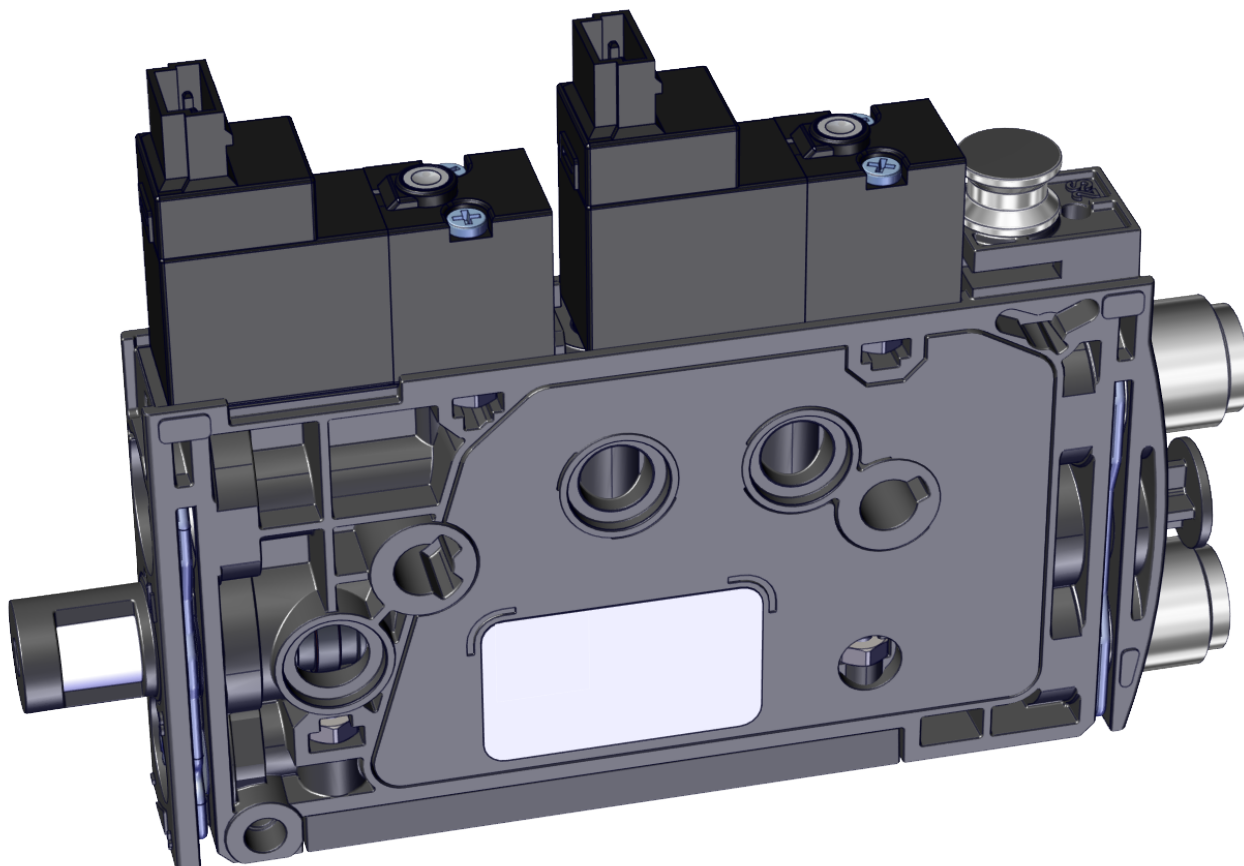




Automation



Innovative Vacuum for Automation

Operating Instructions

VEQ-**-B**

5000048915 | 04.2022

Version 00

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.

Published by

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Product information

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1 Important Information

1.1 Note on Using this Document

Camozzi Automation spa is generally referred to as Camozzi 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 Camozzi 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!
- ⇒ Camozzi is not liable for damage or malfunctions that result from failure to heed these instructions.

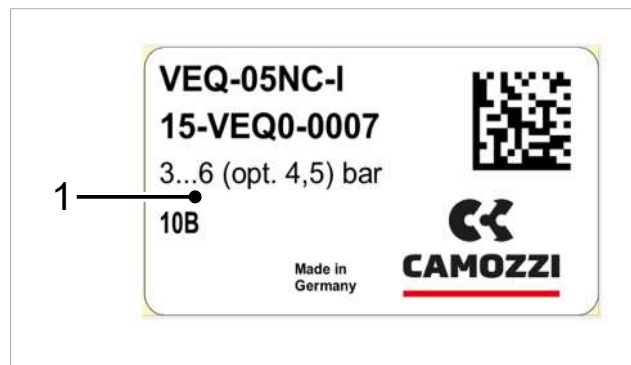
If you still have questions after reading the technical documentation, contact Camozzi Service at: service@camozzi.com

1.3 Type Plate

The type plate (1) is permanently attached to the mini compact ejector and must always be clearly legible.

The type plate contains the following data:

- Part sales designation/type
- Part number
- Permitted pressure range
- Coded date of manufacture
- QR code



Please specify all the information above when ordering replacement parts, making warranty claims or for any other inquiries.

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 mini compact ejector is designed to generate a vacuum for gripping and transporting objects when used in conjunction with suction cups.

The ejector is operated using discrete control signals.

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

Camozzi accepts no liability for damage resulting from non-intended use of the mini valve terminal.

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

- Use in potentially explosive atmospheres
- Use in medical applications
- Lifting people or animals
- Evacuation of objects that are in danger of imploding

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 Warnings in This Document

Warnings warn against hazards that may occur when handling the product. This document contains three levels of danger that you can recognize by the signal word.

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



⚠ 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.



⚠ WARNING

Uncontrolled movements of system components or falling of objects caused by incorrect activation and switching of the Ejector while persons are in the plant (safety door opened and actuator circuit switched off)

Serious injury

- ▶ Ensure that the valves and ejectors are enabled via the actuator voltage by installing a potential separation between the sensor and actuator voltage.
- ▶ Wear the required personal protective equipment (PPE) when working in the danger zone.



⚠ 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

Camozzi 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 Camozzi.
3. The product must be operated only in perfect condition.

3 Product Description

3.1 Description of the Mini Compact Ejector

3.1.1 Applying Suction to the Workpiece (Vacuum Generation)

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, i.e. by 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.

The venturi nozzle on the ejector is activated and deactivated using the suction command:

- In the NO (normally open) variant, the venturi nozzle is deactivated when the suction signal is received.
- In the NC (normally closed) variant, the venturi nozzle is activated when the suction signal is received.

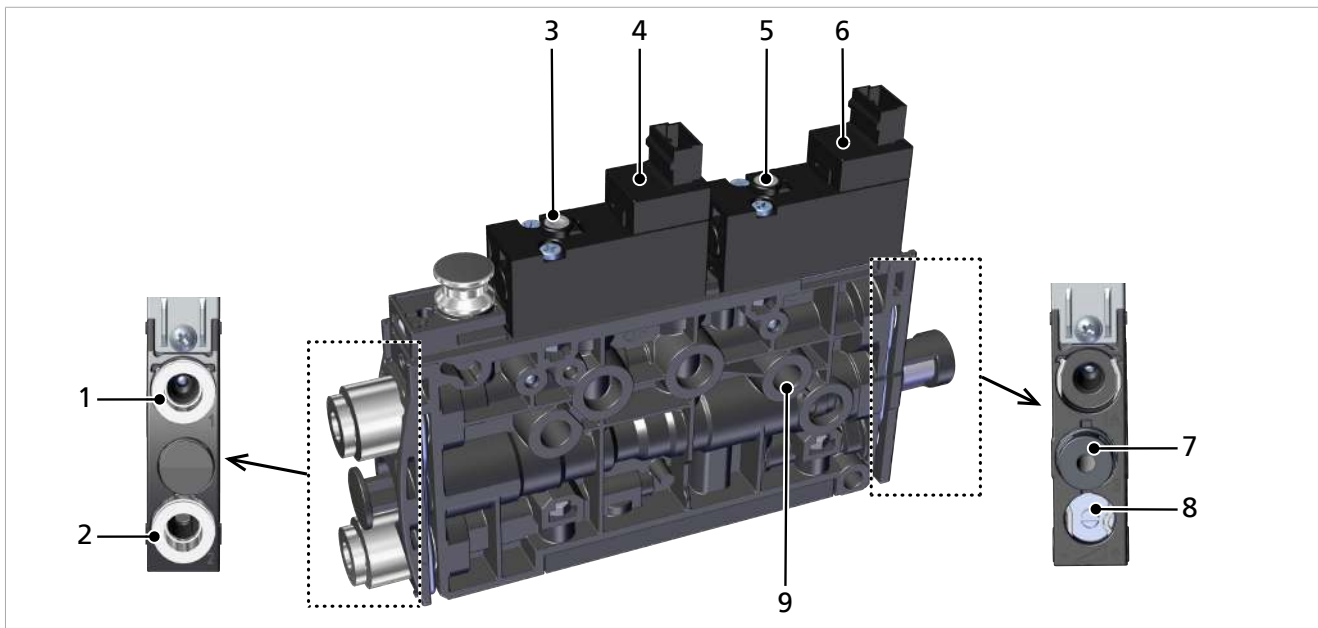
When objects with airtight surfaces are picked up, the integrated non-return valve prevents the vacuum from dropping.

3.1.2 Depositing the Workpiece/Part (Blowing Off)

In blow off mode, the vacuum circuit of the ejector is supplied with compressed air. This ensures that the vacuum drops quickly, allowing the workpiece/part to be deposited quickly.

The "Blow off" pilot valve is controlled directly. The ejector switches to blow off mode for as long as the signal is present.

3.2 Ejector Structure



- | | | | |
|---|---|---|------------------------------------|
| 1 | Compressed air connector (marking 1) | 6 | "Blow-off" solenoid valve |
| 2 | Vacuum connection (marking 2) | 7 | Silencer (marking 3) |
| 3 | Button for actuating the "suction" solenoid valve manually | 8 | Valve screw for blow off flow rate |
| 4 | "Suction" solenoid valve | 9 | Mounting holes 2x |
| 5 | Button for actuating the "blow off" solenoid valve manually | — | — |

4 Technical Data

4.1 General parameters

Parameter	Version	Symbol	Limit value			Comment
			min.	optimal	max.	
Working temperature		T _{amb}	0° C	—	+50° C	—
Storage temperature		T _{Sto}	-10° C	—	60° C	—
Humidity		H _{rel}	10% r.h.	—	85% r.h.	Free from condensation
Degree of protection		—	—	—	IP40	—
Operating pressure (flow pressure)	05	P	3.5 bar	4 bar	6 bar	—
	07		3.5 bar	4 bar	6 bar	—
	10		3.5 bar	4.5 bar	6 bar	—
Operating medium	Air or neutral gas, filtered to 5 µm, without oil, class 3-3-3 compressed air quality in acc. with ISO 8573-1					

4.2 Electrical Parameters

Supply voltage	DC 24 V ± 10% (PELV ¹⁾)		
Polarity reversal protection	Yes		
Current consumption (at 24 V)	—	Typical current consumption	Max. current consumption
	SCPMb – xx – NC	50 mA	70 mA
	SCPMb – xx – NO	75 mA	115 mA

¹⁾ The power supply must correspond to the regulations in accordance with EN60204 (protected extra-low voltage).

4.3 Mechanical Data

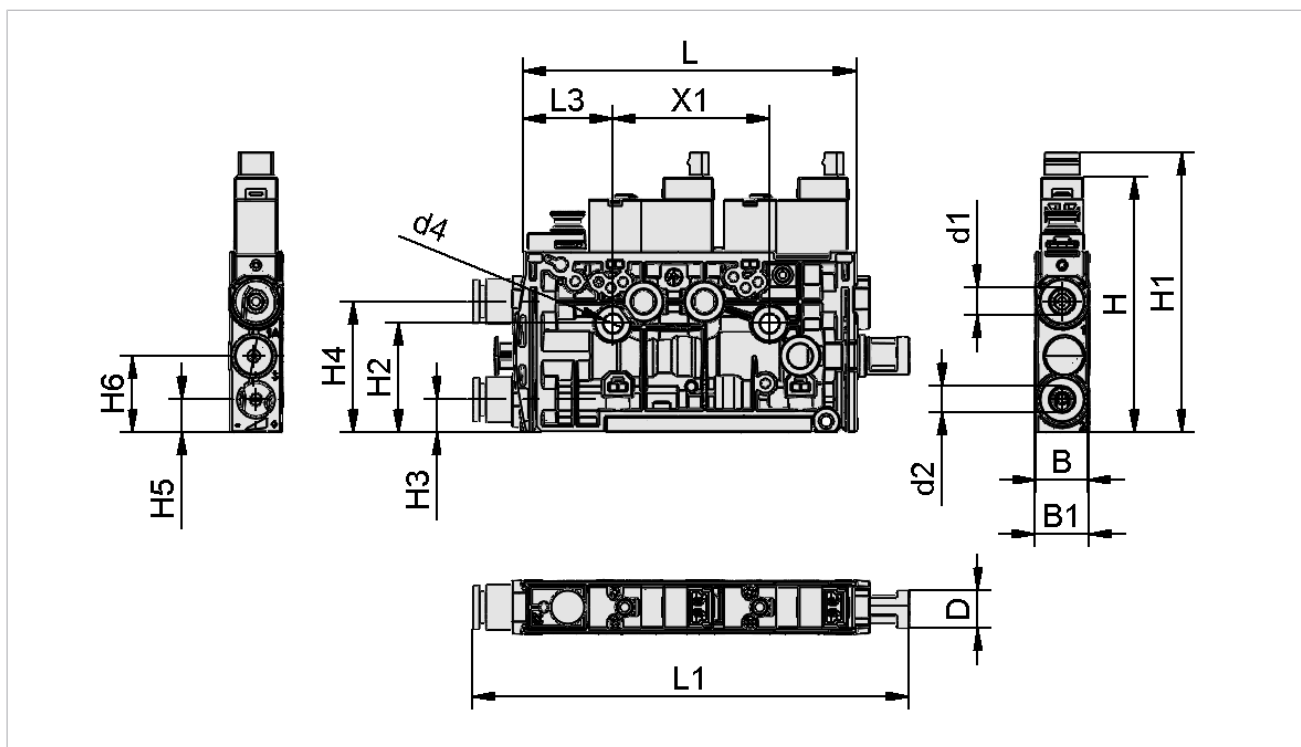
4.3.1 Performance Data

	Type	Nozzle 05	Nozzle 07	Nozzle 10
Nozzle size [mm]		0.5	0.7	1.0
Degree of evacuation [%]		87		
Max. suction rate [l/min] ¹⁾		7.5	15	28
Air consumption for suction [l/min]		9	22	45
Air consumption for blow off [l/min]		10		
Sound pressure level, unobstructed suction [dB(A)] ¹⁾		66	70	71
Sound pressure level, suction [dB(A)]		55	70	72
Pressure range [bar]		3.5 to 6		
Rec. diameter of compressed air hose [mm] ²⁾		2		4
Rec. diameter of vacuum hose [mm] ²⁾		2		4

Type	Nozzle 05	Nozzle 07	Nozzle 10
Weight [g]	80		

¹⁾ At optimum operating pressure (SCPM...05/07: 4 bar; SCPM...10: 4.5 bar) ²⁾ For max. length of 2 m

4.3.2 Dimensions



L	B	L3	X1	H1	H2	H3	H4	H5
76.5	12	20.5	36	64.2	24.95	7.5	30	7.5
H6	d1	d2	D	H	d4	B1	L1	
17.5	4.2	4.2	9	41.5	4.3	12.5	95.3 / 98.3	

All specifications are in mm

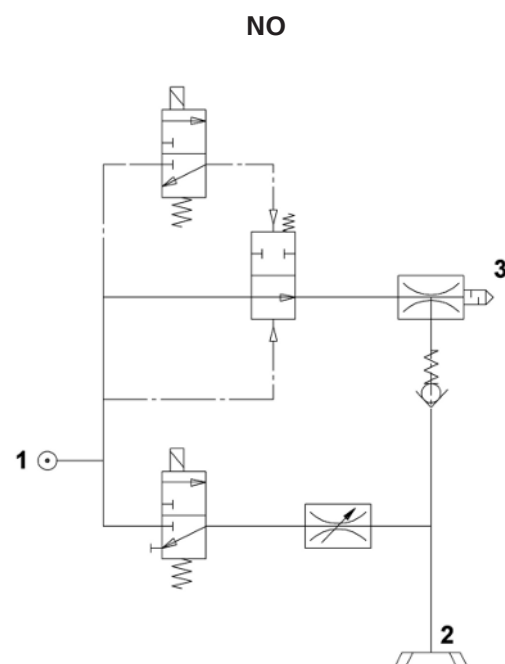
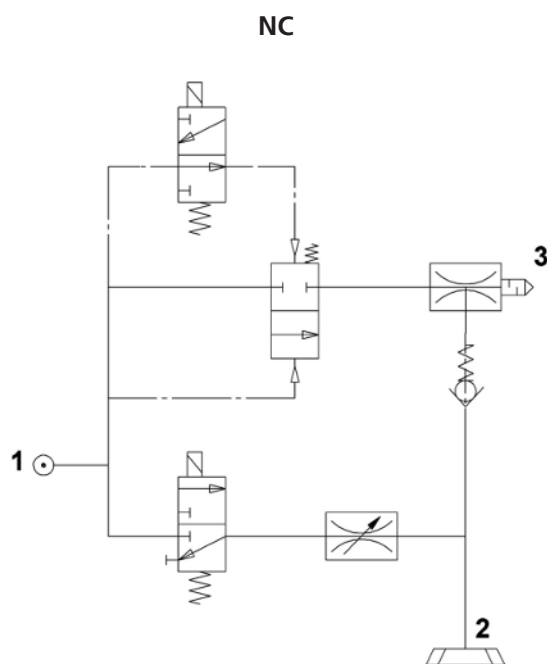
4.3.3 Maximum Torque

Connector	Max. torque
Mounting hole d4	1 Nm

4.3.4 Pneumatic circuit plans

Key:

NC	Normally closed
NO	Normally open
1	Compressed air connection
2	Vacuum connection
3	Exhaust outlet



5 Blow off modes

5.1 Externally Controlled Blow-Off

The “blow off” valve is controlled directly by the “blow off” command. The ejector switches to blow off mode for as long as the “blow off” signal is present.

The “blow off” signal is given priority over the “suction” signal.

6 Transport and Storage

6.1 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 Camozzi Automation spa.

7 Installation

7.1 Installation Instructions



⚠ CAUTION

Improper installation or maintenance

Personal injury or damage to property

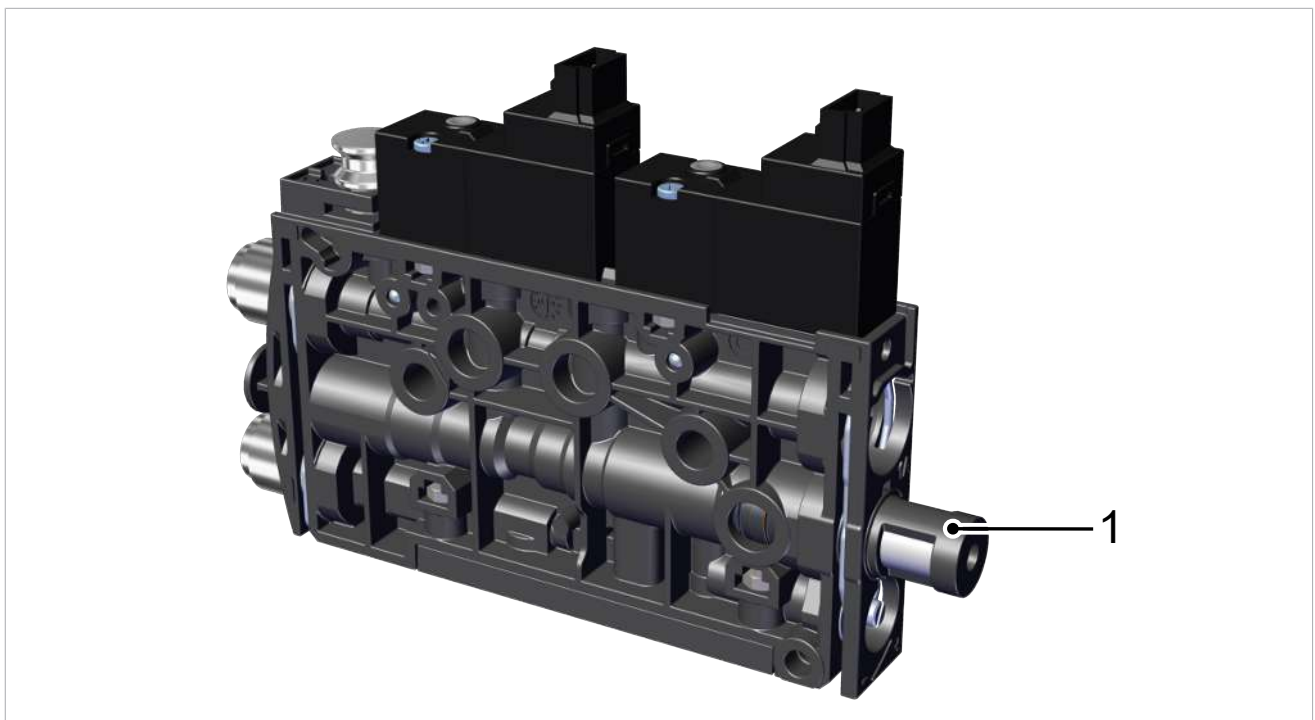
- ▶ During installation and maintenance, make sure that the product is disconnected and depressurized and that it cannot be switched on again without authorization.

For safe installation, the following instructions must be observed:

- Use only the connectors, mounting holes and attachment materials that have been provided.
- Mounting and removal must be performed only when the device is unpressurized and disconnected from the mains.
- Pneumatic and electrical line connections must be securely connected and attached to the product.

7.2 Installation

The ejector can be installed in any position.

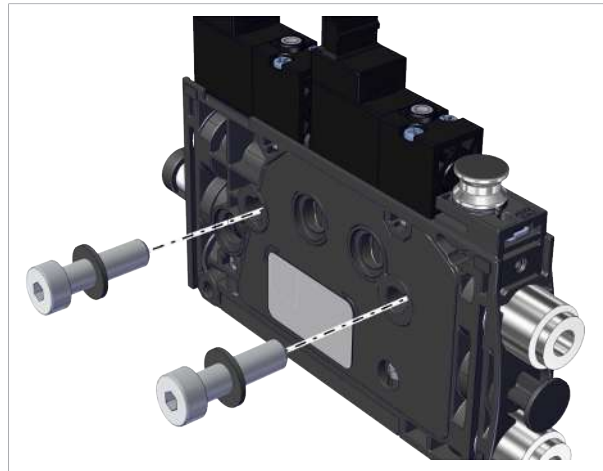


When installing the ejector, make sure that the area around the silencer (1) remains free to ensure the unimpeded discharge of the escaping air.

The ejector is usually mounted using the holes on the side. Alternatively, it can be mounted using a DIN rail or a mounting bracket (> See *ch. Accessories, Page 29*).

Side mounting

- ▶ There are two 4.3 mm through-holes for mounting the ejector. Use screws at least 20 mm in length. Use washers if you are using fastening screws M4 for the mounting process. The ejector must be attached using at least 2 screws; the maximum tightening torque is 1 Nm.



For start of operations, the ejector must be connected to the controller via the connection plug with a connection cable. The compressed air must be supplied by the higher-level machine.

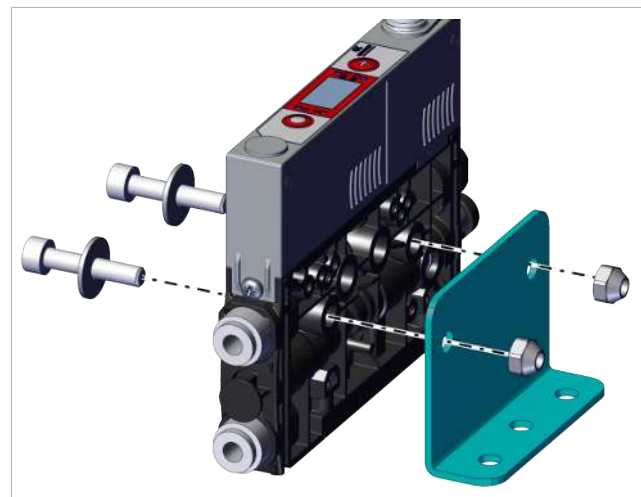
The installation process is described and explained in detail below.

7.3 Mounting on a DIN Rail (Optional)

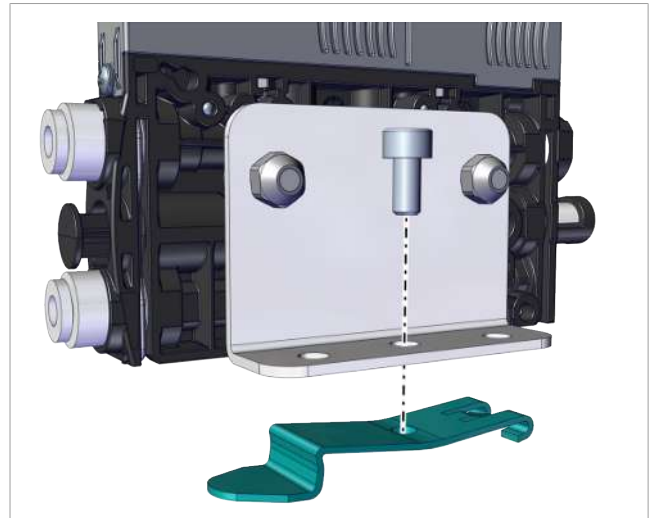
The product can also be mounted on a TS 35-type DIN rail using the mounting kit.

- ✓ The mounting kit is on-hand.

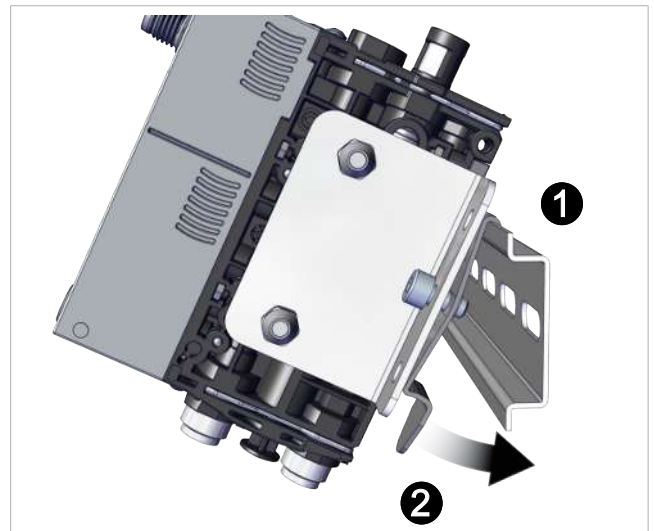
1. Attach the bracket in the correct position on the mini compact ejector with a tightening torque of 1 Nm.



2. Loosely screw the clamps onto the bracket in the correct position.



3. Attach the assembly with the bracket onto the DIN rail ① and press it onto it ②.



4. Tighten the screw to tighten the clamp so that the assembly is fastened to the DIN rail.



The figures shown for the mini compact ejector may deviate from the customer's version, because they are used here as examples of different versions of the mini compact ejectors.

7.4 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

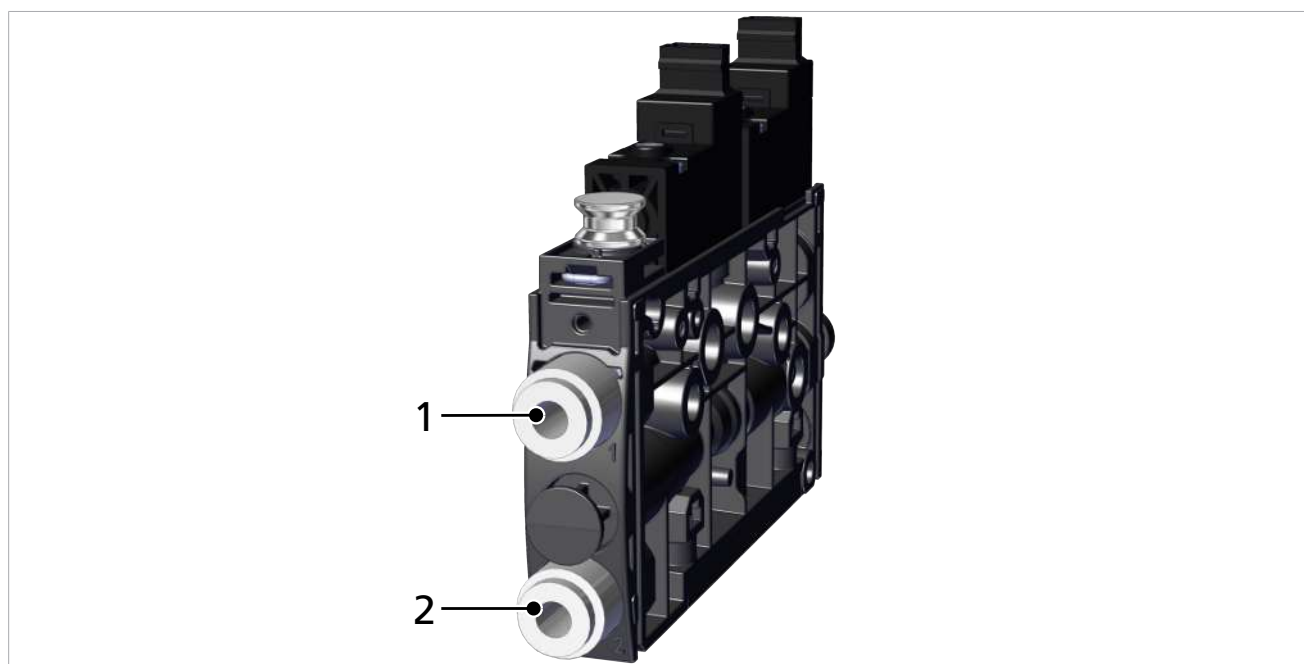
Noise pollution due to incorrect installation of the pressure and vacuum connections

Hearing damage

- ▶ Correct installation.
- ▶ Wear ear protectors.

7.4.1 Connecting the Compressed Air and Vacuum

Description of the pneumatic connector



1 Compressed air connector (marking 1)

2 Vacuum connector (marking 2)

The threaded or push-in compressed air connector is marked with the number 1 on the ejector.

- ▶ Connect compressed air hose. For threaded connectors, the maximum tightening torque is 1 Nm.

The threaded or push-in vacuum connector is marked with the number 2 on the ejector.

- ▶ Connect the vacuum hose. For threaded connectors, the maximum tightening torque is 1 Nm.

7.4.2 Instructions for the Pneumatic Connection

To ensure problem-free operation and a long service life for the mini compact ejector, always use adequately maintained compressed air and take the following requirements into account:

- Use air or neutral gas in accordance with EN 983, filtered to 5 µm, unoiled
- Dirt particles or foreign bodies in the connections, hoses or pipelines may lead to partial or complete loss of function in the mini compact ejector
- Keep the hoses and pipelines as short as possible
- Keep the hose lines free of bends and crimps
- Use only pipes or hoses with the recommended inner diameter to connect the mini compact ejector:

Use hoses with sufficient internal diameter.	Internal Ø for nozzle size 0.5 and 0.7 mm	Internal Ø for nozzle size 1 mm
Compressed air side, to ensure that the mini compact ejector achieves its performance data.	2 mm	4 mm
Vacuum side, to avoid high flow resistance. If the selected internal diameter is too small, the flow restrictor and the evacuation times increase and the blow off times are extended.	2 mm	4 mm

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

7.5 Electrical Connection



NOTE

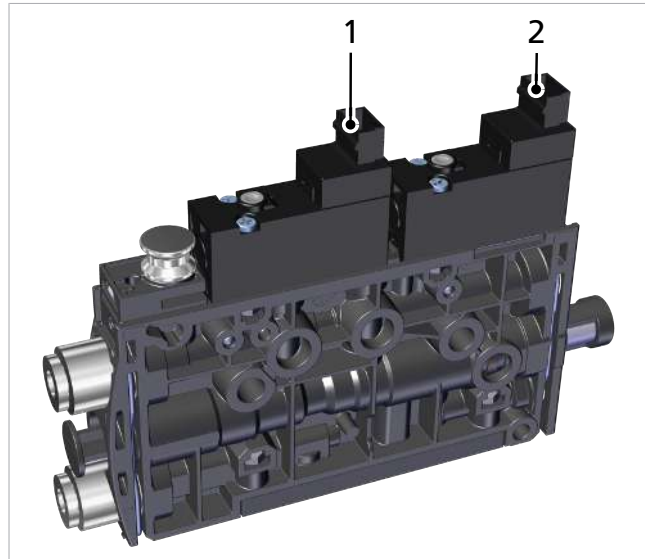
Incorrect power supply

Destruction of the integrated electronics

- ▶ Operate the product using a power supply unit with protected extra-low voltage (PELV).
- ▶ The system must incorporate safe electrical cut-off of the power supply in compliance with EN60204.
- ▶ Do not connect or disconnect the connector under tension and/or when voltage is applied.

The electrical connection is established directly via the connection plugs of the valves. The connection of the valves is independent of the polarity.

- ✓ Provide connection cable (for example, 2x item no. 70-1303-0192)



- ▶ Insert the connection cables into the electrical connections (1 and 2) until they click into place.

8 Operation

8.1 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 system:

1. Before each start of operations, check that the safety features are in perfect condition.
2. Check the product for visible damage and deal with any problems immediately (or notify the supervisor).
3. Ensure that only authorized personnel are present in the working area of the machine or system and that no other personnel are put in danger by switching on the machine.

During automatic operation, there must be no people in the system danger area.

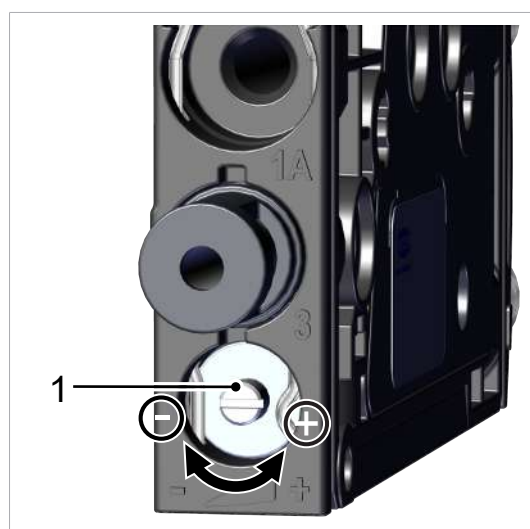
8.2 Changing the Blow-Off Flow Rate on the Ejector



Do not overwind past the stop on the valve screw. The blow off flow rate can be adjusted within the range between 0% and 100%.

The figure shows the position of the valve screw (1) for adjusting the blow off volume flow. The valve screw is equipped with a stop on both sides.

- Turn the valve screw (1) clockwise to reduce the flow rate.
- Turn the valve screw (1) counterclockwise to increase the flow rate.



9 Help with Malfunctions

Fault	Possible cause	Solution
Power supply disrupted	Electrical connection	<ul style="list-style-type: none"> ▶ Make sure device is properly connected to power
Ejector does not respond	No power supply	<ul style="list-style-type: none"> ▶ Check electrical connection
	No compressed air supply	<ul style="list-style-type: none"> ▶ Check the compressed air supply
Vacuum level is not reached or vacuum is built up too slowly	Silencer is dirty	<ul style="list-style-type: none"> ▶ Replace the silencer
	Leakage in hose line	<ul style="list-style-type: none"> ▶ Check hose connections
	Leakage at suction cup	<ul style="list-style-type: none"> ▶ Check suction cup
	Operating pressure too low	<ul style="list-style-type: none"> ▶ Increase operating pressure. Note the maximum limits!
	Internal diameter of hose line too small	<ul style="list-style-type: none"> ▶ Observe recommendations for hose diameter
Load cannot be held	Suction cup too small	<ul style="list-style-type: none"> ▶ Select a larger suction cup
	Vacuum level too low	<ul style="list-style-type: none"> ▶ Increase operating pressure (observe max. permissible limits)

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.



NOTE

Incorrect maintenance work

Damage to the ejector!

- ▶ Always switch off supply voltage before carrying out any maintenance work.
- ▶ Secure before switching back on.
- ▶ The ejector must only be operated with a silencer.

- ▶ Before carrying out work on the system, establish the atmospheric pressure in the compressed air circuit of the product.

10.2 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.
3. Ensure that no moisture can reach the electrical connection or other electrical components.

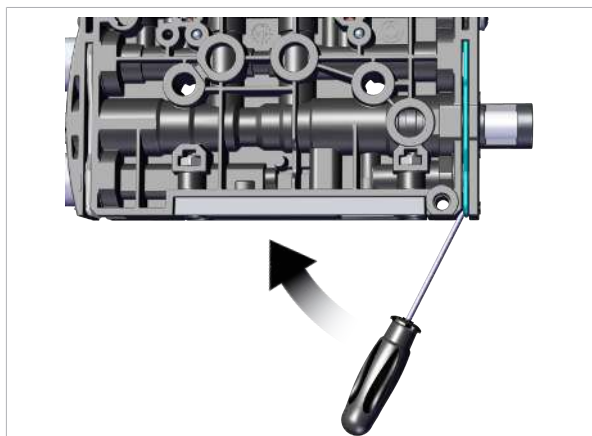
10.3 Replacing the Silencer Insert

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

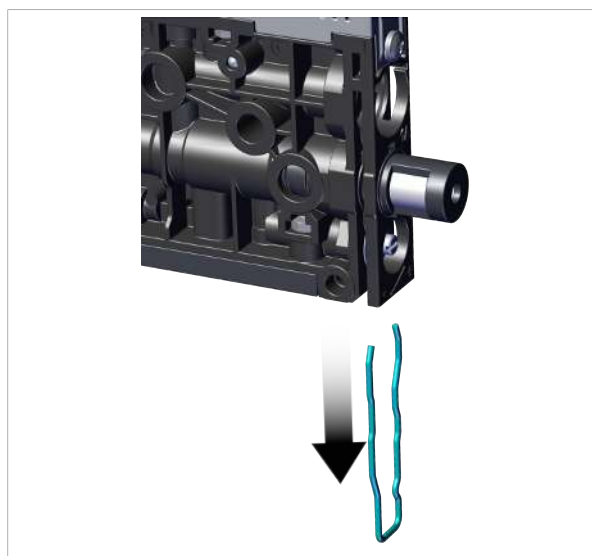
If the suction capacity decreases, replace the silencer insert:

- ✓ Deactivate the ejector and depressurize the pneumatic systems.

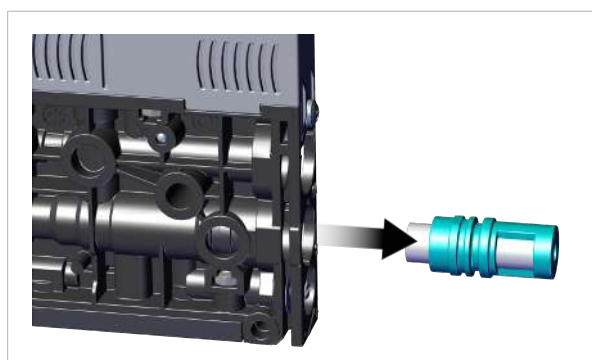
1. Place a small flat screwdriver on the ejector as shown and loosen the clamp.



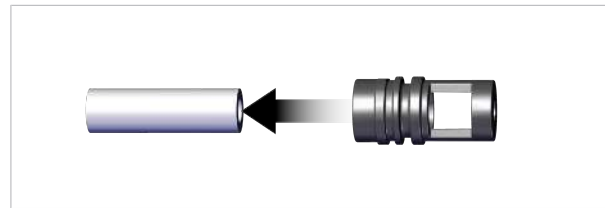
2. Remove the clamp.



3. Then remove the silencer and silencer insert from the ejector.

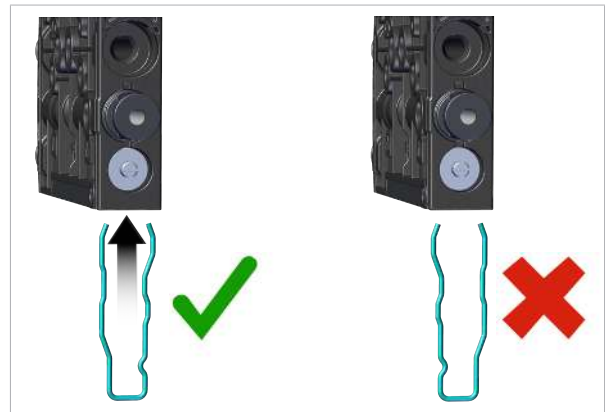


4. Pull the silencer insert out of the housing and dispose of it.



5. Insert the new silencer insert into the housing and reinstall the silencer.

6. Mount the clamp in the correct position.



- ⇒ The clamp is mounted flush with the underside of the ejector and the clamp legs both lie in the grooves. It does not protrude from the ejector.



7. Check that the silencer is held tightly by pulling on the housing (hand-tight).

11 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.

12 Accessories

Designation	Part no.	Note
Connection cable, 121-830P	70-1303-0192	Connector 1: Vent Micro10 mm connector; Cable length: 3000 mm Connector 2: Cable, 2-pin; material: PUR cable
Connection cable CS-DR06HB-E200	70-1303-0190	Connector 1: M8 socket angle, 6-pin, cable length: 2000 mm Connector 2: Cable, 6-pin; material: PUR cable, shape: 90° an- gle
Connection cable CS-AG05HB-E200	70-1303-0191	Connector 1: M8 socket angle, 6-pin, cable length: 2000 mm Connector 2: M12, 5-pin plug, material: PUR cable, shape: 90° angle
Connection cable CS-DF06HB-E500	70-1303-0189	Connector 1: M8 socket, 6-pin; cable length: 5000 mm Connector 2: Cable, 6-pin; material: PUR cable
Mounting bracket (mounting angle) VEQ-ST	60A5100-0162	BEF-WIN 15x50x36.1 1.5, for SCPM

13 Decommissioning and Recycling

13.1 Disposing of the Product

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

13.2 Materials Used

Component	Material
Housing	PA6-GF
Inner components	Aluminum alloy, anodized aluminum alloy, stainless steel, POM
Silencer insert	Porous PE
Screws	Galvanized steel
Sealing	Nitrile rubber (NBR)
Lubrication	Silicone-free

Contact

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Product Certification

National and international directives, regulations and standards

productcertification@camozzi.com

Technical Assistance

Technical information

Product information

Special products

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