

5 Port Direct Operated Solenoid Valve

Series VS4□10

Metal Seal

Model

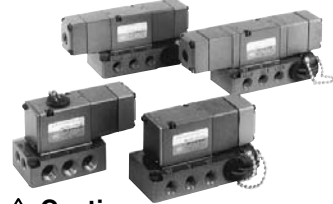
| Number of positions | Symbol | Model | Port size Rc (Nominal size) | Flow characteristics | | | | | | Max. (1) operating cycle (cpm) | | Response time (ms) | | Weight (kg) | |
|---------------------|--------|-----------|--------------------------------|------------------------------|------|------|------------------------------|------|------|--------------------------------|-----|--------------------|------------|-------------|------|
| | | | | P → A/B | | | A/B → EA/EB | | | AC | DC | AC | DC | AC | DC |
| | | | | C [dm ³ /(s·bar)] | b | Cv | C [dm ³ /(s·bar)] | b | Cv | | | | | | |
| 2 (Single) | | VS4110-01 | 1/8 (6A) | 3.2 | 0.42 | 0.86 | 3.2 | 0.37 | 0.80 | 1,200 | 180 | 13 or less | 45 or less | 0.7 | 0.82 |
| | | VS4110-02 | 1/4 (8A) | 4.0 | 0.17 | 0.91 | 3.4 | 0.47 | 0.89 | | | | | | |
| | | VS4110-03 | 3/8 (10A) | 4.1 | 0.19 | 0.96 | 3.9 | 0.35 | 1.00 | | | | | | |
| 2 (Double) | | VS4210-01 | 1/8 (6A) | 3.2 | 0.42 | 0.86 | 3.2 | 0.37 | 0.80 | 1,200 | 180 | 13 or less | 40 or less | 0.9 | 1.14 |
| | | VS4210-02 | 1/4 (8A) | 4.0 | 0.17 | 0.91 | 3.4 | 0.47 | 0.89 | | | | | | |
| | | VS4210-03 | 3/8 (10A) | 4.1 | 0.19 | 0.96 | 3.9 | 0.35 | 1.00 | | | | | | |
| 3 (3 position) | | VS4310-01 | 1/8 (6A) | 3.1 | 0.37 | 0.80 | 3.2 | 0.35 | 0.82 | 360 | 180 | 15 or less | 45 or less | 0.98 | 1.22 |
| | | VS4310-02 | 1/4 (8A) | 3.8 | 0.23 | 0.89 | 3.6 | 0.33 | 0.89 | | | | | | |
| | | VS4310-03 | 3/8 (10A) | 4.2 | 0.23 | 1.00 | 3.8 | 0.32 | 0.99 | | | | | | |
| | | VS4410-01 | 1/8 (6A) | 3.1 | 0.28 | 0.77 | 3.0 | 0.28 | 0.75 | 360 | 180 | 15 or less | 45 or less | 0.98 | 1.22 |
| | | VS4410-02 | 1/4 (8A) | 3.9 | 0.22 | 0.94 | 3.5 | 0.27 | 0.84 | | | | | | |
| | | VS4410-03 | 3/8 (10A) | 4.0 | 0.26 | 1.00 | 3.7 | 0.32 | 0.94 | | | | | | |

Note 1) Min. operating frequency is once every 30 days. (Based on JIS B 8375.)

Note 2) Based on JIS B 8375-1981. (At the pressure of 0.5 MPa, without surge suppressor)

Note 3) Electrical entry: From sub-plate

Note 4) "Note 1" and "Note 2" are with controlled clean air.



Caution

Be sure to read before handling. Refer to front matter 53 for Safety Instructions and pages 3 to 8 for 3/4" Port Solenoid Valve Precautions.

How to Calculate the Flow Rate

For obtaining the flow rate, refer to front matters 42 to 45.

Standard Specifications

| | | |
|---|--|--|
| Fluid | Air/Inert gas | |
| Operating pressure range | 0 to 1.0 MPa | |
| Ambient and fluid temperature | -20 to 60°C* | |
| Manual override | Possible | |
| Electrical entry | Grommet, Conduit, DIN terminal, Conduit terminal | |
| Lubrication | Non-lube | Usable with non-lube |
| | Lubrication | Use turbine oil Class 1 (ISO VG32), if lubricated. |
| Impact/Vibration resistance (m/s ²) | 150/50 (Note) | |
| Manifold | Possible | |

* Use dry air (Dew point: -20°C or less). If using a lubricant, be sure to use a lubricant for low temperatures.
 Note) 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)

Solenoid Specifications

| | |
|-------------------------------|--------------------------------------|
| Coil rated voltage | 100, 200 VAC, 50/60 Hz; 24 VDC |
| Allowable voltage fluctuation | -15 to +10% of rated voltage |
| Coil insulation type | Class B or equivalent (130°C) (Note) |

Note) Based on JIS C 4003

How to Order

Symbol

| | |
|---|----------------|
| 1 | Single |
| 2 | Double |
| 3 | Closed center |
| 4 | Exhaust center |

VS4 1 1 0 - 02 1 C

Thread type

| | |
|-----|------|
| NiL | Rc |
| N | NPT |
| T | NPTF |
| F | G |

Option

| | |
|-----|-----------------------------|
| NiL | None |
| P | Manual override (With lock) |
| R | With speed controller unit |

Piping

| | |
|---|---------------------------|
| 0 | Side ported (Sub-plate) |
| 1 | Bottom ported (Sub-plate) |
| 4 | Without sub-plate |

Port size

| | |
|----|---|
| 00 | Without sub-plate |
| 01 | 1/8 |
| 02 | 1/4 |
| 03 | 3/8 (Bottom ported cannot be selected.) |

Coil rated voltage

| | |
|---|-------------------|
| 1 | 100 VAC (50/60Hz) |
| 2 | 200 VAC (50/60Hz) |
| 3 | 110 VAC (50/60Hz) |
| 4 | 220 VAC (50/60Hz) |
| 5 | 24 VDC |

For other rated voltages, please consult with SMC.

Electrical entry

| | | | |
|----|--|-----|---|
| U | Grommet | TZ | Conduit terminal. With surge voltage suppressor (With AXI 307-1-C) |
| UL | Grommet, With light (AC only) | TLZ | Conduit terminal. With light/surge voltage suppressor (With AXI 307-1-C; AC only) |
| C | Conduit | D | DIN terminal |
| CL | Conduit, With light (AC only) | DL | DIN terminal, With light |
| T | Conduit terminal | DZ | DIN terminal. With surge voltage suppressor |
| TL | Conduit terminal. With light (AC only) | DLZ | DIN terminal. With light/surge voltage suppressor |

Series VS4□10

Apparent Power (Power Consumption)

| | | | | |
|--|----|---------|------|-------------------|
| Apparent power (VA) (Power consumption (W)) | AC | Inrush | 50Hz | 51 VA (64 VA *) |
| | | | 60Hz | 45 VA (55 VA *) |
| | | Holding | 50Hz | 17 VA (5.3/5.5 W) |
| | | | 60Hz | 11 VA (2.9/3.2 W) |
| Power consumption (W) | DC | | | 5.5 |

* In the case of 3 position type.

Option Specifications

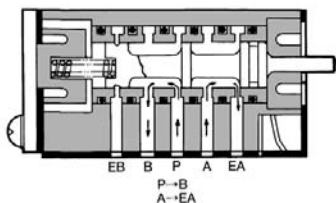
- Bottom ported (Sub-plate)
- Coil rated voltage (110/220 VAC, 12/100 VDC)

Enclosure (Based on JIS C 0920)

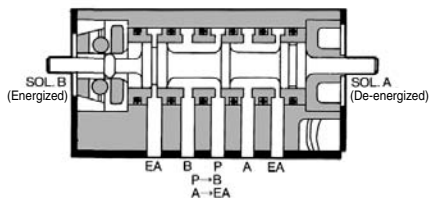
| | | | | |
|------------------|---------------------------------|----------|--------------|------------------|
| Electrical entry | Grommet (Sub-plate/ Valve body) | Conduit | DIN terminal | Conduit terminal |
| Dustproof | Standard | Standard | Standard | Standard |
| Dripproof | — | Option | Option | Option |

Construction Principle

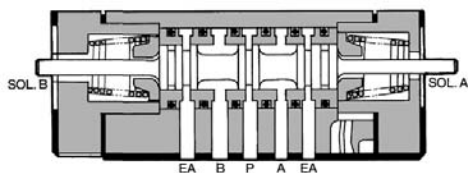
VS4110



VS4210



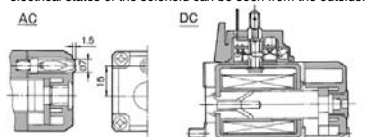
VS4310 (Closed center)



Accessory (Option)

1. Indicator light (AC)

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



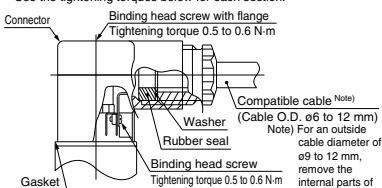
Note) There is polarity of (1) +, (2) -.

DIN terminal

Since internal connections are as shown below for the DIN terminal, make connections to the power supply accordingly.

| | | |
|--------------|------|------|
| Terminal no. | 1 | 2 |
| DIN terminal | +(-) | -(+) |

- There is no polarity. (DC type with indicator light has polarity. ① +, ② -)
- Use compatible heavy duty cords with cable O.D. of ø6 to 12 mm.
- Use the tightening torques below for each section.



| With rubber plug | Manual override | | Applicable model |
|------------------|-----------------|-----------|------------------|
| | Non-locking | With lock | |
| SC0003-□ | SC0004B-□ | SC0004A-□ | VS4110 VS4210 |
| SC0013-□ | SC0014B-□ | SC0014A-□ | VS4310 VS4410 |

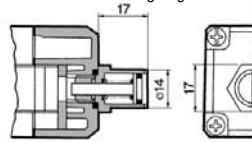
* Indicate the voltage to be used.
(100 VAC: 01, 200 VAC: 02)

2. Manual override

Remove rubber plug at the top of the solenoid cap to install manual override. Push the override with a screwdriver to the required stroke and the valve will shift. With the override in the same position, turn it to the right or left 90° and it will lock. Turn it back 90° to unlock.

⚠ Caution

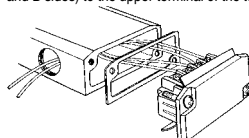
Be sure to unlock it before energizing the valve electrically.



| Description | Part no. | Applicable model | (In the case of a 2 position double solenoid valve, use a non-locking manual override because it has a locking function in the main valve.) |
|-------------------------------|-------------|----------------------------|---|
| Manual override (With lock) | AC PB0111 | VS4110 VS4310 VS4410 | |
| Manual override (Non-locking) | AC PB0101 | VS4210 | |
| | DC PB0101-1 | VS4210 | |

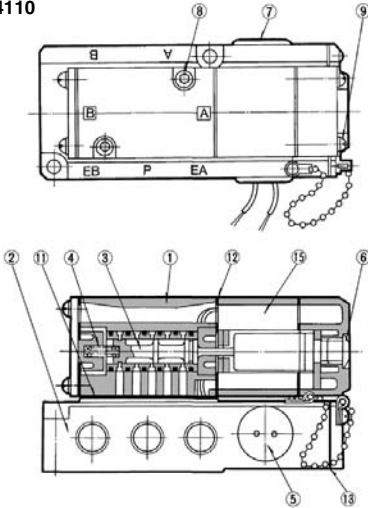
3. Terminal wiring

• Lead wire from the solenoid is connected to the lower terminal of the terminal block under the junction cover of sub-plate. Connect the lead wire of the power supply corresponding to the solenoid (single solenoid: A side/double solenoid: both A and B sides) to the upper terminal of the terminal block.

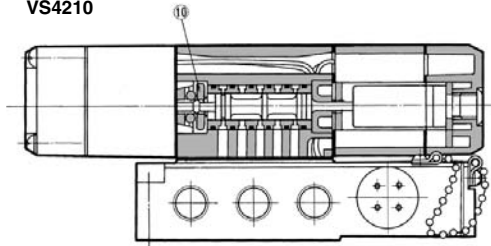


Construction

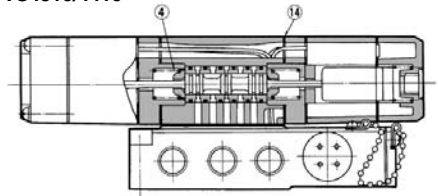
VS4110



VS4210



VS4310/4410



- VV061
- VV100
- V100
- S070
- VQD
- VQD-V
- VKF
- VK
- VT
- VS4**
- VS3

Sub-plate Assembly Part No.

| Electrical entry | Part no. |
|-----------------------------|------------------------------|
| C: Conduit | VS4010-CS- 01 02 03 |
| T: Conduit terminal | VS4010-TS- 01 02 03 |
| U: Grommet, D: DIN terminal | VS4010-S- 01 02 03 |

* Mounting bolt and gasket are not included.

Part No. for Mounting Bolt and Gasket

BG-VS4010

Component Parts

| No. | Description | Material |
|-----|-----------------------------|---------------------|
| 1 | Body | Aluminum die-casted |
| 2 | Sub-plate | Aluminum die-casted |
| 3 | Spool/Sleeve | Stainless steel |
| 4 | Spring | Piano wire |
| 5 | Rubber plug for wire | NBR |
| 6 | Plug for cap | NBR |
| 7 | Rubber plug | NBR |
| 8 | Mounting bolt | Carbon steel |
| 9 | Mounting screw | Carbon steel |
| 10 | Detent assembly | |
| 11 | Gasket | NBR |
| 12 | Gasket | NBR |
| 13 | Gasket | NBR |
| 14 | Gasket | NBR |

⑮ Solenoid Capsule Assembly (With rubber plug)

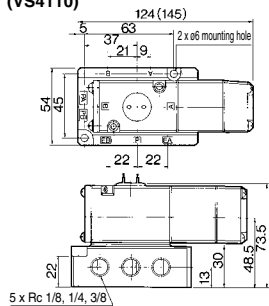
| | Specifications | Part no. | |
|----------|----------------------|-------------|-------------|
| | | VS4110/4210 | VS4310/4410 |
| Standard | Grommet/Conduit | SCA001-□ | SCA011-□ |
| | Conduit terminal | SCA001-□ | SCA011-□ |
| Option | DIN terminal | SCAD001-□ | SCAD011-□ |
| | With indicator light | AC | SCA003-□ |
| | Grommet/Conduit | | |
| | Conduit terminal | SCA013-□ | |
| | With indicator light | AC | SCAD003-□ |
| | DIN terminal | | |

* Indicate the used voltage.(100 VAC: 01, 200 VAC: 02, 110 VAC: 03, 220 VAC: 04, 24 VDC: 52)

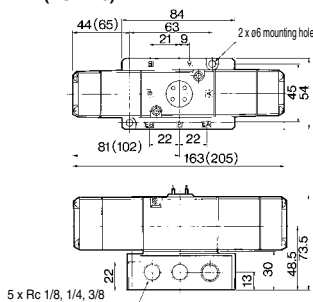
Series VS4□10

Dimensions

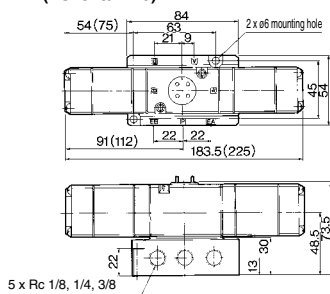
Grommet (VS4110)



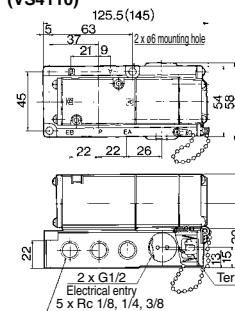
(VS4210)



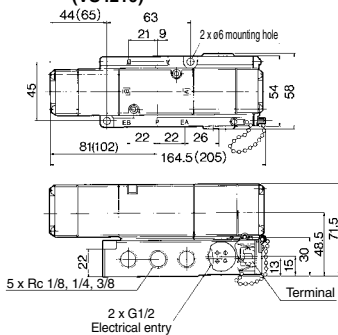
(VS4310/4410)



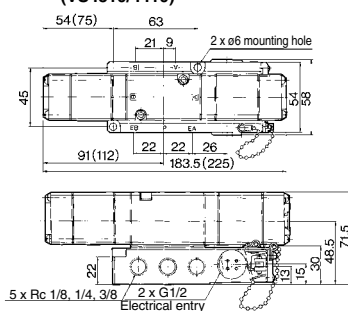
Conduit Conduit terminal (VS4110)



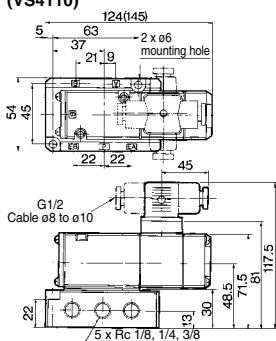
(VS4210)



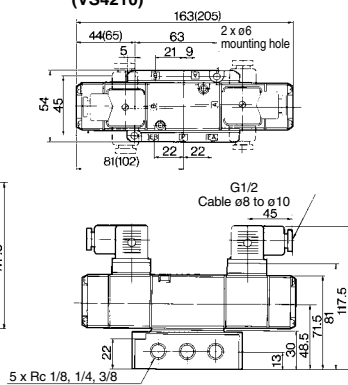
(VS4310/4410)



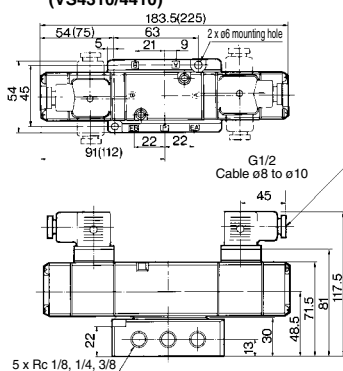
DIN terminal (VS4110)



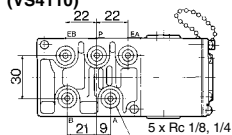
(VS4210)



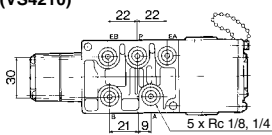
(VS4310/4410)



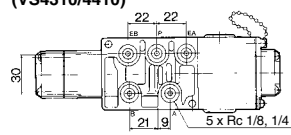
Bottom ported (VS4110)



(VS4210)

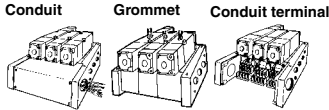


(VS4310/4410)



Series VVS410

Manifold Specifications



Specifications

| | |
|------------------|--|
| Applicable valve | VS4110/4210/4310/4410 |
| Valve stations | Max. 10 stations (Standard) |
| Accessory | With terminal ⁺ With interface regulator ⁺ With stop valve/With flow controls |

* Option

Standard Piping Specifications

| Type | Configuration | Port size Rc | | | Conduit ⁺ port size G |
|----------------|---------------|--------------------|--------------------|----------------------|--|
| | | P | A, B | EA, EB | |
| Common EXH | | 1/4, 3/8 (Side) | 1/8, 1/4 (Side) | 1/4, 3/8 (Side) | 1, 1 1/4 |
| Individual EXH | | 1/4, 3/8 (Side) | 1/8, 1/4 (Side) | 1/8, 1/4 (Bottom) | |

* Optional piping: Individual SUP and different pressure SUP. But it will be the bottom porting specifications.
 (Note) Each port size will be a big size for standard. When the small size is desired, indicate separately.

How to Order

VVS41 0 - 05 SC 1 T - [] - []

Series VS4□10 Manifold

Porting specifications

| Symbol | P | A, B | EA, EB |
|--------|-------|--------|--------|
| 0 | Side | Side | Side |
| 1 | Side | Bottom | Side |
| 9 | Other | | |

Stations

| Symbol | Stations |
|--------|------------|
| 02 | 2stations |
| : | : |
| 10 | 10stations |

Electrical entry

| Symbol | Electrical entry position |
|--------|---------------------------|
| SC | Manifold |
| SU | Valve body |

Symbol (passage)

| Symbol | SUP | EXH |
|--------|---------------------|---------------------|
| 1 | Common (side) | Common (side) |
| 2 | Common (side) | Individual (bottom) |
| 3 | Individual (bottom) | Common (side) |
| 4 | Individual (bottom) | Individual (bottom) |
| 5 | Dissimilar pressure | Common (side) |
| 6 | Dissimilar pressure | Individual (bottom) |

Thread type

| Symbol | Thread type |
|--------|-------------|
| Nil | Rc |
| N | NPT |
| T | NPTF |
| F | G |

Option (spacer)

| Symbol | Option |
|--------|---------------------|
| Nil | None |
| S | With stop valve |
| R | With throttle valve |

Accessory

| Symbol | Accessory |
|----------------|---------------------|
| Nil | None |
| T ⁺ | With terminal block |

* Only SC type applicable.

VV061

VV100

V100

S070

VQD

VQD-V

VKF

VK

VT

VS4

VS3

⚠️ Precautions

Be sure to read before handling. Refer to front matter 53 for Safety Instructions and pages 3 to 8 for 3/4/5 Port Solenoid Valve Precautions.

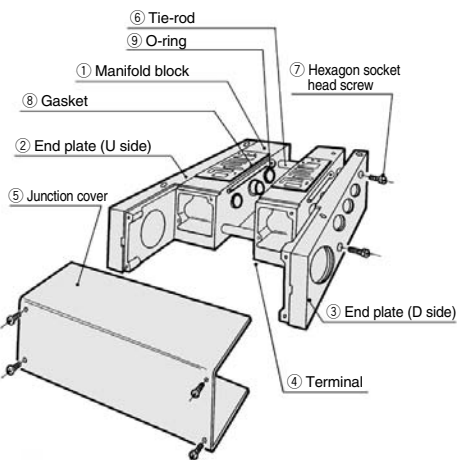
Mounting

⚠️ Caution

- SUP port and EXH port are positioned on both sides of manifold block. Air can be supplied from either side; however, the unused port must be plugged in this case. When operating 6 or more valve stations within a manifold at the same time, take SUP air pressure from both sides and open EXH port to the atmosphere.
- When manifolding an exhaust center 3 position valve, use the individual EXH style manifold. (Back pressure may cause actuator to malfunction.)

Series VVS410

Construction



• Replacement Parts: Sub-assembly

| No. | Description | Assembly part no. | Electrical entry |
|-----|-----------------------------|---|------------------|
| 1 | Manifold block assembly | AXT336-1A-1 ⁰¹ | Type SC (T only) |
| | | AXT336-1A-2 ⁰² | Type SU |
| | | AXT336-1A-3 ⁰³ | Type SC |
| 2 | End plate (U side) assembly | AXT336-2A-1 ⁰¹ | Type SC |
| | | AXT336-2A-2 ⁰² | Type SU |
| | | AXT336-2A-3 ⁰³ | Type SC |
| 3 | End plate (D side) assembly | AXT336-3A-1 ⁰¹ | Type SU |
| | | AXT336-3A-2 ⁰² | Type SC |
| | | AXT336-3A-3 ⁰³ | Type SU |
| 4 | Terminal assembly | AXT622-5A | |
| 5 | Junction cover assembly | AXT336-4A- Stations | |
| 6 | Tie-rod | AXT336-5- Stations | |

• Replacement Parts

| No. | Description | Material | Part no. |
|-----|---------------------------|--------------|-------------|
| 7 | Hexagon socket head screw | Carbon steel | M6 x 25 |
| 8 | Gasket | NBR | AXT335-12-3 |
| 9 | O-ring | NBR | AS568-015 |

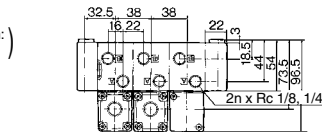
• Manifold Optional Parts Assembly

| Option | Part no. |
|-----------------------|---|
| Blanking plate | AXT336-7A |
| Throttle valve spacer | AXT392A |
| Stop valve spacer | AXT395A |
| Interface regulator | ARB110-00- ¹ (P port regulation) ² (A/B port regulation) |
| Block disk | AXT336-6 |
| Rubber plug | AXT336-9 |

Dimensions

Type SC

(Electrical entry position:
Manifold block)

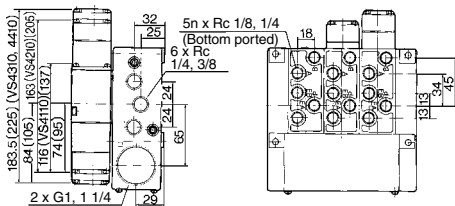
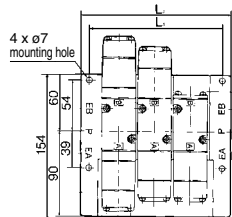


| Formula/Stations | 2 | 3 | 4 | 5 | 6 | 7 |
|------------------|---|---|---|---|---|---|
|------------------|---|---|---|---|---|---|

$L_1 = 38n + 27$ 103 141 179 217 255 293

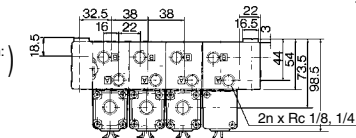
$L_2 = 38n + 44$ 120 158 196 234 272 310

Formula for manifold weight M = 0.405n + 0.49 (kg)



Type SU

(Electrical entry position:
Valve body)



| Formula/Stations | 2 | 3 | 4 | 5 | 6 | 7 |
|------------------|---|---|---|---|---|---|
|------------------|---|---|---|---|---|---|

$L_1 = 38n + 27$ 103 141 179 217 255 293

$L_2 = 38n + 44$ 120 158 196 234 272 310

Formula for manifold weight M = 0.325n + 0.39 (kg)

