

## Operating Instructions

# Ejector SEG

### 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](http://www.schmalz.com/services)

# 2 Fundamental Safety Instructions

## 2.1 Intended Use

The ejector is used for vacuum generation, i.e. for evacuating suction cups for holding payloads or for evacuating other volumes.

The vacuum generated should be monitored in order to detect any issues with vacuum generation.

Neutral gases are approved as evacuation media. Neutral gases include air, nitrogen and inert gases (e.g. argon, xenon and neon).

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 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 accepts no liability for damages caused by non-intended usage of the ejector.

In particular, the following are considered non-intended use:

- Use in potentially explosive atmospheres
- Use in medical applications
- Evacuation of objects that are in danger of imploding

## 2.3 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. Assembly and maintenance work must only be carried out by qualified personnel.

The following target groups are addressed in these operating instructions:

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

## 2.4 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
 <b>WARNING</b>	Indicates a medium-risk hazard that could result in death or serious injury if not avoided.
 <b>CAUTION</b>	Indicates a low-risk hazard that could result in minor or moderate injury if not avoided.

## 2.5 Residual Risks



### **WARNING**

#### **Noise pollution due to the escape of compressed air**

Hearing damage!

- ▶ Wear ear protectors.
- ▶ The ejector must only be operated with a silencer.



### **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.



### **CAUTION**

**Depending on the purity of the ambient air, the exhaust air can contain particles, which escape from the exhaust air outlet at high speed.**

Eye injuries!

- ▶ Do not look into the exhaust air flow.
- ▶ Wear eye protection.



## CAUTION

### Vacuum close to the eye

Severe eye injury!

- ▶ Wear eye protection.
- ▶ Do not look into vacuum openings such as suction lines and hoses.

## 2.6 Modifications to the Product

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

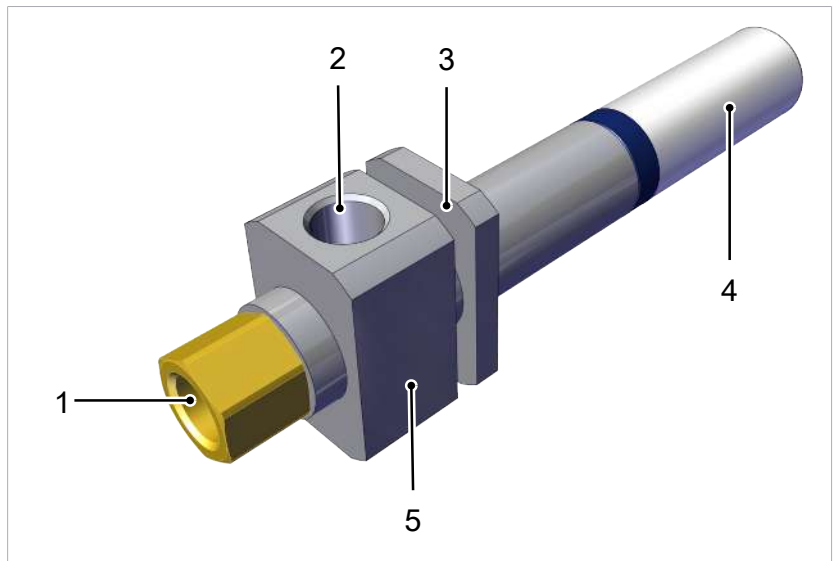
1. The product must be operated only in its original condition as delivered.
2. Use only original spare parts from Schmalz.
3. The product must be operated only in perfect condition.

## 3 Operating Principle and Product Design

The ejector is supplied with compressed air via the connector (1). The compressed air flowing through generates a vacuum at the connector (2) and is vented into the environment via the connector (4) (silencer or exhaust pipe).

The slot (3) that runs around is used to mechanically attach the ejector.

The variants SEG 05/ 07 are designed with a mounting hole of size M5 x 4 at position (5).

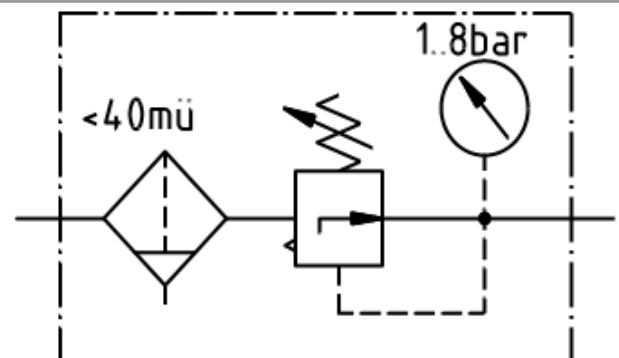


## 4 Technical Data

### 4.1 General Parameters

Parameter	Description
Material	Anodized aluminum / brass / plastic
Temperature range	-10 to +80° C
Operating pressure	5 bar
Media	Filtered (<math><40\ \mu\text{m}</math>), lubricant-free air, 1 to 8 bar

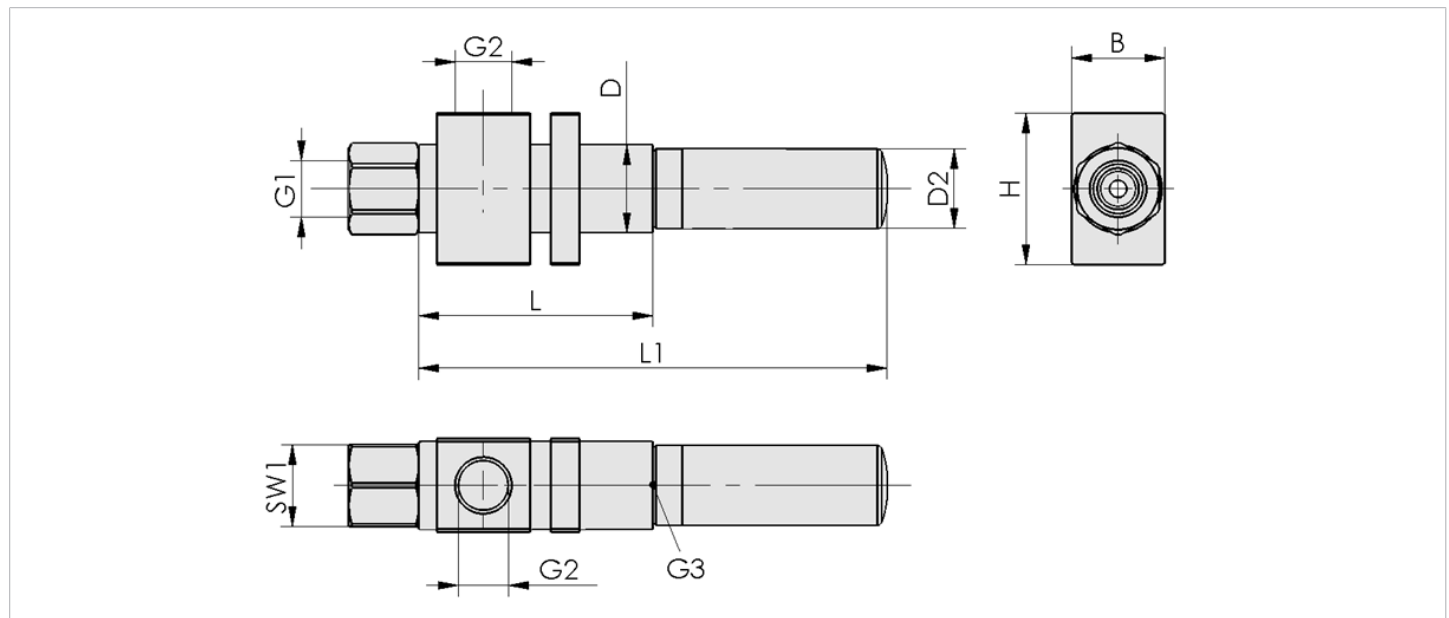
Circuit diagram



## 4.2 Performance Data

Type	Nozzle Ø [mm]	Suction rate [NI/min]	Max. vacuum [%]	Air consumption [NI/min]	Weight [g]
SEG 05 HS-S / SEG 05 HS-S SDA	0.5	7	85	13	11
SEG 07 HS-S / SEG 07 HS-S SDA	0.7	14	85	24	11
SEG 07 HS / SEG 07 HS SDA	0.7	14	85	24	45
SEG 10 HS / SEG 10 HS SDA	1	34	85	49	50
SEG 15 HS / SEG 15 HS SDA	1.5	69	85	113	110
SEG 20 HS / SEG 20 HS SDA	2	124	85	200	130
SEG 20 LS / SEG 20 LS SDA	2	170	55	200	130
SEG 25 HS / SEG 25 HS SDA	2.5	184	85	310	295
SEG 25 LS / SEG 25 LS SDA	2.5	260	55	310	295
SEG 30 HS / SEG 30 HS SDA	3	240	85	445	404
SEG 30 LS / SEG 30 LS SDA	3	370	55	445	404

## 4.3 Dimensions



Type	L	B	H	L1	D	G1	G2	G3	D2	SW1
SEG 05 HS-S	32	10	20	-	9	M5	M5	M5	-	8
SEG 05 HS-S SDA	32	10	20	56	9	M5	M5	M5	7	8
SEG 07 HS-S	32	10	20	-	9	M5	M5	M5	-	8
SEG 07 HS-S SDA	32	10	20	56	9	M5	M5	M5	7	8
SEG 07 HS	40	16	26	-	16	1/8"	1/8"	1/8"	-	14
SEG 07 HS SDA	40	16	26	80	16	1/8"	1/8"	1/8"	13.6	14
SEG 10 HS	45	16	26	-	16	1/8"	1/8"	1/8"	-	14
SEG 10 HS SDA	45	16	26	85	16	1/8"	1/8"	1/8"	13.6	14
SEG 15 HS	60	22	38	-	21	1/4"	1/4"	1/4"	-	17
SEG 15 HS SDA	60	22	38	106	21	1/4"	1/4"	1/4"	20	17
SEG 20 HS	75	26	38	-	25	1/4"	1/4"	3/8"	-	17
SEG 20 HS SDA	75	26	38	131	25	1/4"	1/4"	3/8"	20	17
SEG 20 LS	75	26	38	-	25	1/4"	1/4"	3/8"	-	17
SEG 20 LS SDA	75	26	38	131	25	1/4"	1/4"	3/8"	20	17
SEG 25 HS	100	32	50	-	30	3/8"	1/2"	1/2"	-	22
SEG 25 HS SDA	100	32	50	163	30	3/8"	1/2"	1/2"	27	22

Type	L	B	H	L1	D	G1	G2	G3	D2	SW1
SEG 25 LS	100	32	50	-	30	3/8"	1/2"	1/2"	-	22
SEG 25 LS SDA	100	32	50	163	30	3/8"	1/2"	1/2"	27	22
SEG 30 HS	110	42	50	-	40	3/8"	1/2"	3/4"	-	22
SEG 30 HS SDA	110	42	50	200	40	3/8"	1/2"	3/4"	31	22
SEG 30 LS	110	42	50	-	40	3/8"	1/2"	3/4"	-	22
SEG 30 LS SDA	110	42	50	200	40	3/8"	1/2"	3/4"	31	22

All specifications are in 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

For safe installation, the following instructions must be observed:

- Use only the connectors, mounting holes and attachment materials that have been provided.
- Carry out mounting or removal only when the device is depressurized.
- Pneumatic line connections must be securely connected and attached to the product.
- Ensure that you make all connections correctly and never close them off – danger of bursting!
- When using hose connectors (plug-in couplings and plug-in screw unions), make sure that they are suitable for use with a vacuum.
- To ensure a vacuum-tight connection, make sure that the hose engages correctly into the coupling.
- In the case of severe contamination, use a suitable filter.
- The ejector should be protected from vibrations and impacts.

### 6.2 Pneumatic Connection



#### ⚠ 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



#### ⚠ CAUTION

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

Hearing damage

- ▶ Correct installation.
- ▶ Wear ear protectors.

## 6.2.1 Instructions for the Pneumatic Connection

Use only screw unions with cylindrical G-threads for the compressed air and vacuum connection!

To ensure problem-free operation and a long service life of the ejector, only use adequately maintained compressed air and consider the following requirements:

- Use air or neutral gas in accordance with EN 983, filtered to 40 µm, lubricant-free.
  - Dirt particles or foreign bodies in the ejector connections, hoses or pipelines can lead to partial or complete ejector malfunction.
1. Shorten the hoses and pipelines as much as possible.
  2. Keep hose lines free of bends and crimps.
  3. Only use a hose or pipe with the recommended internal diameter to connect the ejector, otherwise use the next largest diameter.
    - On the compressed air side, ensure that the internal diameter has the dimensions required for the ejector to achieve its performance data.
    - On the vacuum side, ensure that the internal diameters have the necessary dimensions for preventing high flow resistance. If the selected internal diameter is too small, the flow resistance and the evacuation times increase and the blow off times are extended.

Hose diameters that are too small, elbow unions and 90° bends cause a corresponding flow resistance. This hinders the rapid build-up of the vacuum.

However, arbitrarily large hose diameters should not be selected either. The increased volume results in longer evacuation times.

The following table shows the recommended line cross-sections (internal diameter):

Performance class	Line cross-section (internal diameter) in mm <sup>1)</sup>	
	Pressure side	Vacuum side
05 – 07-M5	2	2
07 – 10	2	4
15	4	6
20	4	9
25 – 30	6	12

<sup>1)</sup>Based on a maximum hose length of 2 m.

- ▶ For longer hose lengths, the cross-sections must also be larger.

## 7 Maintenance

### 7.1 Safety Instructions

Maintenance work may only be carried out by qualified personnel.

- ▶ Create atmospheric pressure in the ejector's compressed air circuit before working on the system!



#### **⚠ WARNING**

**Failure to follow the instructions in these Operating instructions may result in injuries!**

- ▶ Read the Operating instructions carefully and observe the contents.

### 7.2 Cleaning the Ejector

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.

### 7.3 Replacing the Silencer

Heavy infiltration of dust, oil, etc. may contaminate the silencer and reduce the suction capacity. Cleaning the silencer is not recommended due to the capillary effect of the porous material.

If the suction capacity decreases, replace the silencer.

- ✓ Deactivate the ejector and depressurize the pneumatic systems.
- ▶ Detach and replace the silencer.

## 8 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.