Multi stage nozzle ejector ensuring high vacuum of -94kPa (-27.8 inHg).

Large suction flow rate of Max. 1,110ℓ (39.2 cfm)/min [ANR] with multi layer structure.
Characteristics

Securing high vacuum and large flow rate
- By adoption of multi-stage nozzle and multi layer structure, suction flow can be secured approx. 2.2 times (on average) larger than air consumption.

| Pressure Supply | 0.5MPa (72.5psi) |
| Final vacuum   | -94kPa (27.8inHg) |

- About Times: Approximate values

<table>
<thead>
<tr>
<th>Suction Flow</th>
<th>Nozzle Code</th>
<th>161</th>
<th>162</th>
<th>163</th>
<th>164</th>
<th>165</th>
<th>166</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Consumption</td>
<td></td>
<td>440</td>
<td>550</td>
<td>660</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(220 ℓ)</td>
<td>330 ℓ</td>
<td>760 ℓ</td>
<td>(31.4cfm)</td>
<td>890 ℓ</td>
<td>(39.2cfm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>550 ℓ</td>
<td>(19.4cfm)</td>
<td>1020 ℓ</td>
<td>(36.0cfm)</td>
<td>1110 ℓ</td>
<td>(39.2cfm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>660 ℓ (12.3cfm)</td>
<td>1100 ℓ (39.2cfm)</td>
<td>31.4 ℓ</td>
<td>(39.2cfm)</td>
<td>23.3 ℓ</td>
<td>(39.2cfm)</td>
</tr>
</tbody>
</table>

Excellent in ozone resistance FKM for all sealing rubber.

Silencer installing direction is selectable.
- Selectable from Three directions: Side, Front(*1) and With rotary joint, depending on the installation space.

*1. Front installation is only for single layer type: 161, 162.
*2. Vacuum characteristic changes by silencer Q’ty and its installing direction.

Body can be fixed freely with two brackets.
Suitable for applications in various industrial fields.

- Best suited for a various range of industries, as well as automobile, semiconductor, food and medicine industries.

Suction Conveyance

Best suited for large and heavy or porous work-piece in automobile industry and packaging industry, etc.

Defoaming・Deaeration

Bubble and air contained in adhesive, cosmetics (cream) and distilled water can be removed.

Vacuum packing

Can be used for vacuum packing of food or the like, removing air from the package.

Vacuum Chuck

The processing accuracy can be stabilized because the distortion and thermal deformation of the work-piece hardly occurs. Also, the work-piece can be fixed easily.
# Model Designation (Example)

**Model Designation of Attachment parts (Example)**

![Model Designation Image]

1. **Nozzle specification**

<table>
<thead>
<tr>
<th>Code</th>
<th>161</th>
<th>162</th>
<th>163</th>
<th>164</th>
<th>165</th>
<th>166</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer</td>
<td>Single layer</td>
<td>Double layer</td>
<td>Triple layer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nozzle quantity</td>
<td>1 pc.</td>
<td>2 pcs</td>
<td>3 pcs</td>
<td>4 pcs</td>
<td>5 pcs</td>
<td>6 pcs</td>
</tr>
<tr>
<td>Suction/min [ANR]</td>
<td>290ℓ (10.2cfm)</td>
<td>550ℓ (19.4cfm)</td>
<td>760ℓ (26.8cfm)</td>
<td>890ℓ (31.4cfm)</td>
<td>1,020ℓ (36.0cfm)</td>
<td>1,110ℓ (39.2cfm)</td>
</tr>
<tr>
<td>Consumption/min [ANR]</td>
<td>110ℓ (3.9cfm)</td>
<td>220ℓ (7.8cfm)</td>
<td>330ℓ (11.7cfm)</td>
<td>440ℓ (15.5cfm)</td>
<td>550ℓ (19.4cfm)</td>
<td>660ℓ (23.3cfm)</td>
</tr>
</tbody>
</table>

2. **Vacuum port size**

<table>
<thead>
<tr>
<th>Code</th>
<th>O6</th>
<th>O8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taper pipe female thread</td>
<td>Rc3/4</td>
<td>Rc1</td>
</tr>
</tbody>
</table>

3. **Exhaust port** (Connection type: Taper pipe female thread, Size: Rc3/4)

- No Code: No silencer, End cap 1pc.
- S1: Silencer 1pc. End cap 1pc.
- S2: Silencer 1pc. Rotate joint 1pc. End cap 2pcs

**Vacuum characteristic**: High-vacuum large flow (Rated supply pressure: 0.5MPa, Final vacuum: -94kPa)

**Air supply port size**: O2: Rc1/4 (Taper pipe female thread)

---

# Model Designation of Attachment parts (Example)

**Parts name**

<table>
<thead>
<tr>
<th>Code</th>
<th>R</th>
<th>E</th>
<th>B</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotate joint</td>
<td>End cap</td>
<td>Bracket (2pcs/set)</td>
<td>Dummy plug (2pcs/set)</td>
<td></td>
</tr>
<tr>
<td>Rc3/4</td>
<td>R3/4</td>
<td>R3/4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Silencer** (For direct mounting to body or attaching to rotate joint)

**Bush** (For connecting Push-in fitting (Thread size: R1/2) to vacuum port (Rc3/4))
Specifications

<table>
<thead>
<tr>
<th>Nozzle type</th>
<th>161</th>
<th>162</th>
<th>163</th>
<th>164</th>
<th>165</th>
<th>166</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layers</td>
<td>Single layer</td>
<td>Double layer</td>
<td>Triple layer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nozzle quantity</td>
<td>1 pc.</td>
<td>2 pcs</td>
<td>3 pcs</td>
<td>4 pcs</td>
<td>5 pcs</td>
<td>6 pcs</td>
</tr>
<tr>
<td>Suction flow rate (/min ANR)</td>
<td>290L (10.2cfm)</td>
<td>550L (19.4cfm)</td>
<td>760L (26.8cfm)</td>
<td>890L (31.4cfm)</td>
<td>1,020L (36.0cfm)</td>
<td>1,110L (39.2cfm)</td>
</tr>
<tr>
<td>Air consumption (/min ANR)</td>
<td>110L (3.9cfm)</td>
<td>220L (7.8cfm)</td>
<td>330L (11.7cfm)</td>
<td>440L (15.5cfm)</td>
<td>550L (19.4cfm)</td>
<td>660L (23.3cfm)</td>
</tr>
<tr>
<td>Fluid medium</td>
<td>Air</td>
<td>Air</td>
<td>Air</td>
<td>Air</td>
<td>Air</td>
<td>Air</td>
</tr>
<tr>
<td>Operating pressure range (MPa)</td>
<td>0.3 ~ 0.7 (43.5~101.5psi)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated supply pressure (MPa)</td>
<td>0.5 (72.5psi)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temp. range (°C)</td>
<td>5 ~ 50 (no freezing) (41~122°F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nozzle diameter (mm)</td>
<td>Ø1.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Construction (VLMH163 or 164)

Safety instruction manual

⚠️ Warnings

1. Maintenance of Large Flow Vacuum Generator VLM Series should be conducted by a person with the understanding about the construction of this product and enough knowledge about pneumatic equipment.

⚠️ Cautions

1. When selecting an exhaust piping, or use without silencer with dust existing in air or pipe, dust may enter from the exhaust port by back-flow at operation stop, and it may cause malfunction and performance drop.
2. Vacuum characteristics may be changed upon plumbing conditions and other variants.
3. Do not use the generator in corrosive gas, flammable gas, chemicals, sea water, water or steam. As the generator may be damaged and lead to leakage.
4. Do not use the generator in places where they can be exposed to water drops, oil drops, duct, etc. The generator is neither drip-proof nor dust-proof, so that trouble may result.
5. Diameter of tube connected to vacuum port to be as large as possible and length as long as possible, to ensure the generator performance.
6. Falling or shock may cause damage or leakage to the generator.
7. Install silencer to every layer of the generator, otherwise performance may be deteriorated.
8. Do not supply positive pressure more than 0.3MPa such as blow-off air to vacuum circuit. It causes check packing damage.
9. Use of vacuum filter is recommended to prevent possible entering of foreign substances from vacuum port (V).
Characteristics

Large Flow Vacuum Generator VLM
Appearance drawing

Model code: **VLM H161-202-3**
**VLM H162-202-3**

- **No silencer**: ⇒ 3: No code
- **Silencer: Side installation**: ⇒ 3: S1
- **Silencer with rotate joint**: ⇒ 3: S2
- **Silencer: Front installation**: ⇒ 3: S1

Unit: mm

<table>
<thead>
<tr>
<th>Model code</th>
<th>weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLM H161-202-3</td>
<td>848</td>
</tr>
<tr>
<td>VLM H162-202-3</td>
<td>909</td>
</tr>
<tr>
<td>VLM H161-202-S1</td>
<td>882</td>
</tr>
<tr>
<td>VLM H162-202-S1</td>
<td>943</td>
</tr>
<tr>
<td>VLM H161-202-S2</td>
<td>952</td>
</tr>
<tr>
<td>VLM H162-202-S2</td>
<td>1,013</td>
</tr>
</tbody>
</table>

※1) Reference dimension when silencer installed.
※2) Reference dimension when end cap installed.
※3) Reference dimension when silencer and rotate joint installed.
※4) Replaced with vacuum port size code from the model designation (example) in page 4.
※5) The installation method of bracket in this dimensional drawing is only one example. Refer page 2 for other bracket installation method.

---

No silencer ⇒ 3: No code
Silencer: Side installation ⇒ 3: S1
Silencer with rotate joint ⇒ 3: S2
Silencer: Front installation ⇒ 3: S1

Air supply port (P): Rc1/4
Sensor port: Rc1/8
Vacuum port (V): Rc3/4 or Rc1
Exhaust port (EX): Rc3/4

Exhaust port (EX): Rc3/4

Silencer with rotate joint

Silencer: Front installation

Model code weight (g)
VLM H161-202      848
VLM H162-202      909
VLM H161-202-S1   882
VLM H162-202-S1   943
VLM H161-202-S2   952
VLM H162-202-S2   1,013
Model code: VLM H163-202-3  
VLM H164-202-3  

Double layer, nozzle 3pcs  
Double layer, nozzle 4pcs  

No silencer ⇒①: No code  
Silencer: Side installation ⇒③: S1  
Silencer with rotate joint ⇒③: S2  

Air supply port (P): Rc1/4  
Sensor port: Rc1/8  
Vacuum port (V): Rc3/4 or Rc1  
Exhaust port (EX): Rc3/4  

Silencer: Side installation  
Silencer with rotate joint  

Unit: mm  

Sensor port: Rc1/8  
Exhaust port (EX): 2-Rc3/4  

※1) Reference dimension when silencer installed.  
※2) Reference dimension when end cap installed.  
※3) Reference dimension when silencer and rotate joint installed.  
※4) Replaced with vacuum port size code from the model designation (example) in page 4.  
※5) The installation method of bracket in this dimensional drawing is only one example. Refer page 2 for other bracket installation method.  

<table>
<thead>
<tr>
<th>Model code</th>
<th>weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLM H163-202</td>
<td>1,358</td>
</tr>
<tr>
<td>VLM H164-202</td>
<td>1,393</td>
</tr>
<tr>
<td>VLM H163-202-S1</td>
<td>1,426</td>
</tr>
<tr>
<td>VLM H164-202-S1</td>
<td>1,461</td>
</tr>
<tr>
<td>VLM H163-202-S2</td>
<td>1,566</td>
</tr>
<tr>
<td>VLM H164-202-S2</td>
<td>1,601</td>
</tr>
</tbody>
</table>
Model code: **VLM H165-202-3**  
**VLM H166-202-3**  

- No silencer ⇒③: No code  
- Silencer: Side installation ⇒③: S1  
- Silencer with rotate joint ⇒③: S2

**Triple layer, nozzle 5pcs**  
**Triple layer, nozzle 6pcs**

---

**Air supply port (P): Rc1/4**  
**Sensor port: Rc1/8**  
**Vacuum port (V): Rc3/4 or Rc1**  
**Exhaust port (EX): Rc3/4**

---

**Silencer: Side installation**

---

**Unit**: mm

---

---

<table>
<thead>
<tr>
<th>Model code</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLM H165-202</td>
<td>1,828</td>
</tr>
<tr>
<td>VLM H166-202</td>
<td>1,848</td>
</tr>
<tr>
<td>VLM H165-202-S1</td>
<td>1,930</td>
</tr>
<tr>
<td>VLM H166-202-S1</td>
<td>1,950</td>
</tr>
<tr>
<td>VLM H165-202-S2</td>
<td>2,140</td>
</tr>
<tr>
<td>VLM H166-202-S2</td>
<td>2,160</td>
</tr>
</tbody>
</table>

---

*1) Reference dimension when silencer installed.  
*2) Reference dimension when end cap installed.  
*3) Reference dimension when silencer and rotate joint installed.  
*4) Replaced with vacuum port size code from the model designation (example) in page 4.  
*5) The installation method of bracket in this dimensional drawing is only one example. Refer page 2 for other bracket installation method.
Maintenance

Follow below procedures for cleaning the nozzle and the diffuser:

1. Loosen all screws on the bottom of generator and remove top case and nozzle clip.
2. Remove diffuser from the generator body.
3. Remove nozzle 3 and nozzle 1 & 2 ass’y in this order. (Do not disassemble nozzle 1 & 2 ass’y.)
4. Remove deposits by air blow or wiping with soft cloth from the diffuser, nozzle, packing and seal.
5. Assemble the body with the nozzle 1 & 2, nozzle 3 and the diffuser in reverse order of disassembling and install the nozzle clip. Fasten the screws with the tightening torque 1N·m~1.2N·m. Make sure the packing is in the proper position.

![Diagram showing dissassembly and assembly process of the Large Flow Vacuum Generator VLM.](image-url)
Related products

Push-in fittings for air supply port
※ Air supply port size : Rc1/4.

<table>
<thead>
<tr>
<th>Bracket</th>
<th>Rotate joint</th>
<th>End cap</th>
<th>Dummy plug</th>
<th>Silencer (without elbow block)</th>
<th>Bush</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rc3/4</td>
<td>R3/4</td>
<td>R3/4</td>
<td>R3/4</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model code</th>
<th>Model code</th>
<th>Model code</th>
<th>Model code</th>
<th>Model code</th>
<th>Model code</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLM-B</td>
<td>VLM-R</td>
<td>VLM-E</td>
<td>VLM-D</td>
<td>VVSSR06</td>
<td>PF06-04</td>
</tr>
</tbody>
</table>

Push-in fittings for vacuum port
※ These push-in fittings can be used only when the vacuum port size is Rc3/4 and installing a bush listed above (PF06-04).

<table>
<thead>
<tr>
<th>PC</th>
<th>Straight</th>
<th>PL</th>
<th>Elbow</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC10-02</td>
<td>PCoD-R</td>
<td>PL10-02</td>
<td></td>
</tr>
<tr>
<td>PC12-02</td>
<td>PCoD-R</td>
<td>PL12-02</td>
<td></td>
</tr>
</tbody>
</table>

Large digital pressure sensor (vacuum switch)

VUS-32 Compound pressure type
- Rated pressure range : -100 〜 100kPa
- Easily viewable LCD dual displays, high level visibility with 3-color display
- Improved wiring workability and maintenance by lead wire with connector
- Copy function enables to copy various settings to slave-side sensor

Digital pressure gauge

GPD-V Negative pressure type
- Rated pressure range : -101 〜 0Pa
- Pressure is clearly digital displayed by a single push of a button
- Display with only 1 battery, no need of wiring
- A power saving mode is adapted. Battery life is about 3 years (at 5 times indication/day)

Air Tank

ATS
- Tank capacity : 0.4 〜 20ℓ
- Reducing the vacuum pressure fluctuations and pulsations
- Tank capacity is selectable from 6 variations
- Tank is made of stainless steel
- For more detail information on these products, please check our web site (http://en.pisco.co.jp/).