Vacuum units for profile extrusion

BluSystems – reduced energy consumption, easy installation and simple operation
Energy saving and function

Intelligent vacuum units reduce operating costs

Leakage air supply is wasted energy

The vacuum and discharge pumps are responsible for most of the power consumption in calibration tables. Up to now, they have been selected based on the high suction capacity requirement during the start-up process for calibration.

To achieve the significantly lower suction capacity requirement in the subsequent operating state, systems are still used which supply leakage air or which throttle the vacuum pumps on the suction side. The electrical power consumption of the vacuum pumps remains consistently high - a completely unnecessary waste of energy.

Energy saving with BluSystems

The enormous energy saving with BluSystems is achieved by not adding leakage air. If smaller suction volumes or a lower vacuum is required after the profile has been calibrated, an internal control automatically reduces the speed of the electric motors, thereby lowering both the vacuum generation and the electrical power consumption. This demand-based vacuum generation saves large amounts of energy during the production process, which can run over several days in some cases.

The pressure level set on the calibration tools by the machine operator is monitored and maintained automatically through the ongoing pressure measurements and speed adjustments. Process-related pressure fluctuations are compensated with no intervention from the machine operator.

A second energy-saving effect is also achieved with the reduced operating water cooling requirements, because, at reduced speeds, the vacuum pumps also introduce less energy into the operating water.

Maximum efficiency

The biggest energy efficiency with BluSystems vacuum units is achieved by:

» Using optimized tools, which manage without the use of leakage air as far as possible
» Selecting the correct size and type of vacuum unit
» Using the shortest possible suction lines with a suitable diameter

The saving – a calculation example from practice

Sector: Window profile extrusion

With preproduction series models of BluVac vacuum units, a renowned window profile manufacturer achieved an average saving of 67%. An existing extrusion line was upgraded.

**Before**

- Range with 3 uncontrolled vacuum pumps, type VN 125, electrical power consumption (P1): 3 x 5.2 kW = 15.6 kW

**After**

- Range with 3 BluVac vacuum units, electrical power consumption (P1): 3 x 1.1 kW = 3.3 kW

The reduced power consumption of 12.3 kW resulted in a saving of 49,200 kWh with an estimated 4,000 operating hours a year.

With an estimated € 0.10 per kWh, **this is a saving of € 4,920.-- per year**.

The lower operating water consumption of BluVac vacuum units also results in reduced energy consumption for operating water cooling.

The calibration process is automated by the integrated control.

BluVac vacuum units therefore pay for themselves quickly.
Vacuum units for profile extrusion

BluSystems from Speck Pumpen

**Reduced energy consumption**
Renowned manufacturers of window profiles confirm: Compared with a conventional vacuum pump, BluSystems vacuum units save between 60 % and 90 % of the energy consumption.

The enormous saving is achieved through the leakage-air free and demand-based vacuum generation based on constant pressure measurement and speed regulation of the electric motors.

**Simple installation**
BluSystems has a modular design and includes different types of vacuum units in various sizes. Parallel operation with conventional vacuum pumps and other systems is no problem at all.

Thanks to the decentralised concept, users can upgrade their existing extrusion lines easily without extensive and costly conversion work. Existing pumps or systems can be replaced with BluVac or BluLine vacuum units.

For plant manufacturers, interfaces are also available for PLC controls and BluVac vacuum units as so-called cartridge inserts without separators.

**Easy operation**
Set the vacuum on the operating panel and you’re done. The control ensures that the pressure level is constantly maintained. The machine operator no longer needs to monitor the process for the most part.
BluSystems – one system for a variety of applications

Combine vacuum units to suit your requirements

Each profile has its own unique features - dry calibration, wet calibration. The need for different pressure levels and different suction volumes calls for specific solutions to ensure that the calibration table is optimally equipped.

With BluSystems from Speck, you can choose from four types of vacuum unit with different characteristics and in various sizes and find the best solution for your needs. If you want to use existing vacuum tanks in your calibration table, for example, the decentralized BluVacD vacuum unit is also available.

BluVacCompact (BluVacC)
Type: VI-...-BVC
Vacuum units with integrated separator, second generation in more compact design
» Extraction of air-water mixes
» max. -930 mbar relative
» max. 105 m³/h output
» min. 6 m³/h water discharge

BluLine
Type: VN-...-BL
Vacuum units with vacuum pumps from the VN series
» Extraction of air with high levels of water
» max. -930 mbar relative
» max. 150 m³/h output
» max. 4 m³/h water discharge

BluLine
Type: VG-...-BL
Vacuum units with vacuum pumps from the VG series
» Extraction of air with low levels of water
» max. -930 mbar relative
» max. 145 m³/h output
» max. 2.5 m³/h water discharge

BluLine
Type: VB-...-BL
Vacuum units with side channel compressors from the VB series
» Extraction of moist air
» max. -260 mbar relative
» max. 500 m³/h output

BluVacDezentral (BluVacD)
Decentralized vacuum units for plant-side separators
Combination of vacuum pump/side channel compressor and a discharge pump
» Parallel extraction of air and water from a plant-side separator (e.g. vacuum tank) in the calibration table
» max. 30 m³/h water discharge
BluSystems control units

Simple control of vacuum units

Setting the vacuum
The machine operator sets the desired relative vacuum (setpoint value) on the control unit – the BluSystems control panel is shown here. The control ensures that the pressure level remains constant from this point (just / actual value).

Three operating modes
The software offers three different operating modes depending on the process phase and requirements.

Manual mode is the mode for the start-up process with major pressure fluctuations and a high suction capacity requirement. The machine operator adapts the required suction volume to the motor frequency here via the manual setting.

If the required suction capacity drops and the fluctuations become lower at the end of the start-up process, the system is switched to automatic mode. The control now ensures that the pressure level is constantly maintained. The demand-based vacuum generation results in a significant energy saving.

The automatic mode with frequency control is a quality assurance function, which was developed in cooperation with users. The software detects sudden and unintentional air leakage or infiltrated air occurring during the running process (e.g. through holes in the profile) and reacts with a warning message and/or by switching to manual mode with constant motor speed.

Additional software functions
» Storage and display of operating and consumption data
» Visual warning in the display and/or with warning lights in the event of malfunctions
» Master-slave function when several vacuum units are connected at a pressure level.

Page 17 shows different connection options for control units and vacuum units.

BluSystems operating panel – standard control unit
Properties
» Direct display of actual and setpoint values, the actual and setpoint value can be set with just a few key operations
» Up to 5 different vacuum units can be controlled with one control panel. Many users prefer one control panel per vacuum unit, however.
» Simple and cost-effective

Display and operation
» LCD display, 40 mm x 73 mm
» Robust keys

Protection class
» IP 65

BluSystems PLC interface – interface for PLC controls
Properties
» The solution for calibration table manufacturers with plant-side display and control equipment with PLC controls
» Up to 8 vacuum units can be controlled with the software installed on the coupler
» Profinet interface on board, more on request

Display and operation
» Plant-side

Protection class
» IP 20

BluSystems PLC panel with touchscreen and memory
Properties
» Up to 15 pressure level combinations can be stored
» Up to 8 different vacuum units can be controlled
» Flashing warning light in the event of alarms and dry run

Display and operation
» Robust industrial touchscreen, 118 mm x 90 mm

Protection class
» IP 65
BluVacCompact

VI-...-BVC – vacuum units with integrated separator - second generation

Use
Extraction of air-water mixes

General
BluVacCompact vacuum units are further developed, second generation vacuum units. They are much more compact and robust compared with the first generation, while offering the same performance.

The vacuum units with mechanical seals are available in rust-free materials and cast iron.

Function
The machine operator sets the desired vacuum (setpoint) with the control unit. Air and water are discharged separately.

A pressure sensor in the separator above the water level constantly records the actual vacuum (actual value). Based on these pressure measurements, the frequency converter automatically regulates the set pressure level by adapting the motor speed.

The sensor-free regulation of the water level in the separator takes place via the special design of the bi-functional pump. The water discharge starts when the vacuum generation begins.

The energy saving
The high energy saving is achieved through the demand-based vacuum generation. The cooling requirements for operating water are also reduced.

Two sizes enable the system to be designed optimally to suit your suction volume requirements.

Installation and retrofitting
BluVacCompact can replace existing water-bearing vacuum pumps (e.g. VN series) or conventional vacuum pumps.

BluVacCompact can also replace existing BluVac vacuum units from the first generation - the rail width, connections and capacity are identical.

The footprint is approximately the same as that of a conventional vacuum pump and installation is just as easy as with a vacuum pump.

Control units
See page 5

Fresh water supply
See page 16

Illustration not obligatory

<table>
<thead>
<tr>
<th>Type</th>
<th>max. relative vacuum</th>
<th>max. suction capacity</th>
<th>min. delivery of water</th>
</tr>
</thead>
<tbody>
<tr>
<td>VI-55-BVC</td>
<td>-930 mbar</td>
<td>60 m³/h</td>
<td>6 m³/h</td>
</tr>
<tr>
<td>VI-130-BVC</td>
<td>-930 mbar</td>
<td>105 m³/h</td>
<td>6 m³/h</td>
</tr>
</tbody>
</table>
**Dimensions and data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Frame size</th>
<th>Dimensions</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>VI-55-BVC</td>
<td>90</td>
<td>L1: 381.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>L2: 580</td>
<td></td>
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<td></td>
<td></td>
<td>H1: 181</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>H2: 109</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>H3: 109</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>kg: 67</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>lbs: 148</td>
<td></td>
</tr>
<tr>
<td>VI-130-BVC</td>
<td>100</td>
<td>L1: 382.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>L2: 656</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>H1: 185</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>H2: 113</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td>H3: 119</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>lbs: 205</td>
<td></td>
</tr>
</tbody>
</table>

**Connections**

- **U_{DV}**  SAE 1 1/4 Pressure connection vacuum pump
- **U_{DW}**  SAE 1 1/4 Pressure connection water discharge pump
- **U_{e1}**  G 1/8 Connection for drainage (drainage fresh liquid supply)
- **U_{e}**   G 1/2 Connection for drainage (drainage separator)
- **U_{f}**   G 1/4 Connection for fresh liquid supply of the vacuum pump
- **U_{R}**   Ø 121 mm Inspection opening

BluSystems | Subject to modifications and errors.
05/2015 | 10961044
BluLine

VN-...-BL – vacuum units with vacuum pumps from the VN series

Fresh water supply
with solenoid valve, electro-pneumatic valve or no valve

Pressure level monitoring
Pressure sensor in the suction line

Energy-saving vacuum generation
Speed controlled vacuum pump from the VN series

Use
Extraction of air with high levels of water

General
The reliable VN type pumps are patented single-stage pumps with hub control. The vacuum units with mechanical seals are available in cast iron or stainless steel.

<table>
<thead>
<tr>
<th>Type</th>
<th>max. relative vacuum</th>
<th>max. suction capacity</th>
<th>max. delivery of water</th>
</tr>
</thead>
<tbody>
<tr>
<td>VN-95-BL</td>
<td>-930 mbar</td>
<td>115 m³/h</td>
<td>4 m³/h</td>
</tr>
<tr>
<td>VN-125-BL</td>
<td>-930 mbar</td>
<td>150 m³/h</td>
<td>4 m³/h</td>
</tr>
</tbody>
</table>

Function
The hub control with valve flaps enables water to be pumped in much higher quantities compared with a conventional vacuum pump.

The machine operator sets the desired vacuum (setpoint) with the control unit. A pressure sensor in the suction line constantly records the vacuum (actual value). Based on these pressure measurements, the frequency converter automatically regulates the set pressure level by adapting the motor speed.

The water discharge in this case is always connected with the vacuum generation.

The energy saving
The energy saving is achieved through the demand-based vacuum generation. The cooling requirements for operating water are also reduced.

Two sizes with four motor rated powers enable the system to be designed optimally to suit your suction volume requirements.

Installation and retrofitting
BluLine vacuum units with VN type vacuum pumps can replace existing comparable vacuum pumps.

The supplied pressure sensor is installed on the suction line.

Existing uncontrolled VN type pumps can be upgraded to BluLine designs providing the motor is suitable.

Control units
See page 3

Fresh water supply
See page 13

PIC Pressure Indicate Control
Pressure display and control

L Air
W Water
B Operating / fresh water

Illustration not obligatory

05/2015 | 1096.1044

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Dimensions and data

<table>
<thead>
<tr>
<th>Type</th>
<th>Frame size</th>
<th>Dimensions</th>
<th>Connections</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>VN-95-BL</td>
<td>100</td>
<td>A 160  194 140  176  63  100  13  311  125  275  336  175  78  514  350</td>
<td>$U_e$</td>
<td>$U_B$</td>
</tr>
<tr>
<td>VN-95-BL</td>
<td>112</td>
<td>A 190  224 140  180  113  112  18  309  141  287  322  175  128  598  436</td>
<td>$U_e$</td>
<td>$U_B$</td>
</tr>
<tr>
<td>VN-125-BL</td>
<td>112</td>
<td>A 190  224 140  180  113  112  18  309  141  287  322  175  128  618  436</td>
<td>$U_e$</td>
<td>$U_B$</td>
</tr>
<tr>
<td>VN-125-BL</td>
<td>132</td>
<td>A 216  256 178  218  116  132  16  390  141  307  383  175  131  603  421</td>
<td>$U_e$</td>
<td>$U_B$</td>
</tr>
</tbody>
</table>

Connections:
- $U_b$: Connection for operating liquid
- $U_e$: Connection for drainage (screw plug)
BluLine

VG-...-BL – vacuum units with vacuum pumps from the VG series

<table>
<thead>
<tr>
<th>Type</th>
<th>max. relative vacuum</th>
<th>max. suction capacity</th>
<th>max. delivery of water</th>
</tr>
</thead>
<tbody>
<tr>
<td>VG-30-BL</td>
<td>-930 mbar</td>
<td>34 m³/h</td>
<td>0.4 m³/h</td>
</tr>
<tr>
<td>VG-55-BL</td>
<td>-930 mbar</td>
<td>57 m³/h</td>
<td>0.4 m³/h</td>
</tr>
<tr>
<td>VG-95-BL</td>
<td>-930 mbar</td>
<td>82 m³/h</td>
<td>2.2 m³/h</td>
</tr>
<tr>
<td>VG-130-BL</td>
<td>-930 mbar</td>
<td>120 m³/h</td>
<td>2.4 m³/h</td>
</tr>
<tr>
<td>VG-155-BL</td>
<td>-960 mbar</td>
<td>146 m³/h</td>
<td>2.5 m³/h</td>
</tr>
</tbody>
</table>

Use
Extraction of air with low levels of water or no water

General
The tried-and-tested VG type single-stage pumps are extremely low-maintenance due to the valve-free design with no dead space. The vacuum units with mechanical seals are available in cast iron or stainless steel.

Function
The machine operator sets the desired vacuum (setpoint) with the control unit. A pressure sensor in the suction nozzle constantly records the vacuum (actual value).

Based on these pressure measurements, the frequency converter automatically regulates the pressure level set by the machine operator by adapting the motor speed.

The water discharge in this case is always connected with the vacuum generation.

The energy saving
The energy saving is achieved through the demand-based vacuum generation. The cooling requirements for operating water are also reduced.

Five sizes with six motor rated powers enable the system to be designed optimally to suit your suction volume requirements.

Installation and retrofitting
BluLine vacuum units with VG type vacuum pumps can replace existing comparable vacuum pumps.

Existing uncontrolled VG type pumps can be upgraded to BluLine designs providing the motor is suitable.

Control units
See page 5

Fresh water supply
See page 6

PIC Pressure Indicate Control
Pressure display and control
L Air
W Water
B Operating / fresh water

Illustration not obligatory
Dimensions and data

<table>
<thead>
<tr>
<th>Type</th>
<th>FS</th>
<th>Dimensions</th>
<th>Connections</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>VG-30-BL</td>
<td>90</td>
<td>A 139 B 170 BB 124 C 56 H 90 HA 11 HD 241 h2 88 h3 104 h4 241 q 70 u2 78 w 152 z2 455 z2</td>
<td>U_L G1/4 U_e G1/4 U_b G1/4</td>
<td>27 60</td>
</tr>
<tr>
<td>VG-55-BL</td>
<td>100</td>
<td>A 159 B 195 BB 134 C 63 H 100 HA 13 HD 267 h2 98 h3 113 h4 267 q 74 u2 81 w 175 z2 514 z2</td>
<td>U_L G1/4 U_e G1/4 U_b G1/4</td>
<td>36 79</td>
</tr>
<tr>
<td>VG-95-BL</td>
<td>100</td>
<td>A 160 B 194 BB 140 C 63 H 100 HA 13 HD 311 h2 157 h3 125 h4 363 q 117 u2 189 w 573 z2 461 z2</td>
<td>U_L G1/2 U_e G3/8 U_b G1/2</td>
<td>73 160</td>
</tr>
<tr>
<td>VG-130-BL</td>
<td>100</td>
<td>A 160 B 194 BB 140 C 63 H 100 HA 13 HD 311 h2 157 h3 125 h4 363 q 117 u2 189 w 573 z2 461 z2</td>
<td>U_L G1/2 U_e G3/8 U_b G1/2</td>
<td>82 181</td>
</tr>
<tr>
<td>VG-130-BL</td>
<td>112</td>
<td>A 190 B 224 BB 140 C 113 H 112 HA 18 HD 309 h2 157 h3 141 h4 349 q 117 u2 248 w 666 z2 557 z2</td>
<td>U_L G1/2 U_e G3/8 U_b G1/2</td>
<td>86 194</td>
</tr>
<tr>
<td>VG-155-BL</td>
<td>112</td>
<td>A 190 B 224 BB 140 C 113 H 112 HA 18 HD 309 h2 157 h3 141 h4 349 q 117 u2 248 w 666 z2 557 z2</td>
<td>U_L G1/2 U_e G3/8 U_b G1/2</td>
<td>95 209</td>
</tr>
</tbody>
</table>

Connections:
- U_L Connection for operating liquid
- U_e Connection for drainage (screw plug)
- U_b Connection for ventilation valve
BluLine

VB-...-BL – Vacuum units with side channel compressors from the VB series

Moisture-optimized bearing area
Significantly longer service life than conventional side channel compressors

Energy-saving vacuum generation
Speed-controlled side channel compressor from the VB series

Pressure level monitoring
Pressure sensor in the suction connection

<table>
<thead>
<tr>
<th>Type</th>
<th>max. relative vacuum</th>
<th>max. suction capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>VB-140-BL</td>
<td>-210 mbar</td>
<td>170 m³/h</td>
</tr>
<tr>
<td>VB-210-BL</td>
<td>-260 mbar</td>
<td>255 m³/h</td>
</tr>
<tr>
<td>VB-415-BL</td>
<td>-260 mbar</td>
<td>500 m³/h</td>
</tr>
</tbody>
</table>

Use
Extraction of moist air

General
Side channel compressors from the VB series are optimized in the bearing area for moist operating conditions. This means that they achieve a higher service life compared with conventional side channel compressors. The side channel compressors with rotary shaft seal are available in die-cast aluminium with an anti-corrosion coating on all parts which come into contact with media.

Function
The machine operator sets the desired vacuum (setpoint) with the control unit. A pressure sensor in the suction nozzle constantly records the vacuum (actual value).

Based on these pressure measurements, the frequency converter automatically regulates the pressure level set by the machine operator by adapting the motor speed.

The energy saving
The energy saving is achieved through the demand-based vacuum generation.

Three sizes enable optimal design to suit the supply demands.

Installation and retrofitting
BluLine vacuum units with VB type side channel compressors can replace existing comparable side channel compressors.

Existing uncontrolled VB type side channel compressors can be upgraded to BluLine designs providing the motor is suitable.

Control units
See page 5

PIC
Pressure Indicate Control
Pressure display and control

Air
Dimensions and data

| Type     | Frame size | a  | b1 | h  | h1 | h2 | h3 | m2 | n1 | n2 | q  | s1 | y  | z  | z2 | Connections | Weight |
|----------|------------|----|----|----|----|----|----|----|----|----|----|----|----|----|---------------|--------|
| VB-140-BL | 80         | 75 | 3  | 330| 154| 47 | 302| 95 | 255| 225| 115| 12 | 287| 341| 240 | G1 1/2 | G1 1/2 | 25 | 55    |
| VB-210-BL | 90         | 87 | 4  | 367| 175| 48 | 337| 115| 295| 260| 120| 14 | 334| 383| 294 | G2    | G2    | 35 | 77    |
| VB-415-BL | 100        | 118| 5  | 407| 195| 51 | 379| 140| 325| 290| 125| 15 | 381| 486| 362 | G2    | G2    | 55 | 121   |
BluVacD

Decentralized vacuum units for plant-side separators

Energy-saving vacuum generation
Speed-controlled vacuum pump
or
speed-controlled side channel compressor

Energy-saving water discharge
Speed-controlled discharge pump from the ME-…-BVD series

Use
Extraction of air and water from a plant-side separator (e.g. vacuum tank) in the calibration table

General
The vacuum is generated with type VG-…-BVD vacuum pumps or with a type VB-…-BVD side channel compressor depending on the required pressure level.

The water discharge takes place with type ME-…-BVD water pumps. The water pumps with mechanical seal are available in rust-free plastic design.

Function
Both pumps are connected with a data cable and controlled with a control unit.

The machine operator sets the desired vacuum (setpoint) with the control unit. The pressure control takes place based on continuous pressure measurements (actual value) and the adaptation of the motor speeds.

The water level control in the plant-side separator or vacuum tank takes place based on a hydrostatic filling level measurement in the vacuum tank.

The frequency converter controls the filling level automatically based on these measurements by adapting the motor speed of the discharge pump. The water discharge takes place independently from the vacuum generation.

The energy saving
The energy saving is achieved with the demand-based vacuum generation and the demand-based water discharge based on pressure measurements.

The different sizes of vacuum pumps, side channel compressors and water pumps available enable the system to be optimally designed to suit your suction volume and water delivery requirements.

Installation and retrofitting
The decentralised vacuum units can be retrofitted easily. Piping and mounting the fill level sensor is simple.

<table>
<thead>
<tr>
<th>Type</th>
<th>Control range</th>
<th>max. total head</th>
<th>max. delivery of water</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME-125-BVD</td>
<td>0 – 60 Hz</td>
<td>28.0 m</td>
<td>10.2 m³/h</td>
</tr>
<tr>
<td>ME-90-15-BVD</td>
<td>0 – 60 Hz</td>
<td>22.4 m</td>
<td>26.4 m³/h</td>
</tr>
<tr>
<td>ME-90-20-BVD</td>
<td>0 – 60 Hz</td>
<td>25.0 m</td>
<td>30.3 m³/h</td>
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</tbody>
</table>

Type

<table>
<thead>
<tr>
<th>Type</th>
<th>Performance data as VB-…-BL, see page 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>VB-…-BVD</td>
<td>VG-…-BVD</td>
</tr>
</tbody>
</table>

Type PIC LIC

PIC Pressure Indicate Control
Pressure display and control

LIC Liquid Indicate Control
Filling level display and control

L Air
W Water
F Operating / fresh water

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Dimensions and data

<table>
<thead>
<tr>
<th>Frame size</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME-125-BVD</td>
<td>71kg 11lbs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frame size</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME-90-15-BVD</td>
<td>25kg 55lbs</td>
</tr>
<tr>
<td>ME-90-20-BVD</td>
<td>25kg 55lbs</td>
</tr>
</tbody>
</table>
Fresh water supply

Three options for vacuum units with vacuum pumps

Fresh water supply with pressurised water and valves

The fresh water supply with pressurised water and valves guarantees optimal accuracy during vacuum control, as the entered fresh water quantity always remains constant.

After the vacuum unit is started, the valve on the fresh water connection opens automatically at the same time and supplies the pump with fresh water.

An optional flow sensor protects the vacuum unit from damage if a problem-free fresh water supply cannot be guaranteed. This is the case, for example, with a water supply without or with inadequate pressure boosting systems and/or with pressure fluctuations.

If the fresh water intake is insufficient or if the fresh water intake fails, the software stops the vacuum unit and prevents the mechanical seal from running dry.

For problem-free operation, it has also proven to be beneficial to install a filter before the valve with a mesh size of 300, which is maintained regularly.

Valve types

<table>
<thead>
<tr>
<th>Type / Water pressure</th>
<th>Electro-pneumatic valve</th>
<th>Solenoid valves - two versions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh water quality</td>
<td>2 – 6 bar</td>
<td>2 – 6 bar</td>
</tr>
<tr>
<td>Pressurised air connection</td>
<td>low contamination</td>
<td>no contamination</td>
</tr>
<tr>
<td>Filter (300 μm) before valve</td>
<td>3.5 – 8 bar</td>
<td>–</td>
</tr>
<tr>
<td>Flow sensor</td>
<td>recommended</td>
<td>highly recommended</td>
</tr>
<tr>
<td>Power supply</td>
<td>24 V</td>
<td>optional / recommended</td>
</tr>
<tr>
<td></td>
<td></td>
<td>230 V</td>
</tr>
</tbody>
</table>

Valve-free fresh water supply from controlled liquid supply

The fresh water supply with controlled liquid supply is standard with conventional vacuum pumps in industrial systems. It is suitable for processes where the relative vacuum level is at least -250 mbar.

The vacuum pump takes its fresh water automatically from a water vessel, with a level 300 mm above the centre of the shaft.

Valve-free fresh water supply with process water

Due to their design, liquid ring vacuum pumps are able to take their fresh water from the process water.

This fresh water supply uses simple equipment and is suitable for plants and processes requiring reliable, uninterrupted process water in sufficient quantities.
Installation examples

Installation example for one operating panel per vacuum unit

Installation example for controlling multiple vacuum units with one operating panel

Installation example of a decentralised vacuum unit for plant-side separators (vacuum tanks) - here with side channel compressor

Installation example for controlling a pressure level with two vacuum units via the software function master slave
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