



Operating instructions

Basic Ejector SBPL

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 intended for:

- 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

The displayed figures are only examples. Depending on the particular design, they can differ from the product.

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 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.

The QR code enables access to the digital technical documentation for the product.

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

1.4 Symbols



This symbol indicates useful and important information.

- ✓ This symbol represents a prerequisite that must be met before an action is performed.
- ▶ 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 ejector is used for vacuum generation, i.e. for evacuating suction cups for holding payloads or for evacuating other volumes.

Neutral gases in accordance with EN 983 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 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.

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

- Use in potentially explosive atmospheres
- The product must not be operated in aggressive environments (e.g. ambient air containing solvent fumes).
- Transport and through-suction of potentially explosive materials
- Direct contact with perishable goods/food products
- Use in medical applications
- Suction of aggressive gases or media such as acids, acid fumes, bases, biocides, disinfectants or detergents is not permitted.

2.3 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 operating instructions.
- The operating staff are physically and mentally capable and can be expected to reliably perform the tasks assigned.
- The operating staff have been instructed in the operation of the product and have read and understood the operating instructions.
- Installation, maintenance, and repairs must be carried out only by specialists or by persons who have undergone appropriate training.

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 employees must observe the relevant industry-specific rules and regulations.

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
 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.

2.5 Residual Risks



CAUTION

Falling product

Risk of injury

- ▶ Securely attach the product at the site of operation.
- ▶ Wear safety shoes (S1) and safety glasses when handling and mounting/dismounting the product.



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

Compressed air or vacuum in direct contact with the eye

Severe eye injury

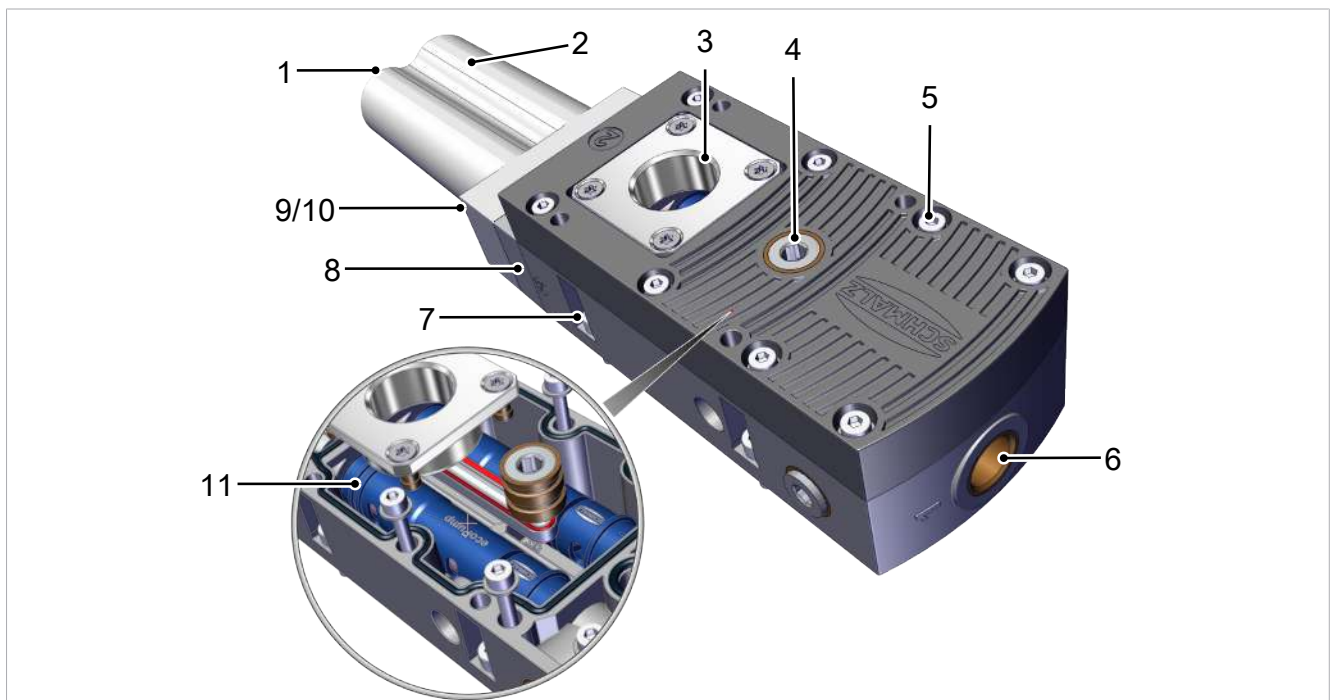
- ▶ Wear eye protection
 - ▶ Do not look into compressed air openings
 - ▶ Do not look into the silencer air stream
 - ▶ Do not look into vacuum openings such as suction cups, suction lines and hoses.
-

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 Product Design



1	Exhaust air outlets	7	M5 fastening screws (4x)
2	Silencer	8	Silencer holder
3	Vacuum connection	9	M4x16 fastening screws (2x for silencer holder)
4	Blow-off connection/ventilation connection, External blow-off with blow-off valve 2/2-NC* (vacuum-tight)	10	M4x35 fastening screws (2x for silencer)
5	M4 fastening screws (8x for enclosure cover)	11	Ejector module
6	Compressed air connection		

4 Technical Data

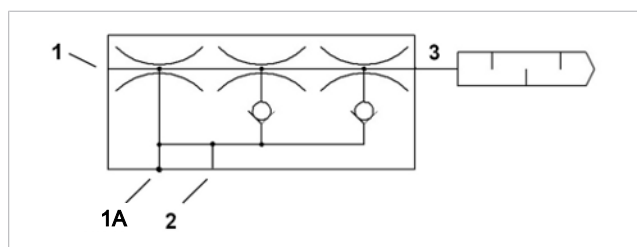
4.1 General parameters

Working temperature	0° C to +60° C
Optimum operating pressure	4 bar to 5 bar
Operating pressure	2 bar to 6 bar
Operating medium on compressed air side	Filtered and oiled or unoled compressed air or neutral gases according to class 7-4-4 of ISO 8573-1
Operating medium on the vacuum side	Dry, non-abrasive gases

4.2 Pneumatic Circuit Diagram

Key:

1	Compressed air connection
2	Vacuum connection
3	Exhaust outlet
1A	Blow-off/ventilation or vacuum sensor

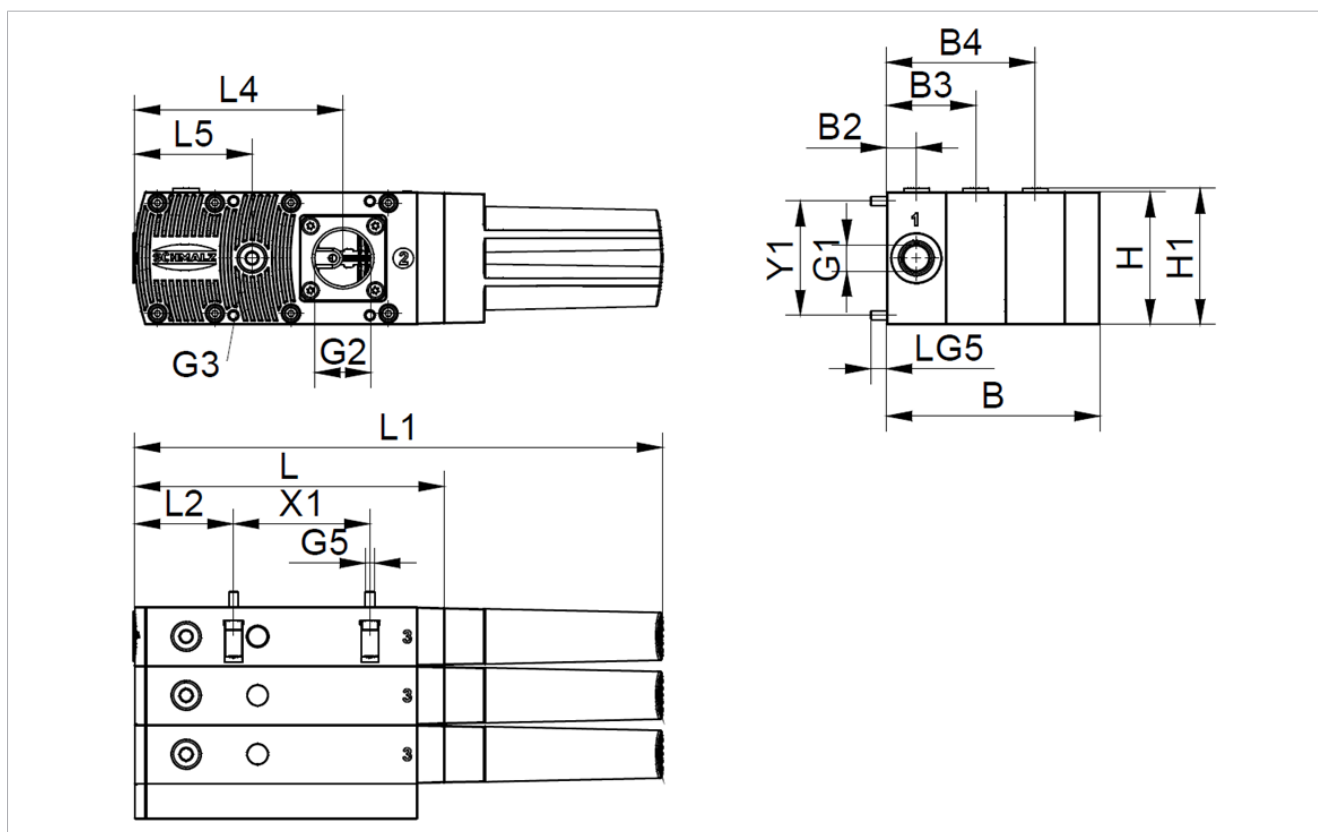


4.3 Performance Data

Type	Degree of evacuation	Max. suction rate	Air consumption ¹⁾	Sound level unobstructed	Sound level with suctioned workpiece	Weight
SBPL 25 HF	60%	290 l/min	80 l/min	61 dB	54 dB	0.8 kg
SBPL 25 HV	90%	300 l/min	105 l/min	65 dB	55 dB	0.8 kg
SBPL 50 HF	60%	500 l/min	160 l/min	65 dB	55 dB	0.8 kg
SBPL 50 HV	90%	510 l/min	210 l/min	66 dB	59 dB	0.8 kg
SBPL 75 HF	60%	710 l/min	230 l/min	67 dB	57 dB	1.1 kg
SBPL 75 HV	90%	720 l/min	305 l/min	68 dB	62 dB	1.1 kg
SBPL 100 HF	60%	860 l/min	300 l/min	69 dB	58 dB	1.1 kg
SBPL 100 HV	90%	870 l/min	395 l/min	70 dB	64 dB	1.1 kg
SBPL 125 HF	60%	1010 l/min	370 l/min	70 dB	60 dB	1.5 kg
SBPL 125 HV	90%	1010 l/min	470 l/min	72 dB	65 dB	1.5 kg
SBPL 150 HF	60%	1120 l/min	435 l/min	71 dB	61 dB	1.5 kg
SBPL 150 HV	90%	1040 l/min	545 l/min	73 dB	66 dB	1.5 kg

¹⁾ At optimal operating pressure (4.5 bar)

4.4 Dimensions



L	H	L1	L2	L4	L5	B2	H1	X1	Y1	G5	Lg5
167.5	72	285.3	54	113	64	16	74	73.5	62	M5 ext. threa d	8.5

Type	B	B3	B4	G1	G2	G3
SBPL 25 HF/HV	51	—	—	3/8" female thread	3/4" int. thread	1/4" internal thread
SBPL 25 HF/HV NPT	51	—	—	NPT3/8 int. thread	NPT3/4" fe- male thread	NPT1/4 int. thread
SBPL 50 HF/HV	51	—	—	3/8" female thread	3/4" int. thread	1/4" internal thread
SBPL 50 HF/HV NPT	51	—	—	NPT3/8 int. thread	NPT3/4" fe- male thread	NPT1/4 int. thread
SBPL 75 HF/HV	83	48	—	3/8" female thread	1" female thread	1/4" internal thread
SBPL 75 HF/HV NPT	83	48	—	NPT3/8 int. thread	NPT1" int. thread	NPT1/4 int. thread
SBPL 100 HF/HV	83	48	—	3/8" female thread	1" female thread	1/4" internal thread
SBPL 100 HF/HV NPT	83	48	—	NPT3/8 int. thread	NPT1" int. thread	NPT1/4 int. thread
SBPL 125 HF/HV	115	48	80	3/8" female thread	1" female thread	1/4" internal thread

Type	B	B3	B4	G1	G2	G3
SBPL 125 HF/HV NPT	115	48	80	NPT3/8 int. thread	NPT1" int. thread	NPT1/4 int. thread
SBPL 150 HF/HV	115	48	80	3/8" female thread	1" female thread	1/4" internal thread
SBPL 150 HF/HV NPT	115	48	80	NPT3/8 int. thread	NPT1" int. thread	NPT1/4 int. thread

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



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.

For safe installation, the following instructions must be observed:

1. Use only the connectors, mounting holes and attachment materials that have been provided.
2. Mounting and removal must be performed only when the device is unpressurized and disconnected from the mains.
3. Hose lines must be laid without bends or crimps.
4. Shorten the hoses and pipelines as much as possible to keep the response times as short as possible.
5. Remove any dirt particles or foreign bodies in the product's connections or in the hoses or pipelines because they can lead to malfunctions or failure.

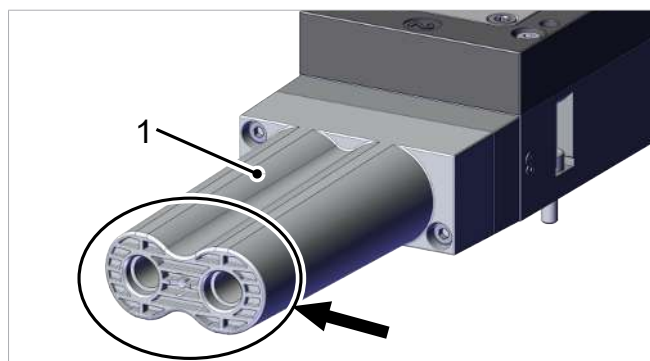
6.2 Mounting



The illustrations shown below may deviate from the customer's version because they serve as examples of different versions of the product.

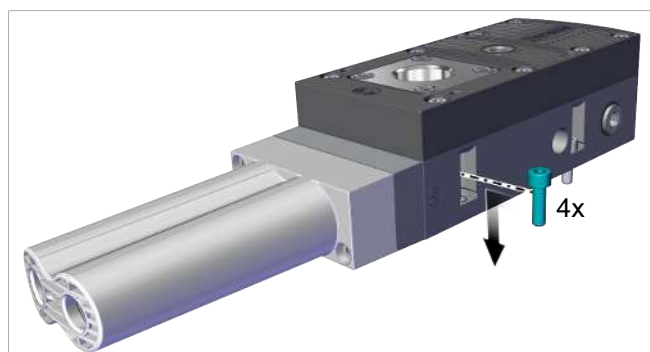
The product can be mounted in any position.

- ▶ When installing the ejector, make sure that the area around the exhaust air opening (1) remains unobstructed to ensure the unimpeded discharge of the escaping air.



The ejector is usually mounted through the holes on the side using four screws.

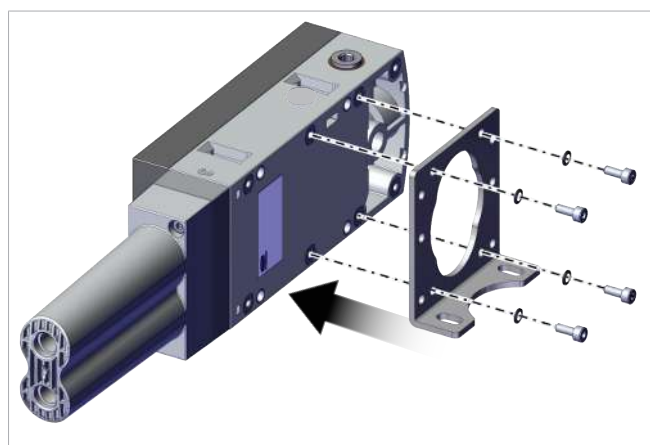
- ▶ Use the supplied M5 screws (4x) to secure the ejector to a suitable mounting with a max. tightening torque of 5 Nm.



Alternative attachment with mounting bracket

For attachment, the product is designed with threaded inserts.

- ▶ Use mounting brackets (see Accessories section).



6.3 Pneumatic Connection

6.3.1 Instructions for the Pneumatic Connection

1. Ensure that you make all connections correctly and never close them off – danger of bursting!
2. To ensure problem-free operation and a long service life for the product, only use adequately maintained compressed air.
3. Use only pipes or hoses with the recommended inner diameter to connect the product:

Type	Recommended hose diameter	
	Compressed air	Vacuum
SBPL 25 HF/HV	6	20
SBPL 50 HF/HV	6	25
SBPL 75 HF/HV	9	32
SBPL 100 HF/HV	9	32
SBPL 125 HF/HV	11	32
SBPL 150 HF/HV	11	32

Internal diameters are based on a maximum hose length of 2 m.

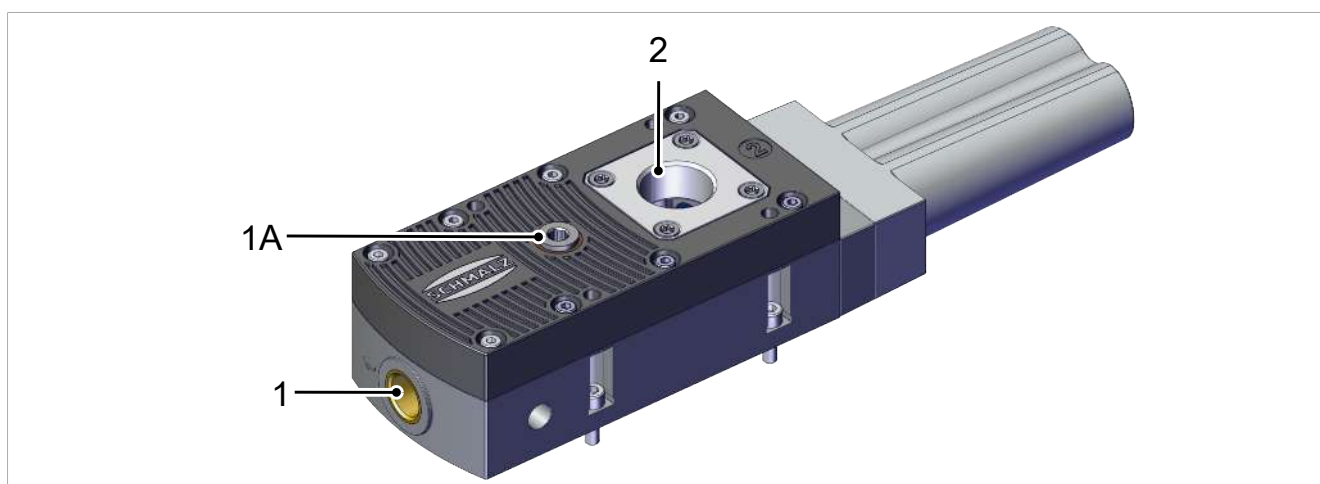


If a hose or pipe with an internal diameter that is too small is used on the compressed air side, the product will not receive enough compressed air to operate at optimal capacity.



If a hose or pipe with an internal diameter that is too small is used on the vacuum side, this will cause the flow resistance along the wall of the hose to be too high and have a negative effect on the suction capacity of the device and on evacuation times as a result. However, the hose diameters should not be arbitrarily large, as the increased volume would extend evacuation times.

6.3.2 Connecting the Compressed Air and Vacuum



1	Compressed air connector (marking 1)	1A	Blow-off connection
2	Vacuum connection (marking 2)	—	—

The compressed air connection is marked with the number 1 on the product.

- ▶ Connect the compressed air hose. Maximum tightening torque = 10 Nm

The vacuum connection is marked with the number 2 on the product.

- ▶ Connect the vacuum hose. Maximum tightening torque = 20 Nm
- ▶ If required, attach a compressed air hose for blow-off on the connection with the number 1A. Maximum tightening torque = 10 Nm

7 Start of Operations

7.1 General Preparations



⚠ 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.

Always carry out the following tasks before activating the device:

1. Check the product for visible damage and deal with any problems immediately (or notify the supervisor).
2. Ensure that the safety features of the machine or system are in perfect condition and check that they are functioning correctly.
3. Make sure all pneumatic connections are occupied and all screws are tight.
4. 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.

7.2 Activating the Product

You can supply the device with compressed air once all pneumatic connections have been made.

The ejector is designed for vacuum handling of airtight parts in combination with suction systems. The vacuum is generated in a nozzle according to the Venturi principle, using suction generated by the flow of accelerated compressed air. Compressed air is channeled into the ejector and flows through the nozzle. A vacuum is generated immediately downstream of the motive nozzle; this causes the air to be sucked through the vacuum connection. The air and compressed air that have been removed by the suction exit together via the silencer or exhaust air channel.

8 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.

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 ejector and for the validity of the warranty.

Wearing parts are not covered by the warranty.

9 Maintenance

9.1 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.

9.2 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.

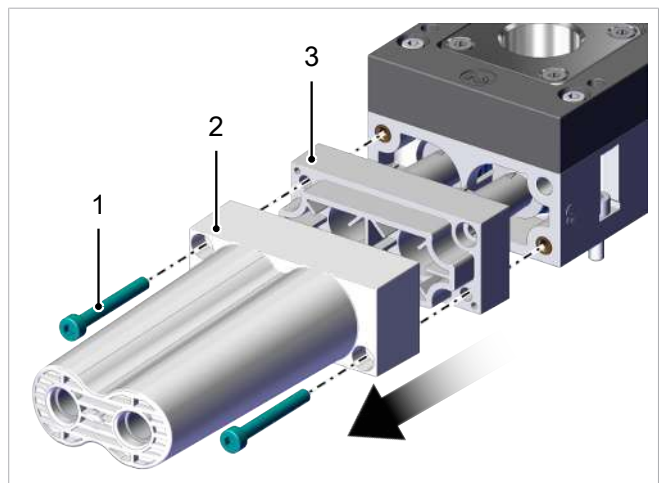
9.3 Cleaning or Replacing the Ejector Module



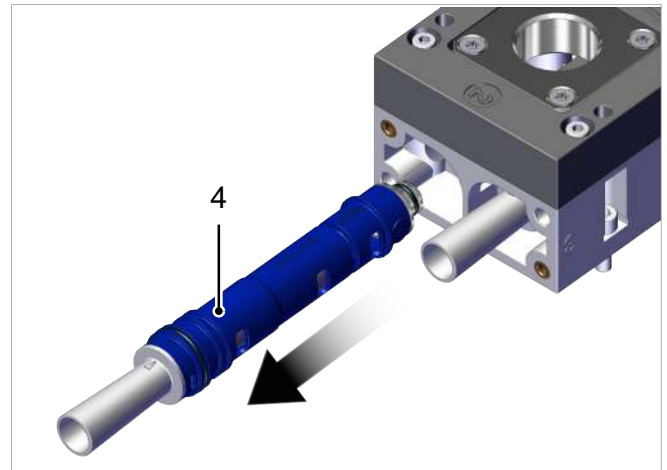
The illustrations shown below may deviate from the customer's version because they serve as examples of different versions of the product.

Removing the ejector module

1. Release the screws (1) and remove the silencer (2) and the silencer holder (3).



2. Pull the ejector module (4) out of the bore-hole.

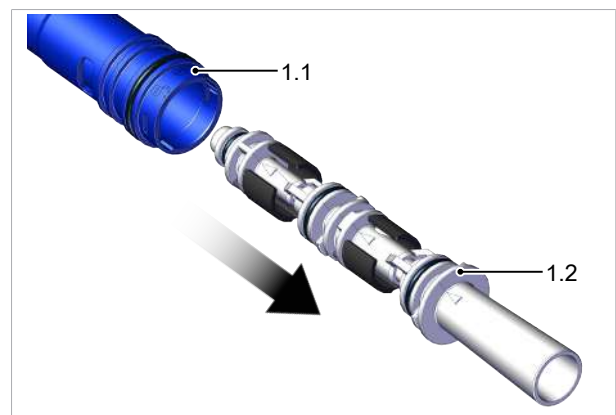


Opening and cleaning the ejector module

1. Turn the nozzle fitting (1.2) relative to the main body (1.1) to the "unlocked" position.

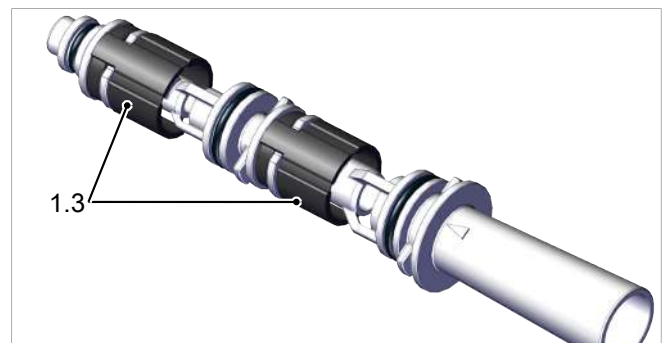


2. Pull the nozzle fitting (1.2) out of the main body (1.1), pulling only in the axial direction.

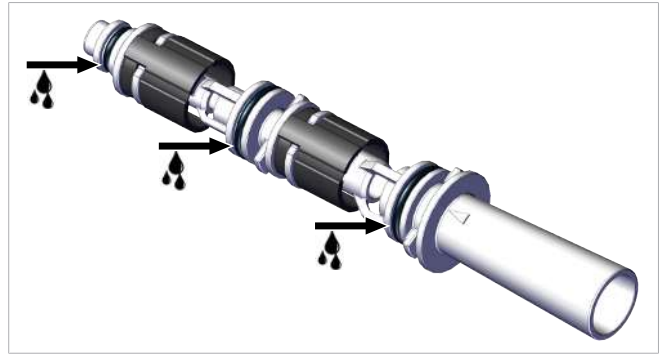


3. Blow off the components with compressed air or clean them under running water.

4. After cleaning, check the non-return valves (1.3) for wear and replace them if necessary.

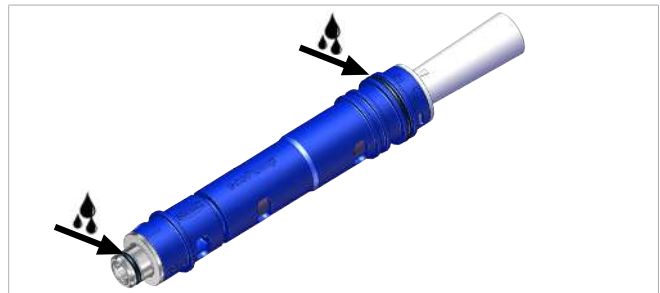


5. Grease the O-rings slightly before mounting the ejector module.

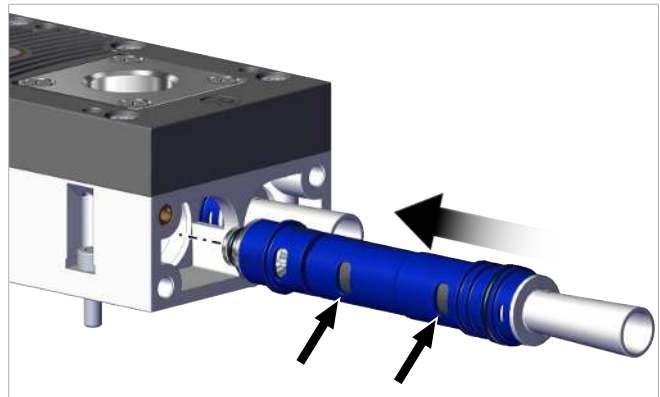


Assembling a new or cleaned ejector module

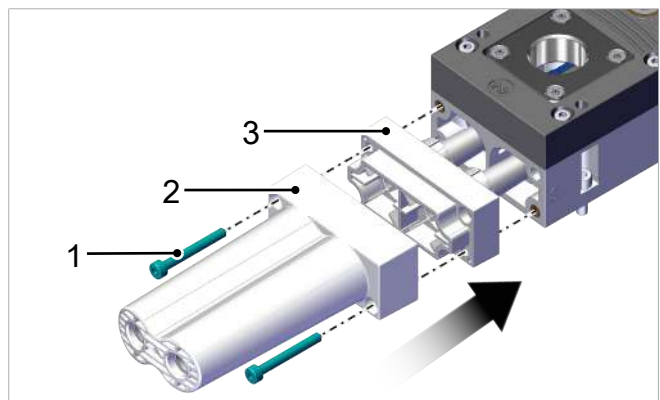
1. Lightly grease the ejector module O-rings (4) before mounting.



2. Ensure that the ejector module (4) is in the correct position and push it into the opening until it stops, with the suction openings of the ejector module (4) as shown.



3. Attach the silencer holder (3) and the silencer (2) using the two screws (1) with a tightening torque of 2 Nm.



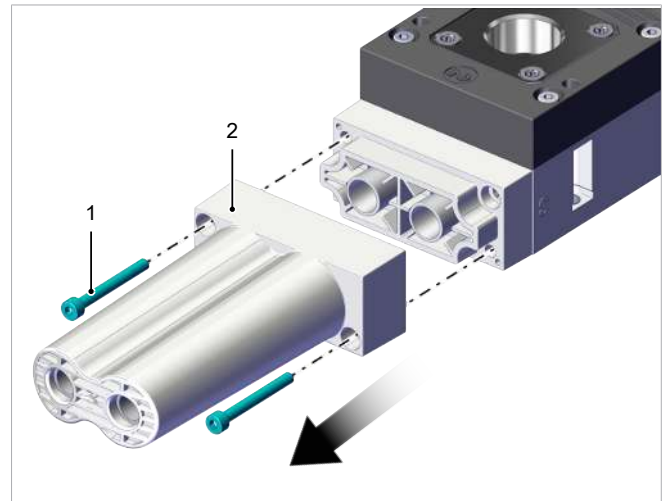
9.4 Replacing the Silencer

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:

- ✓ The relevant spare parts set is made available by the customer.
- ✓ The device has been disconnected from the compressed air supply.

1. Release the screws (1) and remove the silencer (2).



2. Fasten the new silencer with the two new screws using a tightening torque of 2 Nm.

10 Spare and Wearing Parts

The product must be maintained only by qualified mechanics.

Personnel must have read and understood the operating instructions.

Designation	Type	Part no.
Silencer	SD 102x71x33 SBPL/SCPL	10.02.01.01585
Ejector module HF	SEP HF 3 13 22	10.02.01.01996
Multi-stage nozzle in compact design HV	SEP HV 3 16 22	10.02.01.01991
Sealing frame	DI-RA 112.5x34.8 NBR-55	10.02.01.01541
O-ring	O-RING 10x2.5 NBR-70	10.07.08.00002
Round screen	SIEB 36.2x0.2 A2 400 0.4/0.22	10.02.02.07119
Set of spare parts for non-return flap	ERS SEP-22 6xRUE-KLAP	10.02.01.01450

11 Accessories

Depending on the output module, the items listed in the following table are required for an upgrade.

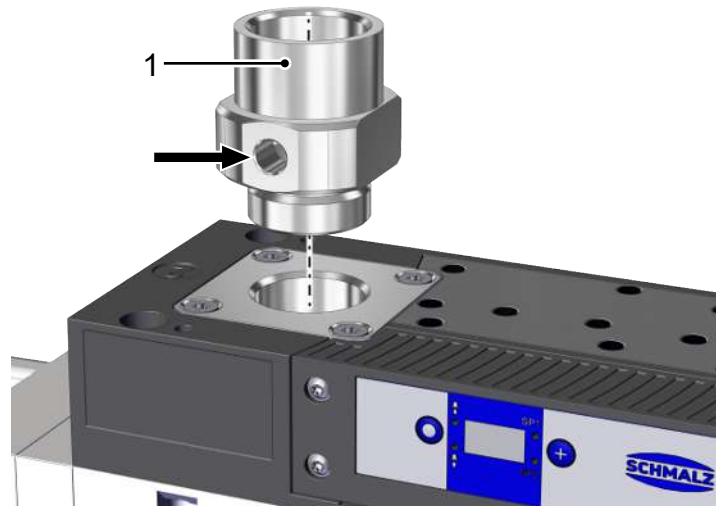
The **installation information** required for the conversion is stored with the relevant **retrofit kit** at www.schmalz.de.

Upgrade	Retrofit kit	Ejector	Sealing plug
SBPL 25 to 50	—	10.02.01.01996 (HF) or 10.02.01.01991 (HV)	Remove 10.02.01.01687!
SBPL 50 to 75	10.02.01.01685	10.02.01.01996 (HF) or 10.02.01.01991 (HV)	10.02.01.01687
SBPL 75 to 100	—	10.02.01.01996 (HF) or 10.02.01.01991 (HV)	Remove 10.02.01.01687!
SBPL 100 to 125	10.02.01.01686	10.02.01.01996 (HF) or 10.02.01.01991 (HV)	10.02.01.01687
SBPL 125 to 150	—	10.02.01.01996 (HF) or 10.02.01.01991 (HV)	Remove 10.02.01.01687!

Designation	Type	Part no.	Note	Hose clamp
Retrofit kit	SET SBPL-75/100	10.02.01.01685	—	—
Retrofit kit	SET SBPL-125/150	10.02.01.01686	—	—
Sealing plug, fitted	VRS-ST 21.8x145 SBPL	10.02.01.01687	—	—
Mounting bracket	BEF-WIN 25x77x72 3 SBPL	10.02.01.01705	—	—
Vacuum gauge (electric)	VAM-D 30x30 VP10 G1/8-AG	10.07.02.00055	—	—
Vacuum gauge	VAM 40 V H	10.07.02.00035	—	—
Solenoid valve, pressure	EMV 3 24V-DC 2/2 NC K-2P	10.05.01.00366	—	—
Hose sleeve for SBPL 25	ST 20 AL-EL	10.02.01.01679	for rated hose Ø 20	10.07.10.00086
Hose sleeve for SBPL 50	ST 25 AL-EL	10.02.01.01680	for rated hose Ø 25	10.07.10.00087
Hose sleeve for SBPL >50	ST 32 AL-EL	10.02.01.01681	for rated hose Ø 32	10.07.10.00018
Vacuum hose	VSL 27-20 PU-DS	10.07.09.00047	—	—
Vacuum hose	VSL 33-25 PU-DS	10.07.09.00051	—	—
Vacuum hose	VSL 42-32 PU-DS	10.07.09.00036	—	—
Exhaust air set	ABL-SET SBPL M	10.02.01.01939	—	—
Exhaust air set	ABL-SET SBPL L	10.02.01.01940	Only for SBPL 25 and SBPL 50	—
Vacuum/pressure switch	VSi V D M8-4	10.06.02.00577	With IO-Link	—

Designation	Type	Part no.	Note	Hose clamp
Extension (round)	VRL-R G1 50.3x39 AL	10.02.01.02093	For SBPLb size 100 to 150	
Extension (round)	VRL-R NPT3/4 44.5x39 AL	10.02.01.02094	For SBPLb size 25 to 75	
Extension (round)	VRL-R G3/4 44.5x39 AL	10.02.01.02096	For SBPLb size 25 to 75	
Extension (round)	VRL-R NPT1 50.3x39 AL	10.02.01.02097	For SBPLb size 100 to 150	

The through hole in the extension is used to measure the vacuum, for example by mounting a vacuum switch or a pressure gauge. Sealing the threads is the responsibility of the operating company.



11.1 Converting the Vacuum Connection to a Hose Sleeve

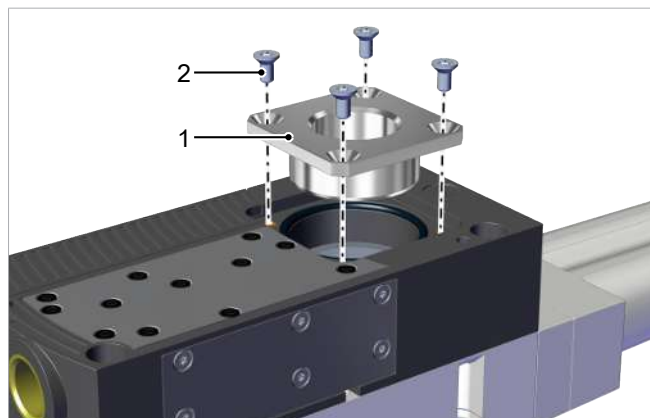
The vacuum connection can be converted to a connection using a hose sleeve. For the corresponding sizes, the part numbers of the appropriate hose sleeves are listed in the accessories.



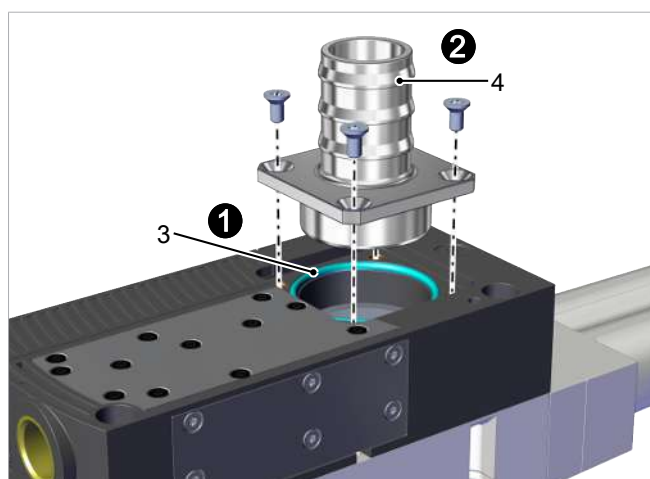
The illustrations shown below may deviate from the customer's version because they serve as examples of different versions of the product.

- ✓ The ejector is deactivated and disconnected from the supply lines.
- ✓ The customer has the correct hose sleeve for the ejector.

1. Remove the four screws (2) and lift the vacuum connection (1) out of the housing.



2. Check that the O-ring (3) is fitted. ①. Insert the vacuum connection with the hose sleeve (4) into the housing and secure using the 4 screws with a tightening torque of 2.5 Nm each. ②.



12 Decommissioning and Disposal

12.1 Disposing of the Product

The components may only be prepared for disposal by qualified specialists.

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

12.2 Materials Used

The table below shows the materials used:

Component	Material
Main body and connection plate	Fiberglass-reinforced plastics
Cover	Fiberglass-reinforced plastic
Inner components	Aluminum alloy, brass, NBR
Screws	Galvanized steel, stainless steel
Seals	Nitrile rubber (NBR)
Mounting plate	Galvanized steel

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