



# Compact Ejector Series VES-1

Use and maintenance instructions

Mat. 93-7547-0005 Rev.-- Doc. 3000494111 Ver.00

The products are designed and manufactured in conformity with the following directives:  
 - 2014/30/UE "Electromagnetic compatibility"  
 They also comply partially or totally with regard to the applicable parts of the following standards:  
 - EN 61000-6-2:2005 Electromagnetic compatibility (EMC)  
 Part 6-2: Generic standards - Immunity for industrial environments  
 - EN 61000-6-4:2007 Electromagnetic compatibility (EMC)  
 Part 6-4: Generic standards - Emissions for industrial environments.  
 - UL 61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use.  
 Part 1: General requirements.  
 and the following technical standards:  
 - EN ISO 4414:2010 Pneumatics - General rules and safety requirements for systems and their components.

For more information regarding the declarations of conformity, see the Certifications section on the website <http://catalogue.camozzi.com>

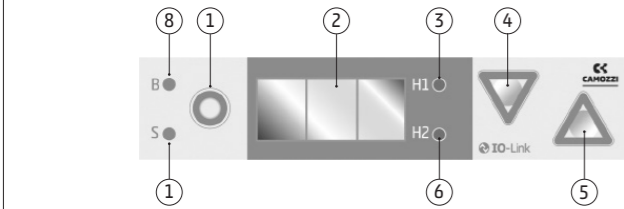
## 1 General recommendations

- Some hazards can only be associated with the product after it has been installed on the machine/equipment.
- It is the task of the final user to identify these hazards and reduced the associated risks accordingly.
- The products dealt with in this manual may be used in circuits that must comply with the standard EN ISO 13849-1.
- For information regarding component reliability, contact Camozzi Automation.
- Before proceeding with use of the product, carefully read all information in this document.
- The instructions in this instructions sheet must be observed together with the instructions and additional information regarding the product in this manual, available from the following reference links:  
 - Website <http://www.camozzi.com>  
 - Camozzi Automation general catalogue  
 - Technical assistance service
- Assembly and start-up operations must be performed exclusively by qualified and authorized personnel on the basis of these instructions.
- It is the responsibility of the system/machine designer to ensure the correct selection of the most suitable pneumatic component according to the intended application.
- For all situations not contemplated in this manual and in situations in which there is the risk of potential damage to objects, or injury to persons or animals, contact Camozzi Automation for advice.
- Never make unauthorized modifications to the product. In this case, any damage or injury to objects, persons or animals will be the responsibility of the user.
- All relevant product safety standards must be observed at all times.
- Never intervene on the machine/system before verifying that all working conditions are safe.
- Before installation and maintenance, ensure that the specific envisaged safety locks are active, and then disconnect the electrical mains (if necessary) and system pressure supply, discharging all residual compressed air from the circuit and deactivating residual energy stored in springs, condensers, recipients and gravity.
- To reduce the noise levels caused by the discharge of air from the component, envisage the use of silencers or convey the fluid to a zone where no personnel are envisaged during normal operation.
- Avoid covering the equipment with paint or other substances that may reduce heat dissipation.
- Avoid cleaning with aggressive agents such as to dull the plastics.

## 2 Installation and start-up

- During unpacking, take great care not to damage the product.
  - Check whether there are any faults caused by product transport or storage.
  - Separate all packaging material to enable the recovery or disposal in accordance with current standards in the country of use.
  - Where possible, avoid the risk of repeated pressure surges on the circuit where the component is installed.
  - The components must be fixed correctly using, where possible, the specific brackets and ensuring that the fixture remains efficient even when the regulator is repeatedly used at a high frequency and in the presence of strong vibrations.
  - In the case of strong vibrations envisage suitable devices/systems able to dampen the effect on the component.
  - Ensure that the tubes are correctly connected and secured to the fittings.
  - If the power supply is turned off, residual pressure may remain on the secondary side of the regulators.
- The manufacturer must provide for additional exhaust components.

## 3 Display and Operating Element in Detail



Nr.	Function
1	MENÙ BUTTON
2	Display
3	H1 limit value LED
4	DOWN BUTTON
5	UP BUTTON
6	H2 limit value LED
7	LED process state "suction"
8	LED process stare "blow off"

### • Definition of the LED indicators

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

Display	Description	Ejector state
B ● S ●	LEDs are both off	No suction from ejector
B ● S ●	LED for the suction function is constantly lit	Ejector sucks or is under control
B ● S ●	LED for the blow off function is constantly lit	Ejector blowing off

### • Meaning of the Vacuum Limit Value LEDs

The LEDs for the vacuum limit values H1 and H2 indicate the current level of the system vacuum relative to the configured limit values.

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

Display	Description	Ejector state
H1 ● H2 ●	LEDs are both off	Rising vacuum: Vacuum < H2 Falling vacuum: Vacuum < (H2-h2)
H1 ● H2 ●	H2 LED lit steadily	Rising vacuum: Vacuum > H2 and < H1 Falling vacuum: Vacuum > (H2-h2) and < (H1-h1)
H1 ● H2 ●	Both LEDs continuously lit	Rising vacuum: Vacuum > H1 Falling vacuum: Vacuum > (H1-h1)

### • Additional Display Functions on the LED Bar Display

The current system vacuum is always displayed in the 8-digit LED bar display.

LED bar display	Meaning
Max. LED lights up briefly	Supply pressure present, otherwise no LED is active
Entire LED bar lights up Max. LED flashes rapidly	Vacuum > permitted range
Max. LED flashes rapidly	Voltage supply > permitted range
10% LED flashes rapidly	Vacuum < permitted range (for example, during

When mounting the M4 fixing screws and washers, apply a tightening torque max. of 2 Nm.

To start up the ejector via the connector, connect the connection cable to the control. The compressed air necessary for generating the vacuum is connected through the appropriate compressed air connection.

The compressed air supply must be supplied through a superordinate machine.

The vacuum connection is connected to the vacuum circuit.

The installation is illustrated in detail below.

Pin			
Display	3	num	7-segment red LED indication
Resolution	±1	mbar	--
Precision	±3	% FS	T <sub>amb</sub> = 25 °C, relative to the final value FS (full-scale)
Linearity error	±1	%	--
Offset error	±2	mbar	After setting the origin without vacuum
Influence temperature	±3	%	0 °C < T <sub>amb</sub> < 50 °C
Display refresh rate	5	1/s	Only affects 7-segment displays
Inactivity interval until exiting the menu	1	min	If no settings have been made in a menu, it automatically switches to display mode.

### • General Parameters

Parameter	Symbol	Limit values			Unit	Comment
		min.	typ.	max.		
Operating temperature	T <sub>amb</sub>	0	---	50	°C	---
Storage temperature	T <sub>sto</sub>	-10	---	60	°C	---
Umidità dell'aria	H <sub>rel</sub>	10	---	90	%rf	Senza condensa
Air humidity	---	---	---	IP65	---	---
Operating pressure (flow pressure)	p	3	4,2	6	bar	---
Vacuum max.	p	---	---	-850	mbar	---
Accuracy of the vacuum sensor	---					± 3% FS (Full Scale)
Means of exercise	Air or neutral gas, filtered 5 µm, with or without oil, compressed air quality class 3-3-3 according to ISO 8573-1					

### • Electrical Parameters

Parameter	Symbol	Limit values			Unit	Comment
		min.	typ.	max.		
Supply voltage	U <sub>sa</sub>	19,2	24	26,4	V <sub>DC</sub>	PELV <sup>1)</sup>
Power consumption from US/A 2) with NO variant	I <sub>sa</sub>	---	---	110	mA	U <sub>sa</sub> = 24,0 V
Power consumption from US/A 2) with NC variant	I <sub>sa</sub>	---	---	70	mA	U <sub>sa</sub> = 24,0 V
Voltage of signal output (PNP)	U <sub>oh</sub>	US <sub>sa</sub> -2	---	V <sub>sa</sub>	V <sub>DC</sub>	I <sub>oh</sub> < 150 mA
Voltage of signal output (NPN)	U <sub>oh</sub>	0	---	2	V <sub>DC</sub>	I <sub>oh</sub> < 150 mA
Power consumption of signal output (PNP)	I <sub>oh</sub>	---	---	150	mA	Short-circuit-pro- of <sup>3)</sup>
Power consumption of signal output (NPN)	I <sub>oh</sub>	---	---	-150	mA	Short-circuit-pro- of <sup>3)</sup>
Voltage of signal input (PNP)	U <sub>ih</sub>	15	---	U <sub>sa</sub>	V <sub>DC</sub>	In reference to
Voltage of signal input (NPN)	U <sub>ih</sub>	0	---	9	V <sub>DC</sub>	In reference to U <sub>sa</sub>
Current of signal input (PNP)	I <sub>ih</sub>	---	5	---	mA	U <sub>sa</sub> = 24,0 V
Current of signal input (NPN)	I <sub>ih</sub>	---	-5	---	mA	U <sub>sa</sub> = 24,0 V
Response time of signal inputs	t <sub>r</sub>	---	3	---	ms	---
Response time of signal outputs	t <sub>r</sub>	---	2	---	ms	Adjustable

<sup>1)</sup> The power supply must correspond to the regulations in accordance with EN60204 (protected extra-low voltage). The signal inputs and outputs are all protected against reverse polarity.

<sup>2)</sup> Plus the output currents

<sup>3)</sup> The signal output is protected against short circuits. However, the signal output is not protected against overloading. Constant load currents > 0.15 A may lead to impermissible heating and therefore the destruction of the ejector.

### • Factory Default Settings

Code	Parameter	Factory setting value
H-1	Vacuum limit value H1	750 mbar
h-1	Hysteresis value h-1	150 mbar
H-2	Vacuum limit value H2	550 mbar
h-2	Hysteresis value h-2	10 mbar
tbl	Blowing time	0,2s
ctr	Adjustment	Activated = on
dc5	Continuous aspiration	Deactivated= OFF
t-1	Evacuation time	2s
-L-	Loss value	250 mbar/s
blo	Blowing function	Blow on command = -E-
un,	Vacuum unit	Vacuum unit in mbar = -bA
tYP	Type of signal	PNP switch = PnP
dLY	Disarming delay	10 ms
dPY	Display rotation	Standard = Std
Eco	ECO mode	Deactivated = OFF
Pin	PIN code	Free entry 0000
o-2	Signal output	Normally open contact "normally open" = no

### • Manual function mode

Through the configuration menu it is possible to prevent access to the menus via a PIN [Pin] code. When the lock is active [Loc] flashes on the display or a PIN code is requested.

The menu is activated as follows:

- Press the **MENU** button  
→ The screen changes to entry
  - Enter the first number of the PIN code with the **UP** or **DOWN** buttons
  - confirm with the **ENTER** button
  - Enter the other two digits as well following the same procedure
  - to activate, press the **MENU** button
- The lock is activated automatically after exiting the selected menu or at the end of the desired function.

For permanent activation it is necessary to set the PIN [000] code again.

Practical tips for setting parameters

- By pressing the **UP** or **DOWN** buttons for about 3 seconds the numerical value to be changed starts to scroll quickly.
- If you exit a changed value after briefly pressing the **MENU** button, the value is not applied.

Code visualization	Parameter	Explanation
H-1	Vacuum limit value H1	Switch-off value of the regulation function (Only with ctr = on and ON5 active)
h-1	Hysteresis value h-1	Hysteresis value of the regulation function
H-2	Limit value of vacuum H2	Switching value for part inspection
h-2	Hysteresis value h-2	Hysteresis value for piece inspection
tbl	Blowing time	Active only with E- or I-t
cAL	Calibration	Vacuum sensor calibration

### • SIO operating mode

In SIO mode all input and output signals are connected to the control directly or via intelligent junction boxes. For this purpose it is necessary to connect, in addition to the supply voltage, two input signals and an output signal through which the ejector communicates with the control. The following functions of the ejector case are used:

- Inputs
  - Suction ON / OFF
  - Blows ON / OFF
  - Exit
  - Feedback H2 (piece control)
- Alternatively, the "Blow" signal can be dispensed with when the ejector is operated in the blowing mode "with internal time control". In this way it is possible to operate on only one port of a configurable junction box (use 1xDO and 1xDI).
- Parameter settings and reading of the internal counters are carried out via the operating and display elements.
- The energy and process control functions are not available in the SIO operating mode.

### • IO-Link operating mode

In the normal state (after activation of the power supply) the ejector always operates in the SIO mode, however it can switch at any time from an IO-Link master to the IO-Link operating mode and vice versa.

When operating the product in IO-Link mode (digital communication), it is necessary to connect the supply voltage, the earth socket and the communication cable to the control either directly or via intelligent junction boxes.

The communication cable for IO-Link (C / Q line) must always be connected to an IO-Link master (point-to-point connection).

The integration of multiple C / Q lines on a single IO-Link masterport port is not possible.

By connecting the Ejector via IO-Link, in addition to the basic functions of the Ejector, such as "Suction", "Blow" and the feedback signals, numerous additional functions are available.

These are among others:

- Current vacuum value
  - Selection of four production profiles (Production-Setup-Profile)
  - Errors and Warnings
  - System status display
  - Access to all parameters
  - Functions for energy and process control (EPC)
- In this way it is possible to read, modify and write back to the Ejector all the modifiable parameters.
- The evaluation of the Condition Monitoring and Energy-Monitoring events makes it possible to draw conclusions on the current handling cycle and carry out trend analyzes.
- The ejector supports IO-Link revision 1.1 with fifteen-byte input data and four-byte output data. It is also compatible with the IO-Link master according to revision 1.0. , one byte of input data and one byte of output data are transmitted here.
- The process data exchange between the IO-Link master and the product is cyclical (maximum data transfer rate with COM2 = 38.4 kBaud).
- The data exchange of the ISDU parameters (acyclic data) takes place via the user program in the control system via communication modules.

## 5 Limitations of use

- Never exceed the technical specifications stated in the paragraph "General characteristics" and the Camozzi general catalogue.
- With the exception of specific intended applications, do not use the product in environments where there is the risk of direct contact with corrosive gas, chemical products, salt water, water or steam.
- If possible, do not install the device:  
 - in closed and small spaces;  
 - exposed to direct sunlight (if necessary, provide a shield);  
 - near heat sources or in areas subject to sudden changes in temperature;  
 - near power on parts with no proper insulation;  
 - near conductors or electrical devices with high alternate or impulsive currents (danger of parasitic currents);  
 - near sources of high intensity electromagnetic waves (antennas) (danger of parasitic currents and / or arcing of electric arcs).

## 6 Maintenance

- Check whether it is possible to have the product serviced at a technical assistance centre.
- Never disassemble units when pressurized
- Shut off all pneumatic, hydraulic and electric supplies before maintenance.

## 7 Environmental notes

- At the end of the product's life cycle, separate the relative materials to enable recycling.
- Observe all current standards in the country of use governing waste disposal.

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