

# 3 Port Direct Operated Solenoid Valve

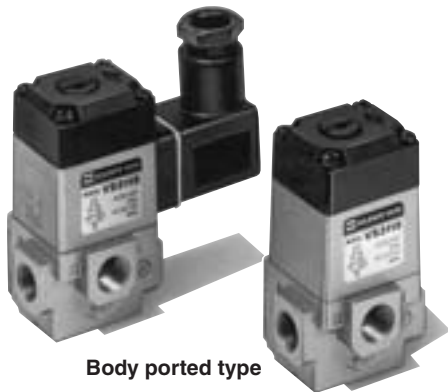
## Series VS3115/3110

### Metal Seal

**Multiple pressure supply is possible with balanced spool sleeve.**

Any given port can accept high or low pressure supply without affecting the system life or operation.

**No-lubrication and dry-air operation possible.**

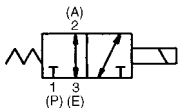


Body ported type



Sub-plate type

JIS Symbol



### Standard Specifications

|                                                        |                 |                                                                 |          |    |
|--------------------------------------------------------|-----------------|-----------------------------------------------------------------|----------|----|
| <b>Fluid</b>                                           |                 | Air/Inert gas                                                   |          |    |
| <b>Operating pressure range</b>                        |                 | 0 to 1.0 MPa                                                    |          |    |
| <b>Proof pressure</b>                                  |                 | 1.5 MPa                                                         |          |    |
| <b>Ambient and fluid temperature</b>                   |                 | -20 to 60°C (No freezing)                                       |          |    |
| <b>Response time <sup>(1)</sup></b>                    |                 | 10 ms or less (AC), 45 ms or less (DC)                          |          |    |
| <b>Max. operating frequency <sup>(2)</sup></b>         |                 | 1,500 c.p.m. (AC), 180 c.p.m. (DC)                              |          |    |
| <b>Manual override</b>                                 |                 | Non-locking                                                     |          |    |
| <b>Lubrication</b>                                     |                 | Not required (Use turbine oil Class 1 ISO VG32, if lubricated.) |          |    |
| <b>Enclosure</b>                                       |                 | Dustproof [Degrees of protection 0] <sup>(4)</sup>              |          |    |
| <b>Shock/Vibration resistance (m/s<sup>2</sup>)</b>    |                 | 150/50 <sup>(5)</sup>                                           |          |    |
| <b>Electrical entry</b>                                |                 | Grommet, DIN terminal                                           |          |    |
| <b>Coil rated voltage</b>                              | <b>Standard</b> | 100, 200 VAC, 50/60 Hz; 24 VDC                                  |          |    |
|                                                        | <b>Option</b>   | 220, 110, 48, and 24 VAC (50/60 Hz)<br>100, 48, and 12 VDC      |          |    |
| <b>Allowable voltage fluctuation</b>                   |                 | -15 to +10% of rated voltage                                    |          |    |
| <b>Coil insulation type</b>                            |                 | Class B or equivalent (130°C) <sup>(6)</sup>                    |          |    |
| <b>Apparent power (VA)<br/>(Power consumption (W))</b> | <b>AC</b>       | <b>Inrush</b>                                                   | 50 Hz    | 51 |
|                                                        |                 |                                                                 | 60 Hz    | 45 |
|                                                        | <b>Holding</b>  | 50 Hz                                                           | 17 (5.3) |    |
|                                                        |                 | 60 Hz                                                           | 11 (2.9) |    |
| <b>Power consumption (W)</b>                           | <b>DC</b>       | 5.5                                                             |          |    |
| <b>Accessory (Option)</b>                              |                 | Bracket (AXT338-11)/For body ported type                        |          |    |
|                                                        |                 | Indicator light                                                 |          |    |
|                                                        |                 | Manual override                                                 |          |    |

Note 1) Based on JIS B 8375-1981. (at 0.5 MPa, without surge voltage suppressor)

Note 2) Minimum operating frequency is once in 30 days. (Based on JIS B 8375.)

Note 3) "Note 1)" and "Note 2)" are with controlled clean air.

Note 4) Based on JIS C 0920.

Note 5) Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)

Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. Test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)

Note 6) Based on JIS C 4003.

### Flow Characteristics/Mass

| Body type        | Valve model  | Port size<br>Rc | Flow characteristics         |      |      |                              |      |      | Mass (kg) |      |
|------------------|--------------|-----------------|------------------------------|------|------|------------------------------|------|------|-----------|------|
|                  |              |                 | P → A                        |      |      | A → E                        |      |      | AC        | DC   |
|                  |              |                 | C [dm <sup>3</sup> /(s·bar)] | b    | Cv   | C [dm <sup>3</sup> /(s·bar)] | b    | Cv   |           |      |
| Body ported      | VS3115-01 □□ | 1/8             | 3.3                          | 0.36 | 0.86 | 2.5                          | 0.39 | 0.66 | 0.34      | 0.46 |
|                  | VS3115-02 □□ | 1/4             | 3.8                          | 0.19 | 0.86 | 3.6                          | 0.34 | 0.88 | 0.34      | 0.46 |
| Base mounted     | VS3110-02 □□ | 1/4             | 4.0                          | 0.12 | 0.93 | 3.2                          | 0.31 | 0.76 | 0.40      | 0.52 |
|                  | VS3110-03 □□ | 3/8             | 4.0                          | 0.15 | 0.94 | 3.6                          | 0.18 | 0.82 | 0.40      | 0.52 |
| For manifold use | VS3114-00 □□ |                 | Without sub-plate            |      |      |                              |      |      | 0.32      | 0.44 |

### ⚠ Caution

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 3 to 7 for 3/4/5 Port Solenoid Valve Precautions.

### How to Calculate the Flow Rate

For obtaining the flow rate, refer to front matters 44 to 47.

VV061

V100

S070

VQD

VKF

VK

VT

VS

# Series VS3115/3110

## How to Order

**VS311 5 - 01 5 D [ ] L - [ ]**

**Piping**

|   |                  |
|---|------------------|
| 5 | Body ported type |
| 0 | Sub-plate type   |
| 4 | Manifold type    |

**Port size**

|    |                   |
|----|-------------------|
| 01 | Rc 1/8            |
| 02 | Rc 1/4            |
| 03 | Rc 3/8            |
| 00 | Without sub-plate |

**Coil rated voltage**

|   |                   |
|---|-------------------|
| 1 | 100 VAC, 50/60 Hz |
| 2 | 200 VAC, 50/60 Hz |
| 3 | 110VAC *          |
| 4 | 220VAC *          |
| 5 | 24 VDC *          |
| 9 | Other             |

\* Option

**Mounting**

|     |                 |
|-----|-----------------|
| Nil | Without bracket |
| B   | With bracket    |

\* Bracket is available only on body ported style.

**Electrical entry**

|   |              |
|---|--------------|
| G | Grommet      |
| D | DIN terminal |

\* DC: DL (With indicator light)

**Accessory (Option)**

|   |                      |
|---|----------------------|
| L | With indicator light |
| P | With manual override |

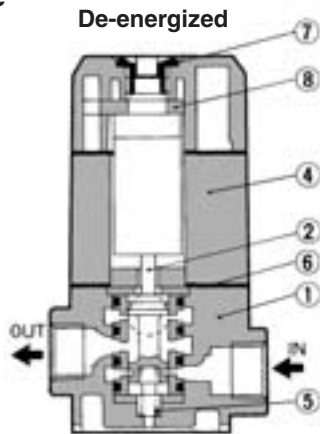
**Thread type**

|     |                 |
|-----|-----------------|
| Nil | Rc              |
| N * | NPT             |
| T * | NPTF            |
| F * | Parallel thread |

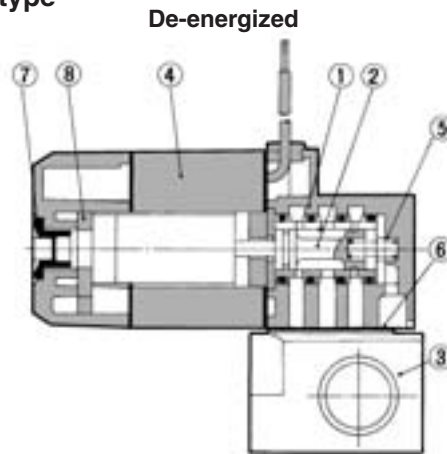
\* Option

## Construction

### Body ported type



### Sub-plate type



### Sub-plate Assembly Part No.: VS3110-S-<sup>02</sup>/<sub>03</sub>

\* Mounting bolts and gaskets are not attached.

### Part No. for Mounting Bolt and Gasket

BG-VS3010

### Component Parts

| No. | Description  | Material            | Note            |
|-----|--------------|---------------------|-----------------|
| 1   | Body         | Aluminum die-casted | Platinum silver |
| 2   | Spool/Sleeve | Stainless steel     |                 |
| 3   | Sub-plate    | Aluminum die-casted | Platinum silver |

### Replacement Parts

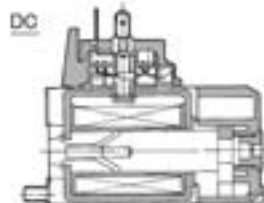
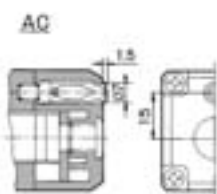
| No. | Description               | Material      | Part no.    |           |           |           |
|-----|---------------------------|---------------|-------------|-----------|-----------|-----------|
|     |                           |               | VS3115-□G   | VS3115-□D | VS3110-□G | VS3110-□D |
| 4   | Solenoid capsule assembly | AC            | SCA006-□    | SCAD001-□ | SCA006-□  | SCAD001-□ |
|     |                           | DC            | SCA001-□    | SCAD001-□ | SCA001-□  | SCAD001-□ |
| 5   | Spring                    | Piano wire AC | AXT338-6    |           |           |           |
|     |                           | DC            | AZ832-16    |           |           |           |
| 6   | Gasket                    | NBR           | AXT333-14   |           | AXT338-15 |           |
| 7   | Plug for cap              | Resin         | AXT333-16   |           |           |           |
| 8   | Stopper                   | Resin AC      | AXT333-7-11 |           |           |           |
|     |                           | DC            | AXT333-32-8 |           |           |           |

□: Enter the operating voltage.  
(100VAC: 01, 200VAC: 02, 24VDC: 52)

## Accessory (Option)

### Indicator light

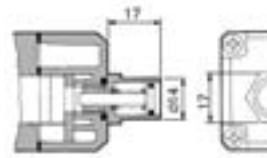
When solenoid is energized, indicator light illuminates, thus the electrical state of the solenoid can be seen from the outside.



Note) There is polarity of (1) +, (2) -.

### Manual override

Remove the rubber plug on the top of the solenoid cap to mount the manual override. Push the override with a screwdriver to the required stroke and the valve will shift. Turn to the right or left at 90 degrees to lock it. Turn it back 90 degrees to unlock. Be sure to unlock the override before energizing the valve electrically.



| Description                   | Part no.          |          |
|-------------------------------|-------------------|----------|
|                               | AC                | DC       |
| Manual override (With lock)   | PB0111-3 (PB0111) | PB0111-1 |
| Manual override (Non-locking) | PB0101            | PB0101-1 |

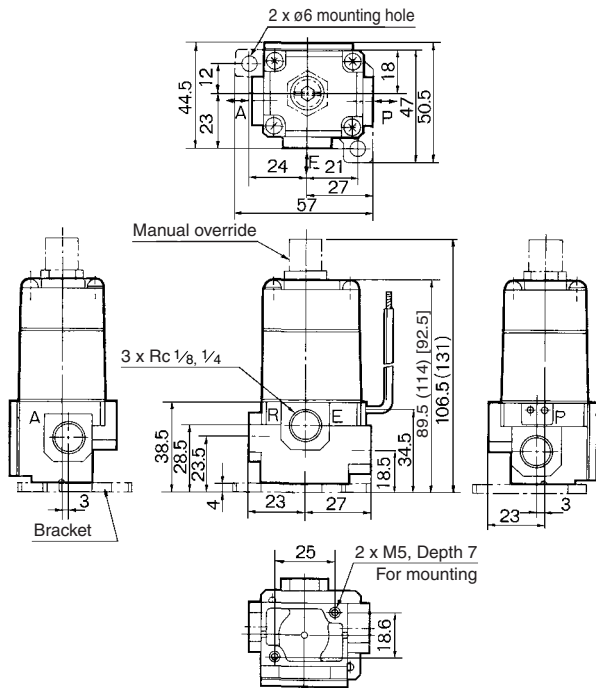
( ): With indicator light

# 3 Port Direct Operated Solenoid Valve Series VS3115/3110

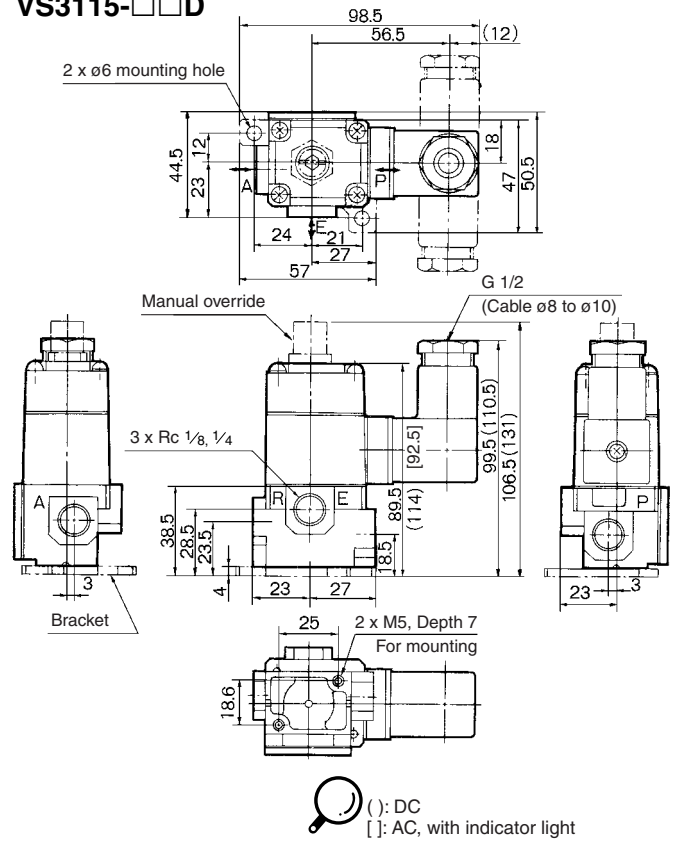
## Dimensions

### Body ported type

#### VS3115-□□G



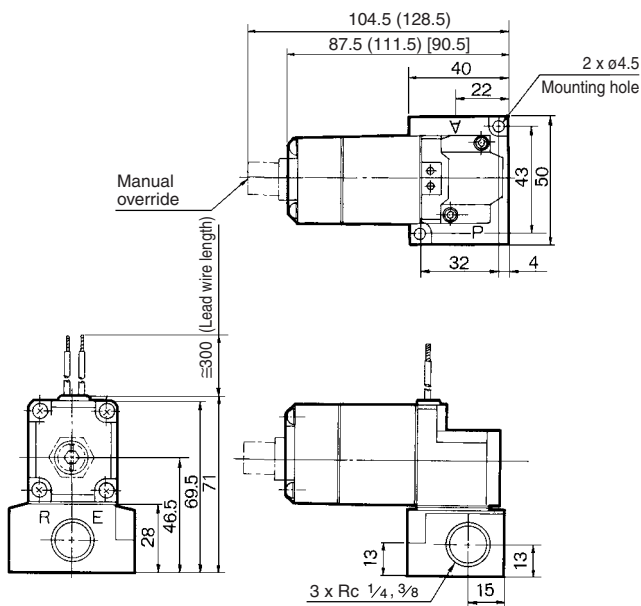
#### VS3115-□□D



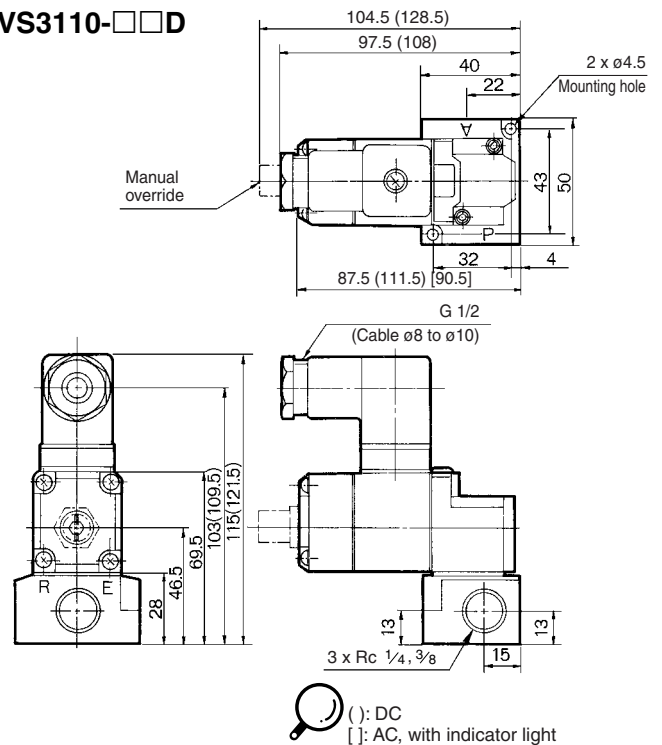
- VV061
- V100
- S070
- VQD
- VKF
- VK
- VT
- VS

### Sub-plate type

#### VS3110-□□G

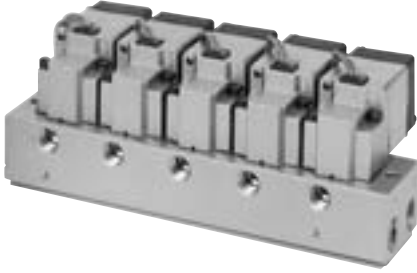


#### VS3110-□□D



# Series VS3115/3110

# Manifold Specifications



## Specifications

| <b>Manifold type</b>           |                         |                                         | B mount     |                |            |      |                        |
|--------------------------------|-------------------------|-----------------------------------------|-------------|----------------|------------|------|------------------------|
| <b>Max. number of stations</b> |                         |                                         | 10 stations |                |            |      |                        |
| Exhaust type                   | Port location/Port size |                                         |             | Port direction |            |      | Applicable valve model |
|                                | P                       | A                                       | E           | P              | A          | E    |                        |
| Common                         | Base<br>3/8             | Base<br>1/4                             | Base<br>3/8 | Side           | Side       | Side | VS3114-00□□            |
|                                |                         |                                         |             | Side           | Bottom     | Side |                        |
| <b>Accessory</b>               |                         | Blanking plate (With gaskets and screw) |             |                | AXT338-17A |      |                        |

## How to order manifold

VVS31 **0** - **05** 1 - **□**

**Valve stations**

|   |      |        |      |
|---|------|--------|------|
| 0 | Side | Side   | Side |
| 1 | Side | Bottom | Side |

**EXH port type**

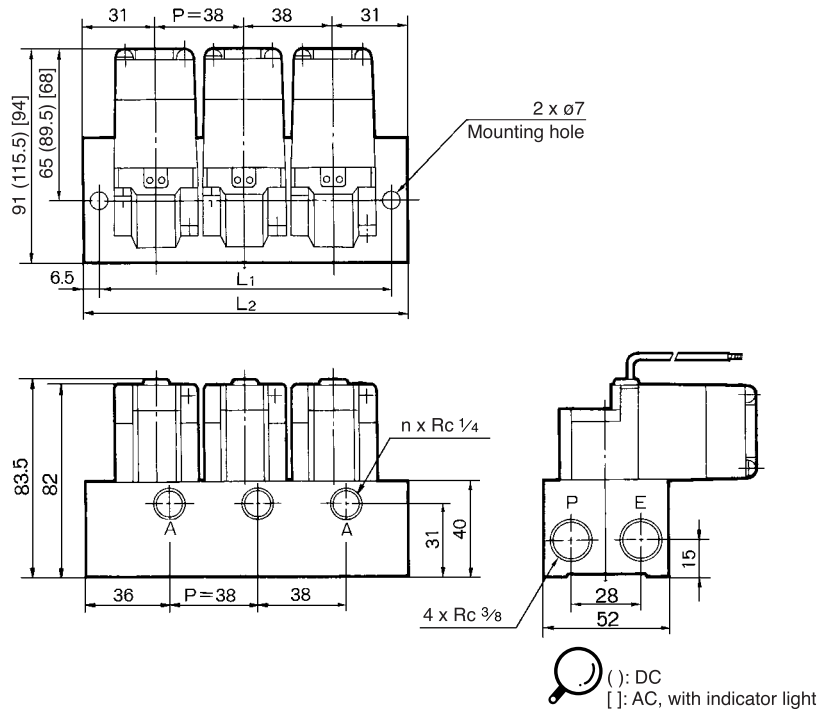
|   |            |
|---|------------|
| 1 | Common EXH |
|---|------------|

**Thread type**

|     |                 |
|-----|-----------------|
| Nil | Rc              |
| N*  | NPT             |
| T*  | NPTF            |
| F*  | Parallel thread |

\* Option

## Dimensions



| L              | n | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |
|----------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| L <sub>1</sub> |   | 87  | 125 | 163 | 201 | 239 | 277 | 315 | 353 | 391 |
| L <sub>2</sub> |   | 100 | 138 | 176 | 214 | 252 | 290 | 328 | 366 | 404 |

L<sub>1</sub> = 38n + 11, L<sub>2</sub> = 38n + 24 n: Station  
Formula for manifold weight M = 0.16n + 0.1 (kg)

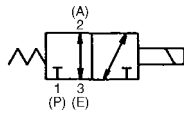
# 3 Port Direct Operated Solenoid Valve

## Series VS3135/3145

### Metal Seal



JIS Symbol



### Specifications

|                                                          |           |                                                       |
|----------------------------------------------------------|-----------|-------------------------------------------------------|
| <b>Fluid</b>                                             |           | Air/Inert gas                                         |
| <b>Proof pressure</b>                                    |           | 1.5 MPa                                               |
| <b>Operating pressure range</b>                          |           | 0 to 1.0 MPa                                          |
| <b>Ambient and fluid temperature (°C) <sup>(1)</sup></b> |           | -20 to 60                                             |
| <b>Lubrication <sup>(2)</sup></b>                        |           | Not required                                          |
| <b>Manual override</b>                                   |           | Option (Non-locking type available)                   |
| <b>Electrical entry</b>                                  |           | Grommet, Conduit terminal, Dripproof conduit terminal |
| <b>Coil rated voltage</b>                                | <b>AC</b> | 100, 200 V 50/60 Hz                                   |
|                                                          | <b>DC</b> | 24 V                                                  |
| <b>Allowable voltage fluctuation</b>                     |           | -15 to +10% of rated voltage                          |
| <b>Coil insulation type</b>                              |           | Class B or equivalent (130°C) <sup>(3)</sup>          |
| <b>Shock/Vibration resistance (m/s<sup>2</sup>)</b>      |           | 150/50 <sup>(4)</sup>                                 |



Note 1) If it is low temperature, dry air should be used. (No freezing)

Note 2) Use turbine oil Class 1 (ISO VG32), if lubricated.

Note 3) Based on JIS C 4003.

Note 4) Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)

Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. Test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)

### Model

| Valve model                                      | VS3135                          |             |       |                                 |     |     | VS3145                          |             |      |                                 |    |      |     |  |  |
|--------------------------------------------------|---------------------------------|-------------|-------|---------------------------------|-----|-----|---------------------------------|-------------|------|---------------------------------|----|------|-----|--|--|
|                                                  | P → A                           |             |       | A → E                           |     |     | P → A                           |             |      | A → E                           |    |      |     |  |  |
|                                                  | C<br>[dm <sup>3</sup> /(s·bar)] | b           | Cv    | C<br>[dm <sup>3</sup> /(s·bar)] | b   | Cv  | C<br>[dm <sup>3</sup> /(s·bar)] | b           | Cv   | C<br>[dm <sup>3</sup> /(s·bar)] | b  | Cv   |     |  |  |
| Flow characteristics                             | 1/4                             | 6.1         | 0.3   | 1.5                             | 6.1 | 0.4 | 1.6                             | —           | —    | —                               | —  | —    |     |  |  |
|                                                  | 3/8                             | 7.2         | 0.2   | 1.8                             | 7.3 | 0.2 | 1.8                             | —           | —    | —                               | —  | —    |     |  |  |
|                                                  | 1/2                             | 9.0         | 0.2   | 2.3                             | 9.0 | 0.3 | 2.4                             | 18          | 0.27 | 4.8                             | 16 | 0.34 | 4.1 |  |  |
|                                                  | 3/4                             | —           | —     | —                               | —   | —   | —                               | 20          | 0.21 | 5.1                             | 15 | 0.46 | 4.5 |  |  |
| Response time <sup>(1)</sup> (ms)                | AC                              | 30 or less  |       |                                 |     |     |                                 | 30 or less  |      |                                 |    |      |     |  |  |
|                                                  | DC                              | 60 or less  |       |                                 |     |     |                                 | 80 or less  |      |                                 |    |      |     |  |  |
| Max. operating <sup>(2)</sup> frequency (c.p.m.) | AC                              | 300 or less |       |                                 |     |     |                                 | 180 or less |      |                                 |    |      |     |  |  |
|                                                  | DC                              | 180 or less |       |                                 |     |     |                                 | 180 or less |      |                                 |    |      |     |  |  |
| Mass (kg)                                        | AC                              | 0.8         |       |                                 |     |     |                                 | 1.6         |      |                                 |    |      |     |  |  |
|                                                  | DC                              | 1.1         |       |                                 |     |     |                                 | 2.4         |      |                                 |    |      |     |  |  |
| Apparent power (VA)                              | AC                              | Inrush      | 50 Hz | 100                             |     |     |                                 |             |      | 300                             |    |      |     |  |  |
|                                                  |                                 |             | 60 Hz | 90                              |     |     |                                 |             |      | 360                             |    |      |     |  |  |
|                                                  | Holding                         | 50 Hz       | 20    |                                 |     |     |                                 |             | 50   |                                 |    |      |     |  |  |
|                                                  |                                 | 60 Hz       | 14    |                                 |     |     |                                 |             | 60   |                                 |    |      |     |  |  |
| Power consumption (W)                            | DC                              | 13.2        |       |                                 |     |     |                                 | 24          |      |                                 |    |      |     |  |  |



Note 1) Based on JIS B 8375-1981. (at 0.5 MPa, without surge voltage suppressor)

Note 2) Min. operating frequency is once in 30 days. (Based on JIS B 8375.)

Note 3) "Note 1)" and "Note 2)" are with controlled clean air.

### How to Order

VS31 3 5-02 1 - - -

### Caution

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 3 to 7 for 3/4" Port Solenoid Valve Precautions.

### How to Calculate the Flow Rate

For obtaining the flow rate, refer to front matters 44 to 47.

#### Body size

|   |              |
|---|--------------|
| 3 | 3/8 Standard |
| 4 | 1/2 Standard |

#### Port size

|    |        |
|----|--------|
| 02 | Rc 1/4 |
| 03 | Rc 3/8 |
| 04 | Rc 1/2 |
| 06 | Rc 3/4 |

#### Coil rated

|     |                   |
|-----|-------------------|
| 1   | 100 VAC, 50/60 Hz |
| 2   | 200 VAC, 50/60 Hz |
| 3 * | 110 VAC, 50/60 Hz |
| 4 * | 220 VAC, 50/60 Hz |
| 5   | 24 VDC            |
| 9 * | Other             |

\* Option

#### Electrical entry

|     |                                              |
|-----|----------------------------------------------|
| Nil | Grommet                                      |
| T   | Conduit terminal                             |
| WTB | Dripproof conduit terminal                   |
| TZ  | Conduit terminal w/ surge voltage suppressor |
| TL  | Conduit terminal w/ indicator light          |

#### Thread type

|     |                 |
|-----|-----------------|
| Nil | Rc              |
| N * | NPT             |
| T * | NPTF            |
| F * | Parallel thread |

\* Option

#### Option

|     |                 |
|-----|-----------------|
| Nil | None            |
| P   | Manual override |

VV061

V100

S070

VQD

VKF

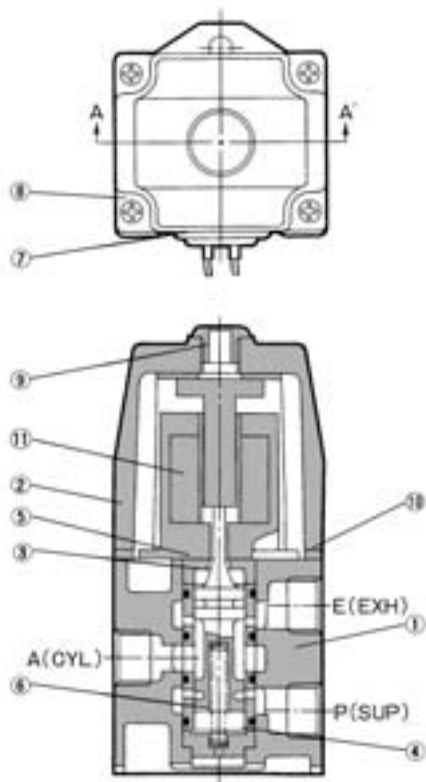
VK

VT

VS

# Series VS3135/3145

## Construction



A-A' cross section

### Component Parts

| No. | Description    | Material            | Note            |
|-----|----------------|---------------------|-----------------|
| 1   | Body           | Aluminum die-casted | Platinum silver |
| 2   | Solenoid cover | Aluminum die-casted | Platinum silver |
| 3   | Spool/Sleeve   | Stainless steel     |                 |

### ⑪ Solenoid Coil Assembly Part No.

| Electrical entry | Voltage | Part no.  |           |
|------------------|---------|-----------|-----------|
|                  |         | VS3135    | VS3145    |
| Grommet          | 100 VAC | A01-01    | A12-01    |
|                  | 200 VAC | A01-02    | A12-02    |
|                  | 24 VDC  | A07-52    | A08-52    |
| Conduit terminal | 100 VAC | A01-01-63 | A12-01-63 |
|                  | 200 VAC | A01-02-63 | A12-02-63 |
|                  | 24 VDC  | A07-52-63 | A08-52-63 |

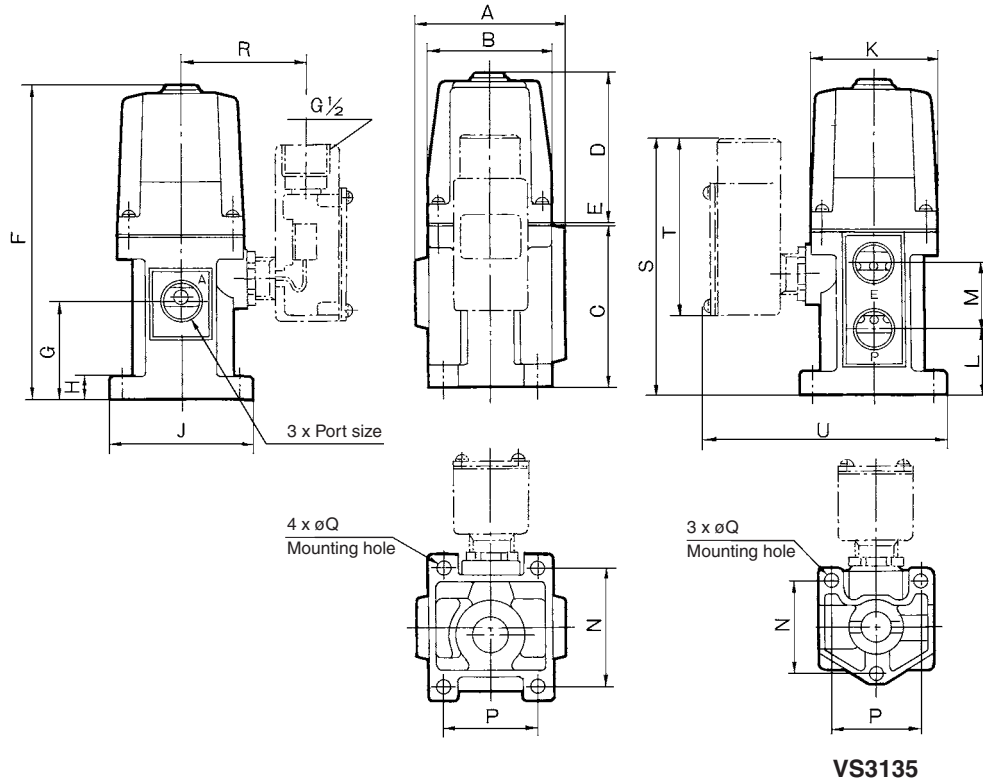
### Replacement Parts

| No. | Description                  | Material   | Part no.   |          |
|-----|------------------------------|------------|------------|----------|
|     |                              |            | VS3135     | VS3145   |
| 4   | Cap                          | Resin      | XT019-6    | AXT103-4 |
| 5   | Bushing                      | Resin      | XT013-13-2 | XT021-12 |
| 6   | Spring                       | Steel wire | XT010-15   | XT103-5  |
| 7   | Rubber plug for wire         | NBR        | XT010-20   | XT010-20 |
| 8   | Round head combination screw | Steel wire | XT010-21   | XT010-21 |
| 9   | Plug for cover               | NBR        | XT041-1    | XT041-1  |
| 10  | Gasket                       | NBR        | XT013-31-2 | NXT030-8 |

# 3 Port Direct Operated Solenoid Valve *Series VS3135/3145*

## Dimensions

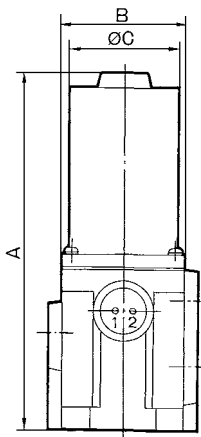
### VS3135/3145



VV061  
V100  
S070  
VQD  
VKF  
VK  
VT  
VS

| Model     | Port size Rc  | A  | B  | C  | D  | E | F   | G  | H  | J  | K  | L  | M  | N  | P  | øQ | Terminal dimensions |     |    |     |
|-----------|---------------|----|----|----|----|---|-----|----|----|----|----|----|----|----|----|----|---------------------|-----|----|-----|
|           |               |    |    |    |    |   |     |    |    |    |    |    |    |    |    |    | R                   | S   | T  | U   |
| VS3135-02 | 1/4, 3/8, 1/2 | 64 | 64 | 65 | 70 | 1 | 136 | 35 | 9  | 64 | 54 | 19 | 32 | 50 | 50 | 7  | 60                  | 120 | 96 | 118 |
| VS3135-03 |               |    |    |    |    |   |     |    |    |    |    |    |    |    |    |    |                     |     |    |     |
| VS3135-04 |               |    |    |    |    |   |     |    |    |    |    |    |    |    |    |    |                     |     |    |     |
| VS3145-04 | 1/2, 3/4      | 82 | 68 | 88 | 92 | 1 | 181 | 53 | 12 | 81 | 70 | 35 | 36 | 66 | 52 | 9  | 66                  | 140 | 96 | 133 |
| VS3145-06 |               |    |    |    |    |   |     |    |    |    |    |    |    |    |    |    |                     |     |    |     |

## DC



| Model     | Port size Rc  | A   | B  | øC   |
|-----------|---------------|-----|----|------|
| VS3135-02 | 1/4, 3/8, 1/2 | 129 | 64 | 50.8 |
| VS3135-03 |               |     |    |      |
| VS3135-04 |               |     |    |      |
| VS3145-04 | 1/2, 3/4      | 196 | 68 | 60.5 |
| VS3145-06 |               |     |    |      |