SOLENOID VALVE FOR VACUUM

VA01 series
Most suitable for vacuum and vacuum break control!

Small-sized 3-port 2-position direct-acting solenoid valve for vacuum

**VA01PSV23** for vacuum

**VA01PSP23** for vacuum break (positive pressure)

- **Compact and lightweight**
  Very compact plastic body in 10 mm width, weighting only 25 g.

- **Two types of vacuum control and vacuum break control available**
  Two types of models for vacuum control and vacuum break control (positive pressure : 0.5 MPa max.) are available as VA01 Series.

- **Minimized vacuum leak**
  Vacuum leak is reduced to less than 2 kPa/min (at −90 kPa, 20 cm³).

- **Quick response time**
  5 ms response time and stable action at the time of turning on.

- **Mountable on manifold**
  Common vacuum supply port or common positive pressure supply port manifolds are available.

- **Usable for air blow**
  Small-sized directing-acting valve VA01PSV23 can be used for air blow.

- **Configurable with composite manifold (option)**
  It is possible to configure a vacuum unit with a double manifold equipped with both solenoid valves for vacuum and vacuum break.

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</tr>
</tbody>
</table>
Most suitable for attraction and conveyance of very small work!

4-port 3-position direct-acting solenoid valve for vacuum VA01PEP34

- Lightweight and compact
  Body width 10 mm, weight 56 g

- One unit works for both vacuum control and vacuum break controls.
  Vacuum control valve and vacuum break control valve (pressur: 0.5MPa max.) are united.

- Quick response time
  5 ms response time and stable action at the time of turning on/off.

- Throttle valve for vacuum break flow control
  Air flow for vacuum break can be controlled according to work being attracted by setting a needle valve in the flow path for vacuum break.

- Atmospheric release mechanism
  It serves to release the suction side pressure to the atmospheric air once and then supply air for vacuum break, when doing vacuum break from the vacuum state. This feature will be highly effective for loading and unloading very small work quickly in a stable state.

- Manifolding
  Vacuum port for common or individual manifolds are available, making it possible to manifold up to 12 stations.

To customers having the following problems in attracting very small work:

- Parts around vacuum-breaking air are blown off, when work is detached.
- Timing of detaching work tends to vary.
- Re-attraction occurs after work is detached.
- Two solenoid valves are required to set up an atmospheric release circuit.

Using VA01 PEP34 will cut down these problems.
**3-port 3-position direct-acting solenoid valve for vacuum**

**VA01RDP33**

- **Lightweight and compact**  
  Body width 10 mm, weight 45 g

- **One unit works for both vacuum control and vacuum break controls.**  
  Vacuum control valve and vacuum break control valve (pressure 0.2 MPa max.) are united.

- **Holds vacuum at intermediate position**  
  Solenoid valve returns to intermediate position at the time of power failure and emergency stop, and holds attraction with vacuum pad.

- **Quick response time**  
  5 ms response time and stable action at the time of turning on/off

- **Throttle valve for vacuum break flow control**  
  Air flow for vacuum break can be controlled according to work being attracted by setting a needle valve in the flow path for vacuum break.

- **Manifolding**  
  Vacuum port for common or individual manifolds are available, making it possible to manifold up to 20 stations.

- **Manifold with throttle valve for vacuum flow control**  
  Vacuum flow can be controlled according to work by setting a needle valve in the flow path to each solenoid valve in the manifold.
Small-sized 3-port 2-position direct-acting latching solenoid valve for vacuum

**VA01PLV23** for vacuum

**VA01PLP23** for vacuum break (positive pressure)


*Newly developed one coil latch type solenoid is incorporated!*

**Compact** Double solenoid has been downsized to single solenoid.

**Energy saving** Energy-saving circuit is incorporated; power consumption during holding is 0.5W.

**Safety** No necessity for turning on power continuously to hold switching position.

Detent mechanism to hold switching position with permanent magnet assures safety operations such as keeping attraction by vacuum.

**Powerful lineup of VA01 series**

In addition to 2-position/3-position types and air releasing type, 3-port latch type solenoid valve has joined in this series.

Full lineup of solenoid valves with 10mm body width for vacuum is available.

**Minimized vacuum leak**

Vacuum leak is reduced to 2kPa/min (at $-90$kPa, 20cm$^3$)
FOR SAFETY USE

Be sure to read the following instructions before use.
For common and individual instructions, refer to the text of this catalog.

The following safety precautions are provided to prevent damage and danger to personnel and to provide instructions on the correct usage of this product. These precautions are classified into 3 categories; “CAUTION”, “WARNING” and “DANGER” according to the degree of possible injury or damage and the degree of impendence of such injury or damage.

Be sure to comply with all precautions along with JIS B8370(1) and ISO 4414(2), as they include important content regarding safety.

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**CAUTION**
Indicates a potentially hazardous situation which may arise due to improper handling or operation and could result in personal injury or property-damage-only accidents.

**WARNING**
Indicates a potentially hazardous situation which may arise due to improper handling or operation and could result in serious personal injury or death.

**DANGER**
Indicates an impending hazardous situation which may arise due to improper handling or operation and could result in serious personal injury or death.

---

(1) JIS B8370 : General Rules for Pneumatic Systems
(2) ISO 4414 : Pneumatic fluid power-General rules relating to systems

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**WARNING**

- The applicability of vacuum equipment to the intended system should be judged by the pneumatic system designer or the personnel who determined specifications for such system.
  As operating conditions for products contained in this catalog are diversified, the applicability of vacuum equipment to the intended system should be determined by the pneumatic system designer or the personnel who determined specifications for such system after conducting an analysis or testing as necessary.
  Before making a system, the system designer should thoroughly examine all specifications for such a system and also take into consideration the possibility of any trouble with the equipment.
- The vacuum equipment should be handled by persons who have sufficient knowledge and rich experience.
  Improper handling of compressed air and vacuum will result in danger.
  Assembling, operation and maintenance of machinery using vacuum equipment should be performed by persons who have sufficient knowledge and rich experience.
- Never operate machinery nor remove the equipment until safety is assured.
  - Before checking or servicing machinery and equipment, be sure to check that steps for prevention of dropping or runaway of the driven component have been completely taken.
  - When removing the equipment, make sure that the above-mentioned safety measures have been done beforehand.
  - Then turn off air supply and power to the system and purge compressed air in the system.
  - When restarting machinery and equipment, check that proper prevention of malfunction has been provided for and then restart carefully.
- When using the vacuum equipment in the following conditions or environments, take the proper safety measures and consult KURODA beforehand.
  - Conditions and environments other than specified and outdoor use.
  - Applications to nuclear power equipment, railroads, aircraft, vehicles, medical equipment, equipment connected with food and drink, amusement facilities and safety devices such as emergency interruption devices, clutch/brake circuits for a press and the likes.
  - Applications which require extreme safety and will also greatly affect men and property.
Be sure to read them before use.
Also refer to Par. "For Safety Use" and instructions mentioned for each series of solenoid valves.

**WARNING**
- Power failure and trouble of air supply will lead to vacuum down; this sometimes results in an accident.
  Take a safety measure against such and accident.
  If vacuum pad loses its sucking force due to vacuum down, the workpiece being carried will drop, endangering the human body and machine. Provide prevention against the drop of a workpiece or take a proper safety measure.
- Do not use for emergency shutoff valves.
  Solenoid valves listed in this catalogue are not designed for use in emergency shutoff valves and other safety applications.
  When using the solenoid valve for such applications, provide an independent means to assure safety.
- Exhausting residual air
  Provide a residual air exhausting function in due consideration of maintenance and inspection.
- Use in vacuum
  In order to prevent sucking foreign matters from the suction pad and exhaust port, provide an inline filter, air muffler between the suction pad and solenoid valve and at the exhaust port.
- Applying current continuously for long time
  When using a solenoid valve while applying current to it continuously for a long period of time, contact KURODA beforehand.
- Remodeling the solenoid valve
  Do not remodel the solenoid valve.

**CAUTION**
- Use at low temperature
  When using a solenoid valve at 5°C or below, provide an air dryer or other proper means to prevent moisture from solidifying or freezing.
- Shock and vibration
  Reduce shocks and vibrations applied to the solenoid valve to less than the prescribed value. (refer to specifications.)
  Applying shocks and vibrations exceeding the prescribed value may result in a malfunction of the solenoid valve.

**SELECTION**
- Check the specifications.
  Solenoid valves listed in this catalog are designed for vacuum or compressed air. Avoid using other fluid than vacuum or compressed air. Do not use a solenoid valve at any pressure and temperature outside the range of specifications, otherwise resulting in a breakdown or malfunction.

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![Diagram of C-R circuit](attachment:diagram.png)

**CAUTION**
- Leak current
  When a C-R element is used in the contack protective circuit (surge voltage protection), leak current will flow through the C-R element.
  If this leak current becomes large, a malfunction will occur. Therefore, reduce leak current to less than 1 mA.
Be sure to read them before use. Also refer to Par. "For Safety Use" and instructions mentioned for each series of solenoid valves.

### MOUNTING

#### WARNING

- When mounting the solenoid valve, firmly fix it while using care to prevent the stationary part and joint from loosening. If the solenoid valve is mounted with insufficient strength, it may sometimes come off.
- Do not start the system until it is ensured that equipment works properly. After mounting the solenoid valve, connect power supply and then perform a functional test and a leak test. Check that it has been correctly mounted and works properly, before starting the system.
- Coating with paint
  - When coating the resin portion with paint, it may be adversely affected by paint and solvent. For the propriety of painting, contact KURODA beforehand.
  - Do not peel off the nameplate affixed on the solenoid valve and do not erase or smear out the letter on it.
- Provide space for maintenance and inspection.

#### CAUTION

- Do not wipe off the model name inscribed on a nameplate etc., with organic solvent. The inscribed indication may be erased.
- Tightening torque for mounting screw
  - Recommended tightening torque range is shown as below.

<table>
<thead>
<tr>
<th>Valve No.</th>
<th>Screw size</th>
<th>Tightening torque (N-m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VA01PSV23</td>
<td>M1.7</td>
<td>0.10〜0.14</td>
</tr>
<tr>
<td>VA01PSP23</td>
<td>M1.7</td>
<td>0.12〜0.20</td>
</tr>
<tr>
<td>VA01PEP34</td>
<td>M1.7</td>
<td>0.12〜0.20</td>
</tr>
<tr>
<td>VA01RDP33</td>
<td>M1.7</td>
<td>0.12〜0.20</td>
</tr>
<tr>
<td>VA01PLV23</td>
<td>M1.7</td>
<td>0.10〜0.14</td>
</tr>
<tr>
<td>VA01PLP23</td>
<td>M1.7</td>
<td>0.10〜0.14</td>
</tr>
</tbody>
</table>

- Fit an air muffler to the exhaust port of the solenoid valve. Dust or foreign matter that enters it may cause a malfunction of the solenoid valve.

### PIPING

#### CAUTION

- Avoid spiral pipe laying. When spiral pipe laying is used in a vacuum line, it may sometimes delay attaining vacuum due to the resistance of piping or cause vacuum down at the suction end; resulting in the malfunction of the vacuum sensor.
- For manifold type solenoid valve, pay attention to piping diameter. When increasing the number of manifolded units, flow may be insufficient according to circumstances. In this case, supply and exhaust from both sides of the manifold.
- Before piping
  - Thoroughly flush the inside of each pipe to remove chips, coolant, dust, etc. before piping.
- How to wind a seal tape
  - When winding a seal tape around the threaded portion, leave space of 1.5 to 2 thread turns.

- Avoid wrong piping. When connecting a pipe to each equipment, be careful not to mistake the supply port etc. by referring to the nameplate affixed to the product or the product catalog.
Solenoid Valves for Vacuum/Common Instructions

Be sure to read them before use.
Also refer to Par. "For Safety Use" and instructions mentioned for each series of solenoid valves.

Pipining

⚠️ CAUTION

- Screw of pipe and joint
  When screwing the pipe and joint, use care to prevent chips and sealant from entering the pipe and joint.
  Tighten them within a proper range of tightening torque.

<table>
<thead>
<tr>
<th>Port size</th>
<th>Tightening torque (N•m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3</td>
<td>0.3~0.5</td>
</tr>
<tr>
<td>M5</td>
<td>1.5~2.0</td>
</tr>
<tr>
<td>R, Rc 1/8</td>
<td>7.0~9.0</td>
</tr>
<tr>
<td>R, Rc 1/4</td>
<td>12~14</td>
</tr>
</tbody>
</table>

Aplicable Tubes

⚠️ CAUTION

- Used nylon tubes or polyurethane tubes made by KURODA for Instant Joints. When using tubes made by other companies, check the diametral accuracy.
  There are some commercially available tubes that do not satisfy the specified diametral accuracy.

- Do not extremely bend the tube near the joint; otherwise resulting in the break or bucking of the tube.
  When using the tube with it bent, use at more than minimum bend radius.

- When using with other fluid than air, consult KURODA.

Connection and Disconnection of Tube

⚠️ CAUTION

How to connect a tube
- When using a tube, cut it at right angles axially with the special tool (Tube Cutter/TC-16). Cutting it with scissors or nippers to cause a deformation may result in air leak or coming off.
- Fully insert the tube up to the tube end.
- Pull the tube lightly and check that it does not come off from the joint.

How to disconnect a tube
- Pull out the tube while pushing the release ring in parallel. Before pulling out the tube, be sure to discharge residual pressure.
- When reusing the disconnected tube, cut off the bitten portion of the tube.

Wiring

⚠️ WARNING

- When doing wiring work, be sure to turn off compressed air, vacuum and power supplies beforehand.
  Wiring work without turning off air, vacuum and power supplies may cause an electric shock or malfunction, this sometimes results in an injury to the human body or a damage to property.

- Avoid mis-wiring.
  Some solenoid valves have polarity: Those operating on DC with built-in indicator light and those equipped with surge protective circuit.
  When wiring to a solenoid valve, check whether or not it has polarity.
  For a solenoid valve having polarity, check the lead wire color and symbol of the polarity by the catalog or actual article beforehand and then make correct wiring.

- Avoid applying stress and tensile force to lead wire repeatedly.
  Wiring made in such a manner that stress and tensile force are repeatedly applied to the lead wire will result in the breaking of wire.
  Provide some degree of margin for wiring.

- Check that there is no insulation failure.
  If an insulation failure occurs in the lead wire connection, extension cable and terminal base, an excess flows to the switching element of the solenoid valve or control unit, sometimes resulting in a damage.

- Do not mistake applied voltage.
  Mistake in applied voltage in case of wiring to a solenoid valve will cause an operation failure or burn out the coil.

- After completion of wiring, check for wrong connection before turning on power.

- Do not supply power at the same time.
  Do not supply power to both double solenoid type valve and latch type solenoid valve at the same time.
Be sure to read them before use.
Also refer to Par. "For Safety Use" and instructions mentioned for each series of solenoid valves.

**OPERATING ENVIRONMENTS**

![DANGER]

- Do not use solenoid valve in an explosive environment.

![WARNING]

- Do not use a solenoid valve in atmospheres containing corrosive gases, chemicals, seawater, water and vapor and in places where a solenoid valve contacts these matters.
- Do not use a solenoid valve in a place where vibrations or shocks are directly applied to it.
- When a solenoid valve is exposed to the direct sunlight, fit a protective cover to the solenoid valve.
- When a solenoid valve is located around a heat source, shut off the radiant heat.
- When installing a solenoid valve in the control panel, take proper heat-radiating measures so that the inside temperature may be kept within the specified temperature range.
- When using a solenoid valve in a place where it is exposed to welding spatters, provide a protective cover or other proper prevention.

  Welding spatters may burn out the plastic parts of the solenoid valve, sometimes resulting in a fire.

**MAINTENANCE AND INSPECTION**

![WARNING]

- Inspection before maintenance
  First check that load drop prevention has been provided. Then shut off air and power supplies to the system and exhaust residual air in the system beforehand.
- Inspection after maintenance
  When restarting the system, check that preventive measures against flying-out of the actuator have been taken. Then connect compressed air supply to the pneumatic system, and perform a proper functional test and a leak test to check that it works safely without fail, before starting the system.
- Operation at low frequency
  To prevent an operation failure, perform the switching action of the solenoid valve once per 30 days. (Be careful of air supply.)
- Manual operation
  When the solenoid valve is manually operated, the system connected to it is also operated. Make sure safety before operation.
- Disassembly of solenoid valve
  When disassembling the solenoid valve, contact KURODA beforehand.

![CAUTION]

- Draining
  To keep the quality of air to a certain level, drain the air filter at periodical intervals.
- Check and clean the vacuum filter and silencer every-day, and also change the element periodically.

  Sifting will deteriorate the performance.

**QUALITY OF AIR**

![WARNING]

- Use pure air.
  Compressed air containing corrosive gases, chemicals, salt, etc. causes a breakdown or operation failure. So do not use such air.

![CAUTION]

- Fit an air filter with filtration of $5 \mu$m or fine.
- Install an air dryer.
  Compressed air containing much drainage causes the operation failure of pneumatic equipment. Install and air dryer, lower the temperature and reduce drainage.
- Take proper countermeasures against sludge.
  If sludge produced in compressor oil enters pneumatic equipment, it will cause the operation failure of pneumatic equipment. It is recommendable to use compressor oil (NISSEKI FAIRCALL A68, IDEMITSU DAPHUNY SUPER CS68) featuring minimized sludge production or use a coalescing filter to prevent sludge from entering the pneumatic equipment.
SOLENOID VALVES VA01 SERIES/INDIVIDUAL INSTRUCTIONS

Be sure to read them before use. Also refer to Par. "For Safety Use" and common instructions.

WIRING SPECIFICATIONS

• L type
  Lead wire (AWG26 length 300 mm)

• P type
  Connector with lead wire (AWG26 length 500 mm), side outlet (with indicator light & surge suppressor)

• U type
  Connector with lead wire (AWG26 length 500 mm), upside outlet (with indicator light & surge suppressor)

HOW TO USE CONNECTORS

CAUTION

• How to attach and detach a connector
  When attaching a connector, pinch the clip with your finger and insert the connector into the pin straight to the end.
  When detaching a connector, pinch the clip with your finger and pull out the connector straight.

INTERNAL CIRCUIT OF P & U TYPE

VA01PSP23/VA01PSV23/VA01RDP33

VA01PEP34
CONTINUOUS SUPPLY OF POWER

⚠️ CAUTION

• Latch type solenoid valve requires no continuous supply of power.

After switching by pulse signal, that position is held until reverse direction signal is input. However, set input signal at minimum required excitation time (0.05ms) or over.
Small-sized 3-port 2-position direct-acting solenoid valve for vacuum

VA01PSV23 for vacuum
VA01PSP23 for vacuum break (positive pressure)

Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Fluid</th>
<th>VA01PSV23</th>
<th>VA01PSP23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port size</td>
<td>M5</td>
<td>Air</td>
<td>Air</td>
</tr>
<tr>
<td>Flow</td>
<td>Vacuum</td>
<td>( \ell ) /min (ANR)</td>
<td>22 (at (-100)kPa)</td>
</tr>
<tr>
<td></td>
<td>Vacuum break</td>
<td>( \ell ) /min (ANR)</td>
<td>-</td>
</tr>
<tr>
<td>Pressure range</td>
<td>(-100\sim-0)kPa</td>
<td>0\sim0.5)MPa</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>°C</td>
<td>(-10\sim50)</td>
<td></td>
</tr>
<tr>
<td>Response time</td>
<td>ON</td>
<td>ms</td>
<td>5 or less</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>ms</td>
<td>5 (10) or less</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>V</td>
<td>DC24</td>
<td></td>
</tr>
<tr>
<td>Permissible voltage fluctuation</td>
<td>%</td>
<td>(\pm10)</td>
<td></td>
</tr>
<tr>
<td>Heat resistance grade</td>
<td></td>
<td>Grade B</td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>W</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Wiring</td>
<td>Lead wire, connector with lead wire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration resistance/Shock resistance</td>
<td>m/s²</td>
<td>150/50</td>
<td></td>
</tr>
<tr>
<td>Mass</td>
<td>g</td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

(Note) • When using the valve for vacuum break at less than 5 °C by supplying compressed air, use dry air passing through an air dryer to prevent dew condensation and freezing.

• Response time in bracket ( ) shows with surge suppressor.

Ordering instruction

Solenoid valve

VA01 PS V23 - 1 L - M5 - 6

1. Type of piping  
   PS Sub-base piping Single solenoid

2. Function  
   V23 2-position 3-port Vacuum
   P23 2-position 3-port Vacuum break (Positive pressure)

3. Voltage  
   1 DC24V

4. Wiring specifications  
   L Lead wire
   P Connector with lead wire, Side outlet (With indicator light & surge suppressor)
   U Connector with lead wire, Upside outlet (With indicator light & surge suppressor)

5. Port size  
   No mark No sub-base  
   M5 M5×0.5

(Note) Model without sub-base is provided with mounting screw and base gasket.

6. Wiring accessories  
   No mark No connector  
   E Connector with lead wire (Length : 500 mm)

Manifold

MFS - V01 V3 CC - M5

1. Number of stations  
   2 2 stations  
   : :  
   20 20 stations

2. Type of valve  
   V3 PSV23 for vacuum  
   P3 PSP23 for positive pressure

3. Manifold specifications  
   CC Common 1, Common 3

4. Port size  
   M5 M5×0.5

Connector with lead wire

<table>
<thead>
<tr>
<th>Lead wire length</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>500mm</td>
<td>PC2-D24-CL5 (Standard)</td>
</tr>
<tr>
<td>1000mm</td>
<td>PC2-D24-CL10</td>
</tr>
</tbody>
</table>

CAUTION • Supply pressure of \(-100\) to 0 kPa to vacuum supply port of VA01PSV23. Do not supply positive pressure.

• Supply pressure of 0 to 0.5 MPa to positive pressure supply port of VA01PSP23. Do not supply vacuum pressure.
## Dimensions

**Solenoid valve**

(Unit: mm)

<table>
<thead>
<tr>
<th>Port 3</th>
<th>M5×0.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vacuum supply port</td>
</tr>
<tr>
<td>2</td>
<td>Output port</td>
</tr>
<tr>
<td>3</td>
<td>Atmospheric release port</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port 2</th>
<th>M5×0.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pressure port</td>
</tr>
<tr>
<td>2</td>
<td>Output port</td>
</tr>
<tr>
<td>3</td>
<td>Exhaust port</td>
</tr>
</tbody>
</table>

**Manual override**

- 2.5 x 2.5
- (Mounting hole)

**LED wire length**

- 300 AWG26

**L type**

**P type**

**U type**
Small-sized 3-port 2-position direct-acting solenoid valve for vacuum

Dimensions

Manifold

(Unit : mm)

<table>
<thead>
<tr>
<th>n</th>
<th>A</th>
<th>B</th>
<th>n</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>130</td>
<td>122</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>35.5</td>
<td>27.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>46</td>
<td>38</td>
<td></td>
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</tr>
<tr>
<td>4</td>
<td>56.5</td>
<td>48.5</td>
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<td></td>
</tr>
<tr>
<td>5</td>
<td>67</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>77.5</td>
<td>69.5</td>
<td></td>
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</tr>
<tr>
<td>7</td>
<td>88</td>
<td>80</td>
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</tr>
<tr>
<td>8</td>
<td>98.5</td>
<td>90.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>109</td>
<td>101</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>119.5</td>
<td>111.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>224.5</td>
<td>216.5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

L type

Port 1
M5×0.8
Vacuum port/
Pressure port

Port 2
n-M5×0.8
Output port

Lead wire length 300
AWG26

Blank plate
V23-BP

Atmospheric release port/
Exhaust port

P type

U type

Lead wire length 500
AWG26

Circuit diagram

1: No.1
2: 2
3: 3

(Mounting hole)

5.5
15
35.5

2×3.5

27.5
38
48.5
59
69.5
80
90.5
101
111.5
122
130
140.5
151
161.5
172
182.5
193
203.5
214
224.5

KURODA
# Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Unit</th>
<th>VA01PEP34</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model No.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fluid</strong></td>
<td></td>
<td>Air</td>
</tr>
<tr>
<td><strong>Port size</strong></td>
<td></td>
<td>M5</td>
</tr>
<tr>
<td><strong>Flow</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vacuum</td>
<td>R/min (ANR)</td>
<td>20 at −100kPa (Port 3→2)</td>
</tr>
<tr>
<td>Vacuum break</td>
<td>R/min (ANR)</td>
<td>14 at 0.5MPa (Port 1→2)</td>
</tr>
<tr>
<td><strong>Pressure range</strong></td>
<td></td>
<td>−100~−30kPa</td>
</tr>
<tr>
<td><strong>Ambient temperature</strong></td>
<td>°C</td>
<td>−10~50</td>
</tr>
<tr>
<td><strong>Response time</strong></td>
<td>ms</td>
<td>ON : 5 or less</td>
</tr>
<tr>
<td><strong>Rated voltage</strong></td>
<td>V</td>
<td>DC24</td>
</tr>
<tr>
<td><strong>Permissible voltage fluctuation</strong></td>
<td>%</td>
<td>±10</td>
</tr>
<tr>
<td><strong>Heat resistance grade</strong></td>
<td></td>
<td>Grade B</td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
<td>W</td>
<td>0.9 (Holding), 4 (Inrush)</td>
</tr>
<tr>
<td><strong>Wiring</strong></td>
<td></td>
<td>Lead wire, connector with lead wire</td>
</tr>
<tr>
<td><strong>Vibration resistance/Shock resistance</strong></td>
<td>m/s²</td>
<td>150/50</td>
</tr>
<tr>
<td><strong>Mass</strong></td>
<td>g</td>
<td>56</td>
</tr>
</tbody>
</table>

(Nota) When using the valve for vacuum break at less than 5 kPa by supply ing compressed air, use dry air passing through an air dryer to prevent dew condensation and freezing.

## Ordering instruction

### Solenoid valve

- **VA01**
- **EP3**
- **4**
- **1**
- **U**
- **M5**
- **⑤Port size**
  - **M5**
  - **M5 × 0.8**

### Manifold

- **MFS**
- **V01P4**
- **CC**
- **M5**

- **Number of stations**
  - **2**
  - **2 stations**
  - **12**
  - **12 stations**

- **Manifold specifications**
  - **CC**
    - Common 1 (Positive pressure), Common 3 (Vacuum)
  - **CI**
    - Common 1 (Positive pressure), Individual 3 (Vacuum)

- **Port size**
  - **M5**
  - **M5 × 0.8**

- **Connector with lead wire**
  - **Lead wire length**
    - 500mm: PC2-D24-CL5 (Standard)
    - 1000mm: PC2-D24-CL10

### Notes

- **Type of piping**
  - **P**
    - Sub-base piping
- **Function**
  - **EP3**
    - 3-position with atmospheric release mechanism, Double solenoid
- **Voltage**
  - **1**
    - DC24V
- **Wiring specifications**
  - **U**
    - Connector with lead wire, Upside outlet (With indicator light & surge suppressor)
- **Wiring accessories**
  - **No mark**
    - No connector
  - **E**
    - Connector with lead wire (Length: 500 mm)
- **Option**
  - **No mark**
    - No option
  - **F**
    - Atmospheric release port with filter

### CAUTION

- Use positive pressure supply port within pressure range of 0 to 0.5 MPa. Do not supply vacuum pressure.
- Use vacuum supply port within pressure range of −100 to 0 kPa. Do not supply positive pressure.
4-port 3-position direct-acting solenoid valve for vacuum

Dimensions
Solenoid valve

(Unit : mm)

Port 1
M5×0.8
Positive pressure supply port

Port 3
M5×0.8
Vacuum supply port

Lead wire length 500
AWG26

Port 2
M5×0.8
Output port

Atmospheric release port
(Mounting hole)

Throttle valve for vacuum break flow control

Manual override (Vacuum side)

Manual override (Positive pressure side)

Atmospheric release port with filter

1 : Positive pressure supply port
2 : Output port
3 : Vacuum supply port
Y : Atmospheric release port
4-port 3-position direct-acting solenoid valve for vacuum

Dimensions

Manifold

(Unit: mm)

MFS□-V01P4CC-M5

Port 3
2-M5×0.8
Vacuum supply port
(Opposite side plugged)

Port 1
2-M5×0.8
Positive pressure supply port
(Opposite side plugged)

MAX41
MIN38.5

Throttle valve for vacuum break flow control

Lead wire length 500 AWG26

Atmospheric release port

2-φ3.5
(Mounting hole)

Blank plate
V34-BP

Port 2
n-M5×0.8
Output port

<table>
<thead>
<tr>
<th>n</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>39.5</td>
<td>32.5</td>
</tr>
<tr>
<td>3</td>
<td>50</td>
<td>43</td>
</tr>
<tr>
<td>4</td>
<td>60.5</td>
<td>53.5</td>
</tr>
<tr>
<td>5</td>
<td>71</td>
<td>64</td>
</tr>
<tr>
<td>6</td>
<td>81.5</td>
<td>74.5</td>
</tr>
<tr>
<td>7</td>
<td>92</td>
<td>85</td>
</tr>
<tr>
<td>8</td>
<td>102.5</td>
<td>95.5</td>
</tr>
<tr>
<td>9</td>
<td>113</td>
<td>106</td>
</tr>
<tr>
<td>10</td>
<td>123.5</td>
<td>116.5</td>
</tr>
<tr>
<td>11</td>
<td>134</td>
<td>127</td>
</tr>
<tr>
<td>12</td>
<td>144.5</td>
<td>137.5</td>
</tr>
</tbody>
</table>

n: Number of stations
4-port 3-position direct-acting solenoid valve for vacuum

Dimensions
Manifold (Unit: mm)

<table>
<thead>
<tr>
<th>n</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>39.5</td>
<td>32.5</td>
</tr>
<tr>
<td>3</td>
<td>50</td>
<td>43</td>
</tr>
<tr>
<td>4</td>
<td>60.5</td>
<td>53.5</td>
</tr>
<tr>
<td>5</td>
<td>71</td>
<td>64</td>
</tr>
<tr>
<td>6</td>
<td>81.5</td>
<td>74.5</td>
</tr>
<tr>
<td>7</td>
<td>92</td>
<td>85</td>
</tr>
<tr>
<td>8</td>
<td>102.5</td>
<td>95.5</td>
</tr>
<tr>
<td>9</td>
<td>113</td>
<td>106</td>
</tr>
<tr>
<td>10</td>
<td>123.5</td>
<td>116.5</td>
</tr>
<tr>
<td>11</td>
<td>134</td>
<td>127</td>
</tr>
<tr>
<td>12</td>
<td>144.5</td>
<td>137.5</td>
</tr>
</tbody>
</table>

n: Number of stations

Port 1: 2-M16x0.8 Positive pressure supply port (Opposite side plugged)

Port 3: n-M5×0.8 Vacuum supply port

Port 2: n-M5×0.8 Opposite side plugged

Port 4: 2-ϕ3.5 (Mounting hole)

Throttle valve for vacuum break flow control

Lead wire length 500 AWG26

Vacuum supply port

Atmospheric release port

Blank plate V34-BP

V34-BP
### Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Fluid</th>
<th>Unit</th>
<th>VA01RDP33</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port size</td>
<td></td>
<td></td>
<td>M5</td>
</tr>
<tr>
<td>Flow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vacuum</td>
<td>l/min (ANR)</td>
<td></td>
<td>10 at 90kPa (Port 3 → 2)</td>
</tr>
<tr>
<td>Vacuum break</td>
<td>l/min (ANR)</td>
<td></td>
<td>8 at 0.2MPa (Port 1 → 2)</td>
</tr>
<tr>
<td>Pressure range</td>
<td></td>
<td></td>
<td>−100kPa ~ 0.2MPa</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>°C</td>
<td></td>
<td>−10 ~ 50</td>
</tr>
<tr>
<td>Response time</td>
<td>ms</td>
<td></td>
<td>ON: 5 or less, OFF: 5 (20) or less</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>V</td>
<td></td>
<td>DC24</td>
</tr>
<tr>
<td>Permissible voltage fluctuation</td>
<td>%</td>
<td></td>
<td>±10</td>
</tr>
<tr>
<td>Heat resistance grade</td>
<td></td>
<td></td>
<td>Grade B</td>
</tr>
<tr>
<td>Power consumption</td>
<td>L type</td>
<td>W</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>P, U type</td>
<td>W</td>
<td>0.55</td>
</tr>
<tr>
<td>Wiring</td>
<td>Lead wire, connector with lead wire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration resistance/Shock resistance</td>
<td>m/s²</td>
<td>150/50</td>
<td></td>
</tr>
<tr>
<td>Mass</td>
<td>g</td>
<td>45</td>
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</tr>
</tbody>
</table>

*(Note) When using the valve for vacuum break at less than 5 °C by supplying compressed air, use dry air passing through an air dryer to prevent dew condensation and freezing. Response time in bracket ( ) shows with surge suppressor.*

### Ordering instruction

#### Solenoid valve

<table>
<thead>
<tr>
<th>VA01RDP33</th>
<th>R</th>
<th>DP3</th>
<th>3</th>
<th>1</th>
<th>L</th>
<th>M5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. **Type of piping**
   - R: In-line piping
2. **Function**
   - DP3: 3-position closed center, Double solenoid
3. **Voltage**
   - 1 DC24V
4. **Wiring specifications**
   - L: Lead wire
   - P: Connector with lead wire, Side outlet (With indicator light & surge suppressor)
   - U: Connector with lead wire, Upside outlet (With indicator light & surge suppressor)

#### Manifold

<table>
<thead>
<tr>
<th>MFU</th>
<th>5</th>
<th>V01R3</th>
<th>CC</th>
<th>V</th>
<th>M5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. **Number of stations**
   - 2: 2 stations
   - 20: 20 stations
2. **Manifold specifications**
   - CC: Common 1 (Positive pressure), Common 3 (Vacuum)
   - CI: Common 1 (Positive pressure), Individual 3 (Vacuum)
3. **Throttle valve for vacuum flow control**
   - No mark: No throttle valve
   - No mark: Throttle valve for vacuum flow control (Only for CC specification) (Note) Solenoid valve with throttle valve for vacuum flow control is to be made to order.

### Connector with lead wire

<table>
<thead>
<tr>
<th>Lead wire length</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>500mm</td>
<td>PC2-D24-CL5 (Standard)</td>
</tr>
<tr>
<td>1000mm</td>
<td>PC2-D24-CL10</td>
</tr>
</tbody>
</table>

**CAUTION**

- Use positive pressure supply port within pressure range of 0 to 0.2 MPa. Do not supply vacuum pressure.
- Use vacuum supply port within pressure range of −100 to 0 kPa. Do not supply positive pressure.
3-port 3-position direct-acting solenoid valve for vacuum

Dimensions
Solenoid valve

(Unit: mm)

1: Positive pressure supply port
2: Output port
3: Vacuum supply port

Port 2
M5×0.8
Output port

Port 3
M5×0.8
Vacuum supply port

Port 1
M5×0.8
Positive pressure supply port

Manual override
(Vacuum side)

Manual override
(Positive pressure side)

Throttle valve for vacuum break flow control

Lead wire length 300
AWG26

Lead wire length 500
AWG26

P type

U type
3-port 3-position direct-acting solenoid valve for vacuum

Dimensions

Manifold

MFU-V01R3CC-M5

Circuit diagram

Port 1
Rc\% Positive pressure supply port

Port 2
n-M5×0.8 Output port

Throttle valve for vacuum break flow control

Lead wire length 300 AWG26

Port 3
Rc\% Vacuum supply port

L type

MFU-V01R3CCV-M5 (Order made)

Throttle valve for vacuum flow control

Lead wire length 500 AWG26

L type

Circuit diagram

Port 1
Rc\% Positive pressure supply port

Port 2
n-M5×0.8 Output port

Throttle valve for vacuum break flow control

MAX 41
MIN 38.5

MAX 41
MIN 38.5

[Unit : mm]
3-port 3-position direct-acting solenoid valve for vacuum

**Dimensions**

**Manifold**

(Unit : mm)

<table>
<thead>
<tr>
<th>Port 3</th>
<th>n-M5x0.8</th>
<th>Vacuum supply port</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.5</td>
<td>10.5</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Port 1</th>
<th>Rc1/8</th>
<th>Positive pressure supply port</th>
</tr>
</thead>
<tbody>
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<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port 2</th>
<th>n-M5x0.8</th>
<th>Output port</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>17.5</td>
<td></td>
</tr>
</tbody>
</table>

Throttle valve for vacuum break flow control

Lead wire length 300
AWG26

**L type**

Lead wire length 500
AWG26

<table>
<thead>
<tr>
<th>n</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>137</td>
<td>123</td>
</tr>
<tr>
<td>12</td>
<td>147.5</td>
<td>133.5</td>
</tr>
<tr>
<td>13</td>
<td>158</td>
<td>144</td>
</tr>
<tr>
<td>14</td>
<td>168.5</td>
<td>154.5</td>
</tr>
<tr>
<td>15</td>
<td>179</td>
<td>165</td>
</tr>
<tr>
<td>16</td>
<td>189.5</td>
<td>175.5</td>
</tr>
<tr>
<td>17</td>
<td>200</td>
<td>186</td>
</tr>
<tr>
<td>18</td>
<td>210.5</td>
<td>196.5</td>
</tr>
<tr>
<td>19</td>
<td>221</td>
<td>207</td>
</tr>
<tr>
<td>20</td>
<td>231.5</td>
<td>217.5</td>
</tr>
</tbody>
</table>

n : Number of stations

\[ n \]
Small-sized 3-port 2-position direct-acting latching solenoid valve for vacuum

VA01PLV23 for vacuum
VA01PLP23 for vacuum break (positive pressure)

Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Unit</th>
<th>VA01PLV23</th>
<th>VA01PLP23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid</td>
<td></td>
<td>Air</td>
<td>Air</td>
</tr>
<tr>
<td>Port size</td>
<td>M5</td>
<td>M5</td>
<td></td>
</tr>
<tr>
<td>Flow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vacuum</td>
<td>l/min (ANR)</td>
<td>22 (at −100 kPa)</td>
<td>—</td>
</tr>
<tr>
<td>Vacuum break</td>
<td>l/min (ANR)</td>
<td>—</td>
<td>40 (at 0.5 MPa)</td>
</tr>
<tr>
<td>Pressure range</td>
<td>−100 to 0 kPa</td>
<td>0 to 0.5 MPa</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>°C</td>
<td>−5 to 50</td>
<td></td>
</tr>
<tr>
<td>Response time</td>
<td>ms</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td>V</td>
<td>DC24</td>
<td></td>
</tr>
<tr>
<td>Permissible voltage fluctuation</td>
<td>%</td>
<td>±10</td>
<td></td>
</tr>
<tr>
<td>Heat resistance grade</td>
<td></td>
<td>Grade B</td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>W</td>
<td>Holding: 0.5 (Inrush: 2)</td>
<td></td>
</tr>
<tr>
<td>Wiring</td>
<td>Connector with lead wire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass</td>
<td>g</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

(Note) When using the valve for vacuum break at less than 5 °C by supplying compressed air, use dry air passing through an air dryer to prevent dew condensation and freezing.

Ordering instruction

<table>
<thead>
<tr>
<th>Solenoid valve VA01PL</th>
<th>V23</th>
<th>1</th>
<th>P</th>
<th>M5</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
<td>V23</td>
<td>2-position 3-port Vacuum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P23</td>
<td>2-position 3-port Vacuum break (Positive pressure)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>1</td>
<td>DC24V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wiring specifications</td>
<td>P</td>
<td>Connector with lead wire, Side outlet (With indicator light &amp; surge suppressor)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>U</td>
<td>Connector with lead wire, Upside outlet (With indicator light &amp; surge suppressor)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port size</td>
<td>No mark</td>
<td>Without sub-base</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M5</td>
<td>M5×0.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wiring accessories</td>
<td>No mark</td>
<td>Without connector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>Connector with lead wire (Length: 500 mm)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Manifold MFS</th>
<th>V01</th>
<th>V3</th>
<th>CC</th>
<th>M5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of stations</td>
<td>2</td>
<td>2 stations</td>
<td></td>
<td></td>
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<td></td>
<td>10</td>
<td>10 stations</td>
<td></td>
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<tr>
<td>Type of valve</td>
<td>V3</td>
<td>PLV23 for vacuum</td>
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<td></td>
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<tr>
<td></td>
<td>P3</td>
<td>PLP23 for positive pressure</td>
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<tr>
<td>Manifold specifications</td>
<td>CC</td>
<td>Common 1, Common 3</td>
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<td></td>
</tr>
<tr>
<td>Port size</td>
<td>M5</td>
<td>M5×0.8</td>
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<table>
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<tr>
<th>Connector with lead wire</th>
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<tr>
<td>Lead wire length</td>
</tr>
<tr>
<td>500 mm</td>
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<tr>
<td>1000 mm</td>
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</table>

CAUTION

- Supply pressure of −100 to 0 kPa to vacuum supply port of VA01PLV23. Do not supply positive pressure.
- Supply pressure of 0 to 0.5 MPa to positive pressure supply port of VA01PLP23. Do not supply vacuum pressure.
Small-sized 3-port 2-position direct-acting latching solenoid valve for vacuum

Dimensions
Solenoid valve

(Unit : mm)

P type

U type

Manual override 12
Manual override 14

Port 1
M5×0.8

Port 2
M5×0.8

Port 3
M5×0.8

Lead wire length 500
AWG26

Lead wire length 500
AWG26

1 : Vacuum supply port
2 : Output port
3 : Atmospheric release port

1 : Pressure port
2 : Output port
3 : Exhaust port

VA01PLV23

VA01LPV23

VA01LP23
Small-sized 3-port 2-position direct-acting latching solenoid valve for vacuum

Dimensions

Manifold

(Unit: mm)

**MFS□-V01□-3CC-M5**

- **Port 1** M5×0.8
  - Vacuum port/Pressure port
- **Port 2** n-M5×0.8
  - Output port
- **Port 3** M5×0.8
  - Atmospheric release port/Exhaust port

**Lead wire length 300 AWG26**

- **P type**
  - **Lead wire length 300 AWG26**
- **U type**
  - **Lead wire length 300 AWG26**

**Circuit diagram**

**Blank plate V23-BP**

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

<table>
<thead>
<tr>
<th>n</th>
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<tr>
<td>10</td>
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</table>

n: Number of stations
WARNING

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