

IST-EJ-XPRO V1



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SAFETY



WARNING! Do not install or use the EJ-XPRO pump if damaged during transportation, handling or use. A damaged pump can burst and cause injury or damage to property.

Warning signs:



Exhaust air



Suction power



The pump exhaust must not be obstructed



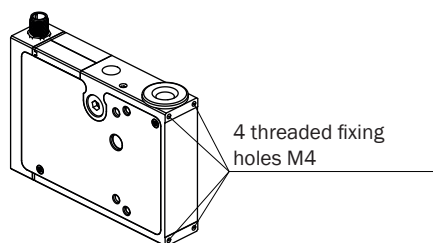
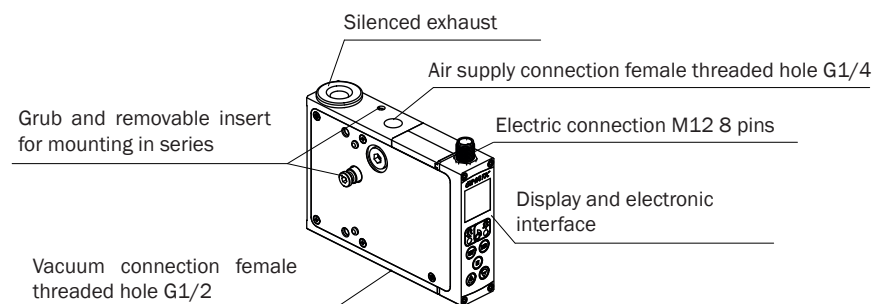
Wear ear protection if working at a distance of less than 2-3 m from the vacuum ejector in operation.

General characteristics

- Vacuum pump based on Gimatic high-efficiency multistage EJ-L (large) cartridges.
- Configurations with solenoid valves for vacuum and blow-off generation.
- Energy saving system, with manual and automatic modes, that saves up to 95% compressed air in sealed applications.
- Large TFT colour display with intuitive and easy-to-read menu and pump status indications.
- Blow-off mechanism electrically controllable by pin or automatic at each cycle.
- Electrical connection via M12 8-pin connector.
- Compressed air connection: G1/4" female.
- Vacuum connection: G1/2" female.
- Integrated silencer.

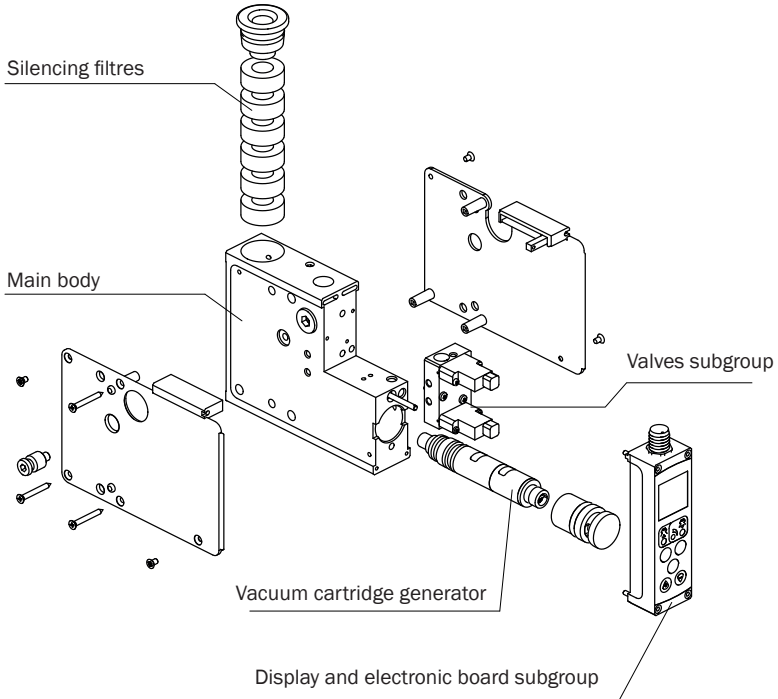
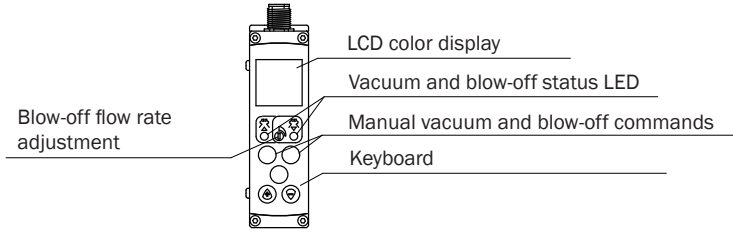
Overview

- Single pump

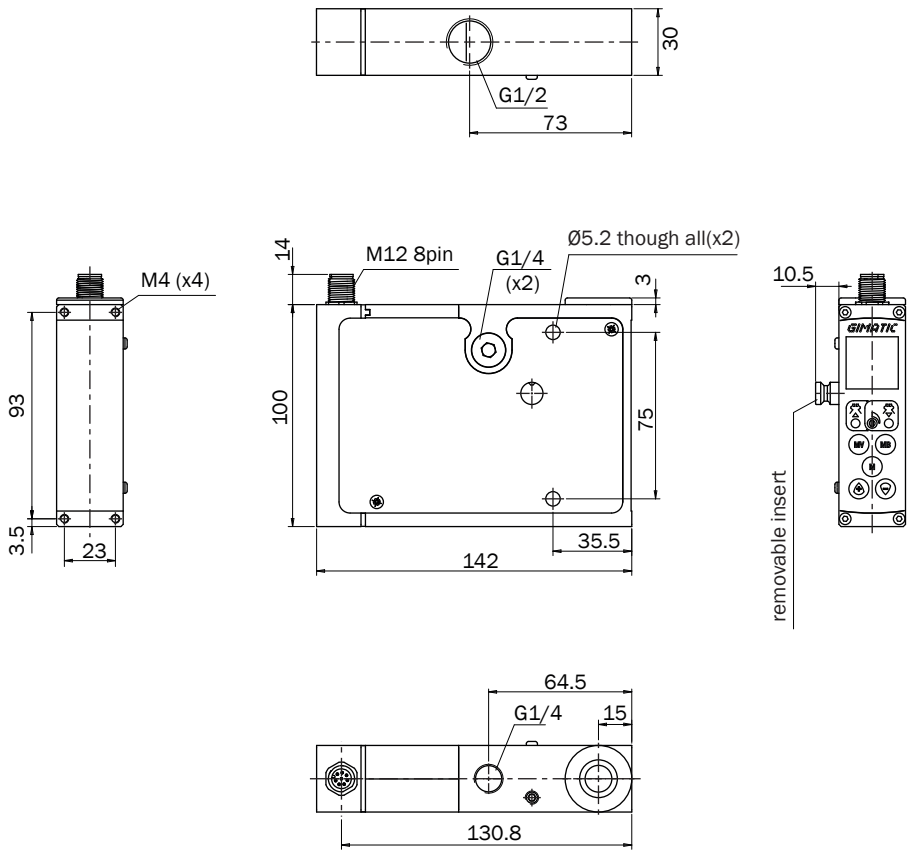


Overview

- Single pump

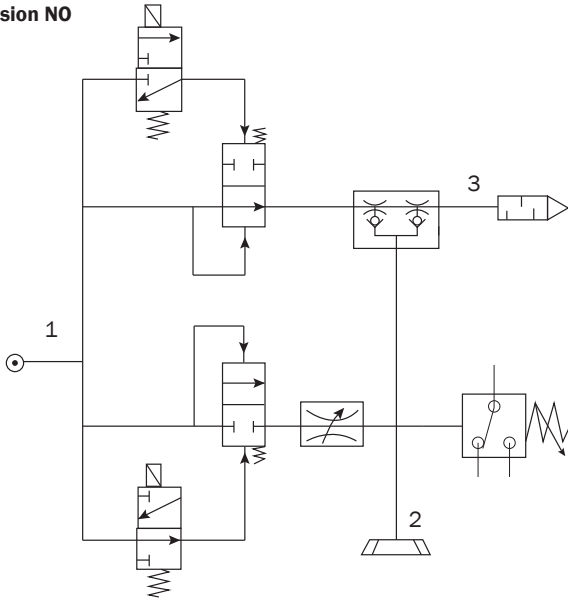


Overall dimensions and indication of mounting holes

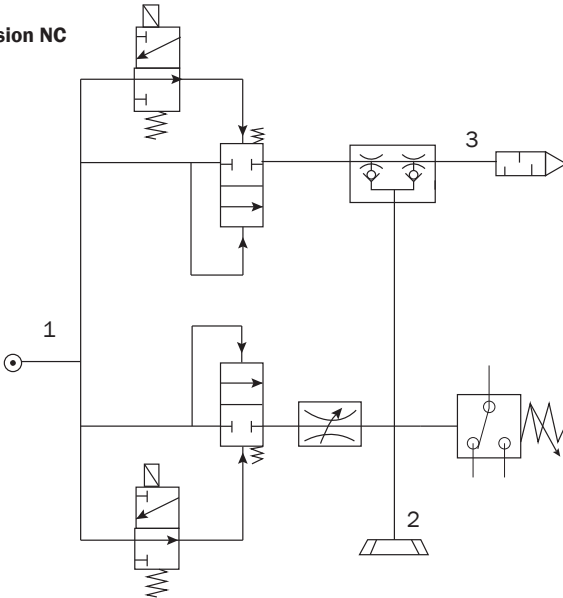


PNEUMATIC CIRCUIT

EJ-XPRO... version N0



EJ-XPRO... version NC



INSTALLATION

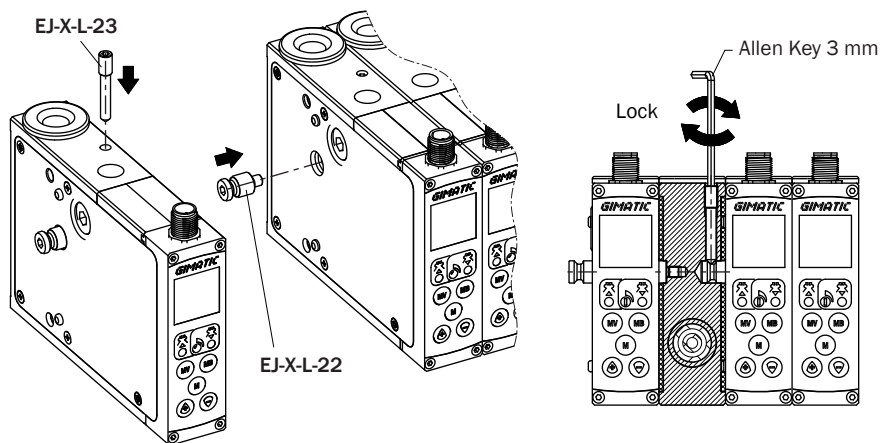
Use the 4 M4 holes provided for the mounting and make sure to leave the pump exhaust unobstructed. Below are the recommended pipe diameters (compressed air and vacuum) to ensure maximum performance. Avoid bottlenecks, excessive lengths and undersized fittings.

| Cartridge | Vacuum connection | Compressed air connection |
|-------------------------------|-------------------|---------------------------|
| 3300051 3300043 3300035 | 12/10 mm* | 8/6 mm* |

*outer diameter/inner diameter

The information applies to pipes with a maximum length of 2 metres.
Compressed air quality must meet the requirements of DIN ISO 8573-1 class 4.

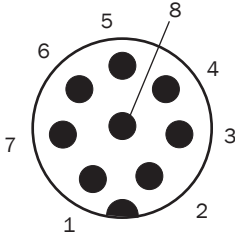
INSTALLATION IN SERIES



ELECTRICAL INSTALLATION

To properly power the pump, use a stabilised 24Vdc power supply (min 1A).

Electrical connection: M12 8-pin male. Digital inputs and outputs: 0-24Vdc, max 200mA

| | No. of pins | Name | Description | Colour |
|---|-------------|---------|--|--------|
|  | 1 | GRIP-ON | Gripped piece digital output | White |
| | 2 | 24V | +24Vdc | Brown |
| | 3 | SENS | Analogue output proportional to vacuum switch signal | Green |
| | 4 | VAC | Vacuum valve control digital input | Yellow |
| | 5 | ES-ON | Energy Saving active status digital output | Grey |
| | 6 | BLW | Blow-off valve control digital input | Pink |
| | 7 | GND | GND | Blue |
| | 8 | ERROR | Pump error digital output | Red |

Pin 1: the GRIP-ON digital output is activated if the vacuum switch signal is greater than or equal to the vacuum threshold set by the user to indicate that the workpiece has been gripped.

Pin 2: device +24Vdc power supply

Pin 3: the SENS analogue output is generated from the output signal from the vacuum switch and is updated regardless of the operating status of the pump. The signal is calibrated to generate a voltage of 0 to 5V.

Pin 4: the VAC digital input accepts a 0-24V voltage.

Pin 5: the ES-ON digital output is activated if the vacuum level reaches the ES high threshold and remains activated for as long as Energy Saving is active.

Pin 6: the BLW digital input accepts a 0-24V input voltage.

Pin 7: GND device power supply

Pin 8: the ERROR digital output indicates any abnormal state of the pump (exceeding of the time limit to generate the vacuum, vacuum switch failure, valve failure and excessive pump temperature).

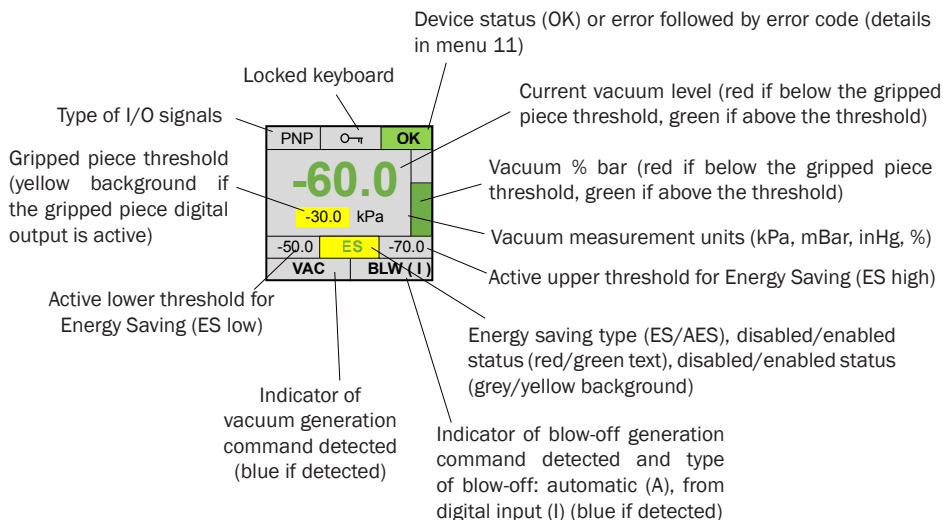
All digital inputs and outputs can be programmed to operate following the PNP or NPN logic, based on the "I/O type" parameter, which can be modified from the menu

MANUAL OVERRIDE

Press and hold the MV (Manual Vacuum) key for at least 3 seconds to activate the vacuum valve or the MB (Manual Blow) key to activate the blow-off valve. This function requires electrical power to the pump and compressed air.

DISPLAY

Normal operation



MENU PARAMETERS

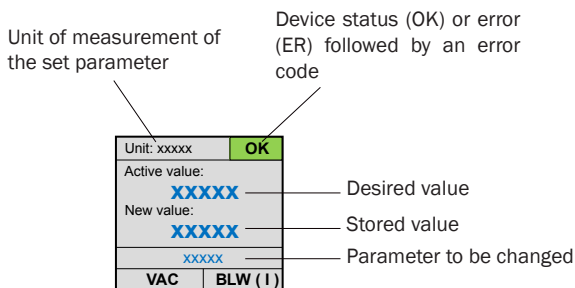
To enter the menu, press and hold the M (Mode) key for 3 seconds. Once the parameters have been changed, press the M key again for 3 seconds to exit the menu and resume normal operation.

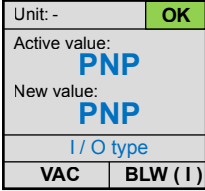
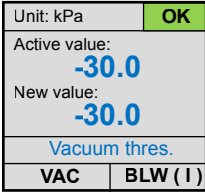
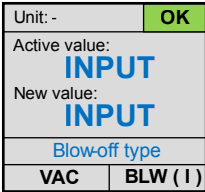
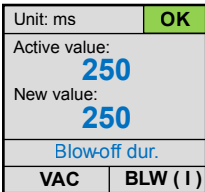
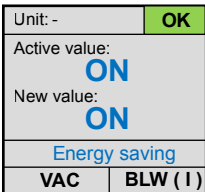
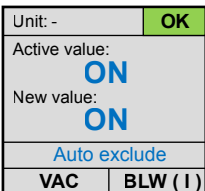
To select the next parameter you wish to change, briefly press the M key. To change the selected parameter, press the + or - key.

To restore the parameter's previously stored value, press the MB key for 3 seconds (this is equivalent to deleting the temporary value).

To confirm the parameter, press the MV key for 3 seconds (NB: if you exit the menu or go to the next screen, the edited parameter will NOT be stored).

To lock/unlock the keypad (and therefore the access to the menu items), hold down the + and - keys simultaneously for 3 seconds.



| n° | Display screen | Parameter explanation |
|----|---|--|
| 1 |  | <p>I / O type [PNP, NPN], default: PNP</p> <p>Type of input and output signals NB: respect the input voltages</p> |
| 2 |  | <p>Vacuum thres [-0.1 – -99.9]kPa, default: -30kPa</p> <p>Piece threshold taken Threshold value that discriminates whether a workpiece has been gripped or not based on the measured vacuum level.</p> |
| 3 |  | <p>Blow-off type [INPUT, AUTO], default: INPUT</p> <p>Type of blow-off The blow-off can be activated by the BLW (INPUT) digital input or automatically at each cycle (AUTO) when the vacuum generation is interrupted</p> |
| 4 |  | <p>Blow-off dur. [10 – 65534]ms, default: 250ms</p> <p>Duration of the blow-off Duration of the blow-off (only used with automatic blow-off)</p> |
| 5 |  | <p>Energy saving [ON, OFF], default: ON</p> <p>Enabling of the energy saving See chapter on Energy Saving</p> |
| 6 |  | <p>Auto exclude [ON, OFF], default: ON</p> <p>Exclusion of energy saving See chapter on Energy Saving</p> |

| | | | | | | | | | | | | | | | | | | |
|-------------------|--|-----------|-------|-----------------|-------|-------------------|-------|---------------|--|-----------------|-----------|---|--|-------------|--|-----|-----------|---|
| 7 | <table border="1"> <tr> <td>Unit: kPa</td> <td>OK</td> </tr> <tr> <td>Active value:</td> <td>-50.0</td> </tr> <tr> <td>New value:</td> <td>-50.0</td> </tr> <tr> <td colspan="2">ES low level</td> </tr> <tr> <td>VAC</td> <td>BLW (I)</td> </tr> </table> | Unit: kPa | OK | Active value: | -50.0 | New value: | -50.0 | ES low level | | VAC | BLW (I) | <p>ES low level [-0.1 – -99.0]kPa, default: -50.0kPa</p> <p>Lower threshold applied for Energy Saving See chapter on Energy Saving</p> | | | | | | |
| Unit: kPa | OK | | | | | | | | | | | | | | | | | |
| Active value: | -50.0 | | | | | | | | | | | | | | | | | |
| New value: | -50.0 | | | | | | | | | | | | | | | | | |
| ES low level | | | | | | | | | | | | | | | | | | |
| VAC | BLW (I) | | | | | | | | | | | | | | | | | |
| 8 | <table border="1"> <tr> <td>Unit: kPa</td> <td>OK</td> </tr> <tr> <td>Active value:</td> <td>-70.0</td> </tr> <tr> <td>New value:</td> <td>-70.0</td> </tr> <tr> <td colspan="2">ES high level</td> </tr> <tr> <td>VAC</td> <td>BLW (I)</td> </tr> </table> | Unit: kPa | OK | Active value: | -70.0 | New value: | -70.0 | ES high level | | VAC | BLW (I) | <p>ES high level [-0.1 – -99.0]kPa, default: -70.0kPa</p> <p>Upper threshold applied for Energy Saving See chapter on Energy Saving</p> | | | | | | |
| Unit: kPa | OK | | | | | | | | | | | | | | | | | |
| Active value: | -70.0 | | | | | | | | | | | | | | | | | |
| New value: | -70.0 | | | | | | | | | | | | | | | | | |
| ES high level | | | | | | | | | | | | | | | | | | |
| VAC | BLW (I) | | | | | | | | | | | | | | | | | |
| 9 | <table border="1"> <tr> <td>Unit: -</td> <td>OK</td> </tr> <tr> <td>Active value:</td> <td>kPa</td> </tr> <tr> <td>New value:</td> <td>kPa</td> </tr> <tr> <td colspan="2">Vacuum units</td> </tr> <tr> <td>VAC</td> <td>BLW (I)</td> </tr> </table> | Unit: - | OK | Active value: | kPa | New value: | kPa | Vacuum units | | VAC | BLW (I) | <p>Vacuum units [kPa, mBar, inHg, %], default: kPa</p> <p>Unit of measurement of the vacuum level detected by the vacuum switch and of all the set thresholds</p> | | | | | | |
| Unit: - | OK | | | | | | | | | | | | | | | | | |
| Active value: | kPa | | | | | | | | | | | | | | | | | |
| New value: | kPa | | | | | | | | | | | | | | | | | |
| Vacuum units | | | | | | | | | | | | | | | | | | |
| VAC | BLW (I) | | | | | | | | | | | | | | | | | |
| 10 | <table border="1"> <tr> <td>Unit: ms</td> <td>OK</td> </tr> <tr> <td>Active value:</td> <td>10000</td> </tr> <tr> <td>New value:</td> <td>10000</td> </tr> <tr> <td colspan="2">Vacuum t-out</td> </tr> <tr> <td>VAC</td> <td>BLW (I)</td> </tr> </table> | Unit: ms | OK | Active value: | 10000 | New value: | 10000 | Vacuum t-out | | VAC | BLW (I) | <p>Vacuum t-out [0 – 65534]ms, default: 10000ms</p> <p>Time limit within which the vacuum level must reach the gripped piece threshold. If it is not reached, error ER101 will be displayed 0 -> time limit deactivated</p> | | | | | | |
| Unit: ms | OK | | | | | | | | | | | | | | | | | |
| Active value: | 10000 | | | | | | | | | | | | | | | | | |
| New value: | 10000 | | | | | | | | | | | | | | | | | |
| Vacuum t-out | | | | | | | | | | | | | | | | | | |
| VAC | BLW (I) | | | | | | | | | | | | | | | | | |
| 11 | <table border="1"> <tr> <td>Unit: -</td> <td>ERxxx</td> </tr> <tr> <td colspan="2">Error code: xxx</td> </tr> <tr> <td colspan="2">Error description</td> </tr> <tr> <td colspan="2">Error info</td> </tr> <tr> <td>VAC</td> <td>BLW (I)</td> </tr> </table> | Unit: - | ERxxx | Error code: xxx | | Error description | | Error info | | VAC | BLW (I) | <p>Error info Numeric code of error ERxxx Detailed error description</p> | | | | | | |
| Unit: - | ERxxx | | | | | | | | | | | | | | | | | |
| Error code: xxx | | | | | | | | | | | | | | | | | | |
| Error description | | | | | | | | | | | | | | | | | | |
| Error info | | | | | | | | | | | | | | | | | | |
| VAC | BLW (I) | | | | | | | | | | | | | | | | | |
| 12 | <table border="1"> <tr> <td>Unit: -</td> <td>OK</td> </tr> <tr> <td colspan="2">EJ-XPRO</td> </tr> <tr> <td colspan="2">Code: xxxxxxxx</td> </tr> <tr> <td colspan="2">FW ver: x.x</td> </tr> <tr> <td colspan="2">Batch: xxxxxxxx</td> </tr> <tr> <td colspan="2">Serial: xxxxxxxx</td> </tr> <tr> <td colspan="2">Device info</td> </tr> <tr> <td>VAC</td> <td>BLW (I)</td> </tr> </table> | Unit: - | OK | EJ-XPRO | | Code: xxxxxxxx | | FW ver: x.x | | Batch: xxxxxxxx | | Serial: xxxxxxxx | | Device info | | VAC | BLW (I) | <p>Device info Product name Order code Firmware version Batch number Serial number</p> |
| Unit: - | OK | | | | | | | | | | | | | | | | | |
| EJ-XPRO | | | | | | | | | | | | | | | | | | |
| Code: xxxxxxxx | | | | | | | | | | | | | | | | | | |
| FW ver: x.x | | | | | | | | | | | | | | | | | | |
| Batch: xxxxxxxx | | | | | | | | | | | | | | | | | | |
| Serial: xxxxxxxx | | | | | | | | | | | | | | | | | | |
| Device info | | | | | | | | | | | | | | | | | | |
| VAC | BLW (I) | | | | | | | | | | | | | | | | | |

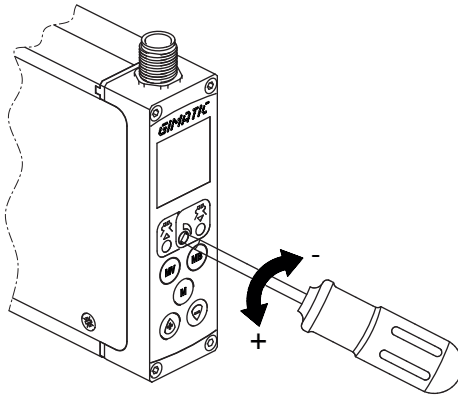
INTEGRATED FUNCTIONS

- BLOW-OFF

The EJ-XPRO pump incorporates two types of blow-off, which can be selected from the menu.

- INPUT: The blow-off is electrically activated by pin no. 6.
- AUTO: At each cycle, a blow-off is automatically performed for the duration set in the menu

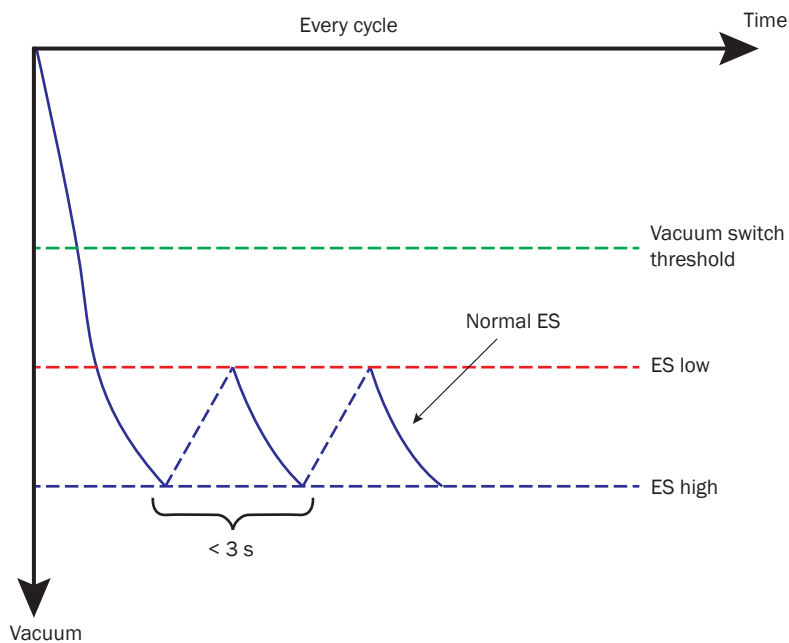
For both modes, the blow-off air flow rate is mechanically adjustable as shown below:



- ENERGY SAVING (ES)

If the function is enabled with the corresponding menu item, and provided there are no leakages, the energy saving feature allows considerable savings of compressed air by switching off vacuum generation and retaining the vacuum in the circuit (this must not be considered as a safety system in the event of compressed air/electricity supply interruption). The vacuum is retained by means of a valve on the cartridge and the blow-off function must therefore be activated in order to release the handled object.

The ES low and ES high thresholds must be set through the menu (see diagram below for operation)



- AUTOMATIC ENERGY SAVING (AES)

If ENERGY SAVING is enabled in the menu, the function AES is activated by setting the ES low and ES high values to -98 kPa and -99 kPa respectively. It allows the automatic setting of energy saving trigger thresholds for each cycle, based on the maximum vacuum level attainable on the material being handled.

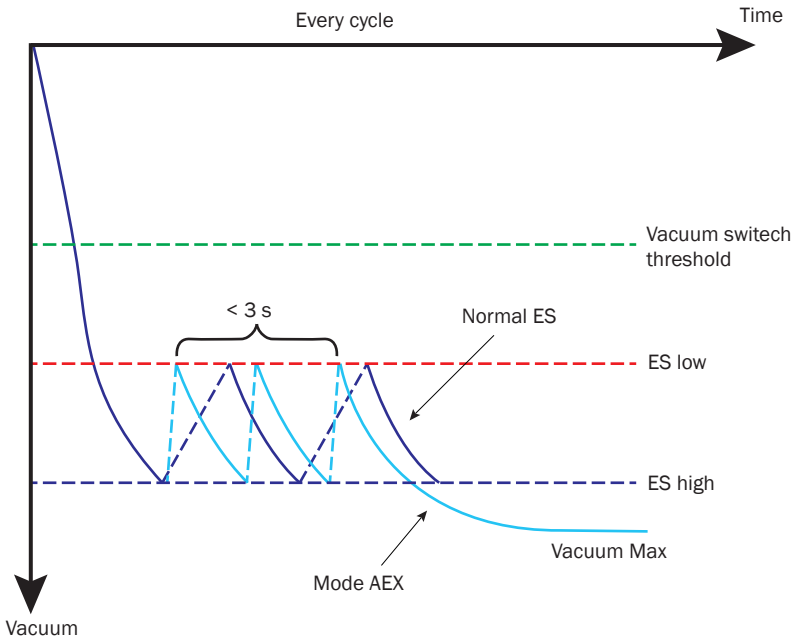
- AUTO EXCLUDE (AEX)

If the object being gripped is too porous, or if there are any leaks in the vacuum circuit to an extent that makes it impossible to use the ENERGY SAVING feature, the AUTO EXCLUDE function will be activated to create maximum vacuum.

In particular, if enabled with the corresponding menu item, the function intervenes by excluding the ES function in all those cases in which there is a high number of reactivations of the vacuum valve in a short time. This function also eliminates frequent activations, extending the life of the vacuum solenoid valve.

≥ 2 reactivations in 3 seconds: the pump is activated to provide continuous vacuum

< 2 reactivations in 3 seconds: pump continues to run with ES



| PNEUMATIC CHARACTERISTICS | |
|---|-------------|
| Maximum supply pressure | 8bar |
| Minimum supply pressure | 4bar |
| Maximum air consumption for vacuum generation | 156NI/min |
| Maximum air consumption for blow-off | 220NI/min |
| Maximum blow-off flow rate | 50NI/min |
| Maximum suction flow rate | 190NI/min |
| Maximum blow-off pressure (zero flow rate) | 0.25bar |
| Valve opening time | ≤ 12ms |
| Valve closing time | ≤ 5ms |
| Supply | Dry air |
| Pneumatic supply connection | G1/4 female |
| Vacuum channel connection | G1/2 female |
| Maximum vacuum level | -95kPa |

| GENERAL CHARACTERISTICS | |
|---------------------------------|--|
| Operating temperature range | 0-60 °C |
| Mass | 800g |
| IP rating | IP54 |
| Materials | Lega 6082-T6, PA66+FG 30%, AISI 303, TPU, PC |
| Operating voltage | 24Vdc (±10%) |
| Electrical connection | M12 8-pin male |
| Manual controls | Yes, monostable buttons |
| Vacuum transducer response time | 1ms |
| Vacuum level analogue output | 0-5Vdc |
| Valve controls | digital PNP/NPN |

FEATURES

- Continuous and manual adjustment of blow-off flow rate
- Integrated silencer
- Status indication via built-in display and integrated LEDs
- Energy saving feature with manual or automatic thresholds
- Automatic energy saving disabling for porous materials
- Automatic gripped piece detection with integrated vacuum switch
- Logical selection of PNP or NPN digital signals from the display
- Manual key lock and unlock function
- 1.3" TFT-LCD RGB display

PUMP ERROR CODES

| ER code | Short description | Extended description |
|---------|----------------------|---|
| ER101 | Vacuum time-out | Gripped piece vacuum level NOT reached within the time limit set by the "Vacuum t-out" parameter * |
| ER110 | Vacuum fault | Vacuum level reading error: transducer faulty or obstructed vacuum channel |
| ER201 | Vacuum valve fault | Abnormal electrical absorption of the vacuum generation valve. Possible electrical failure of the valve or of the control circuit |
| ER202 | Blow-off valve fault | Abnormal electrical absorption of the blow-off generation valve. Possible electrical failure of the valve or of the control circuit |
| ER301 | High temperature | Excessive device temperature detected: some functions may be affected |

When an error occurs, the pump stops its operation, activates the ERROR output, switches to the rest condition and ignores the status of the inputs. To restore normal operation, the user must access the menu, scroll through the screens to "Error info" and hold down the MB key for 3 seconds. If no damage has occurred, the pump will resume normal operation when exiting the menu.

*Only in the case of ER101 error: this error can be removed by simply interrupting vacuum generation, i.e. by deactivating the MV key and VAC input in the model with NO vacuum valve and activating the MV key or the VAC input in the model with NC vacuum valve.

See the vacuum t-out parameter in menu 10 for reference.

ORDERING CODES

| | |
|---------|-------------------|
| 3400100 | EJ-XPRO-L-HF-2-NO |
| 3400101 | EJ-XPRO-L-HV-2-NO |
| 3400102 | EJ-XPRO-L-LP-2-NO |
| 3400103 | EJ-XPRO-L-HF-2-NC |
| 3400104 | EJ-XPRO-L-HV-2-NC |
| 3400105 | EJ-XPRO-L-LP-2-NC |

Example: EJ-XPRO-L-HF-2-NO

EJ-XPRO: Family code

L: Ejector type (caution: use only cartridges with non-return valve)

HF: Ejector class (HF: high flow, HV: high vacuum, LP: low supply pressure)

2: cartridge stages

NO: default condition for vacuum generation (NO: normally open, NC: normally closed)

CARTRIDGE MAINTENANCE AND REPLACEMENT

Access the valve assembly and the vacuum generation cartridge

The pumps of the EJ-XPRO series are designed to make maintenance and replacement of major components quick and easy. The 4 front hex socket head cap screws M2.5x25 can be removed using an Allen key (size 2 mm), to then gently pull the front assembly (consisting of keypad, display, electronic circuit and connector) to separate it from the main body of the pump.

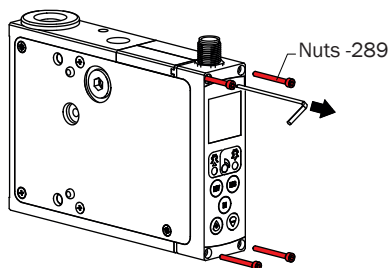


Figure 1

The front assembly is connected to the main body of the pump by just the two red and black two-pin cables that connect to the vacuum and blow-off control solenoid valves. Keeping both cables connected, rotate the front assembly slightly and eventually separate the rear cover of the assembly from the front plastic body by exerting a slight pull.

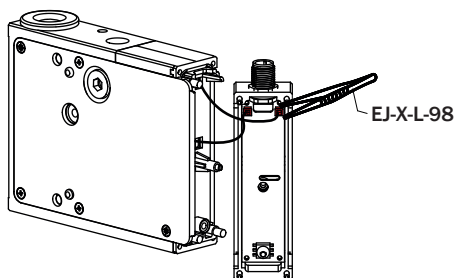


Figure 2

At this point the cables can be disconnected from the PCB connectors by gently pulling on the base of the connectors, thus completely separating the front assembly from the rest of the pump. Take care not to over-tension the conductors in order to prevent them from tearing and/or disconnecting from the respective connector.

Use tweezers to locate and recover the small gasket at the central hole in the circuit. This gasket is only intended to prevent debris from entering the pump under operating conditions, but does not perform pneumatic or vacuum sealing functions.

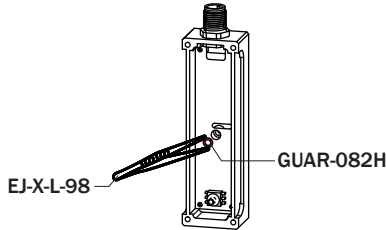


Figure 3

Remove the rear cover, pulling the cables out of their square holes. Locate and recover the gasket on the vacuum measuring channel.

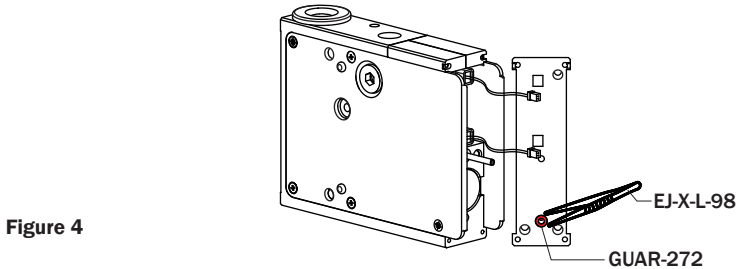


Figure 4

Check that the vacuum seal gasket provided for the vacuum transducer has not been accidentally removed during installation and, if necessary, place it back into place.

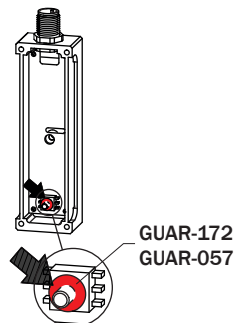


Immagine 5

Replacing the valve unit and/or the vacuum generation cartridge

Position the main body of the pump at the front where it is now possible to access the compartment that houses the solenoid valve assembly and the vacuum generation cartridge.

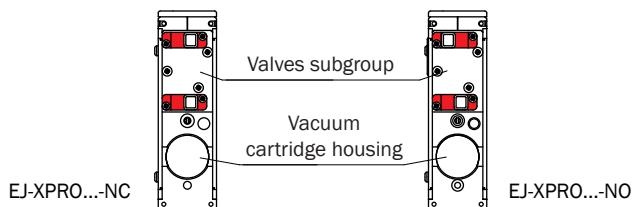


Figure A

The valve assembly can be replaced by removing the three M2.5 x 14 pan head screws using a suitable Phillips screwdriver, taking care not to lose the three gaskets at the rear of the valve assembly.

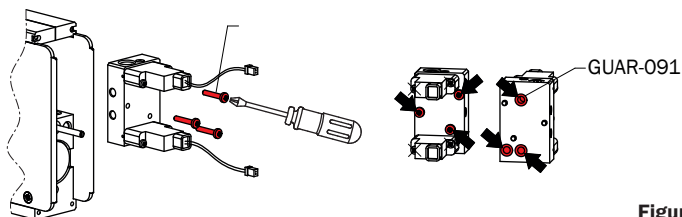


Figure B

Remove the sealing cap to access the vacuum generation cartridge compartment using the EJ-X-L-99 tool, which can also be used to remove and reinsert the cartridge.

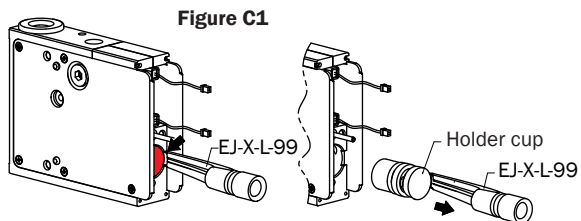


Figure C1

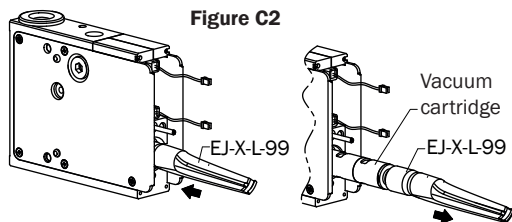


Figure C2

Reassembly

Clean the cartridge seat by removing any foreign matter with tweezers or by simply blowing with pressurised air.

Insert and push the vacuum generation cartridge into its seat until a click is heard due to the mechanical end stop and the correct engagement of the seal into its seat. Position the cap in line with the cartridge and press until it is fully inserted into its seat.

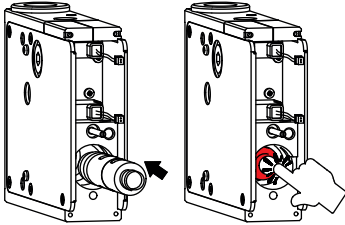


Figure D1

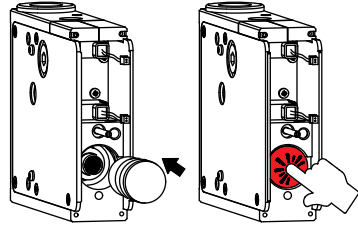


Figure D2

Correctly position the gaskets on the back of the valve unit and secure the unit with the appropriate screws (figure B).

Replace the rear cover of the front assembly, paying attention to the positioning of the gasket (figure 4).

Place the gasket that prevents the entry of foreign bodies at the blow-off intensity adjustment pin.

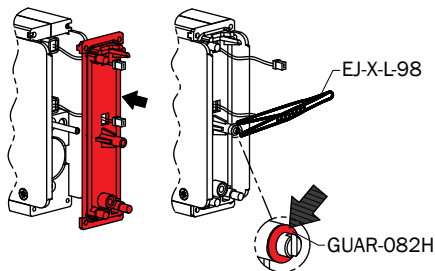
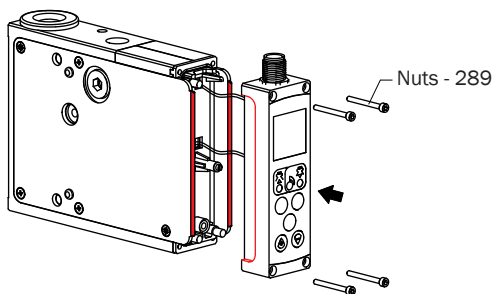


Figure 6

Re-check for the presence of seal gaskets on the vacuum transducer (figure 5) and reconnect the two-pin cables to the respective solenoid valve connectors on the PCB (J2: blow-off valve channel, J3: vacuum valve channel, the connector orientation is not relevant for either of them)(Figure 2). Reposition the front assembly on the main pump body, align the edges on all sides and apply adequate pressure to pre-mount the entire structure.

**Figure E**

Use an Allen key (size 2 mm) to complete the assembly of the entire structure using the 4 front hex socket head cap screws M2.5x25 (images E and 1).

SPARE PARTS AND ACCESSORIES

| Drawing | Ordering code (Alias) | Description |
|---------|------------------------------------|--|
| | <p>3031157 (CFGM1200825P)</p> | <p>M12 female connector with molded PUR cable</p> |
| | <p>3031158 (CFGM1200825SP)</p> | <p>M12 female connector with shielded molded PUR cable</p> |
| | <p>3031159 (CFGM1290825SP)</p> | <p>M12 female connector with shielded molded PUR cable</p> |
| | <p>EJ-X-L-98</p> | <p>3D printed tweezers in PA12 material (gaskets and valves connectors manipulation)</p> |
| | <p>EJ-X-L-99</p> | <p>3D printed tool to extract easily vacuum cartridge</p> |
| | <p>EJ-XPRO-L-KITU</p> | <p>Gaskets spare parts set</p> |
| | <p>3300051 (EJ-L-HV-2-NR)</p> | <p>HV ejector (yellow) with non-return valve</p> |
| | <p>3300043 (EJ-L-HF-2-NR)</p> | <p>HF ejector (green) with non-return valve</p> |
| | <p>3300035 (EJ-L-LP-2-NR)</p> | <p>LP ejector (grey) with non-return valve</p> |