3-Port Solenoid Valve/Residual Pressure Release Valve with Detection of Main Valve Position

**With main valve position detection function**

**Category 2**

The main valve position detection function is used to detect inconsistencies between input signals and valve operations.

**With easy-to-construct redundant system**

**Categories 3 and 4**

When the dual residual pressure release valve is used, if one of the valves fails to operate, the other one releases the residual pressure.

---

**VP/VG Series**

RoHS**

*1 Refer to page 2 for compliant products.

*2 Refer to page 2 for certified products.
With main valve position detection function (Category 2)

Category 2 The safety function only requires the use of a single channel and is automatically checked.

The main valve position detection function is used to detect inconsistencies between input signals and valve operations.

- Input equipment (I): Detection equipment (sensor) of starting event
- Logical operation equipment (L): Relay sequence circuit, PLC control program
- Output equipment (O): Solenoid valve, Electromagnetic switch, Output relay

Recommended valve: VP542-X536

Residual pressure release valve

VP542-X536

• This product is to be used as a component of a safety system; the safety of the equipment as a whole cannot be guaranteed by this single unit alone.

With easy-to-construct redundant system (Categories 3 and 4)

Category 3 The redundancy prevents the loss of the safety function when a single failure occurs. The safety function must be checked before each use. An accumulation of undetected faults can cause the loss of the safety function.

Category 4 The redundancy prevents the loss of the safety function when a single failure occurs. The safety function must be checked before each use. An accumulation of undetected faults does not affect the safety function. (Features a higher DC and MTTFd than Category 3)

When the dual residual pressure release valve is used, if one of the valves fails to operate, the other one releases the residual pressure.

- Input equipment (I1, I2): Detection equipment (sensor) of starting event
- Logical operation equipment (L1, L2): Relay sequence circuit, PLC control program
- Output equipment (O1, O2): Solenoid valve, Electromagnetic switch, Output relay

Recommended valve: VP544-X538, VG342-X87

Residual pressure release valve

VP544-X538

A variety of safety limit switches can be selected.

Made by OMRON

Conduit (VP series only) and M12 connector (4 pin) types are available.

An M12 connector type with 6 pins is available.

With soft start-up function (-X555)

• A function to gradually increase the initial pressure of the pneumatic system has been added to the dual residual pressure release valve.

- Fixed orifice and variable throttle are available as throttle options for adjusting the pressure increase. (ø1, ø1.5, ø2)

Conduit (VP series only) and M12 connector (4 pin) types are available.

An M12 connector type with 6 pins is available.

Output Pressure (P2) vs Time Graph

When P1 reaches half of P2, the main valve of the soft start-up valve turns on.

Soft start-up valve: ON

Start supplying flow-adjusted air with the throttles by energizing valve 1 and valve 2.

Soft start-up valve: OFF

Valve 1, Valve 2: ON

Highly reliable construction

1. The main valve position is detected by relaying the main valve’s movements directly to the reed safety limit switch via the rod.

2. Long service life: B10D: 10 million cycles*1

3. The return spring ensures the release of residual pressure regardless of the pressure level.

*1 For the VP500/700, the safety limit switch made by OMRON
### Standards and Enclosure

<table>
<thead>
<tr>
<th>Model</th>
<th>Category</th>
<th>Safety limit switch manufacturer</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residual Pressure Release Valve</td>
<td>2</td>
<td>OMRON Corporation</td>
<td>EN ISO 13849-1:2015 (CE)</td>
</tr>
<tr>
<td>VP54/74-X536</td>
<td></td>
<td>Rockwell Automation, Inc.</td>
<td>EN ISO 13849-2:2012 (cUL)</td>
</tr>
<tr>
<td>Dual Residual Pressure Release Valve</td>
<td>3, 4</td>
<td>OMRON Corporation</td>
<td>EN ISO 4414:2010 (RoHS)</td>
</tr>
<tr>
<td>VP54/744-X538</td>
<td></td>
<td>Rockwell Automation, Inc.</td>
<td>EN ISO 13849-1:2015 (CE)</td>
</tr>
<tr>
<td>Dual Residual Pressure Release Valve with Soft Start-up Function</td>
<td>3, 4</td>
<td>OMRON Corporation</td>
<td>EN ISO 13849-2:2012 (cUL)</td>
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<tr>
<td>VG342-X87</td>
<td></td>
<td>Rockwell Automation, Inc.</td>
<td>EN ISO 13849-2:2012 (cUL)</td>
</tr>
</tbody>
</table>

### Series Variations

<table>
<thead>
<tr>
<th>Model</th>
<th>Category</th>
<th>Port size</th>
<th>Thread</th>
<th>Flow-rate characteristics C (_2) [dm(^3)/s·bar]</th>
<th>1→2 (P→A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residual Pressure Release Valve</td>
<td>2</td>
<td>3/8</td>
<td>Rc, G, NPT</td>
<td>8.9*1</td>
<td>15.1*1</td>
</tr>
<tr>
<td>VP54/74-X536</td>
<td></td>
<td>1/2</td>
<td>Rc, G, NPT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dual Residual Pressure Release Valve</td>
<td>3, 4</td>
<td>3/8</td>
<td>Rc, G, NPT</td>
<td>6.5</td>
<td>10.3</td>
</tr>
<tr>
<td>VP544/744-X538</td>
<td></td>
<td>1/2</td>
<td>Rc, G, NPT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dual Residual Pressure Release Valve with Soft Start-up Function</td>
<td>3, 4</td>
<td>3/8</td>
<td>Rc, G, NPT</td>
<td>5.2</td>
<td>9.8</td>
</tr>
<tr>
<td>VP544/744-X555</td>
<td></td>
<td>1/2</td>
<td>Rc, G, NPT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dual Residual Pressure Release Valve</td>
<td>3/4</td>
<td>3/4</td>
<td>Rc, G, NPT</td>
<td>26.6</td>
<td></td>
</tr>
<tr>
<td>VG342-X87</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See the SMC website for details on Safety Standard ISO 13849-1, refer to Guide to Products Conforming to International Standards.

* IP65 | IP65 | IP65

*1 Only available for port size 3/4"
Safety Standard ISO 13849-1 Certified

3-Port Solenoid Valve/Residual Pressure Release Valve with Detection of Main Valve Position

**VP500/700-X536, X538, X555**

### How to Order

#### Residual Pressure Release Valve

**Body ported**

<table>
<thead>
<tr>
<th>Series</th>
<th>Pilot</th>
<th>Voltage</th>
<th>Electrical entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 VP500</td>
<td>nil</td>
<td>5 24 VDC</td>
<td>DZ DIN terminal, With light/surge voltage suppressor</td>
</tr>
<tr>
<td>7 VP700</td>
<td>R</td>
<td>5 24 VDC</td>
<td>YZ DIN (EN 175301-803) terminal, With light/surge voltage suppressor</td>
</tr>
</tbody>
</table>

**Base mounted**

<table>
<thead>
<tr>
<th>Series</th>
<th>Pilot</th>
<th>Voltage</th>
<th>Electrical entry</th>
</tr>
</thead>
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</tr>
<tr>
<td>7 VP700</td>
<td>R</td>
<td>5 24 VDC</td>
<td>YZ DIN (EN 175301-803) terminal, With light/surge voltage suppressor</td>
</tr>
</tbody>
</table>

**Part Nos.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Part no.</th>
<th>Applicable model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modular adapter</td>
<td>E310-U03</td>
<td>VP544-3-5-1-03</td>
</tr>
<tr>
<td>Modular adapter</td>
<td>E410-U04</td>
<td>VP544-3-5-1-04</td>
</tr>
<tr>
<td>Modular adapter</td>
<td>E410-U04</td>
<td>VP744-5-1-04</td>
</tr>
</tbody>
</table>

#### Dual Residual Pressure Release Valve

<table>
<thead>
<tr>
<th>Series</th>
<th>Pilot</th>
<th>Voltage</th>
<th>Electrical entry</th>
</tr>
</thead>
<tbody>
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<td>5 24 VDC</td>
<td>DZ DIN terminal, With light/surge voltage suppressor</td>
</tr>
<tr>
<td>7 VP700</td>
<td>R</td>
<td>5 24 VDC</td>
<td>YZ DIN (EN 175301-803) terminal, With light/surge voltage suppressor</td>
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<td>VP544-3-5-1-03</td>
</tr>
<tr>
<td>Modular adapter</td>
<td>E410-U04</td>
<td>VP544-3-5-1-04</td>
</tr>
<tr>
<td>Modular adapter</td>
<td>E410-U04</td>
<td>VP744-5-1-04</td>
</tr>
</tbody>
</table>

### Notes

- Refer to Installation on page 22 before selecting the internal pilot type.
- Refer to page 22 for details on Y type.
- For the internal pilot, the symbol is nil.
- Refer to Piping for External Pilot Type on page 5 for selection of the check valve.
- Refer to page 2 for compliant products.
How to Order

Dual Residual Pressure Release Valve with Soft Start-up Function

VP 5 44 5 DZ 03 M X555

1 Series
5 VP500
7 VP700

2 Pilot
Nil Internal pilot
R External pilot

3 Voltage
5 24 VDC

4 Electrical entry
DZ DIN terminal, With light/surge voltage suppressor
YZ DIN (EN 175301-803) terminal, With light/surge voltage suppressor

∗ Refer to Installation on page 22 before selecting the internal pilot type.

5 Port size
Symbol Port size VP500 VP700
03 3/8 Nil Nil
04 1/2 — —

6 Thread
Nil Rc
F G
N NPT

7 Safety limit switch/Wiring
Nil G1/2 (Made by OMRON)
M M12 connector (Made by OMRON)
S1 M12 connector (Made by Rockwell Automation)

8 With check valve (Only external pilot)
Symbol Check valve Applicable tube O.D. Thread
Nil None — —
A Yes ø6 — —
B Yes ø1/4" ø1.5 fixed orifice

∗ Refer to Piping for External Pilot Type on page 5 for selection of the check valve.

9 Throttle
Nil Variable throttle
10 ø1 fixed orifice
15 ø1.5 fixed orifice
20 ø2 fixed orifice

∗ Refer to page 22 for details on Y type.

Made to Order

1 Series Compatible with Secondary Batteries
For details on 25A-, refer to the Web Catalog “Series Compatible with Secondary Batteries/25A- Series.”

How to Order

25A-VP 4 5 DZ 03 M X536 X538 X555

∗ Electrical entry can be selected only for D type.
Check valve type is available only when the thread type is Rc.

Secondary battery compatible
Valve Specifications

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of actuation</td>
<td>N.C. (Spring return)</td>
</tr>
<tr>
<td>Operation</td>
<td>Internal pilot</td>
</tr>
<tr>
<td>Operating pressure range</td>
<td>0.25 to 0.7 MPa</td>
</tr>
<tr>
<td>External pilot pressure</td>
<td>—</td>
</tr>
<tr>
<td>Maximum operating frequency</td>
<td>30 cycles/minute</td>
</tr>
<tr>
<td>Minimum operating frequency</td>
<td>1 cycle/week</td>
</tr>
<tr>
<td>Operating and ambient temperatures</td>
<td>−10 to 50°C (No freezing)</td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>20 to 90% RH (No condensation)</td>
</tr>
<tr>
<td>Manual override</td>
<td>None</td>
</tr>
<tr>
<td>Pilot exhaust</td>
<td>Individual exhaust</td>
</tr>
<tr>
<td>Lubrication</td>
<td>Not required</td>
</tr>
<tr>
<td>Mounting orientation</td>
<td>Unrestricted</td>
</tr>
<tr>
<td>Impact/Vibration resistance</td>
<td>150/30 m/s²</td>
</tr>
<tr>
<td>Enclosure</td>
<td>IP65</td>
</tr>
<tr>
<td>Operating environment</td>
<td>Indoors</td>
</tr>
<tr>
<td>B₁₀₀ (MTTFd calculation)</td>
<td>10,000,000 cycles</td>
</tr>
</tbody>
</table>

**Internal Pilot Type**

**Caution**

Even when the inlet pressure is within the operating pressure range, restricted piping, etc., may cause reduced flow on the inlet side, leading to the valve not operating properly. Refer to Installation in the Specific Product Precautions for details.

**Piping for External Pilot Type**

**Caution**

The product may not operate when the external pilot pressure is insufficient due to simultaneous operation or restricted air piping. In this case, use the check valve (AKH series) with the external pilot port, change the piping size or adjust the set pressure to provide a constant pressure of 0.25 MPa or more.

Flow-rate Characteristics / Weight

<table>
<thead>
<tr>
<th>Model</th>
<th>Flow-rate characteristics 1→2 (P→A)</th>
<th>Flow-rate characteristics 2→3 (A→R)</th>
<th>Weight [g]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C [dm³/(s·bar)]</td>
<td>b</td>
<td>Cv</td>
</tr>
<tr>
<td>VP542-X536</td>
<td>8.9</td>
<td>0.16</td>
<td>2.2</td>
</tr>
<tr>
<td>VP544-X536</td>
<td>8.8</td>
<td>0.07</td>
<td>2.0</td>
</tr>
<tr>
<td>VP742-X536</td>
<td>15.1</td>
<td>0.21</td>
<td>3.6</td>
</tr>
<tr>
<td>VP744-X536</td>
<td>14.7</td>
<td>0.05</td>
<td>3.3</td>
</tr>
<tr>
<td>VP544-X538</td>
<td>6.5</td>
<td>0.08</td>
<td>1.3</td>
</tr>
<tr>
<td>VP744-X538</td>
<td>10.3</td>
<td>0.08</td>
<td>2.3</td>
</tr>
<tr>
<td>VP544-X555</td>
<td>5.2</td>
<td>0.06</td>
<td>1.1</td>
</tr>
<tr>
<td>VP744-X555</td>
<td>9.8</td>
<td>0.08</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Needle Valve / Flow-rate Characteristics (VP544/744-X555)

![Flow-rate Characteristics Graph](image)

Solenoid Specifications

<table>
<thead>
<tr>
<th>Electrical entry</th>
<th>DIN terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Allowable voltage/frequency</td>
<td>±10%</td>
</tr>
<tr>
<td>Power consumption</td>
<td>0.45 W</td>
</tr>
<tr>
<td>Surge voltage suppressor</td>
<td>Varistor</td>
</tr>
<tr>
<td>Indicator</td>
<td>LED</td>
</tr>
</tbody>
</table>

Safety Limit Switch Specifications

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>OMRON</th>
<th>Rockwell Automation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical entry</td>
<td>DIN terminal</td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td>24 VDC</td>
<td></td>
</tr>
<tr>
<td>Max. voltage</td>
<td>24 VDC</td>
<td></td>
</tr>
<tr>
<td>Insulation voltage</td>
<td>300 V</td>
<td>600 V</td>
</tr>
<tr>
<td>Protection against electric shock</td>
<td>Class II EN 60947-5-1:2004</td>
<td></td>
</tr>
</tbody>
</table>
### Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Terminal/Pin Numbers (Built-in switch 2 N.C.)</th>
<th>Recommended Crimped Terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M12 connector pin number</td>
<td>G1/2 terminal number</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>VP54(R)/744(R)-X536</td>
<td>Internal pilot</td>
<td>External pilot</td>
</tr>
<tr>
<td>VP544(R)/744(R)-X538</td>
<td>Internal pilot</td>
<td>External pilot</td>
</tr>
<tr>
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<td>Internal pilot</td>
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</tbody>
</table>

Safety limit switch terminal [N.C.]
M12 connector pin number
G1/2 terminal number

#### Recommended Crimped Terminals

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Type</th>
<th>Wiring size</th>
</tr>
</thead>
<tbody>
<tr>
<td>J.S.T. Mfg. Co., Ltd.</td>
<td>FV0.5-3.7</td>
<td>AWG20 (0.5 mm²)</td>
</tr>
</tbody>
</table>

J.S.T. Mfg. Co., Ltd. is a Japanese manufacturer.

---

**VP500/700-X536, X538, X555**

3-Port Solenoid Valve/Residual Pressure Release Valve with Detection of Main Valve Position

**Safety Standard ISO 13849-1 Certified**

**VP500/700**

**Optional Accessories**

**Specific Product Precautions**

**Symbols**

Made by OMRON

---

**Symbols**

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Safety limit switch terminal [N.C.]
M12 connector pin number
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J.S.T. Mfg. Co., Ltd. is a Japanese manufacturer.

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**VP500/700**

**Optional Accessories**

**Specific Product Precautions**

**Symbols**

Made by OMRON

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Safety limit switch terminal [N.C.]
M12 connector pin number
G1/2 terminal number

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J.S.T. Mfg. Co., Ltd. is a Japanese manufacturer.
Symbols

Safety limit switch

Made by
Rockwell Automation

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Pin Numbers (Built-in switch 3 N.C.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M12 connector pin number Wiring specification</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>①</td>
</tr>
<tr>
<td></td>
<td>②</td>
</tr>
<tr>
<td></td>
<td>③</td>
</tr>
<tr>
<td></td>
<td>④</td>
</tr>
</tbody>
</table>

VP54□(R)/74□(R)-X536

Internal pilot

External pilot

External pilot/With check valve

Safety limit switch terminal [N.C.]
M12 connector pin number

VP544(R)/744(R)-X538

Internal pilot

External pilot

External pilot/With check valve

VP544(R)/744(R)-X555

Internal pilot

External pilot

External pilot/With check valve
VP542(R)-5 Ø Z1-03 □ □-X536
VP542(R)-5 Ø Z1-03 □ □-M-X536

Port size: 1/8 (Without check valve)
Applicable tube O.D.: ø6, ø1/4” (With check valve)
(External pilot port)

Applicable cable O.D.
ø3.5 to ø7

Port: 3/8
[2(A) port]

2 x ø4.2
(For mounting)

View A
For M12 connector

Safety limit switch (Made by OMRON)
Part number: D4N-2B31 (Conduit G1/2)
D4N-9B31 (M12 connector)

VP544(R)-5 Ø Z1-03 □ □-□-X536

2 x ø5.2
(For mounting)

Safety limit switch (Made by OMRON)
Part number: D4N-2B31 (Conduit G1/2)
D4N-9B31 (M12 connector)

M5 x 0.8
(External pilot port)
<For the external pilot type>

Vent port
(ø6.2)

3/8
[1(P), 3(R) port]
VP500/700-X536

Residual Pressure Release Valve (-X536)

VP542(R)-5\[Z1-03\[S1\[X536

- Safety limit switch
- Made by Rockwell Automation
- Applicable cable O.D.: ø3.5 to ø7

VP544(R)-5\[Z1-03\[S1\[X536

- Safety limit switch
- Made by Rockwell Automation
- Applicable cable O.D.: ø3.5 to ø7

Dimensions

View A

M12 connector

Pin number

Applicable tube O.D.: ø6, ø1/4" (With check valve)

(External pilot port)

Port size: 1/8 (Without check valve)

[2(A) port] 3/8

Distance between ports: 31.5

Safety limit switch (Made by Rockwell Automation)
Part number: 440P-CDPB03R6

(22.6)

(With check valve)

[1(P), 3(R) port] 3/8

[1(P), 3(R) port] 3/8

Vent port (ø6.2)

Pin number

Applicable cable O.D.: ø3.5 to ø7

(External pilot port)

<For the external pilot type>

M5 x 0.8

(External pilot port)

(Max. 10)
Applicable cable O.D. ø3.5 to ø7

Port size: 1/8 (Without check valve)
Applicable tube O.D.: ø6, ø1/4" (With check valve)
(External pilot port)

Safety limit switch (Made by Rockwell Automation)
Part number: 440P-CDPB03R6

With check valve

M12 connector

View A

Pin number

Made by Rockwell Automation

VP500/700-X536

Dimensions

Residual Pressure Release Valve (-X536)

VP742(R)-5□Z1-04□-S1□-X536

Safety limit switch

Applicable cable O.D. ø3.5 to ø7

2 x ø5.2 (For mounting)

Port: 1/2 (Max. 10)

Applicable cable O.D. ø3.5 to ø7

2 x ø6.2 (For mounting)

Port: 1/2 (Max. 10)

M12 connector

View A

Pin number

Made by Rockwell Automation

VP744(R)-5□Z1-04□-S1□-X536

Safety limit switch (Made by Rockwell Automation)
Part number: 440P-CDPB03R6

With check valve

M12 connector

View A

Pin number

Made by Rockwell Automation
**Dimensions**

**VP544(R)-5Z1-03-□-X538**
**VP544(R)-5Z1-03-□-M-□-X538**

*Port size: 1/8 (Without check valve)
Applicable tube O.D.: ø6, ø1/4" (With check valve)*

*Applicable cable O.D.: ø3.5 to ø7*

*Vent port (ø6.2) (With check valve)*

*Safety limit switch (Made by OMRON)*

Part number: D4N-2B31 (Conduit G1/2)
D4N-9B31 (M12 connector)

**Dual Residual Pressure Release Valve (-X538)**

**View A**
*For M12 connector*

**Pin number**

Made by OMRON

**Safety Standard ISO 13849-1 Certified**

3-Port Solenoid Valve/Residual Pressure Release Valve with Detection of Main Valve Position

**VP500/700-X538**

**Specific Product Precautions**

**Optional Accessories**

**Symbols**

**VP500/700**

**X536**

**X538**

**X555**

**VG342**

**X87**
VP500/700-X538

Dimensions

VP544(R)-5Z1-03-S1-X538

Safety limit switch
Made by Rockwell Automation

Port size: 1/8 (Without check valve)
Applicable tube O.D.: ø6, ø1/4” (With check valve)
(External pilot port)

Applicable cable O.D.
ø3.5 to ø7

(22.9) (With check valve)

2 x ø5.2
(For mounting)

M12 connector

2 x 3/8
[3(R) port]

Vent port
(ø6.2)

Safety limit switch (Made by Rockwell Automation)
Part number: 440P-CDPB03R6

Dimensions
VP544(R)-5Z1-03-S1-X538

A

View A
M12 connector

Pin number

Made by Rockwell Automation

Port size: 1/8 (Without check valve)
Applicable tube O.D.: ø6, ø1/4” (With check valve)
(External pilot port)

Applicable cable O.D.
ø3.5 to ø7

(22.9) (With check valve)

2 x ø5.2
(For mounting)

M12 connector

2 x 3/8
[3(R) port]

Vent port
(ø6.2)

Safety limit switch (Made by Rockwell Automation)
Part number: 440P-CDPB03R6

Dimensions
VP544(R)-5Z1-03-S1-X538

A

View A
M12 connector

Pin number
Dimensions

VP744(R)-5\(\bar{Z}\)1-04\(\bar{S}\)-\(\bar{X}\)538
VP744(R)-5\(\bar{Z}\)1-04\(\bar{M}\)-\(\bar{X}\)538

Port size: 1/8 (Without check valve)
Applicable tube O.D.: ø6, ø1/4” (With check valve)

Applicable cable O.D.: ø3.5 to ø7

Safety limit switch
Made by OMRON

Vent port (ø6.2)
(With check valve)

Safety limit switch (Made by OMRON)
Part number: D4N-2B31 (Conduit G1/2)
D4N-9B31 (M12 connector)
Applicable cable O.D.: ø3.5 to ø7

Applicable tube O.D.: ø6, ø1/4" (With check valve)

Port size: 1/8 (Without check valve)

Safety limit switch (Made by Rockwell Automation)
Part number: 440P-CDPB03R6

Dimensions

VP744(R)-5□Z1-0□-S1□-X538

Dual Residual Pressure Release Valve (-X538)
Applicable cable O.D. (ø3.5 to ø7)

35
15
93.8

90.4
8
125
109

5 47
28.5

75.5

101.3

Vent port (ø6.2)

15.5

24.2

(With check valve)

Dual Residual Pressure Release Valve with Soft Start-up Function (-X555)

VP544(R)-5 Z1-03 □ □ □ -X555
VP544(R)-5 Z1-03 □ □ □ -M □ □ □ -X555

Port size: 1/8 (Without check valve)
Applicable tube O.D.: ø6, ø1/4" (With check valve)

Vent port

Made by OMRON

Safety limit switch (Made by OMRON)
Part number: D4N-2B31 (Conduit G1/2) : D4N-9B31 (M12 connector)

Pin number

View A For M12 connector

Dual Residual Pressure Release Valve with Detection of Main Valve Position
VP500/700-X555

3-Port Solenoid Valve/
VP544(R)-5Z1-03-S1-[ ]-X555

Dimensions Dual Residual Pressure Release Valve with Soft Start-up Function (-X555)

Made by Rockwell Automation

- Vent port (ø6.2)
- Port size: 1/8 (Without check valve)
- Applicable tube O.D.: ø6, ø1/4” (With check valve)
- (External pilot port)
- Applicable cable O.D. (ø3.5 to ø7)
- 2 x ø5.2 (For mounting)
- M12 connector
- 2 x 3/8 [3(R) port]
- Variable throttle type
- Safety limit switch (Made by Rockwell Automation)
- Part number: 440P-CDPB03R6
- View A
- Made by Rockwell Automation
- Safety limit switch
- VP500/700-X555
- Pin number
- M12 connector
- Vent port (ø6.2)
- (With check valve)
- (22.9)
- (Max. 10)
- ø1
- M12 connector
- 3/8 [2(A) port]
- 28.5
- 90.4
- 216.1
- 109
- 125
- (90.4)
- (90.428.5)
- 216.7
- 15
- 28.5
- 90.4
- 216.7
- 15.5
- 24.2
- 55.7
- ø5.2

Applicable cable O.D. (ø3.5 to ø7)
Applicable tube O.D.: ø6, ø1/4” (With check valve)
Port size: 1/8 (Without check valve)
Variable throttle type
Safety limit switch
Part number: 440P-CDPB03R6
View A
M12 connector
Pin number
Vent port (ø6.2)
(With check valve)
(22.9)
(With check valve)
(22.9)
(28.5)
Dimensions

Dual Residual Pressure Release Valve with Soft Start-up Function (-X555)

VP744(R)-5 Z1-04-□□-X555
VP744(R)-5 Z1-04-□□-M□□-X555

Safety limit switch
Made by OMRON

Port size: 1/8 (Without check valve)
Applicable tube O.D.: ø6, ø1/4" (With check valve)

Applicable cable O.D.: ø3.5 to ø7

2 x ø6.2
(For mounting)

67 6.5

M12 connector)

2 x 1/2
(5(R) port)

18.5 22.9

Vent port
(ø6.4)

88.9

(Variable throttle type)

(External pilot port)

99 124.8

27.2 18

36

(With check valve)

224.8

88.9

40

1/2

1/8

Solenoid Valve/
Residual Pressure Release Valve with Detection of Main Valve Position VP500/700-X555

VP500/700

Symbols

X536

X538

X555

X87

VG342

Optional Accessories

Specific Product Precautions Symbols

Specific Product Precautions

Optional Accessories

See page 4 for 3-port solenoid valve:
Residual pressure release valve with detection of main valve position VP500/700-X555
VP500/700-X555

Dimensions

Dual Residual Pressure Release Valve with Soft Start-up Function (-X555)

VP744(R)-5 Z1-04 S1 □□□-X555

- Safety limit switch
- Made by Rockwell Automation

Port size: 1/8 (Without check valve)
Applicable tube O.D.: ø6, ø1/4" (With check valve)

Variable throttle type

Max. 10

Made by Rockwell Automation

Part number: 440P-CDPB03R6
VP500/700-X536, X538, X555
Optional Accessories

For details on optional accessories, refer to the Web Catalog.

Piping Adapter: 3/8, 1/2

A piping adapter allows installation/removal of the component without removing the piping and thus makes maintenance easier.

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Port size</th>
<th>A</th>
<th>B</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>E300-03-A</td>
<td>3/8</td>
<td>31.8</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>E400-04-A</td>
<td>1/2</td>
<td>31.8</td>
<td>36</td>
<td>36</td>
</tr>
</tbody>
</table>

*1 in part numbers indicates a pipe thread type. No indication is necessary for Rc; however, indicate N for NPT, and F for G.

Separate interfaces are required for modular unit.

Ordering Example 1

Dual residual pressure release valve
VP544-5DZ1-03-X555 ...... 1 pc.
Filter regulator
AW30-03G-A ................. 1 pc.
Spacer with bracket
Y300T-A .................... 3 pcs.
Piping adapter
E300-03-A .................. 2 pcs.

*1 Products do not come assembled.

Ordering Example 2

Residual pressure release valve/ Base mounted
VP544R-5DZ1-03M-X536 ... 1 pc.
Filter regulator
AW30-03G-A ................ 1 pc.
Spacer with bracket
Y300T-A .................... 3 pcs.
Piping adapter
E300-03-A .................. 2 pcs.

*1 Products do not come assembled.
**VP500/700-X536, X538, X555**

**Spacer with Bracket Mounting Position**

Residual Pressure Release Valve (VP544/744-X536)  
Dual Residual Pressure Release Valve (X538)

<table>
<thead>
<tr>
<th>Model</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP544R-SDZ1-03-536</td>
<td>33.9</td>
<td>75.2</td>
<td>74.2</td>
<td>199.2</td>
<td>AW30-03G-A Y300T-A E300-03-A</td>
</tr>
<tr>
<td>VP744R-SDZ1-03-536</td>
<td>34.4</td>
<td>75.2</td>
<td>89.2</td>
<td>233.2</td>
<td>AW40-04G-A Y400T-A E400-04-A</td>
</tr>
</tbody>
</table>

Dual Residual Pressure Release Valve  
with Soft Start-up Function (X555)

<table>
<thead>
<tr>
<th>Model</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP544R-SDZ1-03-555</td>
<td>33.9</td>
<td>57.2</td>
<td>129.2</td>
<td>254.2</td>
<td>AW30-03G-A Y300T-A E300-03-A</td>
</tr>
<tr>
<td>VP744R-SDZ1-04-555</td>
<td>34.4</td>
<td>75.2</td>
<td>160.2</td>
<td>304.2</td>
<td>AW40-04G-A Y400T-A E400-04-A</td>
</tr>
</tbody>
</table>
VP500/700-X536, X538, X555
Specific Product Precautions

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For 3/4/5-port solenoid valve precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: http://www.smcworld.com

How to Use DIN Terminal Connector

**Caution**

**Connection**
1. Loosen the holding screw and pull the connector out of the solenoid valve terminal block.
2. After removing the holding screw, insert a flat blade screwdriver, etc., into the notch on the bottom of the terminal block and pry it open, separating the terminal block and the housing.
3. Loosen the terminal screws (slotted screws) in the terminal block. Insert the lead core wires into the terminals according to the connection method, and secure the wires by re-tightening the terminal screws.
4. Secure the cord by fastening the gland nut.

**Caution**

When making connections, please note that using a heavy-duty cord of a size outside of the range of supported sizes (ø3.5 to ø7) will not satisfy IP65 (enclosure) standards. Also, be sure to tighten the gland nut and holding screw within their specified torque ranges.

**Changing the entry direction**

After separating the terminal block and housing, the cord entry direction can be changed by rotating the housing in the desired direction (4 directions at 90° intervals).

* When equipped with a light, be careful not to damage the light with the cord’s lead wires.

**Precautions**

Plug in and pull out the connector vertically without tilting it to one side.

**Compatible cable**

Cord O.D.: ø3.5 to ø7 (Reference) 0.5 mm², 2-core or 3-core, equivalent to JIS C 3306

![Diagram of DIN Terminal Connector](image)

**“Y” type**

The Y type DIN connector is in compliance with the DIN standard of a 8 mm pitch between terminals.
- It is not interchangeable with the D type DIN connector with a 9.4 mm pitch between terminals.
- To distinguish it from the D type DIN connector, “N” is listed at the end of voltage symbol.
- The dimensions are the same as those of the D type DIN connector.

Light/Surge Voltage Suppressor

DIN Terminal

![Diagram of Light/Surge Voltage Suppressor](image)

With light (DZ) (YZ)

No. 1
No. 2
Varistor
LED
Coil

There is no polarity.

* The varistor surge voltage suppressor has residual voltage corresponding to the protective element and rated voltage; therefore, protect the controller side from the surge voltage.

Limit Switch Cable

An OMRON or Rockwell Automation M12 connector limit switch cable is available.

**M12 Connector Cable (4 Pins) Made by OMRON**

<table>
<thead>
<tr>
<th>Part number</th>
<th>Cable length [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZS-37-L</td>
<td>300</td>
</tr>
<tr>
<td>ZS-37-M</td>
<td>500</td>
</tr>
<tr>
<td>ZS-37-N</td>
<td>1000</td>
</tr>
<tr>
<td>ZS-37-P</td>
<td>2000</td>
</tr>
<tr>
<td>ZS-37-C</td>
<td>5000</td>
</tr>
</tbody>
</table>

**M12 Connector Cable (6 Pins) Made by Rockwell Automation**

<table>
<thead>
<tr>
<th>Part number</th>
<th>Cable length [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP500-231-1</td>
<td>2000</td>
</tr>
</tbody>
</table>

Rockwell Automation part number: 889R-F6ECA-2

* We recommend using one of the straight type M12 connector cables above. If the L type is used, the cable entry direction will not be fixed.

Installation

1. Use the external pilot type when using the VP500/700-X536 or X538 with the AV series. Install the AV series on the primary side.

2. For the VP500/700-X536 and X538 internal pilot type, even when the inlet pressure is within the operating pressure range, restricted piping, etc., may cause reduced flow on the inlet side, leading to the valve not operating properly.

* The recommended piping size is 3/8” for the VP500 and 1/2” for the VP700. Also, use piping with an ID of 10 mm or larger for the VP500, and 13 mm or larger for the VP700.

* When selecting a regulator or a filter regulator, use piping larger than the recommended size with sufficient flow rate characteristics.

* For extended piping between the regulator and the valve (inlet piping), keep piping as short as possible (1 m or less).

* For use under conditions other than those listed above, please use the external pilot type.
3-Port Solenoid Valve/ Residual Pressure Release Valve with Detection of Main Valve Position

**VG342-X87**

**How to Order**

### Dual Residual Pressure Release Valve

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pilot</td>
<td>2</td>
<td>Voltage</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S</td>
<td>24 VDC</td>
</tr>
<tr>
<td></td>
<td>Nil</td>
<td>Internal pilot</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>External pilot</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4</th>
<th>Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>06</td>
</tr>
<tr>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

### Made to Order

**1 Series Compatible with Secondary Batteries**

For details on 25A-, refer to the Web Catalog “Series Compatible with Secondary Batteries/25A- Series.”

**How to Order**

25A-VG342-5DZ-□-□-M-□-X87

- Fill in according to How to Order above.
- Secondary battery compatible

---

* Primary battery compatible

---

- Electrical entry can be selected only for D type. Check valve type is available only when the thread type is Rc.
Valve Specifications

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of actuation</td>
<td>N.C. (Spring return)</td>
</tr>
<tr>
<td>Operation</td>
<td>Internal pilot</td>
</tr>
<tr>
<td>Operating pressure range</td>
<td>0.25 to 0.7 MPa</td>
</tr>
<tr>
<td>External pilot pressure</td>
<td>—</td>
</tr>
<tr>
<td>Maximum operating frequency</td>
<td>30 cycles/minute</td>
</tr>
<tr>
<td>Minimum operating frequency</td>
<td>1 cycle/week</td>
</tr>
<tr>
<td>Operating and ambient temperatures</td>
<td>–10 to 50°C (No freezing)</td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>95% RH or less (No condensation)</td>
</tr>
<tr>
<td>Manual override</td>
<td>None</td>
</tr>
<tr>
<td>Pilot exhaust</td>
<td>Individual exhaust</td>
</tr>
<tr>
<td>Lubrication</td>
<td>Not required</td>
</tr>
<tr>
<td>Mounting orientation</td>
<td>Unrestricted</td>
</tr>
<tr>
<td>Impact/Vibration resistance</td>
<td>150/50 m/s²</td>
</tr>
<tr>
<td>Enclosure</td>
<td>IP40</td>
</tr>
<tr>
<td>Operating environment</td>
<td>Indoors</td>
</tr>
<tr>
<td>Weight</td>
<td>2.8 kg (1&quot; type: 3.2 kg)</td>
</tr>
<tr>
<td>B100 (MTTFd calculation)</td>
<td>1,000,000 cycles</td>
</tr>
</tbody>
</table>

**Internal Pilot Type**

⚠️ Caution

Even when the inlet pressure is within the operating pressure range, restricted piping, etc., may cause reduced flow on the inlet side, leading to the valve not operating properly. Refer to Installation in the Specific Product Precautions for details.

**Piping for External Pilot Type**

⚠️ Caution

The product may not operate when the external pilot pressure is insufficient due to simultaneous operation or restricted air piping. In this case, use the check valve (AKH series) with the external pilot port, change the piping size or adjust the set pressure to provide a constant pressure of 0.25 MPa or more.

Flow-rate Characteristics

<table>
<thead>
<tr>
<th>Model</th>
<th>Flow-rate characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1→2 (P→A)</td>
</tr>
<tr>
<td></td>
<td>C</td>
</tr>
<tr>
<td>VG342-06-X87</td>
<td>26.6</td>
</tr>
<tr>
<td>VG342-10-X87</td>
<td>25.5</td>
</tr>
</tbody>
</table>

Solenoid Specifications

| Electrical entry | DIN terminal |
| Rated voltage   | 24 VDC |
| Allowable voltage fluctuation | –15% to +10% of the rated voltage |
| Power consumption | 2.2 W |
| Suppressor      | Diode |
| Indicator       | LED |

Safety Limit Switch Specifications

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>OMRON</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rockwell Automation</td>
<td></td>
</tr>
<tr>
<td>Electrical wiring</td>
<td>M12 connector</td>
</tr>
<tr>
<td>Contact resistance</td>
<td>25 mΩ or less</td>
</tr>
<tr>
<td>Min. applicable load</td>
<td>50 mA</td>
</tr>
<tr>
<td>Max. voltage</td>
<td>24 VDC</td>
</tr>
<tr>
<td>Max. load current</td>
<td>50 mA</td>
</tr>
<tr>
<td>Max. load inductance</td>
<td>0.5 H</td>
</tr>
<tr>
<td>Insulation voltage</td>
<td>300 V</td>
</tr>
<tr>
<td>Protection against electric shock</td>
<td>Class II (EN 60947-5-1:2004)</td>
</tr>
</tbody>
</table>

24
VG342-X87

Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Pin Numbers (Built-in switch 2 N.C.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M12 connector pin number</td>
</tr>
<tr>
<td></td>
<td>①</td>
</tr>
<tr>
<td></td>
<td>②</td>
</tr>
<tr>
<td></td>
<td>③</td>
</tr>
<tr>
<td></td>
<td>④</td>
</tr>
</tbody>
</table>

VG342(R)-X87

Internal pilot

External pilot

External pilot/With check valve

| Safety limit switch | Made by OMRON |

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Pin Numbers (Built-in switch 3 N.C.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M12 connector pin number</td>
</tr>
<tr>
<td></td>
<td>①</td>
</tr>
<tr>
<td></td>
<td>⑤</td>
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<td>②</td>
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<td></td>
<td>③</td>
</tr>
<tr>
<td></td>
<td>④</td>
</tr>
</tbody>
</table>

VG342(R)-X87

Internal pilot

External pilot

External pilot/With check valve

| Safety limit switch | Made by Rockwell Automation |

Made by OMRON

Made by Rockwell Automation

Symbols

Pin Numbers (Built-in switch 2 N.C.)

Pin Numbers (Built-in switch 3 N.C.)
**Dimensions**

**VG342(R)-5DZ-06□-M□-X87**

- **Safety limit switch**
  - Made by OMRON

- **Port size:** 1/8 (Without check valve)
  - Applicable tube O.D.: ø8, ø5/16" (With check valve)
  - (External pilot port)

- **Channel 2**
  - M12 x 1
  - Pg9

- **View A**
  - Pin number

- **M12 connector**

- **Dual Residual Pressure Release Valve (-X87)**

- **Specific Product**
  - Precautions Symbols
  - Optional Accessories

- **VP500/700**

- **Symbols**

- **X536**

- **X538**

- **X555**

- **X87**

- Safety Standard ISO 13849-1 Certified
  - 3-Port Solenoid Valve/Residual Pressure Release Valve with Detection of Main Valve Position
  - VG342-X87

- VP500/700

- Specific Product
  - Precautions

- Optional Accessories
Dual Residual Pressure Release Valve (-X87) 

VG342(R)-5DZ-06□-S1□-X87

Port size: 1/8 (Without check valve) 
Applicable tube O.D.: ø8, ø5/16" (With check valve) 
(External pilot port)

Vent port 
Should be normally open.

Channel 2 
A 
M12 x 1
Pg9

Channel 1 

2 x 3/4 [3(R) port] 
Should be normally open.

Dimensions

View A
M12 connector
Pin number

Made by Rockwell Automation

Safety limit switch

Applicable cable O.D.: ø4.5 to ø7
(Part number: 440P-CDPB03R6)

VP500/700
Symbols
X536
X538
X555
X87
Optional Accessories

Specific Product Precautions
Symbols

Specific Product Precautions

Optional Accessories

3-Port Solenoid Valve/ Residual Pressure Release Valve with Detection of Main Valve Position
VG342-X87

VP500/700
Symbols
X536
X538
X555
X87
Optional Accessories

Specific Product Precautions
Symbols

Specific Product Precautions

Optional Accessories

3-Port Solenoid Valve/ Residual Pressure Release Valve with Detection of Main Valve Position
VG342-X87
VG342-X87

Dimensions

VG342(R)-5DZ-10□-S1□-X87

Port size: 1/8 (Without check valve)
Applicable tube O.D.: ø8, ø5/16" (With check valve)
(External pilot port)

64.5

Port size: 1/8 (Without check valve)
Applicable tube O.D.: ø8, ø5/16" (With check valve)

Vent port
Should be normally open
3 x ø8.5
(Mounting hole)

Safety limit switch
(Made by Rockwell Automation)
Part number: 440F-CDPB03R6
Applicable cable O.D.
ø4.3 to ø7

Channel 1
Channel 2

M12 x 1

Pin number

View A
M12 connector

Made by Rockwell Automation

View A

Dual Residual Pressure Release Valve (-X87)
VG342-X87
Specific Product Precautions

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For 3/4/5-port solenoid valve precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: http://www.smcworld.com

How to Use DIN Terminal Connector

Caution

Connection
1. Loosen the holding screw and pull the connector out of the solenoid valve terminal block.
2. After removing the holding screw, insert a flat blade screwdriver, etc., into the notch on the bottom of the terminal block and pry it open, separating the terminal block and the housing.
3. Loosen the terminal screws in the terminal block. Insert the lead core wires into the terminals, and secure the wires by re-tightening the terminal screws.
4. Secure the cord by fastening the gland nut.

Changing the entry direction
After separating the terminal block and housing, the cord entry direction can be changed by rotating the housing in the opposite direction by 180°.

Precautions
Plug in and pull out the connector vertically without tilting it to one side.

Compatible cable
Cord O.D.: ø4.5 to ø7
(Reference) 0.5 to 1.5 mm², 2-core or 3-core, equivalent to JIS C 3306

Applicable crimped terminals
O-terminals: Equivalent to R1.25-4M defined in the JIS C 2805
Rod-terminals: Up to size 1.5

Gland nut
Tightening torque 2.5 to 3.75 N·m

Terminal block
Tightening torque 0.4 to 0.5 N·m

Holding screw
Tightening torque 0.5 to 0.6 N·m

Washer

Grommet (Rubber)

Tightening torque 2.5 to 3.75 N·m

Terminal number
3 locations

30

Light/Surge VoltageSuppressor

Terminal number 1 (+)

Terminal number 2 (–)

Limit Switch Cable

An OMRON or Rockwell Automation M12 connector limit switch cable is available.

M12 Connector Cable (4 Pins) Made by OMRON

<table>
<thead>
<tr>
<th>Part number</th>
<th>Cable length [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZS-37-L</td>
<td>300</td>
</tr>
<tr>
<td>ZS-37-M</td>
<td>500</td>
</tr>
<tr>
<td>ZS-37-N</td>
<td>1000</td>
</tr>
<tr>
<td>ZS-37-P</td>
<td>2000</td>
</tr>
<tr>
<td>ZS-37-C</td>
<td>5000</td>
</tr>
</tbody>
</table>

M12 Connector Cable (6 Pins) Made by Rockwell Automation

<table>
<thead>
<tr>
<th>Part number</th>
<th>Cable length [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP500-231-1</td>
<td>2000</td>
</tr>
</tbody>
</table>

Rockwell Automation part number: 889R-F6ECA-2

- We recommend using one of the straight type M12 connector cables shown above. If the L type is used, the cable entry direction will not be fixed.

Installation

For the VG342-X87 internal pilot type, even when the inlet pressure is within the operating pressure range, restricted piping, etc., may cause reduced flow on the inlet side, leading to the valve not operating properly.

- The recommended piping size is 3/4” or larger. Also, use piping with an I.D. of 19 mm or larger.
- When selecting a regulator or a filter regulator, use piping larger than the recommended size with sufficient flow rate characteristics.
- For extended piping between the regulator and the valve (inlet piping), keep piping as short as possible (2 m or less).
- For use under conditions other than those listed above, please use the external pilot type.
These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)\(^1\), and other safety regulations.

\(^1\) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.

### Safety Instructions

Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.

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#### Caution
- **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

#### Warning
- **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

#### Danger
- **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

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**Edition B**

- A precaution regarding installation has been added to the specific product precautions.
- The service life of the safety limit switch made by Rockwell Automation has been changed.
- The VG-X87 with a safety limit switch made by Rockwell Automation has been added to safety certified products.
- A precaution regarding installation has been added to the specific product precautions.
- Number of pages has been increased from 28 to 32.

---

### Safety Instructions

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

   Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

   The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

   1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
   2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
   3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

   1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
   2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
   3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
   4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

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**Limited warranty and Disclaimer/Compliance Requirements**

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

### Limited warranty and Disclaimer

1. The product is provided for use in manufacturing industries.

   The product herein described is basically provided for peaceful use in manufacturing industries. If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

   If anything is unclear, contact your nearest sales branch.

### Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.

   The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

### Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

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**Revision History**

<table>
<thead>
<tr>
<th>Edition</th>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>- Base-mounted type (VP544-X536, VP744-X536) residual pressure release valves have been added.</td>
</tr>
<tr>
<td></td>
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