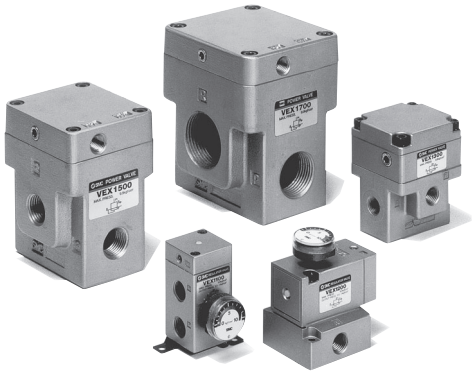
Power Valve: Regulator Valve

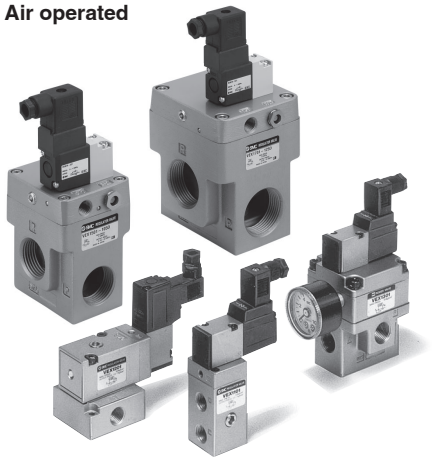
VEX1 Series

Large capacity relief regulator

Rapid tank internal pressure setting, air blow, constant pressure supply and driving, balance and driving, 2 steps directional control setting and multiple steps pressure control



Air operated



External pilot solenoid

Specifications

Model			VEX110□-01/02	VEX120□-01/02	VEX130□-02/03/04	VEX150□-04/06/10	VEX170□-10/12	VEX190□-14/20
Operation type			Air operated, External pilot solenoid					
Fluid			Air					
Max. operating pressure			1.0 MPa					
Set pressure range	Air operated		0.05 to 0.9 MPa					
	Solenoid		0.05 to 0.7 MPa			0.05 to 0.9 MPa		
Ambient and fluid temp.			0 to 50 °C (Air operated: 0 to 60 °C) No condensation					
Hysteresis			0.03 MPa					
Repeatability			0.01 MPa					
Sensitivity			0.01 MPa					
Mounting			Free					
Lubrication			Not required (Use turbine oil Class 1 ISO VG32, if lubricated.)					
Port size		Port	01	02	01	02	02	03	04	04	06	10	10	12	14	20
		1(P)	1/8	1/4	1/8	1/4	1/4	3/8	1/2	1/2	3/4	1	1	1 1/4	1 1/2	2
		2(A)											1 1/4		2	
		3(R)														
Weight (kg)	Air operated		0.1		0.2		0.4			1.3			1.9		3.9	
	Solenoid		0.2		0.3		0.5			1.4			2.0		4.0	

Pilot Solenoid Valve Specifications

Model			VEX1101 / 1201 / 1301	VEX1501 / 1701 / 1901
Pilot valve			VK334-□□□	VO307K-□□□1
Electrical entry			Grommet, DIN terminal	Grommet, DIN terminal
Coil rated voltage (V)	AC(50/60Hz)		100 V, 110 V, 200 V, 220 V, 240 V	
	DC		12 V, 24 V	
Allowable voltage			±10 % of rated voltage	–15 to +10 % of rated voltage
Apparent power	AC	Inrush	9.5 VA/50 Hz, 8 VA/60 Hz	12.7 VA (50 Hz), 10.7 VA (60 Hz)
		Holding	7 VA/50 Hz, 5 VA/60 Hz	7.6 VA (50 Hz), 5.4 VA (60 Hz)
	DC		4 W (Without indicator light), 4.3 W (With indicator light)	4 W (Without indicator light), 4.2 W (With indicator light)
Manual override			Non-locking push type	

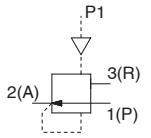
Option

Description		Part no.					
		VEX110□-01/02	VEX120□-01/02	VEX130□-02/03/04	VEX150□-04/06/10	VEX170□-10/12	VEX190□-14/20
Bracket (With bolt and washer)	B	VEX1-18-1A	–	VEX3-32A	VEX5-32A	VEX7-32A	VEX9-32A
	F	VEX1-18-2A	–	–	–	–	–
Pressure gauge Note)	G	G27-10-01		G36-10-01	G46-10-01		

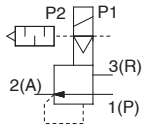
Note) When requiring a gauge different than that mentioned above, specify the model number.
Option is packed with it.
(Refer to Best Pneumatics No. 7.)
Example: VEX1300-03
G36-4-01

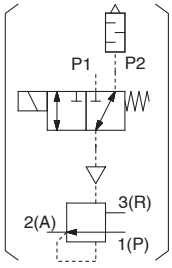
Symbol

Air operated



External pilot solenoid





How to Order

VEX 1 3 0 1 – 03 □ □ D □ – B

Regulator valve

Option

—	None
B	Bracket
F	Foot (VEX110□ only)
G	Gauge

- When specifying more than one option, combine symbols alphabeticaly.

Operation type

0	Air operated
1	External pilot solenoid

Light/Surge voltage suppressor (Only with solenoid)

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

Thread type

—	Rc
F	G (3)
N	NPT
T	NPTF

Note 3) Not conforming to ISO1179-1.

Sub-plate and gasket part no.

Sub-plate	VEX1 – 9 – 1 □ □ P Port size: Symbol / Port size — A: 1/8, B: 1/4 Thread type: Symbol / Thread type — —: Rc, F: G, N: NPT, T: NPTF
Base gasket	VEX1 – 11 – 2

Rated voltage (Only with solenoid)

1	100 VAC (50/60 Hz)
2	200 VAC (50/60 Hz)
3	110 VAC (50/60 Hz)
4	220 VAC (50/60 Hz)
5	24 VDC
6	12 VDC
7	240 VAC (50/60 Hz)

* For other rated voltages, please consult with SMC.

Body size • **Port size** (4) • **Electrical entry (Only with solenoid)**

Body size		Port size: Port	Port size: 1(P), 2(A)	Port size: 3(R)	Electrical entry (Only with solenoid)	Light/Surge voltage suppressor (Only with solenoid): —	S	Z
Body ported	1	01	1/8	1/8	G: Grommet (300 mm)	●	●	×
		02	1/4	1/4	H: Grommet (600 mm)	●	●	×
	3	02	1/4	1/4	D: DIN terminal	●	●	●
		03	3/8	3/8	DO: DIN terminal (Without connector)	●	●	×
		04	1/2	1/2				
	5	04	1/2	1/2	G: Grommet (300 mm)	●	●	×
		06	3/4	3/4				
		10	1	1				
	7	10	1	1 1/4	H: Grommet (600 mm)	●	●	×
		12	1 1/4					
	9	14	1 1/2	2	D: DIN terminal	●	×	●
		20	2					
Base mounted	2	—	Without sub-plate		G: Grommet (300 mm)	●	●	×
		01	1/8	1/8	H: Grommet (600 mm)	●	●	×
		02	1/4	1/4	D: DIN terminal	●	●	●
					DO: DIN terminal (Without connector)	●	●	×

Note 4) Face seal type One-touch fittings cannot be used.

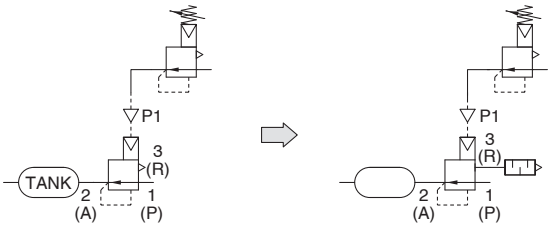
⚠ Caution

Be sure to read this before handling the products.
Refer to back page 50 for Safety Instructions and pages 3 to 9 for 3/4/5 Port Solenoid Valve Precautions.

Application Example

1. Relief regulator (Rapid tank internal pressure setting)

(Relieving type regulator e.g. AR-D)

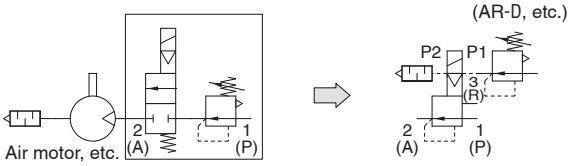


Relieving type diaphragm regulator

- Large exhaust capacity.
- Silencer is easy to connect.

2. Air blow (As 2 port directional control regulator valve)

(AR-D, etc.)



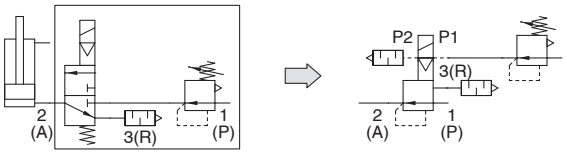
External pilot 2 port solenoid valve (For on/off operation)

Diaphragm regulator (For pressure setting)

- Solenoid on/off operation controls the air flow.
- Setting can be changed by remote control. (Remote control)

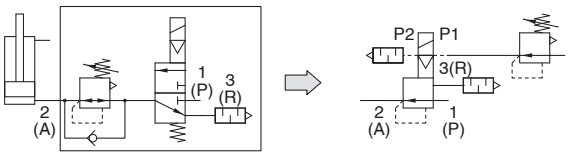
3. Constant pressure supply and driving (As 3 port directional control regulator valve)

Note) The pressure is about 0.01 MPa when OFF because of leakage.



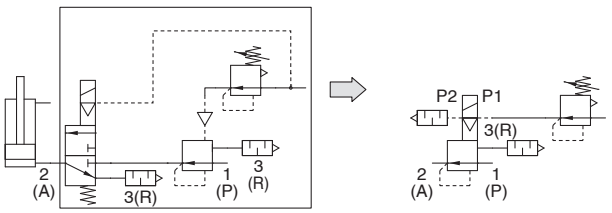
(Solenoid valve) (Regulator)

- Actuator's appropriate pressure control saves energy (Air).



- Actuator driving system becomes simple.

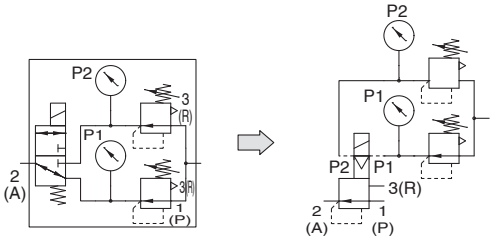
4. Balance and driving



(External pilot solenoid valve) (Relieving type regulator)

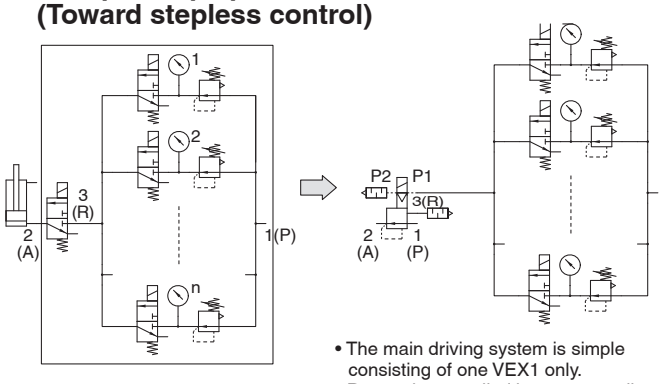
- The large capacity relief valve rapidly responds and sets the balance pressure.
- Solenoid on/off operation drives the cylinder.
- Common exhaust.

5. 2 steps directional control setting

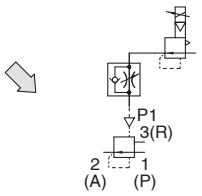


- 3 VALVES IN ONE – A simple main system is ensured.
- Remotely controlled by compact pilot system.

6. Multiple steps pressure control (Toward stepless control)



- The main driving system is simple consisting of one VEX1 only.
- Remotely controlled by compact pilot system.



- Steplessly and remotely controlled by electric signals.
- Flexibile pressure control for welders.

⚠Caution

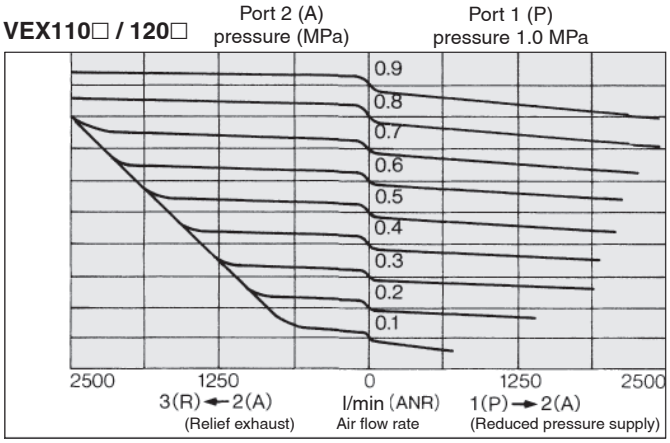
- When the VEX outlet side capacity is small, install a speed controller AS2000, in the pilot pipe to lower the pilot pressure for vibration prevention. (Meter-in)

⚠ Caution ((5) 2 steps directional control setting, (6) multiple steps pressure control setting)

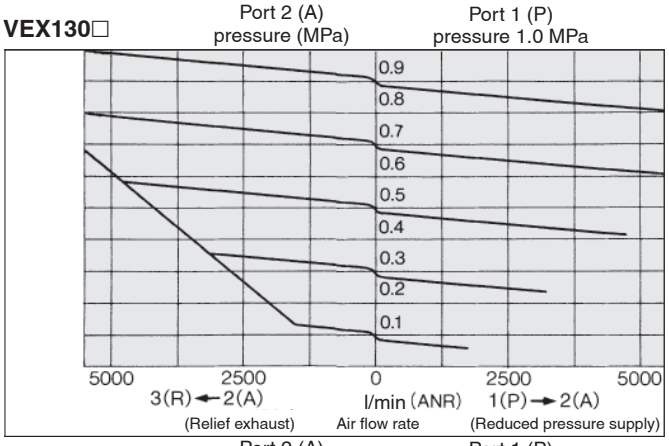
- Relieving type regulator such as AR2000, etc. should be used as pilot regulator in the application.(When the non-relieving type is used, pressure cannot be changed from high to low.)
- A sensitive regulator such as the ARP30, etc. should be used as a pilot regulator on the low pressure side, particularly with 5. 2 steps directional control setting and 6. multipje steps pressure control. (Using a non-sensitive regulator may cause unstable pressure.)

Flow Rate Characteristics

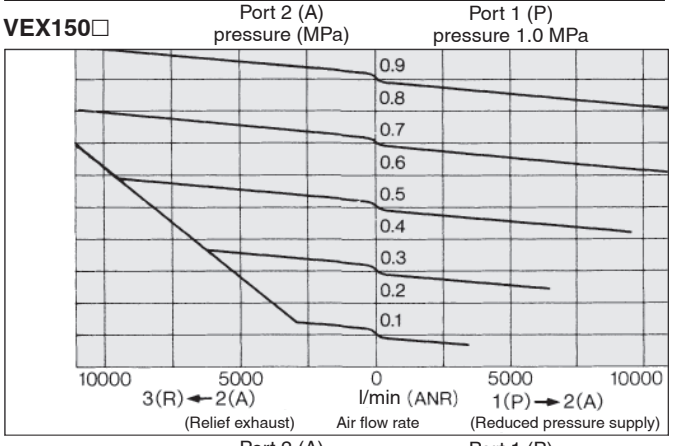
VEX110□ / 120□



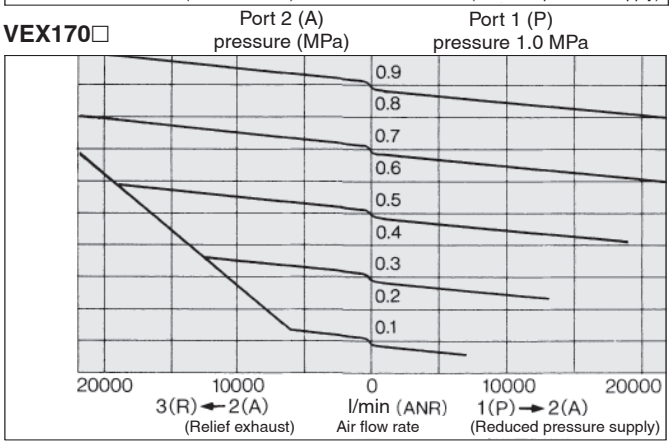
VEX130□



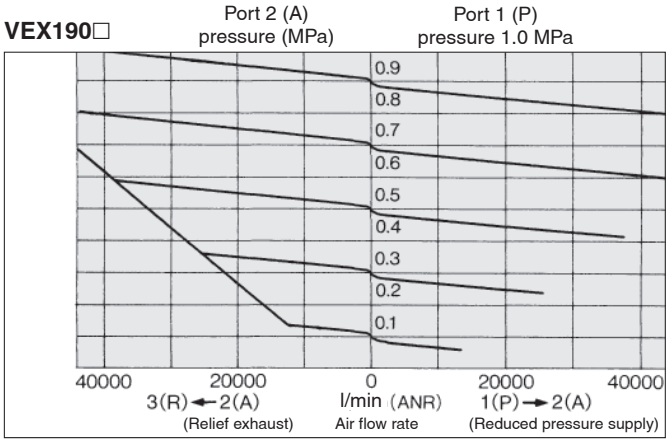
VEX150□



VEX170□

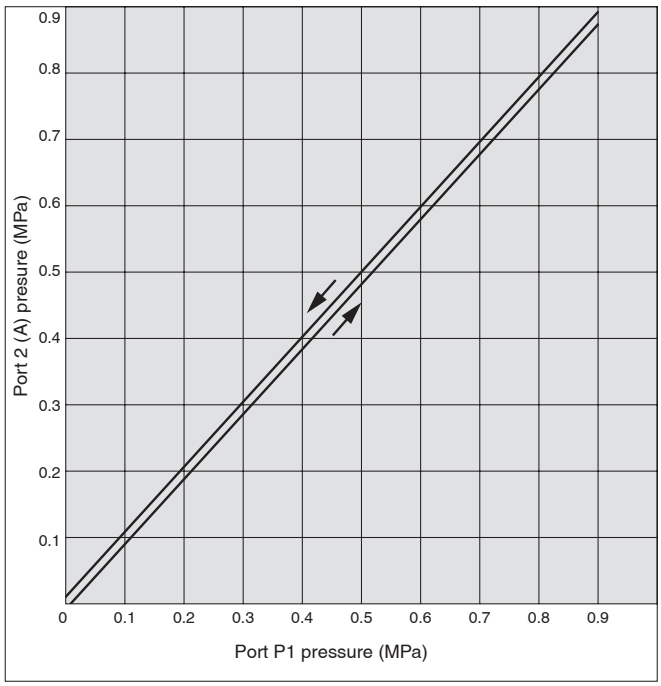


VEX190□



Setting Pressure Characteristics

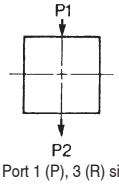
Port P1 pressure is set according to port 2 (A) pressure.



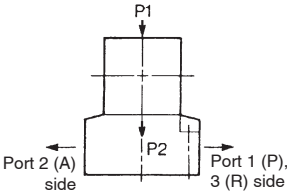
External Pilot Piping

VEX110□

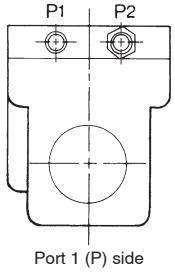
Port 2 (A) side



VEX120□



VEX130□ VEX150□ VEX170□ VEX190□



Port	VEX1□00	VEX1□01
P1	External pilot	External pilot
P2	— (1)	Pilot exhaust

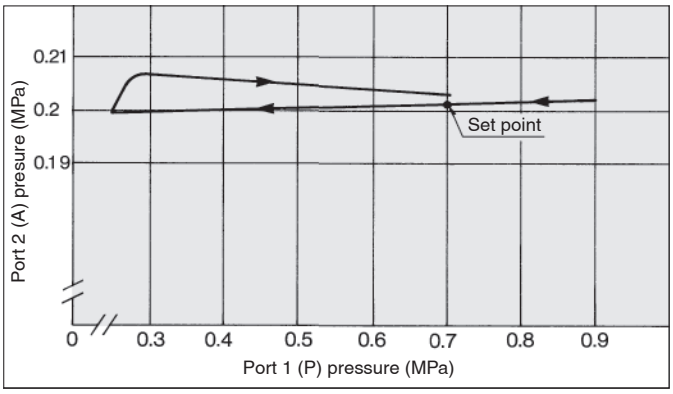
Note 1) Port P2 is not compatible with VEX1□00.

Note 2) A silencer is mounted to port P2 for VEX1 3/5/7/9 01 as a standard. For the 2 steps directional control and multiple steps pressure control setting, use the product after removing a silencer.

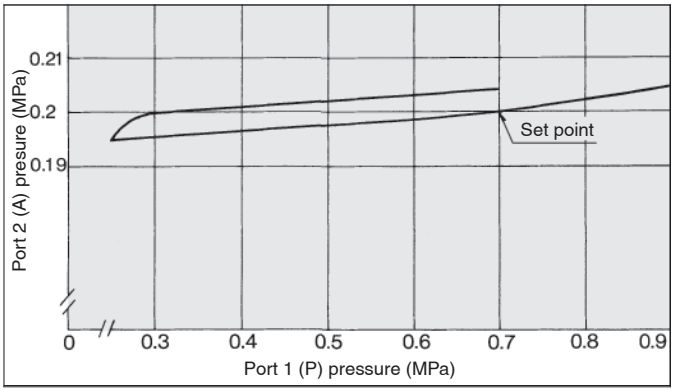
Pressure Characteristics

Shows the outlet pressure (Port 2 (A)) change against the inlet pressure (Port 1(p)) change. They conform to JIS B 8372 (Air pressure regulator).

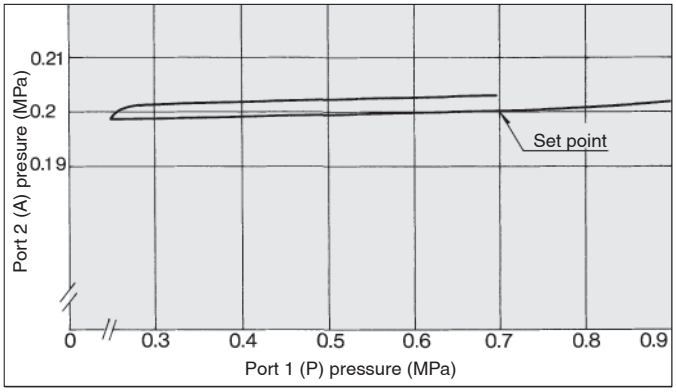
VEX110□ / 120□



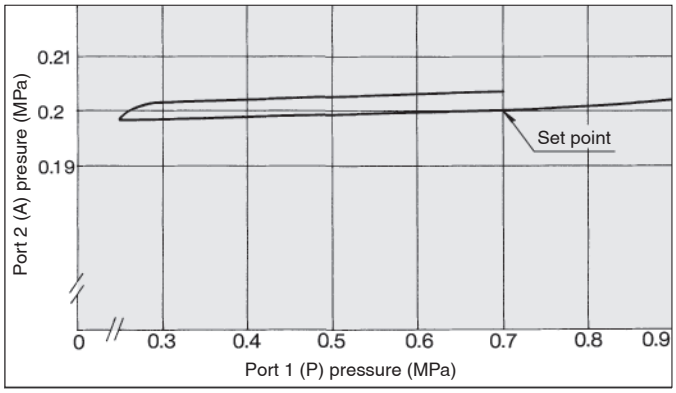
VEX130□



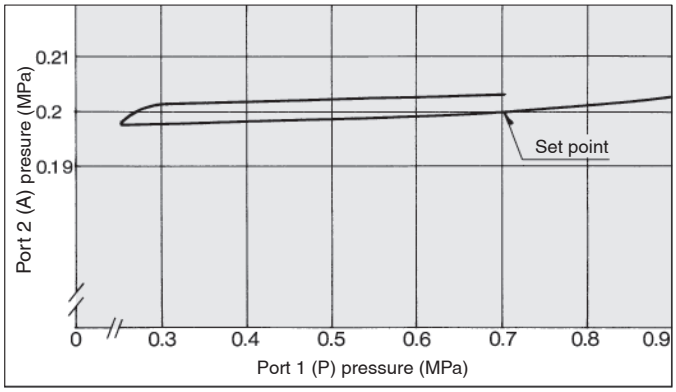
VEX150□



VEX170□

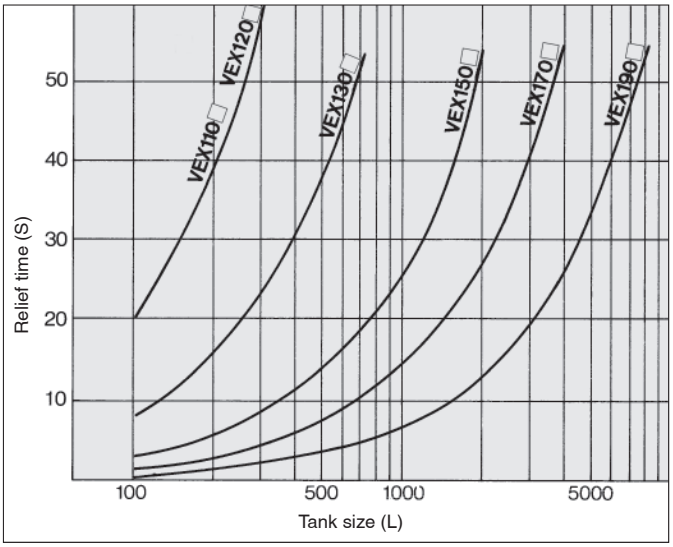


VEX190□

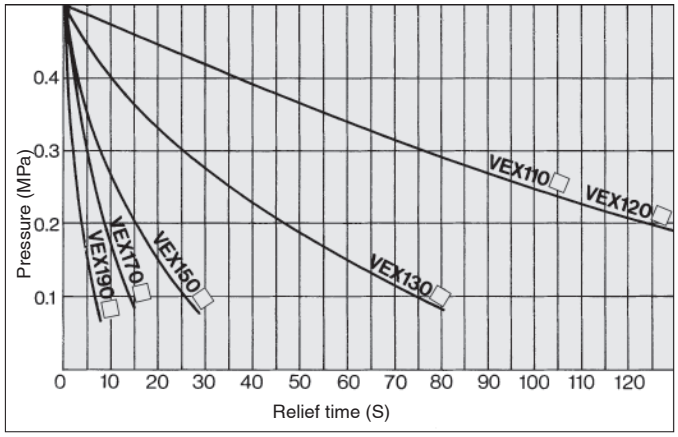


Relief Time

1. Relief time from 0.5 MPa to 0.1 MPa



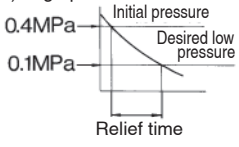
2. Relief time from 1000 L tank



3. Relief time from an arbitrary pressure

[Example] VEX 1500 lowers 2000 L tank from 0.4 MPa to 0.1 MPa:

a) In graph 2. → b) The relief time for the 2000 L tank is found by conversion as shown below.



From above, the relief time is
26 – 3 = 23 s

$$t = \frac{\text{Tank capacity}}{1000} \times \left[\text{Relief time that is read}\right]$$

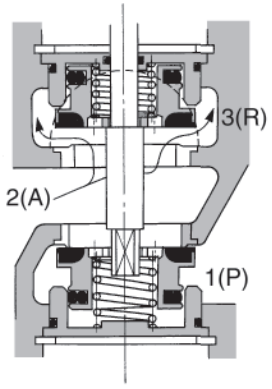
$$= \frac{2000}{1000} \times 23$$

$$= 46$$

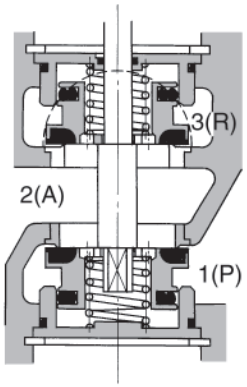
The result is 46 s.

Construction/Working Principle/Component Parts

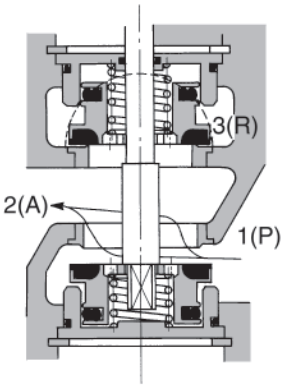
(1) When Port 2 (A) pressure is high Relief exhausting



(2) Setting pressure condition

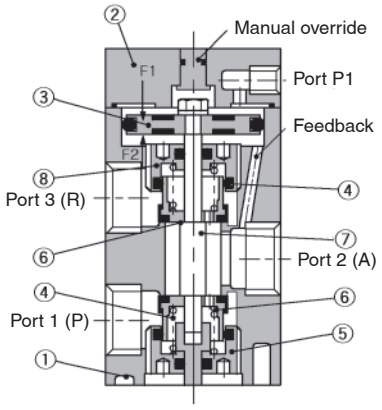


(3) When Port 2 (A) pressure is low Pressure reducing supply

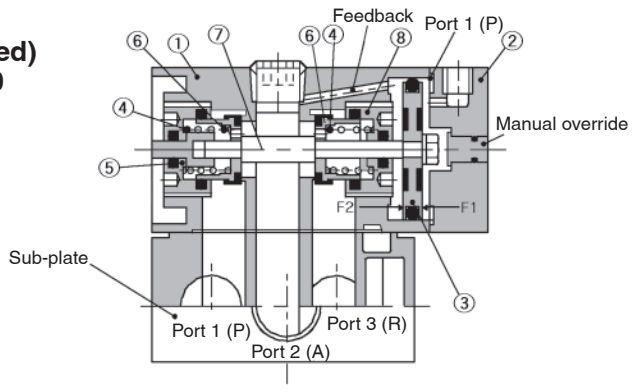


- The balance between the acting force F1 of the pilot pressure (port P1) over the upper surface of the pressure regulating piston ③ and the acting force F2 of the pressure at port 2 (A) leading to a space under the piston through the feed back flow root closes a couple of poppet valves ⑥ and sets port 2 (A) pressure that corresponds to port P1 pressure. The poppet valves are backed up by spring ④- in the pressure balance structure by means of port 2 (A) pressure. (DRW (2))
- When port 2 (A) pressure exceeds port P1 pressure, F2 becomes larger than F1, and the pressure regulating piston moves upward, opening the upper poppet valves. Thus air is released from port 2 (A) to port 3 (R) (DRW (1)). When port 2 (A) pressure lowers enough to restore the balance with port P1 pressurs, the regulator valve returns again to the DRW (2) condition.
- When port 2 (A) pressure is lower than port P1 pressure, F1 becomes larger than F2, and the pressure regulating piston moves downwards, opening the lower poppet valves. Thus air is supplied from port P1 to port 2 (A) (DRW (3)). When port 2 (A) pressure rises enough to restore the balance with port P1 pressure, the regulator valve returns again to the DRW (2) condition.

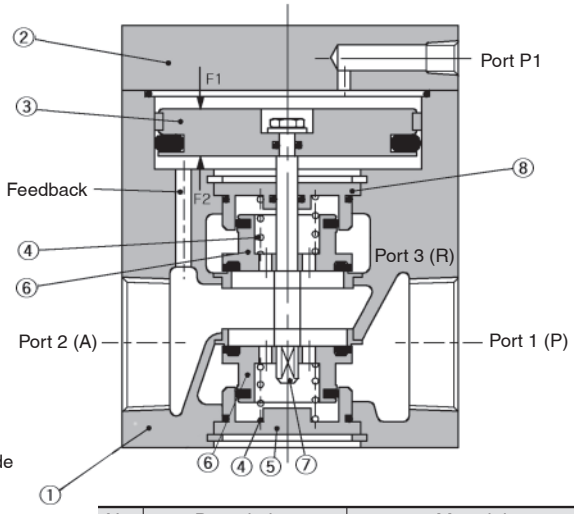
(Air operated) VEX1100



(Air operated) VEX1200



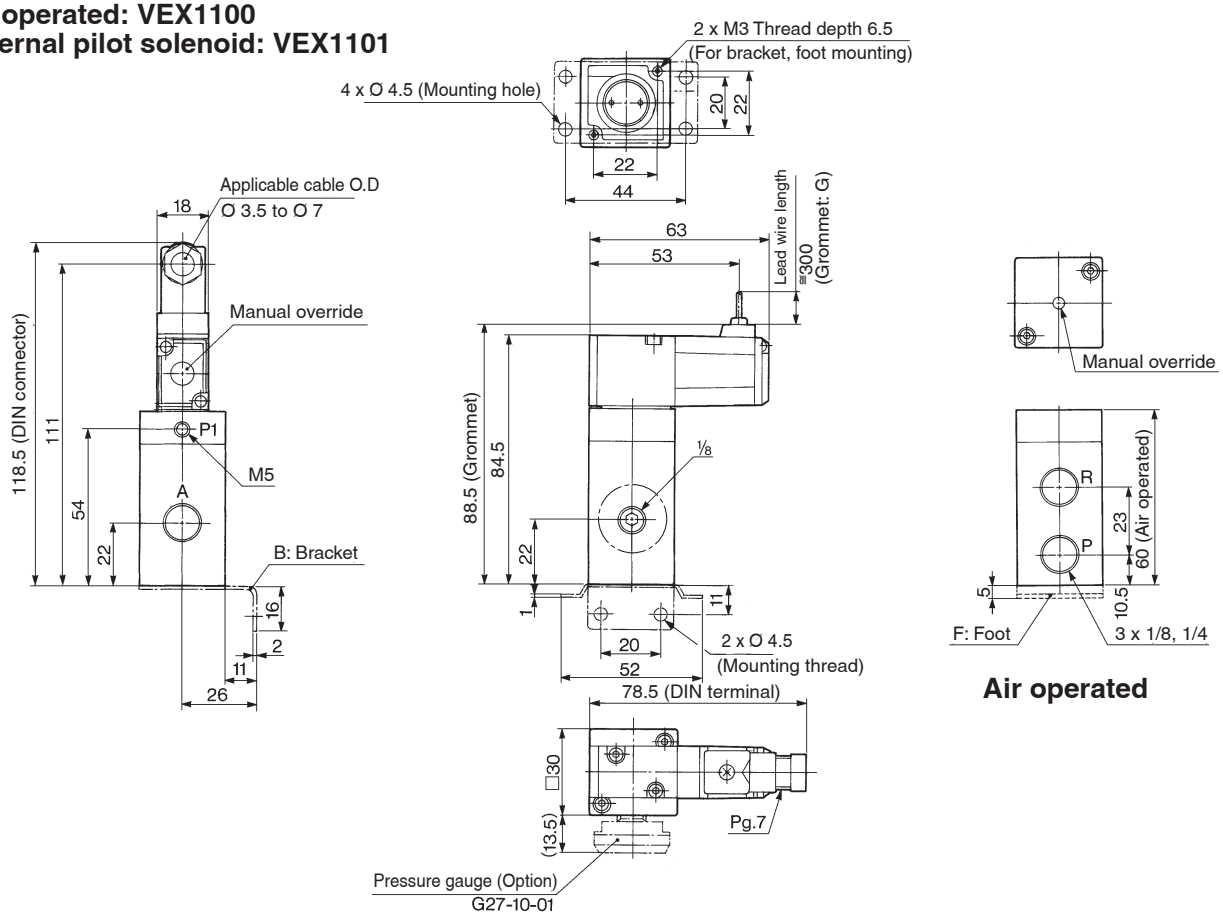
(Air operated) VEX1300/1500/1700/1900



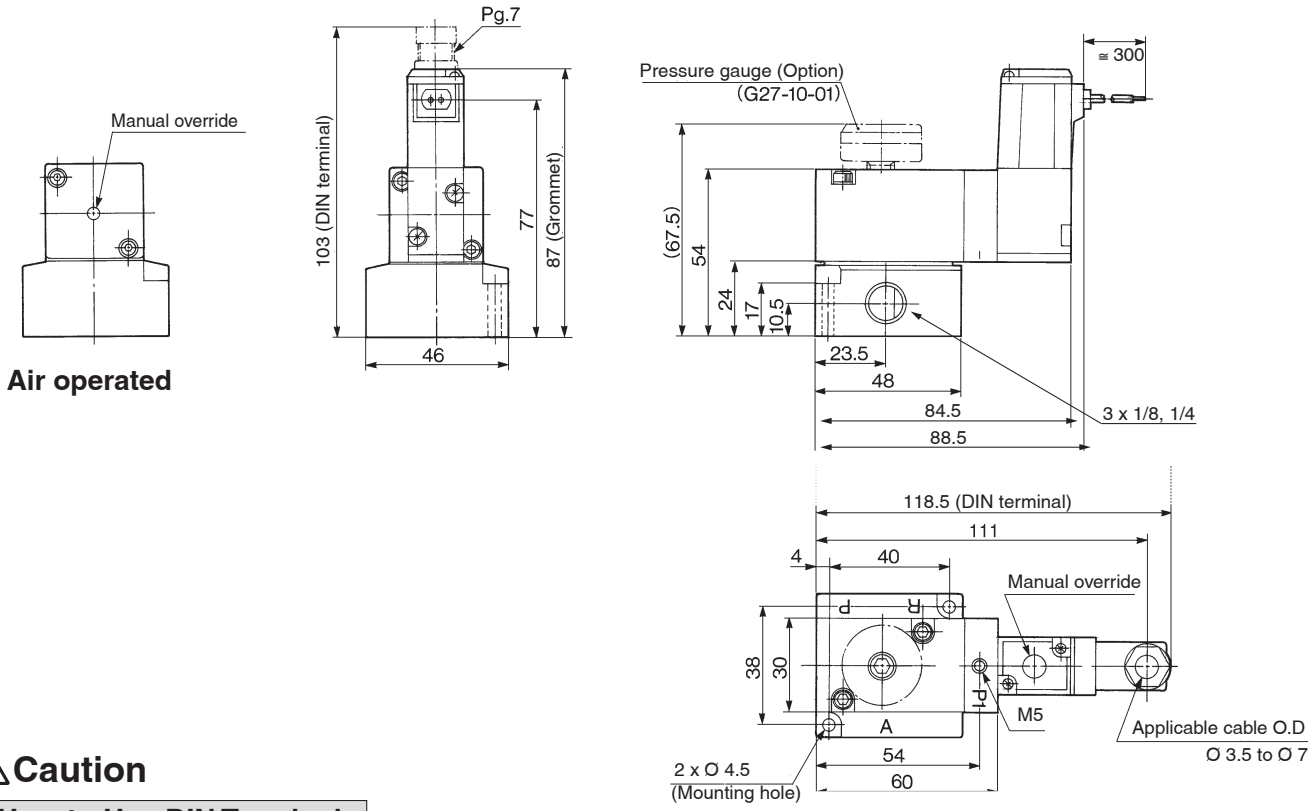
No.	Description	Material
1	**Body**	Aluminium alloy casted
2	**Cover**	Aluminium alloy casted
3	**Regulation piston**	Aluminium alloy
4	**Spring**	Stainless steel
5	**Valve guide**	Aluminium alloy
6	**Poppet valve**	Aluminium alloy, Rubber
7	**Shaft**	Stainless steel
8	**Valve guide**	Aluminium alloy

Dimensions

Air operated: VEX1100
External pilot solenoid: VEX1101



Air operated: VEX1200
External pilot solenoid: VEX1201



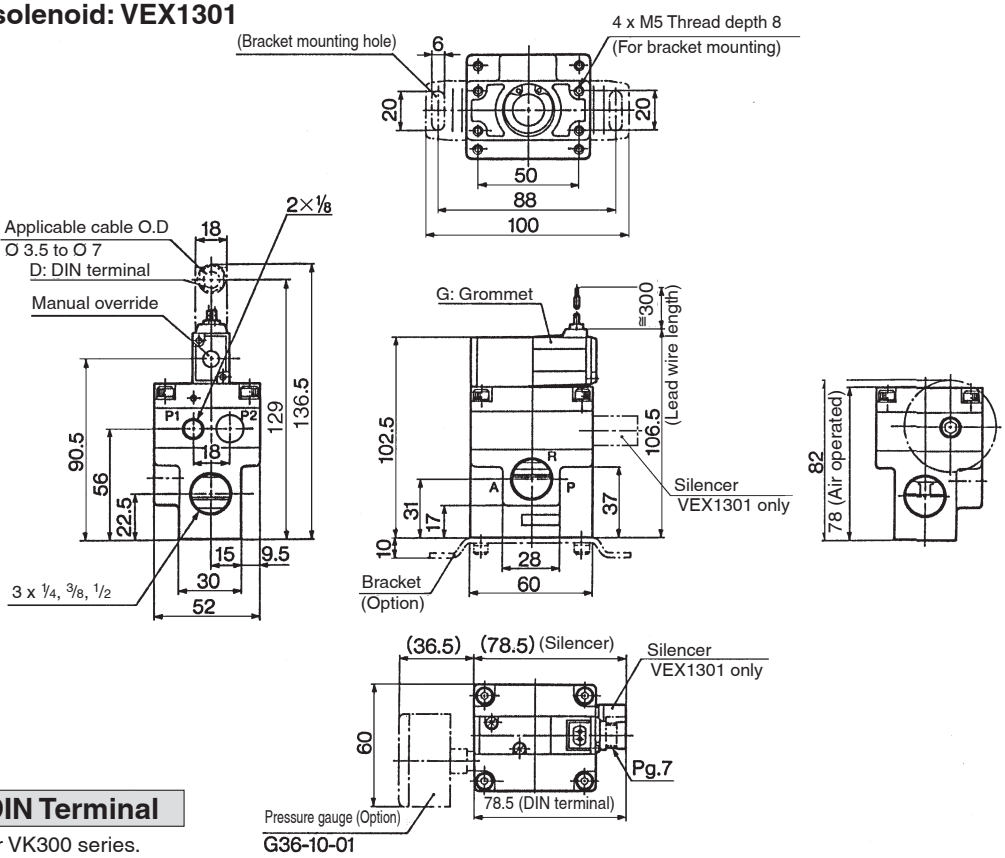
⚠Caution

How to Use DIN Terminal

Refer to page 1418 for VK300 series.

Dimensions

Air operated: VEX1300
External pilot solenoid: VEX1301

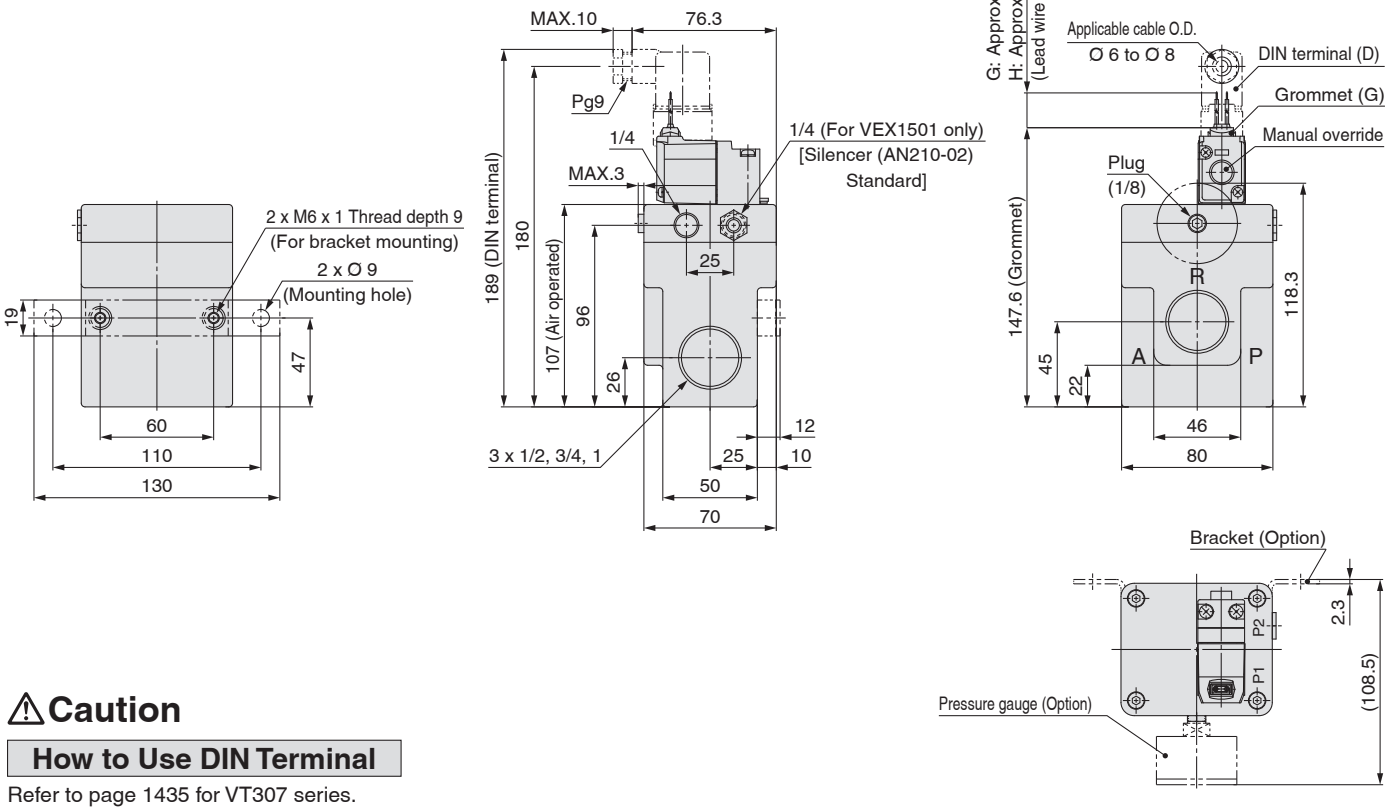


⚠Caution

How to Use DIN Terminal

Refer to page 1418 for VK300 series.

Air operated: VEX1500
External pilot solenoid: VEX1501



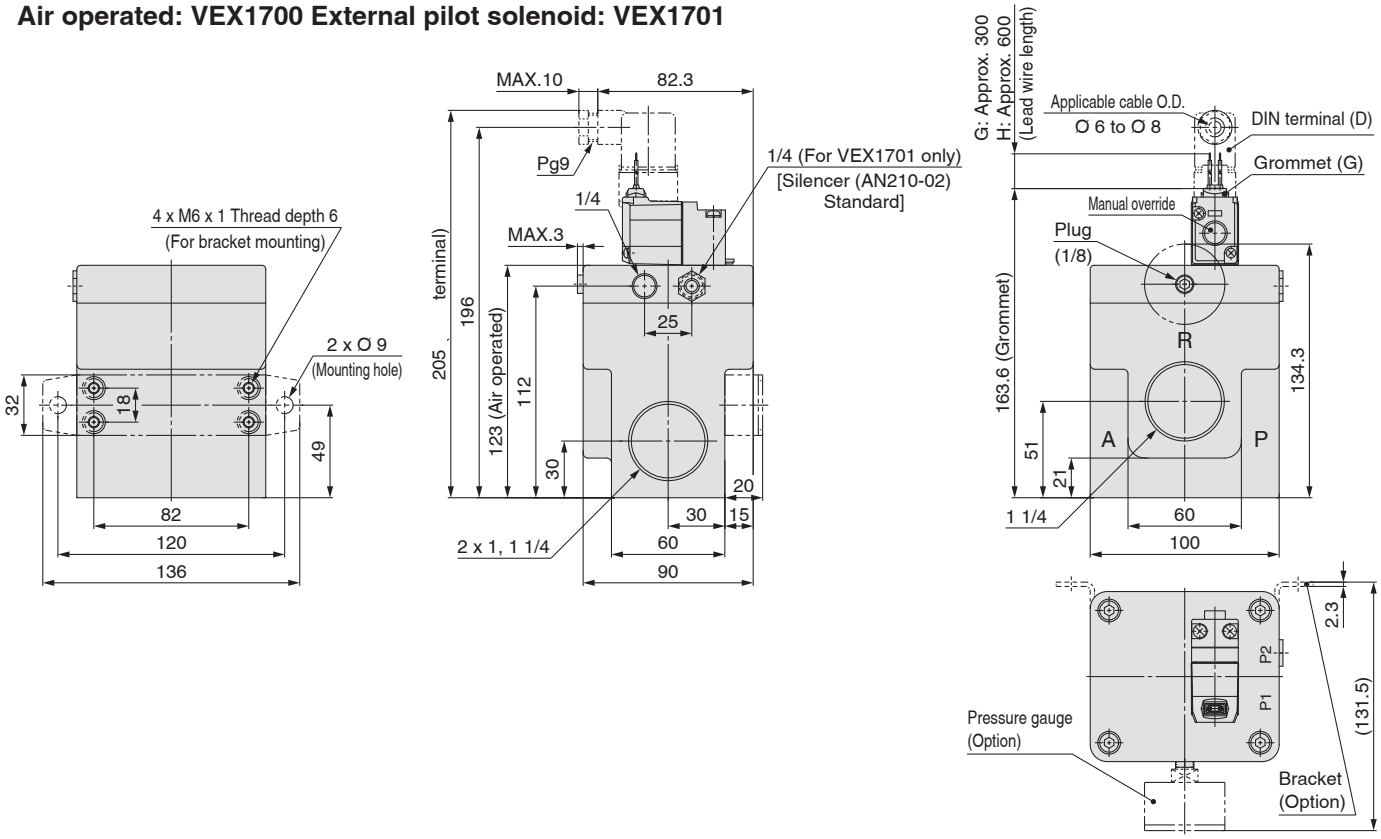
⚠Caution

How to Use DIN Terminal

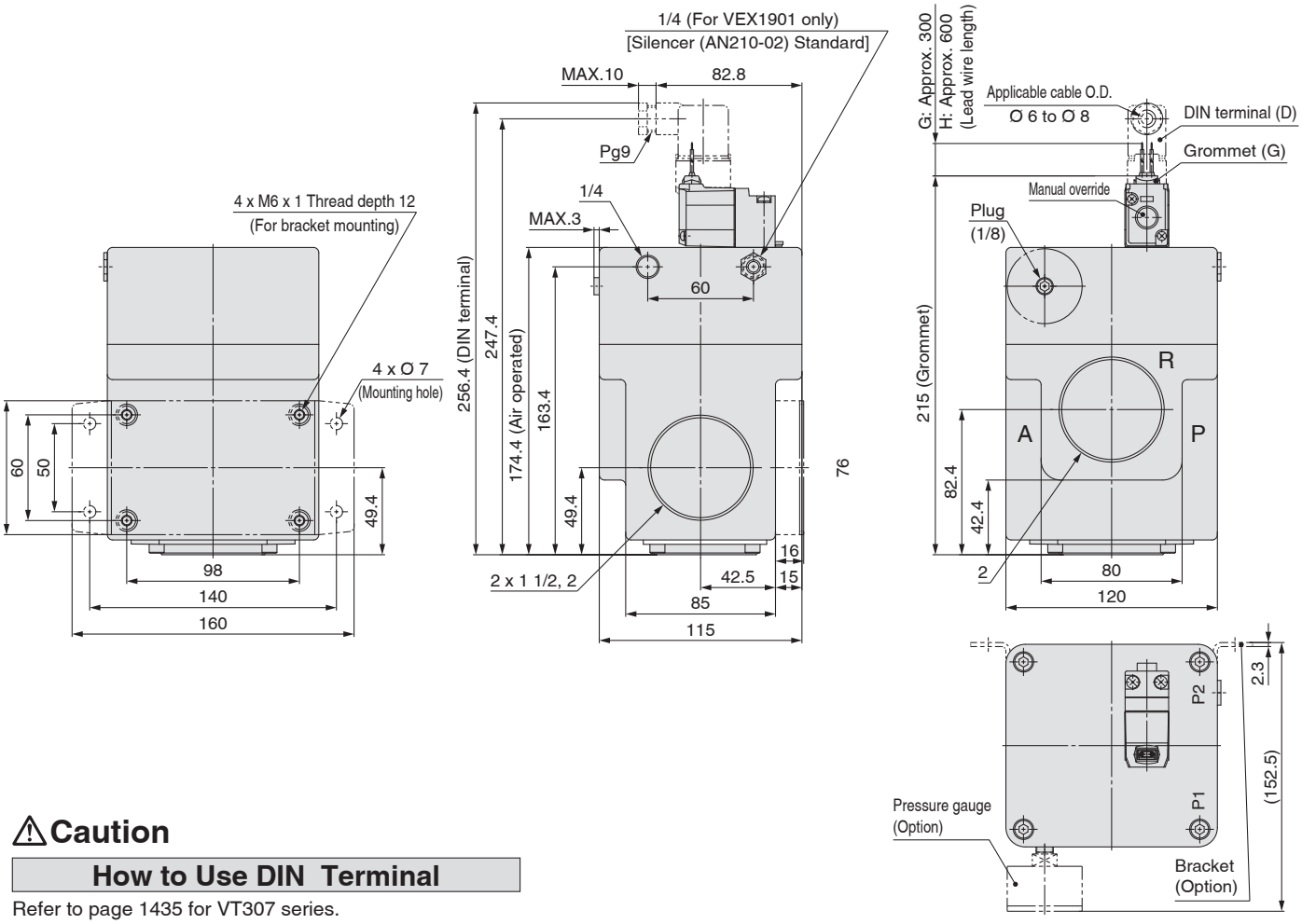
Refer to page 1435 for VT307 series.

Dimensions

Air operated: VEX1700 External pilot solenoid: VEX1701



Air operated: VEX1900 External pilot solenoid: VEX1901

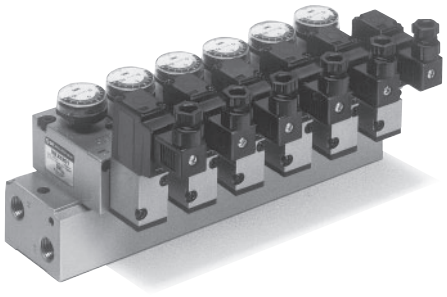


⚠Caution

How to Use DIN Terminal

Refer to page 1435 for VT307 series.

VEX1 Series
Manifold Specifications



Specifications

Valve stations	2 to 8 (1)
Port specifications	Common SUP, EXH
Port size (Port 1 (P), 2 (A), 3 (R))	Rc, NPTF, G, NPT 1/4
Applicable valve	VEX1200/1201 (2)
Applicable blanking plate	VEX1-17 (With gasket and bolts)

Note 1) If there are more than 5 stations, apply pressure from port 1(P) on both sides and exhaust from port 3 (R) on both sides.
Note 2) VEX1200 (air operated) and VEX1201 (external pilot solenoid) are both individual external pilot type. The port P1 on the valve is used as a pilot port, but not the P1 hole on the manifold base.

How to Order

VVEX2 – 1 – 6 – 02 □

VEX1 Series Manifold

Valve stations

2	2 stations
⋮	⋮
8	8 stations

Thread type

—	Rc
F	G (3)
N	NPT
T	NPTF

Note 3) Not conforming to ISO1179-1.

P, A, R port size

02	1/4

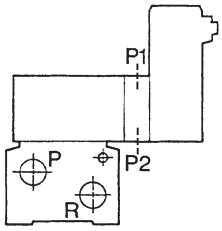
How to Order Manifold
Specify the part numbers for the regulator valve and blanking plates starting from the left of manifold base (After making the port 2 (A) face the front).

(Ex.) VVEX2-1-5-02N····· 1 5 station manifold base, Port thread NPT
* VEX1201-5DZ-G·····4 Regulator valve, External pilot solenoid valve, 24 VDC, DIN terminal, with light/surge voltage suppressor, Option···· with pressure gauge Note)
* VEX1-17····· 1 Blanking plate
Note) In the case of manifold, pressure gauge: G27-10-01 only (O.D. Ø 26)

External Pilot Piping

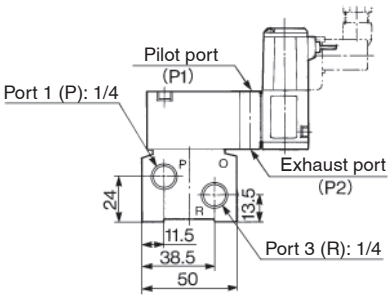
Type / Valve port	Air operated	External pilot solenoid valve
Applicable valve	VEX1200	VEX1201
P1	External pilot	External pilot
P2	— Note)	Pilot exhaust

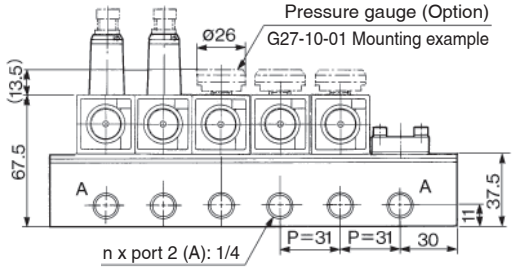
Note) Port P2 is not available for VEX 1200

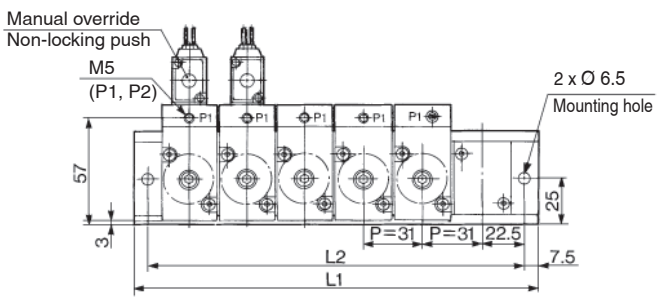


Dimensions

VVEX2-1-1-Station-02







n: Station

L \ n	2	3	4	5	6	7	8	Formula
L1	91	122	153	184	215	246	277	L1 = 31 x n + 29
L2	76	107	138	169	200	231	262	L2 = 31 x n + 14

Power Valve: 3 Position Valve
VEX3 Series

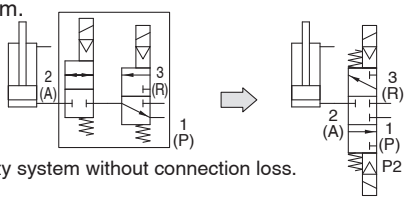
The body sizes 12/22/32/42 have been remodeled. For details, refer to page 1721.

Realise a variety of circuits using simple components.

■ Intermediate and emergency stops of large-sized cylinders

Intermediate and emergency cylinder stops

The 3 position closed centre valve produces a simple and large capacity system.



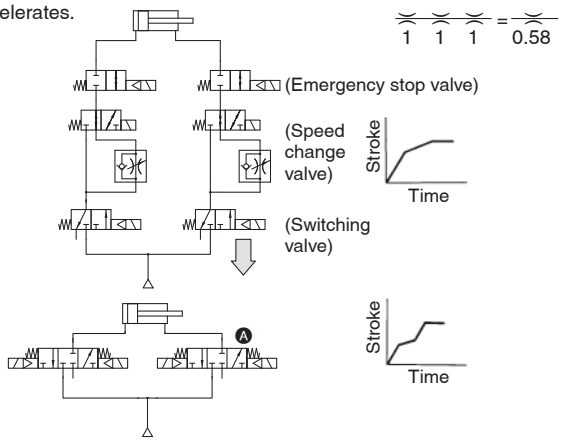
- A large capacity system without connection loss.

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

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

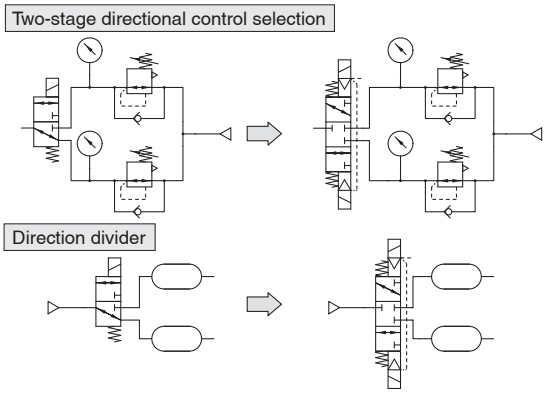
The simple system configuration permits sharp response. The large capacity system configuration without connection loss allows the use of smaller valves and piping.

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

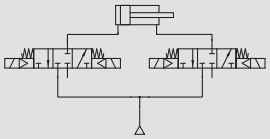


Universal porting could be used as a selector/ divider valve

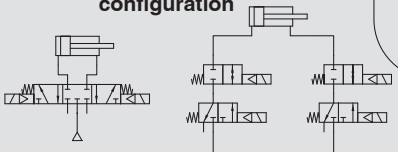
The pressure balancing poppet valve that permits any flow direction allows sequential switching operation, preventing blow by and air entrainment.



System configuration when using VEX



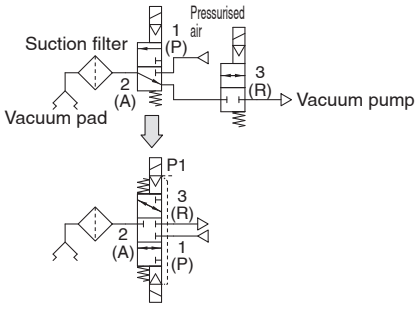
Current system configuration



- There were not many suitable large capacity 5 support valves available with a 3 position closed centre.
- There were not many suitable 2-port valves for stopping.

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.



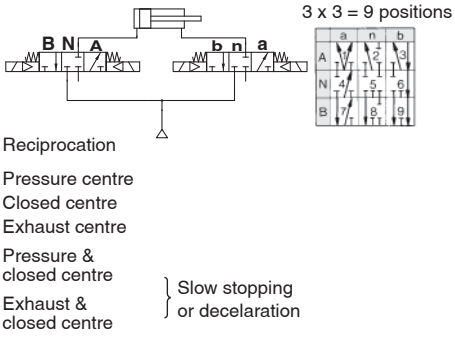
- There is no blow-by when switched from vacuum suction to vacuum release or vice versa.

⚠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.

For operation control of double acting cylinders

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



⚠Caution

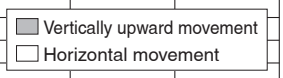
- This valve is not a non-leak specification, and thus cannot be used for long term intermediate stops or emergency stops.

SMC

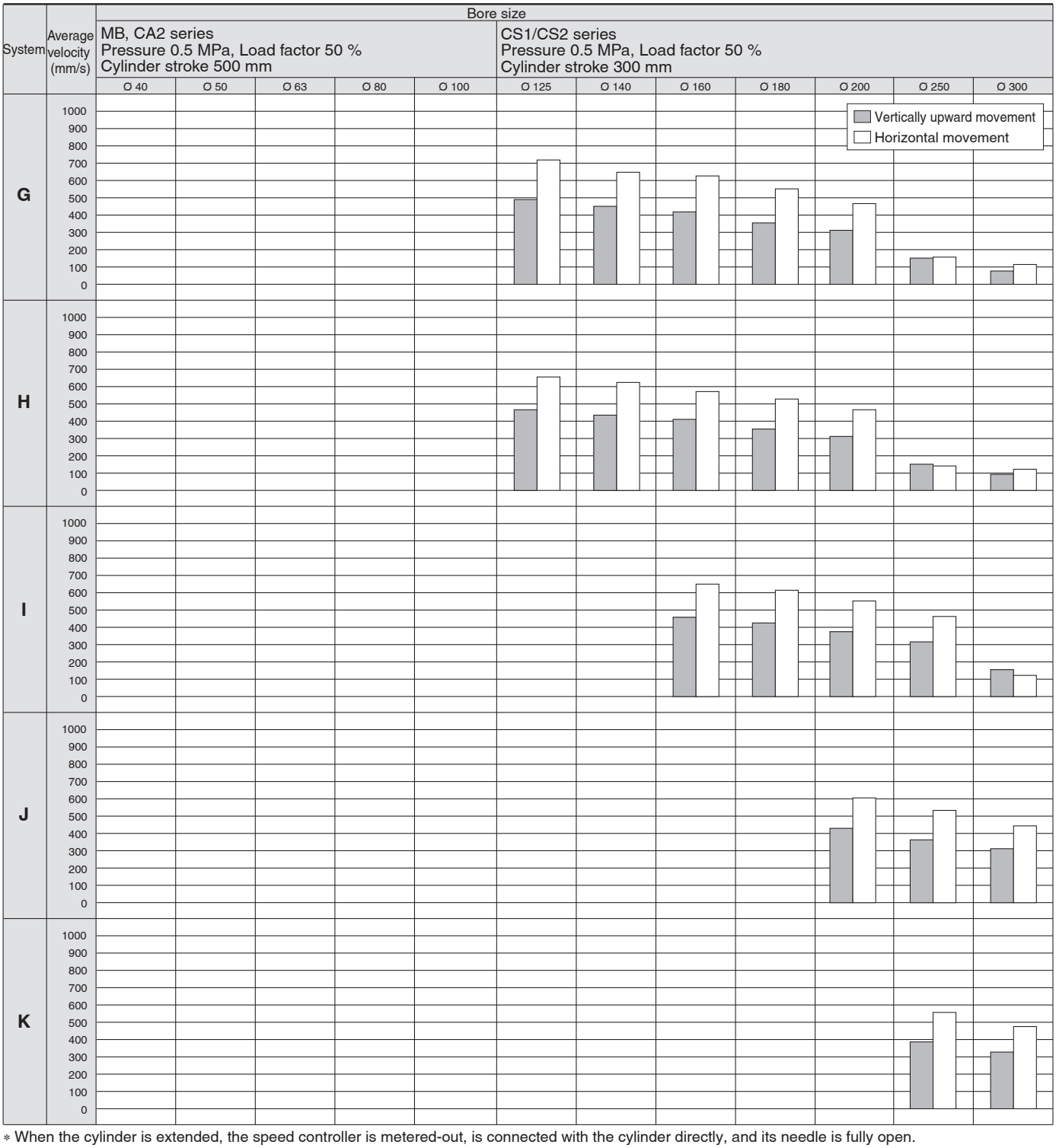
Cylinder Speed Chart

Please assume the chart is offered as the guideline. For details about various each condition, please make use of SMC Model Selection Software and then decide it.

System	Average velocity (mm/s)	Bore size											
		MB, CA2 series Pressure 0.5 MPa, Load factor 50 % Cylinder stroke 500 mm					CS1/CS2 series Pressure 0.5 MPa, Load factor 50 % Cylinder stroke 300 mm						
		⌀40	⌀50	⌀63	⌀80	⌀100	⌀125	⌀140	⌀160	⌀180	⌀200	⌀250	⌀300
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												
D	1000 900 800 700 600 500 400 300 200 100 0												
E	1000 900 800 700 600 500 400 300 200 100 0												
F	1000 900 800 700 600 500 400 300 200 100 0												



∗ When the cylinder is extended, the speed controller is metered-out, is connected with the cylinder directly, and its needle is fully open.
∗ Values on the average velocity of a cylinder are obtained from the stroke length divided by full stroke time.
∗ Load proportion is ((load weight x 9.8)/theoretical force) x 100 %



∗ When the cylinder is extended, the speed controller is metered-out, is connected with the cylinder directly, and its needle is fully open.
∗ Values on the average velocity of a cylinder are obtained from the stroke length divided by full stroke time.
∗ Load proportion is ((load weight x 9.8)/theoretical force) x 100%

Conditions of Speed Chart

System	Solenoid valve	Speed controller	Silencer	Tubing diameter x Length
A	VEX3 $^{1}_{2}$ 2□-02	AS4000-02	AN20-02	O 10 x 1 m
B				O 12 x 1 m
C	VEX3 $^{3}_{4}$ 2□-$^{03}_{04}$	AS420-03	AN30-03	O 12 x 1 m
D		AS420-04	AN40-04	SGP15A x 1 m
E	VEX350□-$^{04}_{06}$ $^{}_{10}$	AS420-04	AN40-04	SGP15A x 1 m
F		AS500-06	AN500-06	SGP20A x 1 m
G		AS600-10	AN600-10	SGP25A x 1 m
H	VEX370□-$^{10}_{12}$	AS600-10	AN600-10	SGP25A x 1 m
I		AS800-12	AN700-12	SGP32A x 1 m
J	VEX390□-$^{14}_{20}$	AS900-14	AN800-14	SGP40A x 1 m
K		AS900-20	AN900-20	SGP50A x 1 m

The body sizes 12/22/32/42 have been remodeled. For details, refer to page 1721.

How to Order

Body size **Port size**(1)

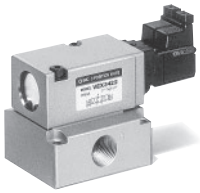
Body size	Port size		
	Port	1 (P), 2 (A)	3 (R)
12	01	1/8	
	02	1/4	
32	02	1/4	
	03	3/8	
	04	1/2	
50	04	1/2	
	06	3/4	
	10	1	
70	10	1	1 1/4
	12	1 1/4	
90	14	1 1/2	2
	20	2	

Electrical entry (Only with solenoid)

Body size	Symbol	Electrical entry (Only with solenoid)	Electrical entry (Only with solenoid)		
			—	S	Z
12, 32	G	Grommet, Lead wire length 300 mm	●	●	×
	H	Grommet, Lead wire length 600 mm	●	●	×
	L	L plug connector, Lead wire length 300 mm	●	●	●
	LN	L plug connector, Without lead wire	●	●	●
	LO	L plug connector, Without connector	●	●	●
	M	M plug connector, Lead wire length 300 mm	●	●	●
	MN	M plug connector, Without lead wire	●	●	●
	MO	M plug connector, Without connector	●	●	●
	D	DIN terminal	●	●	●
	DO	DIN terminal, Without connector	●	●	×
50, 70, 90	G	Grommet, Lead wire length 300 mm	●	●	×
	H	Grommet, Lead wire length 600 mm	●	●	×
	D	DIN terminal	●	×	●

Body ported **VEX3** **12** **0** – **01** □ **5** **D** □ – **B**

Base mounted **VEX3** **22** **0** – **01** □ **5** **D** □ – **B**



Operation type

0	Air operated
1	External pilot solenoid
2	Internal pilot solenoid

Option
(Only bracket or foot may be mounted.)

—	None
B	Bracket (4)
F	Foot (VEX312□ and VEX332□ only)
N	Silencer for pilot exhaust (P2) port (Only with solenoid)

Note 4) Except VEX322□, VEX332□ and VEX342□

Body size **Port size**(1)

Body size	Port size		
	Port	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	

Note 1) Face seal type One-touch fittings cannot be used.

Thread type

—	Rc
F	G(2)
N	NPT
T	NPTF

Note 2) Not conforming to ISO1179-1.

Light/Surge voltage suppressor

—	None
S	With surge voltage suppressor (Grommet only for a body size of 50 or more)
Z	With light/surge voltage suppressor (Except grommet)

Rated voltage (Only with solenoid)

1	100 VAC (50/60 Hz)
2	200 VAC (50/60 Hz)
3	110 VAC (50/60 Hz)
4	220 VAC (50/60 Hz)
5	24 VDC
6	12 VDC
7	240 VAC (50/60 Hz)

For other rated voltages, please consult with SMC.

Electrical entry(3) **(Only with solenoid)**

Symbol	Electrical entry (Only with solenoid)	Electrical entry (Only with solenoid)		
		Nil	S	Z
G	Grommet, Lead wire length 300 mm	●	●	×
H	Grommet, Lead wire length 600 mm	●	●	×
L	L plug connector, Lead wire length 300 mm	●	●	●
LN	L plug connector, Without lead wire	●	●	●
LO	L plug connector, Without connector	●	●	●
M	M plug connector, Lead wire length 300 mm	●	●	●
MN	M plug connector, Without lead wire	●	●	●
MO	M plug connector, Without connector	●	●	●
D	DIN terminal	●	●	●
DO	DIN terminal, Without connector	●	●	×

Note 3) Refer to page 1768 for individual part numbers of plug and DIN connectors. (Common with VZ series)

Sub-plate and base gasket part no.

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

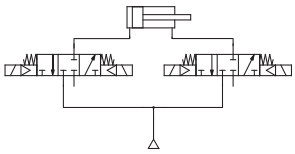
⚠ Caution

Be sure to read this before handling the products.
Refer to back page 50 for Safety Instructions and pages 3 to 9 for 3/4/5 Port Solenoid Valve Precautions.

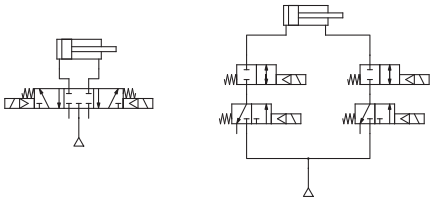
Variety of circuits in simple construction

3 position valve suitable for intermediate and emergency stop of large size cylinder.

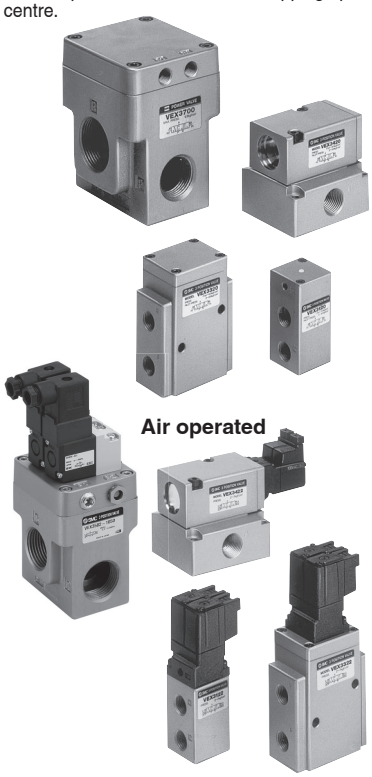
System construction with VEX



Current system construction



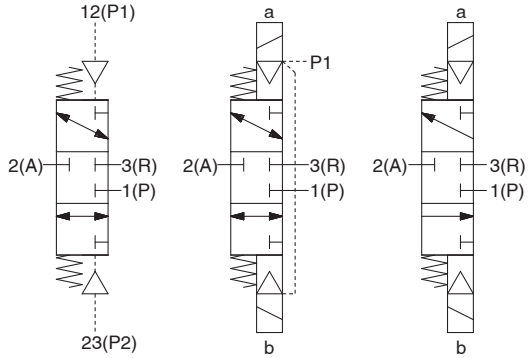
- There were not many suitable large capacity 5 port valves available with a 3 position closed centre.
- There were not many suitable large capacity 2 port valves available for stopping operations.



Air operated

Internal pilot solenoid/External pilot solenoid

Symbol



Air operated | External pilot solenoid | Internal pilot solenoid

Specifications

Model						
	Body ported	VEX312□-$^{01}_{02}$	VEX332□-$^{02}_{03}_{04}$	VEX350□-$^{04}_{06}_{10}$	VEX370□-$^{10}_{12}$	VEX390□-$^{14}_{20}$
	Base mounted	VEX322□-$^{01}_{02}$	VEX342□-$^{02}_{03}_{04}$	—	—	—
Operation type		Air operated, External pilot solenoid, Internal pilot solenoid				
Fluid		Air				
Pressure range	**Air operated**	Main pressure Low vacuum to 1.0 MPa				
		External pilot pressure 0.2 to 1.0 MPa				
	External pilot solenoid	Main pressure Low vacuum to 1.0 MPa				
		External pilot pressure 0.2 to 0.7 MPa		External pilot pressure 0.2 to 0.9 MPa		
	Internal pilot solenoid	Main pressure 0.2 to 0.7 MPa		Main pressure 0.2 to 0.9 MPa		
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			
Max. operating frequency		3 cycles/sec.				
Mounting		Free				
Lubrication		Not required (Use turbine oil Class 1 ISO VG32, if lubricated.)				

Note) Non-lubricated specifications are not available for this product.

Pilot Solenoid Valve Specifications

Model			VEX3121, VEX3221, VEX3321, VEX3421 VEX3122, VEX3222, VEX3322, VEX3422	VEX3501, VEX3701, VEX3901 VEX3502, VEX3702, VEX3902
Pilot valve			Exclusive pilot valve	VO307K-□□□1
Electrical entry			Grommet, L plug connector, M plug connector, DIN terminal	Grommet, Grommet terminal, Conduit terminal, DIN terminal
Coil rated voltage (V)	**AC(50/60Hz)**		100V, 110V, 200V, 220V, 240V	
	DC		6V, 12V, 24V, 48V	
Temperature rise			–15 to +10 % of rated voltage	
Apparent power	**AC**	**Inrush**	4.5 VA/50 Hz, 4.2 VA/60 Hz	12.7 VA (50 Hz), 10.7 VA (60 Hz)
		Holding	3.5 VA/50 Hz, 3 VA/60 Hz	7.6 VA (50 Hz), 5.4 VA (60 Hz)
Power consumption	**DC**		1.8 W (Without indicator light), 2.1 W (With indicator light)	4 W (Without indicator light), 4.2 W (With indicator light)
Manual override			Non-locking push type	Non-locking push type

Note) When replacing the pilot valves specified for valve sizes 1 to 4, please request SMC to replace them at the factory.

Option

Description		Part no.						
		VEX312□-$^{01}_{02}$	VEX322□-$^{01}_{02}$	VEX332□-$^{02}_{03}_{04}$	VEX342□-$^{02}_{03}_{04}$	VEX350□-$^{04}_{06}_{10}$	VEX370□-$^{10}_{12}$	VEX390□-$^{14}_{20}$
Bracket (With bolt and washer)	**B**	VEX1-18-1A	—	—	—	VEX5-32A	VEX7-32A	VEX9-32A
Foot (With bolt and washer)	**F**	VEX1-18-2A	—	VEX3-32-2A	—	—	—	—
Pilot exhaust port P2 silencer Note)	**N**	AN120-M5				AN210-02		

Note) Only with solenoid.

Weight

(kg)

Model	VEX312□-$^{01}_{02}$	VEX322□-$^{01}_{02}$	VEX332□-$^{02}_{03}_{04}$	VEX342□-$^{02}_{03}_{04}$	VEX350□-$^{04}_{06}_{10}$	VEX370□-$^{10}_{12}$	VEX390□-$^{14}_{20}$
Air operated	0.1	0.2	0.3	0.6	1.4	2.1	3.3
Solenoid	0.2	0.3	0.4	0.7	1.6	2.3	3.5

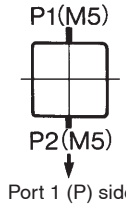
Flow Rate Characteristics

Model		Port size	Flow rate characteristics											
			1 (P)→2 (A)			2 (A)→1 (P)			3 (R)→2 (A)			2 (A)→3 (R)		
			C[dm³/(s·bar)]	b	Cv	C[dm³/(s·bar)]	b	Cv	C[dm³/(s·bar)]	b	Cv	C[dm³/(s·bar)]	b	Cv
Body ported	**VEX312□-01**	1/8	2.4	0.19	0.59	2.4	0.31	0.59	2.3	0.36	0.59	2.5	0.22	0.61
	VEX312□-02	1/4	3.5	0.35	0.89	3.3	0.49	0.89	3.1	0.46	0.89	3.5	0.33	0.93
	VEX332□-02	1/4	4.1	0.36	1.1	4.3	0.42	1.1	4.1	0.41	1.1	4.6	0.25	1.2
	VEX332□-03	3/8	8.7	0.29	2.2	7.9	0.52	2.2	7.8	0.51	2.4	8.7	0.33	2.4
	VEX332□-04	1/2	9.8	0.37	2.7	9.6	0.52	2.7	9.1	0.53	3.0	11	0.37	3.0
	VEX350□-04	1/2	24	0.32	6.4	24	0.30	6.4	25	0.31	6.4	22	0.27	5.7
Base mounted (With sub-plate)	**VEX322□-01**	1/8	3.3	0.34	0.86	3.5	0.39	0.86	3.3	0.37	0.86	3.5	0.36	0.87
	VEX322□-02	1/4	4.1	0.28	0.99	4.1	0.39	0.99	3.8	0.38	0.97	4.4	0.23	1.1
	VEX342□-02	1/4	8.1	0.34	2.0	7.9	0.39	2.0	8.2	0.33	2.1	8.1	0.37	2.2
	VEX342□-03	3/8	12	0.26	3.2	12	0.29	3.2	12	0.28	3.1	13	0.28	3.3
	VEX342□-04	1/2	13	0.20	3.3	13	0.24	3.3	12	0.29	3.2	14	0.20	3.3

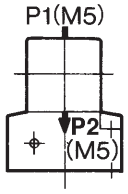
Model		Port size	Effective area (mm²)	Cv
Body ported	**VEX350□-06**	3/4	160	8.9
	VEX350□-10	1	180	10
	VEX370□-10	1	300	17
	VEX370□-12	1 1/4	330	18
	VEX390□-14	1 1/2	590	33
	VEX390□-20	2	670	37

External Pilot Piping

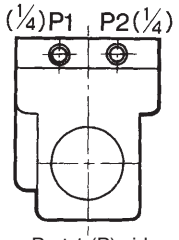
VEX312□



VEX322□



VEX350□
VEX370□
VEX390□



Port	VEX3□□0	VEX3□□1	VEX3□□2
P1	External pilot	External pilot	Plug
P2	External pilot	Pilot exhaust	Pilot exhaust

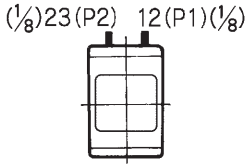
⚠Caution

●VEX3$_{4}^{3}$2$_{2}^{1}$(Solenoid)

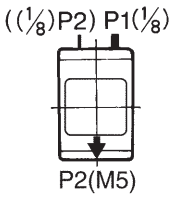
When the VEX3240 air operated power valve is delivered from our factory, the M5 threaded pilot port P2 in the cover is open and the 1/8 pilot port in the sub-plate is plugged. When port P2 on the body Note) is used as a pilot exhaust port, remove the 1/8 plug and put the M5 plug into the pilot valve port P2 to cover it.

Note) Body for VEX332$_{2}^{1}$, sub-plate for VEX342$_{2}^{1}$

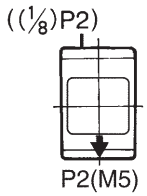
VEX3320
Air operated



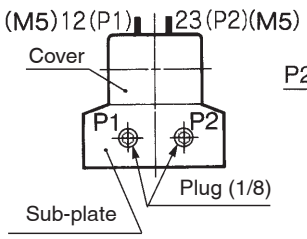
VEX3321
External pilot solenoid



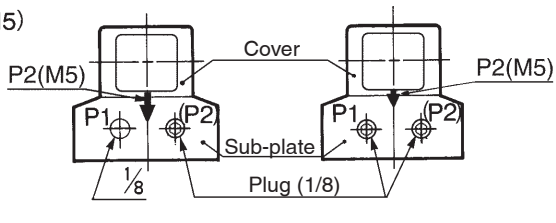
VEX3322
Internal pilot solenoid



VEX3420
Air operated for sub-plate



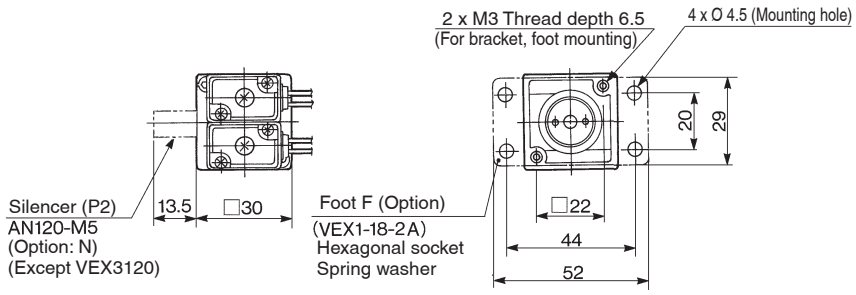
VEX3421
External pilot solenoid for subplate



VEX3422
Internal pilot solenoid for subplate

Body Ported: VEX312□

Air operated: VEX3120 External pilot solenoid: VEX3121 Internal pilot solenoid: VEX3122



A perspective drawing

DIN terminal (D)

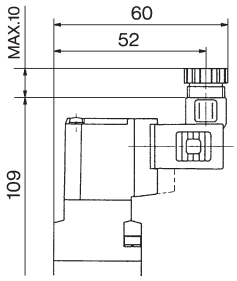
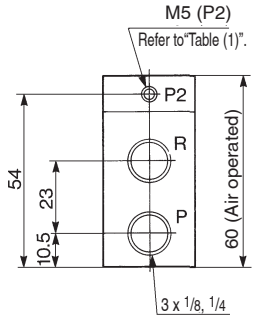
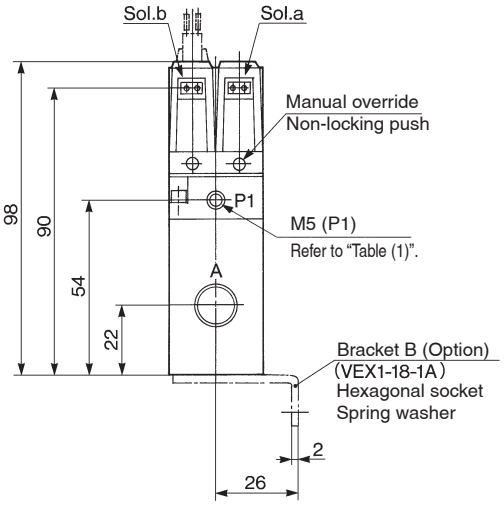
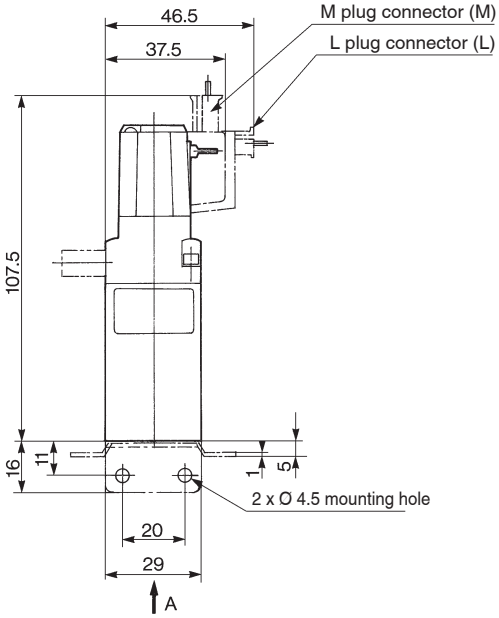


Table (1)
With/Without Plug for M5 Port

Model	P1	P2
VEX3120	None	None
VEX3121	None	None
VEX3122	With plug	None







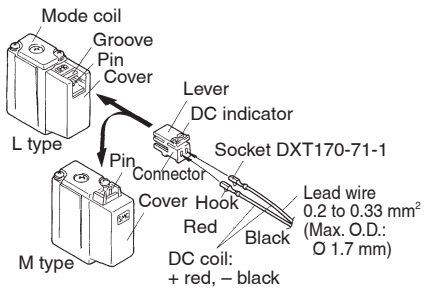
⚠Caution

How to Use Plug Connector/Applicable Model: VEX312$^{1}_{2}$/322$^{1}_{2}$/332$^{1}_{2}$/342$^{1}_{2}$

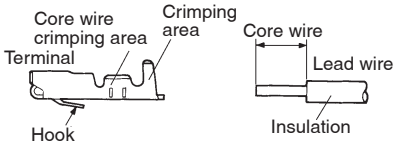
Attaching/Detaching of a plug

1. To install the connector
Push the connector straight on the pins of the solenoid, making sure the lip of the lever is securely positioned in the groove on the solenoid cover.

2. To deinstall the connector
Press the lever against the connector and pull the connector away straight from the solenoid.



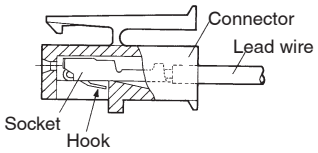
Crimping lead wire and socket
Peel 3.2 to 3.7 mm of the tip of the lead wire, enter the core wires neatly into a socket and press contact it with a press tool. Be careful so that the cover of lead wire does not enter into the core press contacting part. (Please contact SMC for the dedicated crimping tools.)



Attaching/Detaching of a socket with lead wire

1. Attaching
Insert a socket into the square hole (indicated at +, –) of connector, push fully the lead wire and lock by hanging the hook of a socket to the seat of connector. (Pushing in can open the hook and lock it automatically.) Then confirm the locking by lightly pulling on the lead wire.

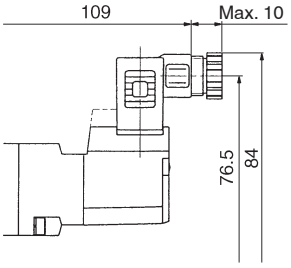
2. Detaching
For pulling out a socket from connector, pull out the lead wire while pushing the hook of a socket with a stick with a fine point (1 mm). If a socket is to be re-used as it is, return the hook to the outside.

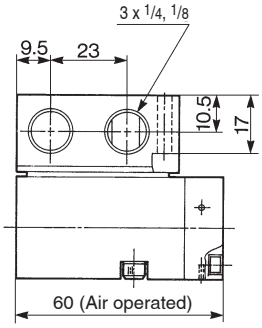


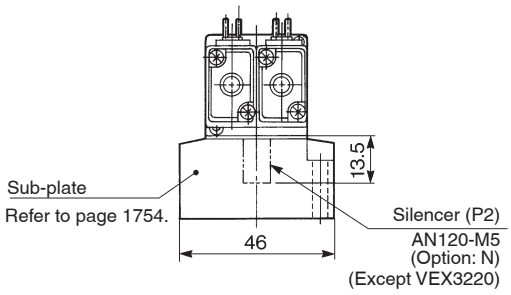
Base Mounted: VEX322□

Air operated: VEX3220 External pilot solenoid: VEX3221 Internal pilot solenoid: VEX3222

DIN terminal (D)







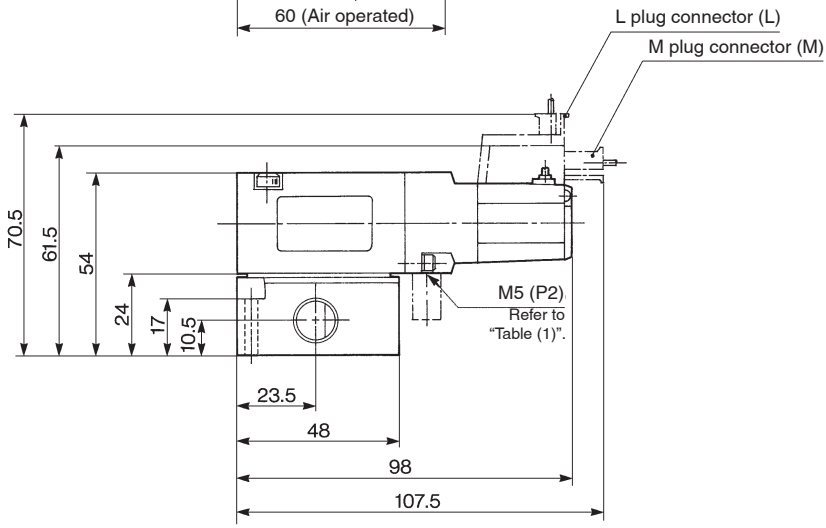
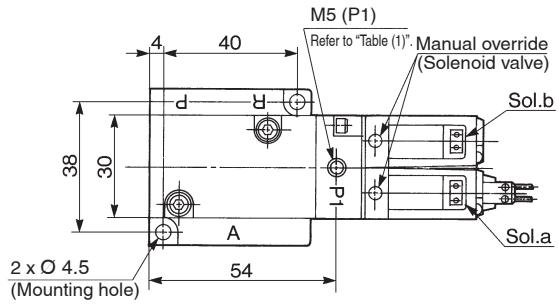


Table (1)
With/Without Plug for M5 Port

Model	P1	P2
VEX3220	None	None
VEX3221	None	None
VEX3222	With plug	None



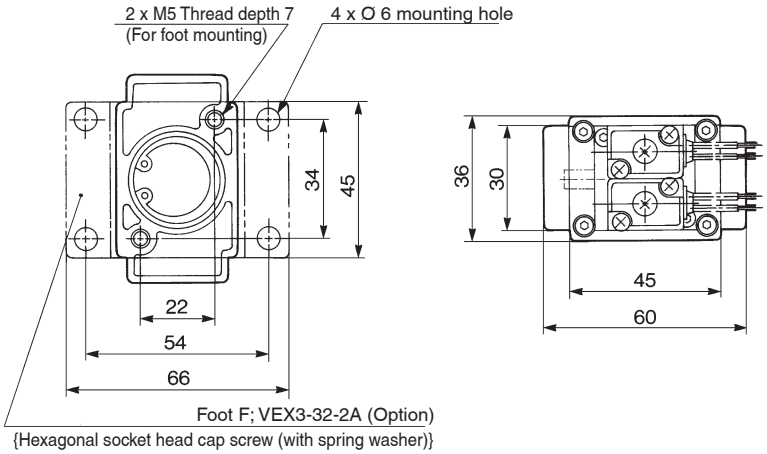
⚠Caution

How to Use DIN Terminal

Refer to page 1768.

Body Ported: VEX332□

Air operated: VEX3320 External pilot solenoid: VEX3321 Internal pilot solenoid: VEX3322



A perspective drawing

DIN terminal (D)

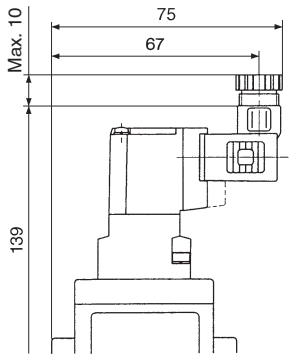
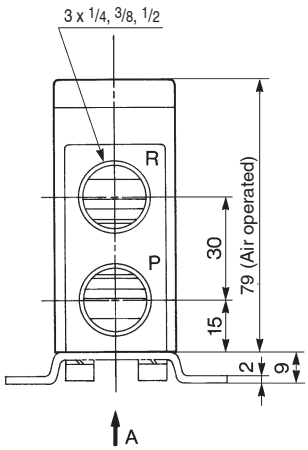
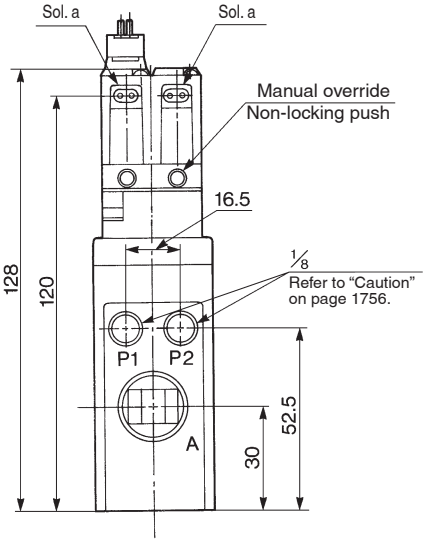
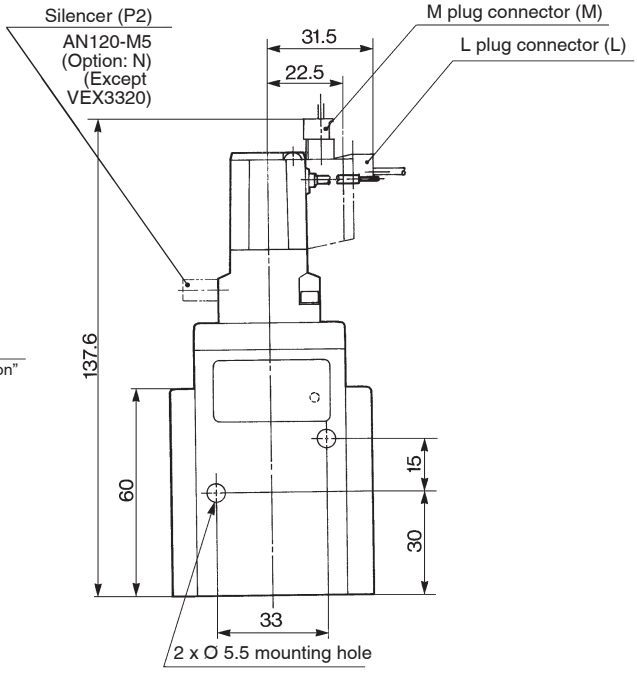


Table (1)
With/Without Plug for 1/8 Port

Model	P1	P2
VEX3320	None	None
VEX3321	None	With plug
VEX3322	With plug	With plug



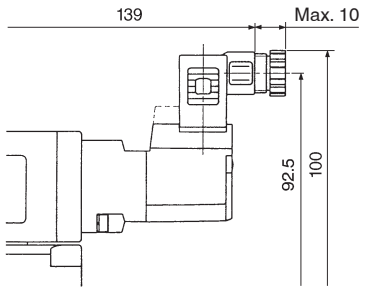


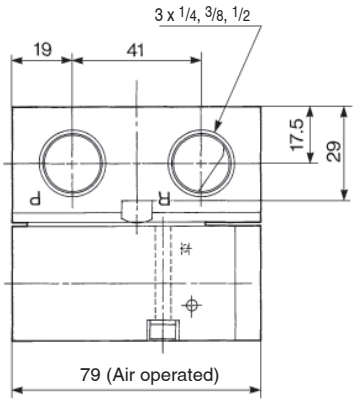


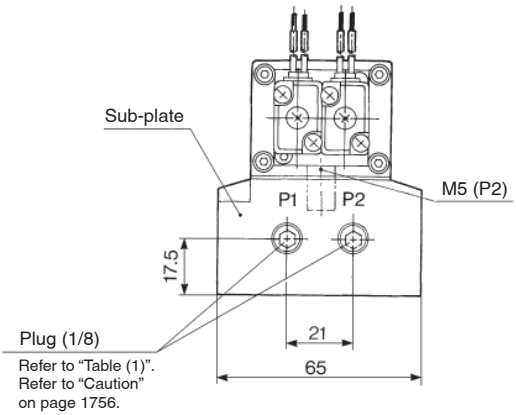
Base Mounted: VEX342□

Air operated: VEX3420 External pilot solenoid: VEX3421 Internal pilot solenoid: VEX3422

DIN terminal (D)







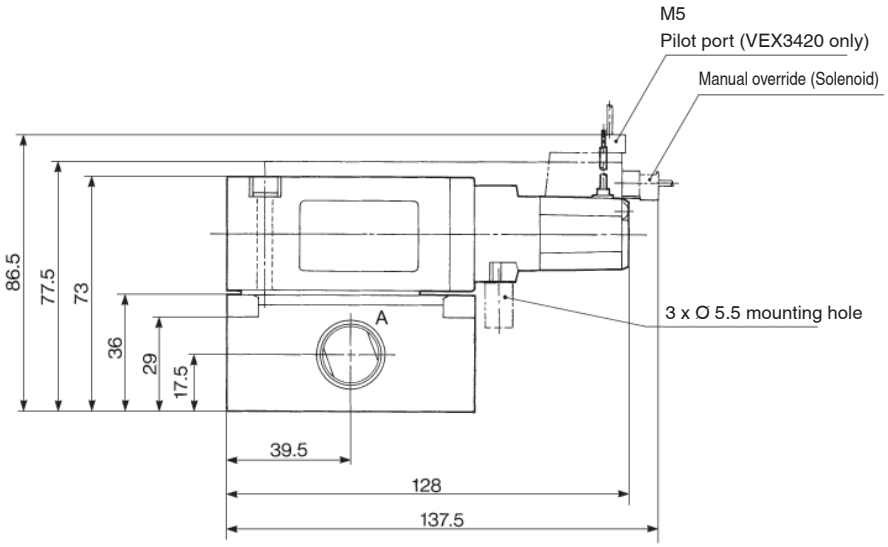
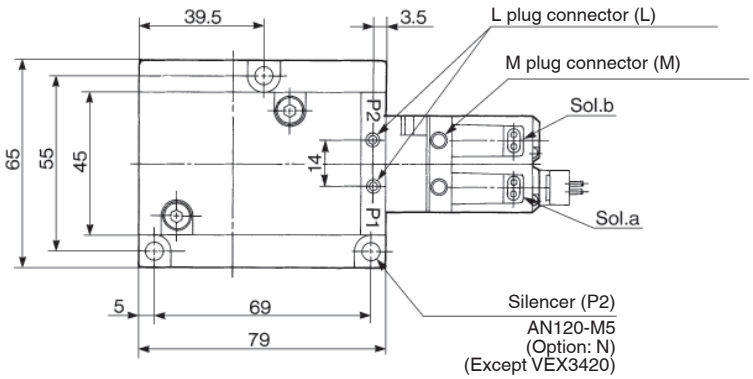


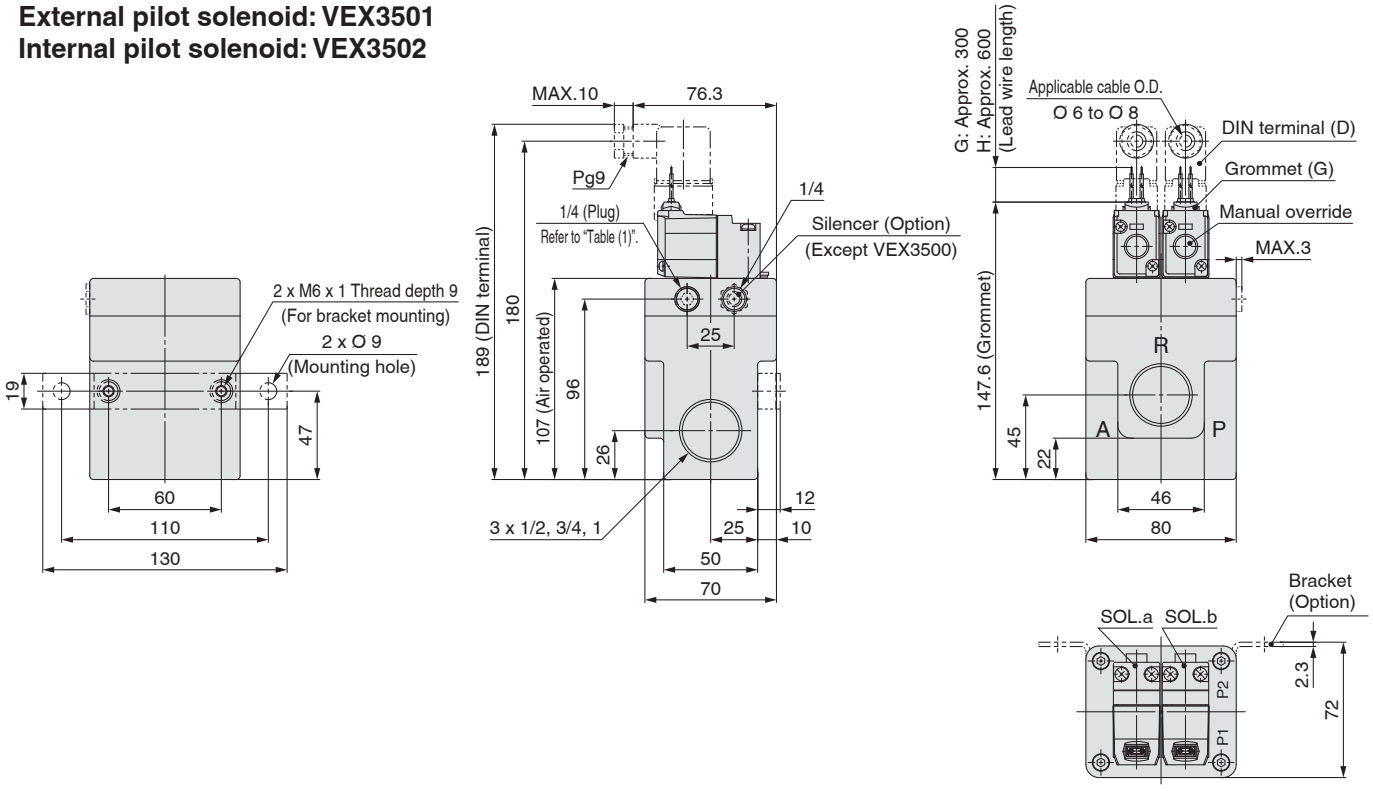
Table (1)
With/Without Plug for Sub-plate

Model	P1	P2
VEX3420	With plug	With plug
VEX3421	None	With plug
VEX3422	With plug	With plug



Body Ported: VEX350□/370□

Air operated: VEX3500
External pilot solenoid: VEX3501
Internal pilot solenoid: VEX3502



Air operated: VEX3700
External pilot solenoid: VEX3701
Internal pilot solenoid: VEX3702

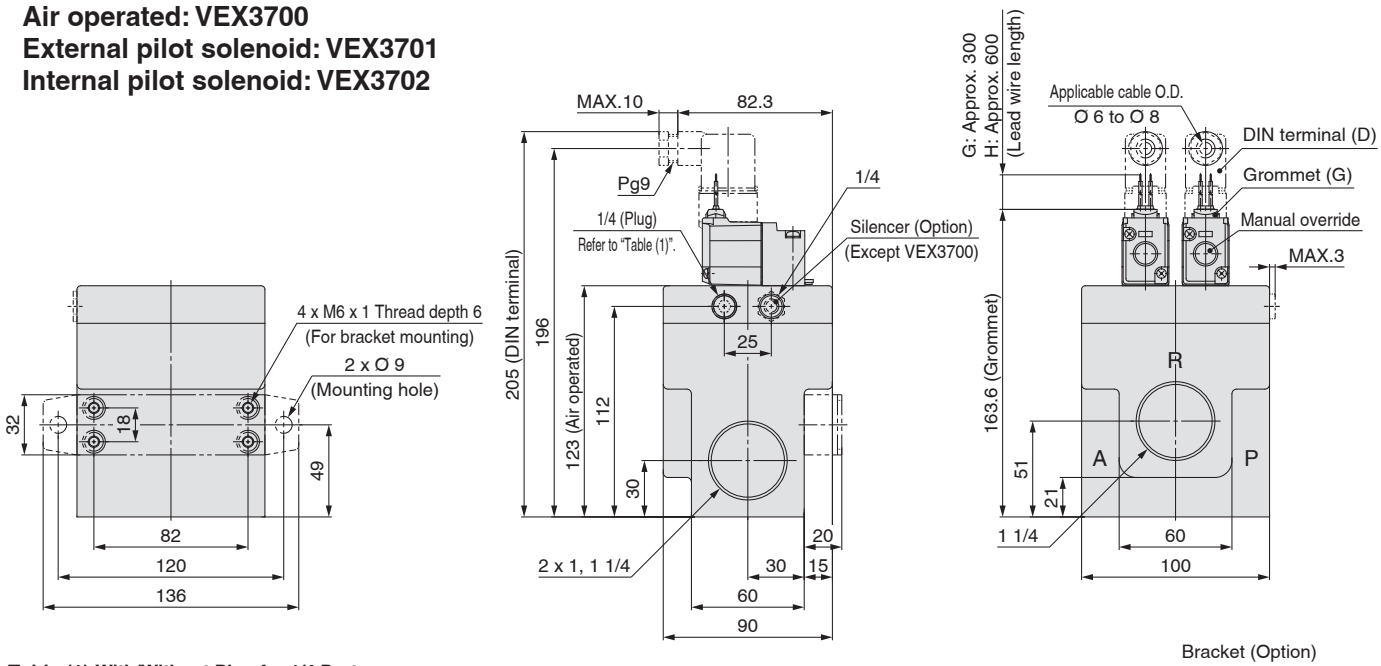


Table (1) With/Without Plug for 1/4 Port

Model	P1	P2
VEX3$^{5}_{7}$00	None	None
VEX3$^{5}_{7}$01	None	None
VEX3$^{5}_{7}$02	With plug	None

⚠Caution

How to Use DIN Terminal

Refer to page 1435 for VT307 series.

Base Mounted: VEX390□

Air operated: VEX3900
External pilot solenoid: VEX3901
Internal pilot solenoid: VEX3902

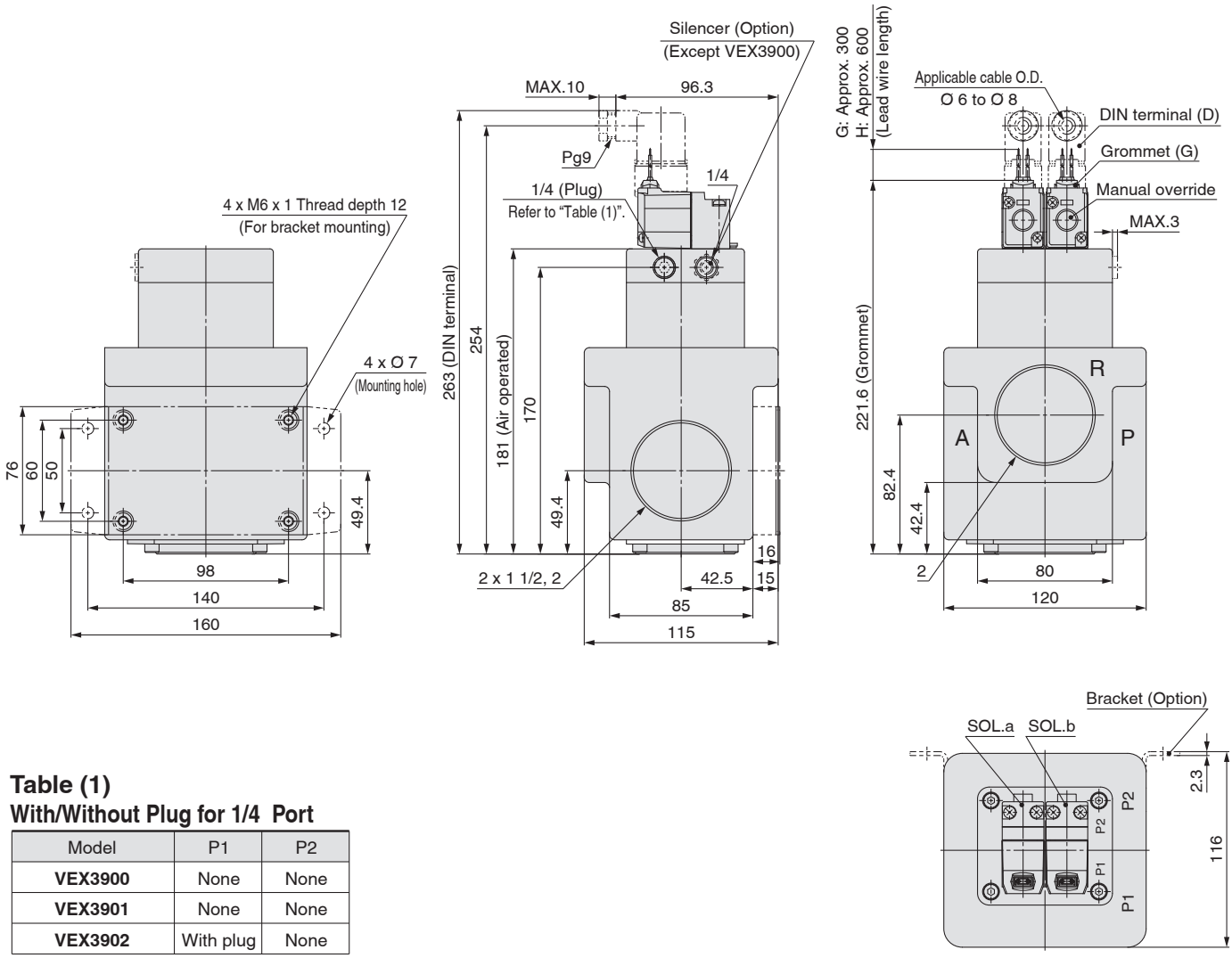


Table (1)
With/Without Plug for 1/4 Port

Model	P1	P2
VEX3900	None	None
VEX3901	None	None
VEX3902	With plug	None

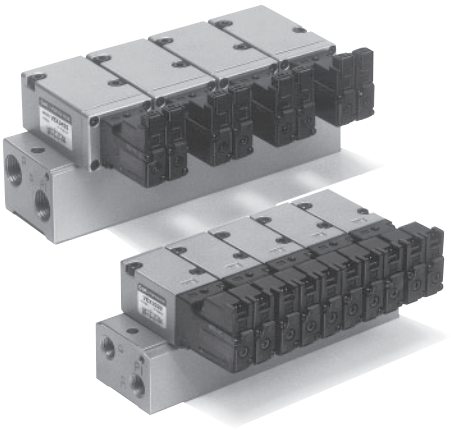
⚠Caution

How to Use DIN Terminal

Refer to page 1435 for VT307 series.

VEX3 Series
Manifold Specifications

Manifold: VVEX Series



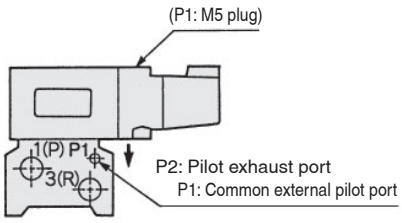
Specifications

Model		VVEX2	VVEX4		
Applicable valve		VEX3220/VEX3222	VEX3420/VEX3422		
Valve stations Note)		2 to 8	2 to 6		
Port specifications		Common SUP, EXH			
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 (With gasket, screw)	VEX4-5 (With gasket, screw)		

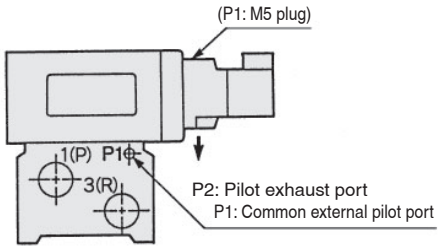
Note) When VVEX2 series is used with more than 5 stations, or VVEX4 series is used with more than 4 stations, apply pressure to the port 1 (P) on both sides and exhaust from the port 3 (R) on both sides.

Common External Pilot Piping

VVEX2-2



VVEX4-2



How to Order Manifold Base

VVEX 2– 1 – 6 – 02 □

Thread type

—	Rc
N	NPT
F	G
T	FNPT

Body size • **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	02	1/4		
				⋮	⋮				
	2	Common external pilot		6	6				
				⋮	⋮				
				8	8				
4	1	Internal pilot	VEX3422 (Air operated: VEX3420 Note)	2	2	A	3/8		1/4
				⋮	⋮	B	3/8		
	2	Common external pilot		6	6	C	1/2		3/8

Note) Air operated
VEX 3220 and VEX3420 (air operated) are used. Distinction between the pilots (internal or extertal pilot) of the manifold base does not matter. Either may be used.

Example for ordering a manifold base:
The valve and blank 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)
VVEX2-2-7-02N
∗VEX3222-1LN 6 pcs. } Solenoid
∗VEX1-17 1 pc. }
VVEX4-2-6-A
∗VEX3420 5 pcs. } Air operated
∗VEX4-5 1 pc. }

VEX3 manifold (Size 2, 4) Pilot type

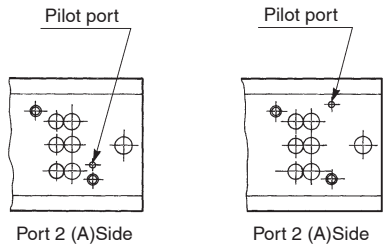
Manifold pilot type	Manifold part no.	Applicable valve part no.	Operating pressure range	Pilot pressure range
Air operated type	VVEX□-□-□-□	VEX3220/VEX3420	Low vacuum to 1.0 MPa	0.2 to 1.0 MPa
Internal pilot type	VVEX□-1-□-□	VEX3222/VEX3422	0.2 to 0.7 MPa	—
Common external pilot type	VVEX□-2-□-□	VEX3222/VEX3421/VEX3422	Low vacuum to 1.0 MPa	0.2 to 0.7 MPa
Individual external pilot type	VVEX□-□-□-□	VEX3221		

Note) If external pilot types are used, the common external pilot type is recommended.

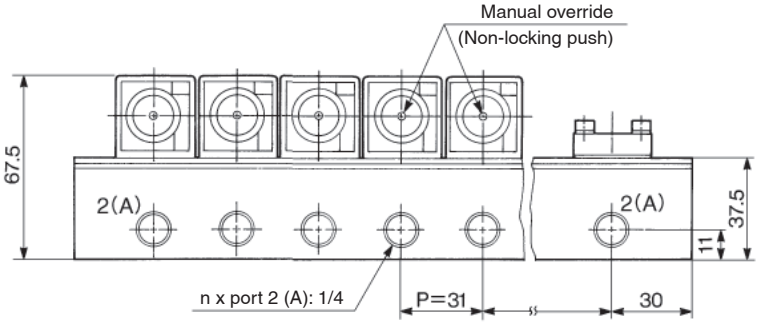
Manifold: VVEX2-□

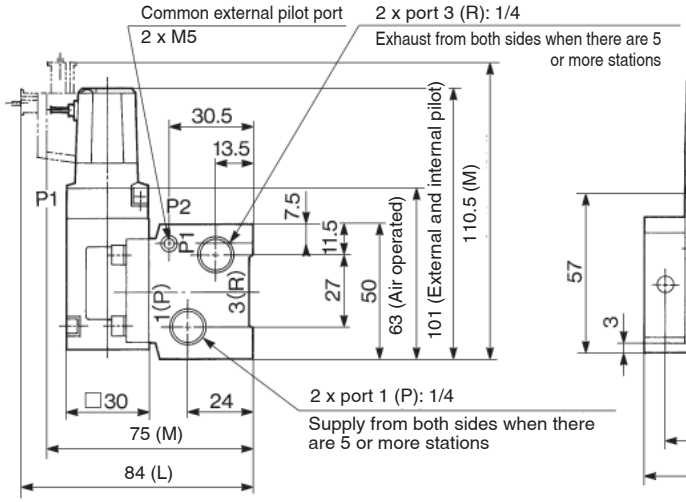
VVEX2-$\frac{1}{2}$ Applicable valve: VEX3220/3222

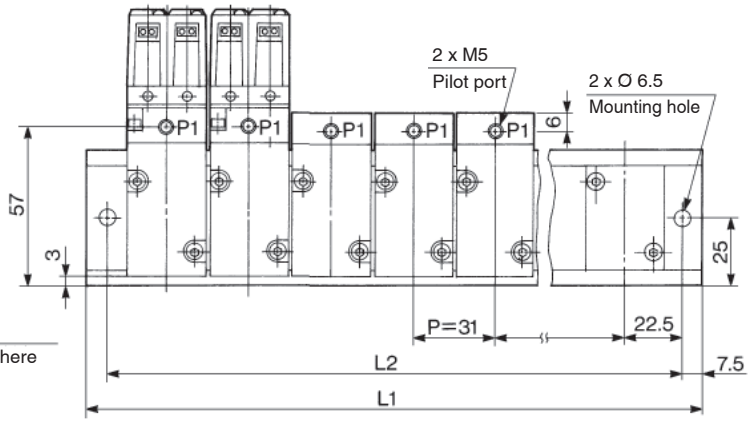
Valve mounting side

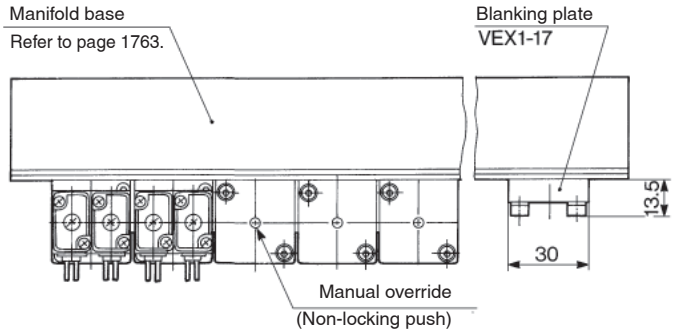


Internal pilot type **Common external pilot**









L Dimension

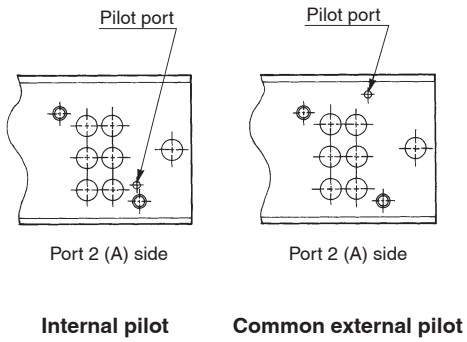
Formula $L_1 = 31n + 29$, $L_2 = 31n + 14$ n: Station

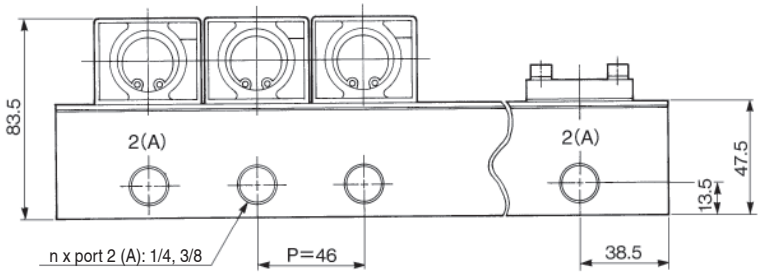
L \ n	2	3	4	5	6	7	8
L1	91	122	153	184	215	246	277
L2	76	107	138	169	200	231	262

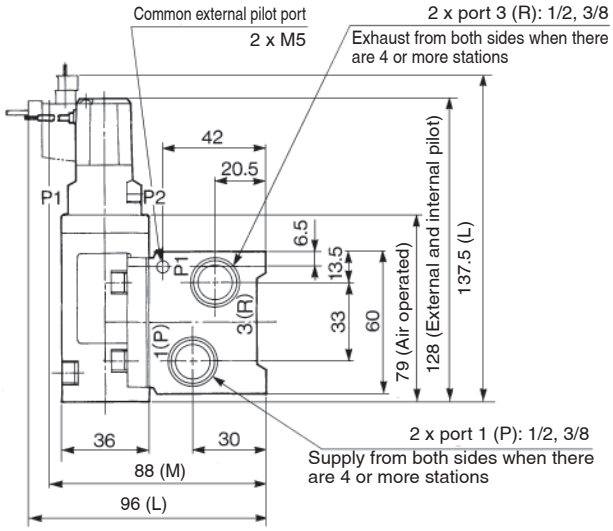
Manifold: VVEX4-□

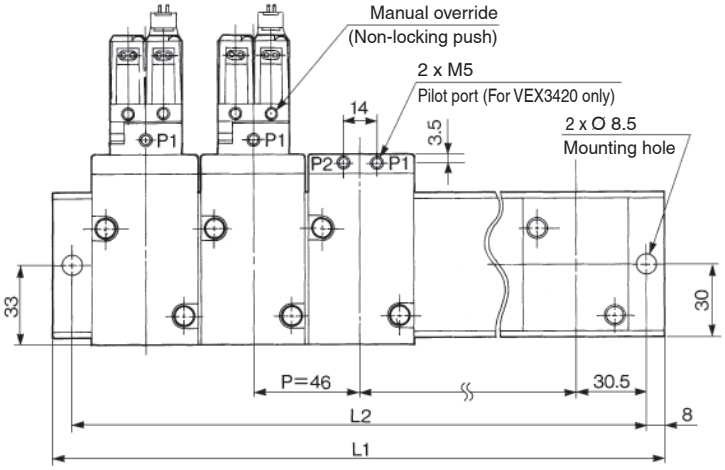
VVEX4-1 Applicable valve: VEX3420/3422
VVEX4-2 Applicable valve: VEX3420/3422

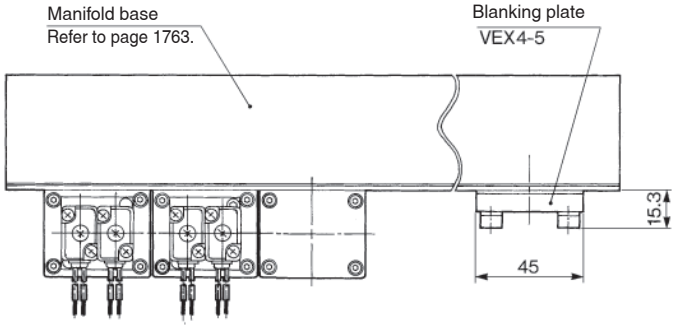
Valve mounting side









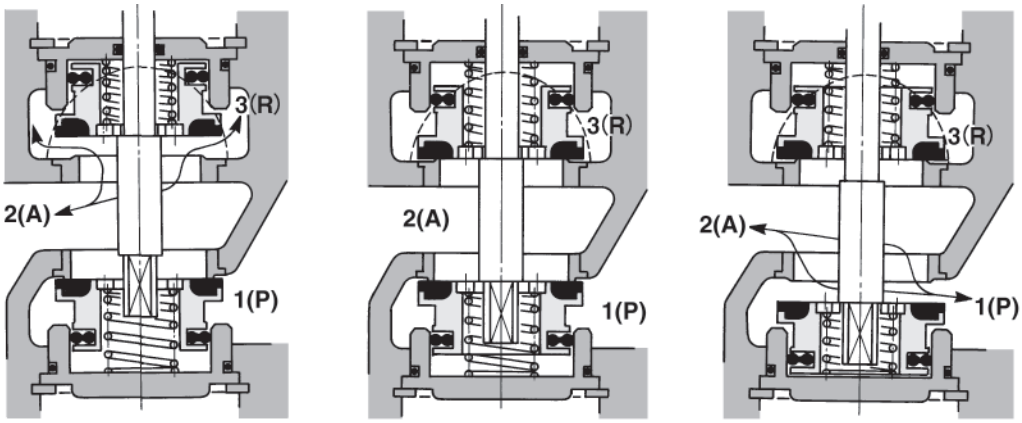


L Dimension $L_1 = 46n + 31$, $L_2 = 46n + 15$ n: Station

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

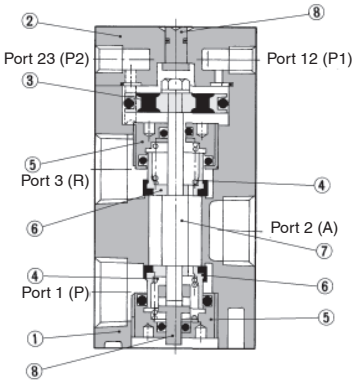
Construction/Working Principle/Component Parts

(1) 2(A)⟷R 3(R) **(2) Closed centre** **(3) 2(A)⟷R 3(R)**

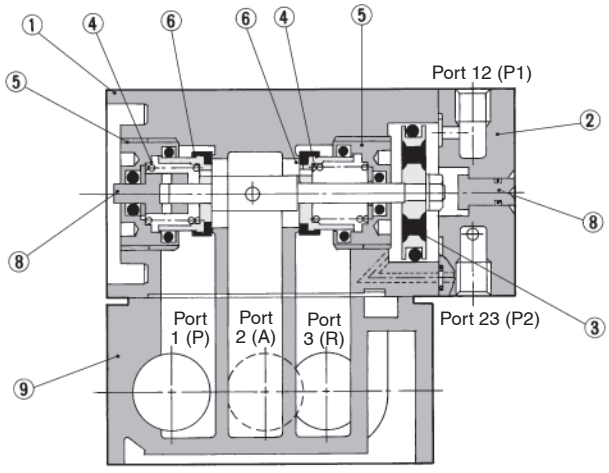


- This is a 3 port switch valve in which the shaft ⑦ - extending from the driving piston ③ opens/closes a pair of poppet valves ⑥. The poppet valve has a pressure balancing mechanism in which port 2 (A) pressure is constantly applied from the back and the centre spring ④ is acting as a backup.
- When neither the pilot solenoid valve "a" nor "b" are energized (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 (DRW (2)).
- When the pilot solenoid valve "a" is energized (or when pressurized 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) (DRW (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 energized (or when pressurized 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) (DRW (1)). The lower poppet valve continues to close the port 1 (P) by means of pressure balance and the spring.

VEX3120 (Air operated)



VEX3220 (Air operated)

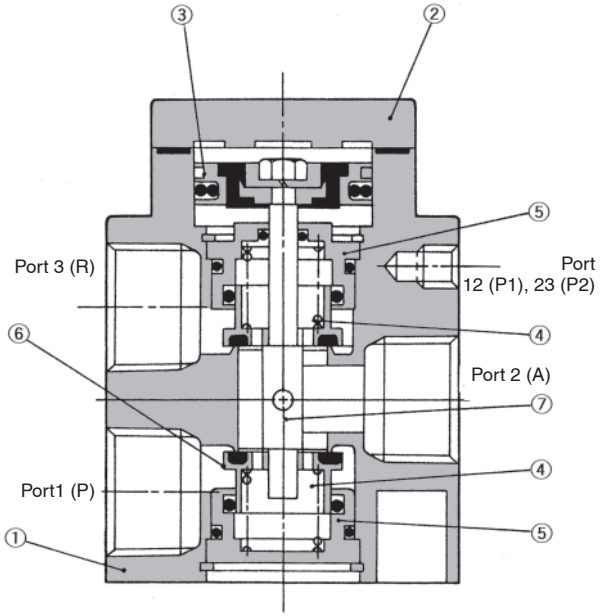


Component Parts

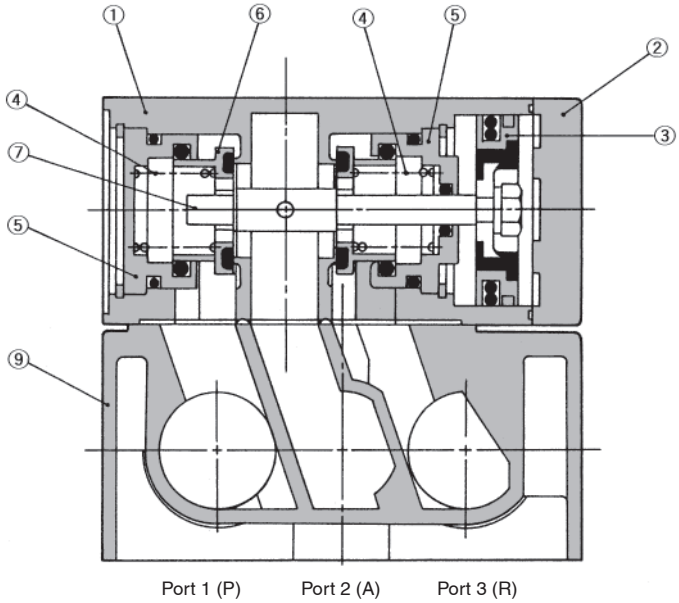
No.	Description	Material
1	**Body**	Aluminium alloy
2	**Cover**	Aluminium alloy
3	**Working piston**	Aluminium alloy
4	**Centre spring**	Stainless steel
5	**Valve guide**	Aluminium alloy
6	**Poppet valve**	Aluminium alloy, Rubber
7	**Shaft**	Stainless steel
8	**Manual override**	POM
9	**Sub-plate**	Aluminium alloy

Construction/Working Principle/Component Parts

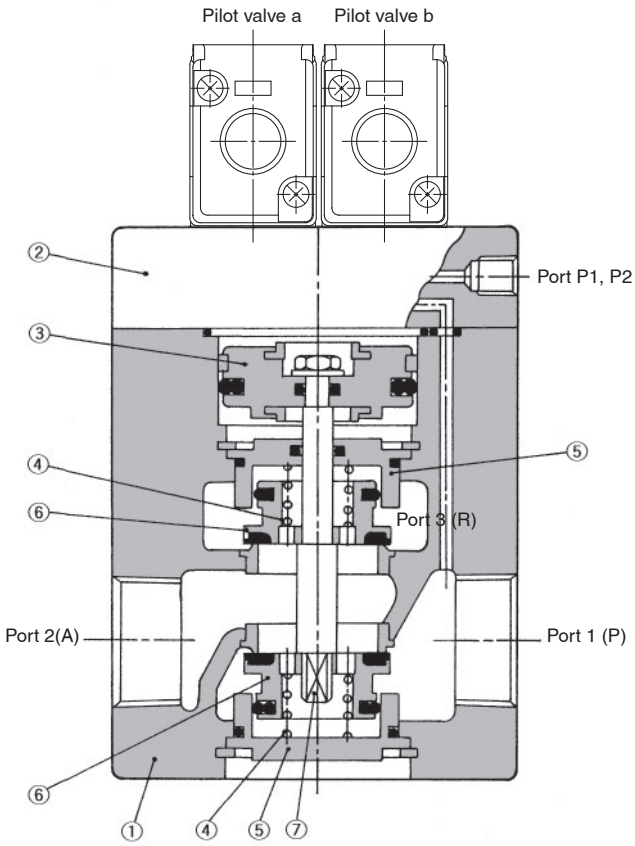
VEX3320 (Air operated)



VEX3420 (Air operated)



VEX350□/370□/390□ (Solenoid)



VEX3 Series
Specific Product Precautions

Be sure to read this before handling the products.
Refer to back page 50 for Safety Instructions.

Connectors for the VEX3 Series Body Sizes 12, 22, 32 and 42 (For connectors for body sizes 50, 70, and 90, refer to VT307 series.)

Plug Connector Lead Wire Length

⚠ Caution

The standard length of a plug connector with lead wire is 300 mm, but the following lengths are also available.

How to Order Connector Assembly

DXT170 − 80 − □ A − □

Lead wire colors

Symbol	Lead wire with socket	Note
—	Socket only (2 pcs.)	Without lead wire
1	Blue (2 pcs.)	For 100 VAC
2	Red (2 pcs.)	For 200 VAC
3	Grey (2 pcs.)	For other VAC
4	Red: +, Black:−	For DC

Lead wire length

Symbol	Lead wire length (L mm)
—	300
6	600
10	1000
15	1500
20	2000
25	2500
30	3000

How to Order

Specify the connector assembly part number together with the part number for the plug connector's solenoid valve without connector.
Note) The solenoid valve and the connector assembly are shipped separately.

Connector Assembly with Cover

⚠ Caution

Connector assembly with protective cover enhances dust protection.
- Effective to prevent short circuit accidents due to penetration of foreign matter into the connector part.
- Cover material adopts the chloroprene rubber which is excellent in weather ability and electric insulation properties. However, use caution not to splash cutting oil, etc. onto it.
- Simple and unencumbered appearance by adopting a round-shaped cord.

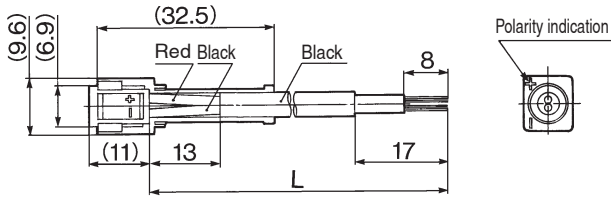
How to Order

DXT170 − 123 − A − □

Lead wire length

Symbol	Lead wire length (L mm)
—	300
6	600
10	1000
15	1500
20	2000
25	2500
30	3000

Connector assembly with cover: Dimensions



How to Use DIN Connector

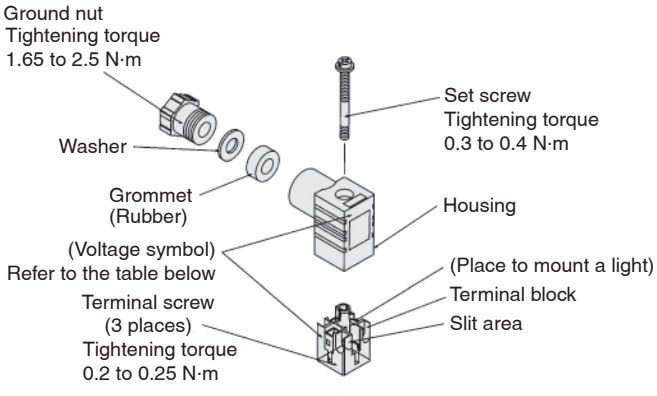
⚠ Caution

Wiring
1) Loosen the set screws and pull out connector from the terminal block of solenoid valve.
2) Pull out screws and insert a screwdriver to the slit area near the bottom of terminal block to separate the terminal block and housing.
3) Loosen the terminal screws (slotted screws) on the terminal block, insert the core of the lead wire into the terminal in accordance with the wiring method, and secure with the terminal screws.
4) Tighten the ground nut to secure the cord.

Change of electrical entry
After separating the terminal block and housing, the cord entry direction can be changed by attaching the housing in the desired direction (4 directions in 90° increments).
∗ When equipped with light, avoid damaging the light with lead wire.

Caution
Plug a connector in or out vertically, never at an angle.

Applicable cables
Cord O.D.: Ø 3.5 to Ø 7
(Reference) 0.5 mm² 2-core and 3-core wires equivalent to JIS C 3306.



DIN connector part no.

Without light	DXT170-176-1

With Light

Rated voltage	Voltage symbol	Part no.
100 VAC	100 V	DXT170-176-2-01
200 VAC	200 V	DXT170-176-2-02
110 VAC	110 V	DXT170-176-2-03
220 VAC	220 V	DXT170-176-2-04
240 VAC	240 V	DXT170-176-2-07
6 VDC	6 VD	DXT170-176-3-51
12 VDC	12 VD	DXT170-176-3-06
24 VDC	24 VD	DXT170-176-3-05
48 VDC	48 VD	DXT170-176-3-53

Connector with light circuit

NL: Neon light
R: Resistor

D: Protective diode
LED: LED diode
R: Resistor

⚠ 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.

⚠ **Danger:**	**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
⚠ **Warning:**	**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
⚠ **Caution:**	**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

1) ISO 4414: Pneumatic fluid power – General rules and safety requirements for systems and their components.
ISO 4413: Hydraulic fluid power – General rules and safety requirements for systems and their components.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.
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. Our products cannot be used beyond their specifications.
Our products are not developed, designed, and manufactured to be used under the following conditions or environments.
Use under such conditions or environments is not covered.
1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogues and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

⚠ Caution

We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.
Use in non-manufacturing industries is not covered.
Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.
The new Measurement Act prohibits use of any unit other than SI units in Japan.

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, whichever 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.

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