



Flow Gripper SFG

Assembly Instructions

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 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.

1.2 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 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.
NOTE	Indicates a danger that leads to property damage.

2 Fundamental Safety Instructions

2.1 Emissions

The SFG emits noise due to the operation with compressed air.



⚠ 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.



⚠ 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.

2.2 Intended Use

The product is built in accordance with the latest standards of technology and is delivered in a safe operating condition; however, hazards may arise during use.

The flow gripper SFG with integrated vacuum generation is used in combination with suction cups to grip and transport dry food products using vacuum power. It is particularly well suited to applications that require a high suction flow rate.

The flow gripper and the suction cups have a "hygienic design," are made from food-safe materials and are easy to clean. This means they are suitable for direct contact with baked and confectionery goods such as cookies, waffles, etc.

The extremely flexible contact elements are designed:

- For highly textured surfaces with a high degree of leakage
- For sensitive food products that require minimal, gentle surface pressure
- With a special plug connection for mounting/removing the suction cups without tools and easy cleaning

Neutral gases are approved as evacuation media. Neutral gases include air, nitrogen and inert gases (e.g. argon, xenon and neon). For further information, see (> See *ch. Technical Data*).

The product is intended for industrial use.

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

3 Product Description

3.1 Application Description

The SFG includes integrated vacuum generation and is used for gripping and handling. It is generally suitable for all applications that require a high suction flow rate.

For operation (i.e. to generate the vacuum), compressed air must be connected to the appropriate interface.

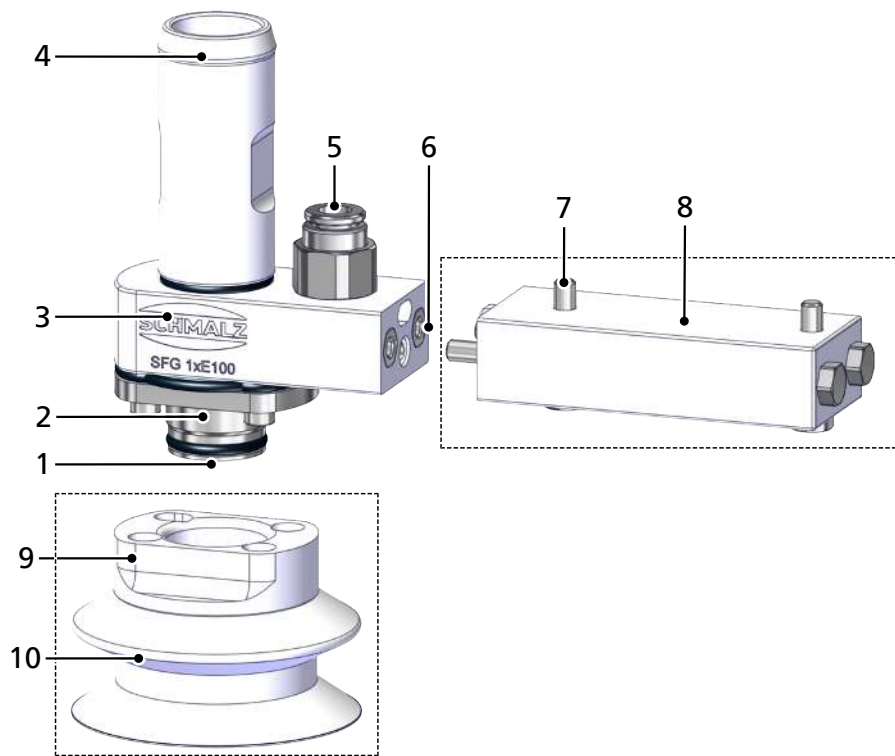
The SFG does not contain any moving parts, which makes it low maintenance and less susceptible to faults.

The flow gripper is equipped with a special suction cup interface that allows it to grip different workpieces by using the appropriate suction cups. A variety of different suction cups can be connected.

To promote food safety, the following standards and guidelines were followed for guidance for the design and materials during the definition of the SFG:

- EHEDG Doc. 8 and Doc. 13
- EN 16722
- FDA CFR Title 21
- ISO 21469
- 1935/2004/EC

3.2 Design of the Flow Gripper SFG



1	Vacuum vent	2	Quick-change interface for the suction cup
3	Main body with integrated vacuum generator	4	Exhaust air connection
5	"Suction" compressed air connection	6	Connection interface or interface to the mounting set
7	M4 screws (in the optional mounting set)	8	Optional: Mounting set for mounting on beams or robots
9	Quick-change interface between the suction cup and vacuum generator	10	Wearing and spare parts: Suction cup

4 Technical Data

4.1 General Parameters

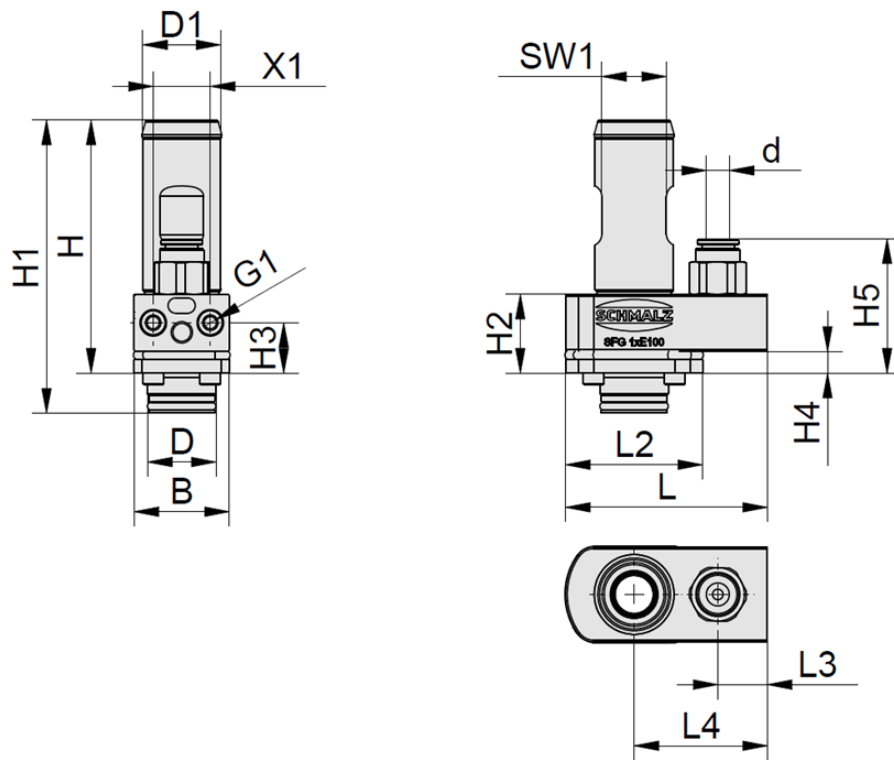
Parameter	Unit	SFG
"Suction" operating pressure	bar	1.0 – 5.0
Temperature range	° C	+5 to +75
Recommended internal hose Ø for "suction"	mm	4
Recommended hose diameter for "exhaust air"	mm	26/20
Mass	g	108
Operating medium	Use only well-maintained compressed air (air or neutral gas according to EN 983, filtered to 40 µm, oiled or unoled).	

Property	Unit	Operating pressure				
		1.0	2.0	3.0	4.0	5.0
Air consumption ¹⁾	l/min	60	90	120	158	198
Suction flow rate ^{1) 2)}	l/min	270	405	508	588	650
Vacuum ¹⁾	mbar	21	45	91	112	121

¹⁾ Tolerance +/-10% for all specified values. Measurements without exhaust hoses!

²⁾ If the exhaust air hose is longer than 1 m, the suction capacity is reduced as the length of the hose increases.

4.2 Dimensions



B	D	D1	d	G1	SW1	H	H1	H2
25	18	20.5	6	M4 internal thread	17	66.4	76.9	20.2
H3	H4	H5	L	L2	L3	L4	X1	
12.7	5.2	34.7	53	36	13	35	15	

5 Installation

5.1 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 due to incorrect installation of the pressure and vacuum connections

Hearing damage

- ▶ Correct installation.
- ▶ Wear ear protectors.

Take note of the following when mounting:

- Dirt particles or foreign bodies in the gripper connections, hoses or pipelines can lead to partial or complete gripper malfunction.
- Shorten the hoses and pipelines as much as possible.
- Insufficient compressed air is supplied if the internal diameter on the compressed air side is too small. This prevents the gripper from performing as specified in its defined performance data.
- Hose lines must be laid without bends or crimps.

5.2 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-M4 female thread to mechanically attach the SFG.

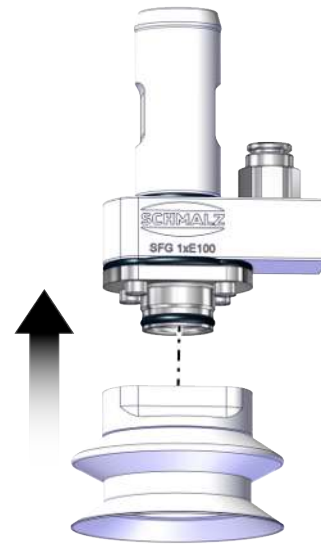


Optional: Using the Mounting Set



1. Mount the mounting set on the SFG. **1**.
2. Mount the assembly on a handling system **2**.
Flange plates for connecting to robot systems are available – (> See *ch. Accessories, Page 9*).

- ▶ Attach the suction area or suction cup (accessories) to the SFG through the special, toolless quick-change interface.



5.3 Connecting Compressed Air

- ▶ Connect the compressed air connection (inlet) for the integrated vacuum generation supply for the "suction" function using the size-6/4 plug-in screw union.



5.4 Optional: Connecting the Exhaust Air

The exhaust air can be discharged through a hose.

This reduces the noise level during operation and discharges particles contained in the exhaust air.

Depending on the length of the exhaust air hose, the power of the flow gripper may be reduced.

If the exhaust air hose is longer than 1 m, the suction capacity and achievable vacuum level are reduced as the length of the exhaust air hose increases.



- ▶ Connect a hose with a 20 mm inner Ø to the exhaust air outlet.

6 Cleaning the Flow Gripper

To safely clean the SFG, its materials must not react to the cleaning agent and antimicrobial chemicals (disinfectants).



NOTE

Incorrectly cleaning the product and its components

Damage to the product or individual components due to aggressive cleaning agents or excessive temperatures!

- ▶ For cleaning, use only cleaning agents that do not corrode or damage the materials used.
- ▶ Do not use sharp-edged objects (wire brushes, sandpaper, etc.).
- ▶ Do not exceed the specified max. temperature during cleaning.

The table below shows the materials used:

Component	Material/material number
Flow Gripper SFG	
Main body	POM C LW FOOD
Exhaust duct	POM C LW FOOD
Vacuum generation	1.4305
O-rings	NBR
Thread inserts	1.4310
Screws	1.4401
Plug-in screw union	1.4404
Ball	1.4404
Suction cups SAUG-SFG and SAUG-FL	
Suction cup connection disc	POM C LW FOOD
Suction cup	SI 65/SI-MD 55
Suction area	POM C LW FOOD
Mounting set SFG	
Sheet	POM C LW FOOD
Screws	1.4301/1.4401

While cleaning the parts, a max. temperature of 75° C must be observed.

The type and frequency of cleaning is the responsibility of the operating company.

7 Spare and Wearing Parts

Maintenance work may only be carried out by qualified personnel.

The following list contains the primary spare parts.

Type	Designation	Part no.
SAUG-SFG 20 SI-HD	Suction cup (round)	10.01.30.00998
SAUG-SFG 30 SI-HD	Suction cup (round)	10.01.30.00997
SAUG-SFG 40 SI-HD	Suction cup (round)	10.01.30.00994
SAUG-SFG 50 SI-HD	Suction cup (round)	10.01.30.00993
SAUG-SFG 20 SI-MD	Suction cup (round)	10.01.30.01047
SAUG-SFG 30 SI-MD	Suction cup (round)	10.01.30.01048
SAUG-SFG 40 SI-MD	Suction cup (round)	10.01.30.01049
SAUG-SFG 50 SI-MD	Suction cup (round)	10.01.30.01050
SAUG-FL SFG 60 POM	Suction area	10.01.30.01001
FLSA 20 SI-HD	Flat suction gripper (round)	10.01.06.03888
FLSA 30 SI-HD	Flat suction gripper (round)	10.01.06.03746

Type	Designation	Part no.
FLSA 40 SI-HD	Flat suction gripper (round)	10.01.06.03886
FLSA 50 SI-HD	Flat suction gripper (round)	10.01.06.03467
FLSA 20 SI-MD	Flat suction gripper (round)	10.01.06.04724
FLSA 30 SI-MD	Flat suction gripper (round)	10.01.06.04725
FLSA 40 SI-MD	Flat suction gripper (round)	10.01.06.04726
FLSA 50 SI-MD	Flat suction gripper (round)	10.01.06.03991

8 Accessories

The following list contains the primary accessories.

Type	Designation	Part no.
ABLU-SL-26-20-PU-PS	Exhaust air hose	10.07.09.00213
VSL 6-4 PE	Vacuum hose	10.07.09.00014
Mounting set SFG	Mounting set SFG (for mounting on horizontal surfaces)	10.01.30.00992
FLAN-PL 63x11.5-UNI	Flange plate (round), for custom adaptation to the robot system (Mounting set 10.01.30.00992 required)	10.01.30.00017
FLAN-PL 63x10.5-AD1	Flange plate (round), bolt circle diameter of 50 mm (for robot type ADEPT QUATTRO s650) (Mounting set 10.01.30.00992 required)	10.01.30.00016

9 Warranty

This system is guaranteed in accordance with our general terms of trade 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 Disposing of the product

- ▶ Sort and dispose of all components according to the country-specific regulations.



For proper disposal, please contact a company specializing in the disposal of technical goods and instruct the company to observe the applicable disposal and environmental regulations. Schmalz is happy to assist you in finding a suitable company.