3 Port 3 Position Valve

Pilot Solenoid **Air Operated**

New

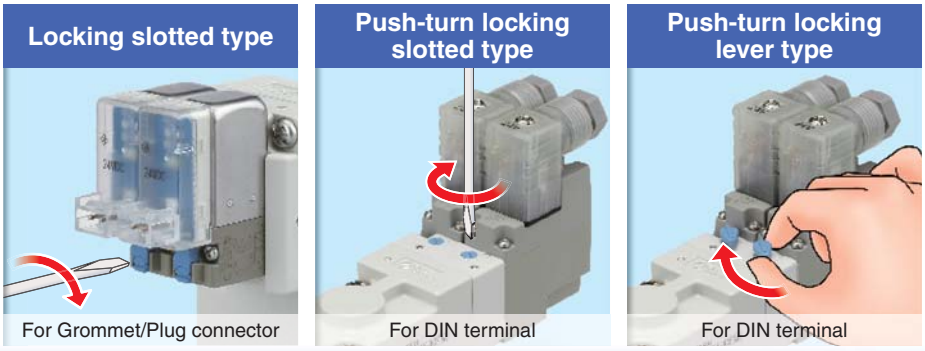
CE RoHS

Intermediate stopping of cylinders up to Ø 125* is possible.

* For VEX3$^{3}_{4}$2□, 300 mm/s, horizontal movement

Power consumption: 1 W

3 Manual override options added



Variations

	Body size	Port size	Flow-rate characteristics *1 Q [l/min (ANR)]	Applicable cylinder *2 Ø 63	Ø 80	Ø 100	Ø 125
Body ported	VEX312□	1/4	919				
Body ported	VEX332□	3/8	2198				
Base mounted	VEX322□	1/4	1029				
Base mounted	VEX342□	1/2	3113				

*1 For 1 (P) → 2 (A) *2 For 300 mm/s, horizontal movement

Series VEX3

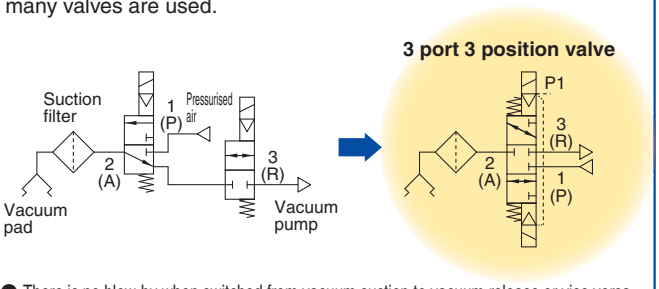
SMC

CAT.EUS11-112A-UK

Applications

Vacuum suction and release

The 3-port, 3-position double solenoid that permits vacuum suction, release, and suspension (closed) is ideal for a system where many valves are used.



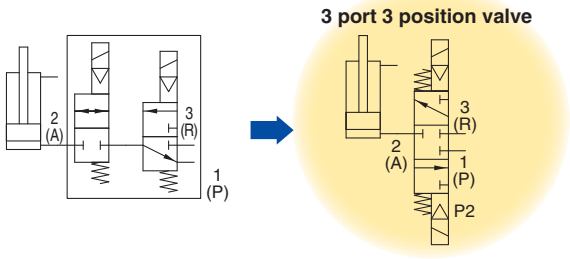
● There is no blow-by when switched from vacuum suction to vacuum release or vice versa.

⚠ Caution

● When maintaining the vacuum of port 2(A), the vacuum may decrease due to leakage from the vacuum pad or piping. Conduct vacuum suction at the vacuum adsorption position. Furthermore, it cannot be used as an emergency cutoff valve.

Intermediate cylinder stops

3-position closed centre type. A system with a more simple design, but the same size, is now available.



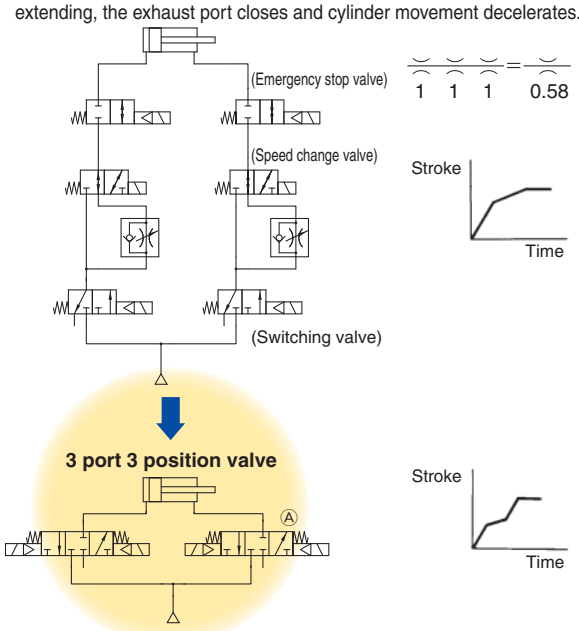
● A large capacity system without connection loss

1 1 = 0.71 (Valves and piping can be made smaller.)

Terminal deceleration and an intermediate speed change circuit can be produced easily.

The simple system configuration permits sharp response. The large capacity system configuration without connection loss allows the use of smaller valves and piping.

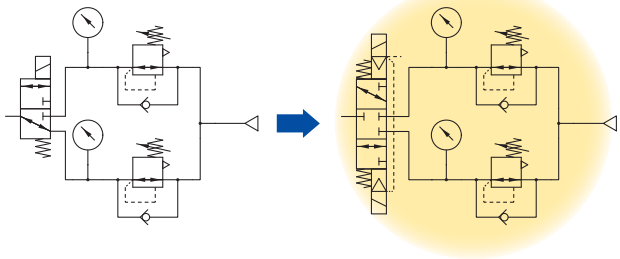
● For example, when solenoid ⓑ of valve Ⓐ is turned off while the cylinder is extending, the exhaust port closes and cylinder movement decelerates.



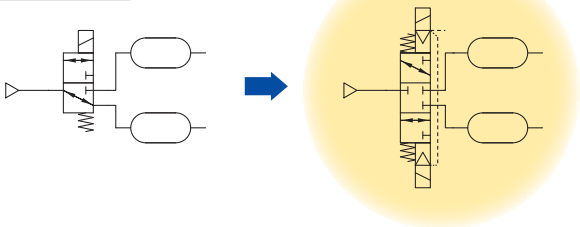
Universal porting could be used as a selector/divider valve.

The pressure balancing poppet valve that permits any flow direction allows sequential switching operation, preventing blow-by and air entrainment.

Two-stage directional control selection

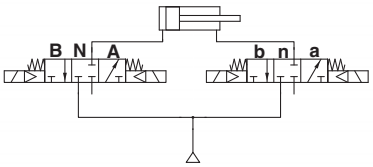


Direction divider



For operation control of double acting cylinders

Two 3-port 3-position valves driven by a double acting cylinder allow operation control in 9 positions (3 positions x 3 positions = 9 positions) including slow stopping, acceleration, and deceleration.



3 x 3 = 9 positions

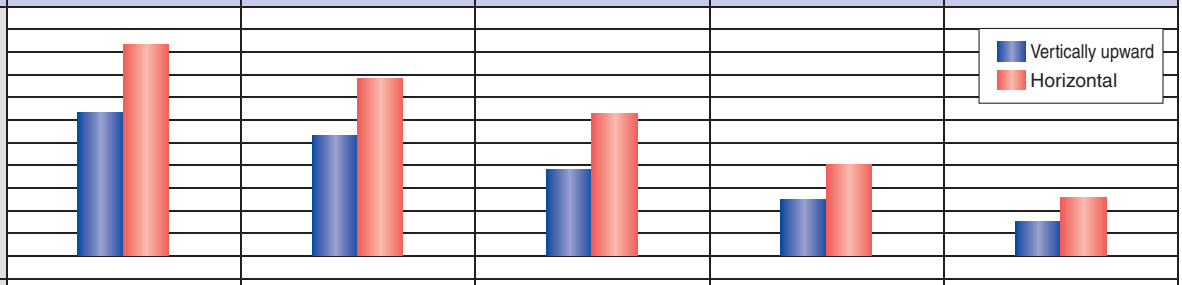
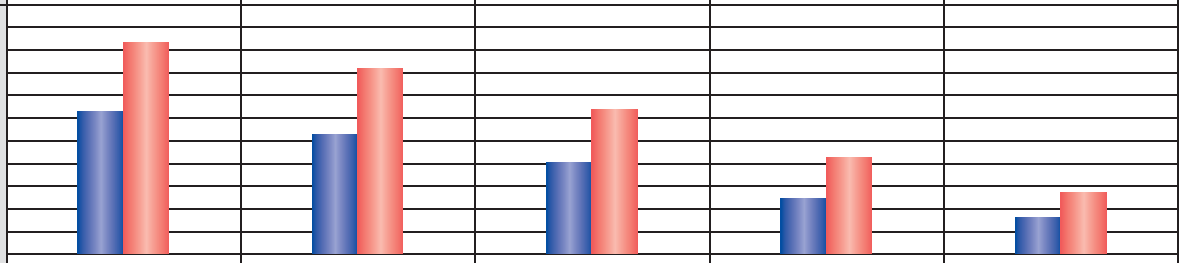
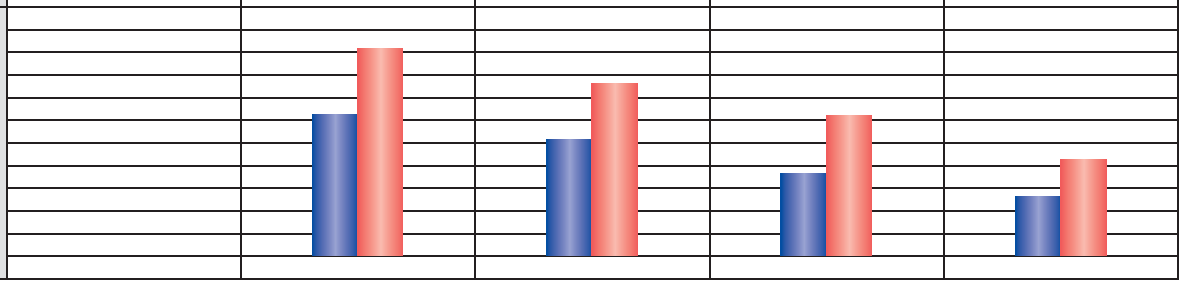
	a	n	b
A	1	2	3
N	4	5	6
B	7	8	9

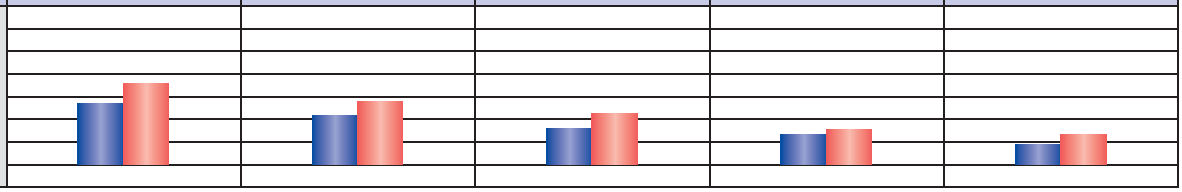
3, 7 — Reciprocation
1 — Pressure centre
5 — Closed centre
9 — Exhaust centre
2, 4 — Pressure & closed centre
6, 8 — Exhaust & closed centre
Slow stopping or deceleration

⚠ Caution ● This valve allows air leakage, and thus cannot be used for long term intermediate stops.

Cylinder Speed Chart

This chart is provided as guidelines only. For performance under various conditions, use SMC's Model Selection Software before making a judgment.

System	Average speed [mm/s]	Bore size: Series MB, CA2 — Pressure 0.5 MPa, Load ratio 50 %, Stroke 500 mm				
		Ø 40	Ø 50	Ø 63	Ø 80	Ø 100
A	1000 900 800 700 600 500 400 300 200 100 0					
B	1000 900 800 700 600 500 400 300 200 100 0					
C	1000 900 800 700 600 500 400 300 200 100 0					

System	Average speed [mm/s]	Bore size: Series CS1, CS2 — Pressure 0.5 MPa, Load ratio 50 %, Stroke 300 mm				
		Ø 125	Ø 140	Ø 160	Ø 180	Ø 200
D	600 500 400 300 200 100 0					

∗ Values at extension of a directly coupled cylinder when meter-out speed controllers are used with the needle full open.
∗ The average speed of the cylinder is obtained by dividing the stroke by the total stroke time.
∗ The load ratio is obtained by the following formula: ((Load mass x 9.8)/Theoretical output) x 100 %

Conditions

System	Solenoid valve	Speed controller	Silencer	Tubing diameter x Length
A	VEX3$\frac{1}{2}$2□-02	AS4000-02	AN20-02	Ø 10 x 1 m
B				Ø 12 x 1 m
C	VEX3$\frac{3}{4}$2□-$\frac{03}{04}$	AS420-03	AN30-03	Ø 12 x 1 m
D		AS420-04	AN40-04	SGP15A x 1 m

3 Port 3 Position Valve
Body Ported
Series VEX3

Air operated　　Pilot solenoid

How to Order

Air operated VEX3 [12] 0 – [01] [ ] 1 – [B]

Pilot solenoid VEX3 [12] [2] – [01] [ ] [5] [D] [ ] [ ] 1 – [B]

Operation type

1	External pilot solenoid
2	Internal pilot solenoid

Thread type

—	Rc
F	G
N	NPT
T	NPTF

Body size / Port size

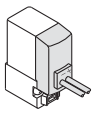
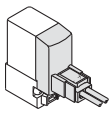
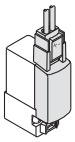
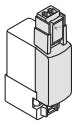
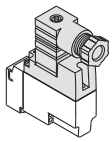
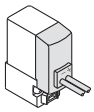
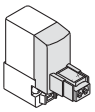
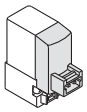
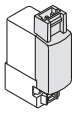
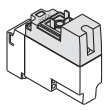
Body size	Port size	
	Port	1(P), 2(A), 3(R)
12	01	1/8
	02	1/4
32	02	1/4
	03	3/8
	04	1/2

Rated voltage

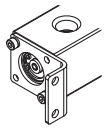
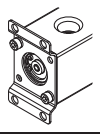
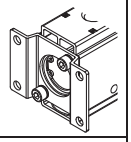
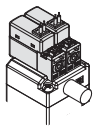
5	24 V DC
6	12 V DC
V	6 V DC
S	5 V DC
R	3 V DC

∗ DC specification of type D and DO is only available with 12 and 24 V DC.

Electrical entry

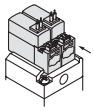
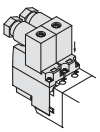
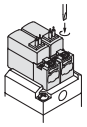
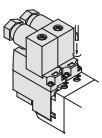
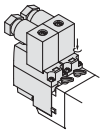
Grommet	L plug connector	M plug connector		DIN terminal
G: Lead wire length 300 mm	**L**: With lead wire (Length: 300 mm)	**M**: With lead wire (Length: 300 mm)	**MN**: Without lead wire	**D**: With connector
				
H: Lead wire length 600 mm	**LN**: Without lead wire	**LO**: Without connector	**MO**: Without connector	**DO**: Without connector
				

Option

—	None	—
B	Bracket (VEX312□ only)	
F	Foot bracket (VEX312□ and VEX332□ only)	VEX312□  VEX332□ 
N∗	Pilot exhaust (PE) silencer	

∗ Only with solenoid

Manual override

—	Non-locking push type	Grommet/ (L/M) plug connector  DIN terminal 
B	Locking slotted type	Grommet/ (L/M) plug connector 
D	Push-turn locking slotted type	DIN terminal 
E∗	Push-turn locking lever type	DIN terminal 

∗ Except external pilot solenoid

Light/surge voltage suppressor

Electrical entry for G, H, L, M

—	None
R	With surge voltage suppressor (Non-polar type)
U	With light/surge voltage suppressor (Non-polar type)

Electrical entry for D

—	None
S	With surge voltage suppressor
Z	With light/surge voltage suppressor

∗ DOZ is not available.

3 Port 3 Position Valve Base Mounted

Series VEX3

Air operated Pilot solenoid

How to Order

Air operated VEX3 [22] 0 – [01] [ ] 1

Pilot solenoid VEX3 [22] [2] – [01] [ ] [5] [D] [ ] [ ] 1 – [ ]

Operation type

1	External pilot solenoid
2	Internal pilot solenoid

Body size / Port size

Body size	Port	Port size 1(P), 2(A), 3(R)
22	—	Without sub-plate*
	01	1/8
	02	1/4
42	—	Without sub-plate*
	02	1/4
	03	3/8
	04	1/2

* With a gasket and 2 mounting bolts

Thread type

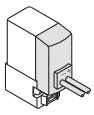
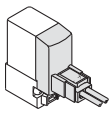
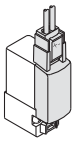
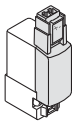
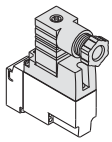
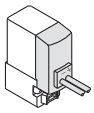
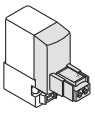
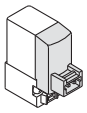
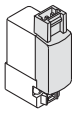
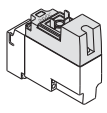
—	Rc
F	G
N	NPT
T	NPTF

Rated voltage

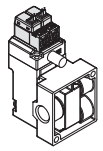
5	24 V DC
6	12 V DC
V	6 V DC
S	5 V DC
R	3 V DC

* DC specification of type D and DO is only available with 12 and 24 V DC.

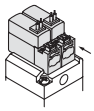
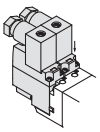
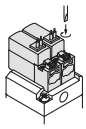
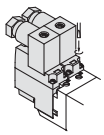
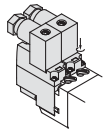
Electrical entry

Grommet	L plug connector	M plug connector		DIN terminal
G: Lead wire length 300 mm	**L**: With lead wire (Length: 300 mm)	**M**: With lead wire (Length: 300 mm)	**MN**: Without lead wire	**D**: With connector
				
H: Lead wire length 600 mm	**LN**: Without lead wire	**LO**: Without connector	**MO**: Without connector	**DO**: Without connector
				

Option

—	None	—
N	Pilot exhaust (PE) silencer	

Manual override

—	Non-locking push type	Grommet/ (L/M) plug connector 	DIN terminal 
B	Locking slotted type	Grommet/ (L/M) plug connector 	
D	Push-turn locking slotted type	DIN terminal 	
E*	Push-turn locking lever type	DIN terminal 	

* Except external pilot solenoid

Light/surge voltage suppressor

Electrical entry for G, H, L, M

—	None
R	With surge voltage suppressor (Non-polar type)
U	With light/surge voltage suppressor (Non-polar type)

Electrical entry for D

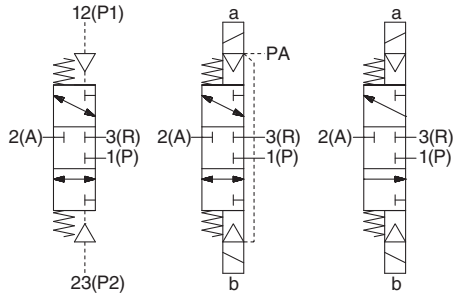
—	None
S	With surge voltage suppressor
Z	With light/surge voltage suppressor

* DOZ is not available.

Air operated

Internal pilot solenoid / External pilot solenoid

Symbol



Air operated | External pilot solenoid | Internal pilot solenoid

⚠ Caution

This is not a manual override. Do not press this button, as it can result in damage to the product. This applies to body sizes 1 and 2.

Specifications

Model			
	Body ported	VEX312□-01/02	VEX332□-02/03/04
	Base mounted	VEX322□-01/02	VEX342□-02/03/04
Operation type		Air operated, External pilot solenoid, Internal pilot solenoid	
Fluid		Air	
Air operated operating pressure range [MPa]	Operating pressure range	–101.2 kPa to 1.0	
	Pilot pressure range	0.2 to 1.0	
Internal pilot operating pressure range [MPa]		0.2 to 0.7	
External pilot operating pressure range [MPa]	Operating pressure range	–101.2 kPa to 1.0	
	Pilot pressure range	0.2 to 0.7	
Ambient and fluid temperature		0 to 50 °C (Air operated: 60 °C)	
Response time (Pilot pressure 0.5 MPa)		40 ms or less	60 ms or less
Maximum operating frequency		3 Hz	
Mounting		Free	
Lubrication Note 1)		Not required (Use turbine oil Class 1 ISO VG32, if lubricated.)	

Note 1) Non-lubricated specification is not available for this product.

Pilot Solenoid Valve Specifications

Model			VEX3121, VEX3221, VEX3321, VEX3421 VEX3122, VEX3222, VEX3322, VEX3422
Pilot valve			V114□, V115□
Electrical entry			Grommet (G), L plug connector (L), M plug connector (M), DIN terminal (D)
Rated coil voltage [V]	**DC**		3 V, 5 V, 6 V, 12 V, 24 V
Allowable voltage fluctuation			–10 to +10 % of rated voltage*
Power consumption [W]	**DC**	**G, L, M**	1.0 (With indicator light: 1.1)
		D	1.0 (With indicator light: 1.1)

* Allowable voltage fluctuation for S and Z types 24 V DC: –7 % to +10 %
12 V DC: –4 % to +10 %

Flow-rate Characteristics/Weight

Model		Port size	Flow-rate characteristics 1(P) → 2(A) C [dm³/(s·bar)]	b	Q Note) [l/min (ANR)]	2(A) → 1(P) C [dm³/(s·bar)]	b	Q Note) [l/min (ANR)]	Weight [kg] Air operated	(External/Internal) Pilot solenoid
Body ported	VEX312□-01	1/8	2.4	0.19	572	2.4	0.31	614	0.1	0.2
	VEX312□-02	1/4	3.5	0.35	919	3.3	0.49	962	0.1	0.2
	VEX332□-02	1/4	4.1	0.36	1084	4.3	0.42	1187	0.3	0.4
	VEX332□-03	3/8	8.7	0.29	2198	7.9	0.52	2362	0.3	0.4
	VEX332□-04	1/2	9.8	0.37	2610	9.6	0.52	2870	0.3	0.4
Base mounted (With sub-plate)	VEX322□-01	1/8	3.3	0.34	861	3.5	0.39	945	0.2	0.3
	VEX322□-02	1/4	4.1	0.28	1029	4.1	0.39	1107	0.2	0.3
	VEX342□-02	1/4	8.1	0.34	2114	7.9	0.39	2134	0.6	0.7
	VEX342□-03	3/8	12	0.26	2977	12	0.29	3032	0.6	0.7
	VEX342□-04	1/2	13	0.20	3113	13	0.24	3187	0.6	0.7

Model		Port size	Flow-rate characteristics 3(R) → 2(A) C [dm³/(s·bar)]	b	Q Note) [l/min (ANR)]	2(A) → 3(R) C [dm³/(s·bar)]	b	Q Note) [l/min (ANR)]	Weight [kg] Air operated	(External/Internal) Pilot solenoid
Body ported	VEX312□-01	1/8	2.3	0.36	608	2.5	0.22	606	0.1	0.2
	VEX312□-02	1/4	3.1	0.46	882	3.5	0.33	907	0.1	0.2
	VEX332□-02	1/4	4.1	0.41	1123	4.6	0.25	1134	0.3	0.4
	VEX332□-03	3/8	7.8	0.51	2312	8.7	0.33	2255	0.3	0.4
	VEX332□-04	1/2	9.1	0.53	2744	11	0.37	2930	0.3	0.4
Base mounted (With sub-plate)	VEX322□-01	1/8	3.3	0.37	879	3.5	0.36	926	0.2	0.3
	VEX322□-02	1/4	3.8	0.38	1019	4.4	0.23	1072	0.2	0.3
	VEX342□-02	1/4	8.2	0.33	2126	8.1	0.37	2157	0.6	0.7
	VEX342□-03	3/8	12	0.28	3013	13	0.28	3264	0.6	0.7
	VEX342□-04	1/2	12	0.29	3032	14	0.20	3353	0.6	0.7

Note) These values have been calculated according to ISO 6358 and indicate the flow rate under standard conditions with an inlet pressure of 0.6 MPa (relative pressure) and a pressure drop of 0.1 MPa.

Electrical entry
For Grommet, L/M plug connector

How to Order Pilot Valve Assembly

V1 1 4 A − 5 M □ □

Type of actuation

1	Normally closed

Specification

A	Large flow type (for DC)

Rated voltage

5	24 V DC
6	12 V DC
V	6 V DC
S	5 V DC
R	3 V DC

Manual override

—	Non-locking push
B	Locking slotted

Light/surge voltage suppressor

—	Without light/surge voltage suppressor
R	With surge voltage suppressor
U	With light/surge voltage suppressor

Electrical entry

24, 12, 6, 5, 3 V DC		
Grommet	L plug connector	M plug connector
G: Lead wire length 300 mm **H**: Lead wire length 600 mm	**L**: With lead wire (Length: 300 mm) **LN**: Without lead wire **LO**: Without connector	**M**: With lead wire (Length: 300 mm) **MN**: Without lead wire **MO**: Without connector

∗ LN and MN types are with 2 sockets.
∗ Refer to page 16 for the different lead wire lengths of L and M plug connectors.
∗ Refer to page 17 for the connector assembly with a dustproof cover for L and M plug connectors.

Electrical entry
For DIN terminal

How to Order Pilot Valve Assembly

V115 A − 5 D □

Specification

A	Large flow type (for DC)

Rated voltage

5	24 V DC
6	12 V DC

Light/surge voltage suppressor

—	Without light/surge voltage suppressor
S	With surge voltage suppressor (Non-polar type)
Z	With light/surge voltage suppressor (Non-polar type)

∗ DOZ is not available.

Electrical entry

D	DIN terminal (Type D)	With connector
DO		Without connector

How to Order Sub-plate and Base Gasket

Body size	22	42
Sub-plate	**VEX1 − 9 − 2 A □** **Port size** Symbol: A 1/8; B 1/4 **Thread type** Symbol: — Rc; F G; N NPT; T NPTF	**VEX4 − 2A − 1 A □** **Port size** Symbol: A 1/8; B 3/8; C 1/2 **Thread type** Symbol: — Rc; F G; N NPT; T NPTF
Base gasket	**VEX1−11−2**	**VEX4−4**

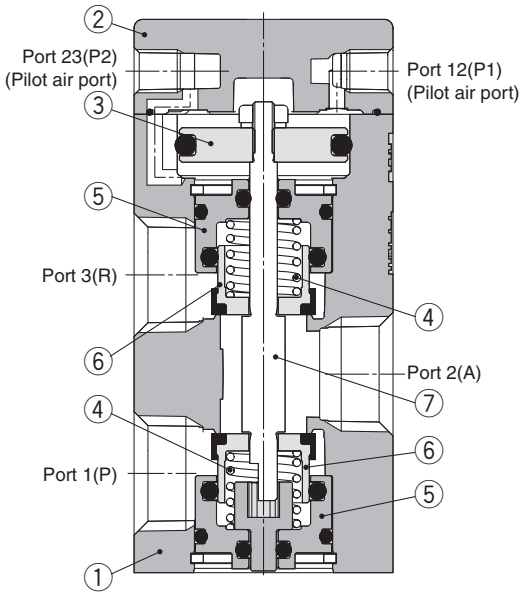
Options/Part Number

Description		Part number			
		VEX312□-$^{01}_{02}$	**VEX322□-$^{01}_{02}$**	**VEX332□-$^{02}_{03}_{04}$**	**VEX342□-$^{02}_{03}_{04}$**
Bracket (With bolt and washer)	**B**	VEX1-18-1A	—	—	—
Foot bracket (With bolt and washer)	**F**	VEX1-18-2A	—	VEX3-32-2A	—
Pilot exhaust (PE) silencer Note)	**N**	AN120-M5			

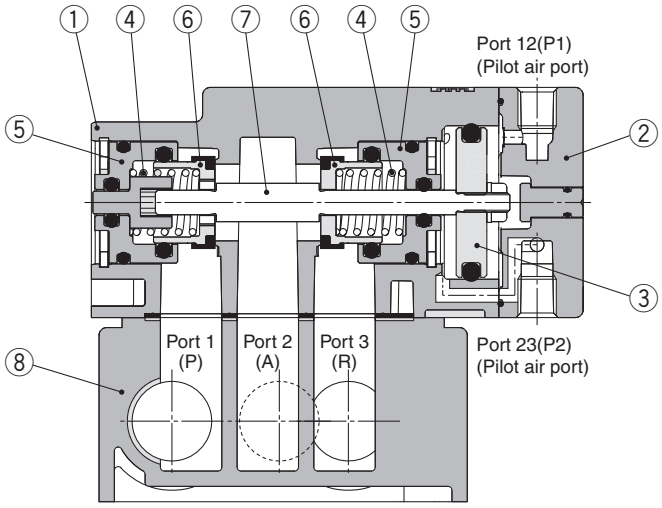
Note) Only with solenoid

Construction

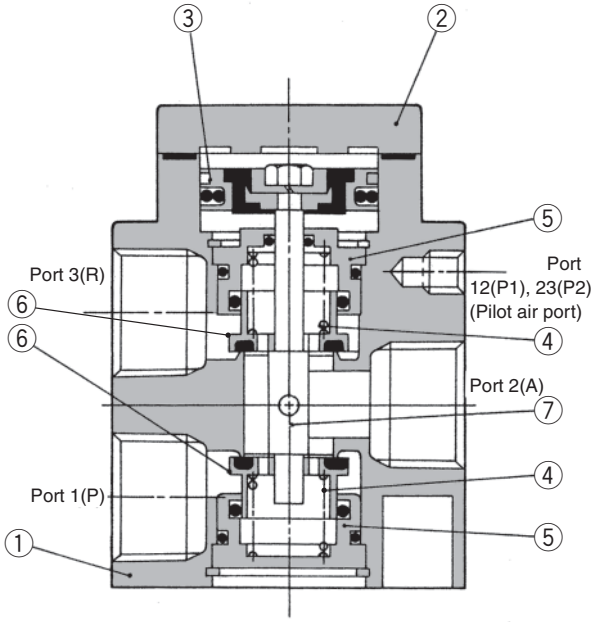
VEX3120 (Air operated)



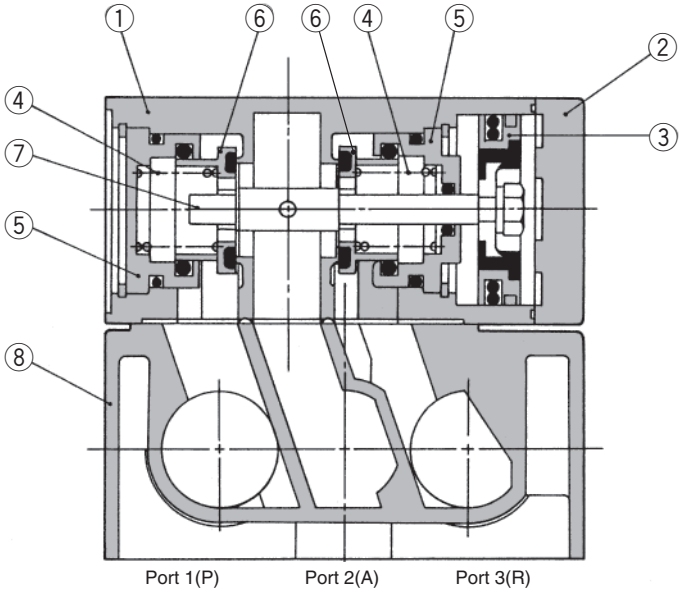
VEX3220 (Air operated)



VEX3320 (Air operated)



VEX3420 (Air operated)



Component Parts

No.	Description	Material
1	**Body**	Aluminium alloy
2	**Cover**	Aluminium alloy
3	**Working piston**	Aluminium alloy
4	**Centre spring**	Stainless steel
5	**Valve guide**	Aluminium alloy
6	**Poppet valve**	Aluminium alloy, Rubber
7	**Shaft**	Stainless steel
8	**Sub-plate (Refer to page 6.)**	Aluminium alloy

Working Principle

Fig. (1) A ⟷ R

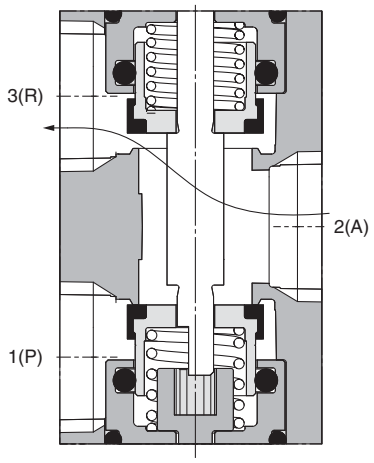


Fig. (2) Closed centre

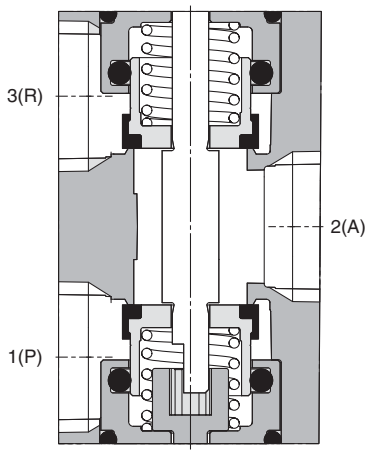
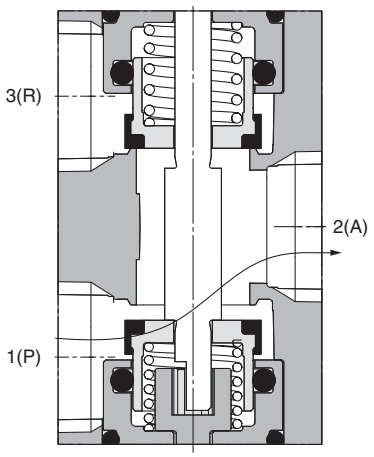


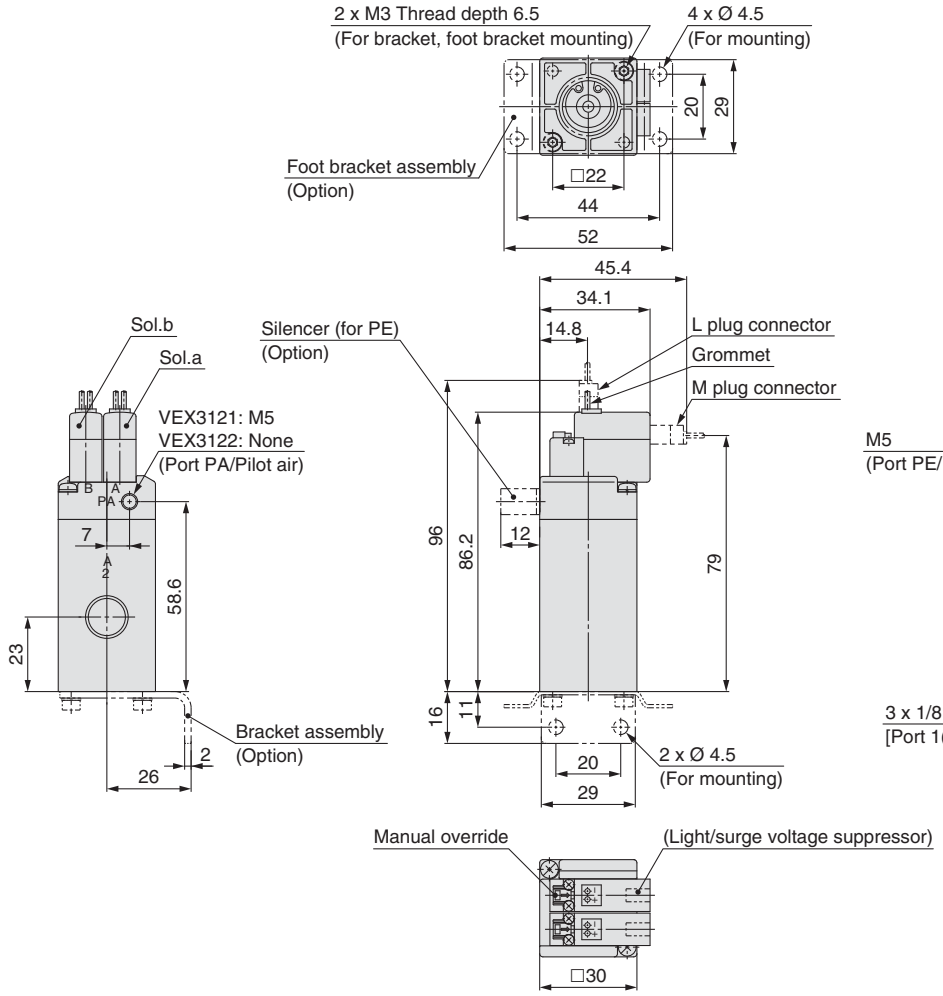
Fig. (3) P ⟷ A



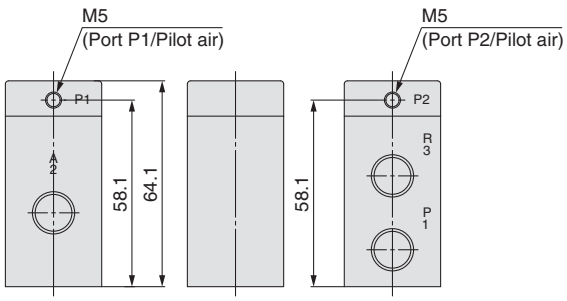
- This is a 3-port switch valve in which the shaft ⑦ extending from the driving piston ③ opens/closes a pair of poppet valves ⑥. The poppet valve has a pressure balancing mechanism in which port 2(A) pressure is constantly applied from the back and the centre spring ④ is acting as a backup.
- When neither the pilot solenoid valve “a” nor “b” are energised (or when air is exhausted both from the port 12(P1) and 23(P2) of the air operated type), no force will act on the working piston, and the spring closes the poppet valve, thus the valve assumes the closed centre position (Fig. (2)).
- When the pilot solenoid valve “a” is energised (or when pressurised air enters through the port 12(P1) of the air operated type), pilot air that enters the space above the working piston pushes down the piston and opens the lower poppet valve, thus connecting the port 1(P) and port 2(A) (Fig. (3)). The upper poppet valve continues to close the port 3(R) by means of pressure balance and the spring.
- When the pilot solenoid valve “b” is energised (or when pressurised air enters through the port 23(P2) of the air operated type), the pilot air that enters the space under the working piston pushes the piston upward and opens the upper poppet valve, thus connecting the port 2(A) and port 3(R) (Fig. (1)). The lower poppet valve continues to close the port 1(P) by means of pressure balance and the spring.

Dimensions: Body Ported/VEX312□

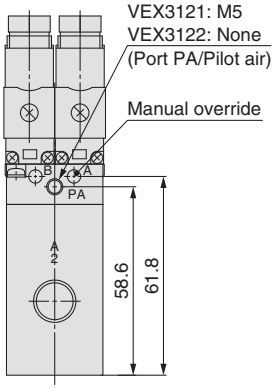
External pilot solenoid: VEX3121 Internal pilot solenoid: VEX3122



Air operated: VEX3120



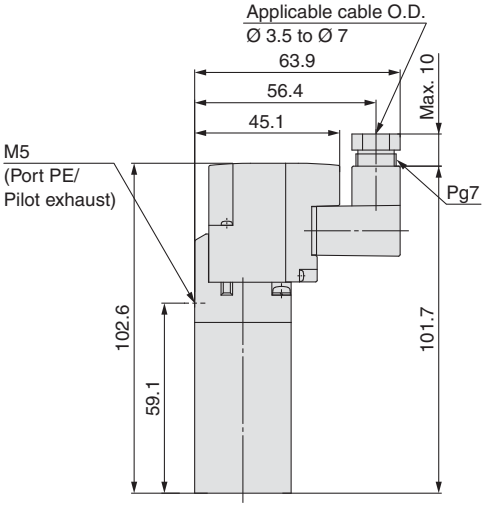
DIN terminal (D)



⚠ Caution

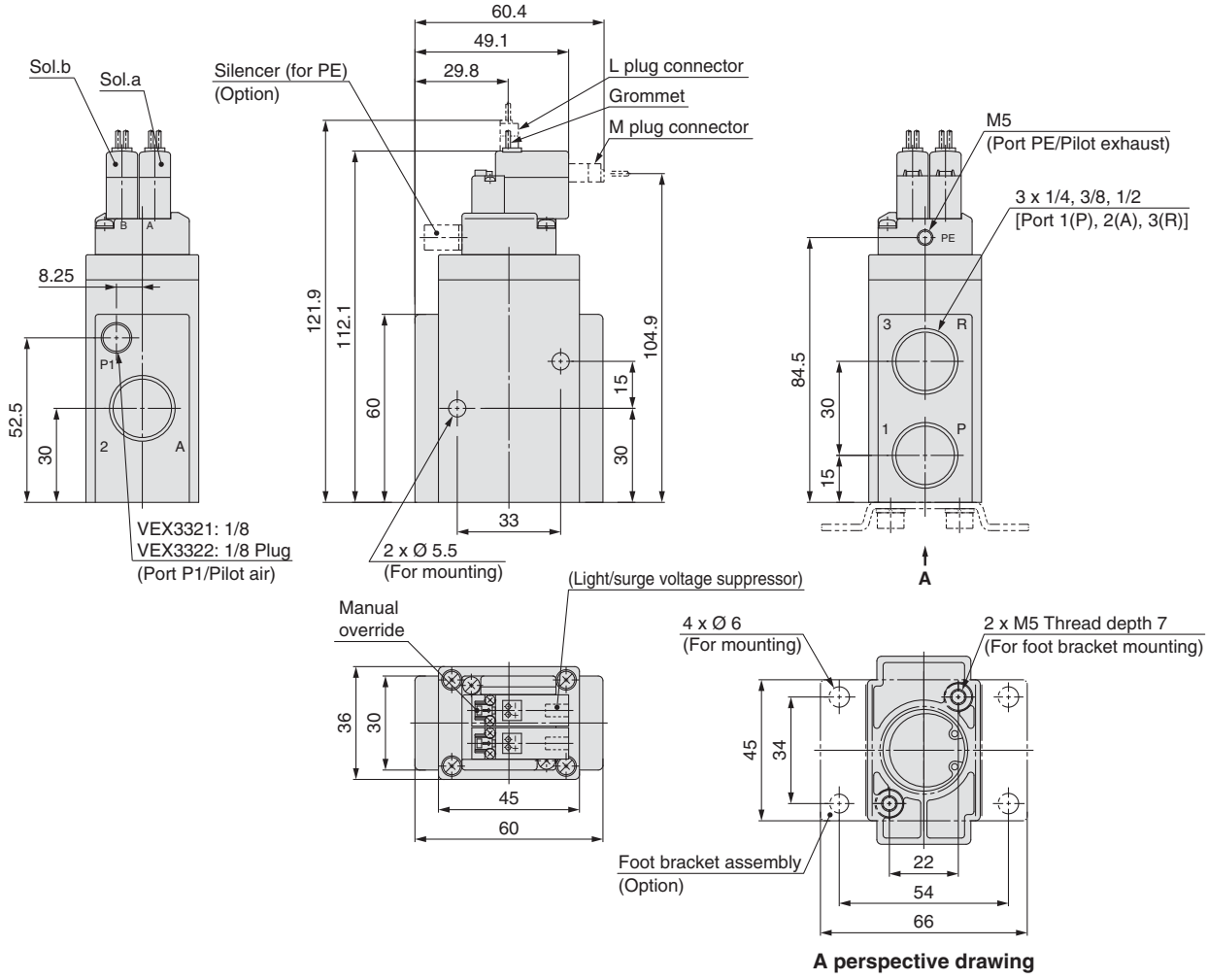
How to Use DIN Terminal Connector

Refer to page 18.



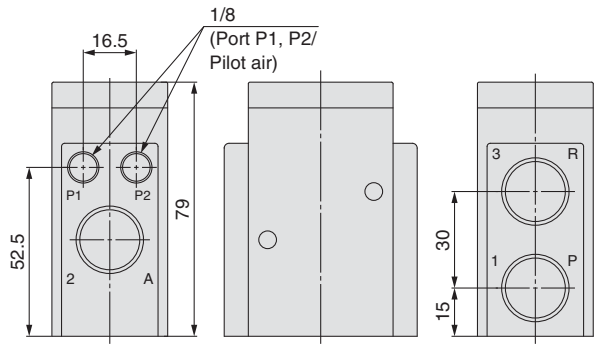
Dimensions: Body Ported/VEX332□

External pilot solenoid: VEX3321 Internal pilot solenoid: VEX3322



A perspective drawing

Air operated: VEX3320

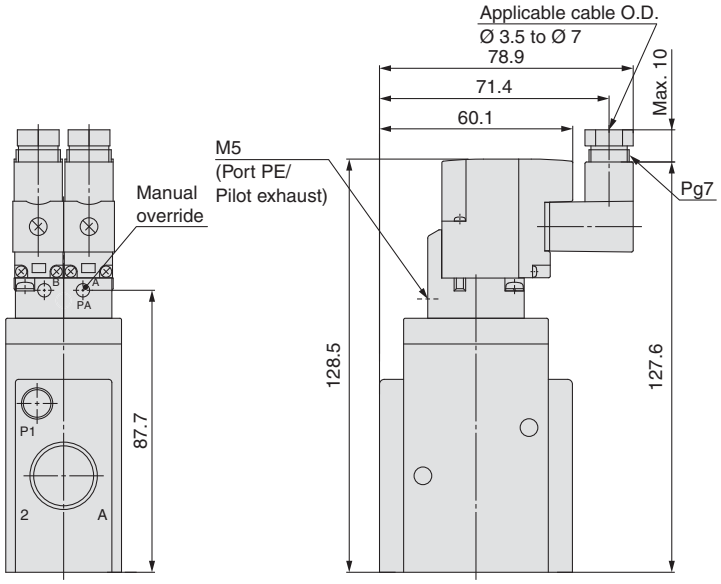


DIN terminal (D)

⚠ Caution

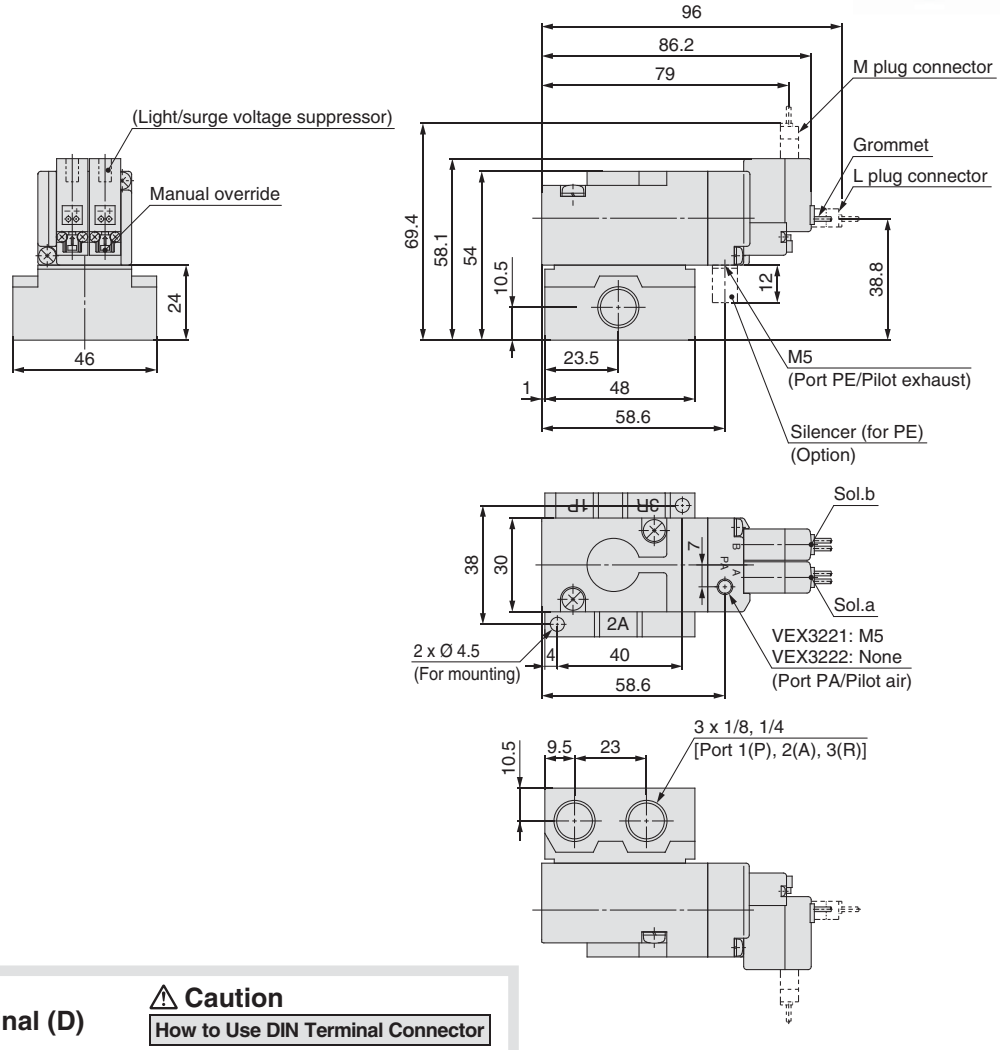
How to Use DIN Terminal Connector

Refer to page 18.



Dimensions: Base Mounted/VEX322□

External pilot solenoid: VEX3221 Internal pilot solenoid: VEX3222

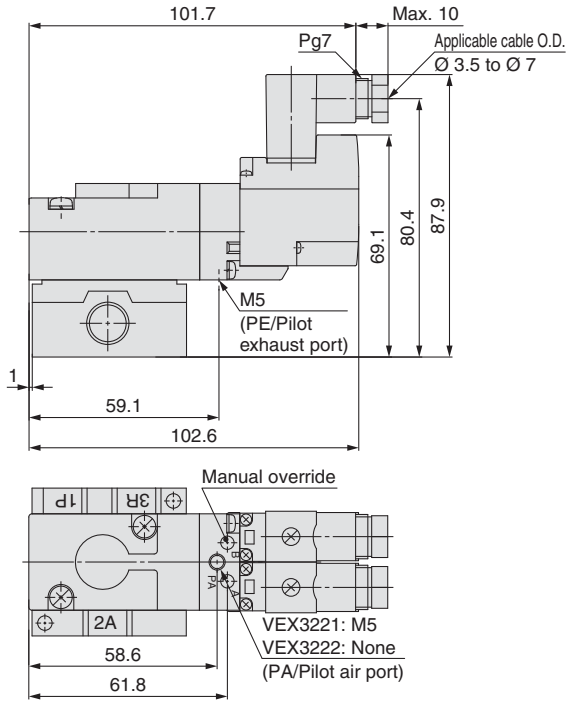


DIN terminal (D)

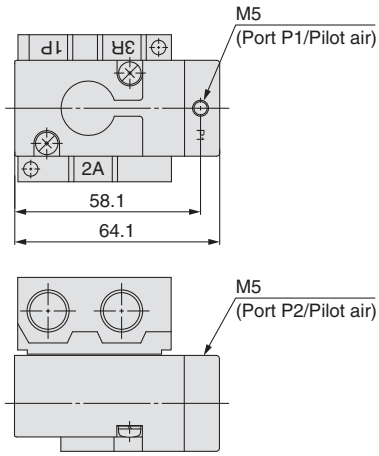
⚠ Caution

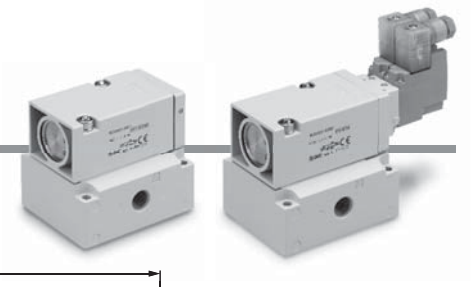
How to Use DIN Terminal Connector

Refer to page 18.



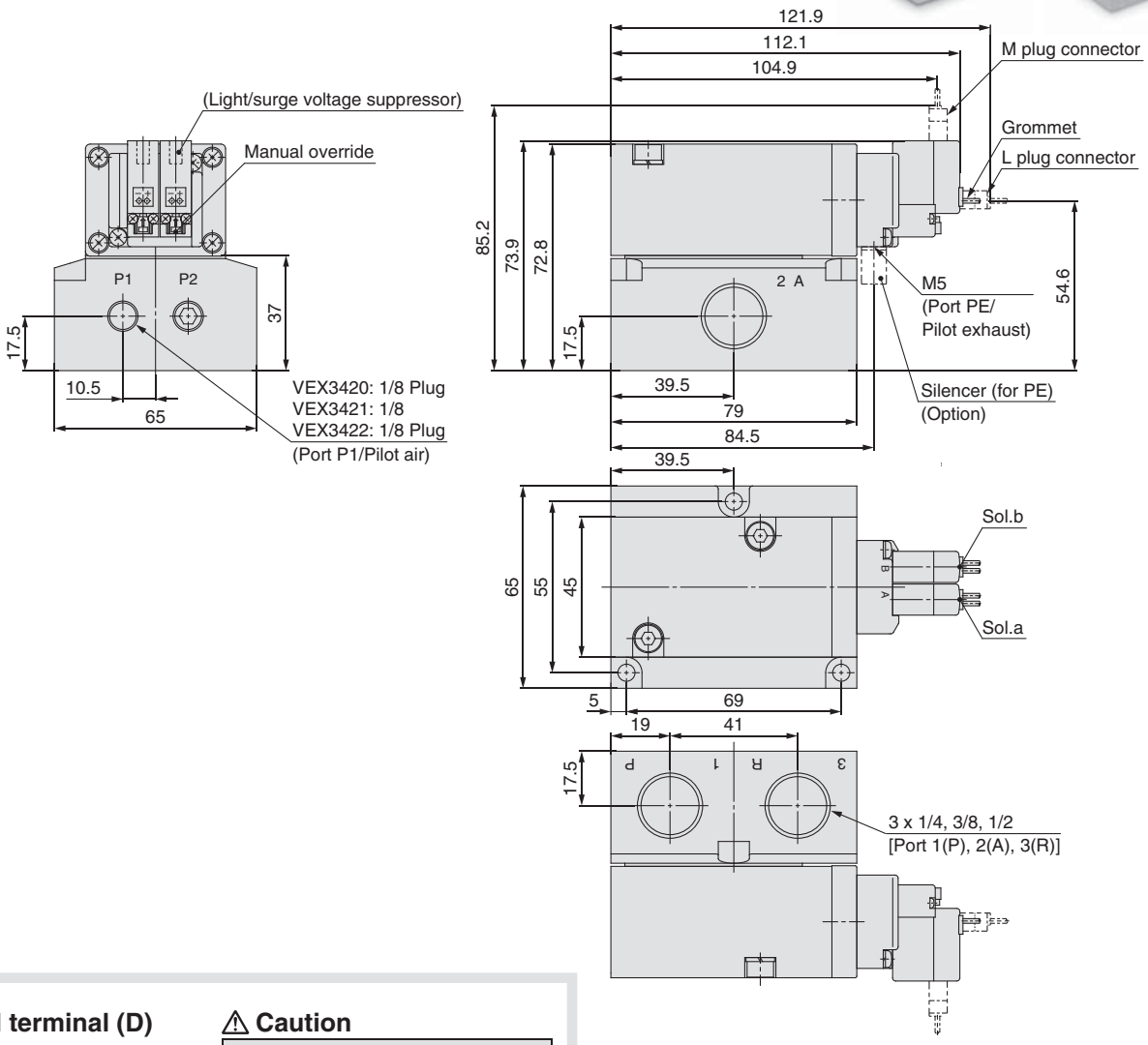
Air operated: VEX3220





Dimensions: Base Mounted/VEX342□

External pilot solenoid: VEX3421 Internal pilot solenoid: VEX3422

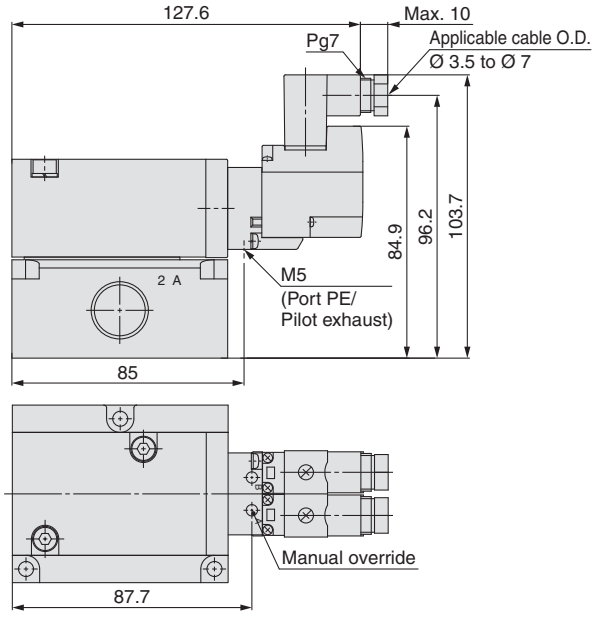


DIN terminal (D)

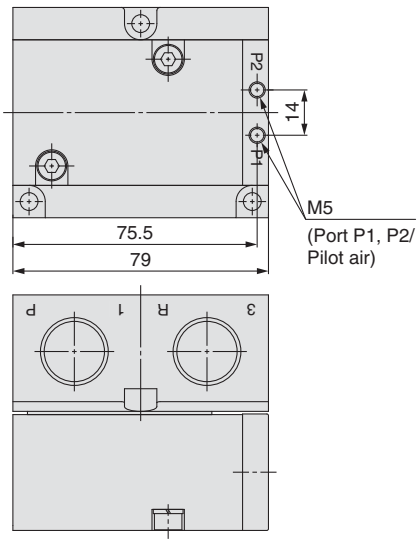
⚠ Caution

How to Use DIN Terminal Connector

Refer to page 18.



Air operated: VEX3420



3 Port 3 Position Valve/*Series VEX3*
Manifold Specifications

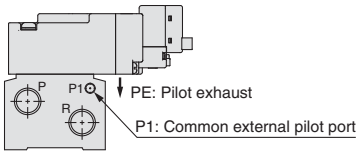
Specifications

Model		VVEX2	VVEX4		
Applicable valve		VEX3220, VEX3222	VEX3420, VEX3422		
Valve stations Note)		2 to 8 stations	2 to 6 stations		
Port specification		Common SUP, EXH			
Manifold pilot type		Internal pilot, Common external pilot			
Common external pilot port size		M5 x 0.8 Length of thread 5			
Port size	**1(P)**	1/4	3/8	3/8	1/2
	3(R)				
	2(A)		1/4	3/8	3/8
Applicable blanking plate		VEX1-17-3A (With gasket, screw)	VEX4-5-3A (With gasket, screw)		

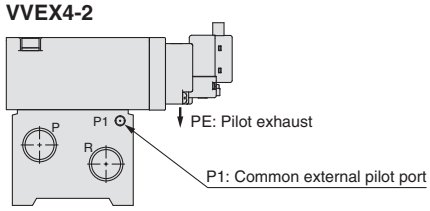
Note) When the VVEX2 series is used with 5 stations or more, or the VVEX4 series is used with 4 stations or more, apply pressure to the port P on both ends and exhaust from the port R on both ends.

Common External Pilot Piping

VVEX2-2



VVEX4-2



How to Order Manifold Base

VVEX 2 – 1 – 6 – 02 □

Thread type

—	Rc
F	G
N	NPT
T	NPTF

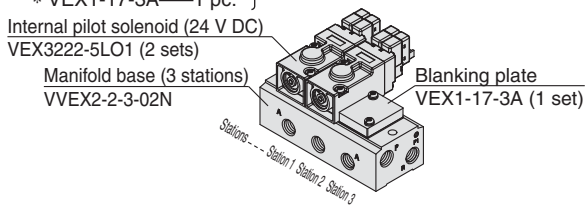
Body size ● **Manifold pilot type** ● **Valve stations** ● **Port size**

Body size	Pilot type		Applicable valve	Valve stations		Port size			
						Port	1(P)	3(R)	2(A)
2	**1**	Internal pilot	VEX3222 (Air operated: VEX3220 Note)	**2**	2 stations	**02**	1/4		
				⋮	⋮				
	2	Common external pilot		**6**	6 stations				
				⋮	⋮				
				8	8 stations				
4	**1**	Internal pilot	VEX3422 (Air operated: VEX3420 Note)	**2**	2 stations	**A**	3/8		1/4
				⋮	⋮	**B**	3/8		
	2	Common external pilot		**6**	6 stations	**C**	1/2		3/8

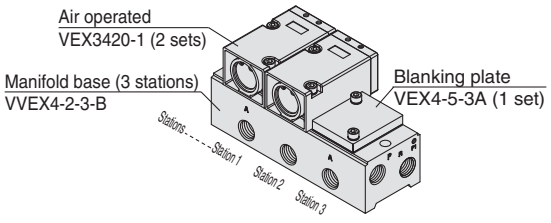
Note) Air operated
The VEX3220 and VEX3420 (air operated) are used. Distinction between the pilots (internal or common external pilot) of the manifold base does not matter. Either may be used.

Example for ordering a manifold base:
The valve and blanking plate for manifold arrangement should be specified in order from the left side of the manifold base (with the port 2(A) on your side).
(Example) VVEX2-2-3-02N

∗ VEX3222-1LO1 2 pcs.
∗ VEX1-17-3A——1 pc.
} Pilot solenoid



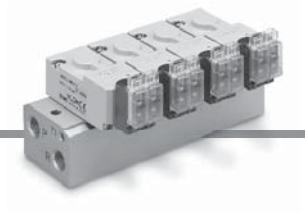
VVEX4-2-3-B
∗ VEX3420-1——2 pcs.
∗ VEX4-5-3A——1 pc.
} Air operated



VEX3 Manifold (Size 2, 4) Pilot Type

Manifold pilot type	Manifold base part number	Applicable valve part number	Operating pressure range	Pilot pressure range
Air operated type	VVEX□-□-□-□	VEX3220, VEX3420	−101.2 kPa to 1.0 MPa	0.2 to 1.0 MPa
Internal pilot type	VVEX□-1-□-□	VEX3222, VEX3422	0.2 to 0.7 MPa	—
Common external pilot type	VVEX□-2-□-□	VEX3222, VEX3422	−101.2 kPa to 1.0 MPa	0.2 to 0.7 MPa
Individual external pilot type	VVEX□-□-□-□	VEX3221, VEX3421	−101.2 kPa to 1.0 MPa	

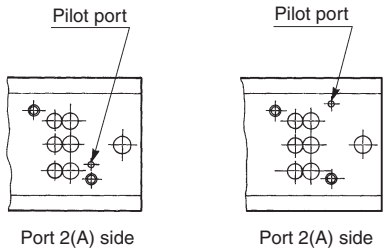
Note) If external pilot types are used, the common external pilot type manifold base is recommended. (Applicable valve: VEX3222, VEX3422)



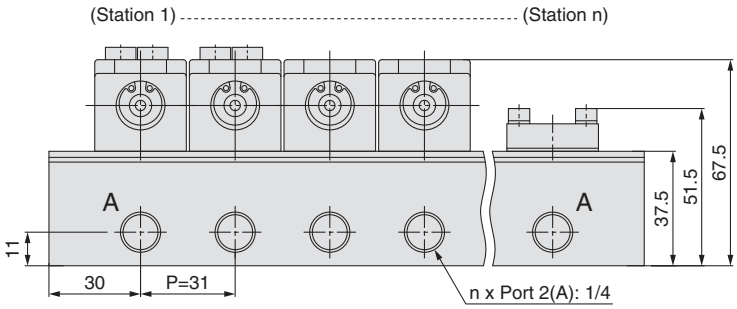
Dimensions: Manifold/VVEX2-□

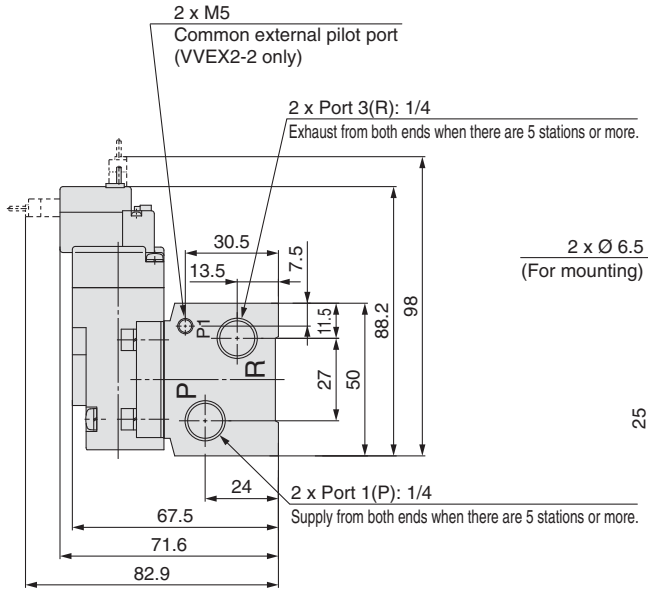
VVEX2-1 Applicable valve: VEX3220/3222
VVEX2-2 Applicable valve: VEX3220/3222

Valve mounting surface

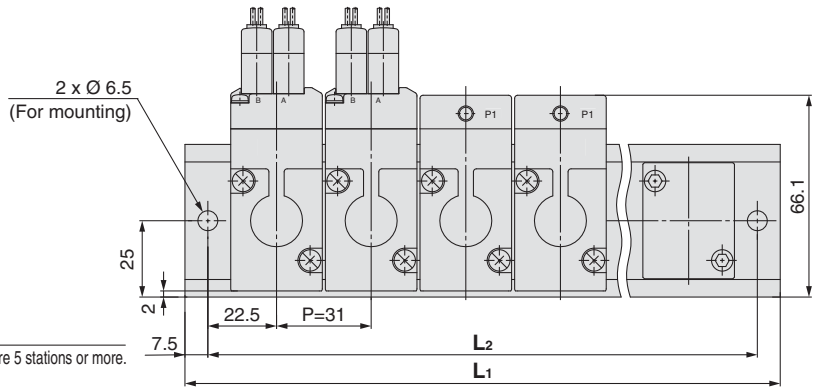


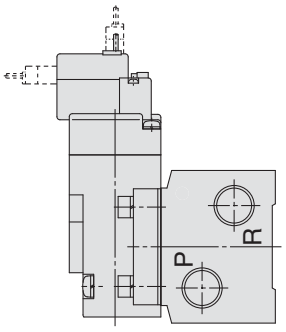
Internal pilot **Common external pilot**



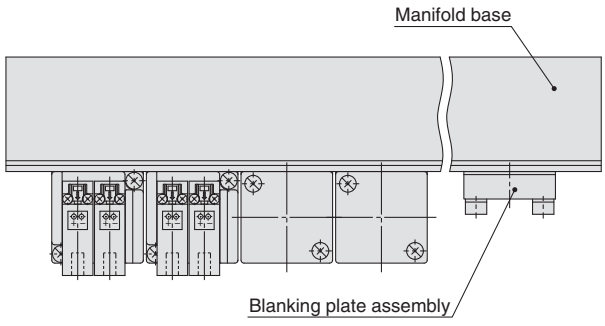


VVEX2-2 (Common external pilot)





VVEX2-1 (Internal pilot)

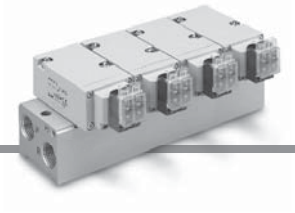


L Dimensions

[mm]

L dimension \ Station	2	3	4	5	6	7	8
L_1	91	122	153	184	215	246	277
L_2	76	107	138	169	200	231	262

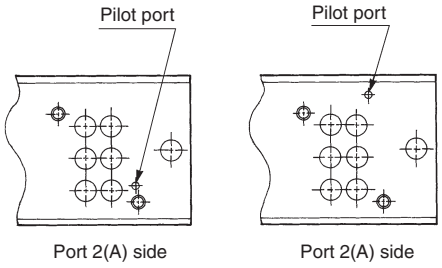
Formula: L_1=31n+29, L_2=31n+14 n: Stations



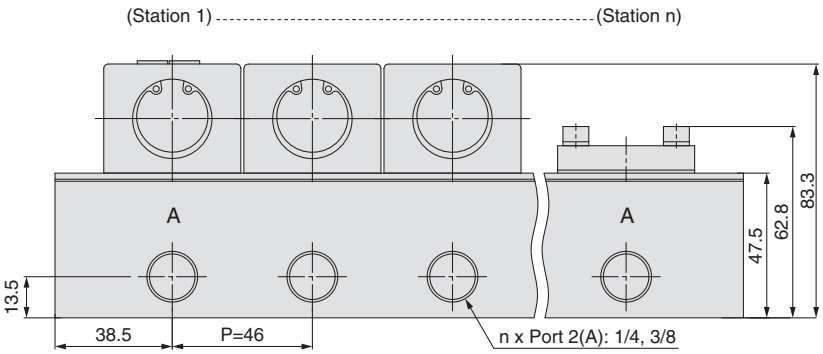
Dimensions: Manifold/VVEX4-□

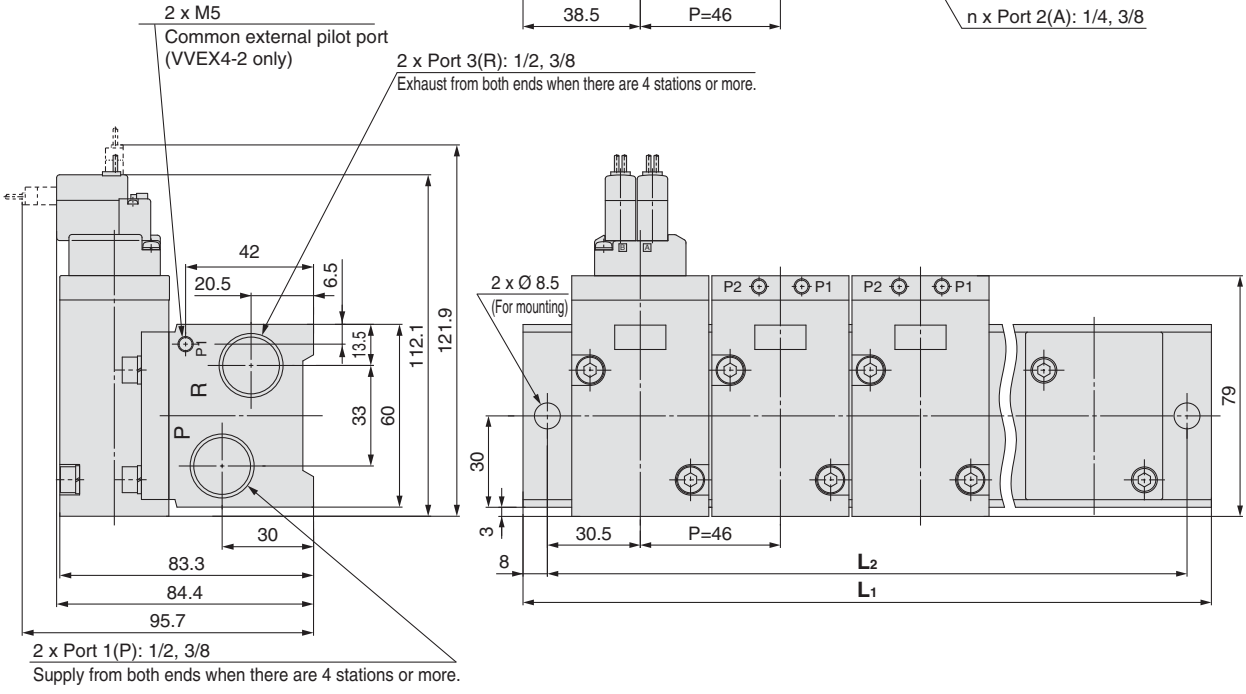
VVEX4-1 Applicable valve: VEX3420/3422
VVEX4-2 Applicable valve: VEX3420/3422

Valve mounting surface

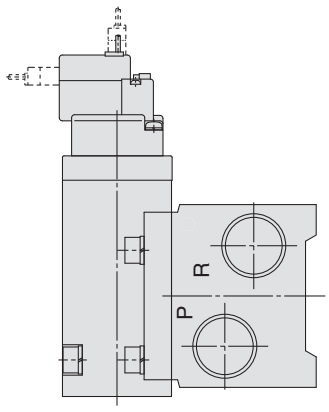


Internal pilot **Common external pilot**

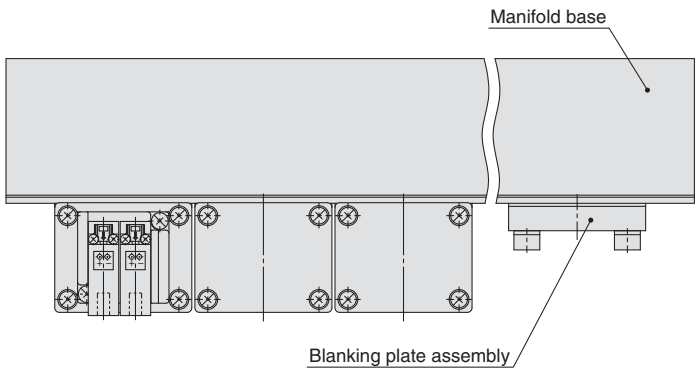




VVEX4-2 (Common external pilot)



VVEX4-1 (Internal pilot)



L Dimensions

[mm]

L dimension \ Station	2	3	4	5	6
L_1	123	169	215	261	307
L_2	107	153	199	245	291

L_1=46n+31, L_2=46n+15 n: Stations

Series VEX3
Specific Product Precautions 1

Be sure to read this before handling. Refer to the back cover for Safety Instructions. For 3/4/5 Port Solenoid Valve Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on the SMC website, http://www.smc.eu

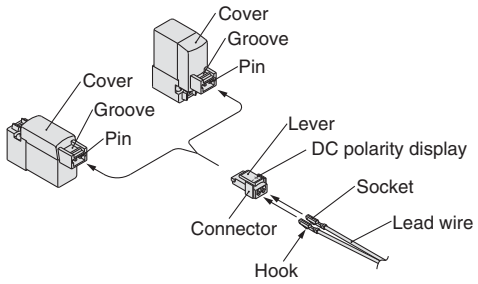
Connectors for VEX3 Series Body Sizes 12, 22, 32 and 42

How to Use Plug Connector

⚠ Caution

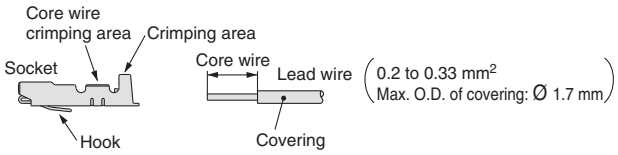
1. Attaching and detaching connectors

- To attach a connector, hold the lever and connector unit between your fingers and insert straight onto the pins of the solenoid valve so that the lever's pawl is pushed into the groove and locks.
- To detach a connector, remove the pawl from the groove by pushing the lever downward with your thumb, and pull the connector straight out.



2. Crimping of lead wires and sockets

Strip 3.2 to 3.7 mm at the end of the lead wires, insert the ends of the core wires evenly into the sockets, and then crimp with a crimping tool. When this is done, take care that the coverings of the lead wires do not enter the core wire crimping area.
Use an exclusive crimping tool for crimping.
(Please contact SMC for special crimping tools.)



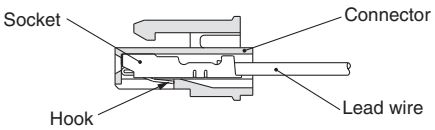
3. Attaching and detaching sockets with lead wires

● Attaching

Insert the sockets into the square holes of the connector (⊕, ⊖ indication), and continue to push the sockets all the way in until they lock by hooking into the seats in the connector. (When they are pushed in, their hooks open and they are locked automatically.) Then confirm that they are locked by pulling lightly on the lead wires.

● Detaching

To detach a socket from a connector, pull out the lead wire while pressing the socket's hook with a stick having a thin tip (approx. 1 mm). If the socket will be used again, first spread the hook outward.



Plug Connector Lead Wire Length

Standard length is 300 mm, but the following lengths are also available.

How to Order Connector Assembly

For DC: SY100 – 30 – 4A – □

Without lead wire: SY100 – 30 – A
(with connector and 2 of sockets only)

● Lead wire length

—	300 mm
6	600 mm
10	1000 mm
15	1500 mm
20	2000 mm
25	2500 mm
30	3000 mm
50	5000 mm

How to Order

Enter the part number for a plug connector solenoid valve without connector together with the part number for a connector assembly.

<Example> Lead wire length 2000 mm

<For DC>

VEX3122-015LO1
SY100-30-4A-20

Series VEX3
Specific Product Precautions 2

Be sure to read this before handling. Refer to the back cover for Safety Instructions. For 3/4/5 Port Solenoid Valve Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on the SMC website, http://www.smc.eu

Connector Assembly with Cover

⚠ Caution

Connector assembly with dustproof protective cover

- Effective to prevention of short circuit failure due to the entry of foreign matter into the connector.
- Chloroprene rubber for electrical use, which provides outstanding weather resistance and electrical insulation, is used for the cover material. However, do not allow contact with cutting oil etc.
- Simple and unencumbered appearance by adopting a round-shaped cord.

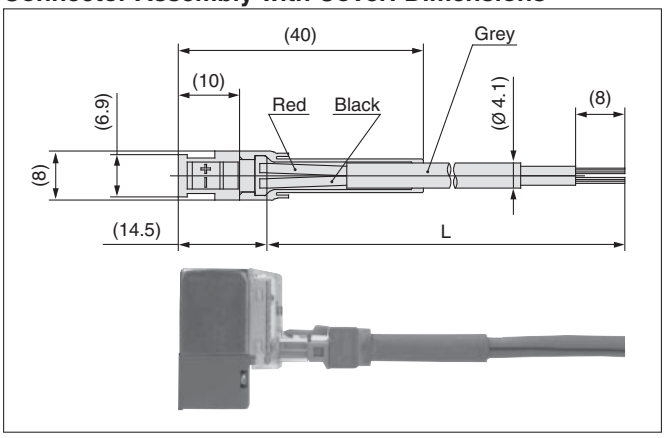
How to Order

SY100−68−A− □

● **Lead wire length**

—	300 mm
6	600 mm
10	1000 mm
15	1500 mm
20	2000 mm
25	2500 mm
30	3000 mm
50	5000 mm

Connector Assembly with Cover: Dimensions



How to Order

Enter the part number for a plug connector solenoid valve without connector together with the part number for a connector assembly with cover.

<Example> Lead wire length 2000 mm
VEX3122-015LO1
SY100-68-A-20

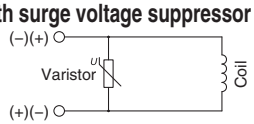
Surge Voltage Suppressor

⚠ Caution

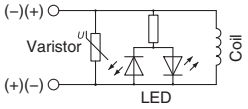
<For DC>
Grommet, L/M Plug Connector

■ **Non-polar type**

With surge voltage suppressor (□R)

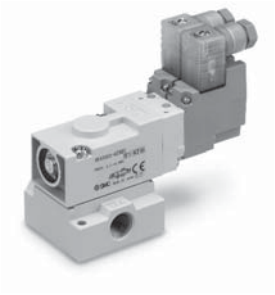


With light/surge voltage suppressor (□U)

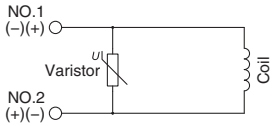


(The non-polar type can be used with the connections made either way.)

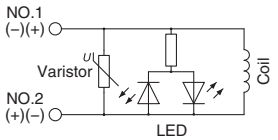
DIN Terminal



With surge voltage suppressor (DS)



With light/surge voltage suppressor (DZ)



DIN terminal has no polarity.

Specific Product Precautions 3

Be sure to read this before handling. Refer to the back cover for Safety Instructions. For 3/4/5 Port Solenoid Valve Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on the SMC website, http://www.smc.eu

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 head 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) on the terminal block, insert the cores of the lead wires into the terminals according to the connection method, and fasten them securely with the terminal screws.
4. Secure the cord by fastening the ground nut.

⚠ Caution

When making connections, take note that using other than the supported size (Ø 3.5 to Ø 7) heavy-duty cord will not satisfy IP65 (enclosure) standards. Also, be sure to tighten the ground nut and holding screw within their specified torque ranges.

⚠ Caution

Changing the entry direction

After separating the terminal block and housing, the cord entry can be changed by attaching 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.

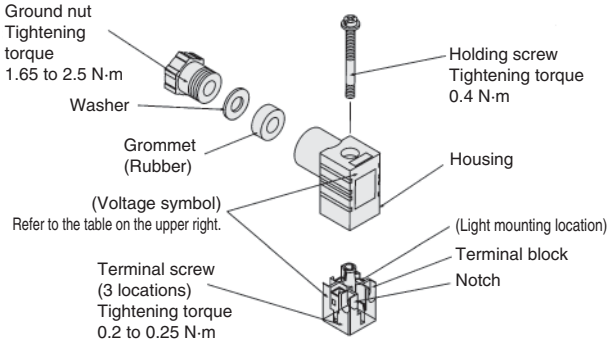
Precautions

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

Compatible cable

Cord O.D.: Ø 3.5 to Ø 7

(Reference) 0.5 mm^2, 2-core or 3-core, equivalent to JIS C 3306



DIN Connector Part Number

⚠ Caution

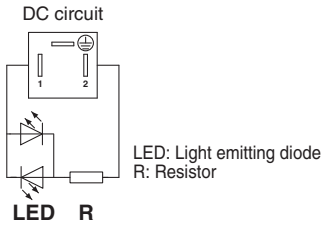
<Type D>

Without light	SY100-61-1

With light

Rated voltage	Voltage symbol	Part number
24 V DC	24 V	SY100-61-3-05
12 V DC	12 V	SY100-61-3-06

Circuit Diagram with Light



⚠ Safety Instructions

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.

⚠ 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.

*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.
etc.

⚠ Warning

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 catalogue 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 catalogue.
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.

⚠ Caution

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.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, wichever is first.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

***2) Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

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.
2. 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.

⚠ Safety Instructions Be sure to read "Handling Precautions for SMC Products" (M-E03-3) before using.

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