

Automation



# Innovative Vacuum for Automation Operating Instructions VEQ-\*\*\*\*-S

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#### Note

The Operating instructions were originally written in German. Store in a safe place for future reference. Subject to technical changes without notice. No responsibility is taken for printing or other types of errors.

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# 1 Important Information

## 1.1 Note on Using this Document

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.

- $\checkmark$  This symbol represents a prerequisite that must be met prior to an operational step.
- This symbol represents an action to be performed.
- $\Rightarrow$  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. 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



## 

Noise pollution due to the escape of compressed air

Hearing damage!

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



## 

#### 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.



## 

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.



## 

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.



## 

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 Product Design



4 M8 electrical connection, 6-pole

## 3.2 Controls and Displays in Detail

The mini compact ejector is fitted with the following elements to ensure simple operation:

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





#### 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	BOFF	Mini compact ejector not blowing off
		B lit up	Mini compact ejector blowing off
7	Suction LED S	OFF	Mini compact ejector not sucking
		S lit up	Mini compact ejector sucking

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
	SP1 SP2		Falling vacuum: Vacuum < rP2
4 and 6		SP2 LED lights up continuously	Rising vacuum: vacuum > SP2 and < SP1
	SP1 SP2		Falling vacuum: vacuum > rP2 and < rP1
4 and 6	Both LEDs contir		Rising vacuum: Vacuum > SP1
	SP1 SP2	ously lit	Falling vacuum: Vacuum > rP1

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# 4 Technical Data

## 4.1 Display Parameters

Parameter	Value	Comment
Display	3-digit	Red 7-segment LED display
Resolution	±1 mbar	—
Accuracy	±3% FS	T <sub>amb</sub> = 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 ex- ited	1 min	The display mode is accessed automatically when no settings are made in a menu.

## 4.2 General parameters

Parameter	ter Version Symbol Limit value					Comment
			min.	optimal	max.	
Working tempera- ture		T <sub>amb</sub>	0° C		+50° C	_
Storage tempera- ture		T <sub>sto</sub>	-10° C		60° C	_
Humidity		$H_{rel}$	10% r.h.		85% r.h.	Free from condensation
Degree of protec- tion			—	_	IP40	_
	05		3.5 bar	4 bar	6 bar	—
Operating pres-	07	P	3.5 bar	4 bar	6 bar	—
sure (flow pres- sure)	10		3.5 bar	4.5 bar	6 bar	—
Operating	ral gas, filte	red to 5 µm,	, without oil	, class 3-3-	3 compressed air quality	

# medium in acc. with ISO 8573-1

## 4.3 Electrical Parameters

Supply voltage	DC 24 V $\pm$ 10% (PELV <sup>1</sup> )					
Polarity reversal protec- tion	Yes					
Current consumption (at 24 V)		Typical current consump- tion	Max. current consump- tion			
	SCPMc – xx – NC	50 mA	70 mA			
	SCPMc – xx – NO	75 mA	115 mA			

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

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## 4.4 Mechanical Data

## 4.4.1 Performance Data

Туре	Nozzle 05	Nozzle 07	Nozzle 10
Nozzle size [mm]	0.5	0.7	1.0
Degree of evacuation [%]		87	
Max. suction rate [l/min] <sup>1)</sup>	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)] <sup>1)</sup>	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] <sup>2)</sup>	-	2	4
Rec. diameter of vacuum hose [mm] <sup>2)</sup>	-	2	4
Weight [g]		80	

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

## 4.4.2 Dimensions



G3	L	В	Н	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	ŀ	-15	H6	d1		d2	L1	d	3	B1
30	7	7.5	17.5	4.2		4.2	95.3	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 (	Switching point SP1	750 mbar
-P	Reset point rP1	600 mbar
585	Switching point SP2	550 mbar
- 65	Reset point rP2	540 mbar
ЕРГ	Blow off time	0 s
ctr	Control	Activated = 🗆 🗆
E- 1	Evacuation time	0 s
	Leakage value	0 mbar/s
ບຕເ	Vacuum unit	Vacuum unit in mbar = b日┌



## 4.4.5 Pneumatic circuit plans

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

NC



# 5 Operating and Menu Concept

The mini compact ejector is operated using two buttons on the foil keypad:



#### MENU 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. Millibar is fixed as the unit. The measured value is displayed as positive compared to the ambient air pressure.

## 5.1 Button Assignments in Display Mode

#### **Displaying the Software Version**

The software version indicates the software currently running on the internal controller.

- ✓ The mini compact valve is in display mode
- Press the MENU button
- $\Rightarrow$  The software ID is displayed.
- To exit the function, press the **MENU** button.

The **PLUS** button has no function (the display shows  $[ L \Box \Box ]$ ).

## 5.1.1 Opening the Menu

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

- Press the **PLUS** button briefly.
- $\Rightarrow$  The main menu opens with the first parameter [5P  $\,$  ].

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.
- $\Rightarrow$  The EF menu opens with the first parameter [ $\Box \Box \Box$ ].

Opening the INF menu:

- 1. Press the **PLUS** button several times until the parameter  $\square$  papears on the display.
- 2. Press the **MENU** button to switch to the INF submenu for information.
- $\Rightarrow$  The INF menu opens with the first parameter [ $\Box \Box |$ ].



## 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
- The supply voltage US

The display cycle returns to the vacuum display after a complete cycle or can be canceled at any time by pressing any button.

#### 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.
  - $\Rightarrow$  Loc appears on the display.
- $\Rightarrow$  The keypad lock is activated.

#### Deactivating the keypad lock:

- Hold down the **PLUS** button for 3 seconds.
  - $\Rightarrow$   $\Box \neg \Box$  appears on the display.
- $\Rightarrow$  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 (	Switching point 1	Value at which the control function deactivates (only active if $[\Box \Box \Box] = [\Box \Box]$ )
-P	Reset point 1	Reset value 1 for the control function
592	Switching point 2	Switching value for the "Parts control" signal
- 65	Reset point 2	Reset value 2 for the "Parts control" signal
EBL	Blow off time	Blow off time setting for time-controlled blow off (only active if value $> 0$ )
cAL	Zero-point adjust- ment (calibration)	Calibrate vacuum sensor, zero point = ambient pressure
EF	Extended functions	Open the "Extended Functions" submenu
INF	Information	Open the "Information" submenu



Display code	Parameter	Explanation
Inc	Incorrect	The entered value is not within the permissible value range. This is an informational message that appears if incorrect informa- tion is entered.

#### 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.
  - $\Rightarrow$  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.
  - $\Rightarrow$  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.
  - $\Rightarrow$  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.
- $\Rightarrow$  If the entered value is not within the permissible value range, this is briefly indicated on the display [ lnc] 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. permissi- ble leakage	Values config- urable between [] and []]]	Permitted leakage Unit: millibar per second
E-1	Max. permissi- ble evacuation time	configurable be- tween 0.01 and 9.99 seconds in steps of 0.01 □FF	Permitted evacuation time No monitoring
UN I	Vacuum unit		Define the displayed vacuum unit

Display code	Parameter	Possible settings	Explanation
		6Я- кРЯ ,Н9 Р5 ,	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]
-65	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.
  - $\Rightarrow$  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.
  - $\,\Rightarrow\,\,$  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.
- $\Rightarrow$  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.
  - $\Rightarrow$  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.
- $\Rightarrow$  The selected setting is briefly shown on the display.
- $\Rightarrow$  The display then automatically jumps to the parameter that was just set.

## 5.4 Info menu [INF]

The "Info" [INF] menu is available 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		
	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		
Sor	Serial number	Display the serial number Information about the production period		

#### 5.4.2 How Data is Displayed in the Info Menu

Counter values or 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 Overview of Functions

Description	Parameter	See section		
Picking up the workpiece (vac- uum generation)		(> See ch. Applying Suction to the Workpiece/Part (Vacuum Generation), Page 21)		
Depositing the workpiece/part (blowing off)		(> See ch. Depositing the Workpiece/Part (Blowing Off), Page 22)		
Operating modes		(> See ch. Operating Modes, Page 22) Automatic operation and manual operation		
Switching point setting	5P 1/-P 1 5P2/-P2	(> See ch. Monitoring the system vacuum and defin- ing limit values, Page 24)		
Calibrate zero point	cAL	(> See ch. Calibrating the sensor, Page 24)		
Energy-saving function, control function	ctr	(> See ch. Control functions, Page 25)		
Defining blow off time	EBL	(> See ch. Blow off modes, Page 25)		
Display unit	υΠι	(> See ch. Selecting the display unit, Page 25)		
Reset to factory settings	-65	(> See ch. Reset to factory settings, Page 26)		
Counter(s)		(> See ch. Counters, Page 26)		
	555			
Software version	Soc	Displaying the software version		
Part number	Art	(> See ch. Displaying the part number, Page 27)		
Serial number	Soc	(> See ch. Displaying the serial number, Page 28)		
Condition monitoring (CM)	E- 1	Condition Monitoring (CM)		
	-L-			
Optional: external blow off Compressed air connector 1A	—	Optional: External blow-off connection (EB)		
Error messages	e.g. E03	Error messages		
	FFF			
	-FF			

## 6.2 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, the venturi nozzle is deactivated when the suction signal is received.
- In the NC (normally closed) version, the venturi nozzle is activated when the suction signal is received.

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.

## 6.3 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

## 6.4 Operating Modes

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#### 6.4.1 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.

#### 6.4.2 Manual Mode



## 

#### 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**



## 

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.
- $\Rightarrow$  The suction LED lights up.
- $\Rightarrow$  The ejector begins to suck.

#### Deactivating manual suction

- ✓ The ejector is in "suction" mode.
- Press the **MENU** button again.
- $\Rightarrow$  The suction process is deactivated.



- Alternatively, press the **PLUS** button.
- $\Rightarrow$  The ejector changes to the "blow-off" state for as long as you hold the button down.



If the controller is on [ことっ] = [ロロ] 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.
- $\Rightarrow$  The blow-off LED lights up.
- $\Rightarrow$  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.
- $\Rightarrow$  The blow-off LED is no longer lit.

## 6.5 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 [5P i], [-P i], [5P2] and [-P2].

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

## 6.6 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  $\pm 3$  percent of the end value of the measuring range.

If the permissible limit of  $\pm 3\%$  is exceeded, error code [ $\Box \Box \exists$ ] will appear on the display.

The zero-point adjustment function is executed in the main menu using the parameter [ $\Box \Pi L$ ].

- 1. To adjust the zero point, press the **PLUS** button several times until  $[\Box AL]$  appears on the display.
- 2. Confirm using the **MENU** button.
- 3. Use the **PLUS** button to choose between [**NO**] and [ $\exists E \exists$ ] (vacuum sensor calibration).
- 4. Confirm using the **MENU** button.
- $\Rightarrow$  The sensor is calibrated.



## 6.7 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  $\Box \Box \Box \Box \Box \Box$  parameter in the Extended Functions menu.

#### 6.7.1 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  $[\Box \Box \Box ] = [\Box \Box \Box ]$ .

## 6.7.2 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  $[\Box \Box \Box] = [\Box \Box]$ .

## 6.8 Blow off modes

#### 6.8.1 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.

#### 6.8.2 Internally Time-Controlled Blow-Off

The function is activated by setting a blow off time using the  $[\Box \Box \Box]$  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.

#### 6.8.3 Setting the blow off time

The blow off time can be set using the  $[\Box \Box \Box]$  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.

## 6.9 Selecting the display unit

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

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

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#### The following units are available:

Unit	Explanation
bar	The vacuum level is displayed in mbar. The setting for this unit is $[b \exists \neg]$ .
Pascal	The vacuum level is displayed in kPa. The setting for this unit is $[kPR]$ .
Inch of Hg	The vacuum level is displayed in inHg. The setting for this unit is $[1H_3]$ .
psi	The vacuum level is displayed in psi. The setting for this unit is $[P5_{-1}]$ .

## 6.10 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  $[\neg E 5]$  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  $[\neg \Box \Box]$ .
- 2. Confirm using the MENU button.
- 3. Use the **PLUS** button to select  $[\exists E \subseteq G]$  for the parameter value.
- 4. Confirm using the MENU button.
- $\Rightarrow$  The ejector is reset to the factory settings.

The reset to factory settings function does not affect the following elements:

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

## 6.11 Counters

The ejector has two internal counters,  $[\Box \Box ]$  and  $[\Box \Box 2]$ , 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" value 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.

Designation	Display parameter	Description
Counter 1	[cc <sup> </sup> ]	Counter for suction cycles ("suction" signal input)
Counter 2	[cc2]	Counter for the "suction valve" switching fre- quency

#### Calling up the counter values

- ✓ Select the counter you wish to see in the system menu.
- Confirm your selection of the counter 1 [□□ <sup>1</sup>] or counter 2 [□□<sup>2</sup>] parameter using the MENU button.
- ⇒ The first three decimal places of the counter total will be displayed (the digits x 10<sup>6</sup>). 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 the 3-digit blocks taken together:

Displayed section	<b>10</b> <sup>6</sup>	10 <sup>3</sup>	10º
Digit block	0.48	618	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.

## 6.12 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. Use the **PLUS** button to select the part number parameter  $\exists \neg \vdash$ .
- 2. Use the **MENU** button to confirm the part number parameter  $\exists \neg \exists$ .
  - $\Rightarrow$  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.



## 6.13 Displaying the serial number

The serial number indicates the production period of the ejector.

- ✓ The ejector is in the Info menu □F
- 1. Use the **PLUS** button to select the serial number parameter  $\Box \Box \Box$ .
- 2. Use the **MENU** button to confirm the serial number parameter  $\Box \Box \Box$ .
  - $\Rightarrow$  The first three decimal places of the serial number are displayed (the digits x 10<sup>6</sup>). 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	<b>10</b> <sup>6</sup>	10 <sup>3</sup>	10 <sup>°</sup>
Digit block	9.00	00.0	000

In this example, the serial number is: 900000000

• To exit the Info menu, press the **MENU** button.

## 6.14 Condition Monitoring (CM)

## 6.14.1 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 [ b - 1 ]. Setting the value to [ b - 1 ] (= off) deactivates monitoring. The maximum permitted evacuation time setting is 9.99 s.



If the measured evacuation time t1 exceeds the specified value (> $\Box\Box\Box$ ), the display alternately shows  $\exists - 1$  and the vacuum level.

After 5 correctly measured evacuation times, the error message  $\lfloor - \rfloor$  is reset. The message is also immediately deleted if you set the permissible evacuation time to the value  $\Box\Box\Box$ .

#### 6.14.2 Leakage monitoring



Measuring the leakage:

In control mode ( $[\Box \Box \Box] = [\Box \Box]$ ), 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  $[\Box \Box \Box]$  (= 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  $\Box\Box\Box$ .

# 7 Transport and Storage

#### 7.1 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.



# 8 Installation

#### 8.1 Installation Instructions



## 

#### 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.

## 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 Accessories.



#### 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 **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.



## 8.3 Pneumatic Connection



## 

**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.

#### 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:



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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.

## 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.



## 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 supplies the mini compact ejector 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).

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 <sup>1)</sup>	Function
4	1	US	Brown	24 V power supply
	2	IN1	White	"Suction" signal input
$5/ \bullet \bullet \rangle^3$	3	GND	Blue	Ground
• 6	4	OUT	Black	"Parts control" output (SP2)
	5	IN2	Gray	"Blow off" signal input
	6	—	Pink	Not used

<sup>1)</sup> When using a Camozzi connection cable, part no. 70-1303-0190 (see accessories)

# 9 Operation

#### 9.1 General Preparations



## 

#### 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 super-visor).
- 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	<ul> <li>Make sure device is properly con- nected to power</li> </ul>
No communication	Incorrect electrical connection	<ul> <li>Check electrical connection and pin assignment</li> </ul>
	Higher-level controller not cor- rectly configured	Check the controller configuration
Product does not re- spond	No power supply	<ul> <li>Check electrical connection and pin assignment</li> </ul>
	No compressed air supply	<ul> <li>Check the compressed air supply</li> </ul>
Vacuum level is not	Silencer is dirty	<ul> <li>Replace silencer insert</li> </ul>
reached or vacuum is	Leakage in hose line	<ul> <li>Check hose connections</li> </ul>
built up too slowly	Leakage at suction cup	<ul> <li>Check suction cup</li> </ul>
	Operating pressure too low	<ul> <li>Increase operating pressure. Note the maximum limits!</li> </ul>
	Internal diameter of hose line too small	<ul> <li>Observe recommendations for hose diameter</li> </ul>
Load cannot be held.	Vacuum level too low	<ul> <li>Increase the control range for the air saving function</li> </ul>
	Suction cup too small	<ul> <li>Select a larger suction cup</li> </ul>
The buttons do not re- spond and the display does not show [bcc]	The keypad lock is activated	<ul> <li>Deactivate the keypad lock</li> </ul>
No display on the screen	Faulty electrical connection	<ul> <li>Check electrical connection and pin assignment</li> </ul>
Display shows error code	See the "Error codes" table	<ul> <li>See "Error Codes" table in the fol- lowing chapter</li> </ul>
Warning message "Leakage too high" even though handling cycle is working opti- mally	Limit value -L- (permissible leak- age per second) set too low	<ul> <li>Determine typical leakage values in a good handling cycle and set as limit value</li> </ul>
	Limit values SP1 and rP1 for leak- age measurement set too low	<ul> <li>Set limit values in such a way that there is a clear differentiation be- tween the neutral and suction sys- tem states.</li> </ul>
Warning message "Leakage too high" does not appear even	Limit value -L- (permissible leak- age per second) set too high	<ul> <li>Determine typical leakage values in a good handling cycle and set as limit value</li> </ul>
though there is high leakage in the system	Limit values SP1 and rP1 for leak- age measurement set too high.	<ul> <li>Set limit values in such a way that there is a clear differentiation be- tween the neutral and suction sys- tem states.</li> </ul>

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#### **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)
607	Supply voltage is too low
ΕIЛ	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.
E- 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.



## 

#### 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 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.

## **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:

- $\checkmark$  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.





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

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# 13 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

# 14 Decommissioning and Recycling

## 14.1 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.

#### 14.2 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



# **15 Attachment**

# 15.1 Overview of Display Codes

Display code	Parameter	Comment
SP (	Switching point 1	Value at which the control function deactivates
-P	Reset point 1	Reset value 1 for the control function
592	Switching point 2	Activation value of "Parts control" signal output
- 65	Reset point 2	Reset value 2 for the "Parts control" signal
EBL	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
	Counter 1	Counter for suction cycles (suction signal input)
662	Counter 2	Counter for valve switching frequency
Soc	Software	Displays the software version
Soc	Serial number	Displays the serial number of the ejector
Art	Part number	Displays the part number of the ejector
100	Vacuum unit	Vacuum unit in which the measurement and setting values are displayed
68г	Vacuum level in mbar	The displayed vacuum level is shown in mbar.
PS,	Vacuum level in psi	The displayed vacuum level is shown in psi.
,H9	Vacuum level in inHg	The displayed vacuum is shown in inches of Hg.
кРЯ	Vacuum level in kPa	The displayed vacuum level is shown in kPa.
E-1	Max. permissible evac- uation time Evacuation time t1 ex- ceeded	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 leak- age 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 al- ternately show -L- and the vacuum level.
ctr	Control	Set the air saving function (control function)
-65	Reset	All adjustable values are reset to the factory settings.
loc	Inconsistent	The entered value is not within the permissible value range. This is an informational message that appears if incorrect informa- tion is entered.
0or	Out of range	Input value invalid
Loc	The keypad lock is ac- tivated	The buttons are locked.
Unc	The keypad lock is de- activated	The buttons are not locked.
E03	Error 03	Zero-point adjustment of the vacuum sensor outside $\pm 3\%$ FS
EON	Error 07	Supply voltage is too low
ЕΊЛ	Error 17	Supply voltage is too high

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Display Paramet	tor	

Display code	Parameter	Comment
FFF		Present vacuum exceeds the measurement range
-FF		Overpressure in vacuum circuit; this normally happens exclusively in blow off mode.



# Contact Camozzi Automation spa

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