



Operating Instructions

Flow Gripper SCG-HSS

Note

The Operating 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 Note on Using this Document

J. Schmalz GmbH is generally referred to as Schmalz in this document.

The document contains 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 document describes the product at the time of delivery by Schmalz and is aimed at:

- Installers who are trained in handling the product and can operate and install it
- Technically trained service personnel performing the maintenance work
- Technically trained persons who work on electrical equipment

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 Operating instructions may result in 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 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
 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.

1.4 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.

2 Fundamental Safety Instructions

2.1 Intended Use

The flow gripper SCG-HSS with flexible and adjustable pin curtain gripping surface and integrated vacuum generation is used to reliably handle:

- Workpieces with highly textured surfaces, including those with openings and drilled holes
- Delicate and electrostatic-sensitive components such as populated printed-circuit boards



The product is intended for industrial use.

Intended use includes observing the technical data and the installation and operating instructions in this manual.

2.2 Non-Intended Use

Schmalz does not accept any liability for any direct or indirect losses or damages that result from using the product. This applies, in particular, to any use of the product that is not in accordance with the intended purpose and to any use that is not described or mentioned in this documentation.

2.3 Personnel Qualifications

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

1. Task only qualified personnel to perform the tasks described in these Operating instructions.
2. The product must be operated only by persons who have undergone appropriate training.

These Operating instructions are intended for fitters who are trained in handling the product and who can operate and install it.

2.4 Emissions

The device emits noise due to operation with compressed air and a vacuum.



CAUTION

Noise pollution caused by exhaust air or leakage during operation

Hearing damage

- ▶ In the event of leakage, check connections and lines and remedy leakages
- ▶ Wear ear protectors.

2.5 Overpressure



CAUTION

If the air pressure is too high while the pin curtain extends, the pins speed up and become separated from the gripper.

Risk of eye injury

- ▶ Apply a maximum of 2 bar of compressed air on compressed air connection (2) for extending the pins.
- ▶ Be careful while connecting the pneumatic lines.
- ▶ Check that the connections are installed correctly on a regular basis.
- ▶ While extending the pins, do not hold the gripper toward your face.
- ▶ Wear eye protection.

2.6 Vacuum



CAUTION

During suction, vacuum is generated on the underside of the pin curtain.

Hair, skin, body parts and items of clothing can be sucked in.

- ▶ Wear protective glasses and tight-fitting clothing.
- ▶ Use a hairnet if necessary.
- ▶ Do not look or reach into the suction cup openings.

2.7 Modifications to the Product

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

1. The product must be operated only in its original condition as delivered.
2. Use only original spare parts from Schmalz.
3. The product must be operated only in perfect condition.

3 Product Description

3.1 Product Name

The breakdown of the item designation (e.g. SCG-HSS-1xE100-AR-25-47) is as follows:

Property	Variants	Explanation
Abbreviated designation	SCG-HSS	Schmalz Coanda Gripper – Highly Structured Surfaces
Vacuum generator	1xE100	1x = number of ejectors E100 = performance class
Exhaust air	AR	Axial exhaust duct
Height adjustment	25	25 mm
Suction area diameter	47	Ø47 mm

3.2 Type Plate

The type plate is permanently attached to the product and must always be clearly legible. It contains product identification data and important technical information.

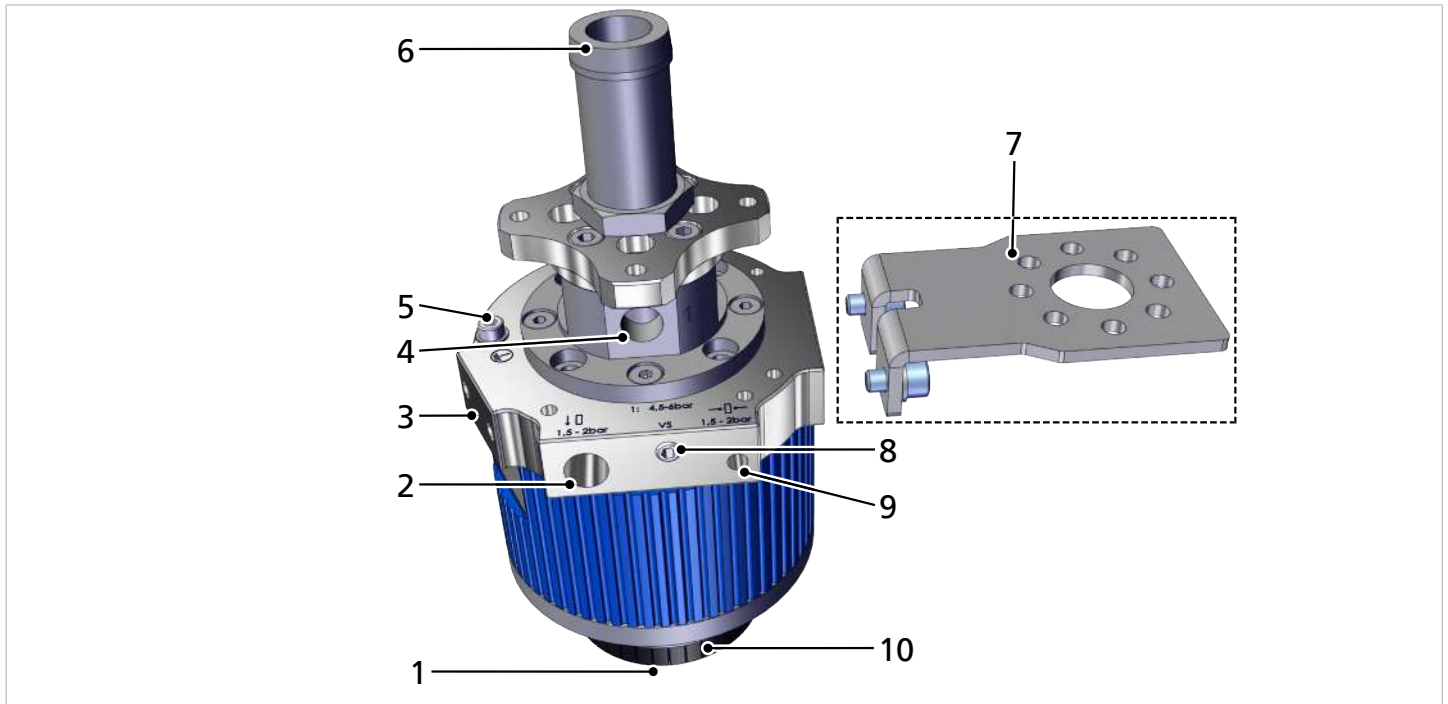
- ▶ For spare parts orders, warranty claims or other inquiries, have the information on the type plate to hand.

Type plate (1) contains the following information:

- QR code
- Part number
- Manufacturing date
- Serial number



3.3 Structure of the SCG-HSS



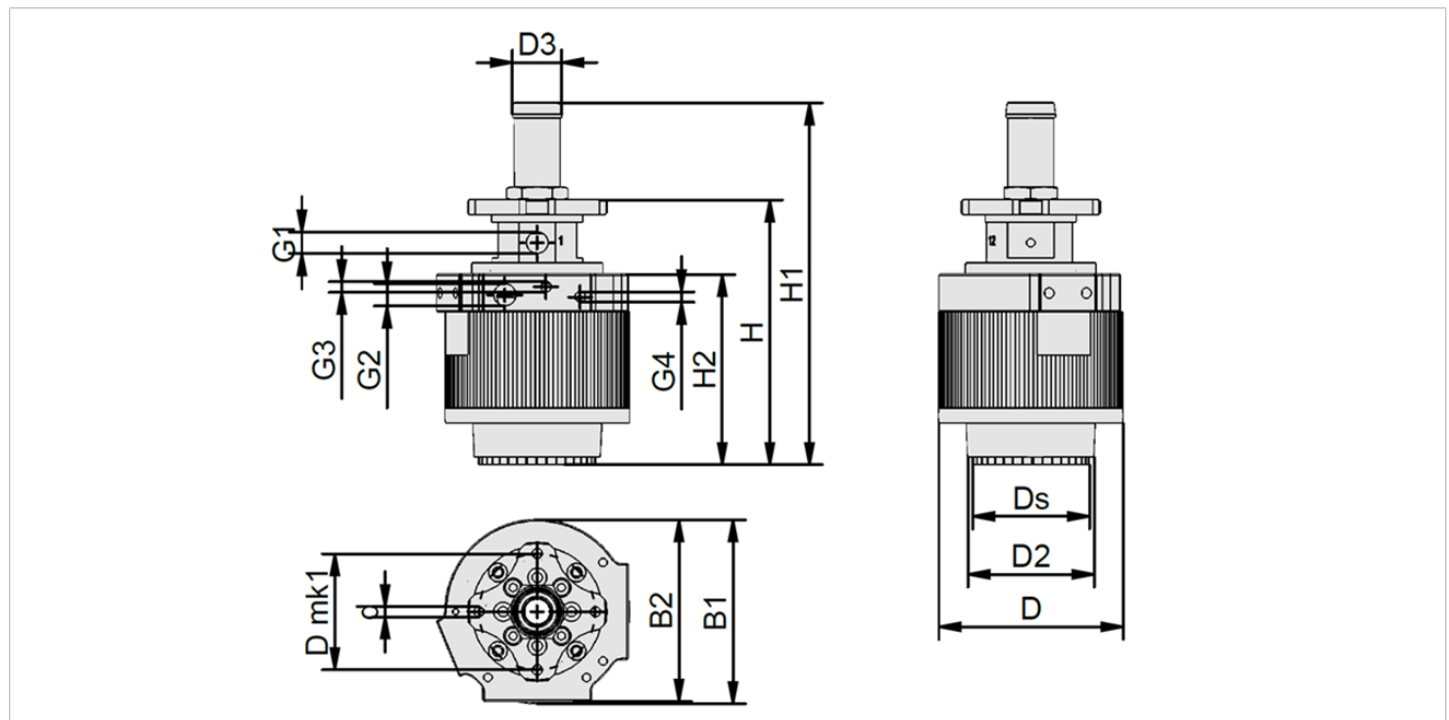
1	Vacuum vent	2	Compressed air connection (max. 2.0 bar)/G 1/8"; extending the pins with a compressed air pulse; not continuously applied
3	Thread (2 x M5) for vacuum switch holder (series VS) – OPTIONAL	4	Compressed air connection (max. 6 bar)/G 1/8"; vacuum generator; continuously applied (during operation/200 l/min); label 1
5	PE connection (ground)	6	Outgoing air nozzle and exhaust air connection / connection for silencer
7	Optional: holder(s)	8	Connection for external vacuum switch; female M5 thread – OPTIONAL
9	Compressed air connection (max. 2.0 bar)/M5 female; fixing the pins in place, continuously applied (during operation and following the "teach-in" process)	10	Pin curtain/underside and contact area with workpiece

4 Technical Data

4.1 General Parameters

Parameter	Unit	Value
Mass	g	485
Suction rate	l/min	270 to 650
Air consumption	l/min	60 to 200
Compressed air connection P1, vacuum generator (G 1/8")	bar	Max. 6.0
Compressed air connection P2, extending the pins (G 1/8")	bar	Max. 2.0
Compressed air connection P3, fixing the pins in place (M5 female)	bar	Max. 2.0
Operating temperature	°C	5 to 50
Rec. Internal hose Ø (vacuum generation)	mm	4
Gripping surface Ø (pin curtain)	mm	47
PCB weight: populated (one gripper)	g	Up to approx. 250
Max. height difference of components on the work-piece	mm	25
ESD conformity	—	✓
Elec. resistance	Ohms	$10^6 - 10^9$
Operating medium	Air or neutral gas, filtered to 5 µm, without oil, class 7-4-4 compressed air quality in acc. with ISO 8573-1	

4.2 Dimensions



G1	G2	G3	G4	H	H1	H2	D3
G1/8" female thread	G1/8" female thread	M5 female thread	M5 female thread	105	143.5	75.5	19.5
D mk1	d	B1	B2	Ds	D	D2	D2
46	4	73	72	47	70	50	

All dimensions given in millimeters [mm].

5 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.

6 Installation

6.1 Installation Instructions



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 vacuum openings, e.g. suction cups



CAUTION

Noise pollution caused by exhaust air or leakage during operation

Hearing damage

- ▶ In the event of leakage, check connections and lines and remedy leakages
- ▶ Wear ear protectors.

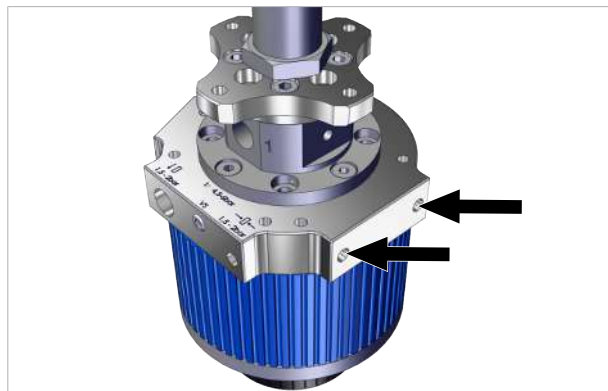
6.2 Mechanical Attachment

Use only the connections, mounting holes and attachment materials that have been provided.

The flow gripper may be installed in any position.

The flow gripper can be adapted to any handling system using the integrated thread on the housing.

- ▶ Use the size-M5 female thread G4 to mechanically attach the SCG-HSS.

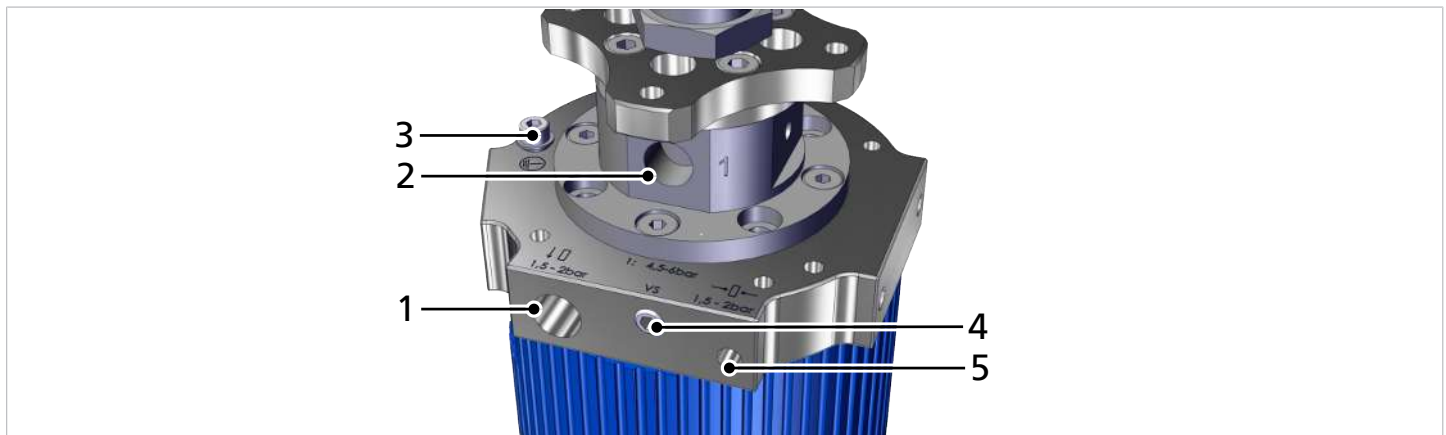


Optional: Using the Mounting Set



- ▶ Mount the mounting set on the SCG-HSS.

6.3 Connection



1	Compressed air connection for extending the pin curtain	2	Compressed air connection for vacuum generation
3	PE connection (ground)	4	Optional: Vacuum connection for a vacuum switch
5	Compressed air connection for clamping the pin curtain	—	—

Optional: Connection for a vacuum switch on the vacuum connection (4)

1. Remove the M5x6 set screw, size 2.5 on the vacuum connection (4).
2. Connect the vacuum switch.

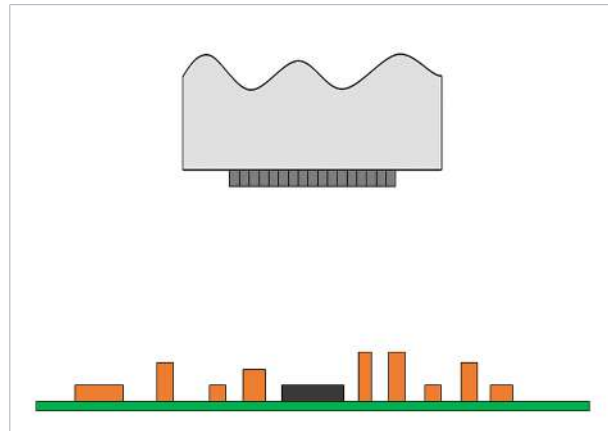
7 Process Sequence

Recommended process sequence for picking up and putting down workpieces with highly textured surfaces.

Prior to actual handling, the gripper is adapted to the surface contour of the workpiece through a teach-in process, with a slight pressure on the pin curtain. Since the pin curtain is under minimal pressure, "overhead applications" are also an option.

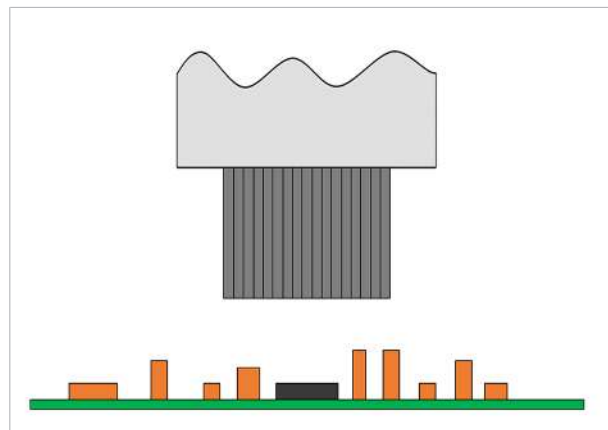
- ✓ The gripper is permanently mounted on the handling device.
- ✓ All the connections are securely tightened.
- ✓ Hoses must not become kinked during movement.
- ✓ All the compressed air connections are depressurized.
- ✓ The gripper has not yet touched the surface of the workpiece. Extending the pins before contact minimizes the load for the workpiece.

1. Move the gripper over the workpiece to be gripped.



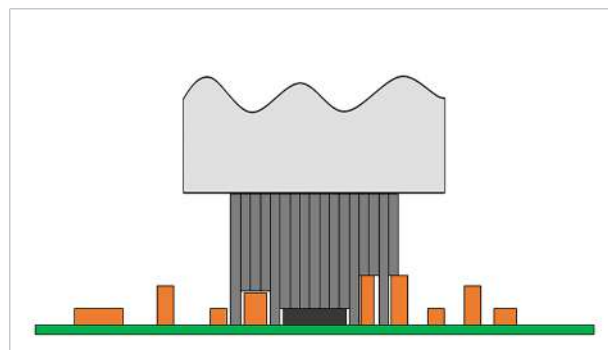
2. A short compressed air pulse (1 second) is activated to extend the pins (1).

Note: If a workpiece is picked up horizontally or overhead, the extension pressure must be maintained. Based on the workpiece, a pressure on the pins of < 1.5 bar can also be selected to reduce the force on sensitive components.



⇒ All the pins are in the end position and the surface can be cleanly taught in and sealed.

3. Align and move to the final pick-up position.
 - ▶ Position the gripper above the center of gravity of the workpiece.



- ⇒ All the pins contact the surface,
- ⇒ all the pins are extended and balance out the surface structure and
- ⇒ each individual pin is retracted at least 5 mm.

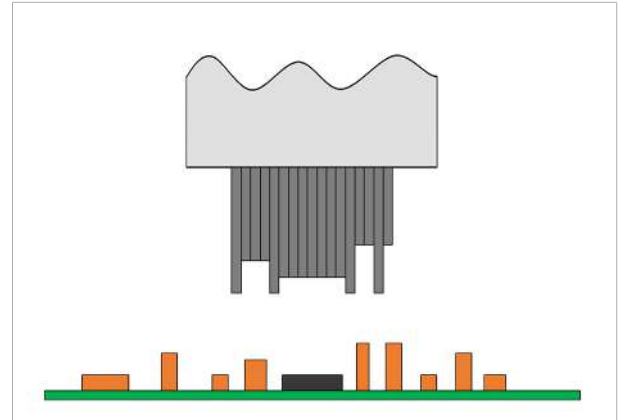
4. Lock the pin curtain by activating the compressed air on connection (5).

5. Start the vacuum generation by activating the compressed air on connection (2) (high flow rate).

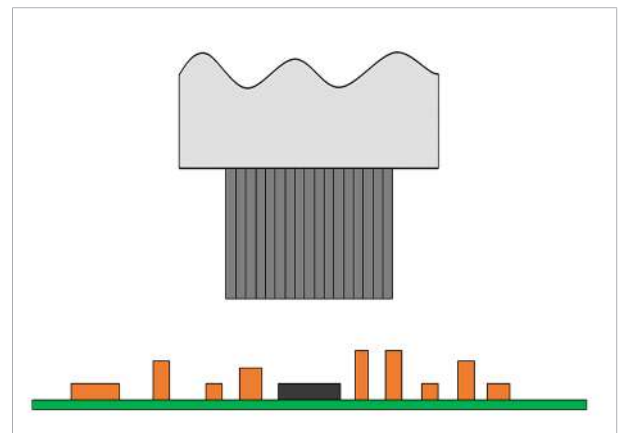
⇒ The workpiece is picked up/fixed in place.

6. Lift the workpiece and move it to the target position.
7. Deactivate vacuum generation on connection (2).
⇒ The workpiece is no longer fastened and held.

8. Lift the gripper away from the workpiece.



9. Release the clamping for the pins by deactivating the compressed air on connection (5) and extend the pins by activating the compressed air on connection (1) for a new teach-in process.



After activating the vacuum generation, a short resting time must be allowed (1 to 2 seconds) so that the vacuum is built up correctly. Alternatively, you can measure the current vacuum level using the vacuum switch on the vacuum connection (4).

8 Maintenance and Cleaning

The product does not require maintenance.

We recommend:

1. Cleaning the surfaces and removing any dirt on a regular basis.
2. Checking the screw union and the plug connection regularly.

9 Warranty

Schmalz guarantees this system pursuant to our General Terms and Conditions of Sale and Delivery. The same applies to spare parts, provided that these are original parts supplied by us.

Wearing parts are not covered by the warranty.

10 Accessories, Spare Parts and Wearing Parts

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.

Designation	Part no.	Type
ERS SCG-HSS 5S (5 pins)	10.01.30.01066	S
SET SCG-HSS M5 (bracket mounting set)	10.01.30.01065	A
SD G3/8-AG 40x80 SCG (silencer)	10.01.30.00352	A
STV-W M5-AG 4	10.08.02.00155	A
STV-GE M5-AG 4	10.08.02.00200	A
STV-W M5-AG 6 (plastic)	10.08.02.00296	A
STV-GE M5-AG 6	10.08.02.00201	A
STV-W G1/8-AG 6 (plastic)	10.08.02.00288	A
STV-GE G1/8-AG 6	10.08.02.00204	A
VSL 6-4 PU	10.07.09.00002	A
VSL 4-2 PU	10.07.09.00001	A

Legend:	S ...	Spare part
	A ...	Accessories

11 Disposing of the Device

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

Component	Material
Housing	PUR vacuum cast resin
Inner components	Aluminum alloy, stainless steel, POM, PUR vacuum cast resin
Seals	NBR
Screws	Galvanized steel, A2

12 EU Conformity

EU Declaration of Incorporation

The manufacturer Schmalz confirms that the product SCG-HSS described in these Operating 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 4414	Pneumatic fluid power – General rules and safety requirements for systems and their components



The Declaration of Incorporation 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.

13 UKCA Conformity

Declaration of incorporation (UKCA)

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

2008	Supply of Machinery (Safety) Regulations
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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 4414	Pneumatic fluid power – General rules and safety requirements for systems and their components



The Declaration of Incorporation (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.