5 Port Direct Operated Solenoid Valve

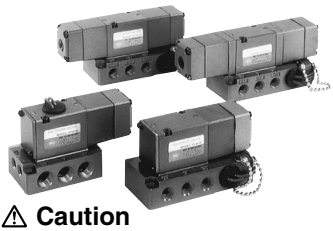
Series VS4□10

Metal Seal

Model

Number of positions	Symbol	Model	Port size Rc (Nominal size)	Flow characteristics						Max. (1) operating cycle (cpm)		Response (2) time (ms)		Weight (3) (kg)	
				P → A/B			A/B → EA/EB								
				C [dm³/(s·bar)]	b	Cv	C [dm³/(s·bar)]	b	Cv	AC	DC	AC	DC	AC	DC
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) (Closed center)		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						
3 (3 position) (Exhaust center)		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 3/4/5 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
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-lude
	Lubrication	Use turbine oil Class 1 (ISO VG32), if lubricated.
Impact/Vibration resistance (m/s²)		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

VS4 1 1 0 – 02 1 C □ – □

Symbol

1	Single
2	Double
3	Closed center
4	Exhaust center

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 AXT307-1-□)
UL	Grommet, With light (AC only)	TLZ	Conduit terminal, With light/surge voltage suppressor (With AXT307-1-□, 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

Thread type

Nil	Rc
N	NPT
T	NPTF
F	G

Option

Nil	None
P	Manual override (With lock)
R	With speed controller unit

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

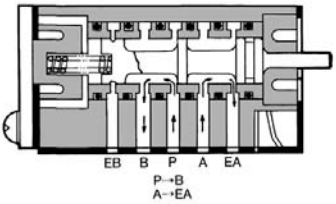
- Bottom ported (Sub-plate)
- Coil rated voltage (110/220 VAC, 12/100 VDC)

Enclosure (Based on JIS C 0920)

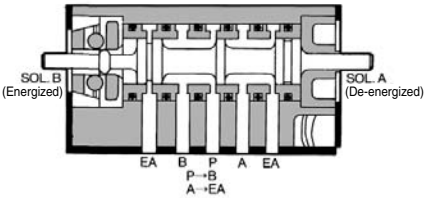
Electrical entry	Grommet (Sub-plate/Valve body)	Conduit	DIN terminal	Conduit terminal
Dustproof	Standard	Standard	Standard	Standard
Dripproof	———	Option	Option	Option

Construction Principle

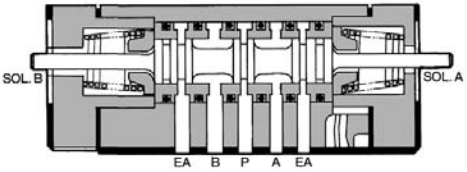
VS4110



VS4210



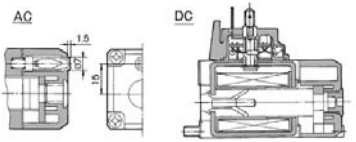
VS4310 (Closed center)



Accessory (Option)

1. Indicator light (AC)

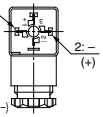
When solenoid gets energized, indicator light illuminates, thus electrical states of the solenoid can be seen from the outside.



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

DIN terminal

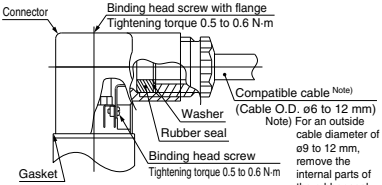
Since internal connections are as shown below for the DIN terminal, make connections to the power supply accordingly.



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.



Note) For an outside cable diameter of ø9 to 12 mm, remove the internal parts of the rubber seal before using.

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

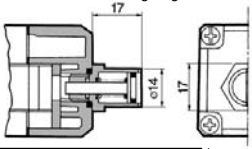
* Indicate the voltage to be used. (100 VAC: 01, 200 VAC: 02)

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.

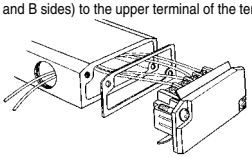


Description		Part no.	Applicable model
Manual override (With lock)	AC	PB0111	VS4110 VS4310 VS4410
	DC	PB0111-1	
Manual override (Non-locking)	AC	PB0101	VS4210
	DC	PB0101-1	

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.

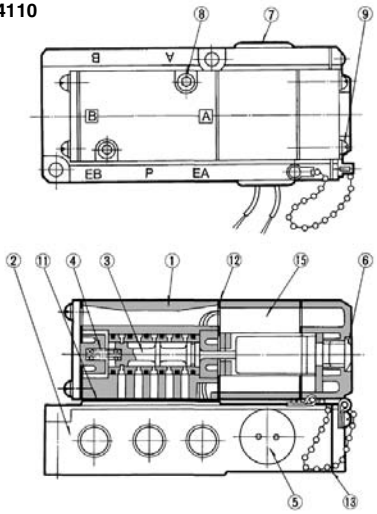
3. Terminal wiring

- 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.

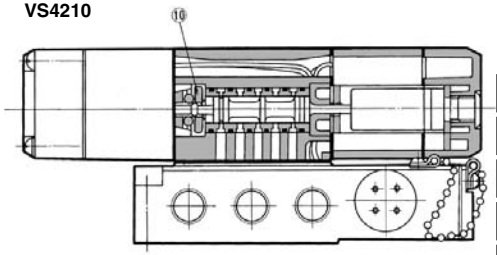


Construction

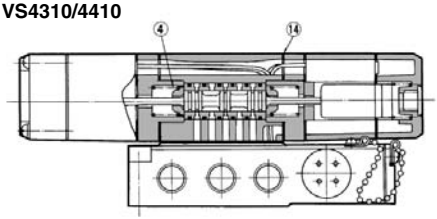
VS4110



VS4210



VS4310/4410



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)

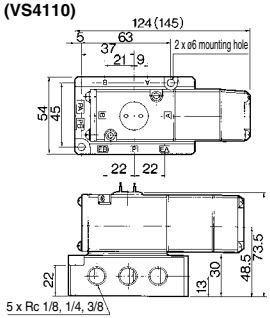
	Specifications		Part no.	
			VS4110/4210	**VS4310/4410**
Standard	Grommet/Conduit Conduit terminal		SCA001-□	SCA011-□
	DIN terminal		SCAD001-□	SCAD011-□
Option	With indicator light Grommet/Conduit Conduit terminal	AC	SCA003-□	SCA013-□
	With indicator light DIN terminal	AC DC	SCAD003-□	SCAD013-□

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

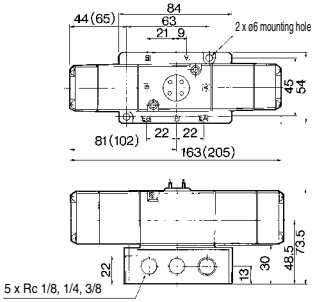
Dimensions

Grommet

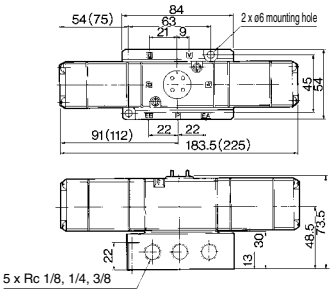
(VS4110)



(VS4210)

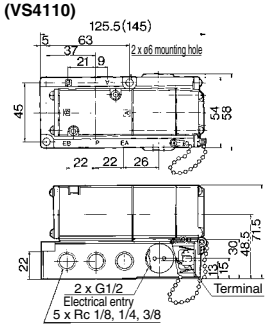


(VS4310/4410)

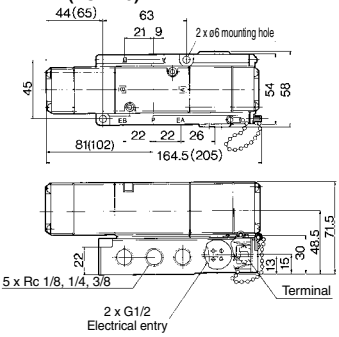


Conduit
Conduit terminal

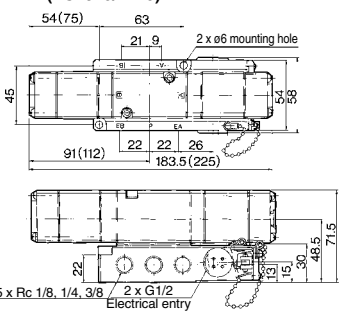
(VS4110)



(VS4210)

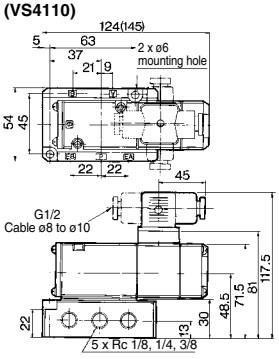


(VS4310/4410)

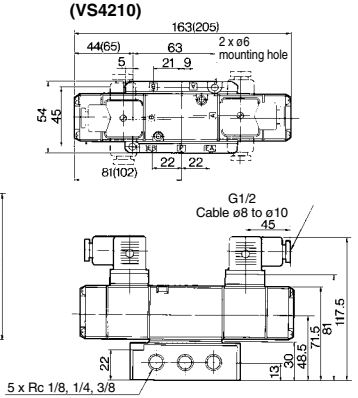


DIN terminal

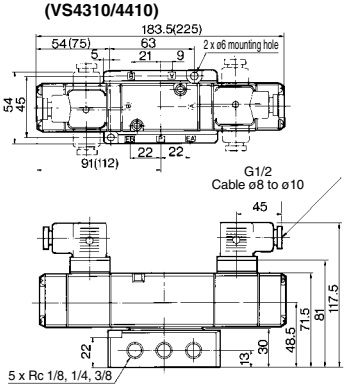
(VS4110)



(VS4210)

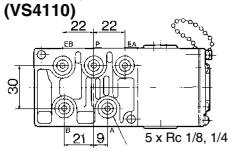


(VS4310/4410)

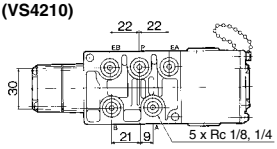


Bottom ported

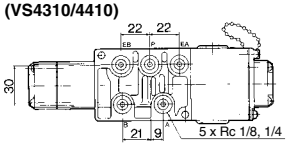
(VS4110)



(VS4210)

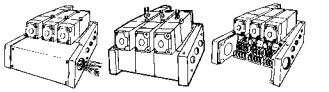


(VS4310/4410)



( ): DC

Manifold Specifications

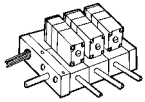
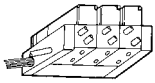


Specifications

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

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)

Accessory

Nil	None
T∗	With terminal block

∗ Only SC type applicable.

Option (spacer)

Nil	None
S	With stop valve
R	With throttle valve

Thread type

Nil	Rc
N	NPT
T	NPTF
F	G

⚠ 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.

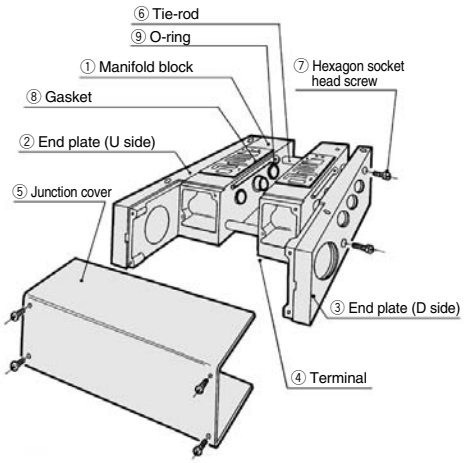
Mounting

⚠ Caution

1. 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.

2. When manifolding an exhaust center 3 position valve, use the individual EXH style manifold. (Back pressure may cause actuator to malfunction.)

Construction



• Replacement Parts: Sub-assembly

No.	Description	Assembly part no.	Electrical entry
1	Manifold block assembly	AXT336-1A-1 $^{01}_{02}$	Type SC (T only)
		AXT336-1A-2 $^{01}_{02}$	Type SU
		AXT336-1A-3 $^{01}_{02}$	Type SC
2	End plate (U side) assembly	AXT336-2A-1- $^{02}_{03}$	Type SC
		AXT336-2A-2- $^{02}_{03}$	Type SU
3	End plate (D side) assembly	AXT336-3A-1- $^{02}_{03}$	Type SC
		AXT336-3A-2- $^{02}_{03}$	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

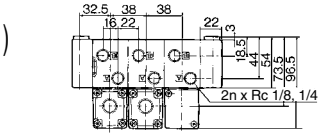
• Manifold Optional Parts Assembly

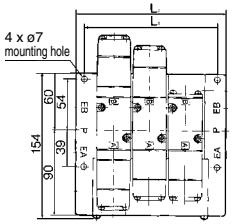
Option	Part no.
Blanking plate	AXT336-7A
Throttle valve spacer	AXT392A
Stop valve spacer	AXT395A
Interface regulator	ARB110-00- $^{1\ (P\ port\ regulation)}_{2\ (A/B\ port\ regulation)}$
Block disk	AXT336-6
Rubber plug	AXT336-9

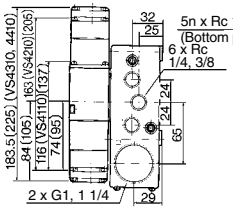
Dimensions

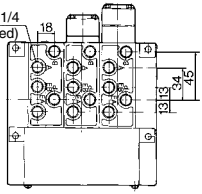
Type SC

(Electrical entry position: Manifold block)







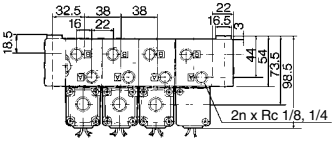


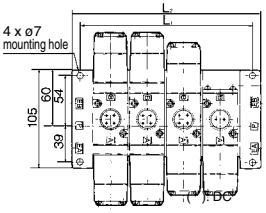
Formula/Stations	2	3	4	5	6	7
L_1 = 38n + 27	103	141	179	217	255	293
L_2 = 38n + 44	120	158	196	234	272	310

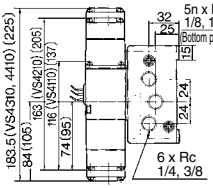
Formula for manifold weight M = 0.405n + 0.49 (kg)

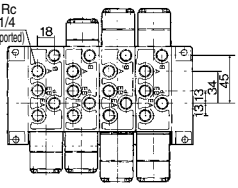
Type SU

(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)

( ): DC