

INSTALLATION AND OPERATING INSTRUCTIONS

Pallet changer

SPP series

DDOC01627

THE KNOW-HOW FACTORY



www.zimmer-group.com



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1 Supporting documents

NOTICE



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

In these installation and operating instructions, "product" replaces 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.

 \Rightarrow 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.
- \Rightarrow 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.

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

NOTICE

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

INFORMATION



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

2 Safety notices

WARNING



Risk of injury during manual loading

Risk of injury due to parts moving independently after the power supply has failed or is switched off (including an emergency stop).

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

Risk of injury due to parts moving independently after accidental or careless actuation of the release actuation.

- ▶ Do not insert a clamping pin into a clamped product.
- ▶ Do not place a clamping pin onto a clamped product.

CAUTION



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, retrofitting 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.
- Note that, due to the spring tension, you should exercise increased caution when uninstalling products with integrated springs.



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 to be used in closed rooms for time-limited handling and holding pallet couplings or clamping pins with tools mounted.

The product is designed exclusively for operation within the parameter limits and operating conditions stipulated in the order confirmation.

The product has been developed for use in commercial or industrial applications.

For questions regarding use outside of the stipulated parameters, please contact Zimmer Customer Service.

4 Personnel qualification

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

5 Product description

5.1 Type plate

There is a laser engraving in the housing of the product.

The laser engraving includes the part number and confirmation number.

01 Part number

(2) Confirmation number





6 Functional description

The product was designed for clamping pallet couplings or clamping pins with high repeat accuracy. Due to its structural design, the system is clamped without pneumatic pressure applied.

The product is adapted to the clamping contour of the clamping pin. The resulting surface contact creates a rigid system that can absorb high forces and torques.

The product has two rotation locks for pallet coupling. If the pallet coupling is not used, the drilling pattern can be used as an alternative rotation lock.

The pallet coupling acts as an interface between the product and the pallet. The rotation lock enables positioning when joining with the product.

Safe operation can be verified by sensors by means of piston position sensing and clamping pin sensing.

All functions can be controlled directly via the standard connections on the sides with threads through pneumatic connections. There is also the option to control the product by means of alternative connections on the bottom of the product.



- 1 Rotation lock
- 2 Alternative rotation lock
- 3 Open
- 4 Blow out/clean
- 5 PLUS connection

6.1 Open

The product is opened when the connection to open the product is supplied with compressed air. The pallet can be removed from or inserted into the clamping plate via the adapted pallet coupling.

The product can be controlled via the M5 connection on the side or a tubeless connection on the bottom side.

Seal the unconnected connection so that it is pressure-tight using an M5 locking screw or an M3 grub screw (on the bottom side), see chapter "Mounting the energy supply system".



6.2 PLUS connection

NOTICE

For dynamic applications, it is recommended to use the product with a pulse at the PLUS connection.

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

The form-fit lock cannot be released until the opening connection is actuated, the clamping piston is pressurized and the PLUS connection is simultaneously vented.

6.3 Blowing out/cleaning

The blow-out or cleaning function prevents dirt and/or liquid from collecting in the pin holder, contact surface and rotation locks.

Both connections must be actuated with compressed air for complete function of the blow-out or cleaning function.

The forced air stream escapes at the contact surfaces on the product.

Air is supplied from two hose lines to a connected duct system. Using two pressure lines increases the volume of escaping air. If the function is controlled with just one hose line, then the open air connection must be closed with a locking screw.

It is recommended that you activate it when the pallet changer approaches the pallet coupling. This will clean both components of soiling and chips.

- ▶ Use a pressure of maximum 6 bar to control the product.
- Switch the compressed air off again immediately before the pallet coupling is completely locked in the pallet changer, since otherwise an air cushion might form.

The pallet changer can be controlled via the M5 connection on the side or a tubeless connection on the bottom side.

Seal the unconnected connection so that it is pressure-tight using an M5 locking screw or an M3 grub screw (on the bottom side), see chapter "Mounting the energy supply system".

6.4 Locking safety in the event of a power failure

INFORMATION

A spring package acts as an energy store and preserves the ability of the pallet changer to be locked in the event of a power failure or interruption.

Please contact Zimmer Customer Service if you have any questions.

7 Technical data

INFORMATION

► For information, refer to the technical data sheet.

Please contact Zimmer Customer Service if you have any questions.

INSTALLATION AND OPERATING INSTRUCTIONS: SPP

8 Accessories/scope of delivery

INFORMATION



- If any accessories not sold or authorized by Zimmer GmbH are used, the function of the product cannot be guaranteed. The accessories from Zimmer GmbH are specifically tailored to the individual products.
- For information on optional accessories and those included in the scope of delivery, refer to the technical data sheet.

9 Transportation/storage/preservation

- Store the product in its original packaging.
- During transport, make sure that no uncontrolled movements can occur if the product is already mounted on the higher-level machine unit.
 - Prior to commissioning and after transport, check all power and communication connections as well as all mechanical connections.
- Observe the following points when storing the product for longer periods of time:
 - Keep the storage location as dust-free and dry as possible.
 - ► Observe the temperature range and avoid temperature fluctuations.
- ▶ Clean all components until all contamination has been removed.
- Seal pneumatic connections with suitable covers.



10 Installation



Risk of injury due to uncontrolled movement

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

- 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.

WARNING



Risk of injury due to objects being ejected

Spring-loaded components can jump out when installing or uninstalling the device.

► Do not remove the cover.

CAUTION



Risk of injury due to uncontrolled movement

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 product before all work.
- Secure the power supply against being switched on unintentionally.
- Check the product 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.

NOTICE

- Mount the product on the mounting piece before applying compressed air to it.
- Install the product on an appropriate mounting surface in accordance with the flatness specifications.

INFORMATION



- Requirements for the mounting surface:
- Permitted flatness deviation: 0.03 mm
- Comply with the tightening torques of the mounting screws.
 - The tightening torque of the mounting screws depends on the mounting piece.
- Verify the permitted load capacity of the required screw connections in accordance with VDI 2230.
- Check the product for possible transport damage before installation.

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10.1 Installing the product

INFORMATION

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Further installation information:

- Mounting screws, cover caps, centering sleeves and filters are included in the scope of delivery.
- Strength class of the mounting screws 10.9 (DIN EN ISO 4762)
- Comply with the maximum tightening torque of e.g. 32 Nm with a 16MnCr5 steel mounting piece.
- Insert the product into the intended position on the mounting piece.
 - Make sure that the centering sleeves are positioned correctly.
- 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.
- Attach the cover caps.



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(2)

3

(4)

5

6

7

8

Open

Blow out/clean

Mounting screw

PLUS connection

Centering sleeve

Mounting piece

Alternative centering sleeve

Cover cap



10.1.1 Mounting piece



The mounting piece must be at least 159 mm wide.

The mounting piece must be at least 60 mm tall.



- 1 Centering sleeve
- 2 Alternative centering sleeve
- ③ Mounting screw

4 Width of the mounting piece

5 Height of the mounting piece

10.2 Mounting the pallet coupling

INFORMATION

- Further installation information:
- Mounting screws, cover caps, centering sleeves and filters are included in the scope of delivery.
- The shim ring is only included in the scope of delivery for the SPP138KA-B.
- Strength class of the mounting screw 12.9 (DIN EN ISO 4762)
- Comply with the maximum tightening torque.

Installation size	Material coupling	Tightening torque [Nm]
SPP138KA-B	Aluminum	187
SPP138KS-B	Steel	310

Mount the clamping pin on the shim ring and the mounting screw on the pallet coupling.

- 1 Mounting screw
- 2 Shim ring (SPP138KA-B)
- 3 Clamping pins

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(2)

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INFORMATION

- Further installation information:
 - Strength class of the mounting screws is at least 12.9 (DIN EN ISO 4762) •
 - Comply with the maximum tightening torque of 82 Nm.
- Center the pallet coupling on the pallet using the centering sleeves.
- Secure the pallet coupling on the pallet using the fastening elements. ►
- Mount the pallet coupling on the pallet using the mounting screws.



(1)Pallet

- 2 Fastening element
- 3 Centering sleeve
- (4) Mounting screw

10.2.1.1 Pallet

It is recommended that you use the drilling pattern to connect the pallet coupling to the pallet.



- 1 Fastening element
- 2 Mounting screw
- 3 Centering sleeve



10.2.1 Alternative connection options for pallets

NOTICE

Malfunction and material damage in case of non-compliance

When replacing only the clamping pin, the required full-surface planar support is not achieved at the exchange interface.

Ensure that the alternative pallet connection completely covers the interface.

NOTICE



Clamping pins

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

- Only use original clamping pins from Zimmer GmbH.
- When using the clamping pin in customer-specific pallet couplings, make sure that the screw-in depth or thickness of the clamping pin is sufficient and that there is sufficient mounting material thickness in the adapter bar of the pallet coupling.

With pallet couplings, it is not permitted to install the clamping pin using incorrect components, e.g., a mounting screw that is too short.

When using customer-specific devices, workpieces or pallets, make sure that the contact surface is large enough to completely cover the contact surface of the product.

INFORMATION

- Check the permitted load capacity of the alternative pallet connection.
- Verify the permitted load capacity of the required clamping pin screw connections in accordance with VDI 2230.

INFORMATION



When using the alternative pallet connection, the drilling pattern of the locating bolt must be adjusted to the clamping pin.

More installation information on the clamping pin:

- Mounting screw with thread size M16
- Strength class of the mounting screws 12.9 (DIN EN ISO 4762)
- Comply with the maximum tightening torque.

There are two ways to install the clamping pin:

- Use the thread of the clamping pin for a rear screw connection.
- Use the thread in the pallet for a frontal screw connection with an ISO 10642 countersunk screw.
- In the alternative pallet connection, use the drilling pattern of the locating bolts and the installation recommendation of the clamping pin.
- 1 Clamping pin
- 2 Locating bolt
- 3 Alternative pallet connection



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10.2.1.1 Clamping pins



Make sure that the length of the thread M does not exceed dimension g.

T +0.1

Order No.	SPZ138BZ16-B
Ø d1 [mm]	25
Ø d2 [mm]	35
Ø d3 [mm]	31.2
Ø D1 [mm]	25
a [mm]	4.9
g [mm]	29
l [mm]	32
SW [mm]	22
D [mm]	5
Μ	M16
Mx	M12





10.3 Installing the power supply

NOTICE

- ► For more information, refer to the pneumatic diagram.
- ► For more information refer to the technical data sheet.
- Close off unused connections using suitable dummy plugs.
- Use compressed air in accordance with DIN ISO 8573-1 [4:4:4].

INFORMATION



The filter is included in the scope of delivery.

10.3.1 Venting the piston chamber

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

► Release the valves or shut-off valves.

If the PLUS connection is not used, the filter must be installed 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.

10.3.2 Tube connection

- ► Unscrew the grub screws.
- Install suitable pneumatic connections.
- 1 Open
- 2 Blow out/clean
- ③ PLUS connection
- 4 Filter
- 5 Pneumatic connection



10.3.3 Tubeless connection

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- Lock the thread tightly to the tube connection
- Make sure that the mounting piece is sealed in the area of the alternative connections.
- If the PLUS connection is not in use, insert a filter into the connection.
 - Make sure that the filter closes flush with the product.
- Seal the alternative connections if the standard connections are to replace the alternative connections.
- 1 Alternatively: Open
- 2 Alternatively: Blow out/clean
- 3 Alternatively: PLUS connection





10.4 Installing the sensors



- 1 Sensing 5: Product is clamped and closed
- 2 Sensing 6: Clamping pins present
- 3 Sensing 4: Product open

10.4.1 Standard circuit diagram

Piston position sensor:

- Product open
- Product clamped
- Product closed: no clamping pins clamped
- Clamping pin sensing:
- Clamping pins present

Sensing	Product open	Product clamped	Product closed
4	1	0	0
5	0	1	0
6	0	1	0

0 = Sensor does not switch

1 = Sensor switches

10.4.2 Alternative circuit diagram

Piston position sensor:

- Product open
- Product is clamped and closed
- Clamping pin sensing:
- Clamping pins present

Sensing	Product open	Product clamped	Product closed
4	1	0	0
5	0	1	1
6	0	1	0

0 = Sensor does not switch

1 = Sensor switches

10.4.3 Mounting the magnetic field sensor

INFORMATION



For further information, refer to the installation and operating instructions for the MFS01-S-KHC-P1-PNP sensor on our website.

The sensors can be set to the following sensing.

INSTALLATION AND OPERATING INSTRUCTIONS: SPP

10.4.3.1 Sensing: Product open

- Move the product into the "Product opened" position.
- Slide the sensor into the groove until it switches.
- Tighten the mounting screw using the Allen key.
- Test whether the sensor detects that the product is opened.

	Dimension [mm]	
Х	approx. 15	

- 1 Groove
- 2 Mounting screw
- 3 Sensor

10.4.3.2 Sensing: Product clamped to pallet coupling

- Clamp the pallet coupling.
 - When using the PLUS function, the pallet coupling must be clamped with PLUS.
- Push the sensor as far as it will go to the end stop in the groove.
- Slide the sensor back slowly until it switches.
- Tighten the mounting screw using the Allen key.
- Test whether the sensor detects that the product is clamped to the pallet coupling.

Dimension [mm]
approx. 18

Alternative circuit diagram:

Y

- Move the product into the "Product closed" position.
- Slide the sensor into the groove until it switches.
- Tighten the mounting screw using the Allen key.
- Test whether the sensor detects that the product is clamped or closed.

Dimension [mm]	
approx. 20	

- 1 Mounting screw
- 2 Groove

Υ

3 Sensor









10.4.4 Mounting the inductive sensor

The inductive sensor checks for the presence of the clamping pin in the pallet coupling.



NOTICE



Adjust the switch point of the proximity sensor so that the signal only detects the clamping pin when the clamping pin is completely in the locking area.

11 Commissioning

11.1 Checking operational readiness

- After the product has been properly installed, check the following properties to verify that it is ready to be operated:
 - Check the pneumatic connections for leaks by looking and listening.
 - Check all mounting screws for their prescribed tightening torque.
 - Check the product for leaks while it is pressurized by looking and listening.

12 Operation

- ▶ To clean the contact surfaces between the pallet changer and the pallet coupling, use the integrated blow-out function.
- Protect the opening of the pin from dirt when the product is not in use.
- During operation, secure the product against unintentional loosening.

12.1 Piston position sensor

INFORMATION



The operator of the product has sole responsibility for piston position sensing.

The entire contact surface of the product must be covered to ensure correct sensing during the piston position sensing.

Please contact Zimmer Customer Service if you have any questions.



13 Maintenance

CAUTION

Material damage resulting from blowing out with compressed air

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

CAUTION

Material damage caused by liquid and solvent-based cleaning agents

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

NOTICE



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.

The maintenance interval depends on the respective application. The higher the strain, the more frequently maintenance must be carried out.

- ► Have maintenance work be performed by Zimmer Customer Service whenever possible.
- ⇒ Dismantling and reassembling the product without authorization may result in complications, as special installation equipment is required in some cases. Zimmer GmbH accepts no liability for any resulting malfunctions or damage.

Interval	Maintenance work
After 10,000 cycles or every 3 weeks	 Visual inspection The visual inspection merely involves visually inspecting component parts and their function. If any irregularities or damage are identified during the visual inspection, a more detailed check of the component parts must be carried out. Carry out a visual inspection.
	Clean the product if it is dirty.
	Check the screw fitting of the clamping pin of the pallet coupling for a secure hold.
After 50,000 cycles or every year	Clamping force measurement
	Measure the clamping force.
	• Suitable devices for measuring the clamping force are available as accessories.
	\Rightarrow If the clamping force falls short by less than 15%:
	Further use of the product is at your own discretion.
	Or allow Zimmer GmbH to perform a check.
	\Rightarrow If the clamping force falls short by more than 15%:
	Allow Zimmer GmbH to perform a check.

14 Error diagnosis



Malfunction due to contamination

When dirt penetrates the product, this can lead to malfunctions.

Always completely cover the contact surface of the product.

Error/fault	Cause	Measure
Product does not open.	 Operating pressure is too low Leakage/blockage/pinching of the power supply lines 	 Increase the operating pressure (4.5 to 7 bar). Check the supply lines.
	• There is too much load acting upon the clamping pin.	Reduce the load on the product.
	Clamping piston does not move.	Vent the PLUS connection.
Long response time (too little air is fed in)	Valve is too small (product opens after a delay)	 Select a larger valve.
	Power supply lines from the valve to the product are too long (product opens after a delay)	Shorten the supply lines.
		Keep the distance of the product to the valve as short as possible.
		 Increase the cross section of the supply lines.
Air leak or blow-off noise	Housing parts are leaky.	 Realign the product.
	Installation error	Re-install the product.
		Check the pneumatic connections and sealing locations.
		 Open and close the product multiple times.
	Connecting cables are leaky.	Check the supply lines.

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 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

- **L** +49 7844 9138 0
- ⊠ info@zimmer-group.com
- www.zimmer-group.com

We hereby declare that the incomplete machine described below

Product designation:	Pallet changer
Type designation:	SPP series

conforms 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. 1.5.1, No. 1.5.3, No. 1.5.4, No. 1.6.4, No. 1.7.1, No. 1.7.3.

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.

Commissioning of the incomplete machine is prohibited until it has been found that – where applicable – the machine in which the above-mentioned incomplete machine is to be installed complies with the Machinery Directive (2006/42/ EC) and an EC Declaration of Conformity has been drawn up in accordance with Annex II 1 A.

Clemens Kimmig

Rheinau, Germany, 2022-05-05

Authorized representative for compiling the relevant technical documents

(Place and date of issue)

Veasti (+.

Martin Zimmer (Legally binding signature) Managing Partner