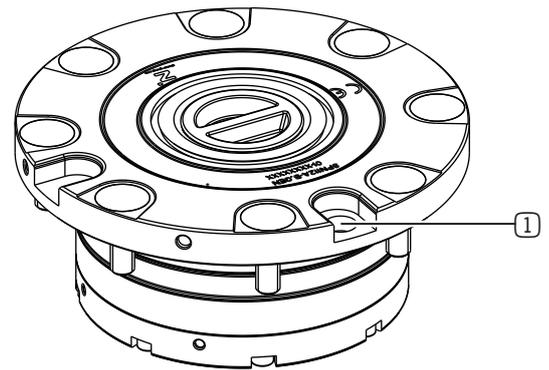
Different functions are available depending on whether the *SD*, *AD* or *ED* product version of the product has been selected.

The product has two rotation locks.

The product is pneumatically operated.

The sensors are operated electrically.

① Rotation lock

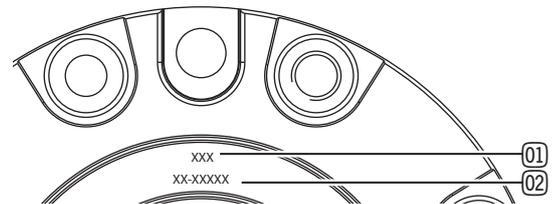


5.1 Type plate

A type plate, as a laser engraving, is affixed to the housing of the product.

① Article number

② Confirmation number



6 Functional description

The product is clamped using spring force without pneumatic pressure applied.

The clamping force can be further increased by using an impulse on the PLUS connection. The form-fit lock can only be released when compressed air is applied to the *Open* connection and the PLUS connection is vented.

The *blow-out/clean* function and a seal prevent dirt and liquids from penetrating the product when clamped. If the product is not in use, this can be prevented by a manually inserted locking bolt or the automatic lock.

The *piston position sensing* and *positioning check* functions ensure a secure clamping process.

All functions can be controlled directly by means of the contact surface and the standard connections with O-rings.

There is also the option to control the product by means of alternative connections on the bottom of the product.

In the *AD* and *ED* product variants, the *piston position sensing* and *positioning check* functions are enabled by sensors.

6.1 Function of the connections

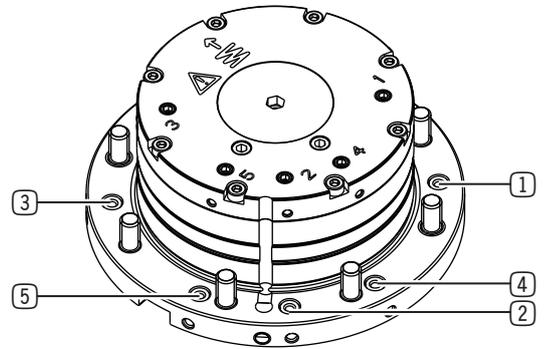
INFORMATION



The functions *blow-out/clean/positioning check* and *piston position sensing* are only available in the *AD* and *ED* product variant.

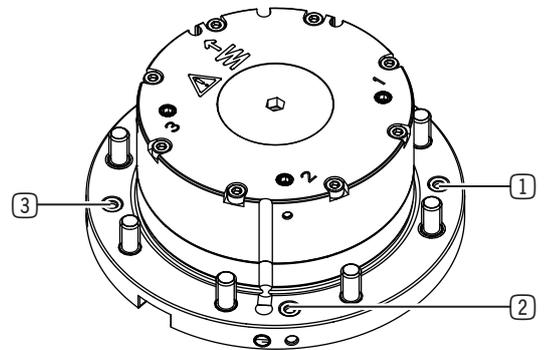
AD product variant

- ① Open
- ② PLUS connection
- ③ Blow-out/clean/positioning check
- ④ Connection 4 piston position sensing
- ⑤ Connection 5 piston position sensing



ED product variant

- ① Open
- ② PLUS connection
- ③ Blow-out/clean



6.1.1 Open

The product is clamped without pneumatic pressure applied. A spring package acts as an energy store and preserves the clamped state in the event of a power failure or interruption.

It is opened when the *Open* connection is supplied with compressed air.

6.1.2 PLUS connection

NOTICE



Material damage and malfunction in case of non-compliance

- ▶ Always use the PLUS connection for dynamic applications to ensure sufficient clamping force.

A pulse of compressed air at the PLUS connection supports the clamping process and increases the clamping force. The product remains spring-loaded.

6.1.3 Blow-out/clean

When compressed air is applied to the *blow-out/clean* connection, the product is blown out via the bolt opening and thus cleaned.

Before the workpiece or pallet is placed on top, the pressure at this connection must be switched off, as otherwise a pressure cushion may form or vibrations may occur.

- ▶ Switch off the pressure as soon as the workpiece or pallet is approx. 1 mm above the product.
- ▶ Switch on the pressure as soon as the workpiece or pallet has been lifted by approx. 1 mm.
- ▶ Maintain the maximum permitted operating pressure.
- ▶ For the *AD* product variant, make sure that you can switch between the operating pressure for the *blow-out/clean* function and a reduced pressure supply limited to 1.5 bar for the *positioning check* function.
- ▶ Please note that the *blow-out/clean* function may only be activated when the automatic lock is clamped.

6.1.4 Pneumatic positioning check (AD)

NOTICE



Malfunction in case of non-compliance

Pressure fluctuations can influence the settings of the measuring devices and lead to incorrect measurement results.

- ▶ Keep the pressure and the air volume constant.
- ▶ Keep the supply lines as short as possible or ensure a sufficiently large cross-section.
- ▶ Check the control components regularly.
- ▶ If necessary, reset the control components.

INFORMATION

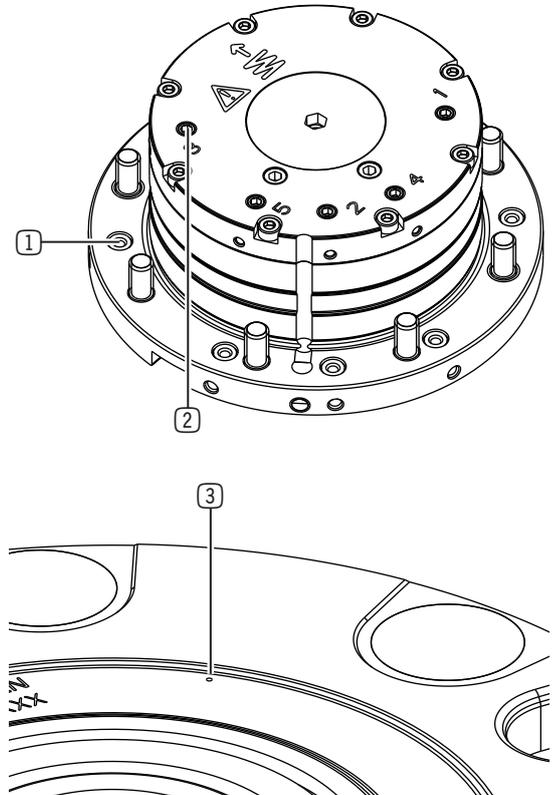


The operator of the product has sole responsibility for this function.

- ▶ Make sure that the entire contact surface of the product is covered.
- ▶ Please contact Customer Service if you have any questions.

By applying compressed air to the *positioning check* connection, it is possible to check whether the workpiece or pallet is correctly positioned on the product.

- ▶ Use a pressure switch or a flow sensor for the sensing.
- ▶ Apply pressure of 1.5 bar to the connection.



- ① Blow-out/clean/positioning check
- ② Alternatively: Blow-out/clean/positioning check
- ③ Hole for measuring the flow or dynamic pressure

The following table describes the meaning of the states.

Connection no.	Operating pressure [bar]	Status	Effect	Meaning
3	1.5	0	Dynamic pressure	The clamped product is positioned correctly on the contact surface.
		1	Flow rate	The clamped product is not positioned correctly on the contact surface.

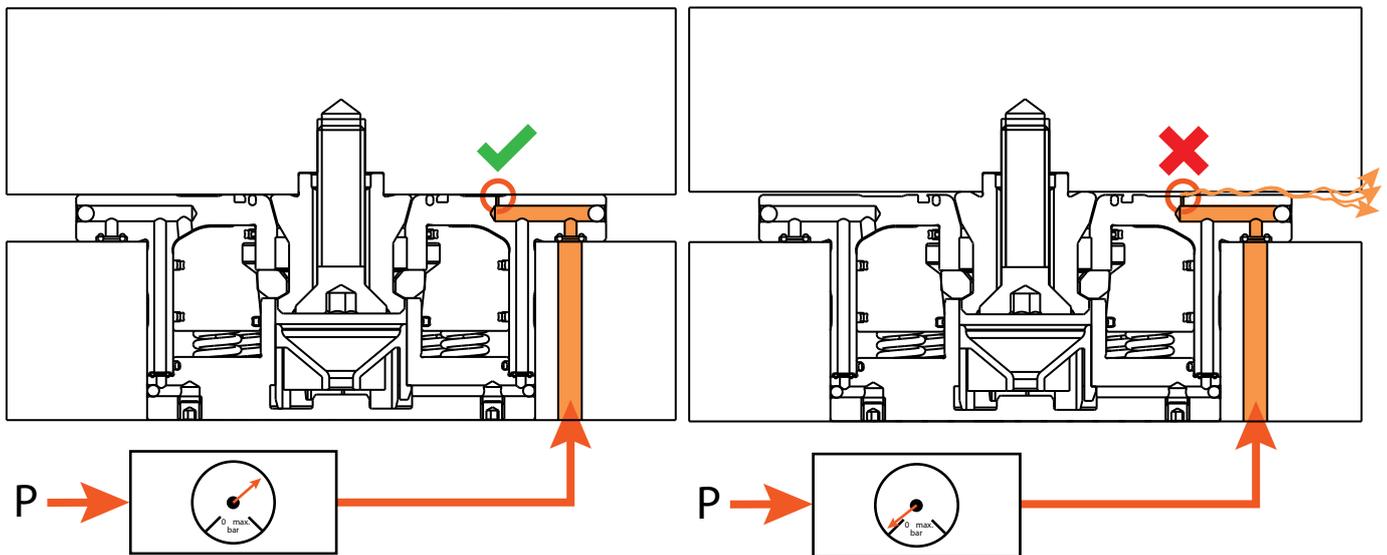
6.1.4.1 Dynamic pressure sensing via a pressure switch

- ▶ Use a pressure manometer, an adjustable throttle valve and a pressure switch.
- ▶ Make sure that the measurable differential pressure is high enough to allow a reliable evaluation via the pressure switch.
- ▶ Make sure that the hysteresis of the pressure switch does not exceed a value of ± 0.2 bar.
- ▶ If necessary, adjust the threshold value to the respective installation situation when querying several products in status 0.

Recommendation

- Setting range of the pressure switch: 0.5 bar–2 bar
- Threshold value of the pressure switch: 1 bar
- Throttle valve setting:
 - Status 1 (flow): maximum 0.7 bar
 - Status 0 (dynamic pressure): minimum 1.3 bar

6.1.4.2 Schematic diagram of a piston position sensing with a pressure switch



The clamped product is positioned correctly on the contact surface.
 ⇒ Dynamic pressure

The clamped product is not positioned correctly on the contact surface.
 ⇒ Flow rate

6.1.4.3 Dynamic pressure sensing via a flow sensor

- ▶ Use a pressure manometer, an adjustable throttle valve and a flow sensor.
- ▶ Make sure that the measurable differential volume stream is high enough to allow a reliable evaluation via the flow sensor.

When sensing multiple products, increase the values of the flow rate.

- ▶ Adjust the throttle valve setting to the specific installation situation.

Recommendation

- Measurement range of the flow sensor: 0.5 l/min–25 l/min
- Switching point of the flow sensor: 4.5 l/min
- Throttle valve setting:
 - Status 1 (flow): minimum 7 l/min
 - Status 0 (dynamic pressure): maximum 2 l/min

6.1.5 Electrical positioning check (ED)

NOTICE



Malfunction in case of non-compliance

The sensor only detects ferromagnetic metals.

- ▶ Ensure that ferromagnetic material is present in the detection area of the sensor, e.g. through a built-in part, if the workpiece or pallet is not made of ferromagnetic material.

INFORMATION



The sensors are available as accessories.

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

The inductive sensor can check whether the workpiece or pallet is positioned correctly on the product.

6.1.6 Pneumatic piston position sensing (AD)

NOTICE



Malfunction in case of non-compliance

Pressure fluctuations can influence the settings of the measuring devices and lead to incorrect measurement results.

- ▶ Make sure that products can be loaded or unloaded without damage if you are not using the pneumatic piston position sensing.
- ▶ Make sure that the drilled holes are not blocked and the air can flow unimpeded to ensure accurate sensing.
- ▶ Keep the pressure and the air volume constant.
- ▶ Keep the supply lines as short as possible or ensure a sufficiently large cross-section.
- ▶ Check the control components regularly.
- ▶ If necessary, reset the control components.

INFORMATION



The operator of the product has sole responsibility for this function.

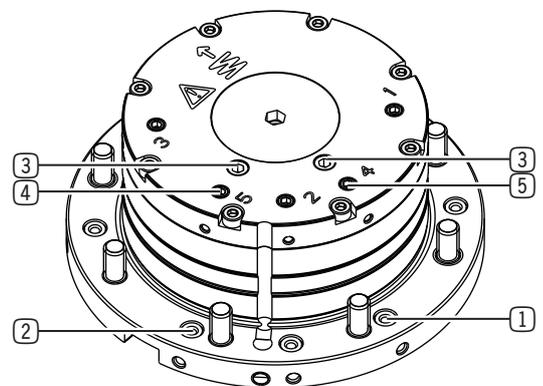
- ▶ Make sure that the entire contact surface of the product is covered.
- ▶ Please contact Customer Service if you have any questions.

Two dynamic pressure sensors are integrated in the piston position sensing to determine whether the product is open or clamped. Depending on the position of the piston, pressure is built up and measured in the open or clamped state. It is possible to use either only one of the two dynamic pressure sensors or both simultaneously for alternating piston position sensing.

Controlling the dynamic pressure sensing requires a reduced pressure supply limited to 1.5 bar.

The connection designated for this must be controlled for piston position sensing.

- ① Connection 4 piston position sensing
- ② Connection 5 piston position sensing
- ③ Air discharge
- ④ Alternatively: Connection 5 piston position sensing
- ⑤ Alternatively: Connection 4 piston position sensing



The following table describes the meaning of the states.

Connection no.	Operating pressure [bar]	Open	Clamped	Closed
4	1.5	0	1	1
5	1.5	1	0	1

Status 0: Dynamic pressure

Status 1: Flow rate

6.1.6.1 Dynamic pressure sensing via a pressure switch

- ▶ Use a pressure manometer, an adjustable throttle valve and a pressure switch.
- ▶ Make sure that the measurable differential pressure is high enough to allow a reliable evaluation via the pressure switch.
- ▶ Make sure that the hysteresis of the pressure switch does not exceed a value of ± 0.2 bar.
- ▶ If necessary, adjust the threshold value to the respective installation situation when querying several products in status 0.

Recommendation

- Setting range of the pressure switch: 0.5 bar–2 bar
- Threshold value of the pressure switch: 1 bar
- Throttle valve setting:
 - Status 1 (flow): maximum 0.7 bar
 - Status 0 (dynamic pressure): minimum 1.3 bar

6.1.6.2 Dynamic pressure sensing via a flow sensor

- ▶ Use a pressure manometer, an adjustable throttle valve and a flow sensor.
- ▶ Make sure that the measurable differential volume stream is high enough to allow a reliable evaluation via the flow sensor.

When sensing multiple products, increase the values of the flow rate.

- ▶ Adjust the throttle valve setting to the specific installation situation.

Recommendation

- Measurement range of the flow sensor: 0.5 l/min–25 l/min
- Switching point of the flow sensor: 4.5 l/min
- Throttle valve setting:
 - Status 1 (flow): minimum 7 l/min
 - Status 0 (dynamic pressure): maximum 2 l/min

6.1.7 Electrical piston position sensing (ED)

INFORMATION



The sensors are available as accessories.

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

Two permanent magnets are integrated in the piston for electrical piston position sensing. Magnetic field sensors can be used to determine whether the product is open or clamped.

7 Technical data

The B10d value of the product is 3 million cycles.

INFORMATION



- ▶ You can find the information in the technical data sheet on our website.
- ▶ Please contact Customer Service if you have any questions.

8 Accessories/scope of delivery

INFORMATION



If any accessories not sold or authorized by Zimmer Group GmbH are used, the function of the product cannot be guaranteed. Zimmer Group 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 off unused connections using pressure-resistant closures.

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.

Assembly requirements

Permissible flatness tolerance [mm]	0.02
Strength class of the mounting screws	10.9

INFORMATION



Further installation information:

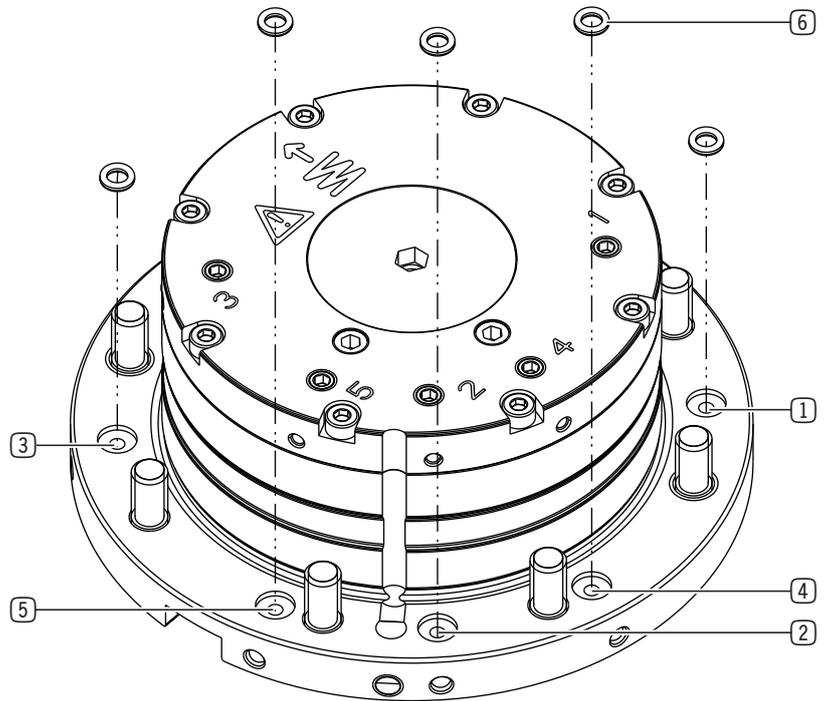
- Mounting screws, cover caps and filters are included in the scope of delivery.

- ▶ Install the product on an appropriate mounting surface in accordance with the flatness specifications.
- ▶ Make sure that the mounting piece is sufficiently rigid.
- ▶ Ensure the cleanliness of the connection surfaces.
- ▶ Please note the permitted tightening torques of the mounting screws at www.zimmer-group.com/en/td.
 - ▶ Verify the permitted load capacity of the required screw connections in accordance with VDI 2230.

10.1 Installing the product

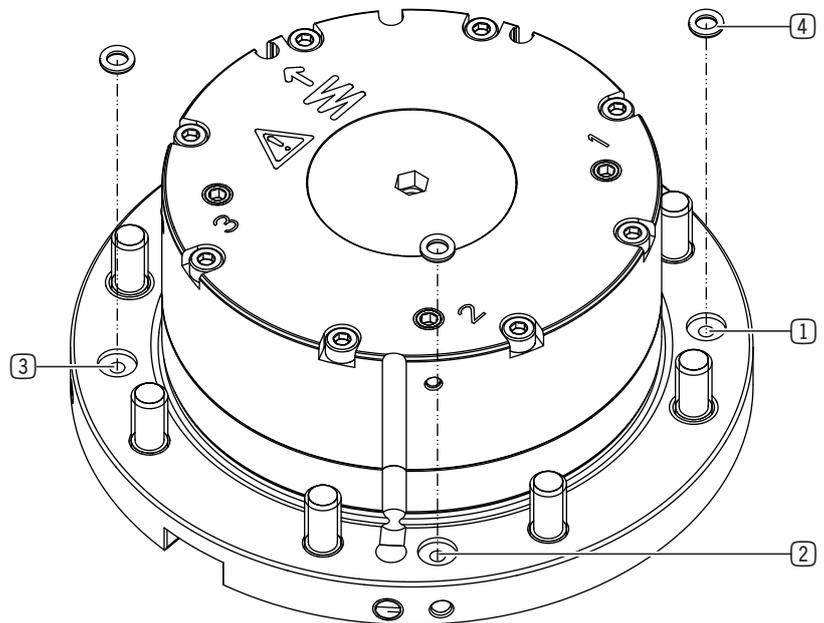
- ▶ If you are not using the PLUS connection, insert a filter.
 - ▶ Make sure that the filter closes flush with the product.
 - ▶ For more information, refer to the "Venting the piston chamber" section.
- ▶ Lubricate the O-rings.
- ▶ Insert the O-rings.

AD product variant



- ① Open
- ② PLUS connection
- ③ Blow-out/clean/positioning check
- ④ Connection 4 piston position sensing
- ⑤ Connection 5 piston position sensing
- ⑥ O-ring

ED product variant



- ① Open
- ② PLUS connection
- ③ Blow-out/clean
- ④ O-ring

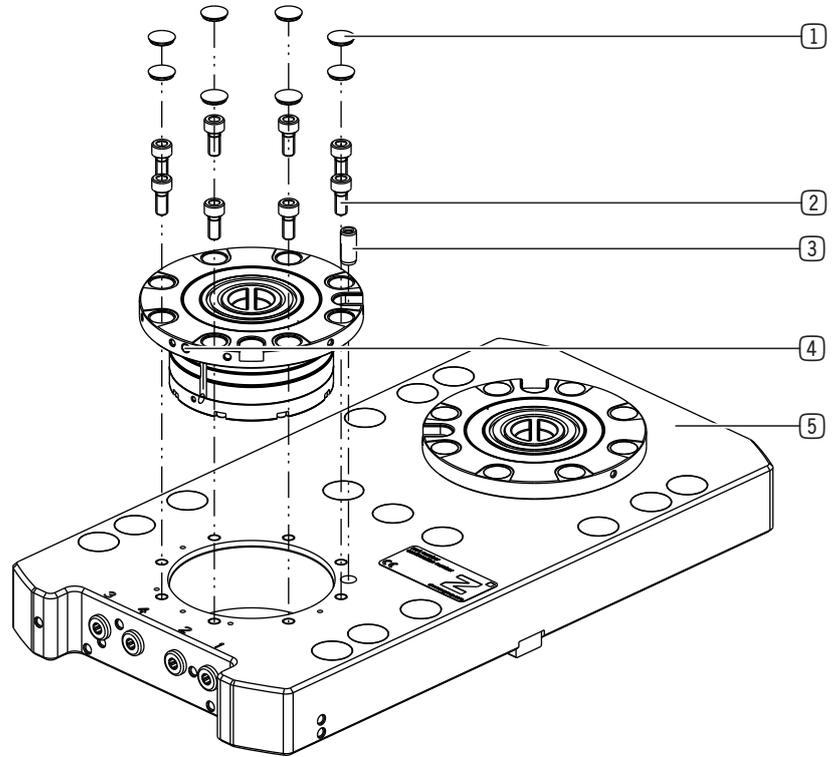
INFORMATION



► For information on the mounting piece, refer to the technical data sheet.

- Insert the product into the intended position on the mounting piece.
 - Make sure that the standard connections for the tubeless connection are positioned correctly.
- For the *ED* product variant, make sure that the sensor cables are laid without kinks or crushing.
- When installing the *ED* product variant on a mounting piece made of ferromagnetic material, observe the specifications of the mounting piece.
 - For more information, refer to the installation drawings in the Appendix.
- If necessary, insert the straight pin for the rotation lock.
- Manually screw the mounting screws into the thread until the product is in contact.
- Make sure that the vent holes and filters are completely open to the passage of air over their entire cross section and protected against liquids and chips.
- Tighten the mounting screws with the corresponding tightening torque.
- Attach the cover caps.

- ① Cover cap
- ② Mounting screw
- ③ Straight pins
- ④ Vent hole
- ⑤ Mounting piece



10.2 Overview of clamping pins

Article number	Centering pin	Retention pins	Sword pins
SPN062E6SD-B SPN062E4SD-B SPN062E6AD-B SPN062E4AD-B SPN062E6ED-B SPN062E4ED-B	SPZ062BZ08-B	SPZ062BE08-B	SPZ062BS08-B
SPN112E6SD-B SPN112E4SD-B SPN112E6AD-B SPN112E4AD-B SPN112E6ED-B SPN112E4ED-B	SPZ112BZ10-B SPZ112BZ12-B	SPZ112BE10-B SPZ112BE12-B	SPZ112BS10-B SPZ112BS12-B
SPN138E6SD-B SPN138E4SD-B SPN138E6AD-B SPN138E4AD-B SPN138E6ED-B SPN138E4ED-B	SPZ138BZ12-B SPZ138BZ16-B	SPZ138BE12-B SPZ138BE16-B	SPZ138BS12-B SPZ138BS16-B

10.3 Installing clamping pins

NOTICE



Non-compliance may result in material damage.

The holding force of the product depends on the strength of the screw connection with which the clamping pin is connected to a workpiece, device or pallet.

It is not permitted to install the clamping pin using incorrect components, e.g., mounting screws that are too short.

- ▶ Only use original clamping pins from Zimmer Group GmbH.
- ▶ Make sure that the screw-in depth or thickness of the mounting material in the workpiece or pallet is sufficient.

NOTICE



Material damage and malfunction in case of non-compliance

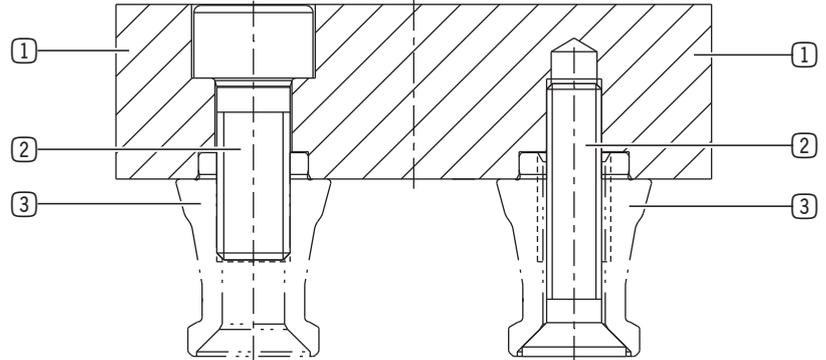
Zimmer Group GmbH is not liable for specially made devices or pallets that do not comply with the specifications described in these instructions.

The operator is responsible for ensuring functionality, accuracy and safety.

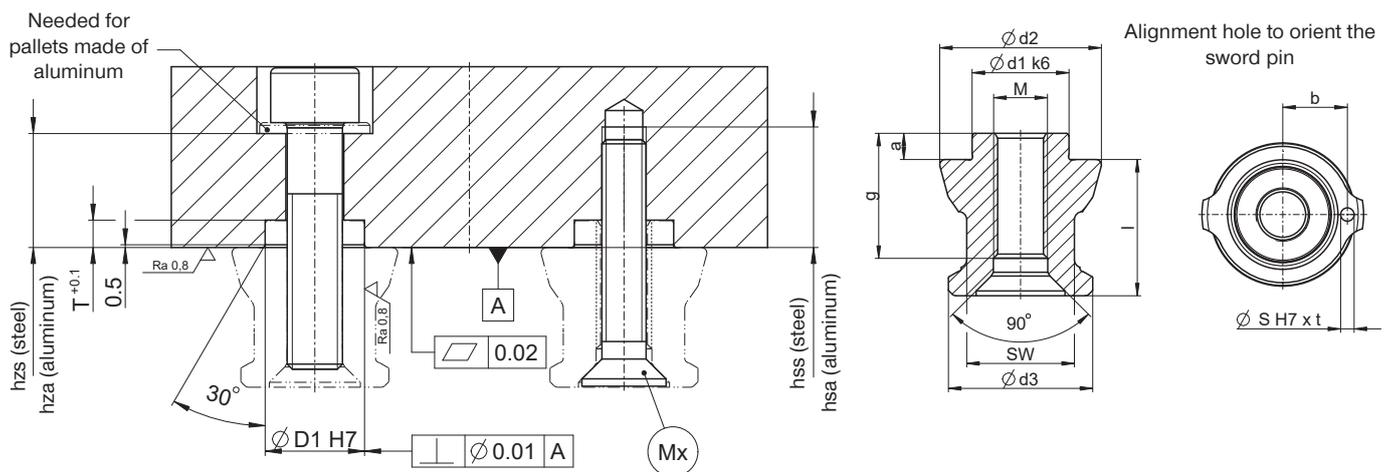
The prefabricated holes can be used for installation of the clamping pins on Zimmer Group GmbH pallets. For installation on other workpieces, devices or pallets, centering holes must be made for the clamping pins.

There are two ways to install the clamping pins.

- ▶ Use the drilling pattern for the mounting pins according to the chosen mounting variant for the workpiece or pallet.
- ▶ Take the installation recommendation into account.
- ▶ Install the clamping pins from above or below to the workpiece or pallet with the correct mounting screws.



- ① Workpiece/Pallet
- ② Mounting screw
- ③ Clamping pins



Technical data (general tolerances in accordance with ISO 2768-m)			
Order number	SPZ062BZ08-B	SPZ062BE08-B	SPZ062BS08-B
Ød1 [mm]	12	12	12
Ød2 [mm]	17	16.85	17
Ød3 [mm]	14.3	14.3	14.3
ØD1 [mm]	12	12	12
a [mm]	2.9	2.9	2.9
g [mm]	12	12	12
b [mm]	7.25	7.25	7.25
S [mm]	1.5	1.5	1.5
t [mm]	1.5	1.5	1.5
l [mm]	19.5	19.5	19.5
SW [mm]	12	12	12
T [mm]	3	3	3
hzs min. [mm]	10	10	10
hza min. [mm]	15	15	15
hss min. [mm]	10	10	10
hsa min. [mm]	15	15	15
M*	M8	M8	M8
Mx**	M6	M6	M6

Technical data (general tolerances in accordance with ISO 2768-m)						
Order number	SPZ112BZ10-B	SPZ112BZ12-B	SPZ112BE10-B	SPZ112BE12-B	SPZ112BS10-B	SPZ112BS12-B
ØD1 [mm]	18	18	18	18	18	18
Ød2 [mm]	30	30	29.85	29.85	30	30
Ød3 [mm]	26.8	26.8	26.8	26.8	26.8	26.8
ØD1 [mm]	18	18	18	18	18	18
a [mm]	4.9	4.9	4.9	4.9	4.9	4.9
g [mm]	24	24	24	24	24	24
b [mm]	12	12	12	12	12	12
S [mm]	2.5	2.5	2.5	2.5	2.5	2.5
t [mm]	3	3	3	3	3	3
l [mm]	25.5	25.5	25.5	25.5	25.5	25.5
SW [mm]	20	20	20	20	20	20
T [mm]	5	5	5	5	5	5
hzs min. [mm]	15	15	15	15	15	15
hza min. [mm]	20	20	20	20	20	20
hss min. [mm]	15	15	15	15	15	15
hsa min. [mm]	25	25	25	25	25	25
M*	M10	M12	M10	M12	M10	M12
Mx**	M8	M10	M8	M10	M8	M10

Technical data (general tolerances in accordance with ISO 2768-m)						
Order number	SPZ138BZ12-B	SPZ138BZ16-B	SPZ138BE12-B	SPZ138BE16-B	SPZ138BS12-B	SPZ138BS16-B
Ød1 [mm]	25	25	25	25	25	25
Ød2 [mm]	35	35	34.85	34.85	35	35
Ød3 [mm]	31.2	31.2	31.2	31.2	31.2	31.2
ØD1 [mm]	25	25	25	25	25	25
a [mm]	4.9	4.9	4.9	4.9	4.9	4.9
g [mm]	29	29	29	29	29	29
b [mm]	15	15	15	15	15	15
S [mm]	2.5	2.5	2.5	2.5	2.5	2.5
t [mm]	3	3	3	3	3	3
l [mm]	32	32	32	32	32	32
SW [mm]	22	22	22	22	22	22
T [mm]	5	5	5	5	5	5
h _{zs} min. [mm]	20	20	20	20	20	20
h _{za} min. [mm]	25	25	25	25	25	25
h _{ss} min. [mm]	20	20	20	20	20	20
h _{sa} min. [mm]	30	30	30	30	30	30
M*	M12	M16	M12	M16	M12	M16
Mx**	M10	M12	M10	M12	M10	M12

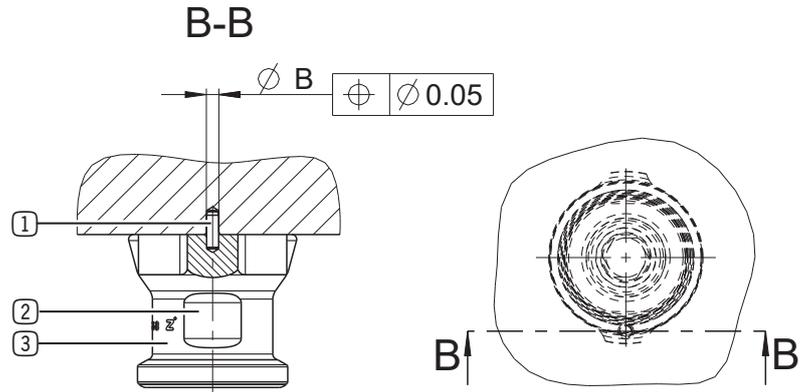
*ISO4762			**ISO10642		
Thread size	Strength class	Max. holding force [kN]	Thread size	Strength class	Max. holding force [kN]
M6	12.9	15	M6	12.9	12
M8	12.9	25	M8	12.9	20
M10	12.9	35	M10	12.9	28
M12	12.9	50	M12	12.9	40
M16	12.9	75	M16	12.9	60
M6	10.9	12	M6	10.9	9.5
M8	10.9	20	M8	10.9	16
M10	10.9	30	M10	10.9	24
M12	10.9	40	M12	10.9	32
M16	10.9	60	M16	10.9	48

10.3.1 Positioning the sword pins

The sword pins can be positioned using a straight pin.

- ▶ If you are using a straight pin, lock the clamping pins to the wrench flats with a flat wrench during installation.
- ⇒ The straight pin will not shear off.
- ▶ Note the dimensions indicated in the table.

- ① Straight pins
- ② Wrench flats
- ③ Clamping pins



Design size	Ø B [mm]
SPN062	1.6
SPN112	2.6
SPN138	2.6

10.3.2 Arranging the clamping pins

NOTICE



Non-compliance may result in material damage.

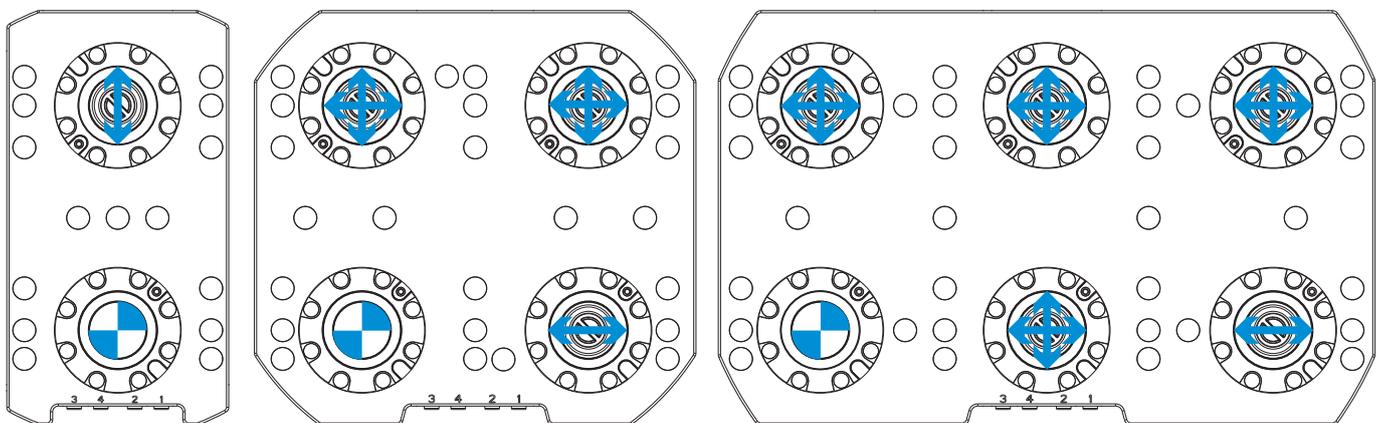
- ▶ Maintain a position tolerance of 0.03 mm when spacing the clamping pins.

INFORMATION



- ▶ You can find more information in the technical data sheet on our website.

Drawing	Pin	Degree of freedom
	Centering pin	No degree of freedom
	Sword pins	Degree of freedom in the direction of the arrow
	Retention pins	Degree of freedom in the direction of the arrow



10.3.3 Note the minimum diameter of the zero-point clamping system

NOTICE

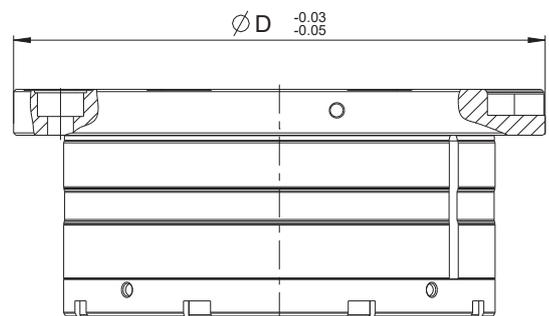


Malfunction in case of non-compliance

If the contact surface is not completely covered, the piston position sensing and positioning check may malfunction and dirt may enter the product.

- ▶ For customer-specific workpieces or pallets, make sure that the contact surface of the clamping plate is always completely covered.
- ▶ To do so, note the diameter of the zero-point clamping systems.

Design size	Ø D min. [mm]
SPN062	62
SPN112	112
SPN138	138



10.3.4 Tightening torques

INFORMATION



The tightening torques apply to screw connections in components made of 16MnCr5 material.

ISO4762			ISO10642		
Thread size	Strength class	Tightening torque [Nm]	Thread size	Strength class	Tightening torque [Nm]
M6	12.9	15	M6	12.9	12
M8	12.9	38	M8	12.9	29
M10	12.9	75	M10	12.9	57
M12	12.9	128	M12	12.9	99
M16	12.9	313	M16	12.9	183
M6	10.9	13	M6	10.9	10
M8	10.9	33	M8	10.9	25
M10	10.9	64	M10	10.9	49
M12	10.9	110	M12	10.9	84
M16	10.9	268	M16	10.9	156

10.4 Installing the automatic seal

WARNING

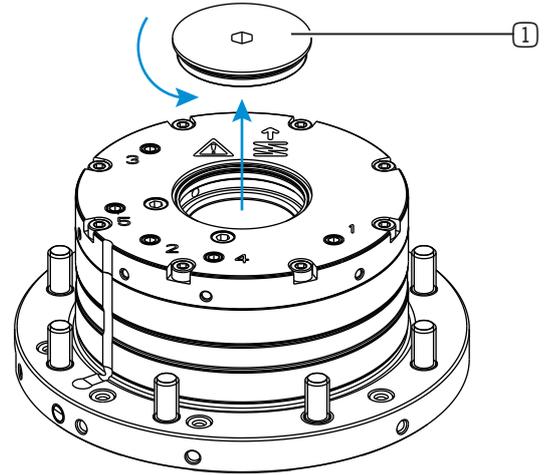


Risk of injury due to objects being ejected

Certain components are under constant spring tension. When removing certain components, springs can spring out uncontrollably and cause serious injuries.

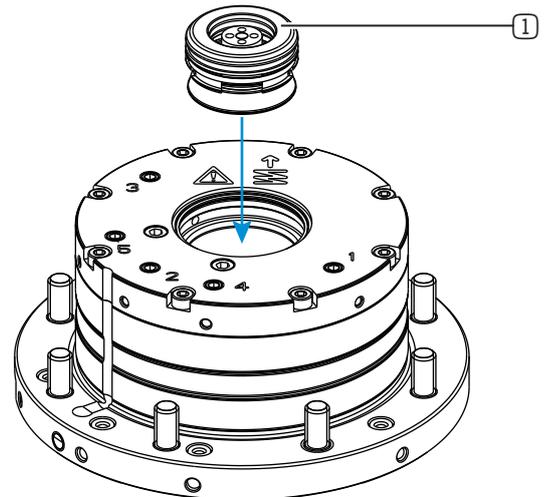
- ▶ Do not loosen the screws on the cover of the zero-point clamping system.
- ▶ Do not remove the cover.

- ▶ Make sure that the opening of the pin is free of foreign objects.
- ▶ Open the product with operating pressure.
- ▶ Remove the locking cover.



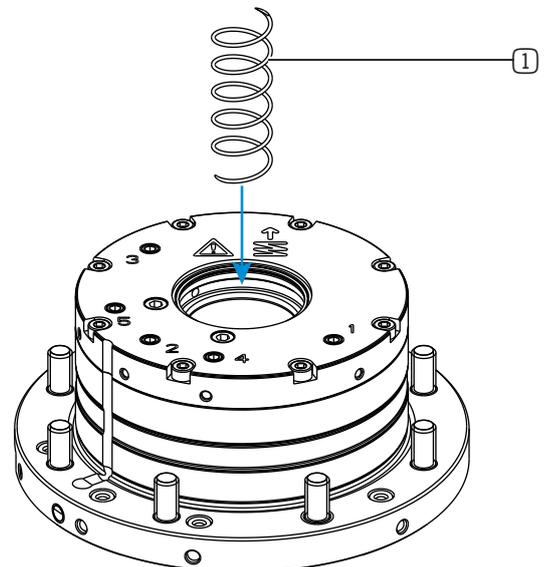
① Locking cover

- ▶ Slide the automatic seal with the seal ring into the lower end position in the product.



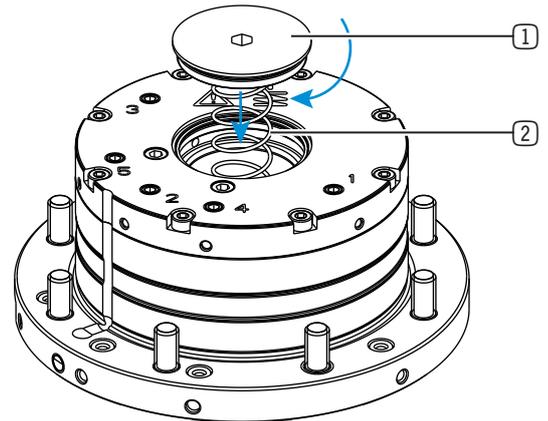
① Automatic seal

- ▶ Slide the pressure spring into the automatic seal.



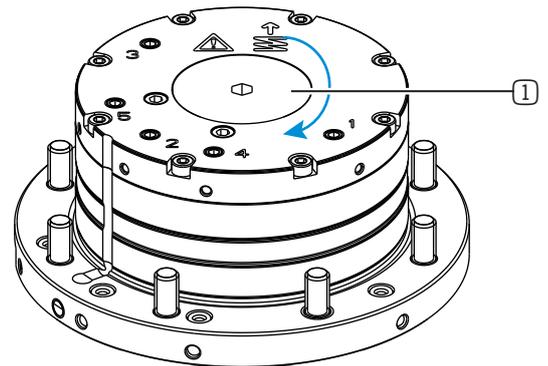
① Pressure spring

▶ Install the locking cover against the pre-load of the pressure spring.



- ① Locking cover
- ② Pressure spring

▶ Tighten the locking cover to 1 Nm.



- ① Locking cover

▶ Check the automatic seal by pressing it down manually with a clamping pin.

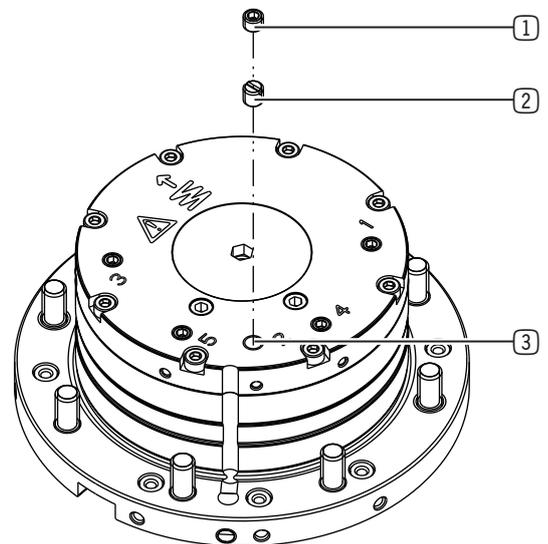
⇒ The automatic seal is installed correctly if it closes the opening of the pin independently when the clamping pin is removed.

10.4.1 Venting the piston chamber

When connecting the product, a complete ventilation of the piston chamber when clamping is only possible via the pneumatic connections.

- ▶ Release the valves or shut-off valves.
- ▶ If the PLUS connection is not used, install the filter to enable the piston chamber to be vented.
 - ▶ Remove the grub screw in the cover of the product.
 - ▶ Install the filter in the PLUS connection.
 - ▶ Make sure that the filter closes flush with the product.

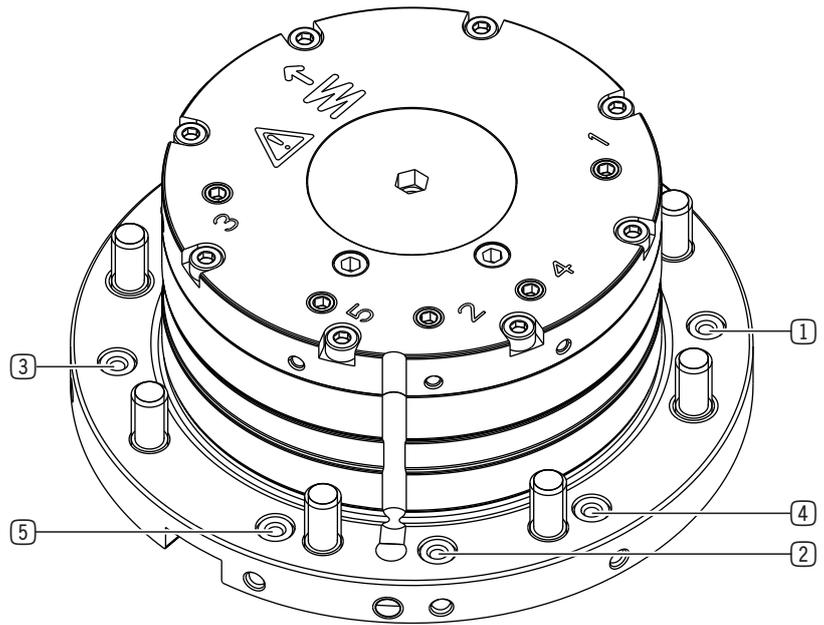
- ① Grub screw
- ② Filter
- ③ PLUS connection



10.4.2 Tubeless connection

The tubeless connection is used by default.

- For more information, refer to the "Installing the product" section.

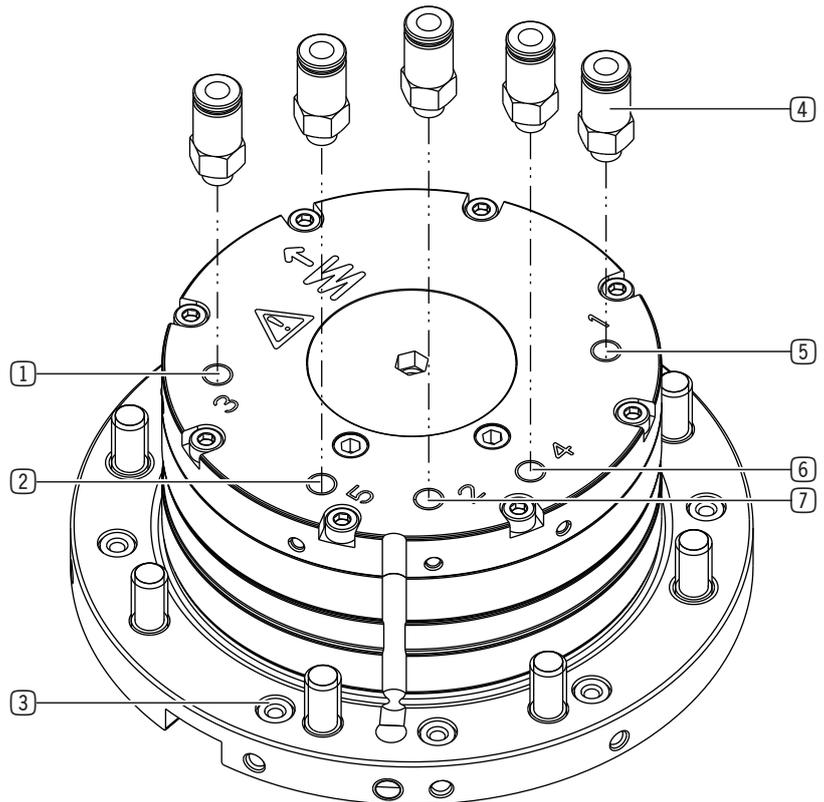


- ① Open
- ② PLUS connection
- ③ Blow-out/clean/positioning check
- ④ Connection 4 piston position sensing (AD)
- ⑤ Connection 5 piston position sensing (AD)

10.4.3 Tube connection

The tube connection is an alternative to the tubeless connection.

- Lubricate the O-rings.
- Unscrew the grub screws.
- Insert the O-rings into the tubeless connection.
- Install suitable pneumatic connections.
- Make sure that the mounting piece is sealed in the area of the alternative connections.
- If you are not using the PLUS connection, insert a filter.
 - Make sure that the filter closes flush with the product.
 - For more information, refer to the "Venting the piston chamber" section.
- Seal the alternative connections if the standard connections are to replace the alternative connections.



- ① Alternatively: Blow-out/clean/positioning check
- ② Alternatively: Connection 5 piston position sensing
- ③ O-ring
- ④ Pneumatic connection (AD)
- ⑤ Alternatively: Connection 4 piston position sensing (AD)
- ⑥ Alternatively: Open
- ⑦ Alternatively: PLUS connection

10.5 Installing the sensors (ED)

NOTICE



Non-compliance may result in material damage.

Cables must be installed with sufficient length.

- ▶ Ensure that the cables cannot be pinched, crushed, or torn off within the movement and swivel ranges.

INFORMATION



The sensors are available as accessories.

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

10.5.1 Adjusting the magnetic field sensors

NOTICE

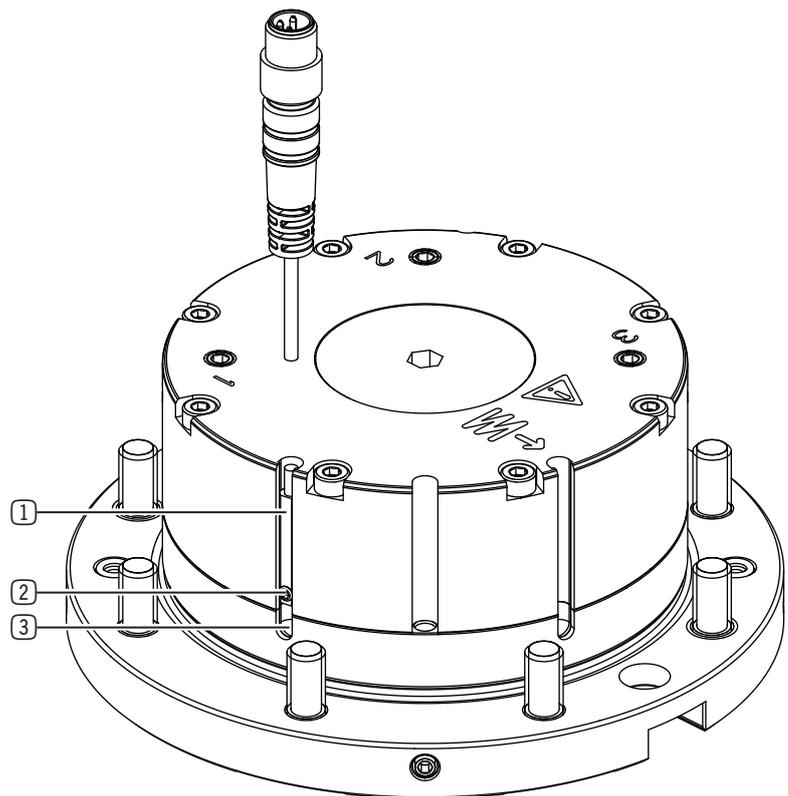


Material damage caused by magnetic influences

- ▶ Note that switching point shifts may occur if the sensors are exposed to an additional, external magnetic field.
- ▶ Do not attach magnets or components with ferromagnetic properties in the vicinity of components that may be affected by them.

10.5.1.1 Sensing: Product open

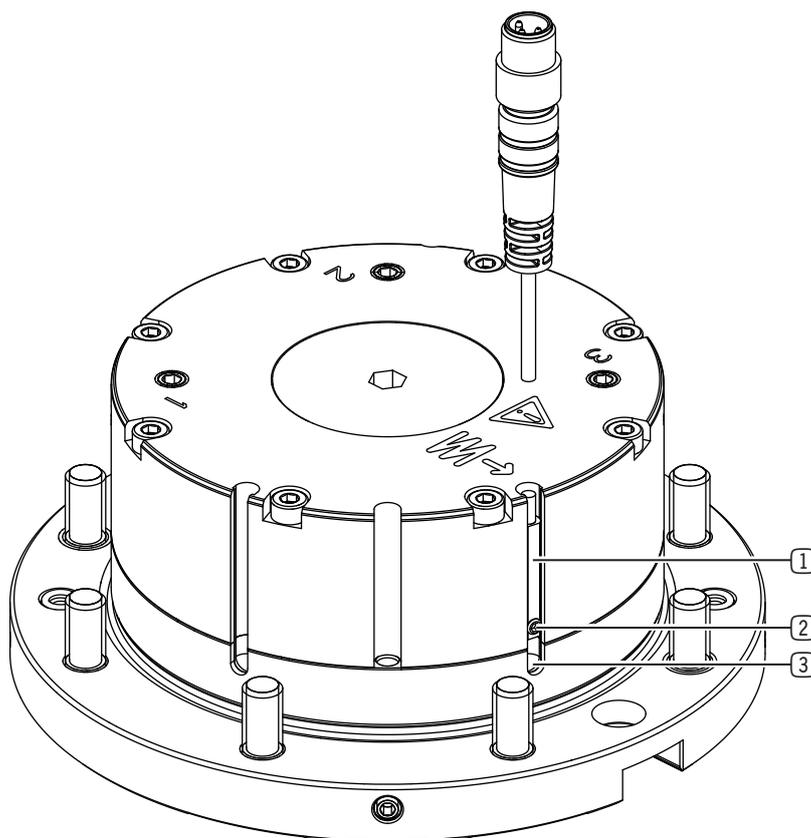
- ▶ Move the product to the *Product opened* position.
- ▶ Slide the sensor into the sensor slot until it switches.
- ▶ Tighten the mounting screw using an Allen key.
- ▶ Test whether the sensor detects that the product is opened.



- ① Sensor
- ② Mounting screw
- ③ Sensor slot

10.5.1.2 Sensing: Product clamped with pin

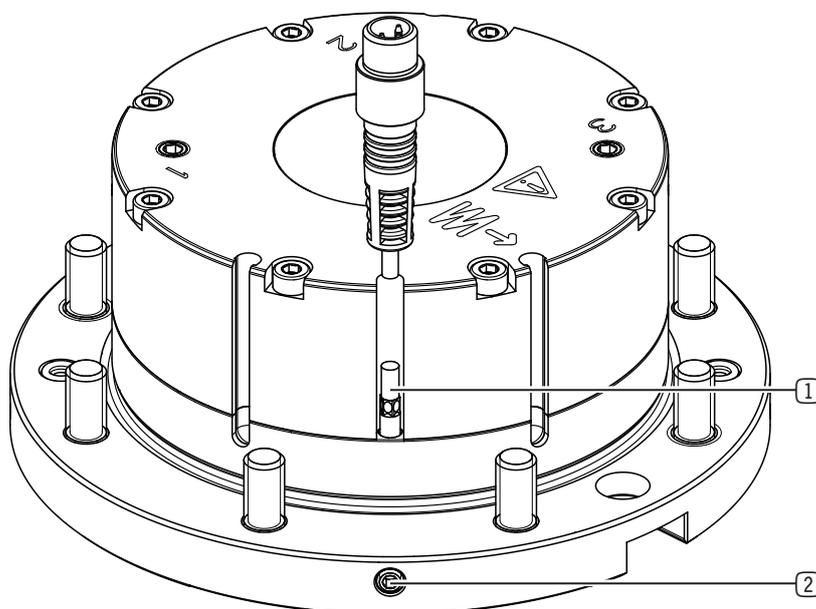
- ▶ Clamp the product.
 - ▶ Please note that the product must be clamped with PLUS when using the PLUS function.
- ▶ Push the sensor as far as it will go to the end stop in the sensor slot.
- ▶ Slide the sensor back slowly until it switches.
- ▶ Tighten the mounting screw using an Allen key.
- ▶ Test whether the sensor detects that the product is clamped with the pin.



- ① Sensor
- ② Mounting screw
- ③ Sensor slot

10.5.2 Setting the inductive sensors

- ▶ Carefully push the sensor into the hole until it rests against the cover cap.
- ▶ Set the switching point of the sensor so that the signal only occurs when the workpiece or pallet is correctly positioned.
- ▶ Tighten the grub screw with an Allen key to secure the sensor in the hole.
- ▶ Test whether the sensor detects that the workpiece or pallet is correctly positioned on the product.



- ① Sensor
- ② Grub screw

10.6 Installing the energy supply

NOTICE



Non-compliance may result in material damage.

- ▶ For more information refer to the pneumatic diagram.
 - ▶ For more information, refer to the pneumatic diagram in the Appendix.
- ▶ 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.
- ▶ Use compressed air in accordance with DIN ISO 8573-1 [7:4:4].

INFORMATION



The filter is included in the scope of delivery.

11 Commissioning

11.1 Checking operational readiness

- ▶ Visually inspect all connections.
- ▶ Check all connections for leaks.
- ▶ Check all mounting screws for the prescribed tightening torque.

12 Operation

- ▶ Thoroughly clean the contact surface of the product as well as the contact surfaces of the clamping pins and the clamping material before clamping.
- ▶ Make sure that the entire contact surface of the product is covered.
- ▶ Secure the product against unintentional loosening during operation.
- ▶ Protect the pin holder from dirt when the product is not in use.
 - ▶ Use accessories such as the locking bolt or the automatic seal.

13 Maintenance

CAUTION



Risk of injury in case of non-compliance

A flawless condition is a requirement for the safety of the product.

- ▶ Take the product immediately out of operation if there is any visible damage or signs of malfunctions.
- ▶ Replace any worn components.
- ▶ Do not put the product into operation again until the damage has been repaired.

NOTICE



Material damage caused by unsuitable cleaning materials

Seals, insulation, coatings and other surfaces may be damaged by solvent-based cleaning agents.

- ▶ Make sure that no liquids penetrate the product.
- ▶ Use chemically and biologically neutral cleaning agents.
- ▶ Use cleaning agents that are categorized as being nonhazardous to health.
- ▶ Use soft, lint-free cloths for cleaning the surface.

The use of the following cleaning agents is strictly prohibited:

- Acetone
- Cleaning solvent
- Nitrocellulose thinner/turpentine oil (solvents)

Maintenance-free operation of the product is guaranteed for up to 3 million cycles.

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

- Operation with impermissible compressed air
- Operation without or with a dirty air filter
- Dirty clamping pin
- Improper use and use that does not comply with the performance data
- 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.

Interval	Maintenance work
After 10,000 cycles or every 3 weeks	<ul style="list-style-type: none"> ▶ Visually inspect all components. ▶ Clean the product if it is dirty. ▶ Check the tightening torques of all mounting screws. ▶ Replace damaged products.

14 Error diagnosis

NOTICE



Malfunction in case of non-compliance

If the contact surface is not completely covered, the piston position sensing and positioning check may malfunction and dirt may enter the product.

- ▶ For customer-specific workpieces or pallets, make sure that the contact surface of the clamping plate is always completely covered.
- ▶ To do so, note the diameter of the zero-point clamping systems.

Error	Possible cause	Measure
Product does not open.	<ul style="list-style-type: none"> • Operating pressure is too low. • Leakages, blockages or crushed power supply lines • Excess force is acting upon the clamping pin. • Piston does not move. 	<ul style="list-style-type: none"> ▶ Apply the corresponding operating pressure to the product. ▶ Check the pneumatics. ▶ Reduce the tensile load or compressive load on the product. ▶ Vent the product via the PLUS connection.
Product has a delay when opening.	<ul style="list-style-type: none"> • Valve is too small. • Supply lines too long 	<ul style="list-style-type: none"> ▶ Use a larger valve. ▶ Keep the supply lines as short as possible or ensure a sufficiently large cross-section.
Air leak or blow-off noise	• Leakage	▶ Check the pneumatics.
	• Installation error	<ul style="list-style-type: none"> ▶ Re-install the product. ▶ Check the seals. ▶ Check the pneumatics. ▶ Open and close the product multiple times.
Dimensional deviations/chatter marks	• Centering pin is not correctly retracted.	▶ Clean the product.
	• Product is dirty.	▶ Clean the product.
	• Product is worn.	▶ Replace the product.

15 Decommissioning/disposal

INFORMATION



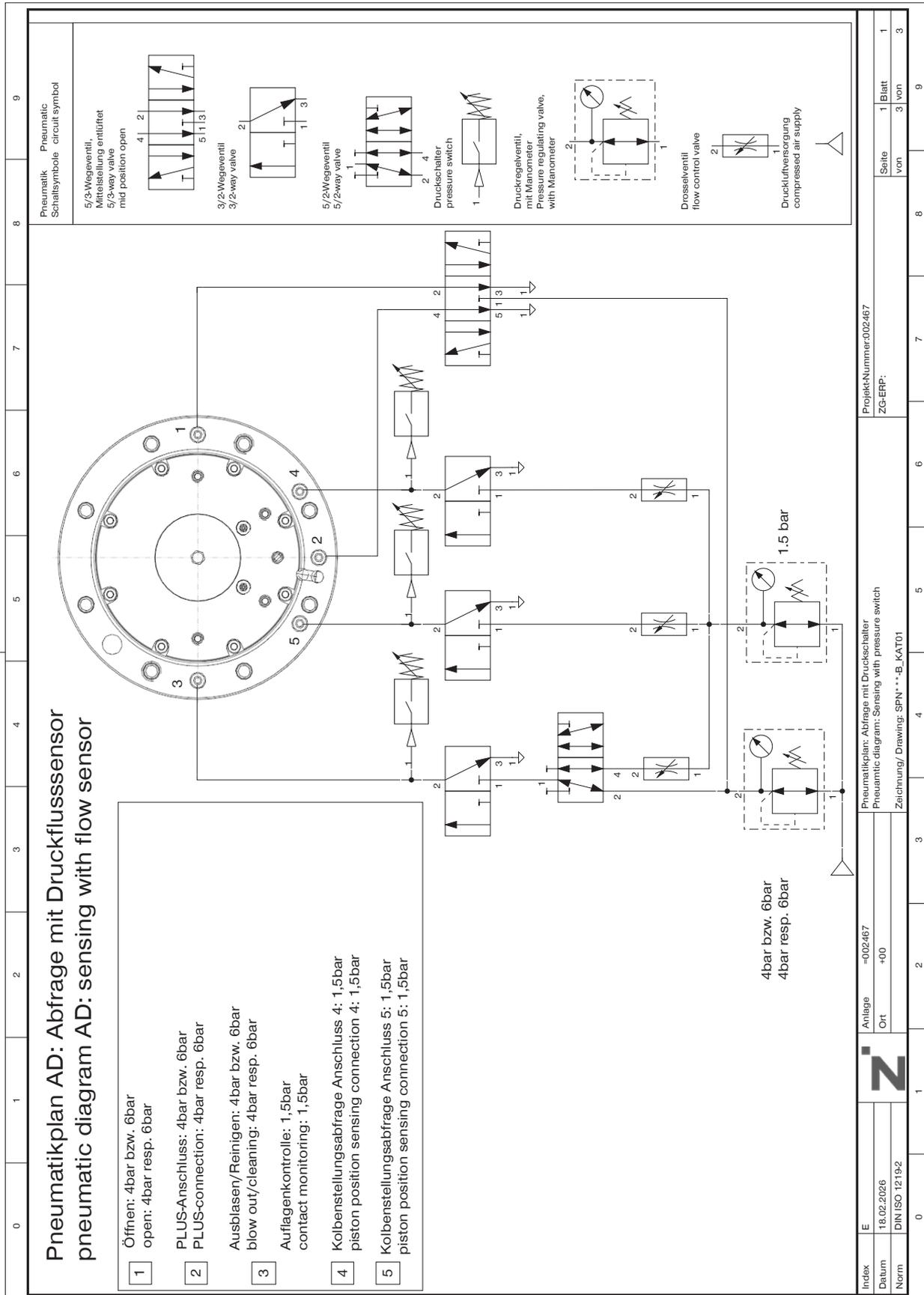
When the product reaches the end of its operational phase, it can be completely disassembled and disposed of.

- ▶ 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.

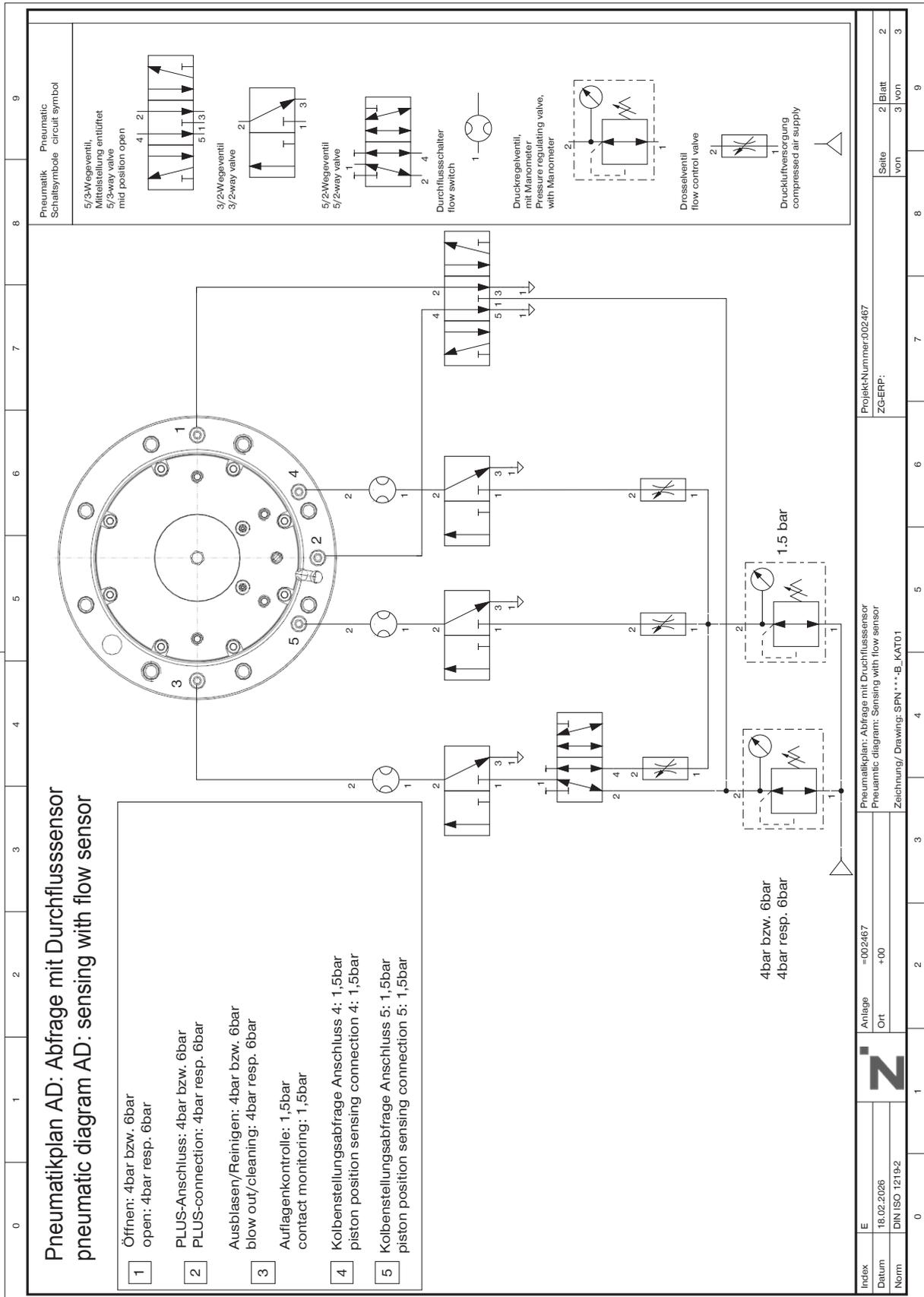
16 Appendix

16.1 Pneumatic diagrams

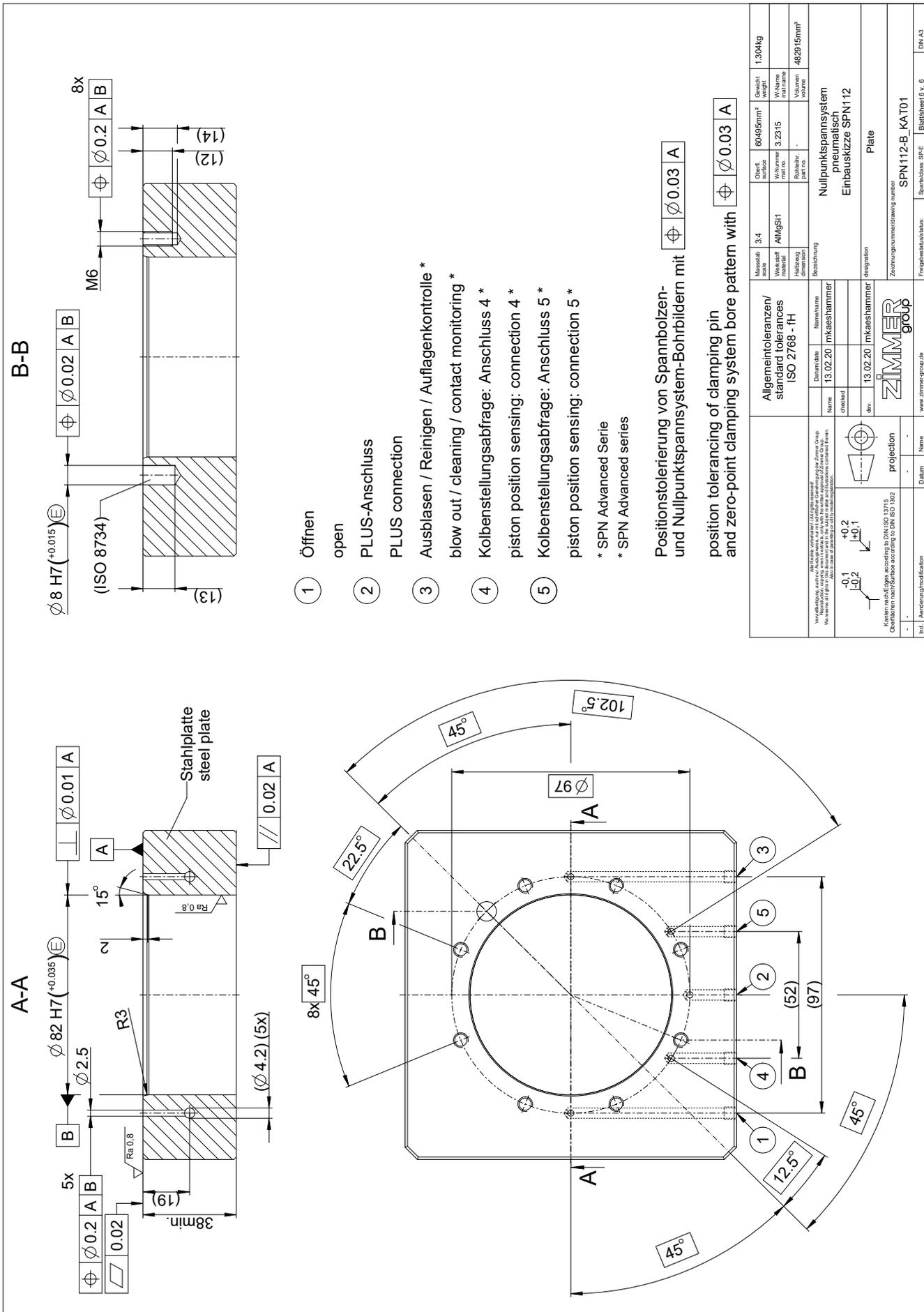
16.1.1 Pneumatic diagram AD – sensing with pressure switch



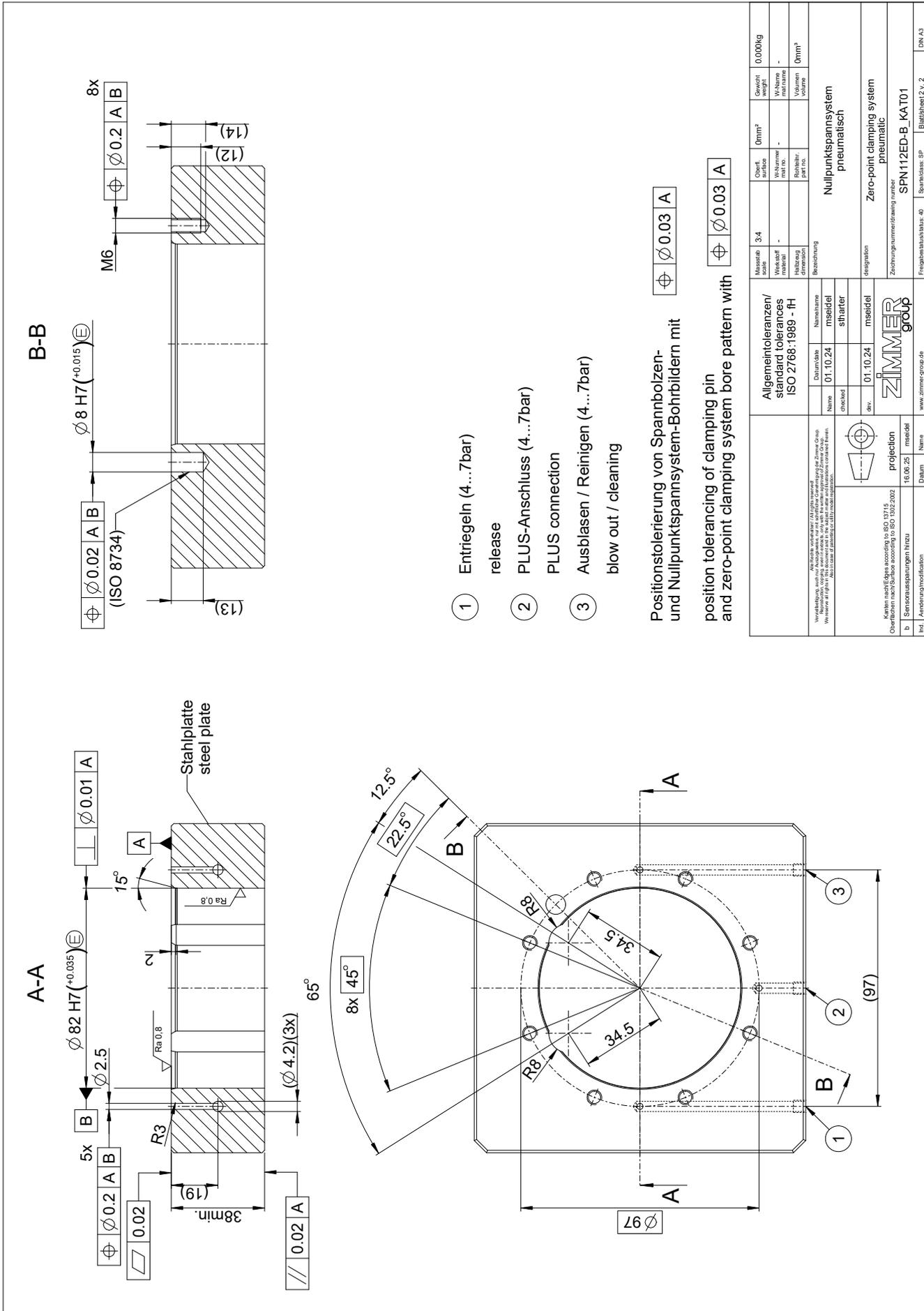
16.1.2 Pneumatic diagram AD – sensing with flow sensor



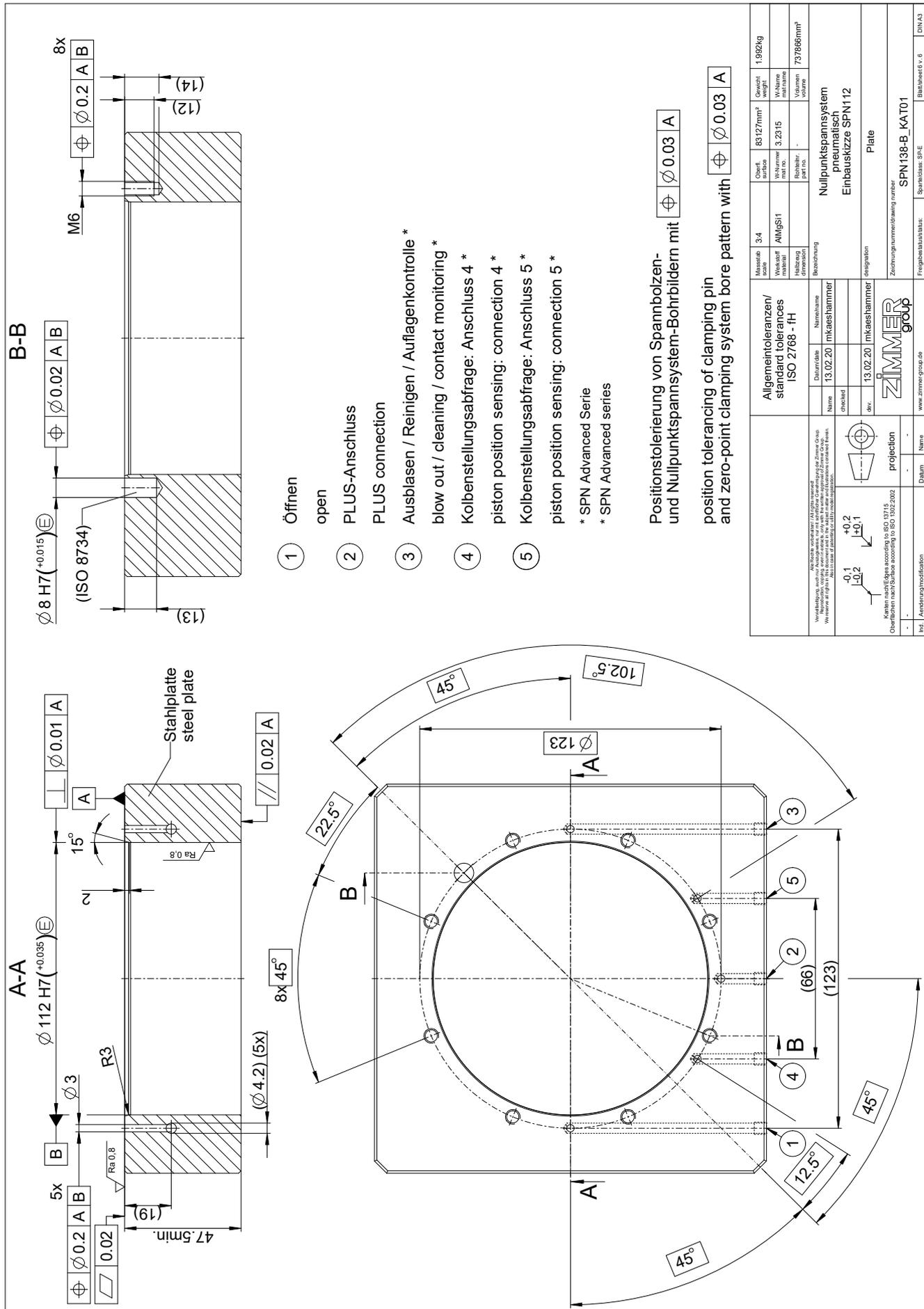
16.2.3 Installation drawing SPN112 AD, SD



16.2.4 Installation drawing SPN112 ED



16.2.5 Installation drawing SPN138 AD, SD



17 Declaration of Conformity

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

Name and address of the manufacturer:

Zimmer Group GmbH

📍 Am Glockenloch 2
77866 Rheinau, Germany

☎ +49 7844 9138 0

✉ info@zimmer-group.com

🌐 www.zimmer-group.com

We hereby declare that the product described below

Product designation: Zero-point clamping system

Type designation: SPN

conforms to the requirements of the 2006/42/EC directive in its design and the version we put on the market.

The following harmonized standards have been used:

DIN EN ISO 12100 Safety of machinery - General principles for design - Risk assessment and risk reduction

DIN EN ISO 13849-1/-2 Safety of machinery - Safety-related parts of control systems

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

Michael Hoch

Authorized representative for the compilation of relevant technical documents

Rheinau, Germany, 2020-03-31

(Place and date of issuance)



Martin Zimmer
(Legally binding signature)
Managing Partner