



Assembly Instructions

Gripping System SBPG

Note

The Assembly instructions were originally written in German. Store in a safe place for future reference. Subject to technical changes without notice. No responsibility is taken for printing or other types of errors.

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1 Important Information

1.1 Warranty and Liability

J. Schmalz GmbH, as a supplier and manufacturer of vacuum technology, takes no responsibility for the function of the bin picker SBPG in a specific process.

The exact application parameters and the individual environment are decisive factors for selecting the right components.

The specifications for our products are based on our current technical knowledge and experience, as well as the available literature. We encourage you to test the products under the specific conditions that apply to your application purposes, and we would be glad to use our experience to assist you.

The packaging material, the goods that are packaged, the fill level, porosity, surface condition, center of gravity or the air content of the workpiece influence the entire handling process.

Following functional testing, different suction cup sizes or modifications to the configuration may be necessary.

Therefore, J. Schmalz GmbH accepts no liability and excludes all legal claims for damages.

The products and the configurator are subject to technical changes or further development without notice.

We are not liable for any damage resulting from the use of non-original spare parts or accessories.

The exclusive use of original spare parts is a prerequisite for the proper functioning of the gripper and for the validity of the warranty.

Wearing parts are not covered by the warranty.

1.2 The Technical Documentation Is Part of the Product

1. For problem-free and safe operation, follow the instructions in the documents.
2. Keep the technical documentation in close proximity to the product. The documentation must be accessible to personnel at all times.
3. Pass on the technical documentation to subsequent users.
 - ⇒ Failure to follow the instructions in these Assembly instructions may result in life-threatening injuries!
 - ⇒ Schmalz is not liable for damage or malfunctions that result from failure to heed these instructions.

If you still have questions after reading the technical documentation, contact Schmalz Service at:

www.schmalz.com/services

1.3 Note on Using this Document

J. Schmalz GmbH is generally referred to as Schmalz in these Assembly instructions.

These Assembly instructions contain important notes and information about the different operating phases of the product:

- Transport, storage, start of operations and decommissioning
- Safe operation, required maintenance, rectification of any faults

The Assembly instructions describe the product at the time of delivery by Schmalz.

1.4 Warnings in This Document

Warnings warn against hazards that may occur when handling the product. The signal word indicates the level of danger.

Signal word	Meaning
DANGER	Indicates a high-risk hazard that will result in death or serious injury if not avoided.
WARNING	Indicates a medium-risk hazard that could result in death or serious injury if not avoided.
CAUTION	Indicates a low-risk hazard that could result in minor or moderate injury if not avoided.
NOTE	Indicates a danger that leads to property damage.

1.5 Symbol



This symbol indicates useful and important information.

- ✓ This symbol represents a prerequisite that must be met prior to an operational step.
- ▶ This symbol represents an action to be performed.
- ⇒ This symbol represents the result of an action.

Actions that consist of more than one step are numbered:

1. First action to be performed.
2. Second action to be performed.

1.6 Type Plate

The type plate is permanently attached to the product and must always be clearly legible.

The type plate contains the following data:

- Company logo/address
 - Designation
 - Product serial no.
 - Date of manufacture
 - Product weight
 - Max. permitted input pressure
 - QR code
- ▶ Please specify all the information above when ordering replacement parts, making warranty claims or for any other inquiries.

1.7 Other Applicable Documents

The following operating instructions must also be observed when setting up the gripper SBPG:

- The operating instructions for the ejector nozzle SEP
- The operating instructions for the vacuum switch VSi

In addition, refer to the spare and wear parts list 30.30.01.02462.

2 Fundamental Safety Instructions

2.1 Intended Use

The bin picker is used to remove small parts from containers. Its slim design allows it to reach deep into the container. The versions with a swiveling unit can also reach products that are in unfavorable positions in the container with ease.

The system must be operated only at the supply voltage specified for the components.

The loads to be lifted must be rigid enough to ensure they are not destroyed during lifting.

The bin picker is built in accordance with the latest standards of technology and is shipped in a safe operational condition. However, hazards can arise during use. Observe the warnings in these operating instructions.

The maximum lift capacity must not be exceeded (> See ch. Technical Data).

2.2 Non-Intended Use

Schmalz accepts no liability for damage caused by the use of the gripper for purposes other than those described under Intended Use. Use of the gripper for loads that are not specified in the order confirmation or that have different physical properties than those specified in the order confirmation shall be considered non-intended use. In particular, the following are considered non-intended use:

- Use as a climbing aid
- Lifting people or animals
- Storing loads while picked up
- Supporting the lifting process by applying external forces
- Applying suction to building components, equipment or supporting surfaces.
- Applying suction to bulk materials (e.g. granulates)
- Evacuation of objects that are in danger of imploding
- Removing building components or fixtures.

2.3 Danger Zone

Persons in the danger zone of the gripper may suffer life-threatening injuries.

Gripper operating modes

- Automatic operation on the industrial robot or gantry
- Collaborative operation on the lightweight robot (cobot)

For both operating modes, the system integrator must carry out a risk assessment of the entire system and define the danger zone precisely. In doing so, country-specific provisions and regulations must be observed.

Automatic operation on the industrial robot or gantry

- During automatic operation of the handling system, no persons or animals may be present in the danger zone.
- In other operating modes, ensure that no unauthorized persons or animals are present in the danger zone.
- Ensure that collisions with the surrounding environment and objects are avoided to prevent the load from breaking off.

During automatic operation of the handling system, the danger zone must be secured to prevent access by persons (protective barrier or sensor system).

The danger zone of the gripper includes the following areas:

- The area directly below the gripper and load.
- The area immediately surrounding the gripper and load.
- The working area of the automatic handling system.

2.4 Environmental and Operating Conditions

The gripping system must **not** be operated under the following conditions:

- In potentially explosive atmospheres
- Use in an environment with acidic or alkaline media



CAUTION

Dangerous gases, vapors or dusts are sucked in and dispersed by the vacuum generator.

Difficulty breathing.

- ▶ Before commencing work, ensure that the ambient air does not contain any hazardous substances.
- ▶ Make sure that there are no hazardous substances on the load that can be sucked in.
- ▶ If the ambient air is dusty, use a dust filter (particle size max. 5 µm).



CAUTION

Blockage of the vacuum system from sucking in liquids

Risk of injury from falling load!

- ▶ Do not pick up liquids or bulk materials.
- ▶ Observe the VSi display.

The gripping system must be operated only under the following conditions:

- The environment must be free from humidity, moisture, dirt, dust, oil or other climatic conditions that may reduce friction levels.
 - The gripping system must be sufficiently dimensioned for the loads to be lifted.
- ▶ If in doubt, consult Schmalz before the start of operations.

2.5 Personnel Qualifications

Unqualified personnel cannot recognize dangers and are therefore exposed to higher risks!

The operating company must ensure the following points:

- The personnel must be commissioned for the activities described in these instructions.
- The staff must be at least 18 years of age and physically and mentally capable.
- The product must be operated only by persons who have undergone appropriate training.
- Personnel must receive regular safety briefings (frequency as per country-specific regulations).
- Work on electrical equipment must be carried out only by qualified electrical specialists.
- Installation, maintenance, and repairs must be carried out only by specialists from J. Schmalz GmbH or by persons who can prove that they have undergone appropriate training at Schmalz.

The following target groups are addressed in these instructions:

- Mechanical and electrical specialists who are responsible for installing, troubleshooting and maintaining the product.

The operator of the system must comply with country-specific regulations regarding the age, ability and training of the personnel.

Applicable for Germany:

A qualified employee is defined as an employee who has received technical training and has the knowledge and experience – including knowledge of applicable regulations – necessary to enable him or her to recognize possible dangers and implement the appropriate safety measures while performing tasks. Qualified personnel must observe the pertinent industry-specific rules and regulations.

2.6 Personal Protective Equipment

To avoid injury, always use appropriate protective equipment that is suitable for the situation. The protective equipment must meet the following standards:

- Protective work shoes in safety class S1 or higher
- Sturdy work gloves in safety category 2133 or higher
- Industrial helmet
- Ear protection class L or higher
- Eye protection class F
- Hair net
- Closely fitting clothing

2.7 Technical Condition

If the product is operated while in a defective state, safety and function will be impaired.

- Only operate the gripper when in perfect working order as originally delivered.
- Follow the maintenance schedule.
- Use only original spare parts from Schmalz.
- If the operating behavior changes, check the gripper for faults. Rectify faults immediately!
- Do not independently modify or alter the gripper.
- Safety features must not be disabled under any circumstances.

Schmalz assumes no liability for consequences of modifications over which it has no control.

2.8 Responsibility of the Integrator

The integrator is obligated to perform a risk assessment for the environmental conditions at the installation location.

The integrator is also responsible for third parties in the working area of the gripper. The operating company must ensure that they have the appropriate qualifications and skills.

- Ensure that regular breaks are taken.
- Ensure that the gripper cannot be started up by unauthorized persons.
- During maintenance or repair work, ensure that the gripper cannot be operated.
- Clearly define the responsibilities for the various activities performed with the gripper.
- Ensure that these responsibilities are observed.
- When handling unfamiliar loads, carry out tests where necessary to ensure safe operation:
 - The load is sufficiently rigid that it cannot be damaged during handling.

2.9 Country-Specific Regulations for the Operating Company

1. Observe the country-specific regulations regarding accident prevention, safety testing and environmental protection.
2. The gripper is to be used in combination with an automated handling system (gantry/robot). Ensure that the appropriate country-specific regulations and safety regulations are adhered to.

3 Product Description

3.1 General Description of the Gripper

Gripping systems use a vacuum to lift defined products. Workpieces of different sizes can be lifted. The gripping system achieves its maximum load-bearing capacity when the suction cup is placed on an airtight workpiece with a smooth surface.

The handling system is responsible for the motion in the various axes (robot/gantry). The gripping system is mounted on the robot/gantry through the flange (interface DIN EN ISO 9409-1 50-4-M6).

Parts of the gripper SBPG are produced using an additive manufacturing process.

The gripper consists of a main gripper body in which the vacuum switch and – depending on the version – the vacuum generator nozzle are integrated, an (optional) swiveling unit and a quick-change adapter (standard: vacuum and compressed air duct open).

Additional quick-change adapters and adapters for connecting to other types of robot are available as accessories. (> See ch. Accessories)

The gripper is available in four different versions:

- Internal vacuum generation and pneumatic swiveling unit (SBPG X PSE ...)
- Internal vacuum generation, rigid (SBPG X ...)
- External vacuum generation and pneumatic swiveling unit (SBPG M PSE ...)
- External vacuum generation, rigid (SBPG M ...)

In the case of grippers with external vacuum generation, external vacuum generation is not included in the delivery. If you have any questions about the design, please contact the Schmalz service team at:

www.schmalz.com/services

Damping elements in the gripper with integrated vacuum generation SBPG X

For sound damping, the gripper is equipped with **ring-shaped** damping elements at the factory. In order to further dampen the sound, the gripper has a set of **solid material** damping elements (> See ch. 10.6 Disassembling and Cleaning the Silencer Inserts, p. 29).

However, the elements are replaced at the expense of the suction rate (> See ch. 4.1 General Parameters, p. 16).

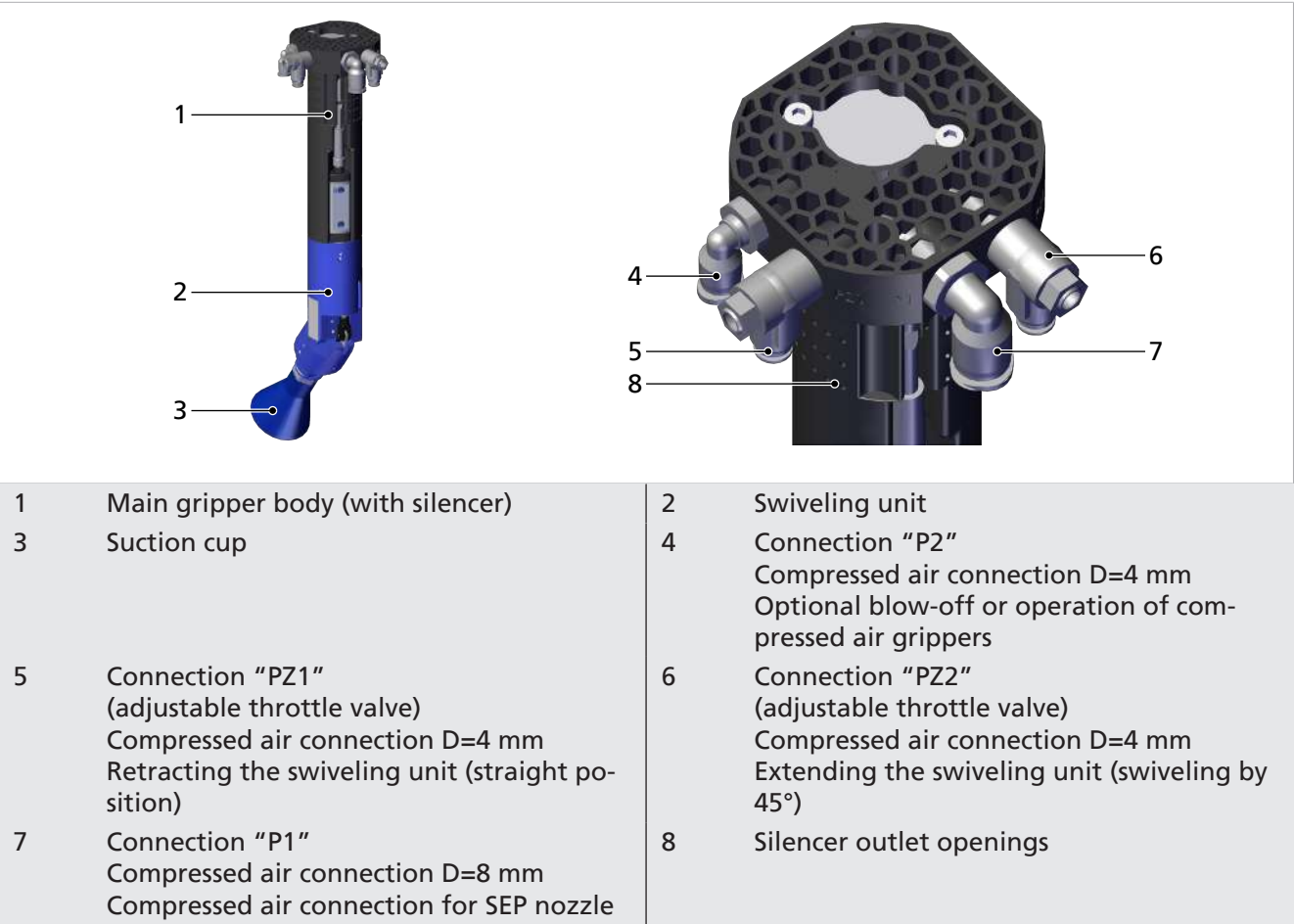
3.2 Variants and Type Key

The bin picker SBPG is available in four basic variants. The version is indicated in the item designation. The item designation is composed as follows:

Abbreviated designation	Vacuum generation	Swiveling unit	Pitch circle Ø flange [mm]	Suction cup type
SBPG	X = integrated M = external	PSE	50	SVE (standard)

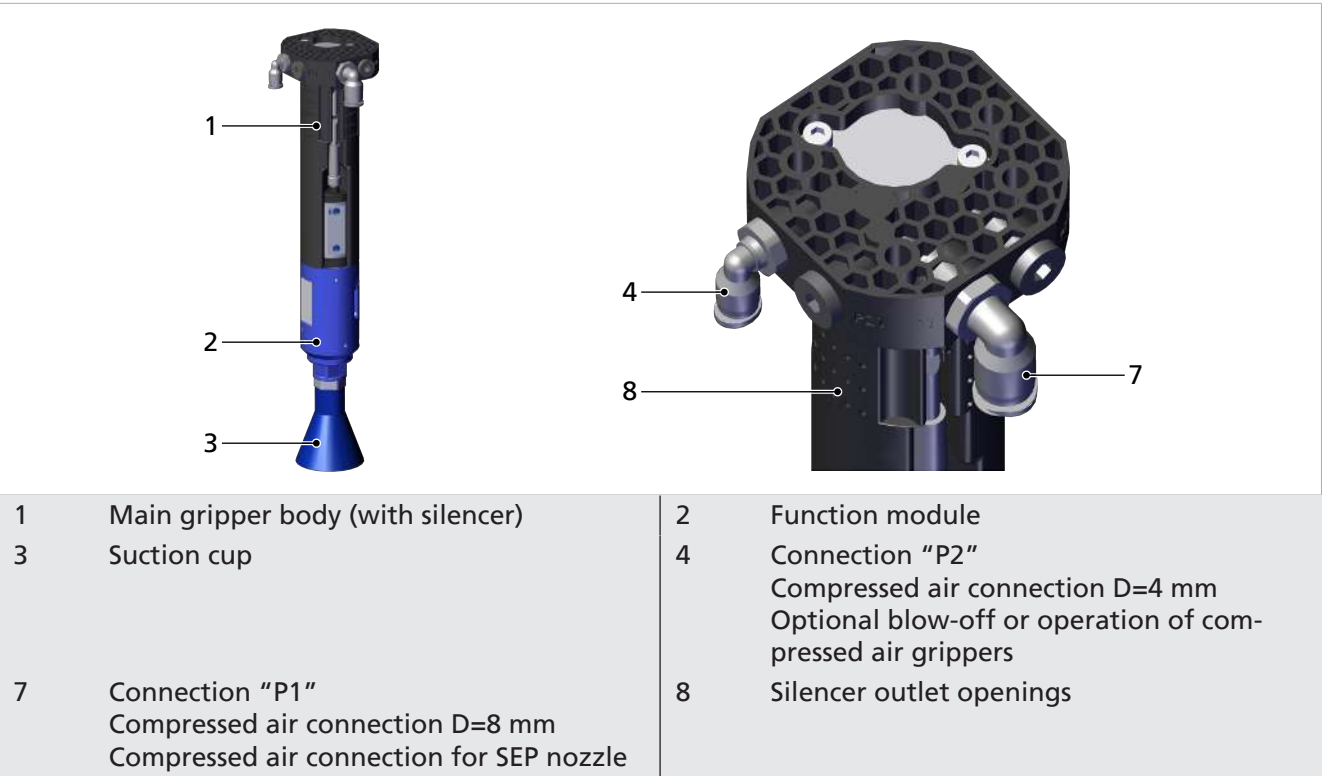
3.3 SBPG X PSE

The vacuum generator is integrated into the gripper, and the vacuum is monitored by the integrated vacuum switch. The swiveling unit allows parts to be approached in the optimum way.



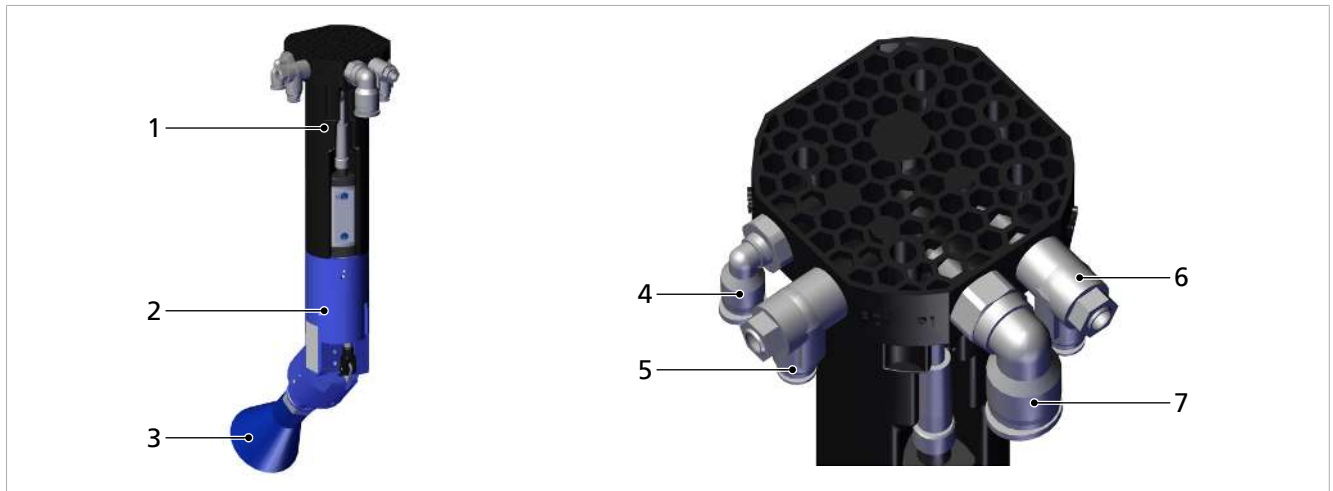
3.4 SBPG X

The vacuum generator is integrated into the gripper, and the vacuum is monitored by the integrated vacuum switch.



3.5 SBPG M PSE

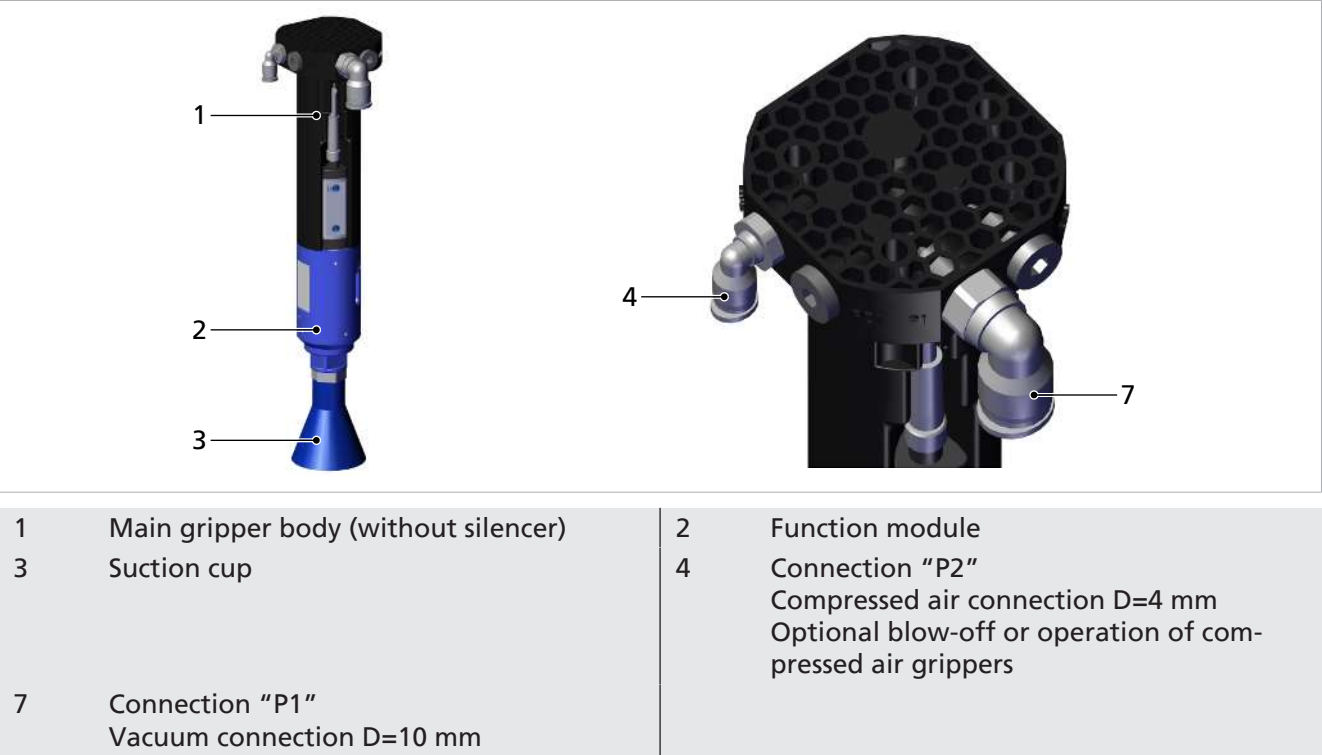
The gripper is supplied by an external vacuum. The vacuum is monitored by the integrated vacuum switch. The swiveling unit allows parts to be approached in the optimum way.



1	Main gripper body (without silencer)	2	Swiveling unit
3	Suction cup	4	Connection "P2" Compressed air connection D=4 mm Optional blow-off or operation of compressed air grippers
5	Connection "PZ1" (adjustable throttle valve) Compressed air connection D=4 mm Retracting the swiveling unit (straight position)	6	Connection "PZ2" (adjustable throttle valve) Compressed air connection, 4 mm Extending the swiveling unit (swiveling by 45°)
7	Connection "P1" Vacuum connection D=10 mm		

3.6 SBPG M

The gripper is supplied by an external vacuum. The vacuum is monitored by the integrated vacuum switch.



3.7 Quick-change function

All gripper versions are delivered with a quick-change function. It allows different types of suction gripper to be changed quickly and without tools, and also allows for quick-change adapters with different vacuum and compressed air connections (> See ch. Accessories).

- 1. Variant 1 (standard): vacuum and compressed air duct open (standard)
- 2. Variant 2 (accessories): vacuum duct open, compressed air duct closed
- 3. Variant 3 (accessories): compressed air duct open, vacuum duct closed (e.g. for operation of mechanical grippers)

The adapter is held by a magnet; during the suction process, the vacuum also assists with a secure connection.

The quick-change adapter is released or changed through a combined lift-and-turn motion. When doing so, we recommend using the suction plate holder as the "station" (> See ch. Accessories).

1. "Moving" the gripping system into the suction plate holder



2. Release the quick-change adapter from the gripping system through a combined lift-and-turn motion.

3.8 Swivel Function

The swiveling unit can be used to swivel the suction cup or gripper by 45° on one side. This feature makes it easy to reach and, as a result, handle products that are in an unfavorable position in the container (e.g. in a corner) with the robot. The robot can make a straight approach with the gripper and does not have to tilt itself. This may even make it possible to use a smaller robot size.

3.9 NFC Interface

NFC (Near Field Communication) refers to a standard for wireless data transfer between different devices over a short distance.

The vacuum switch VSi functions as a passive NFC tag that can be read or written to by a reading device such as a smartphone or tablet with NFC activated. Access to the parameters of the vacuum switch via NFC also works without a connected supply voltage.

There are two options for communicating via NFC:

- Read access only can be obtained via a website viewed in a browser. For this, no additional app is needed. The read device only needs to have NFC active and Internet access.
- Another option for communication is the "Schmalz ControlRoom" control and service app. This permits not only read access, but also active reconfiguration of the parameters via NFC. The Schmalz ControlRoom app is available at the Google Play Store.



The reading distance is very short for NFC applications. Determine the position of the NFC antenna in the reading device used. If parameters of the device are modified via NFC, then the power supply must subsequently remain stable for at least three seconds to prevent data loss (error E01).

You can find more information about NFC functionality in the operating instructions for the vacuum switch in (> See ch. Other Applicable Documents).

4 Technical Data

4.1 General Parameters

Parameter	Gripper type				Unit
	SBPG X PSE ...	SBPG X ...	SBPG M PSE ...	SBPG M ...	
Max. suction rate * "Series" ring-shaped damping element	180		—		l/min
Max. suction rate * Solid material damping element	105		—		l/min
Required flow rate **	—		150		l/min
Permissible lift capacity ***	20		20		N
Compressed air consumption *	140		—		l/min
Sound level when fully covered * "Series" ring-shaped damping element	84 (during unobstructed suction) 67 (suction applied)		—		dBA
Sound level when fully covered * Full material damping element	64 (during unobstructed suction) 63 (suction applied)		—		dBA
Max. vacuum *	730		—		mbar
Weight	0.72	0.56	0.68	0.52	kg

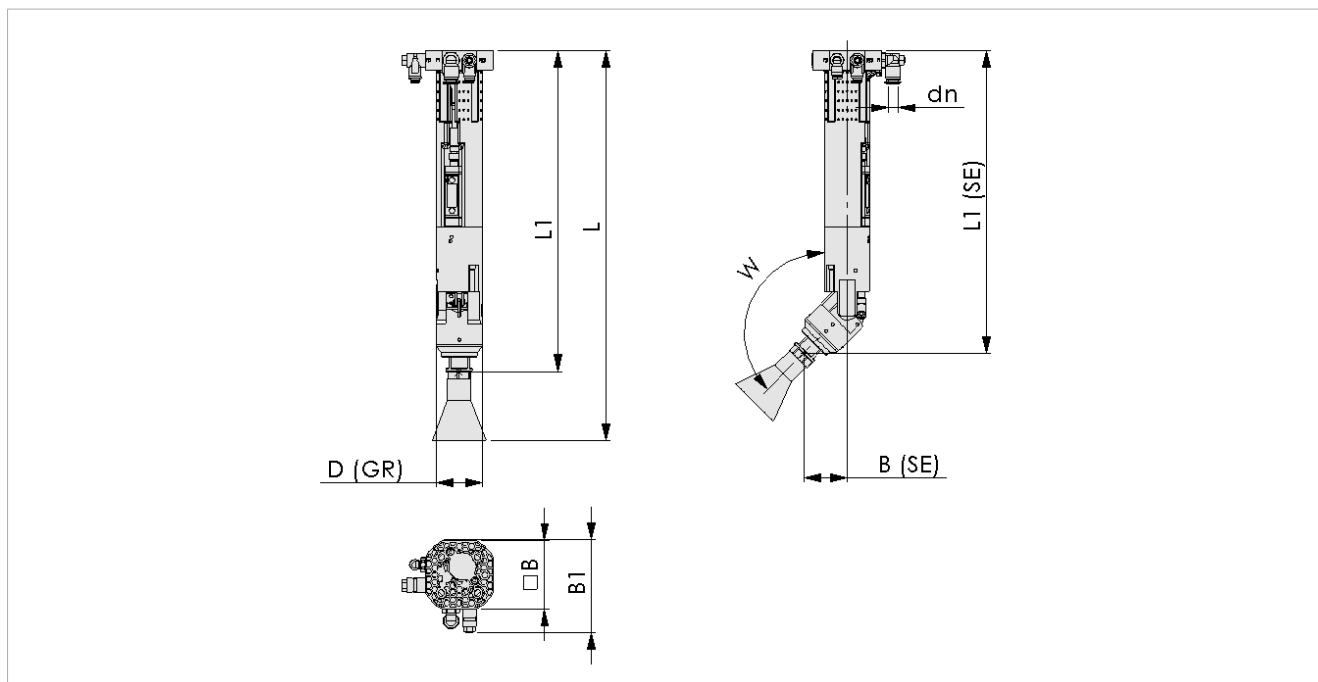
* At 5 bar (flowing) compressed air inlet pressure

** At minimum, the external vacuum generator used must supply the specified suction flow rate (at the vacuum connection piece of the SBPG M) with a vacuum of -0.15 bar

*** For an in-depth system design, we always recommend performing suction tests with the original work-piece.

Note: The swiveling unit PSE can be swiveled by 45° using the integrated pneumatic cylinder

4.2 Dimensions



Type	L *	B	D (GR)	L1	L1 (SE)	B1	B (SE)	dn	W
SBPG X PSE 50 SVE	384	67	45	316	298	91	43	8	135°
SBPG X 50 SVE	336	67	45	268	—	88	—	8	—
SBPG M PSE 50 SVE	364	67	45	296	278	94	43	10	135°
SBPG M 50 SVE	316	67	45	248	—	94	—	10	—

*Suction cups of other types and with other heights are available upon request
 All specifications (apart from angles) are in mm

5 Transportation and Storage

5.1 Checking the Delivery

The scope of delivery can be found in the order confirmation. The weights and dimensions are listed in the delivery notes.

1. Compare the entire delivery with the supplied delivery notes to make sure nothing is missing.
2. Damage caused by defective packaging or occurring in transit must be reported immediately to the carrier and J. Schmalz GmbH.

5.2 Reusing the Packaging

The product is delivered in cardboard packaging. The packaging should be reused to safely transport the product at a later stage.



Keep the packaging for future transport or storage.

6 Installation

6.1 Installation Instructions



⚠ CAUTION

Improper installation or maintenance

Personal injury or damage to property

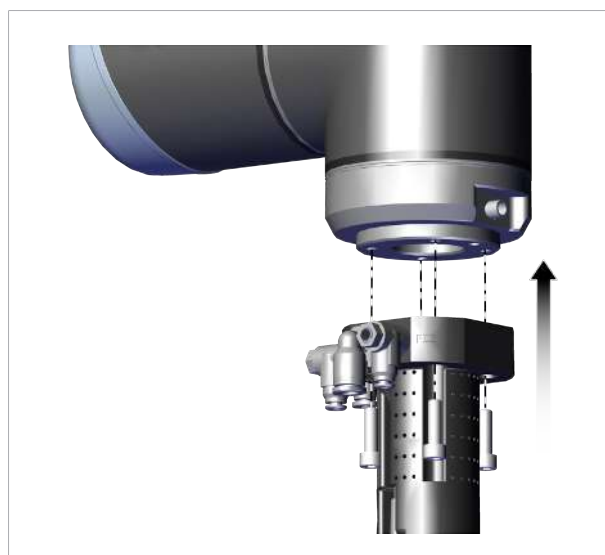
- ▶ Prior to installation and before maintenance work, the product must be disconnected from the power supply, depressurized (vented to the atmosphere) and secured against unauthorized restart.

The gripper may be installed in any position.

The gripper is adapted to a robot directly (interface DIN EN ISO 9409-1 50-4-M6) or by using a changeable flange adapter plate. Alternative flange adapter plates can be chosen from the range of accessories. (> See ch. Accessories)

6.2 Mechanical Attachment

1. The gripper is mounted directly on the robot (interface DIN EN ISO 9409-1 50-4-M6). With regard to torque, see the specifications of the robot manufacturer (however, max. 10 Nm)



2. Adapter plates are available for other robot types (> See ch. Accessories)

6.3 Electrical Connection



⚠ DANGER

Electric shock from touching live components

Serious injury or death!

- ▶ Make sure that the electrical components are not live before installation, maintenance and troubleshooting.
- ▶ Switch off the mains switch and secure against unauthorized restart.

A vacuum switch is installed on all gripper types. The connection is established using a 4-pin M8 plug integrated in the vacuum switch. Observe the operating instructions for the vacuum switch (> See ch. Other Applicable Documents).

6.4 Pneumatic connection

1. Shorten the hoses and pipelines as much as possible.
2. Keep hose lines free of bends and crimps.
3. Lay hose lines in such a way that they do not rub.



⚠ CAUTION

Compressed air or vacuum in direct contact with the eye

Severe eye injury

- ▶ Wear eye protection
- ▶ Do not look into compressed air openings
- ▶ Do not look into the silencer air stream
- ▶ Do not look into vacuum openings, e.g. suction cups

The pneumatic connections and their function are described in detail in the chapter "Product Description."

If you do not want to use the "blow-off function" on the gripper, close the "P2" connection with a plug. Alternatively, you can also use the appropriate quick-change adapter (> See ch. Accessories).

7 Start of Operations

7.1 Personnel Qualification

Unqualified personnel cannot recognize dangers and are therefore exposed to higher risks!

1. Only instruct qualified personnel to perform the tasks described in these operating instructions.
2. The product may only be operated by persons who have undergone appropriate training.
3. Electrical work and installations may only be carried out by qualified electrical specialists.
4. Assembly and maintenance work must only be carried out by qualified personnel.

7.2 Before Initial Start of Operations

Before the initial start of operations following the installation, repair, servicing or maintenance work, you must check the following:

- All mechanical connectors are properly attached and secured.
- All screws and nuts are tightened to specified torques.
- All components are installed.
- The safety distances have been maintained.
- The electrical cable and supply hoses are properly routed.
- The EMERGENCY STOP switch for the overall system is working.
- The type plate is clearly legible.



⚠ DANGER

Electric shock from touching live components

Serious injury or death!

- ▶ Make sure that the electrical components are not live before installation, maintenance and troubleshooting.
- ▶ Switch off the mains switch and secure against unauthorized restart.



⚠ CAUTION

Noise pollution due to incorrect installation of the pressure and vacuum connections

Hearing damage

- ▶ Correct installation.
- ▶ Wear ear protectors.



⚠ CAUTION

Vacuum close to the eye

Severe eye injury!

- ▶ Wear eye protection.
- ▶ Do not look into vacuum openings, e.g. suction cups.



⚠ CAUTION

Risk of crushing if the suction cup is abruptly attached to a workpiece

- ▶ Do not place any body parts between the suction cup and the workpiece
-

Handling process

1. Placement of the gripper on the workpiece
 - Position the gripper optimally on the workpiece
 - Bellows suction cups must be compressed by at least 50%
2. Generate or establish vacuum
 - Apply compressed air at the compressed air connection (variants with an internal vacuum supply)
 - Apply vacuum at the vacuum connection (variants with an external vacuum supply)
3. Movement of the gripper after reaching the pre-set vacuum value
4. Lower workpieces onto clear, even surfaces
5. Only switch off the vacuum when the workpiece rests completely and safely on a secure surface
 - When switching off the device, the suction cups are automatically ventilated
 - Optionally, a blow-off pulse can be produced at the compressed air connection.
6. Return gripper to a neutral state, switch off SUCTION and BLOW-OFF

8 Operation

8.1 Preparations

- ▶ The product must be operated only by persons who have undergone appropriate training.

To avoid injury, always use appropriate protective equipment that is suitable for the situation. The protective equipment must meet the following standards:

- Protective work shoes in safety class S1 or higher
- Ear protection class L or higher
- Sturdy work gloves in safety category 2133 or higher
- Eye protection class F



WARNING

Extraction of hazardous media, liquids or bulk material

Personal injury or damage to property!

- ▶ Do not extract harmful media such as dust, oil mists, vapors, aerosols etc.
- ▶ Do not extract aggressive gases or media such as acids, acid fumes, bases, biocides, disinfectants or detergents.
- ▶ Do not extract liquids or bulk materials, e.g. granulates.

Before each activation of the gripping system, the following measures must be taken:

1. Check the device for visible damage. Correct any faults or report them to the supervising personnel.
2. Ensure that only authorized persons are present in the working area of the machine or system in order to prevent any hazard from switching on the machine.
3. Ensure that the danger zone of the machine or system is free of persons during automatic operation in non-HRC applications.



WARNING

Applications with collaborative robots:

Insufficient vacuum generation or insufficient coverage of the gripper.

The load drops immediately.

Risk of injury from falling load!

- ▶ The operator must be separated from the handling area of the load by a secure barrier.

9 Troubleshooting

9.1 Safety

Maintenance work may only be carried out by qualified personnel.



⚠ WARNING

Risk of injury due to incorrect maintenance or troubleshooting

- ▶ Check the proper functioning of the product, especially the safety features, after every maintenance or troubleshooting operation.



⚠ CAUTION

Improper installation or maintenance

Personal injury or damage to property

- ▶ Prior to installation and before maintenance work, the product must be disconnected from the power supply, depressurized (vented to the atmosphere) and secured against unauthorized restart.

9.2 Faults, Causes, Solutions

Fault	Possible cause	Solution
Vacuum level is not reached or vacuum is created too slowly	Leakage in hose line	Check hose connections
	Leakage or wear on the suction cup/sealing	Check the suction cup/sealing and replace if necessary
	Vacuum generator of the SEP nozzle or foam inserts in the silencer dirty	Remove and clean the SEP nozzle or foam inserts in the silencer
	Quick-change adapter is not attached to the swiveling unit/is tilted	Manually remove the quick-change adapter, check it for damage, check its function and reconnect it
Load cannot be held	Vacuum level too low	See above for possible causes
	Suction force not suitable for load	Increase vacuum if necessary or connect more suitable suction cups
	The gripper is not pressed firmly enough onto the workpiece to be lifted	Press the gripper more firmly onto the workpiece. On even surfaces, we recommend compressing the suction cup by at least 50%
	Too short retention time for the gripper on the workpiece to be lifted	Extend the retention time
	Too fast or jerky lifting of workpieces	Optimize the motion Avoid acceleration peaks (especially when lifting the workpieces)
	The workpieces to be lifted are not suitable for the grippers	Use a different gripping system
Suction cups wear out very quickly	The suction cup is angled or makes a grinding noise when applied to the workpiece to be lifted	Set it down vertically on the workpiece
Version for ext. vacuum generator only: External vacuum generator	If present: The dust filter of the vacuum generator is dirty	Clean or replace dust filter
	Suction cup is damaged/torn	Replace suction cup

Fault	Possible cause	Solution
works, but workpieces are not picked up	Workpiece is too heavy	Workpiece is not suitable
	Vacuum is too high	Determine the maximum possible vacuum of the vacuum generator; check the system for leaks (hose connections, sealing, etc.); valves are dirty; the workpiece is too porous
	Suction cup is not applied firmly enough	Press the gripping system more firmly onto the surface. On even surfaces, we recommend compressing the suction cup by approx. 50%
Versions with internal vacuum generator only: Internal vacuum generator works, but workpieces are not picked up	Suction cup is damaged/torn	Replace suction cup
	Workpiece is too heavy	Workpiece is not suitable
	Input pressure too low (SEP version only)	Increase the input pressure. Check the hoses for leakage The workpiece is too porous
	Vacuum generator of the SEP nozzle or foam inserts in the silencer dirty	Remove and clean the SEP nozzle or foam inserts in the silencer
	Suction cup is not applied firmly enough	Press the gripper more firmly onto the workpiece. On even surfaces, we recommend compressing the suction cup by at least 50%.
Swiveling unit does not work	Input pressure too low	Increase the pressure
	Throttle valves closed too far	Open the throttle valves
	Hose lines leaking or valves defective	Check lines and valves
	Articulated connector worn (plate (pre-assembled))	Replace the articulated connector (plate (pre-assembled)) – see wear parts (> See ch. Replacing Articulated Connectors)

10 Maintenance

10.1 Safety

Maintenance work may only be carried out by qualified personnel.



⚠ WARNING

Risk of injury due to incorrect maintenance or troubleshooting

- ▶ Check the proper functioning of the product, especially the safety features, after every maintenance or troubleshooting operation.



⚠ CAUTION

Improper installation or maintenance

Personal injury or damage to property

- ▶ Prior to installation and before maintenance work, the product must be disconnected from the power supply, depressurized (vented to the atmosphere) and secured against unauthorized restart.

10.2 Maintenance Schedule



Schmalz stipulates the following checks and check intervals. The operator must comply with the legal regulations and safety regulations applicable at the location of use. These intervals apply to single-shift operation. For heavier use, such as multi-shift operation, the intervals must be shortened accordingly.

Maintenance task	Daily	Weekly	Monthly	Every six months	Yearly
Check if the vacuum generator generates unusual noise under full load?		X			
Check that the connections on the flange are firmly in position		X			
Check the suction cup and main body for wear, cracks and leaks and replace if necessary.		X			
Check SEP nozzle and foam inserts for silencer for dirt and clean if necessary (only variants with internal vacuum generation)			X		
Check the condition of the vacuum hoses (not brittle, no kinks, no chafe marks)			X		
Check all load-bearing parts (e.g. suspension) for deformation, wear or other damage.			X		
Leak test			X		
Is the electrical installation still OK? Is the cable screw union secure?				X	

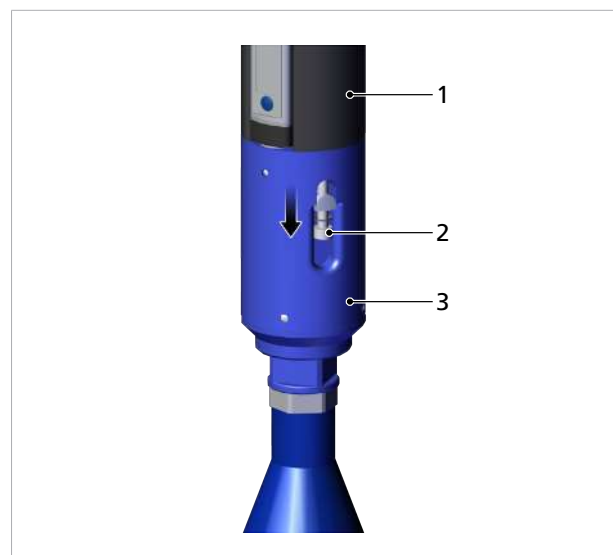
Maintenance task	Daily	Weekly	Monthly	Every six months	Yearly
Check the function of the swiveling unit and quick-change adapter (replace the "pre-assembled plate" articulated connector – see wear parts) (> See ch. Replacing Articulated Connectors)			X		
Check that all the connections are secure, e.g. the screws, hose clamps, etc.				X	
Check the legibility of the type plate and clean it if necessary.					X
The operating instructions are available, legible, and can be accessed by personnel.					X
Check the general condition of the device.				X	

10.3 Cleaning the Gripper

1. For cleaning, do not use aggressive cleaning agents such as industrial alcohol, white spirit or thinners. Only use cleaning agents with pH 7–12.
2. Remove dirt on the exterior of the device with a soft cloth and soap suds at a maximum temperature of 60° C. Make sure that the silencer is not soaked in soapy water.
3. Ensure that no moisture can reach the electrical connection or other electrical components.

10.4 Removing the Ejector Module

- Loosen the 2 screws (2) and separate the main body (1) and function module/swiveling unit (3) from each other



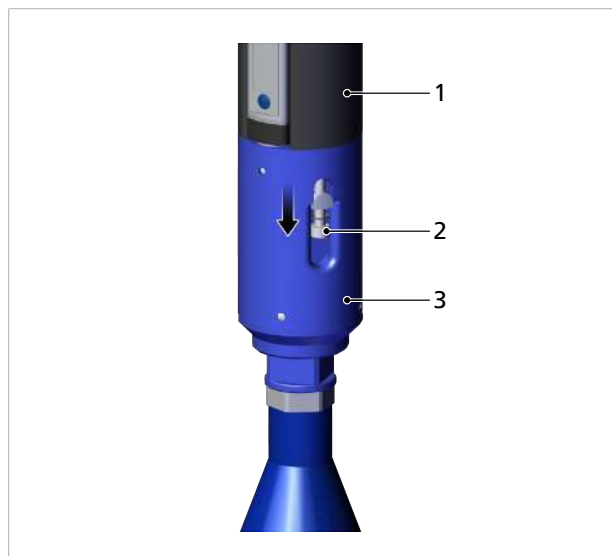
- ▶ Remove the ejector module from the function module/swiveling unit



For further cleaning of the ejector module, refer to operating instructions 30.30.01.00600 (> See ch. Other Applicable Documents).

10.5 Disassembling the Vacuum Switch

- ▶ Loosen the 2 screws (2) and separate the main body (1) and function module/swiveling unit (3) from each other



- ▶ Disconnect the connection cable from the vacuum switch

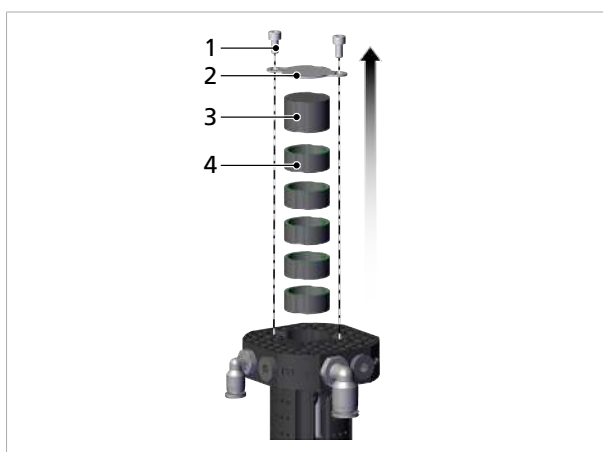


- ▶ Unscrew the vacuum switch



10.6 Disassembling and Cleaning the Silencer Inserts

1. Unscrew the screws (1) on the gripper head



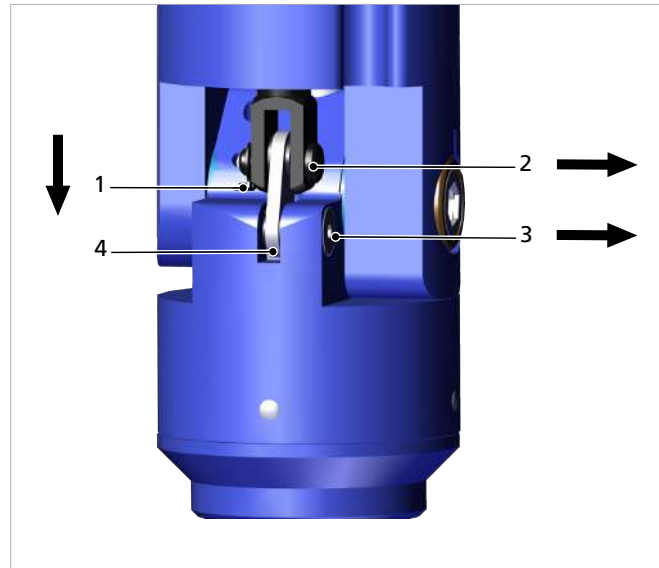
2. Remove the retaining plate (2)
3. Remove the damping elements (3, 4)

The damping elements can be cleaned with a soft brush.

10.7 Replacing Articulated Connectors

The movements of the swiveling unit may cause the articulated connector plate (part no. 10.01.11.04434) to wear.





1. Remove the retaining ring (1)



2. Remove the bolt (2)
3. Unscrew the fitting screw (3)
4. Remove the articulated connector plate (4)

10.8 Accessories, Spare Parts and Wearing Parts

Designation	Part no.	Note
Flange adapter plate for interface DIN EN ISO 9409-1 31.5-4-M5	10.01.45.00016	
Flange adapter plate for interface DIN EN ISO 9409-1 63-4-M6	10.01.45.00017	
Connection cable with open cable ends, M8-4P, length 5000 mm, ASK B-M8-4 5000 K-4P	10.06.02.00031	
Suction cup assembly SGA-14-HT1-60, 3/8" external thread	10.01.45.00020	
Suction cup assembly FSG-32-HT1-60, 3/8" external thread	10.01.45.00021	
Suction cup assembly SPB1-30-ED-65, 3/8" external thread	10.01.45.00022	
Suction cup assembly SVE-53-PU-55, 3/8" external thread	10.01.19.00257	

Designation	Part no.	Note
Ø10 mm vacuum hose 10.07.09.00084	10.07.09.00084	for connecting the gripper to an external vacuum generator (SBPG M only)
Ø8 mm compressed air hose VSL 8-6 PU	10.07.09.00003	for connecting the gripper to the compressed air source (vacuum generation)
Ø4 mm compressed air hose VSL 4-2 PU	10.07.09.00001	for connecting the gripper to the compressed air source (pneum. swiveling unit/blow-off)
Solenoid valve EMV 10 24V-DC 3/2 NO	10.05.01.00070	for controlling the vacuum (only SBPG M)
Quick-change adapter SWA P/Pu 45 SBPG	10.01.45.00008	with open compressed air and vacuum duct 
Quick-change adapter SWA Pu 45 SBPG	10.01.45.00009	with open vacuum duct 
Quick-change adapter SWA P 45 SBPG	10.01.45.00010	with open compressed air duct 
Suction plate holder HTR-S UNI RA	10.01.45.00005	Holder for use as a "station" for the quick-change adapter with suction cup. An inductive sensor can be fitted on the sheet metal angle bracket (for monitoring the presence of the suction cup in the holder). In addition, two screws and two safety washers are also supplied. The sensor is not included in the delivery. We recommend an M8 inductive sensor with a 4 mm switching distance. 
Human-robot collaboration kit (only for the gripper version with a pneumatic swiveling unit)	10.01.45.00015	The human-robot collaboration kit consists of a bellows guard, two fillister head screws with flange head and two cover caps for the hex of the throttle valves on the flange.

Spare and wearing parts are listed in the accompanying list 30.30.01.02462.

11 Disposing of the Product

Recover the disassembled parts for recycling or reuse (provided no agreement on return or disposal has been made).

1. Dispose of the product properly after replacement or decommissioning.
2. Observe the country-specific guidelines and legal obligations for waste prevention and disposal.

12 Declarations of Conformity

12.1 EU Declaration of Conformity

The manufacturer Schmalz confirms that the product described in these instructions fulfills the following applicable EU directives:

2014/30/EU	Electromagnetic Compatibility
2011/65/EU	RoHS Directive

The following harmonized standards were applied:

EN ISO 12100	Safety of machinery — General principles for design — Risk assessment and risk reduction
EN ISO 13857	Safety of Machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs
EN ISO 10218-2	Industrial Robots – Safety Requirements – Part 2: Robot Systems and Integration
EN 61000-6-1	Electromagnetic Compatibility - Immunity
EN 61000-6-4+A1	Electromagnetic compatibility - Part 6-4: Generic standards - Emission standard for industrial environments
EN IEC 63000	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
DIN ISO/TS 15066	Robots and robotic devices – Collaborative robots



The EU Declaration of Conformity valid at the time of product delivery is delivered with product or made available online. The standards and directives cited here reflect the status at the time of publication of the operating and assembly instructions.

12.2 EU Declaration of Incorporation

The manufacturer Schmalz confirms that the product described in these instructions fulfills the following applicable EU directives:

2006/42/EC	Machinery Directive
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The product specified is solely intended for installation indoors in a complete system. Startup is prohibited until the end product has been declared to comply with the Directive 2006/42/EC.

The manufacturer commits to provide special documentation of the partly completed machinery to national authorities in electronic form if requested. The special technical documentation belong to the machine as per Annex VII Part B has been created.

The following harmonized standards were applied:

EN ISO 12100	Safety of machinery — General principles for design — Risk assessment and risk reduction
EN ISO 13857	Safety of Machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs
EN ISO 10218-2	Industrial Robots – Safety Requirements – Part 2: Robot Systems and Integration
EN 61000-6-1	Electromagnetic Compatibility - Immunity
EN 61000-6-4+A1	Electromagnetic compatibility - Part 6-4: Generic standards - Emission standard for industrial environments
EN IEC 63000	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
DIN ISO/TS 15066	Robots and robotic devices – Collaborative robots



The EU Declaration of Conformity valid at the time of product delivery is delivered with product or made available online. The standards and directives cited here reflect the status at the time of publication of the operating and assembly instructions.

12.3 UKCA Declaration of Conformity

The manufacturer Schmalz confirms that the product described in these operating instructions fulfills the following applicable UK regulations:

2017	Radio Equipment Regulations
2012	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations

The following designated standards were applied:

EN ISO 12100	Safety of machinery — General principles for design — Risk assessment and risk reduction
EN ISO 13857	Safety of Machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs
EN ISO 10218-1	Industrial Robots – Safety Requirements – Part 1: Robots
EN ISO 10218-2	Industrial Robots – Safety Requirements – Part 2: Robot Systems and Integration
DIN ISO/TS 15066	Robots and robotic devices – Collaborative robots



The Declaration of Conformity (UKCA) valid at the time of product delivery is delivered with the product or made available online. The standards and directives cited here reflect the status at the time of publication of the operating and assembly instructions.

12.4 UKCA Declaration of Incorporation

The manufacturer Schmalz confirms that the product described in these operating instructions fulfills the following applicable UK regulations:

2008 | Supply of Machinery (Safety) Regulations

The product specified is solely intended for installation indoors in a complete system. The start of operations shall be prohibited until the conformity of the final product with the "Supply of Machinery (Safety) Regulations 2008" has been established.

The manufacturer commits to provide special documentation of the partly completed machinery to national authorities in electronic form if requested. The special technical documentation belonging to the machine as per Annex VII Part B has been created.

The following designated standards were applied:

EN ISO 12100	Safety of machinery — General principles for design — Risk assessment and risk reduction
EN ISO 13857	Safety of Machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs
EN ISO 10218-2	Industrial Robots – Safety Requirements – Part 2: Robot Systems and Integration
EN 61000-6-1	Electromagnetic Compatibility - Immunity
EN 61000-6-4+A1	Electromagnetic compatibility - Part 6-4: Generic standards - Emission standard for industrial environments
EN IEC 63000	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
DIN ISO/TS 15066	Robots and robotic devices – Collaborative robots



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