

# Vacuum generators OVEM

**FESTO**



## Vacuum generators OVEM

Key features

### At a glance

Rapid purging of vacuum for safe placement of the workpiece by means of an integrated solenoid valve for controlling the ejector pulse

Central electrical connection via an M12 plug

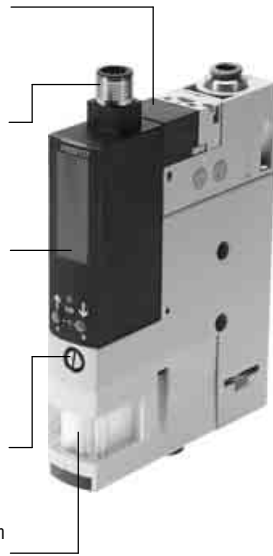
**OVEM-...-1PD/2P/2N/PU/NU/PI/NI/LK**  
Monitoring and visualisation of the vacuum pressure by means of a vacuum sensor with LCD display (bar)

**OVEM-...-LK**

Vacuum sensor with IO-Link

Adjustment of the ejector pulse via a flow control screw

Prevention of contamination of the vacuum generator by means of an integrated filter



Quick and secure installation thanks to QS fitting

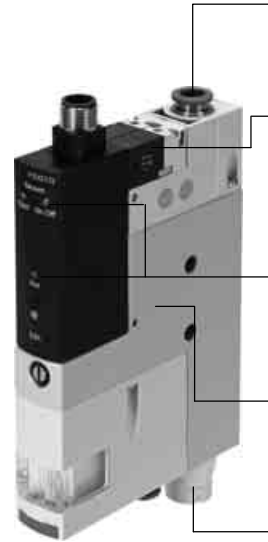
Fast vacuum build-up by means of an integrated solenoid valve for controlling the compressed air supply

**OVEM-...-1P/1N**

Monitoring of the vacuum pressure and status displays for switching output and solenoid valves by means of a vacuum sensor with LED display

Prevention of pressure drops by means of an integrated check valve

Maintenance-free operation and reduced noise level through an integrated, open silencer



### The modular vacuum generator series

The modular vacuum generator series OVEM offers a wide range of individually selectable functions, making it possible to find a solution for the most varied of applications.

| Functions                               | Values   |
|---|--|
| Laval nozzle                            | 0.45 mm  |
|   | 0.7 mm   |
|   | 0.95 mm  |
|   | 1.4 mm   |
|   | 2.0 mm <sup>1)</sup>   |
| Vacuum generator characteristics        | High vacuum  |
|   | High suction rate  |
| Housing size                            | 20 mm, metric version, display in bar                            |
|   | 20 mm, NPT version, display in inchHg <sup>2)</sup>              |
| Pneumatic connections                   | QS fittings, with or without open silencer                       |
|   | QS fittings (inch), with or without open silencer <sup>2)</sup>  |
|   | G female thread, with or without open silencer                   |
|   | NPT female thread, with or without open silencer <sup>2)</sup>   |
|   | Prepared for supply manifold                                     |
| Normal position of the vacuum generator | Normally open, with or without ejector pulse                     |
|   | Normally closed, with or without ejector pulse                   |
| Electrical connection                   | Plug M12 (5-pin)   |
| Vacuum sensor                           | Without vacuum sensor  |
|   | 1 switching output PNP or NPN, LED display                       |
|   | 1 switching output PNP, LCD display                              |
|   | 2 switching outputs PNP or NPN, LCD display                      |
|   | 1 switching output PNP or NPN and 1 analogue output, LCD display |
| IO-Link, LCD display                    |  |
| Alternative vacuum display              | InchHg <sup>3)</sup>   |
|   | InchH2O <sup>2) 3)</sup>   |
|   | Bar <sup>2) 3)</sup>   |

1) Restricted choice of functions

2) Product documentation → Internet: ovem-npt

3) Vacuum sensor with LCD display

## Vacuum generators OVEM

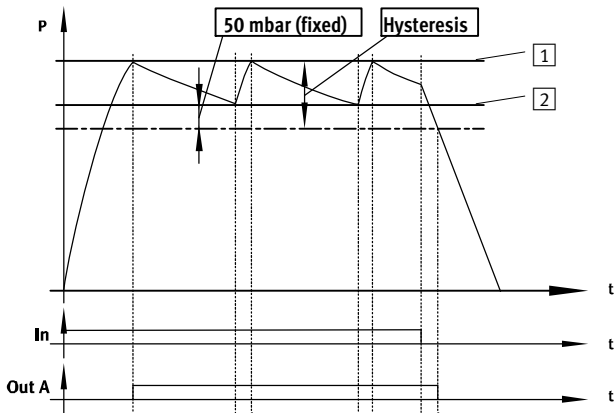
Key features

| The innovative vacuum generator  |   |  |   |
|--|---|--|---|
| Economical   |   | Easy to use  |   |
| <ul style="list-style-type: none"> <li>Short switching times thanks to integrated solenoid valves                             <ul style="list-style-type: none"> <li>Vacuum on/off</li> <li>Ejector pulse</li> </ul> </li> <li>Quick, precise and safe placement of the workpiece by means of the ejector pulse</li> <li>Cost saving through preventive maintenance/service thanks to maintenance indicator</li> </ul>   | <ul style="list-style-type: none"> <li>Cost saving through integrated air-saving function</li> <li>Powerful supply of multiple vacuum generators via a common supply manifold (→ page 19)</li> <li>Low-cost variants with one switching output (OVEM-...-1P/1N)</li> </ul>  | <ul style="list-style-type: none"> <li>Simple installation via M12 plugs and QS fittings</li> <li>Simple mounting via screws</li> <li>All control elements are on one side</li> <li>Quiet operation thanks to integrated silencers</li> </ul>  | <ul style="list-style-type: none"> <li>Vacuum sensor with LCD display (OVEM-...-1PD/2P/2N/PU/NU/PI/NI/LK)                             <ul style="list-style-type: none"> <li>Vacuum is displayed numerically and as a bar chart</li> <li>Important parameters and diagnostic information are displayed</li> </ul> </li> </ul> |
| Reliable   | Space-optimised   | Easy to maintain   | Choice of mounting types  |
| <ul style="list-style-type: none"> <li>Permanent monitoring of the entire vacuum system via a vacuum sensor to reduce downtimes (condition monitoring)</li> <li>Prevention of pressure drop by means of an integrated air-saving function in conjunction with an integrated check valve</li> </ul>   | <p>All functions are compactly integrated in one unit.</p> <ul style="list-style-type: none"> <li>No protruding elements such as valves or vacuum sensor</li> <li>Space-optimised installation is possible as all the control elements can be accessed from one side</li> </ul>   | <ul style="list-style-type: none"> <li>Integrated filter with inspection window for maintenance indication</li> <li>Reduced contamination of the vacuum generator thanks to an open silencer</li> </ul>  | <ul style="list-style-type: none"> <li>Direct mounting or via mounting bracket</li> <li>Straightforward mounting on H-rail via accessories</li> <li>Interlocking of multiple vacuum generators on a common supply manifold (→ page 19)</li> </ul>   |
| Operating principle of OVEM  |   |  |   |
| Vacuum on/off  |   | Vacuum sensor  | Ejector pulse   |
| <p>The compressed air supply is controlled by an integrated solenoid valve. The solenoid valve can be supplied with two different switching functions, NC and NO.</p> <ul style="list-style-type: none"> <li>NC - normally closed:<br/>The vacuum is generated when the vacuum generator is pressurised with compressed air and the solenoid valve has been switched.</li> </ul>   |   | <ul style="list-style-type: none"> <li>NO - normally open:<br/>The vacuum is generated when the vacuum generator is pressurised with compressed air and the solenoid valve is in the normal position.</li> </ul>   | <p>The set or taught-in reference value for the generated vacuum is monitored via an integrated vacuum sensor. If the reference value is reached or if it is not reached due to malfunctions (e.g. leakages, dropped workpiece), the vacuum sensor emits an electrical signal.</p>  |
| After the vacuum is switched off, an ejector pulse is activated and generated by means of a second integrated solenoid valve to release the workpiece safely from the suction cup and to purge the vacuum quickly.   |   |  |   |
| Connection to higher-level systems and configuration of the switching outputs  |   |  |   |
| <b>OVEM-...-1P/1PD/1N</b>  | <b>OVEM-...-2P/2N/PU/NU/PI/NI</b>   | <b>OVEM-...-LK</b>   |   |
| <ul style="list-style-type: none"> <li>Switching inputs for actuating the solenoid valves for vacuum generation and ejector pulse</li> <li>OVEM-...-1P/1N only:<br/>one switching output for supplying a control signal                             <ul style="list-style-type: none"> <li>Configured as an N/O contact</li> <li>Switching function configured as a threshold value comparator</li> </ul> </li> <li>OVEM-...-1PD only:<br/>one digital switching output for supplying a control signal                             <ul style="list-style-type: none"> <li>Switching output can be configured as N/C or N/O contacts</li> <li>Switching function of the output can be configured as a threshold value or window comparator</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>One digital switching input for actuating the solenoid valves</li> <li>Two digital switching outputs or one digital switching output and one analogue output for supplying control signals                             <ul style="list-style-type: none"> <li>Switching outputs can be configured as N/C or N/O contacts</li> <li>Switching function of the outputs can be configured as a threshold value or window comparator</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>If there are two switching outputs, these can be configured independently of each other. This enables tasks to be performed in parallel with one vacuum generator, reducing the time needed for sorting good and reject parts, for example.</li> <li>Digital setpoint and actual value transfer for simple parameterisation and diagnostic feedback. Communication takes place in IO-Link mode with an IO-Link master.</li> <li>SIO mode is supported. In the case of this local configuration using the operating buttons on the vacuum sensor, the OVEM takes on the function of an OVEM-...-2P.</li> </ul> |   |

## Vacuum generators OVEM

Key features

### OVEM-...-1PD/2P/2N/PU/NU/PI/NI/LK – Air-saving function LS (-CE, -OE)

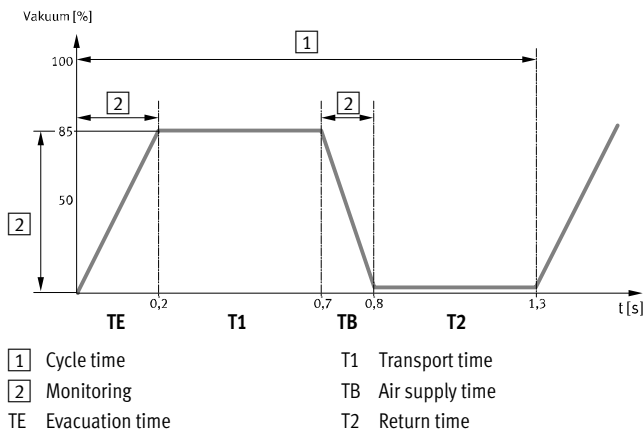


If the desired threshold value **1** for the vacuum is reached, vacuum generation is automatically switched off. A check valve prevents a decrease of the vacuum.

Nonetheless, leakage (e.g. due to rough workpiece surfaces) will slowly

reduce the vacuum. If the vacuum drops below the threshold value **2**, vacuum generation is switched on automatically. Vacuum is generated until the set threshold value **1** is reached again.

### OVEM-...-1PD/2P/2N/PU/NU/PI/NI/LK – Condition monitoring and diagnostics



- 1** Cycle time
- 2** Monitoring
- TE Evacuation time
- T1 Transport time
- TB Air supply time
- T2 Return time

The main operating parameters

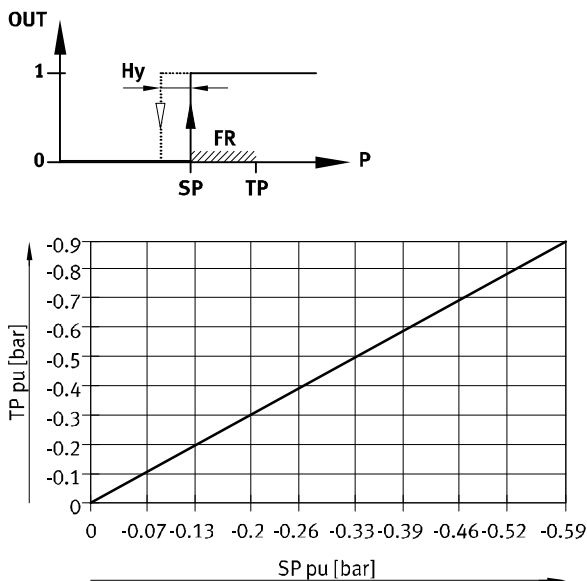
- Vacuum
  - Evacuation time
  - Air supply time
- are continuously measured in the vacuum generator and compared with the individually set reference values (condition monitoring). If deviations in the reference values occur, these will be determined by the vacuum generator and shown on the display (diagnostics).

In addition, in the case of an OVEM with two switching outputs (-2P, -2N, -LK in SIO mode) diagnostic messages can also be transmitted by the switching output Out B.

This permits preventative action

- in order to prevent machine failure or downtime, for example, through timely maintenance
- and to ensure process reliability (adherence to the cycle time).

### OVEM-...-1P/1N – From the teach-in point to the switching point



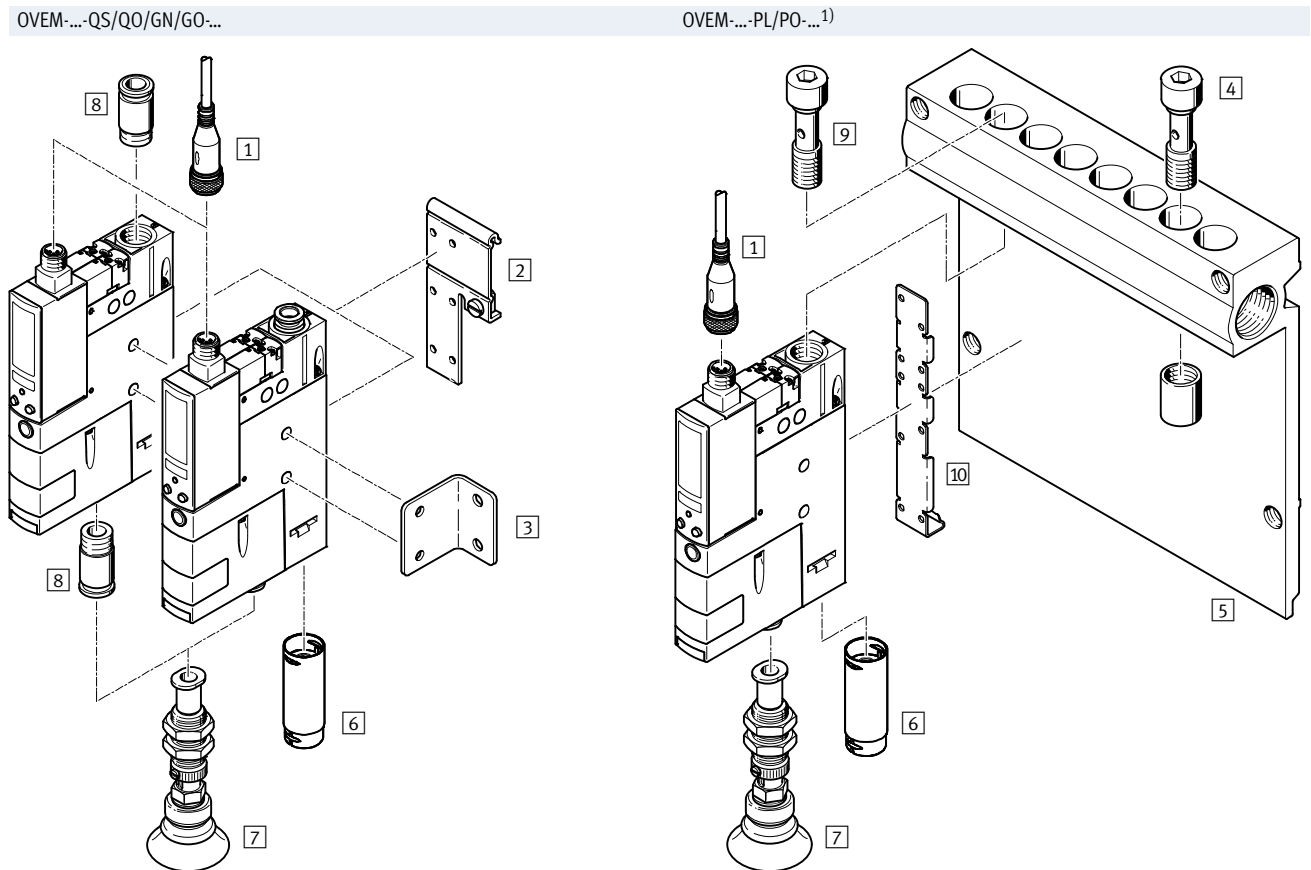
- TP Teach-in point
- SP Switching point
- Hy Hysteresis
- FR Functional reserve

The switching point is determined from the teach pressure and the functional reserve. A function reserve (35% of the teach pressure) is deducted from the teach pressure ( $SP = TP - 0.35 \cdot TP$ ).

For example, with a teach pressure of -0.5 bar, a switching point of -0.33 bar is set. The hysteresis has a fixed value.

# Vacuum generators OVEM

Peripherals overview



1) Hollow bolt [9] and mounting bracket [10] are included in the scope of delivery of the OVEM-...-PL/PO-...

| Mounting components and accessories                  | OVEM-...-QS/QO/GN/GO-... |                 |    |                 | OVEM-...-PL/PO-... |                 | → Page/Internet |
|--|--------------------------|-----------------|----|-----------------|--------------------|-----------------|-----------------|
|  | QS                       | QO              | GN | GO              | PL                 | PO              |                 |
| [1] Connecting cable<br>NEBU-M12                     |                          | ■               |    |                 |                    | ■               | 21              |
| [2] H-rail mounting<br>OABM-H                        |                          | ■               |    |                 |                    | -               | 20              |
| [3] Mounting bracket<br>HRM-1                        |                          | ■               |    |                 |                    | -               | 21              |
| [4] Blanking plug<br>OASC-G1-P                       |                          |                 | -  |                 |                    | ■               | 20              |
| [5] Common supply<br>OABM-P...                       |                          |                 | -  |                 |                    | ■               | 19              |
| [6] Silencer extension<br>UOMS-1/4                   | -                        | ■ <sup>2)</sup> | -  | ■ <sup>2)</sup> | -                  | ■ <sup>2)</sup> | 21              |
| [7] Suction grippers<br>ESG                          |                          |                 | ■  |                 |                    | ■               | esg             |
| [8] Push-in fitting<br>QS                            |                          | -               |    | ■               |                    | -               | quick star      |
| - Suction cup holder<br>ESH                          |                          |                 | ■  |                 |                    | ■               | esh             |
| - Suction cups with connection<br>attachments<br>ESS |                          |                 | ■  |                 |                    | ■               | ess             |

2) Silencer extension UOMN-1/4 [6] is included in the scope of delivery of the OVEM-20.

## Vacuum generators OVEM

Type codes

OVEM – 10 – H – B – QO – CE – N – 2P –

### Type

|      |                  |
|------|------------------|
| OVEM | Vacuum generator |
|------|------------------|

### Nominal size of laval nozzle [mm]

|    |      |
|----|------|
| 05 | 0.45 |
| 07 | 0.7  |
| 10 | 0.95 |
| 14 | 1.4  |
| 20 | 2.0  |

### Ejector characteristic

|   |                   |
|---|-------------------|
| H | High vacuum       |
| L | High suction rate |

### Housing width

|   |                      |
|---|----------------------|
| B | Grid dimension 20 mm |
|---|----------------------|

### Pneumatic connections

|    |  |
|----|--|
| QS | P-V-R with QS fitting  |
| QO | P-V with QS fitting, R with open silencer                                    |
| GN | P-V-R with female thread   |
| GO | P-V with female thread, R with open silencer                                 |
| PL | Common supply manifold prepared, V-R with QS fitting                         |
| PO | Prepared for common supply manifold, V with QS fitting, R with open silencer |

### Normal position of the vacuum generator

|    |   |
|----|---|
| ON | NO, normally open (vacuum generation)                         |
| OE | NO, normally open (vacuum generation) with ejector pulse      |
| CN | NC, normally closed (no vacuum generation)                    |
| CE | NC, normally closed (no vacuum generation) with ejector pulse |

### Electrical connection

|   |                  |
|---|------------------|
| N | Plug M12 (5-pin) |
|---|------------------|

### Vacuum sensor

|     |   |
|-----|---|
| –   | Without vacuum sensor                                 |
| 1P  | 1 switching output PNP                                |
| 1PD | 1 switching output PNP and LCD display                |
| 1N  | 1 switching output NPN                                |
| 2P  | 2 switching outputs PNP                               |
| 2N  | 2 switching outputs NPN                               |
| PU  | 1 switching output PNP, 1 analogue output 0 ... 10 V  |
| PI  | 1 switching output PNP, 1 analogue output 4 ... 20 mA |
| NU  | 1 switching output NPN, 1 analogue output 0 ... 10 V  |
| NI  | 1 switching output NPN, 1 analogue output 4 ... 20 mA |
| LK  | IO-Link   |

### Vacuum display

|   |        |
|---|--------|
| – | Bar    |
| H | InchHg |

## Vacuum generators OVEM

### Technical data


#### Function


NC, normally closed:

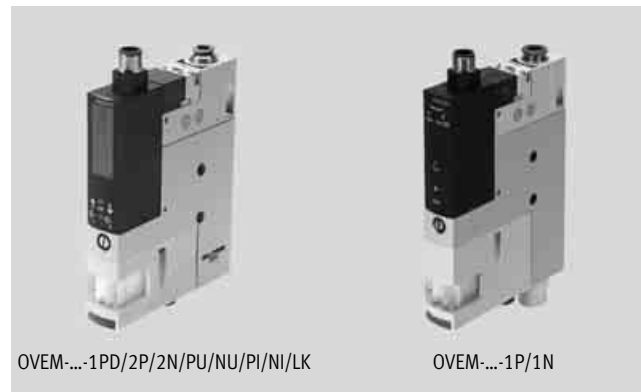
- Ejector pulse
- QS fitting or G female thread
- With open silencer
- Prepared for common supply manifold

NO, normally open:

- Ejector pulse
- QS fitting or G female thread
- With open silencer
- Prepared for common supply manifold

 Temperature range  
0 ... +50 °C

 Operating pressure  
2 ... 8 bar



| General technical data        |      |                         |         |         |         |         |
|-------------------------------|------|-------------------------|---------|---------|---------|---------|
| Type                          |      | OVEM-05                 | OVEM-07 | OVEM-10 | OVEM-14 | OVEM-20 |
| Nominal width of laval nozzle | [mm] | 0.45                    | 0.7     | 0.95    | 1.4     | 2.0     |
| Grid dimension                | [mm] | 20                      |         |         |         |         |
| Grade of filtration           | [µm] | 40                      |         |         |         |         |
| Mounting position             |      | Any                     |         |         |         |         |
| Type of mounting              |      | With through-hole       |         |         |         |         |
|                               |      | With female thread      |         |         |         |         |
|                               |      | Via accessories         |         |         |         |         |
| Pneumatic connection 1 (P)    |      | ➔ Dimensions on page 13 |         |         |         |         |
| Vacuum port (V)               |      | ➔ Dimensions on page 13 |         |         |         |         |
| Pneumatic connection 3 (R)    |      | ➔ Dimensions on page 13 |         |         |         |         |

| Technical data – Design |       |  |   |
|-------------------------|-------|--|---|
| Type                    |       | OVEM-05/07/10/14/20-...-QO/GO/PO               | OVEM-05/07/10/14/20-...-QS/GN/PL              |
| Design                  |       | Modular  |   |
| Ejector characteristic  |       | High vacuum/standard H                         |   |
|                         |       | High suction rate/standard L                   |   |
| Silencer design         |       | Open   | –   |
| Integrated function     | ON/CN | Electric on-off valve                          | Electric on-off valve                         |
|                         |       | Vacuum sensor <sup>1)</sup>                    | Vacuum sensor <sup>1)</sup>                   |
|                         |       | Filter   | Filter  |
|                         |       | Open silencer                                  | –   |
|                         | OE/CE | Electric on-off valve                          | Electric on-off valve                         |
|                         |       | Ejector pulse, electrical                      | Ejector pulse, electrical                     |
|                         |       | Flow control                                   | Flow control                                  |
|                         |       | Vacuum sensor <sup>1)</sup>                    | Vacuum sensor <sup>1)</sup>                   |
|                         |       | Air saving function, electrical <sup>2)</sup>  | Air saving function, electrical <sup>2)</sup> |
|                         |       | Check valve                                    | Check valve                                   |
| Valve function          | ON/OE | Open   |   |
|                         | CN/CE | Closed   |   |
| Manual override         |       | Non-detenting                                  |   |
|                         |       | Additionally via control buttons <sup>2)</sup> |   |

1) Only for OVEM-...-1P/1PD/1N/2P/2N/PU/NU/PI/NI/LK

2) Only possible for OVEM-...-1PD/2P/2N/PU/NU/PI/NI/LK

## Vacuum generators OVEM

Technical data

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| Operating and environmental conditions       |       |   |                                  |
|--|-------|---|----------------------------------|
| Type   |       | OVEM-05/07/10/14/20-...-QO/GO/PO          | OVEM-05/07/10/14/20-...-QS/GN/PL |
| Operating pressure                           | [bar] | 2 ... 8                                   | 2 ... 6                          |
| Nominal operating pressure                   | [bar] | 6   |                                  |
| Operating medium                             |       | Compressed air to ISO 8573-1:2010 [7:4:4] |                                  |
| Note on operating/pilot medium               |       | Lubricated operation not possible         |                                  |
| Ambient temperature                          | [°C]  | 0 ... +50                                 |                                  |
| Temperature of medium                        | [°C]  | 0 ... +50                                 |                                  |
| Relative humidity                            | [%]   | 5 ... 85                                  |                                  |
| Protection class                             |       | III                                       |                                  |
| Degree of protection                         |       | IP65                                      |                                  |
| Corrosion resistance class CRC <sup>1)</sup> |       | 2   |                                  |
| CE marking (see declaration of atmosphere)   |       | To EU EMC Directive <sup>2)</sup>         |                                  |
| Approval certificate                         |       | c UL us listed (OL)                       |                                  |
|  |       | RCM Mark                                  |                                  |

- 1) Corrosion resistance class CRC 2 to Festo standard FN 940070  
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
- 2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: [www.festo.com/sp](http://www.festo.com/sp) → User documentation.  
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

| Performance data – High vacuum  |             |    |     |    |         |     |     |     |         |     |     |     |         |     |     |     |         |     |     |     |
|---|-------------|----|-----|----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|---------|-----|-----|-----|
| Type  | OVEM-05     |    |     |    | OVEM-07 |     |     |     | OVEM-10 |     |     |     | OVEM-14 |     |     |     | OVEM-20 |     |     |     |
| Normal position of the vacuum generator                                 | ON          | OE | CN  | CE | ON      | OE  | CN  | CE  | ON      | OE  | CN  | CE  | ON      | OE  | CN  | CE  | ON      | OE  | CN  | CE  |
| Max. vacuum   | [%] 93      |    |     |    |         |     |     |     |         |     |     |     |         |     |     |     |         |     |     |     |
| Operating pressure for max. vacuum                                      | [bar] 5.1   |    |     |    | 4.1     |     |     |     | 3.5     |     |     |     | 3.6     |     |     |     | 5.3     |     |     |     |
| Max. suction rate with respect to atmosphere                            | [l/min] 6   |    |     |    | 16      |     |     |     | 19.5    |     |     |     | 50.5    |     |     |     | 86.5    |     |     |     |
| Suction rate at p <sub>1</sub> = 6 bar                                  | [l/min] 5.9 |    |     |    | 15.1    |     |     |     | 18.6    |     |     |     | 46      |     |     |     | 80.5    |     |     |     |
| Air supply time <sup>1)</sup> for 1 l volume, at p <sub>1</sub> = 6 bar | 4.8         | 2  | 4.8 | 2  | 1.9     | 0.4 | 1.9 | 0.4 | 1.2     | 0.2 | 1.2 | 0.2 | 0.6     | 0.2 | 0.6 | 0.2 | 0.4     | 0.2 | 0.4 | 0.2 |
| Noise level at p <sub>1</sub> = 6 bar                                   | [db(A)] 51  |    |     |    | 58      |     |     |     | 73      |     |     |     | 77      |     |     |     | 74      |     |     |     |

- 1) Time required to reduce vacuum to -0.05 bar.

| Performance data – High suction rate                                    |              |     |    |     |         |     |    |     |         |     |     |     |         |     |     |     |
|---|--------------|-----|----|-----|---------|-----|----|-----|---------|-----|-----|-----|---------|-----|-----|-----|
| Type  | OVEM-05      |     |    |     | OVEM-07 |     |    |     | OVEM-10 |     |     |     | OVEM-14 |     |     |     |
| Normal position of the vacuum generator                                 | ON           | OE  | CN | CE  | ON      | OE  | CN | CE  | ON      | OE  | CN  | CE  | ON      | OE  | CN  | CE  |
| Max. suction rate with respect to atmosphere                            | [l/min] 13   |     |    |     | 31.5    |     |    |     | 45      |     |     |     | 92      |     |     |     |
| Suction rate at p <sub>1</sub> = 6 bar                                  | [l/min] 12.8 |     |    |     | 31.5    |     |    |     | 45.1    |     |     |     | 88.7    |     |     |     |
| Air supply time <sup>1)</sup> for 1 l volume, at p <sub>1</sub> = 6 bar | 2            | 1.3 | 2  | 1.3 | 1       | 0.2 | 1  | 0.2 | 0.8     | 0.2 | 0.8 | 0.2 | 0.4     | 0.2 | 0.4 | 0.2 |
| Noise level at p <sub>1</sub> = 6 bar                                   | [db(A)] 45   |     |    |     | 53      |     |    |     | 64      |     |     |     | 70      |     |     |     |

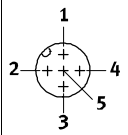
- 1) Time required to reduce vacuum to -0.05 bar.



## Vacuum generators OVEM

Technical data

| Technical data – Electrical data, general |        |                                |                    |              |                |                      |                       |
|---|--------|--------------------------------|--------------------|--------------|----------------|----------------------|-----------------------|
| Type                                      |        | Without vacuum sensor          | With vacuum sensor |              |                |                      |                       |
|   |        |                                | OVEM-...-1P/1N     | OVEM-...-1PD | OVEM-...-2P/2N | OVEM-...-PU/NU/PI/NI | OVEM-...-LK           |
| Electrical connection                     |        | Plug connector M12x1, 5-pin    |                    |              |                |                      |                       |
| Standard switching input                  |        | IEC 61131-2                    |                    |              |                |                      |                       |
| Operating voltage range                   | [V DC] | 20.4 ... 27.6                  |                    |              |                |                      |                       |
| Duty cycle                                | [%]    | 100                            |                    |              |                |                      |                       |
| Coil characteristics 24 V DC              | [W]    | Low-current phase: 0.3         |                    |              |                |                      |                       |
|   |        | High-current phase: 2.55       |                    |              |                |                      |                       |
| Max. current consumption                  | [mA]   | 30                             | 180                | 170          | 270            | 180                  | 150 (270 in SIO mode) |
| Insulation voltage                        | [V]    | 50                             |                    |              |                |                      |                       |
| Surge resistance                          | [kV]   | 0.8                            |                    |              |                |                      |                       |
| Degree of contamination                   |        | 3                              |                    |              |                |                      |                       |
| Protection against incorrect polarity     |        | For all electrical connections |                    |              |                |                      |                       |
| Switching position indication             |        | LED                            |                    | LCD          |                |                      |                       |

| Pin allocation   |  |   |                            |
|--|--|---|----------------------------|
| Plug connector M12x1, 5-pin  | Pin  | Meaning   |                            |
|  |  | OVEM without vacuum sensor  |                            |
|  | 1  | Supply voltage +24 V DC   |                            |
|  | 2  | Switching input for vacuum ON/OFF   |                            |
|  | 3  | 0 V   |                            |
|  | 4  | No function   |                            |
|  | 5  | Switching input for ejector pulse ON/OFF  |                            |
|  |  |   | OVEM-...-1P/1N             |
|  | 1  | Supply voltage +24 V DC   |                            |
|  | 2  | Switching input for vacuum ON/OFF   |                            |
|  | 3  | 0 V   |                            |
|  | 4  | Switching output (switching output for vacuum sensor)                                 |                            |
|  | 5  | Switching input for ejector pulse ON/OFF  |                            |
|  |  |   | OVEM-...-1PD               |
|  | 1  | Supply voltage +24 V DC   |                            |
|  | 2  | Digital output Out A (switching output for vacuum sensor)                             |                            |
|  | 3  | 0 V   |                            |
|  | 4  | Digital switching input (ejector pulse)   |                            |
|  | 5  | Digital switching input (vacuum ON/OFF)   |                            |
|  |  |   | OVEM-...-2P/2N/PU/NU/PI/NI |
|  | 1  | Supply voltage +24 V DC   |                            |
|  | 2  | Digital output Out B (OVEM-...-2P/2N)<br>Analogue output Out B (OVEM-...-PU/NU/PI/NI) |                            |
|  | 3  | 0 V   |                            |
|  | 4  | Digital output Out A (switching output for vacuum sensor)                             |                            |
|  | 5  | Digital switching input (vacuum ON/OFF and ejector pulse)                             |                            |
|  |  |   | OVEM-...-LK                |
| 1  | Supply voltage +24 V DC  |   |                            |
| 2  | Digital output Out B   |   |                            |
| 3  | 0 V  |   |                            |
| 4  | IO-Link communication or digital output Out A (switching output for vacuum sensor) <sup>1)</sup> |   |                            |
| 5  | Not assigned, or digital switching input (vacuum ON/OFF and ejector pulse) <sup>2)</sup>         |   |                            |

1) After a fallback or in SIO mode, this pin has the configuration of a digital switching output.

2) This pin is not assigned in IO-Link mode. After a fallback or in SIO mode, this pin has the configuration of a digital input.

## Vacuum generators OVEM

Technical data

**FESTO**

| Technical data – Vacuum sensor                   |  |                 |                                |        |           |        |          |                    |          |                             |     |  |
|--|--|-----------------|--------------------------------|--------|-----------|--------|----------|--------------------|----------|-----------------------------|-----|--|
| Vacuum sensor                                    | 1PD                                      | 2P              | 2N                             | PU     | NU        | PI     | NI       | LK                 | 1P       | 1N                          |     |  |
| Input signal/measuring element                   |  |                 |                                |        |           |        |          |                    |          |                             |     |  |
| Measured variable                                | Relative pressure                        |                 |                                |        |           |        |          |                    |          |                             |     |  |
| Measuring principle                              | Piezoresistive                           |                 |                                |        |           |        |          |                    |          |                             |     |  |
| Pressure measuring range                         | [bar]                                    | –1 ... 0        |                                |        |           |        |          |                    |          |                             |     |  |
| Display/operation                                |  |                 |                                |        |           |        |          |                    |          |                             |     |  |
| Setting options                                  | Via display and keys                     |                 |                                |        |           |        |          | IO-Link            | Teach-in |                             |     |  |
| Threshold value setting range                    | [bar]                                    | –0.999 ... 0    |                                |        |           |        |          |                    | –1 ... 0 |                             |     |  |
| Hysteresis setting range                         | [bar]                                    | –0.9 ... 0      |                                |        |           |        |          |                    |          |                             |     |  |
| Setting range duration, ejector pulse            | [ms]                                     | – <sup>1)</sup> | 20 ... 9999 (OVEM-05)          |        |           |        |          | 40 ... 9999        |          | –                           |     |  |
|  |  |                 | 40 ... 9999 (OVEM-07/10/14/20) |        |           |        |          |                    |          |                             |     |  |
| Display type                                     | 4-character alphanumeric, backlit LCD    |                 |                                |        |           |        |          |                    |          | LED                         |     |  |
| Displayable units                                | –  | bar             |                                |        |           |        |          |                    | –        |                             |     |  |
|  | H  | inchHg          |                                |        |           |        |          |                    | –        |                             |     |  |
| Indicating range                                 | [bar]                                    | –0.999 ... 0    |                                |        |           |        |          |                    | –        |                             |     |  |
|  | [inchHg]                                 | –29.5 ... 0     |                                |        |           |        |          |                    | –        |                             |     |  |
| Protection against tampering                     | PIN code                                 | –               |                                |        |           |        |          | Electronic locking |          | –                           |     |  |
| Accuracy   |  |                 |                                |        |           |        |          |                    |          |                             |     |  |
| Accuracy FS <sup>2)</sup>                        | [%]                                      | ±3              |                                |        |           |        |          |                    | ±0.5     |                             |     |  |
| Reproducibility switching value FS <sup>2)</sup> | [%]                                      | 0.6             |                                |        |           |        |          |                    | 0.6      |                             |     |  |
| Inputs/outputs                                   |  |                 |                                |        |           |        |          |                    |          |                             |     |  |
| Switching logic at inputs                        | PNP                                      | PNP             | NPN                            | PNP    | NPN       | PNP    | NPN      | PNP                | NPN      | PNP                         | NPN |  |
| Switching output                                 | 1x PNP                                   | 2x PNP          | 2x NPN                         | 1x PNP | 1x NPN    | 1x PNP | 1x NPN   | 2x PNP             | 1x PNP   | 1x NPN                      |     |  |
| Switching function                               | Window comparator                        |                 |                                |        |           |        |          |                    |          | –                           |     |  |
|  | Threshold value comparator <sup>3)</sup> |                 |                                |        |           |        |          |                    |          |                             |     |  |
| Switching status indication                      | Opto-electrical                          |                 |                                |        |           |        |          |                    |          |                             |     |  |
| Switching element function                       | N/O contact                              |                 |                                |        |           |        |          |                    |          |                             |     |  |
|  | N/C contact                              |                 |                                |        |           |        |          |                    |          |                             |     |  |
| Fixed hysteresis                                 | [mbar]                                   | –               |                                |        |           |        |          |                    |          |                             | 20  |  |
| Max. output current                              | [mA]                                     | 100             |                                |        |           |        |          |                    |          |                             |     |  |
| Idle current                                     | [mA]                                     | < 70            |                                |        |           |        |          |                    | < 80     |                             |     |  |
| Residual current                                 | [mA]                                     | 0.1             |                                |        |           |        |          |                    |          |                             |     |  |
| Voltage drop                                     | [V]                                      | ≤ 2             | ≤ 1.5                          |        |           |        |          | ≤ 1.8              |          | ≤ 1.5                       |     |  |
| Analogue output                                  | [V]                                      | –               |                                |        | 0 ... 10  |        | –        |                    | –        |                             |     |  |
|  | [mA]                                     | –               |                                |        | –         |        | 4 ... 20 |                    | –        |                             |     |  |
| Permitted load resistance analogue output        | [ohms]                                   | –               |                                |        | Min. 2000 |        | Max. 500 |                    | –        |                             |     |  |
| Accuracy of analogue output FS <sup>2)</sup>     | [%]                                      | –               |                                |        | 4         |        | –        |                    | –        |                             |     |  |
| Short circuit protection                         | Yes                                      |                 |                                |        |           |        |          |                    |          |                             |     |  |
| Inductive protective circuit                     | Adapted to MZ, MY, ME coils              |                 |                                |        |           |        |          | –                  |          | Adapted to MZ, MY, ME coils |     |  |
| Overload protection                              | Yes                                      |                 |                                |        |           |        |          |                    |          |                             |     |  |

1) Generation of an ejector pulse via a control signal at the digital switching input

2) % FS = % of measuring range final value (full scale)

3) OVEM-...-1P/1N threshold value with fixed hysteresis

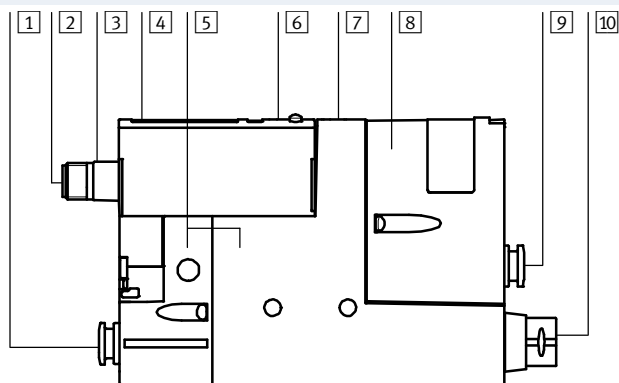
## Vacuum generators OVEM

Technical data

| Technical data – IO-Link |                                 |                        |                        |                        |
|--------------------------|---------------------------------|------------------------|------------------------|------------------------|
| Type                     | OVEM-...-H-...-OE-N-LK          | OVEM-...-L-...-OE-N-LK | OVEM-...-H-...-CE-N-LK | OVEM-...-L-...-CE-N-LK |
| Protocol version         | Device V 1.1                    |                        |                        |                        |
| Profile                  | Smart sensor profile            |                        |                        |                        |
| Function classes         | Binary data channel (BDC)       |                        |                        |                        |
|                          | Diagnostics                     |                        |                        |                        |
|                          | Identification                  |                        |                        |                        |
|                          | Process data variable (PDV)     |                        |                        |                        |
|                          | Teach channel                   |                        |                        |                        |
| Communication mode       | COM2 (38.4 kBaud)               |                        |                        |                        |
| Port class               | A                               |                        |                        |                        |
| Process data width OUT   | 1 bytes                         |                        |                        |                        |
| Process data content OUT | 1 bit (ejector pulse ON/OFF)    |                        |                        |                        |
|                          | 1 bit (vacuum ON/OFF)           |                        |                        |                        |
| Process data width IN    | Parameterisable 8 or 16 bytes   |                        |                        |                        |
| Process data content IN  | 14 bit PDV (pressure reading)   |                        |                        |                        |
|                          | 2 bit BDC (pressure monitoring) |                        |                        |                        |
| Minimum cycle time [ms]  | 3.5                             |                        |                        |                        |
| Data memory required     | 0.5 KB                          |                        |                        |                        |
| Device ID                | 0x00003C                        | 0x00003D               | 0x00003E               | 0x00003F               |

### Materials

Sectional view



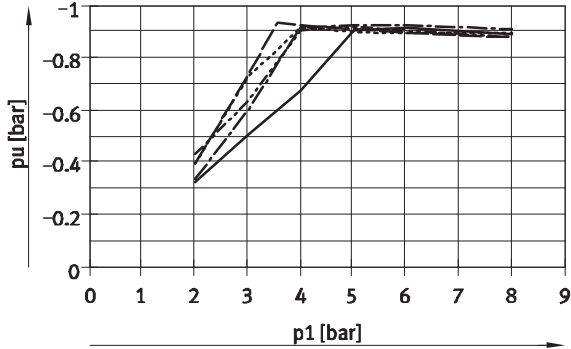
| OVEM              |                   | 1PD/2P/2N/PU/<br>NU/PI/NI/LK | 1P/1N  |
|-------------------|-------------------|------------------------------|--|
| 1                 | Fitting           | QS/QO                        | Nickel-plated brass                          |
|                   | Connecting thread | GN/GO                        | Anodised wrought aluminium alloy             |
| 2                 | Pin contacts      |                              | Gold-plated brass                            |
| 3                 | Plug housing      |                              | Nickel-plated brass                          |
| 4                 | Inspection window |                              | PA   |
| 5                 | Housing           |                              | Die-cast aluminium, reinforced PA            |
| 6                 | Key pad           |                              | TPE-U  |
| 7                 | Regulating screw  | CE/OE                        | Steel  |
| 8                 | Filter housing    |                              | Reinforced PA                                |
| 9                 | Fitting           | QS/QO/<br>PL/PO              | Nickel-plated brass                          |
|                   | Connecting thread | GN/GO                        | Anodised wrought aluminium alloy             |
| 10                | Silencer          | QO/GO/<br>PO                 | Wrought aluminium alloy, PU foam             |
|                   | Fitting           | QS/QO/<br>PL/PO              | Nickel-plated brass                          |
|                   |                   | GN/GO                        | Anodised wrought aluminium alloy             |
| –                 | Screws            |                              | Steel  |
| –                 | Pins              |                              | Steel  |
| –                 | Jet nozzle        |                              | Wrought aluminium alloy                      |
| –                 | Collector nozzle  |                              | POM  |
| –                 | Filter            |                              | Fabric, PA, sintered steel                   |
| –                 | Seals             |                              | NBR  |
| –                 | Hollow bolt       | PL/PO                        | Wrought aluminium alloy                      |
| –                 | Mounting bracket  | PL/PO                        | Stainless steel                              |
| Note on materials |                   |                              | RoHS compliant                               |
|                   |                   | QO/GO/<br>PO                 | Contains paint-wetting impairment substances |

## Vacuum generators OVEM

Technical data

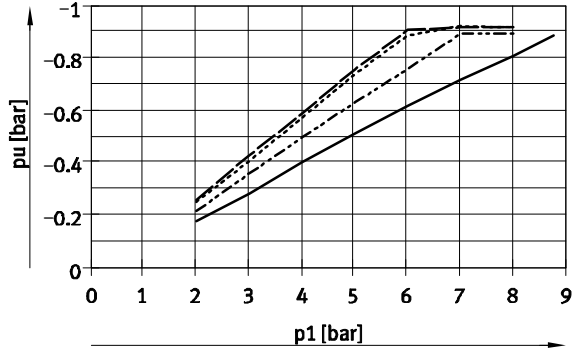
### Vacuum $p_u$ as a function of operating pressure $p_1$

High vacuum



— OVEM-05-H  
- - - OVEM-07-H  
- - - OVEM-10-H  
- - - OVEM-14-H  
- - - OVEM-20-H

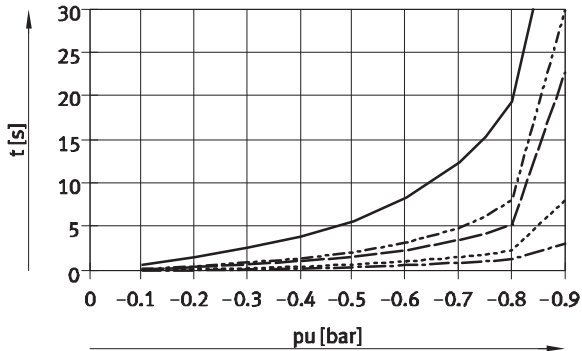
High suction rate



— OVEM-05-L  
- - - OVEM-07-L  
- - - OVEM-10-L  
- - - OVEM-14-L  
- - - OVEM-20-L

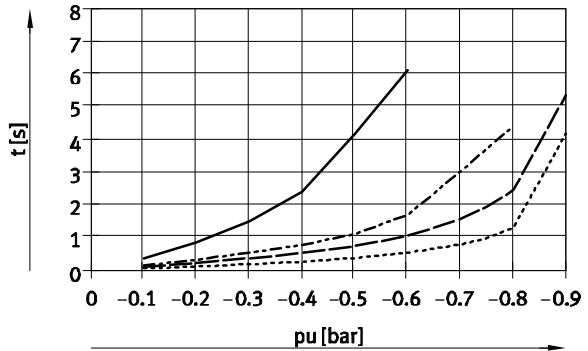
### Evacuation time $t$ as a function of vacuum $p_u$ for 1 l volume at 6 bar operating pressure

High vacuum



— OVEM-05-H  
- - - OVEM-07-H  
- - - OVEM-10-H  
- - - OVEM-14-H  
- - - OVEM-20-H

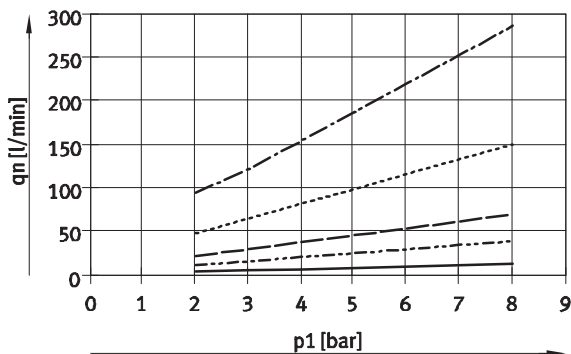
High suction rate



— OVEM-05-L  
- - - OVEM-07-L  
- - - OVEM-10-L  
- - - OVEM-14-L  
- - - OVEM-20-L

### Air consumption $q_n$ as a function of operating pressure $p_1$

High vacuum/high suction rate



— OVEM-05  
- - - OVEM-07  
- - - OVEM-10  
- - - OVEM-14  
- - - OVEM-20

# Vacuum generators OVEM

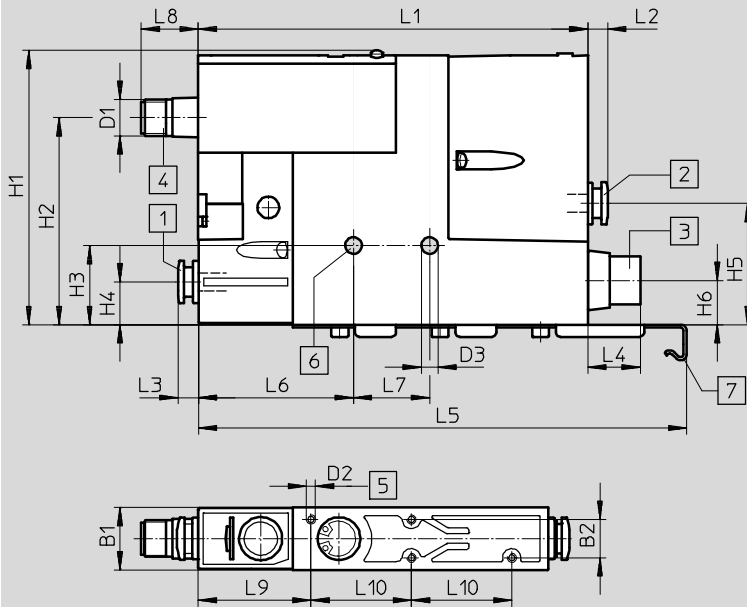
Technical data

**FESTO**

## Dimensions

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### OVEM-05



- 1** Supply port (P)
- 2** Vacuum port (V)
- 3** Exhaust port (R)
- 4** Electrical connection to fit NEBU-M12G5-K-...
- 5** Mounting thread M3  
Max. tightening torque 0.8 Nm
- 6** Mounting hole  
Max. tightening torque 2.5 Nm
- 7** Mounting bracket only provided for OVEM-...-PL/PO

| Type               | Pneumatic connections |                  |                  | D1    | D2 | D3  | B1   | B2   | H1 | H2 | H3 | H4   |
|--------------------|-----------------------|------------------|------------------|-------|----|-----|------|------|----|----|----|------|
|                    | P                     | V                | R                |       |    |     |      |      |    |    |    |      |
| OVEM-05-...-QS-... | (G1/4) <sup>1)</sup>  | QS-6             | QS-8             | M12x1 | M3 | 5.5 | 20.5 | 12.6 | 90 | 68 | 26 | 14.5 |
| OVEM-05-...-QO-... |                       |                  | SD <sup>2)</sup> |       |    |     |      |      |    |    |    |      |
| OVEM-05-...-PL-... |                       |                  | QS-8             |       |    |     |      |      |    |    |    |      |
| OVEM-05-...-PO-... |                       |                  | SD <sup>2)</sup> |       |    |     |      |      |    |    |    |      |
| OVEM-05-...-GN-... |                       |                  | G1/8             |       |    |     |      |      |    |    |    |      |
| OVEM-05-...-GO-... | G1/8                  | SD <sup>2)</sup> |                  |       |    |     |      |      |    |    |    |      |

| Type               | H5  | H6   | L1  | L2  | L3  | L4  | L5    | L6 | L7 | L8 | L9 | L10 |
|--------------------|-----|------|-----|-----|-----|-----|-------|----|----|----|----|-----|
| OVEM-05-...-QS-... | 40  | 14.5 | 115 | 6.5 | 6.5 | 12  | 160.5 | 51 | 25 | 18 | 37 | 33  |
| OVEM-05-...-QO-... |     |      |     |     |     | -   |       |    |    |    |    |     |
| OVEM-05-...-PL-... |     |      |     |     |     | 12  |       |    |    |    |    |     |
| OVEM-05-...-PO-... |     |      |     |     |     | -   |       |    |    |    |    |     |
| OVEM-05-...-GN-... |     |      |     |     |     | 8.2 |       |    |    |    |    |     |
| OVEM-05-...-GO-... | 8.2 | -    |     |     |     |     |       |    |    |    |    |     |

- 1) Thread for mounting on the common supply manifold → 19
- 2) SD = Silencer

### Minimum inside diameter [mm] of the connection tubes for connections with G-female thread

| Type                       | OVEM-05-...-GN/GO |       |
|----------------------------|-------------------|-------|
| Tubing length              | < 0.5 m           | < 2 m |
| Pneumatic connection 1 (P) | 1                 | 2     |
| Vacuum port (V)            | 2                 | 3     |
| Pneumatic connection 3 (R) | 2                 | 3     |

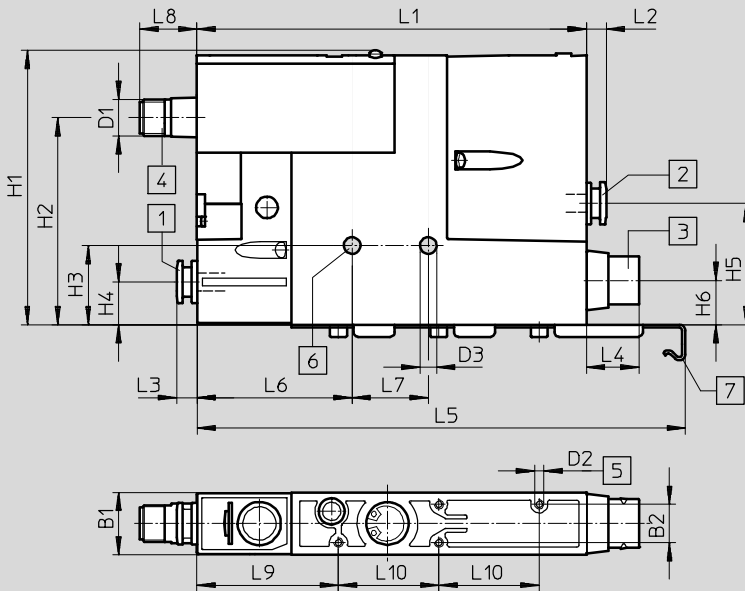
## Vacuum generators OVEM

Technical data

### Dimensions

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OVEM-07/10



- 1 Supply port (P)
- 2 Vacuum port (V)
- 3 Exhaust port (R)
- 4 Electrical connection to fit NEBU-M12G5-K-...
- 5 Mounting thread M3  
Max. tightening torque 0.8 Nm
- 6 Mounting hole  
Max. tightening torque 2.5 Nm
- 7 Mounting bracket only provided for OVEM-...-PL/PO

| Type                  | Pneumatic connections                          |                               |                               | D1    | D2 | D3  | B1   | B2   | H1 | H2 | H3 | H4   |
|-----------------------|--|-------------------------------|-------------------------------|-------|----|-----|------|------|----|----|----|------|
|                       | P  | V                             | R                             |       |    |     |      |      |    |    |    |      |
| OVEM-07/10-...-QS-... | QS-8   | QS-8                          | QS-8                          | M12x1 | M3 | 5.5 | 20.5 | 12.6 | 90 | 68 | 26 | 14.5 |
| OVEM-07/10-...-QO-... |  |                               | SD <sup>2)</sup>              |       |    |     |      |      |    |    |    |      |
| OVEM-07/10-...-PL-... | (G <sup>1</sup> / <sub>4</sub> ) <sup>1)</sup> | QS-8                          | QS-8                          |       |    |     |      |      |    |    |    |      |
| OVEM-07/10-...-PO-... |  |                               | SD <sup>2)</sup>              |       |    |     |      |      |    |    |    |      |
| OVEM-07/10-...-GN-... | G <sup>1</sup> / <sub>4</sub>                  | G <sup>1</sup> / <sub>4</sub> | G <sup>3</sup> / <sub>8</sub> |       |    |     |      |      |    |    |    |      |
| OVEM-07/10-...-GO-... |  |                               | SD <sup>2)</sup>              |       |    |     |      |      |    |    |    |      |

| Type                  | H5 | H6   | L1  | L2   | L3    | L4   | L5 | L6 | L7 | L8 | L9   | L10 |
|-----------------------|----|------|-----|------|-------|------|----|----|----|----|------|-----|
| OVEM-07/10-...-QS-... | 40 | 14.5 | 128 | 6.5  | 6.5   | 12   | -  | 51 | 25 | 18 | 46.5 | 33  |
| OVEM-07/10-...-QO-... |    |      |     |      |       | 17.3 |    |    |    |    |      |     |
| OVEM-07/10-...-PL-... |    |      |     |      | 12    |      |    |    |    |    |      |     |
| OVEM-07/10-...-PO-... |    |      |     | 17.3 | 160.5 |      |    |    |    |    |      |     |
| OVEM-07/10-...-GN-... |    |      |     | 17.2 | 17.2  | -    | -  |    |    |    |      |     |
| OVEM-07/10-...-GO-... |    |      |     |      |       |      |    |    |    |    |      |     |

- 1) Thread for mounting on the common supply manifold → 19
- 2) SD = Silencer

### Minimum inside diameter [mm] of the connection tubes for connections with G-female thread

| Type                       | OVEM-07-...-GN/GO |       | OVEM-10-...-GN/GO |       |
|----------------------------|-------------------|-------|-------------------|-------|
|                            | < 0.5 m           | < 2 m | < 0.5 m           | < 2 m |
| Pneumatic connection 1 (P) | 1.5               | 2     | 2                 | 3     |
| Vacuum port (V)            | 3                 | 4     | 4                 | 5     |
| Pneumatic connection 3 (R) | 3                 | 4     | 4                 | 5     |

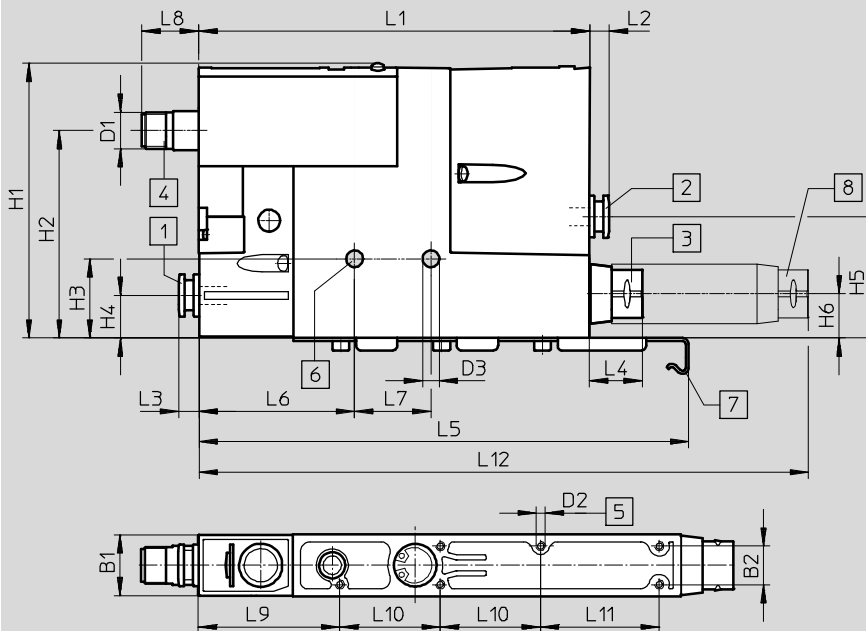
# Vacuum generators OVEM

Technical data

## Dimensions

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OVEM-14/20



- 1 Supply port (P)
- 2 Vacuum port (V)
- 3 Exhaust port (R)
- 4 Electrical connection to fit NEBU-M12G5-K-...
- 5 Mounting thread M3  
Max. tightening torque 0.8 Nm
- 6 Mounting hole  
Max. tightening torque 2.5 Nm
- 7 Mounting bracket only provided for OVEM-...-PL/PO
- 8 Silencer extension (included in the scope of delivery for OVEM-20)

| Type                  | Pneumatic connections                          |                               |                               | D1    | D2 | D3  | B1   | B2   | H1 | H2 | H3 | H4   |
|-----------------------|--|-------------------------------|-------------------------------|-------|----|-----|------|------|----|----|----|------|
|                       | P  | V                             | R                             |       |    |     |      |      |    |    |    |      |
| OVEM-14/20-...-QS-... | QS-8   | QS-8                          | QS-8                          | M12x1 | M3 | 4.3 | 20.5 | 12.6 | 90 | 68 | 25 | 14.5 |
| OVEM-14/20-...-QO-... |  |                               | SD <sup>2)</sup>              |       |    |     |      |      |    |    |    |      |
| OVEM-14/20-...-PL-... | (G <sup>1</sup> / <sub>4</sub> ) <sup>1)</sup> | QS-8                          | QS-8                          |       |    |     |      |      |    |    |    |      |
| OVEM-14/20-...-PO-... |  |                               | SD <sup>2)</sup>              |       |    |     |      |      |    |    |    |      |
| OVEM-14/20-...-GN-... | G <sup>1</sup> / <sub>4</sub>                  | G <sup>1</sup> / <sub>4</sub> | G <sup>3</sup> / <sub>8</sub> |       |    |     |      |      |    |    |    |      |
| OVEM-14/20-...-GO-... |  |                               | SD <sup>2)</sup>              |       |    |     |      |      |    |    |    |      |

| Type                  | H5 | H6   | L1  | L2   | L3   | L4   | L5    | L6 | L7 | L8 | L9   | L10 | L11 | L12 |      |
|-----------------------|----|------|-----|------|------|------|-------|----|----|----|------|-----|-----|-----|------|
| OVEM-14/20-...-QS-... | 40 | 14.5 | 158 | 6.5  | 6.5  | 12   | 160.5 | 57 | 25 | 18 | 46.5 | 33  | 39  | -   |      |
| OVEM-14/20-...-QO-... |    |      |     |      |      | 17.3 |       |    |    |    |      |     |     | -   | -230 |
| OVEM-14/20-...-PL-... |    |      |     |      |      | 12   |       |    |    |    |      |     |     | -   | -    |
| OVEM-14/20-...-PO-... |    |      |     | 17.3 | -    | -230 |       |    |    |    |      |     |     |     |      |
| OVEM-14/20-...-GN-... |    |      |     | 17.2 | 17.2 | 17.2 | -     |    |    |    |      |     |     | -   | -    |
| OVEM-14/20-...-GO-... |    |      |     |      |      |      | 17.3  |    |    |    |      |     |     | -   | -230 |

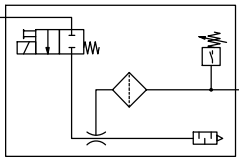
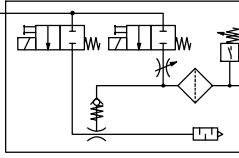




- 1) Thread for mounting on the common supply manifold → 19
- 2) SD = Silencer

### Minimum inside diameter [mm] of the connection tubes for connections with G-female thread

| Type                       | OVEM-14-...-GN/GO |       | OVEM-20-...-GN/GO |       |
|----------------------------|-------------------|-------|-------------------|-------|
|                            | < 0.5 m           | < 2 m | < 0.5 m           | < 2 m |
| Pneumatic connection 1 (P) | 3                 | 4     | 4                 | 5     |
| Vacuum port (V)            | 5.5               | 6     | 6                 | 7     |
| Pneumatic connection 3 (R) | 5.5               | 6     | 6                 | 7     |

## Vacuum generators OVEM

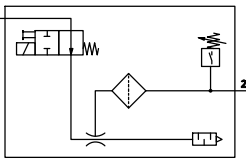
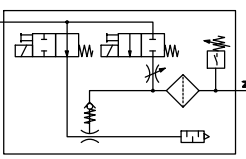
Technical data

| Ordering data and weight  |   |   |                               |                                    |                |  |  |                               |                               |
|---|---|---|-------------------------------|------------------------------------|----------------|--|--|-------------------------------|-------------------------------|
| Circuit symbol  | Description   | Electrical switching output   | Display                       | Nominal width of laval nozzle [mm] | Weight [g]     | Part No.   | Type   |                               |                               |
| NC – normally closed  |   |   |                               |                                    |                |  |  |                               |                               |
|                                | P-V with QS fitting,<br>R with open silencer                        | 2x PNP  | LCD                           | 0.45                               | 320            | <b>538834</b>  | <b>OVEM-05-H-B-QO-CN-N-2P</b>  |                               |                               |
|   |   |   |                               | 0.7                                | 325            | <b>538835</b>  | <b>OVEM-07-H-B-QO-CN-N-2P</b>  |                               |                               |
|   |   |   |                               | 0.95                               |                | <b>538836</b>  | <b>OVEM-10-H-B-QO-CN-N-2P</b>  |                               |                               |
|   |   |   |                               | 1.4                                | 370            | <b>539998</b>  | <b>OVEM-14-H-B-QO-CN-N-2P</b>  |                               |                               |
|                                | With ejector pulse,<br>P-V with QS fitting,<br>R with open silencer | 2x PNP  | LCD                           | 0.45                               | 325            | <b>538831</b>  | <b>OVEM-05-H-B-QO-CE-N-2P</b>  |                               |                               |
|   |   |   |                               | 0.7                                | 330            | <b>538832</b>  | <b>OVEM-07-H-B-QO-CE-N-2P</b>  |                               |                               |
|   |   |   |                               | 0.95                               |                | <b>538833</b>  | <b>OVEM-10-H-B-QO-CE-N-2P</b>  |                               |                               |
|   |   |   |                               | 1.4                                | 380            | <b>539997</b>  | <b>OVEM-14-H-B-QO-CE-N-2P</b>  |                               |                               |
|   |   |   |                               | 2.0                                |                | <b>8023700</b>   | <b>OVEM-20-H-B-QO-CE-N-2P</b>  |                               |                               |
|   |   |   |                               | 2x NPN                             | LCD            | 0.7  | 330  | <b>540018</b>                 | <b>OVEM-07-H-B-QO-CE-N-2N</b> |
|   |   |   |                               |                                    |                | 0.95   |  | <b>540019</b>                 | <b>OVEM-10-H-B-QO-CE-N-2N</b> |
|   |   |   |                               |                                    |                | 1.4  | 380  | <b>540020</b>                 | <b>OVEM-14-H-B-QO-CE-N-2N</b> |
|   |   |   |                               | PNP                                | LED            | 0.45   | 315  | <b>540021</b>                 | <b>OVEM-05-H-B-QO-CE-N-1P</b> |
|   |   |   |                               |                                    |                | 0.7  | 320  | <b>540022</b>                 | <b>OVEM-07-H-B-QO-CE-N-1P</b> |
|   |   |   |                               |                                    |                | 0.95   |  | <b>540023</b>                 | <b>OVEM-10-H-B-QO-CE-N-1P</b> |
|   |   |   |                               |                                    |                | 1.4  | 371  | <b>540024</b>                 | <b>OVEM-14-H-B-QO-CE-N-1P</b> |
|   |   | 2.0   |                               |                                    | <b>8023699</b> | <b>OVEM-20-H-B-QO-CE-N-1P</b>  |  |                               |                               |
|   |   | LCD   | 0.45                          |                                    | 325            | <b>8037697</b>   | <b>OVEM-05-H-B-QO-CE-N-1PD</b>  |                               |                               |
|   |   |   | 0.7                           |                                    | 330            | <b>8037698</b>   | <b>OVEM-07-H-B-QO-CE-N-1PD</b>  |                               |                               |
|   |   |   | 0.95                          |                                    |                | <b>8037699</b>   | <b>OVEM-10-H-B-QO-CE-N-1PD</b>  |                               |                               |
|   |   |   | 1.4                           | 380                                | <b>8037700</b> | <b>OVEM-14-H-B-QO-CE-N-1PD</b>  |  |                               |                               |
|   |   | IO-Link,<br>2x PNP in<br>SIO mode   | LCD                           | 0.45                               | 325            | <b>8037693</b>   | <b>OVEM-05-H-B-QO-CE-N-LK</b>  |                               |                               |
|   |   |   |                               | 0.7                                | 330            | <b>8037694</b>   | <b>OVEM-07-H-B-QO-CE-N-LK</b>  |                               |                               |
|   |   |   |                               | 0.95                               |                | <b>8037695</b>   | <b>OVEM-10-H-B-QO-CE-N-LK</b>  |                               |                               |
|   |   |   |                               | 1.4                                | 380            | <b>8037696</b>   | <b>OVEM-14-H-B-QO-CE-N-LK</b>  |                               |                               |
|   |   | With ejector pulse,<br>P-V with female<br>thread,<br>R with open silencer | 2x PNP                        | LCD                                | 0.7            | 335  | <b>540015</b>  | <b>OVEM-07-H-B-GO-CE-N-2P</b> |                               |
|   |   |   |                               |                                    | 0.95           |  | <b>540016</b>  | <b>OVEM-10-H-B-GO-CE-N-2P</b> |                               |
|   |   |   |                               |                                    | 1.4            | 385  | <b>540017</b>  | <b>OVEM-14-H-B-GO-CE-N-2P</b> |                               |
| 2x NPN  | LCD   |   | 0.7                           | 335                                | <b>540012</b>  | <b>OVEM-07-H-B-GO-CE-N-2N</b>  |  |                               |                               |
|   |   |   | 0.95                          |                                    | <b>540013</b>  | <b>OVEM-10-H-B-GO-CE-N-2N</b>  |  |                               |                               |
|   |   |   | 1.4                           | 385                                | <b>540014</b>  | <b>OVEM-14-H-B-GO-CE-N-2N</b>  |  |                               |                               |
| PNP   | LED   |   | 0.45                          | 300                                | <b>540025</b>  | <b>OVEM-05-H-B-GO-CE-N-1P</b>  |  |                               |                               |
|   |   |   | 0.7                           | 325                                | <b>540026</b>  | <b>OVEM-07-H-B-GO-CE-N-1P</b>  |  |                               |                               |
|   |   |   | 0.95                          |                                    | <b>540027</b>  | <b>OVEM-10-H-B-GO-CE-N-1P</b>  |  |                               |                               |
| 1.4   | 375   | <b>540028</b>   | <b>OVEM-14-H-B-GO-CE-N-1P</b> |                                    |                |  |  |                               |                               |
| With ejector pulse,<br>prepared for<br>common supply<br>manifold,<br>V with QS fitting,<br>R with open silencer | 2x PNP  | LCD   | 2.0                           | 410                                | <b>8023702</b> | <b>OVEM-20-H-B-PO-CE-N-2P</b>  |  |                               |                               |
|   | PNP   | LED   | 2.0                           | 400                                | <b>8023701</b> | <b>OVEM-20-H-B-PO-CE-N-1P</b>  |  |                               |                               |



## Vacuum generators OVEM

Technical data

| Ordering data and weight  |   |                             |                               |                                    |               |                               |                               |               |                               |
|---|---|-----------------------------|-------------------------------|------------------------------------|---------------|-------------------------------|-------------------------------|---------------|-------------------------------|
| Circuit symbol  | Description   | Electrical switching output | Display                       | Nominal width of laval nozzle [mm] | Weight [g]    | Part No.                      | Type                          |               |                               |
| NO – normally open  |   |                             |                               |                                    |               |                               |                               |               |                               |
|  | P-V with QS fitting,<br>R with open silencer                              | 2x PNP                      | LCD                           | 0.45                               | 320           | <b>538828</b>                 | <b>OVEM-05-H-B-QO-ON-N-2P</b> |               |                               |
|   |   |                             |                               | 0.7                                | 325           | <b>538829</b>                 | <b>OVEM-07-H-B-QO-ON-N-2P</b> |               |                               |
|   |   |                             |                               | 0.95                               |               | <b>538830</b>                 | <b>OVEM-10-H-B-QO-ON-N-2P</b> |               |                               |
|   |   |                             |                               | 1.4                                | 370           | <b>539996</b>                 | <b>OVEM-14-H-B-QO-ON-N-2P</b> |               |                               |
|  | With ejector pulse,<br>P-V with QS fitting,<br>R with open silencer       | 2x PNP                      | LCD                           | 0.45                               | 325           | <b>538825</b>                 | <b>OVEM-05-H-B-QO-OE-N-2P</b> |               |                               |
|   |   |                             |                               | 0.7                                | 330           | <b>538826</b>                 | <b>OVEM-07-H-B-QO-OE-N-2P</b> |               |                               |
|   |   |                             |                               | 0.95                               |               | <b>538827</b>                 | <b>OVEM-10-H-B-QO-OE-N-2P</b> |               |                               |
|   |   |                             |                               | 1.4                                | 380           | <b>539995</b>                 | <b>OVEM-14-H-B-QO-OE-N-2P</b> |               |                               |
|   |   |                             |                               | 2x NPN                             | LCD           | 0.7                           | 330                           | <b>540009</b> | <b>OVEM-07-H-B-QO-OE-N-2N</b> |
|   |   |                             |                               |                                    |               | 0.95                          |                               | <b>540010</b> | <b>OVEM-10-H-B-QO-OE-N-2N</b> |
|   | With ejector pulse,<br>P-V with female<br>thread,<br>R with open silencer | 2x PNP                      | LCD                           | 0.7                                | 335           | <b>540006</b>                 | <b>OVEM-07-H-B-GO-OE-N-2P</b> |               |                               |
|   |   |                             |                               | 0.95                               |               | <b>540007</b>                 | <b>OVEM-10-H-B-GO-OE-N-2P</b> |               |                               |
|   |   |                             |                               | 1.4                                | 385           | <b>540008</b>                 | <b>OVEM-14-H-B-GO-OE-N-2P</b> |               |                               |
|   |   |                             |                               | 2x NPN                             | LCD           | 0.7                           | 335                           | <b>540003</b> | <b>OVEM-07-H-B-GO-OE-N-2N</b> |
| 0.95  |   | <b>540004</b>               | <b>OVEM-10-H-B-GO-OE-N-2N</b> |                                    |               |                               |                               |               |                               |
|   |   |                             | 1.4                           | 385                                | <b>540005</b> | <b>OVEM-14-H-B-GO-OE-N-2N</b> |                               |               |                               |

## Vacuum generators OVEM

Ordering data – Modular product system

| Ordering table                                     |   |                 |             |               |
|--|---|-----------------|-------------|---------------|
| Size   | 20  | Condi-<br>tions | Code        | Entry<br>code |
| <b>M</b> Module no.                                | <b>539074</b>   |                 |             |               |
| Vacuum generators                                  | Vacuum generator with solenoid valve for vacuum valve on/off and manual override            |                 | <b>OVEM</b> | OVEM          |
| Nominal width of laval<br>nozzle [mm]              | 0.45  |                 | <b>-05</b>  |               |
|  | 0.7   |                 | <b>-07</b>  |               |
|  | 0.95  |                 | <b>-10</b>  |               |
|  | 1.4   |                 | <b>-14</b>  |               |
|  | 2.0   |                 | <b>-20</b>  |               |
| Ejector characteristic                             | High vacuum   |                 | <b>-H</b>   |               |
|  | High suction rate   | <b>1</b>        | <b>-L</b>   |               |
| Housing size/width [mm]                            | 20  |                 | <b>-B</b>   | -B            |
| Pneumatic connections                              | All connections with QS fittings  |                 | <b>-QS</b>  |               |
|  | Supply/vacuum port with QS fittings, exhaust port with open silencer                        |                 | <b>-QO</b>  |               |
|  | All ports with G female thread  |                 | <b>-GN</b>  |               |
|  | Supply / vacuum port with G female thread, exhaust port with open silencer                  |                 | <b>-GO</b>  |               |
|  | Prepared for supply manifold, vacuum port and exhaust port with QS fittings                 |                 | <b>-PL</b>  |               |
|  | Prepared for supply manifold, vacuum port with QS fittings, exhaust port with open silencer |                 | <b>-PO</b>  |               |
| Normal position of the vacuum<br>generator         | NO, normally open (vacuum generation)   |                 | <b>-ON</b>  |               |
|  | NO, normally open (vacuum generation) with ejector pulse                                    |                 | <b>-OE</b>  |               |
|  | NC, normally closed (no vacuum generation)  |                 | <b>-CN</b>  |               |
|  | NC, normally closed (no vacuum generation) with ejector pulse                               |                 | <b>-CE</b>  |               |
| Electrical connection                              | Plug M12 (5-pin)  |                 | <b>-N</b>   | -N            |
| <b>O</b> Vacuum sensor,<br>(standard scale in bar) | Without vacuum sensor   |                 |             |               |
|  | 1 switching output PNP  |                 | <b>-1P</b>  |               |
|  | 1 switching output PNP and LCD display  | <b>2</b>        | <b>-1PD</b> |               |
|  | 1 switching output NPN  | <b>1</b>        | <b>-1N</b>  |               |
|  | 2 switching outputs PNP   |                 | <b>-2P</b>  |               |
|  | 1 switching output PNP, 1 analogue output 0 ... 10 V  |                 | <b>-PU</b>  |               |
|  | 1 switching output PNP, 1 analogue output 4 ... 20 mA                                       |                 | <b>-PI</b>  |               |
|  | 2 switching outputs NPN   |                 | <b>-2N</b>  |               |
|  | 1 switching output NPN, 1 analogue output 0 ... 10 V  | <b>1</b>        | <b>-NU</b>  |               |
|  | 1 switching output NPN, 1 analogue output 4 ... 20 mA                                       | <b>1</b>        | <b>-NI</b>  |               |
|  | IO-Link   | <b>2</b>        | <b>-LK</b>  |               |
| Alternative vacuum display                         | InchHg  | <b>1</b>        | <b>-H</b>   |               |

**1** L, 1N, NU, NI, H

Not with laval nozzle of nominal size 2.0 mm.

**2** 1PD, LK

Not with normal position of the vacuum generator ON and CN.

**M** Mandatory data

**O** Options

Transfer order code

539074 OVEM - [ ] - [ ] - B - [ ] - [ ] - N - [ ] - [ ]

# Vacuum generators OVEM

Accessories

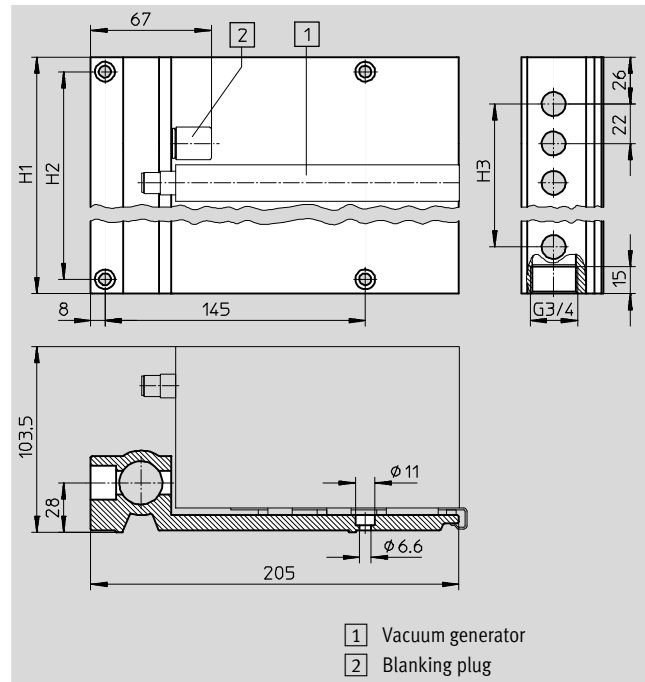
FESTO

**Common supply manifold OABM-P**  
for vacuum generator  
OVEM-...-PL/PO

Pneumatic connection 1: G3/4  
Type of mounting: Via through-hole

Material: Wrought aluminium alloy

Note on materials:  
RoHS-compliant



| Dimensions                 |     |     |     |
|----------------------------|-----|-----|-----|
| Number of device locations | H1  | H2  | H3  |
| 4                          | 118 | 102 | 66  |
| 6                          | 162 | 146 | 110 |
| 8                          | 206 | 190 | 154 |

| Tubing I.D. $d_i$ as a function of total air consumption $q_{nN}$ |       |       |     |        |     |       |        |     |        |       |        |       |       |                                     |        |      |      |
|---|-------|-------|-----|--------|-----|-------|--------|-----|--------|-------|--------|-------|-------|-------------------------------------|--------|------|------|
| Total air consumption [l/min]                                     |       |       |     |        |     |       |        |     |        |       |        |       |       |                                     |        |      |      |
| 50  | 75    | 154   | 175 | 225    | 310 | 400   | 480    | 500 | 750    | 890   | 1000   | 1190  | 1340  | 1850                                | 2240   | 2300 | 2900 |
| Tubing I.D. <sup>1)</sup> [mm]                                    |       |       |     |        |     |       |        |     |        |       |        |       |       |                                     |        |      |      |
| ≥ 2.5   | ≥ 2.9 | ≥ 3.8 | ≥ 4 | ≥ 4.4  | ≥ 5 | ≥ 5.5 | ≥ 5.9  | ≥ 6 | ≥ 7    | ≥ 7.5 | ≥ 8    | ≥ 8.4 | ≥ 8.8 | ≥ 10                                | ≥ 10.8 | ≥ 11 | ≥ 12 |
| Recommended tubing  |       |       |     |        |     |       |        |     |        |       |        |       |       | Technical data → Internet: pun, pan |        |      |      |
| PUN-4   | PUN-6 | PUN-8 |     | PUN-10 |     |       | PUN-12 |     | PUN-16 |       | PAN-16 |       |       |                                     |        |      |      |

1) With a tubing length of 3 m

**Note**

The total air consumption of the fully equipped common supply manifold of vacuum generators with ejector pulse (OE, CE), the individually set values for the ejector pulse (duration and intensity) can result in much higher air consumption.

| Ordering data and weight |                         |                   |            |          |          |
|--------------------------|-------------------------|-------------------|------------|----------|----------|
|                          | No. of device locations | CRC <sup>1)</sup> | Weight [g] | Part No. | Type     |
| Common supply            | 4                       | 2                 | 767        | 549456   | OABM-P-4 |
|                          | 6                       | 2                 | 1045       | 549457   | OABM-P-6 |
|                          | 8                       | 2                 | 1330       | 549458   | OABM-P-8 |

1) Corrosion resistance class CRC 2 to Festo standard FN 940070  
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

# Vacuum generators OVEM

Accessories



## Blanking plug OASC-G1-P

For common supply OABM-P...

Type of mounting: threaded  
Max. tightening torque: 10 Nm

Material:  
Hollow bolt: Wrought aluminium alloy  
Blanking cap: Steel  
Seals: Steel, nitrile rubber  
Note on materials:  
RoHS compliant



| Ordering data |                   |            |          |           |
|---------------|-------------------|------------|----------|-----------|
|               | CRC <sup>1)</sup> | Weight [g] | Part No. | Type      |
| Blanking plug | 2                 | 53         | 549460   | OASC-G1-P |

1) Corrosion resistance class CRC 2 to Festo standard FN 940070  
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

## H-rail mounting kit

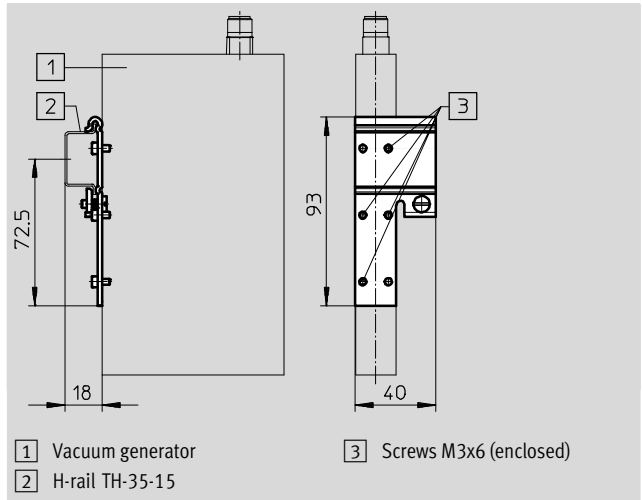
### OABM-H

for vacuum generator OVEM

Max. tightening torque for H-rail mounting: 0.8 Nm

Material: Galvanised steel

Note on materials:  
RoHS-compliant

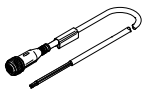
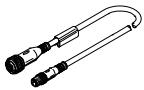
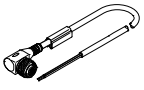



| Ordering data   |  |            |          |        |
|-----------------|--|------------|----------|--------|
|                 |  | Weight [g] | Part No. | Type   |
| H-rail mounting |  | 52         | 549461   | OABM-H |

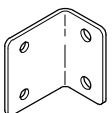
# Vacuum generators OVEM

Accessories

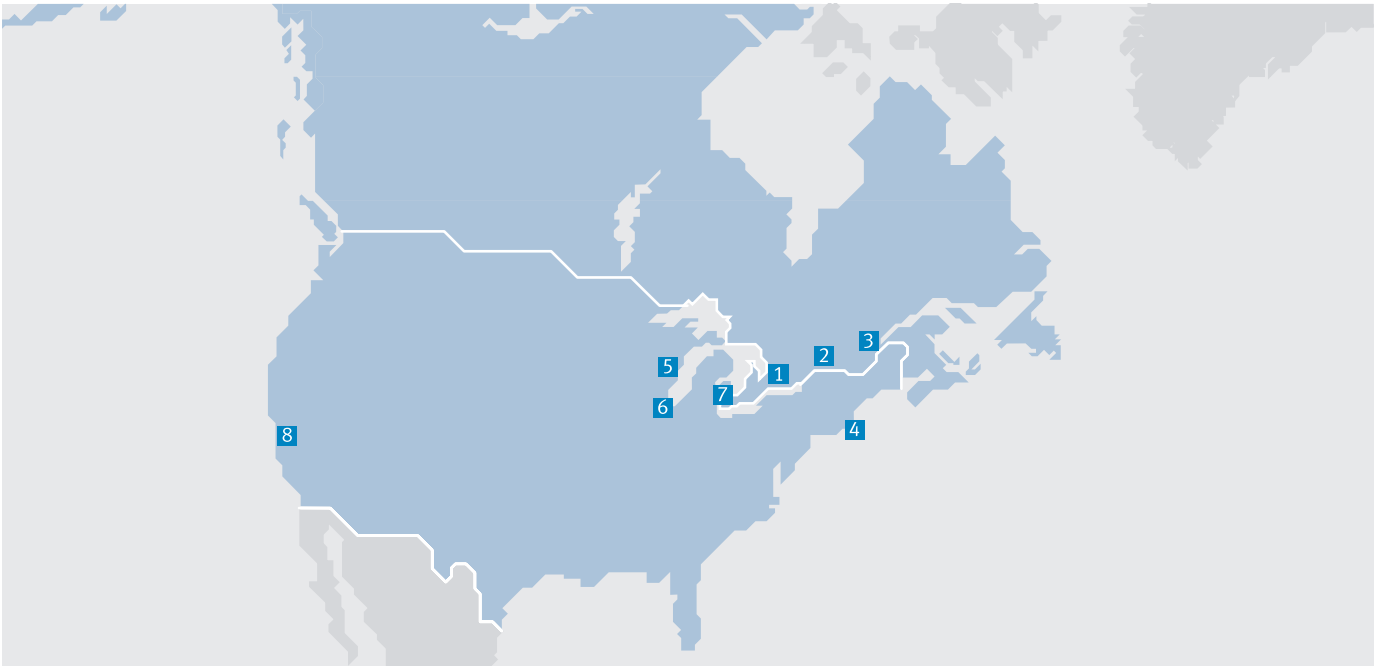
**FESTO**

| Ordering data – Connecting cable NEBU-M12   |   |  |                  | Technical data → Internet: nebu |                       |
|---|---|--|------------------|---------------------------------|-----------------------|
|   | Electrical connection   |  | Cable length [m] | Part No.                        | Type                  |
|   |  | Straight socket, M12x1, 5-pin                | Open end, 5-wire | 2.5                             | 541330                |
| 5   |   |  |                  | 541331                          | NEBU-M12G5-K-5-LE5    |
| 10  |   |  |                  | 554038                          | NEBU-M12G5-K-10-LE5   |
|  | Straight socket, M12x1, 5-pin   | Straight plug, M8x1, 4-pin, rotatable thread | 2.5              | 554036                          | NEBU-M12G5-K-2.5-M8G4 |
|  | Angled socket, M12x1, 5-pin   | Open end, 5-wire                             | 2.5              | 567843                          | NEBU-M12W5-K-2.5-LE5  |
|   |   |  | 5                | 567844                          | NEBU-M12W5-K-5-LE5    |

| Ordering data – Silencer extension UOMS |  |                  | Technical data → Internet: uoms |        |
|---|--|------------------|---------------------------------|--------|
|   | Design   | Type of mounting | Part No.                        | Type   |
|   |  | Open silencer    | Engaging                        | 538436 |

| Ordering data – Mounting bracket HRM |   | Technical data → Internet: hrm |      |
|--------------------------------------|---|--------------------------------|------|
|                                      | Material  | Part No.                       | Type |
|                                      |  | Galvanised steel               | 9769 |

# Festo North America



**1 Festo Canada  
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