Operating instructions

Mini Compact Ejector SCPMc

WWW.SCHMALZ.COM

EN-US · 30.30.01.01963 · 05 · 03/25
Translation of the original operating instructions

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

Contact

J. Schmalz GmbH

Johannes-Schmalz-Str. 1

72293 Glatten, Germany

T: +49 (0) 7443 2403-0

schmalz@schmalz.de

www.schmalz.com

Contact information for Schmalz companies and trade partners worldwide can be found at:

www.schmalz.com/salesnetwork

Contents

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 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

Schmalz assumes no liability for damage caused by non-intended use of the device.

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
- Filling pressurized containers, driving cylinders, valves or other pressure-operated functional elements

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. 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

The system integrator must carry out a risk assessment of the entire system for all operating modes and define the danger zone precisely. In doing so, country-specific provisions and regulations must be observed.

⚠ 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.

⚠ CAUTION

Unexpected movement of the handling system or dropping the lifted payload when the device is active

Risk of injury (trapping or impact) due to collision or the release of a payload

- Do not sit or stand in the transport area of the lifted payload.
- Wear protective work shoes and gloves.

⚠ 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 objects caused by incorrect activation and switching of the device while persons are in the plant (safety door opened and actuator circuit switched off)

Serious injury

- Ensure that the components 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

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.

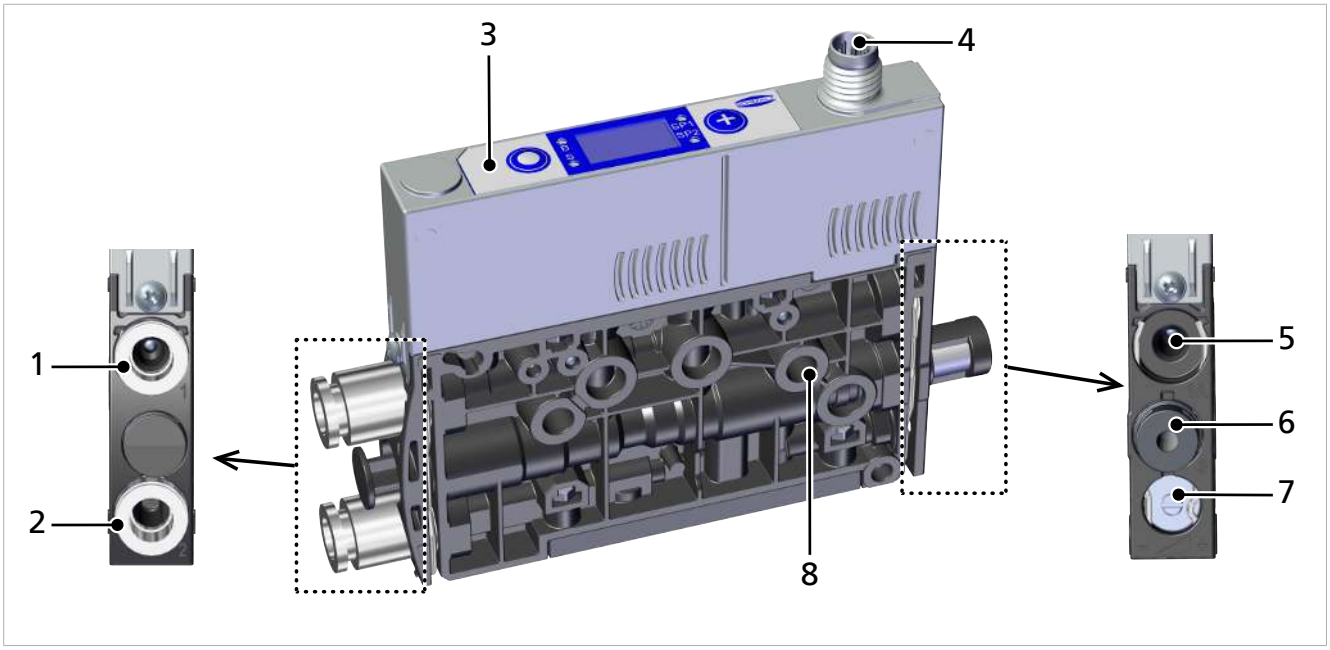
3 Product Description

3.1 Ejector Designation

The breakdown of the item designation (e.g. SCPMb-07-S01-NO-ABC00001C) is as follows:

Property	Variants	
Type	SCPM	
Version	Basic: b Controlled (with air saving function): c Intelligent (with IO-Link): i	
Nozzle size	0.3, 0.5, 0.7, 1.0 and 1.2 mm EV (for an external vacuum supply)	
Fluid connector	S01 (push-in, 4/2 2x)	G01 (M5 female, 2x)
	S04 (push-in, 6/4 2x)	G06 (M7 female, 2x)
	S07 (push-in, 4/2 3x)	G07 (M5 female, 3x)
	S08 (push-in, 6/4 2x, 4/2)	G08 (M7 female, 2x, M5 female)
	S09 (push-in, 4/2, 6/4 2x)	G09 (M5 female, M7 female, 2x)
	4 (push-in, 4/2)	M5 (M5 female)
	6 (push-in, 6/4)	M7 (M7 female)
Suction valve control	NO (normally open), sucks when no voltage is applied NC (normally closed), does not suck when no voltage is applied	
Individual configuration code	Unique 9-digit code (SCPMb-07-S01-NO-**ABC00001C**)	

3.2 Product Design

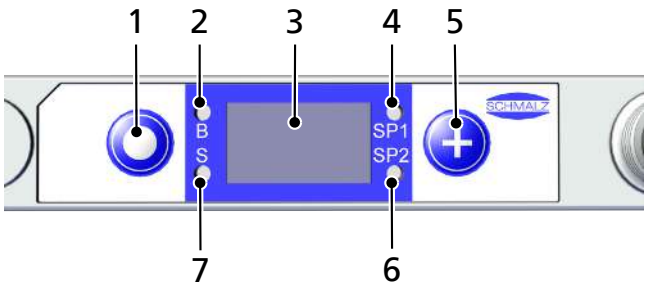


1	Compressed air connector (marking 1)	5	Optional: Compressed air connector for separate blow-off (EB) (marking 1A)
2	Vacuum connection (marking 2)	6	Silencer (marking 3)
3	Operating and display elements	7	Valve screw for blow off flow rate
4	M8 electrical connection, 6-pole	8	2x mounting hole

3.3 Controls and Displays in Detail

The device is fitted with the following elements to ensure simple operation:

- Two buttons on the foil keypad
- The 3-digit display
- Four light-emitting diodes (LEDs) as status indicators



1	**MENU BUTTON**	5	**PLUS BUTTON**
2	LED for "Blow-off" process state	6	LED for switching point limit value SP2
3	Display	7	LED for "Suction" process state
4	LED for switching point limit value SP1	—	—

Definition of the LED indicators

The “suction” and “blow off” process states are each assigned an LED.

Item	Meaning	Status	Description
2	Blow-off LED	B OFF	Device not blowing off
		B illuminated	Device blows off
7	Suction LED	S OFF	No suction from device
		S illuminated	Suction from device

The LEDs for the switching points SP1 and SP2 (limit values) indicate the current level of the system vacuum relative to the limit values set for the parameters:

- SP1 —> switching point 1
- SP2 —> switching point 2
- rP1 —> reset point 1
- rP2 —> reset point 2

The display is independent of the switching function and the assignment of the output.

The table below explains the meanings of the LEDs:

Item	Limit value LEDs		Status
4 and 6		LEDs are both off	Rising vacuum: Vacuum < SP2 Falling vacuum: Vacuum < rP2
4 and 6		SP2 LED continuously lit	Rising vacuum: Vacuum > SP2 and < SP1 Falling vacuum: Vacuum > rP2 and < rP1
4 and 6		Both LEDs continuously lit	Rising vacuum: Vacuum > SP1 Falling vacuum: Vacuum > rP1

4 Technical Data

4.1 Display Parameters

Parameter	Value	Comment
Display	3-digit	Red 7-segment LED display
Solution	±1 mbar	--
Accuracy	±3% FS	T_{amb}= 25° C, based on FS (full-scale) final value
Display refresh rate	5 1/s	Only affects the 7-segment display
Idle time before the menu is exited	1 min	The display mode is accessed automatically when no settings are made in a menu

4.2 General parameters

Parameter	Variant	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)	03	P	2 bar	4 bar	6 bar	—
	05	P	4 bar	4 bar	6 bar	—
	07	P	4 bar	4 bar	6 bar	—
	10	P	4 bar	4.5 bar	6 bar	—
	12	P	4 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					

4.3 Electrical Parameters

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

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

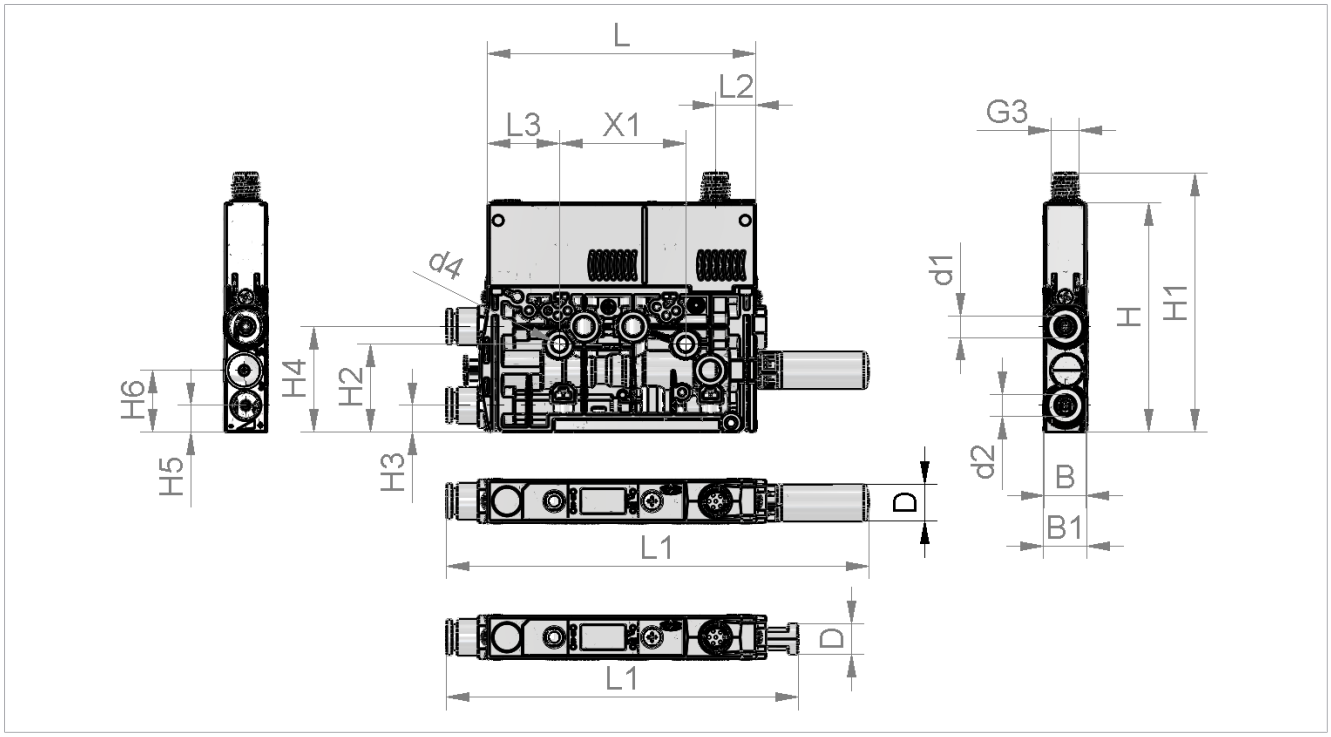
4.4 Mechanical Data

4.4.1 Performance Data

Type	Nozzle 03	Nozzle 05	Nozzle 07	Nozzle 10	Nozzle 12
Nozzle size [mm]	0.3	0.5	0.7	1.0	1.2
Degree of evacuation [mbar]	870				920
Max. suction rate [l/min] [1)]	2.2	7.5	15	28	30
Air consumption for suction [l/min]	3.5	9	22	45	51
Air consumption for blow off [l/min]	10				
Sound pressure level, unobstructed suction [dB(A)] [1)]	51	66	70	71	76
Sound pressure level, suction [dB(A)]	42	55	70	72	75
Pressure range [bar]	2 to 6	4 to 6			
Rec. internal hose diameter on compressed air side [mm] [2)]	2			4	
Rec. internal hose diameter on vacuum side [mm] [2)]	2			4	
Weight [g]	80				

[1)] At optimum operating pressure (SCPM...03/05/07: 4 bar; SCPM...10/12: 4.5 bar) [2)] For max. length of 2 m

4.4.2 Dimensions



G3	L	B	H	L2	L3	X1	H1	H2	H3	d4
M8x1 male thread	76.5	12	65.3	11.4	20.5	36	73.9	24.95	7.5	4.3

H4	H5	H6	d1	d2	L1	D	d3	B1
30	7.5	17.5	Depends on the specific ejector, Product Name				9	12.5

All specifications are in mm

4.4.3 Maximum Torque

Connection	Max. torque
Mounting hole d4	1 Nm
Electrical connector G3	Hand-tight

4.4.4 Factory Settings

Code	Parameter	Value of the factory setting
SP 1	Switching point SP1	750 mbar
rP 1	Reset point rP1	600 mbar
SP2	Switching point SP2	550 mbar
rP2	Reset point rP2	540 mbar
tbL	Blow off time	0 s
ctr	Control	Activated = on
t- 1	Evacuation time	0 s
-L-	Leakage value	0 mbar/s
un i	Vacuum unit	Vacuum unit in mbar = bAr

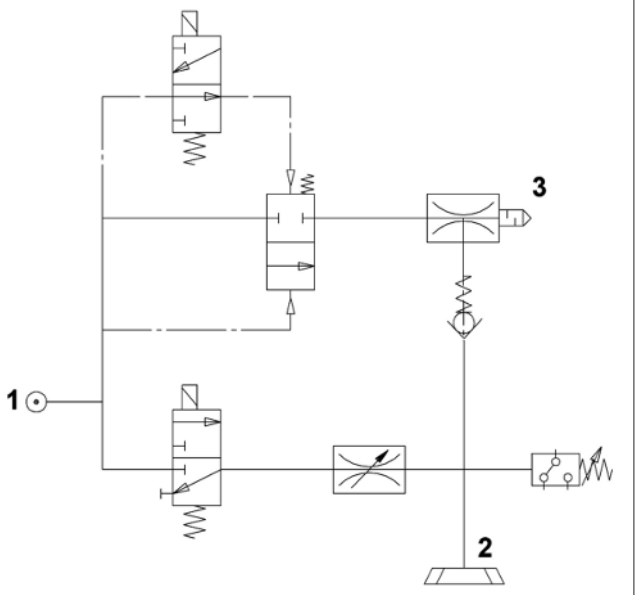
4.4.5 Pneumatic circuit plans

The pneumatic circuit diagrams are shown in simplified form. No sieve is installed in variants with a push-in connection.

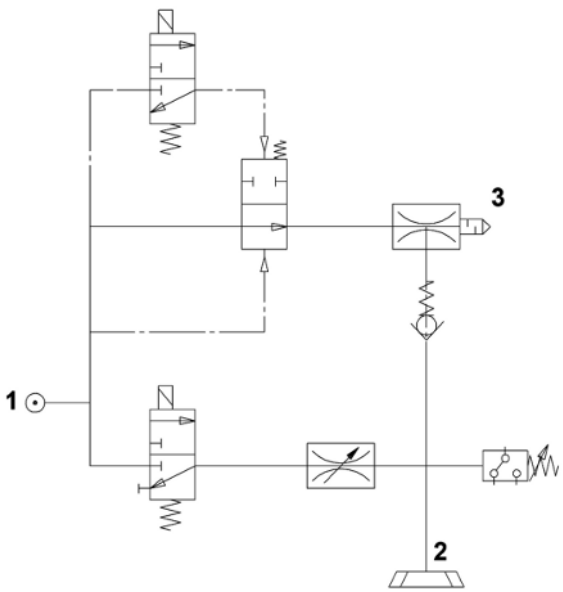
Legend:

NC	Normally closed
NO	Normally open
1	Compressed air connection
2	Vacuum connection
3	Exhaust outlet
1A	“Separate blow off” compressed air connection

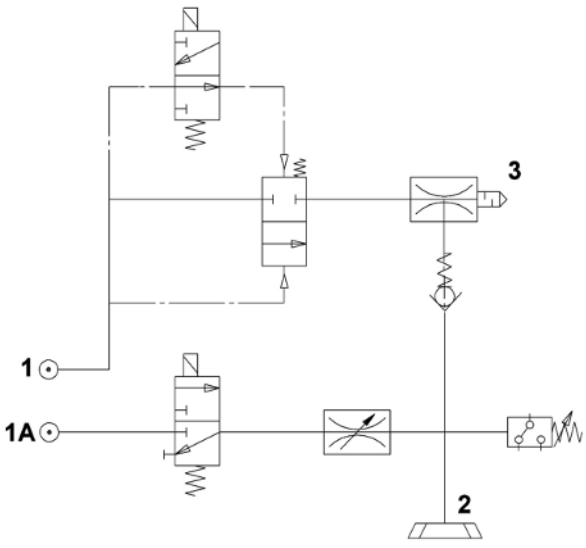
NC



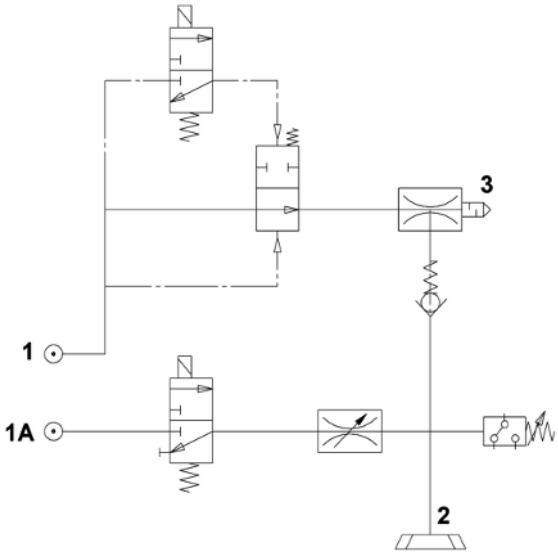
NO



NC-EB



NO-EB



5 Operating and Menu Concept

The device is operated using two buttons on the foil keypad:

 **MENU BUTTON**

 **PLUS BUTTON**

The following information can be shown on the display:

- The current vacuum measurement value
- The selected menu item
- The settings
- Error messages in the form of error codes

The operating menu's home screen shows the currently measured vacuum level in the selected display unit. The measured value is displayed as positive compared to the ambient air pressure.

5.1 Button Assignments in Display Mode

5.1.1 Opening the Menu

Press the **PLUS BUTTON** to open the following menus:

- ▸ Press the **PLUS** button briefly.
- ⇨ The main menu opens with the first parameter [SP 1].

Opening the EF menu for extended functions:

1. Press the **PLUS** button several times until the parameter EF appears on the display.
2. Press the **MENU** button to switch to the EF submenu for extended functions.

⇨ The EF menu opens with the first parameter [ctr].

Opening the INF menu:

1. Press the **PLUS** button several times until the parameter INF appears on the display.
2. Press the **MENU** button to switch to the INF submenu for information.

⇨ The INF menu opens with the first parameter [cc 1].

5.1.2 Displaying the Basic Settings (Slide Show)

When you press the **MENU** button from the home screen, the following parameters are automatically shown one after the other on the display (slide show):

- The vacuum unit
- The value of switching point SP1
- The value of reset point rP1
- The value of switching point SP2
- Current output and input type PNP or NPN
- The supply voltage US

Press the **MENU** button to interrupt the display cycle.

The slide show operates even when the keypad lock is activated.

5.1.3 Locking the Keypad

The keypad lock function requires that the ejector is not in any menu.

Activating the keypad lock:

- Hold down the **PLUS** button for 3 seconds.
  - ⇨ Loc appears on the display.
- ⇨ The keypad lock is activated.

Deactivating the keypad lock:

- Hold down the **PLUS** button for 3 seconds.
  - ⇨ Unc appears on the display.
- ⇨ The keypad lock is deactivated.

The slideshow operates even when the keypad lock is activated.

5.2 Main Menu

All settings for standard applications can be accessed and configured using the main menu.

5.2.1 Functions in the Main Menu

The following table shows an overview of the display codes and parameters in the main menu:

Display code	Parameter	Explanation
SP 1	Switching point 1	Deactivation value of control function (only active if [ctr] = [on])
rP 1	Reset point 1	Reset value 1 for the control function
SP2	Switching point 2	Switching value for the “Part Present” check signal
rP2	Reset point 2	Reset value 2 for the “Parts Present” signal
tbL	Blow off time	Blow off time setting for time-controlled blow off (only active if value > 0)
cAL	Zero-point adjustment (calibration)	Calibrate vacuum sensor, zero point = ambient pressure
EF	Extended functions	Open the “Extended Functions” submenu
INF	Information	Open the “Information” submenu

5.2.2 Changing the Parameters of the Main menu

If you wish to change values, e.g. the switching points, you have to enter the new value digit by digit.

1. Use the **PLUS** button to select the desired parameter.
2. Confirm using the **MENU** button.
   ⇨ The value that is currently set is displayed and the first digit flashes.

3. Use the **PLUS** button to change the value. The value increases by 1 each time that the button is pressed. After 9, the counter goes back to 0 when the **PLUS** button is pressed.
4. Press the **MENU** button to save the changed value.
   ⇨ The first digit is accepted and the second digit flashes.
5. You can use the **PLUS** button to set the second digit.
6. Press the **MENU** button to save the changed value.
   ⇨ The second digit is accepted and the third digit flashes.
7. You can use the **PLUS** button to set the third digit.
8. Press the **MENU** button to save the changed value.

⇨ If the entered value is within the permissible value range, it is accepted and the modified parameter is displayed.

⇨ If the entered value is not within the permissible value range, this is briefly indicated on the display [InC] and the new value is not accepted.

If input is interrupted for longer than 1 minute or if no input is made, the measurement screen is automatically displayed.

5.3 Extended Functions menu (EF)

An Extended Functions menu (EF) is available for applications with special requirements.

5.3.1 Functions in the Extended Functions menu (EF)

The following table shows an overview of the display codes and parameters in the Extended Functions menu.

Display code	Parameter	Possible settings	Explanation
CtR	Energy-saving function	oFF on	Control function off Control active
-L-	Max. permissible leakage	Values configurable between 0 and 999	Permissible leakage Unit: millibar per second
t-1	Max. permissible evacuation time	configurable between 0.01 and 9.99 seconds in steps of 0.01 oFF	Permissible evacuation time No monitoring
Un1	Vacuum unit	 bAr kPA 1H9 PS1	Define the displayed vacuum unit Vacuum level in millibar [mbar] Vacuum level in kilopascal [kPa] Vacuum value in inch of mercury [inHg] Vacuum value in pound-force per square inch [psi]
rES	Reset	no YES	The values remain unchanged Reset parameter values to factory settings

5.3.2 Changing parameters in the Extended Functions menu

Depending on the parameter, there are two different methods for entering values in the EF menu.

When entering numerical values, you enter them digit by digit as in the main menu:

1. Use the **PLUS** button to select the desired parameter.
2. Confirm using the **MENU** button.
   ⇨ The value that is currently set is displayed and the first digit flashes.
3. Use the **PLUS** button to change the value. The value increases by 1 each time that the button is pressed. After 9, the counter goes back to 0 when the **PLUS** button is pressed.
4. Press the **MENU** button to save the changed value.
   ⇨ The first digit is accepted and the second digit flashes.
5. You can use the **PLUS** button to set the second digit.
6. Press the **MENU** button to save the changed value.
   ⇨ The second digit is accepted and the third digit flashes.
7. You can use the **PLUS** button to set the third digit.
8. Press the **MENU** button to save the changed value.

⇨ The value is accepted and the modified parameter is displayed.

If input is interrupted for longer than 1 minute or if no input is made, the measurement screen is automatically displayed.

For other parameters, you can select from predefined settings:

1. Use the **PLUS** button to select the desired parameter.
2. Confirm using the **MENU** button.
   ⇨ The current setting is displayed and flashes.
3. Use the **PLUS** button to switch to the next setting.
4. Press the **MENU** button to save the desired setting.

⇨ The selected setting is briefly shown on the display.

⇨ The display then automatically jumps to the parameter that was just set.

5.4 Info menu [INF]

The Info [INF] menu is provided for reading out system data such as counters, the software version, part numbers and serial numbers.

5.4.1 Functions in the Info menu

The following table shows an overview of the display codes and parameters in the Info menu:

Display code	Parameter	Explanation
cc 1	Counter 1	Counter for suction cycles (suction signal input)
cc2	Counter 2	Counter for valve switching cycles
Soc	Software	Display firmware revision
Art	Part number	Display the part number
Snr	Serial number	Display the serial number Information about the production period

5.4.2 How Data is Displayed in the Info Menu

Counter valuesor numbers with more than 3 digits are displayed in a special manner.

Counter values and serial numbers are 9-digit whole numbers. These numbers are divided into 3 blocks of 3 numbers when shown on the display. Each time a decimal point is displayed to indicate if it is the highest, middle or lowest block. The display starts with the 3 highest-value digits and can be scrolled through using the **PLUS** button.

1. Use the **PLUS** button to select the desired parameter.
2. Confirm using the **MENU** button.
3. Use the **PLUS** button to display or scroll through the blocks that make up the value.

6 Description of Functions

6.1 Applying Suction to the Workpiece/Part (Vacuum Generation)

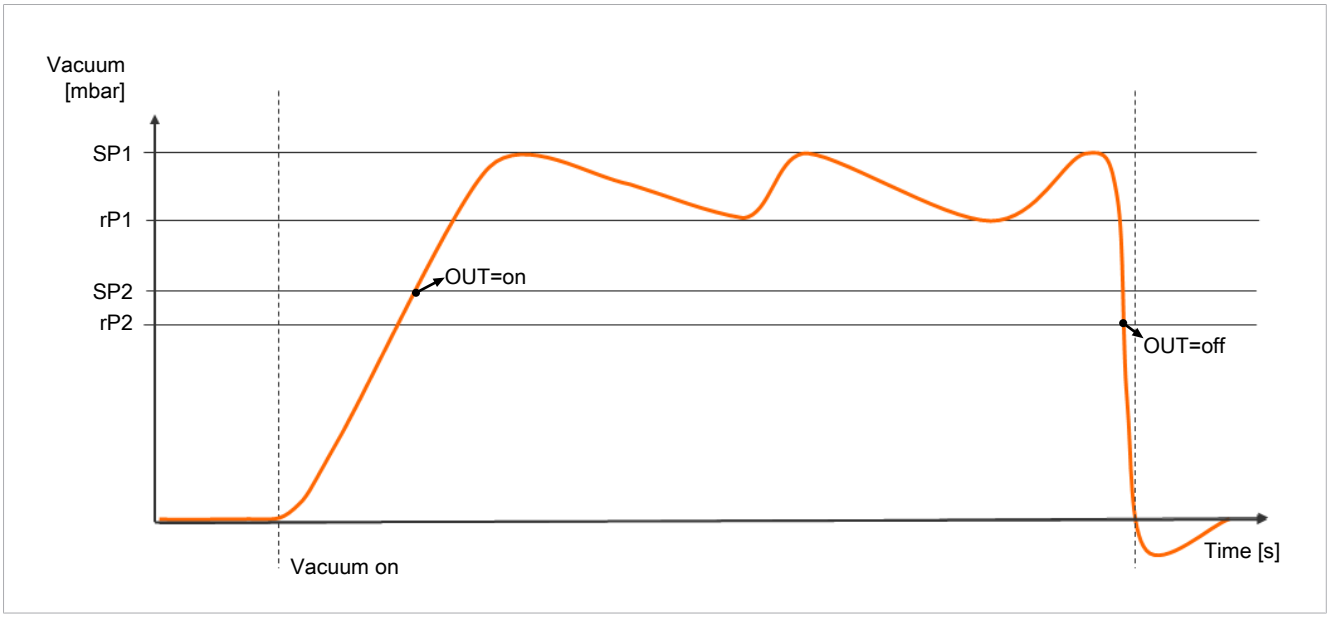
The ejector is designed for handling and holding workpieces by means of a vacuum in combination with suction systems. The vacuum is generated in a nozzle according to the venturi principle, using suction generated by the flow of accelerated compressed air. Compressed air is channeled into the ejector 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.

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

- In the NO (normally open) version, vacuum generation is deactivated when the suction signal is received.
  (This means that if the power fails or if no control signal is present, vacuum is constantly generated (continuous suction).)
- In the NC (normally closed) version, vacuum generation is activated when the suction signal is received.
  (This means that if there is a power failure or if there is no control signal, no vacuum is generated.)

An integrated sensor records the vacuum generated by the venturi nozzle. The exact vacuum value is shown on the display.

The diagram below shows the vacuum curve for when the air saving function is activated:



The ejector has an integrated air saving function and automatically regulates the vacuum in suction mode:

- The electronics switch the Venturi nozzle off as soon as the vacuum limit value set for switching point SP1 is reached.
- When objects with airtight surfaces are picked up, the integrated non-return valve prevents the vacuum from dropping.
- If leakages cause the system vacuum to drop below the limit value configured for the switching point rP1, the venturi nozzle is switched back on.
- The OUT output is set once a workpiece is picked up securely, based on the vacuum value. This enables the further handling process.

6.2 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.

During blow off, [–FF] is shown on the display.

The ejector provides two blow off modes for selection:

- Externally controlled blow off
- Internally time-controlled blow off

6.3 Operating Modes

6.3.1 Automatic Operation

Once the product is connected to the power supply, it is ready for operation and enters automatic mode. This is the normal operating mode, in which the product is operated by the system control unit.

The operating mode may be changed from automatic operation to manual operation using the buttons.

Parameterization always takes place in automatic operation.

6.3.2 Manual Mode

⚠ CAUTION

Changing the output signals in manual mode

Personal injury or damage to property!

- Electrical connection and manual operation may be performed only by a qualified specialist who can predict the effects that signal changes will have on the entire system.

In manual mode, the suction and blow-off functions can be controlled independently of the higher-level controller using the buttons on the foil keypad of the operating element. Among other things, this function is used to detect and eliminate leakages in the vacuum circuit.

In this operating mode, the “SP1” and “SP2” LEDs both flash.

Activating Manual Mode

⚠ CAUTION

External signals may change manual mode

Personal injury or property damage due to unforeseen work steps!

- There must be no people in the system’s danger area while it is in operation.

✓ The ejector is shown on the measurement screen.

▸ Press and hold the **MENU** and **PLUS** buttons simultaneously for at least 3 seconds.

⇨ The “SP1” and “SP2” LEDs flash.

Deactivating Manual Mode

✓ The ejector is in “manual mode”.

▸ Briefly press the **MENU** and **PLUS** buttons at the same time.

⇨ The “SP1” and “SP2” LEDs cease to flash.

The device also exits manual mode when the status of the external signals changes.
When the ejector receives an external signal, it switches to automatic mode.

Activating and Deactivating Manual Suction

Activating manual suction

✓ The ejector is in “manual mode”. The “SP1” and “SP2” LEDs flash.

▸ Press the **MENU** button to activate “suction” mode.

⇨ The suction LED lights up.

⇨ The ejector begins to suck.

Deactivating manual suction

✓ The ejector is in “suction” mode.

▸ Press the **MENU** button again.

⇨ The suction process is deactivated.

▸ Alternatively, press the **PLUS** button.

⇨ The ejector changes to the “blow-off” state for as long as you hold the button down.

If the controller is on [ctr] = [on] it uses the configured limit values in “manual” mode as well.

Activating and Deactivating Manual Blow-off

✓ The ejector is in “manual mode”.

▸ Press and hold the **PLUS** button.

⇨ The blow-off LED lights up.

⇨ The ejector blows off for as long as you keep the button pressed down.

▸ Release the **PLUS** button to end the blow-off.

⇨ The blow-off process is deactivated.

⇨ The blow-off LED is no longer lit.

6.4 Monitoring the system vacuum and defining limit values

The ejector has integrated sensors for measuring the vacuum.

The current vacuum level is shown on the display.

The limit values are set in the main menu using the parameters [SP 1], [rP 1], [SP2] and [rP2].

Limit values SP1 and rP1 are used by the control function to control the vacuum.

Overview of the limit values:

Limit value parameter	Description
SP1	Switching point for air-saving regulation
rP1	Reset point for air-saving regulation
SP2	Activation value of “Part Present” signal output
rP2	Deactivation value of “Part Present” signal output

6.5 Calibrating the sensor

Since the sensor integrated in the ejector is subject to variation due to the manufacturing process, we recommend calibrating the sensor after installation. In order to calibrate the ejector, the system’s pneumatic circuits must be open to the atmosphere.

A zero offset is only possible in the range of ±3 percent of the end value of the measuring range.

If the permissible limit of ±3% is exceeded, error code [E03] will appear on the display.

The zero-point adjustment function is executed in the main menu using the parameter [cAL].

1. To adjust the zero point, press the **PLUS** button several times until [cAL] appears on the display.
2. Confirm using the **MENU** button.
3. Use the **PLUS** button to choose between [**NO**] and [YES] (vacuum sensor calibration).
4. Confirm using the **MENU** button.

⇨ The sensor is calibrated.

6.6 Control functions

The ejector allows you to conserve compressed air or prevent a too powerful vacuum from being generated. Vacuum generation is interrupted once the configured switching point SP1 is reached. If leakage causes the vacuum to fall below the reset point rP1, vacuum generation resumes.

The following operating modes can be set for the control function using the [ctr] parameter in the Extended Functions menu.

6.6.1 No Control (Continuous Suction)

The ejector produces continuous suction with maximum power. This setting is recommended for non-airtight workpieces, which would otherwise cause vacuum generation to switch on and off continuously due to the high rate of leakage.

For this mode, the control function is set to [ctr] = [oFF].

6.6.2 Control

The ejector switches off vacuum generation when the switching point SP1 is reached and switches it back on when the vacuum falls below the reset point rP1. The switching point evaluation for SP1 follows the control function. This setting is particularly recommended for airtight workpieces.

For this mode, the control function is set to [ctr] = [on].

6.7 Blow off modes

6.7.1 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.

6.7.2 Internally Time-Controlled Blow-Off

The function is activated by setting a blow off time using the [tbL] parameter in the main menu.

The “blow off” valve is automatically activated for the configured time period as soon as the ejector leaves “suction” mode.

The “blow off” signal overrides the “suction” signal, even if the specified blow off time is very long.

6.7.3 Setting the blow off time

The blow off time can be set using the [tbL] parameter in the main menu.

The value displayed indicates the blow off time in seconds. The blow off time can be set between 0.01 and 9.99 seconds.

Set the time for time-controlled blow off (only active if value > 0). If you set the value to 0, the ejector is automatically in “externally controlled blow off” mode.

6.8 Selecting the display unit

This function determines the unit in which the vacuum level is displayed.

You can set the function using the [unit] parameter in the EF menu.

The following units are available:

Unit	Explanation
bar	The vacuum level is displayed in mbar. The setting for this unit is [bAr].
Pascal	The vacuum level is displayed in kPa. The setting for this unit is [kPA].
Inch of Hg	The vacuum level is displayed in inHg. The setting for this unit is [inHg].
psi	The vacuum level is displayed in psi. The setting for this unit is [PSI].

6.9 Reset to factory settings

The ejector can be reset to its factory settings using the following function:

- The configuration of the ejector
- The initial setup

This function is executed using the parameter [rES] in the EF menu.

The factory settings for the ejector are listed in the Technical Data section.

⚠ WARNING

By activating/deactivating the product, output signals lead to an action in the production process!

Personal injury

- Avoid possible danger zone.
- Remain vigilant.

A description of how to reset the ejector to factory settings using the display and operating element follows:

✓ The EF menu is open.

1. Use the **PLUS** button to select the parameter [rES].
2. Confirm using the **MENU** button.
3. Use the **PLUS** button to select [YES] for the parameter value.
4. Confirm using the **MENU** button.

⇨ The ejector is reset to the factory settings.

The function for resetting factory settings does not affect the following:

- The counter readings
- The zero-point adjustment of the sensor.

6.10 Counters

The ejector has two internal counters, [cc 1] and [cc2], which cannot be erased:

Counter 1 increases with each valid pulse at the “suction” signal input, meaning that it counts all the suction cycles during the ejector’s service life.

Counter 2 increases each time the “suction” valve is switched on. As a result, the average switching frequency of the air saving function can be determined using the difference between counters 1 and 2.

Description	Display parameter	Description
Counter 1	[cc 1]	Counter for suction cycles (“suction” signal input)
Counter 2	[cc2]	Counter for the “suction valve” switching frequency

Calling up the counter values

✓ Select the counter you wish to see in the system menu.

- Confirm your selection of the counter 1 [cc 1] or counter 2 [cc2] parameter using the **MENU** button.

⇨ The first three decimal places of the counter total will be displayed (the digits x 10^6). This corresponds to the three-digit block with the highest value.

Use the **PLUS** button to display the remaining decimal places of the counter total, in order of descending value. The decimal points indicate which 3-digit block of the counter total is shown in the display.

The counter total is comprised of 3 blocks of digits:

Displayed section	10^6	10^3	10^0
Digit block	0.48	6 1.8	593

The current counter total in this example is 48 618 593.

Counter levels that cannot be deleted are saved only in increments of 1000. That means that when the operating voltage is switched off, up to 999 counter steps are lost.

6.11 Displaying the part number

The part number of the ejector is printed on the label and also stored electronically.

- ✓ The ejector is in the Info menu.
1. Select the part number Art parameter.
2. Use the **MENU** button to confirm the part number parameter Art.
   - ⇨ The first two digits of the part number are displayed.
3. Press the **PLUS** button again several times.

⇨ The remaining digits of the part number are displayed. The decimal points shown are part of the part number.

In the first block displayed, the point on the far right (after the second digit), which is part of the part number, is not displayed for technical reasons.

The part number consists of 4 blocks with a total of 11 digits.

Displayed section	1	2	3	4
Digit block	10	02.0	2.00	383

The part number in this example is 10.02.02.00383.

- ▸ To exit the function, press the **MENU** button.

6.12 Displaying the serial number

The serial number indicates the production period of the ejector.

- ✓ The ejector is in the Info menu InF
1. Select the serial number Snr parameter.
2. Use the **MENU** button to confirm the serial number parameter Snr.
   - ⇨ The first three decimal places of the serial number are displayed (the digits x 10^6). This corresponds to the three-digit block with the highest value.
3. Press the **PLUS** button again several times.

⇨ The remaining digits of the serial number are displayed. The decimal points show which 3-digit block of the serial number is shown in the display.

The serial number consists of 3 blocks with a total of 9 digits:

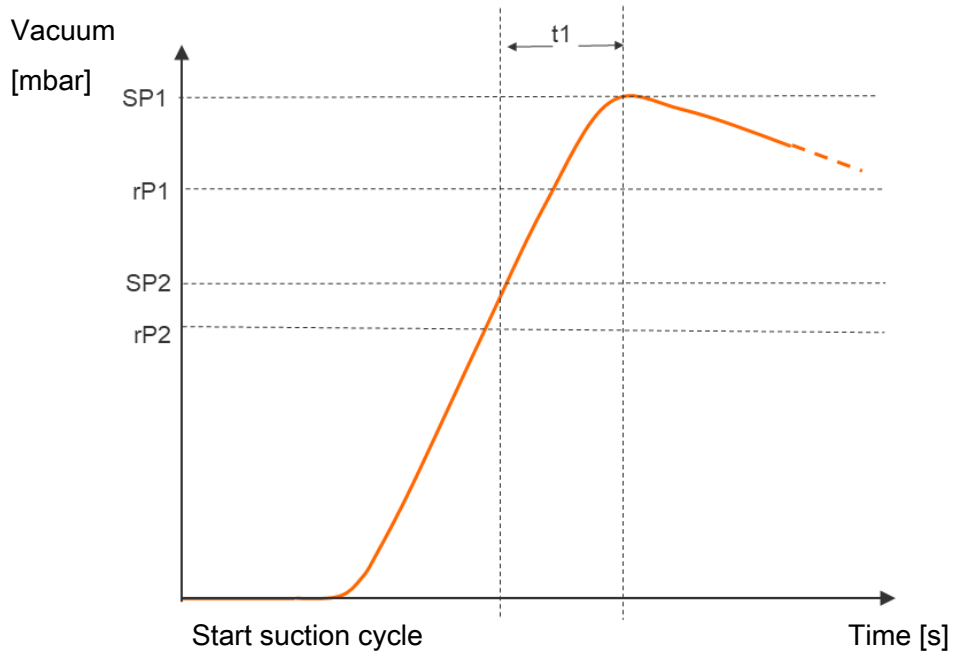
Displayed section	10^6	10^3	10^0
Digit block	9.00	00.0	000

In this example, the serial number is: 900000000

- ▸ To exit the Info menu, press the **MENU** button.

6.13 Condition Monitoring (CM)

6.13.1 Evacuation Time Monitoring



Measuring the evacuation time t1:

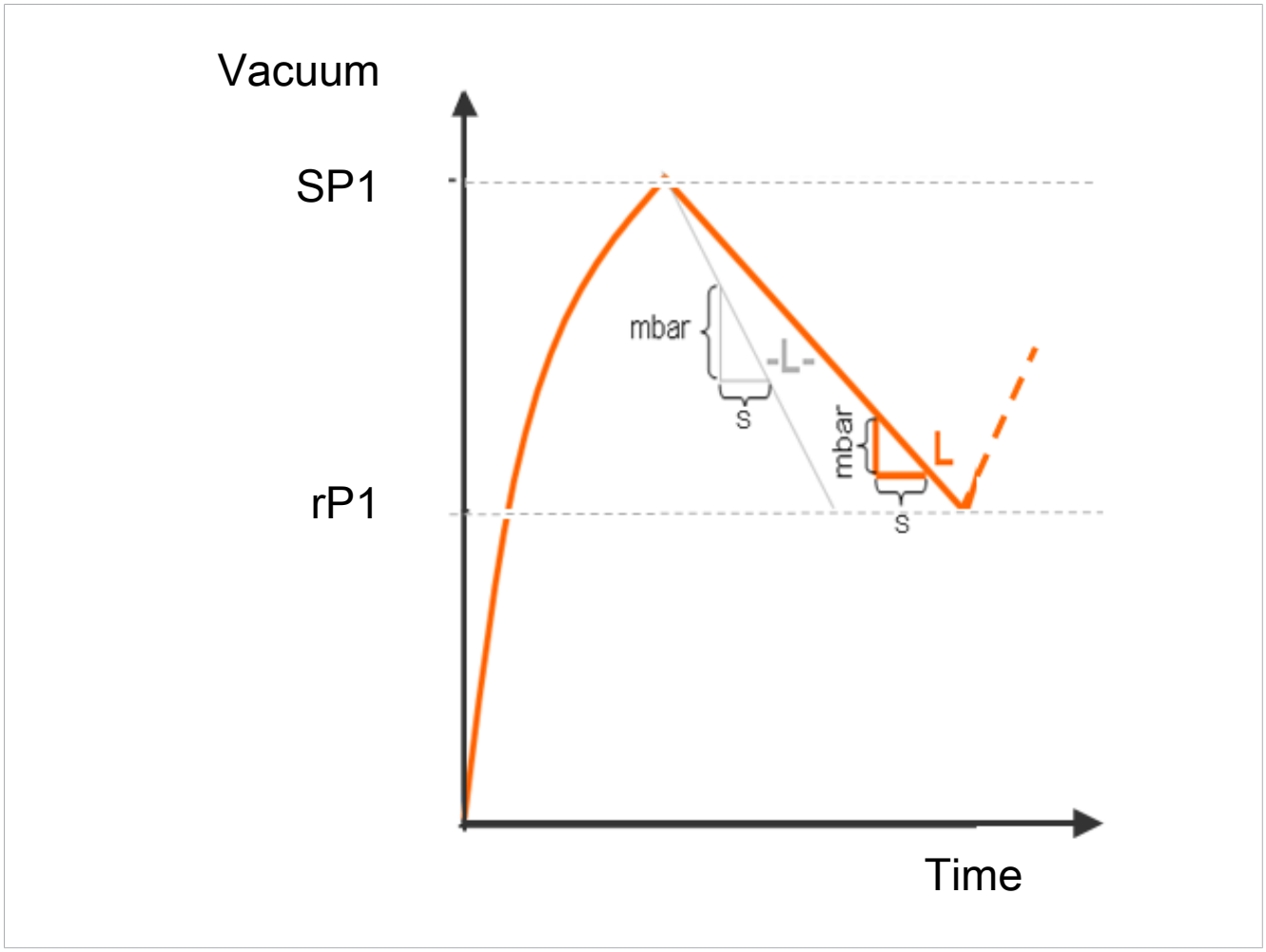
The interval between reaching the switching points SP2 and SP1 is measured (in ms).

The specified value for the max. permitted evacuation time can be set in the Extended Functions menu with the parameter [t- I]. Setting the value to [□□□] (= off) deactivates monitoring. The maximum permitted evacuation time setting is 9.99 s.

If the measured evacuation time t1 exceeds the specified value (>□□□), the display alternately shows t- I and the vacuum level.

After 5 correctly measured evacuation times, the error message t- I is reset. The message is also immediately deleted if you set the permissible evacuation time to the value □□□.

6.13.2 Leakage monitoring



Measuring the leakage:

In control mode ([ctr] = [on]), the vacuum drop/leakage over a certain period of time is measured (as vacuum drop per unit time in mbar/s) from the point when the air saving function interrupts suction after reaching switching point SP1.

The specified value for the max. permitted leakage -L- can be set in the Extended Functions menu with the parameter [-L-]. Setting the value to [000] (= off) deactivates monitoring. The maximum leakage that can be set is 999 mbar/second.

If the leakage L is greater than the set value -L-, the display will alternately show -L- and the vacuum level.

The -L- error message is reset after 5 airtight suction cycles (measured leakage value < specified value). The message is also immediately deleted if you set the permissible leakage to the value 000.

7 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.

8 Installation

8.1 Installation Instructions

⚠ CAUTION

Improper installation or maintenance

Injury to persons 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.

To ensure 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.

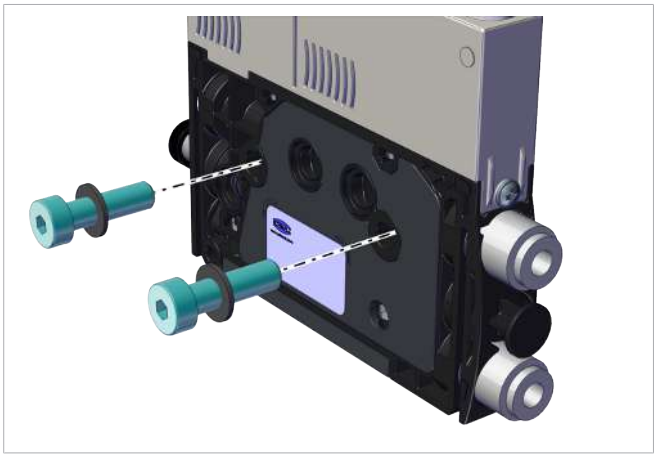
8.2 Mounting

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 through the holes on the side using two screws. Alternatively, it can be mounted using a DIN rail or a mounting bracket (> See ch. 14 Accessories, p. 49).

8.2.1 Mounting with Two Screws

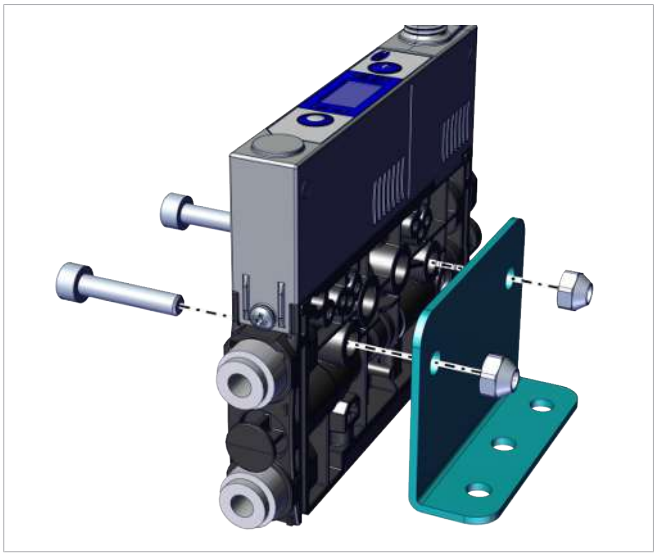


- There are two 4.3 mm through-holes for mounting the mini compact ejector. Use screws at least 20 mm in length. Use washers if you are using fastening screws M4 for the mounting process. The mini compact ejector must be fastened in place using at least two screws. The maximum tightening torque is 1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

8.2.2 Mounting on a DIN Rail (Optional)

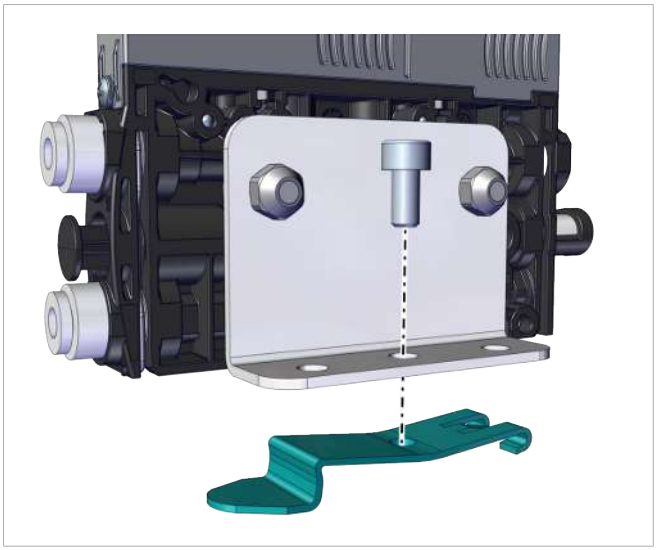
The product can also be mounted on a TS 35-type DIN rail using the mounting kit.

✓ The mounting kit is on-hand.

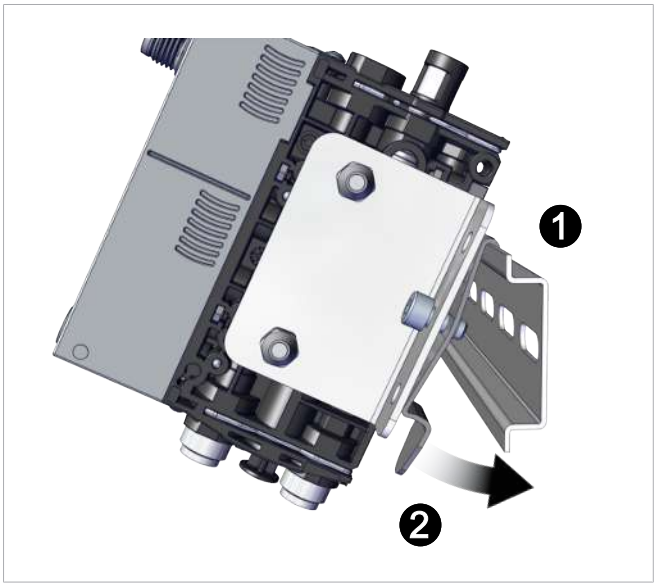


1. Attach the bracket in the correct position on the mini compact ejector with a tightening torque of 1 Nm.

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



3. Attach the assembly with the bracket onto the DIN rail ❶ and press it onto it ❷.



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.

8.3 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 such as suction cups, suction lines and hoses.

⚠ CAUTION

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

Hearing damage!

- Correct installation.
- Wear ear protectors.

NOTE

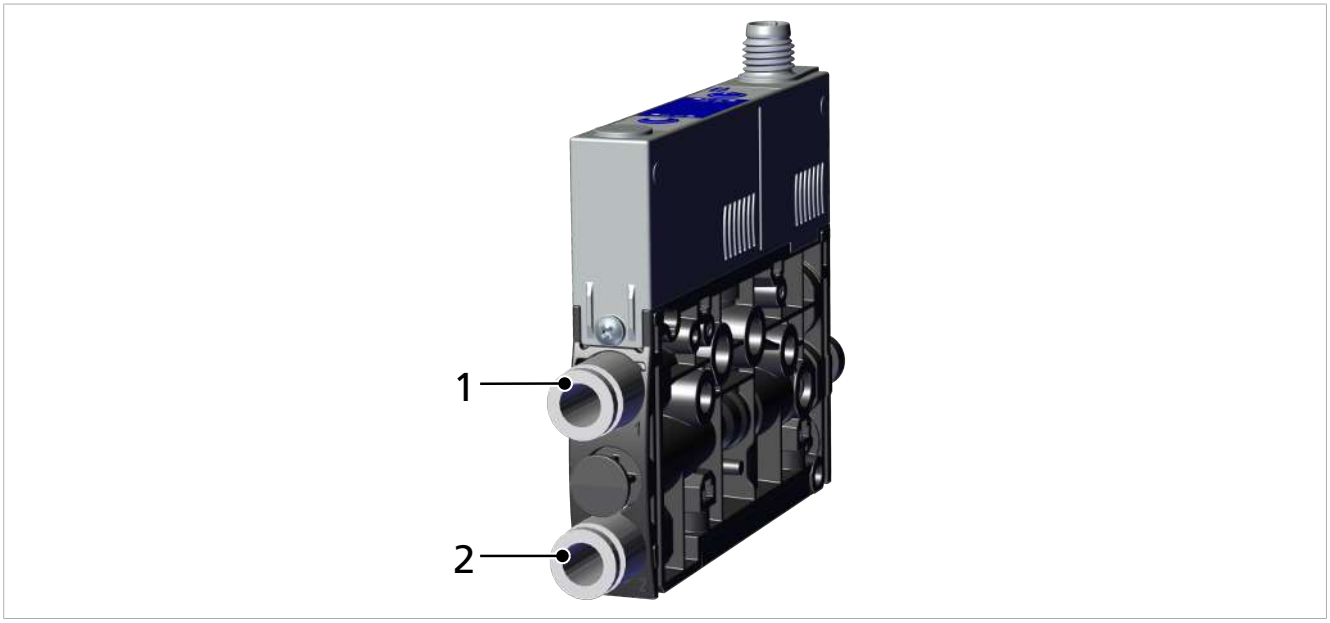
Operating pressure above the recommended maximum pressure

Product damage

- Use the product only within the nominal pressure range.

8.3.1 Connecting the Compressed Air and Vacuum

Description of the Pneumatic Connector



1	Compressed air connector (marking 1)	2	Vacuum connection (marking 2)

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

- Connect the 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 mini compact ejector.

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

8.3.2 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 0.3 / 0.5 / and 0.7 mm**	**Internal Ø for nozzle size 1 and 1.2 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.

8.3.3 Separate Blow-Off Supply Connection (EB) (Option)

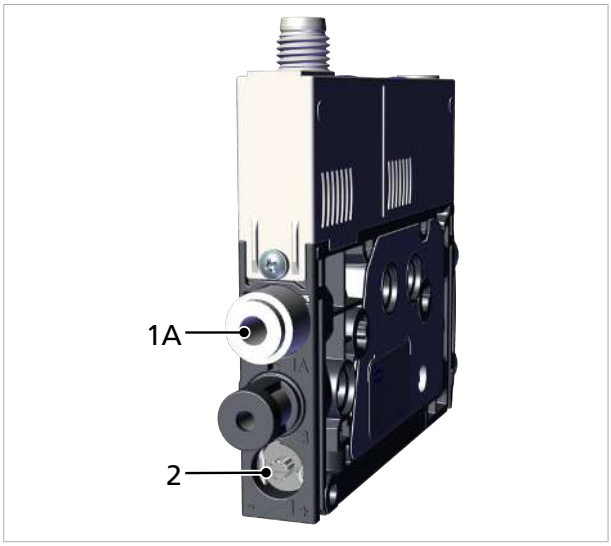
The mini compact ejector is also available with an additional compressed air connector for the blow off function.

With this function, the blow off pulse is controlled separately and independently of the compressed air supply for vacuum generation, allowing you to use a different medium (e.g. nitrogen) for the blow off function.

The blow off flow rate can also be set between 0% and 100% directly on the mini compact ejector. This can be used, for example, to set down small and lightweight workpieces with high positioning precision (> See ch. 9.2 Changing the Blow-Off Flow Rate on the Ejector, p. 41).

The hose size and the thread on the connector depend on the particular mini compact ejector and can have the following dimensions:

- Push-in: 4/2
- M5-IG



- Connect the compressed air hose for separate blow off (connector marked with 1A) and adjust the blow off flow rate using the adjusting screw (2).

8.4 Electrical Connection

⚠ CAUTION

Changing output signals when the product is switched on or plug is connected

Personal injury or damage to property!

- The electrical connection must be performed only by specialists who can evaluate the effects of signal changes on the overall system.

⚠ WARNING

Electric shock

Risk of injury

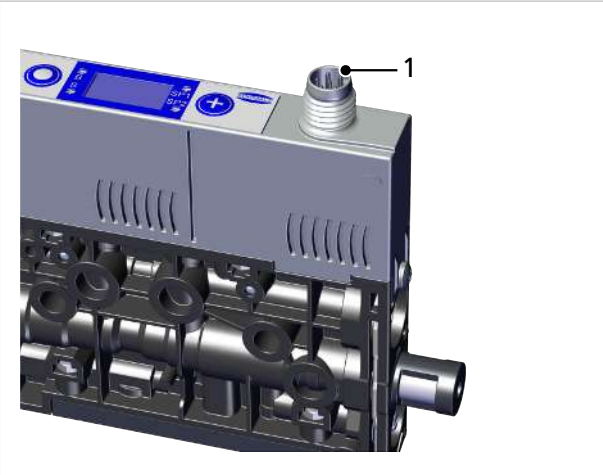
- Operate the product using a power supply unit with protected extra-low voltage (PELV).

The electrical connection supplies the product with power and communicates with the controller of the higher-level machine using defined outputs.

8.4.1 Connecting the Connection Cable

Establish the mini compact ejector's electrical connection using plug connector 1 as shown in the figure.

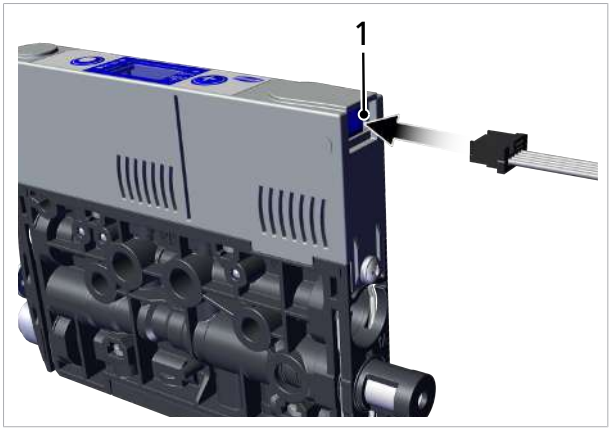
✓ Provide a connection cable with an M8 6-pole socket (customer's responsibility).



- Attach the connection cable to the mini compact ejector (maximum tightening torque = hand-tight).

For mini compact ejectors with a JST plug, establish the ejector's electrical connection using plug connector 1 as shown in the figure.

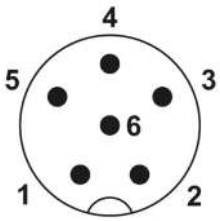
✓ Provide a connection cable with a 5-pole JST plug (customer's responsibility).



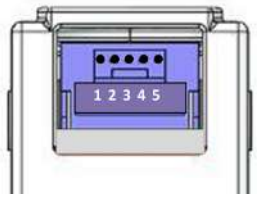
- Fasten the connection cable to the mini compact ejector.

Ensure that the electrical cable does not exceed the maximum length of 20 meters.

8.4.2 Pin Assignments

M8 plug	PIN	Symbol	Wire color [1)]	Function
	1	US	Brown	24 V supply voltage
	2	IN1	White	“Suction” signal input
	3	GND	Blue	Ground
	4	OUT	Black	“Parts present check” output (SP2)
	5	IN2	Gray	“Blow off” signal input
	6	—	Pink	Not used

[1)] When using a Schmalz connection cable, part no. 21.04.05.00488 (see accessories)

JST socket	PIN	Symbol	Litz wire color	Function
	1	US	White	24 V supply voltage
	2	IN1	Brown	“Suction” signal input
	3	GND	Green	Ground
	4	OUT	Yellow	Analog output
	5	IN2	Gray	“Blow off” signal input

9 Operation

9.1 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.

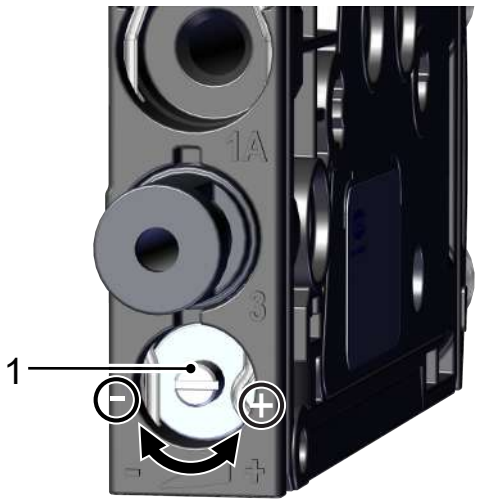
During automatic operation, there must be no people in the system danger area.

9.2 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.



10 Troubleshooting

10.1 Help with Malfunctions

Fault	Possible cause	Solution
Power supply disrupted	Electrical connection	▸ Make sure device is properly connected to power
No communication	Incorrect electrical connection	▸ Check electrical connection and pin assignment
	Higher-level controller not correctly configured	▸ Check the controller configuration
Product does not respond	No power supply	▸ Check electrical connection and pin assignment
	No compressed air supply	▸ Check the compressed air supply
Vacuum level is not reached or vacuum is built up too slowly	Silencer is dirty	▸ Replace silencer insert
	Leakage in hose line	▸ Check hose connections
	Leakage at suction cup	▸ Check suction cup
	Operating pressure too low	▸ Increase operating pressure. Note the maximum limits!
	Internal diameter of hose line too small	▸ Observe recommendations for hose diameter
Load cannot be held.	Vacuum level too low	▸ Increase the control range for the air saving function
	Suction cup too small	▸ Select a larger suction cup
The buttons do not respond and the display does not show [⌊▭⊏]	The keypad lock is activated	▸ Deactivate the keypad lock
No display on the screen	Faulty electrical connection	▸ Check electrical connection and pin assignment
Display shows error code	See the “Error codes” table	▸ See "Error Codes" table in the following chapter
Warning message “Leakage too high” even though handling cycle is working optimally	Limit value -L- (permissible leakage per second) set too low	▸ Determine typical leakage values in a good handling cycle and set as limit value
	Limit values SP1 and rP1 for leakage measurement set too low	▸ Set limit values in such a way that there is a clear differentiation between the neutral and suction system states.
Warning message “Leakage too high” does not appear even though there is high leakage in the system	Limit value -L- (permissible leakage per second) set too high	▸ Determine typical leakage values in a good handling cycle and set as limit value
	Limit values SP1 and rP1 for leakage measurement set too high.	▸ Set limit values in such a way that there is a clear differentiation between the neutral and suction system states.

10.2 Error messages

If an error occurs, it appears on the display in the form of an error code (“E number”). The ejector’s response to an error depends on the type of error.

Display code	Error description
E03	Zero-point adjustment outside ±3% FS (full scale)
E07	Supply voltage is too low
E 17	Supply voltage is too high
FFF	Present vacuum exceeds the measurement range
-FF	Overpressure in vacuum circuit; this normally happens only in blow-off mode.
t- 1	The measured evacuation time t1 exceeds the specified value; the display alternately shows t-1 and the vacuum level
-L-	The leakage L is greater than the set value -L-; the display alternately shows -L- and the vacuum level

11 Maintenance

11.1 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.

11.2 Cleaning the Product

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.

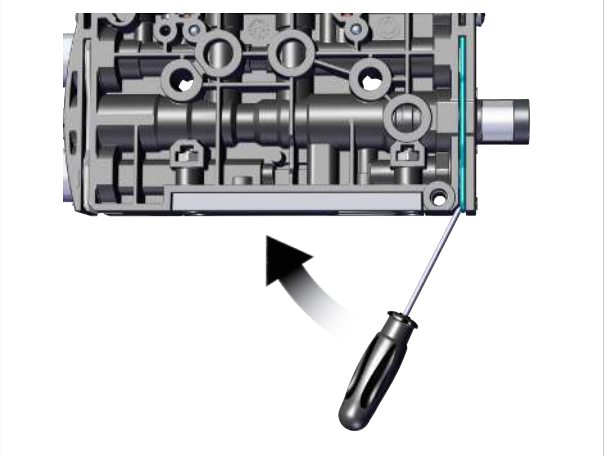
11.3 Replacing the Silencer Insert

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.

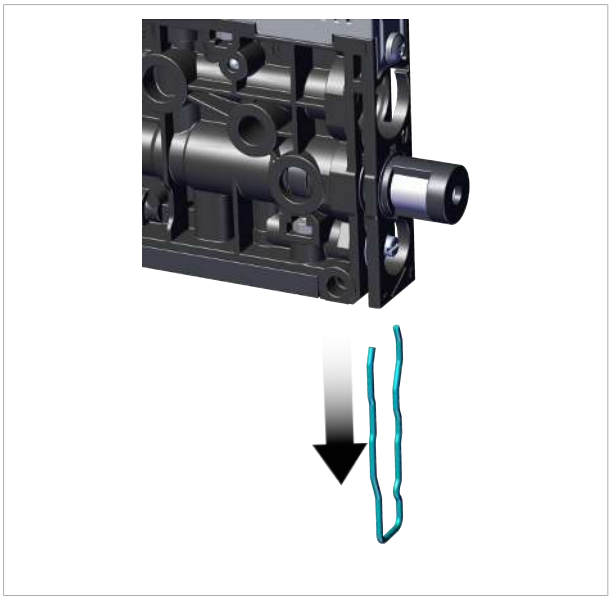
If the suction capacity decreases, replace the silencer insert:

✓ Deactivate the ejector and depressurize the pneumatic systems.

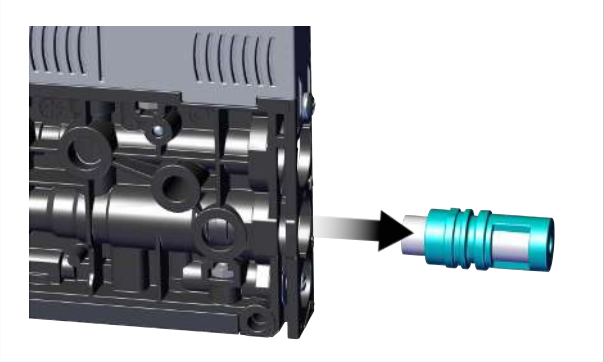
1. Place a small flat screwdriver on the ejector as shown and loosen the clamp.



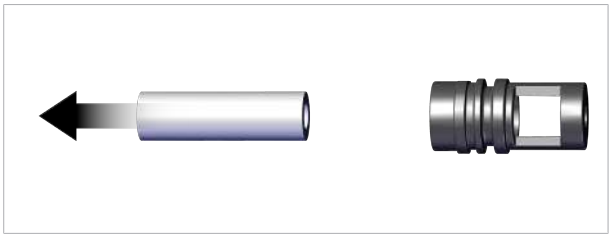
2. Remove the clamp.



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

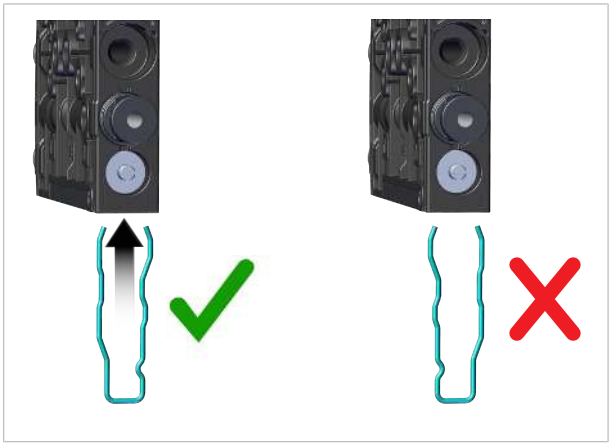


4. Pull the silencer insert out of the housing and dispose of it.

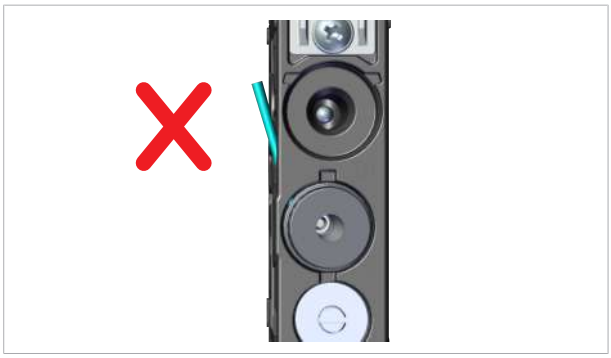


5. Insert the new silencer insert into the housing and reinstall the silencer.

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).

12 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.

13 Spare 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.

The following list contains the most important spare and wearing parts.

Designation	Part no.	Type
Silencer insert	10.02.02.05403	Wearing part
NO ejector suction valve for nozzle size 03	10.05.01.00394	Spare part
NO ejector suction valve for nozzle size 05/07/10/12	10.05.01.00382	Spare part
NC ejector suction valve for nozzle size 03	10.05.01.00382	Spare part
NC ejector suction valve for nozzle size 05/07/10/12	10.05.01.00394	Spare part
Blow off valve (NC valve)	10.05.01.00382	Spare part
Ejector wearing part, VST SCPMi/c/b	10.02.02.06536	Wearing part
Ejector wearing part, VST SCPMi/c/b-EV	10.02.02.06537	Wearing part

When tightening the fastening screws on the valves, observe the maximum tightening torque of 0.1 Nm.

14 Accessories

Designation	Part no.	Note
Connection cable, ASK WB-M8-6 2000 K-6P	21.04.05.00488	M8 socket, 6-pole; length: 2000 mm; open cable end, 6-pole; 90° angle
Connection cable ASK B-M8-6 5000 K-6P	21.04.05.00255	M8 socket, 6-pole; length: 5000 mm; open cable end, 6-pole
Connection cable, ASK WB-M8-6 2000 S-M12-5	21.04.05.00489	M8 socket, 6-pole; cable length: 2000 mm; M12 plug, 5-pole; 90° angle
Connection cable, ASK B-MIC10 3000 K-2P	21.04.06.00086	Vent Micro10 mm socket; cable length: 3000 mm, cable, 2-pole
Connection cable ASK JST-5 2000 K-5P	21.04.05.00779	JST plug, 5-pole, cable length: 2000 mm, open cable end, 5-pole
Connection distributor ASV SCPMi B-M8-6 2xS-M12-4	10.02.02.05602	For: SCPMi, M8 socket, 6-pole, connection 2: 2x M12 plug, 4-pole; length: 1000 mm
Silencer for vacuum generator SD 10.5x31.7 SCPM	10.02.02.05807	Low-noise
Plug-in screw union M5 STV-GE M5-AG 4	10.08.02.00468	—
Plug-in screw union M7 STV-GE M7-AG 6	10.08.02.00469	—
DIN rail mounting kit SET SCPM MOUNT1	10.02.02.05805	For TS 35-type DIN rail
Mounting bracket BEF-WIN 15x50x36.1 1.5 SCPM	10.02.02.05824	—
Exhaust air set ABL-SET SCPMi/c/b	10.02.02.06080	Plug-in screw union and thread adapter
Thread adapter (assembled) ADP-G M5-IG 10.8x6 SCPMi/c/b	10.02.02.05778	—
Thread adapter (assembled) ADP-G M7-IG 10.8x7.9 SCPMi/c/b	10.02.02.05522	—
Thread adapter (assembled) ADP-G M5-IG 10.5x8.6 SCPMi/c/b	10.02.02.05643	For: mini compact eject. SCPMi/c/b, thread G1: M5 female, outside diameter 10.5 mm, length 8.6 mm
Thread adapter (assembled) ADP-G M7-IGx15 SCPMi/c/b	10.02.02.05641	For: mini compact eject. SCPMi/c/b, thread M7 female, length 15 mm

15 Decommissioning and Disposal

15.1 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.

15.2 Materials Used

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

16 Attachment

16.1 Overview of Display Codes

Display code	Parameter	Comment
SP 1	Switching point 1	Value at which the control function deactivates
rP 1	Reset point 1	Reset value 1 for the control function
SP2	Switching point 2	Activation value of “Parts control” signal output
rP2	Reset point 2	Reset value 2 for the “Parts control” signal
tbL	Blow off time	Set the blow-off time for “time blow off”
cAL	Zero-point adjustment	Calibrate the vacuum sensor
EF	Extended functions	Open the “Extended Functions” submenu
INF	Information	Open the “Info” submenu
cc 1	Counter 1	Counter for suction cycles (suction signal input)
cc2	Counter 2	Counter for valve switching frequency
Soc	Software	Displays the software version
Snr	Serial number	Displays the serial number of the ejector
Art	Part number	Displays the part number of the ejector
un i	Vacuum unit	Vacuum unit in which the measurement and setting values are displayed
bAr	Vacuum level in mbar	The displayed vacuum level is shown in mbar.
PS i	Vacuum level in psi	The displayed vacuum level is shown in psi.
iHg	Vacuum level in inHg	The displayed vacuum is shown in inches of Hg.
kPA	Vacuum level in kPa	The displayed vacuum level is shown in kPa.
t- 1	Max. permissible evacuation time Evacuation time t1 exceeded	Set the maximum permitted evacuation time, or The measured evacuation time t1 exceeds the specified value; the display alternately shows t-1 and the vacuum level.
-L-	Max. permissible leakage Leakage L larger than -L-	Set the maximum permissible leakage in mbar/s, or The leakage L is greater than the set value -L-; the display will alternately show -L- and the vacuum level.
ctr	Control	Set the air saving function (control function)
rES	Reset	All adjustable values are reset to the factory settings.
Inc	Inconsistent	The entered value is not within the permissible value range. This is an informational message that appears if incorrect information is entered.
Oor	Out of range	Input value invalid
Loc	The keypad lock is activated	The buttons are locked.
Unc	The keypad lock is deactivated	The buttons are not locked.
E03	Error 03	Zero-point adjustment of the vacuum sensor outside ±3% FS
E07	Error 07	Supply voltage is too low
E 17	Error 17	Supply voltage is too high
FFF		Present vacuum exceeds the measurement range

Display code	Parameter	Comment
-FF		Overpressure in vacuum circuit; this normally happens exclusively in blow off mode.

16.2 Declarations of Conformity

16.2.1 EU Declaration of Conformity

The manufacturer Schmalz confirms that the product Ejector described in these operating instructions fulfills the following applicable EU directives:

2006/42/EC	Machinery Directive
2014/30/EU	Electromagnetic Compatibility
2011/65/EU	Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment

The following harmonized standards were applied:

EN ISO 12100	Safety of machinery — General principles for design — Risk assessment and risk reduction
EN 61000-6-2+AC	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-6-3+A1+AC	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
EN 50581	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

The EU Declaration of Conformity 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.

16.2.2 UKCA Conformity

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

2008	Supply of Machinery (Safety) Regulations
2016	Electromagnetic Compatibility Regulations
2012	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations

The following designated standards were applied:

EN ISO 12100	Safety of machinery — General principles for design — Risk assessment and risk reduction
EN 61000-6-2+AC	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-6-3+A1+AC	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
EN 50581	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

The Declaration of Conformity (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.

At Your Service Worldwide

Vacuum automation

WWW.SCHMALZ.COM/AUTOMATION

Handling systems

WWW.SCHMALZ.COM/EN-US/VACUUM-LIFTERS-AND-CRANE-SYSTEMS

J. Schmalz GmbH
Johannes-Schmalz-Str. 1
72293 Glatten, Germany
T: +49 (0) 7443 2403-0
schmalz@schmalz.de
WWW.SCHMALZ.COM