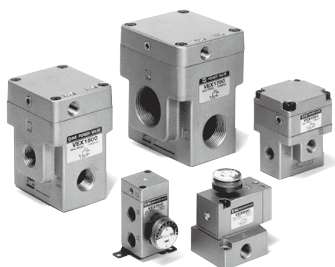


Power Valve: Regulator Valve

Series VEX1

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



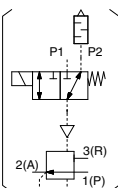
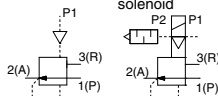
Air operated



External pilot solenoid

Symbol

Air operated



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	Air operated		0.05 to 0.9 MPa												
range	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			
	2(A)	1/8	1/4	1/8	1/4	1/4	3/8	1/2	1/2	3/4	1		1 1/4	1 1/2	2
	3(R)											1 1/4		2	
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	

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

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	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)
power	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	G36-10-01	G46-10-01	G46-10-01	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. 6.)
Example: VEX1300-03
G36-4-01

How to Order

VEX 1 3 0 1 - 03 [] [] D [] - B

Regulator valve

Operation type

0	Air operated
1	External pilot solenoid

Thread type

Nil	Rc
F	G ⁽³⁾
N	NPT
T	NPTF

Note 3) Not conforming to ISO1179-1.

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.

Option

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

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

Light/Surge voltage suppressor (Only with solenoid)

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

Sub-plate and gasket part no.

Sub-plate

Base gasket

VEX1 - 9 - 1 [] [] P

Port size

Symbol	Port size
A	1/8
B	1/4

Thread type

Symbol	Thread type
Nil	Rc
F	G
N	NPT
T	NPTF

VEX1 - 11 - 2

Body size

Port size

Electrical entry (Only with solenoid)

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

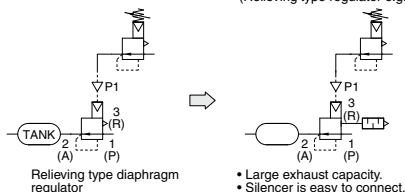
⚠ Caution

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

Application Example

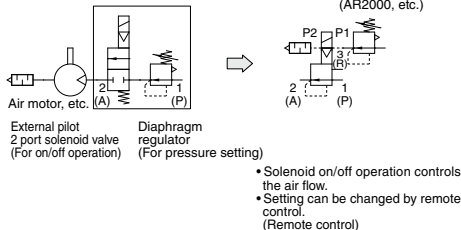
1. Relief regulator (Rapid tank internal pressure setting)

(Relieving type regulator e.g. AR2000)



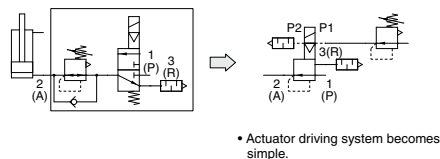
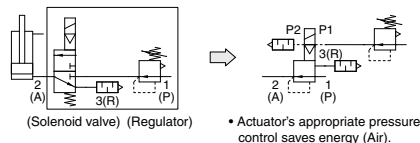
2. Air blow (As 2 port directional control regulator valve)

(AR2000, etc.)

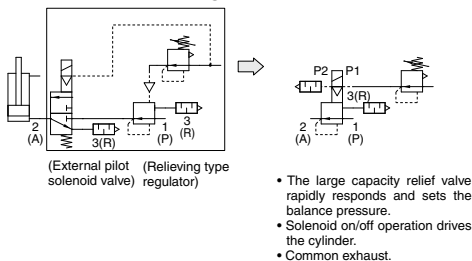


3. Constant pressure supply and driving (As 3 port directional control regulator valve)

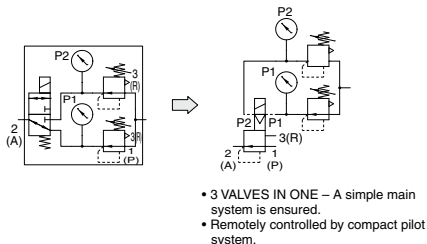
Note) The pressure is about 0.01 MPa when OFF because of leakage.



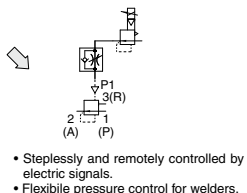
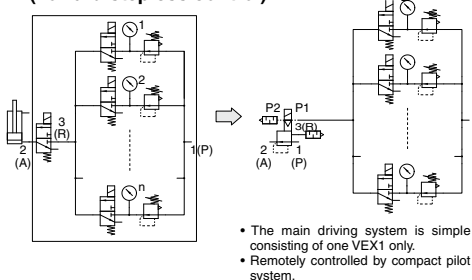
4. Balance and driving



5. 2 steps directional control setting



6. Multiple steps pressure control (Toward stepless control)



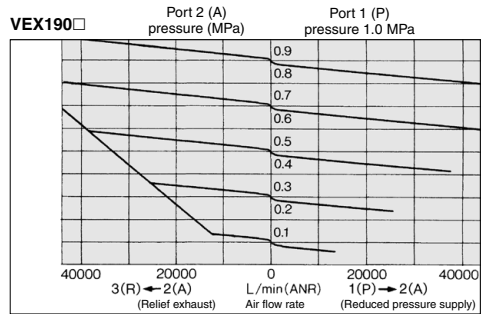
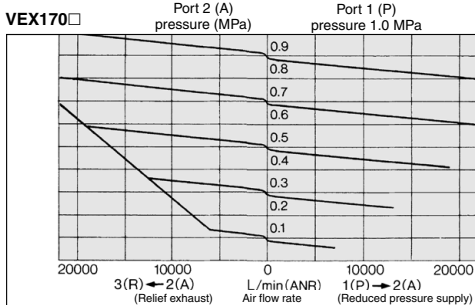
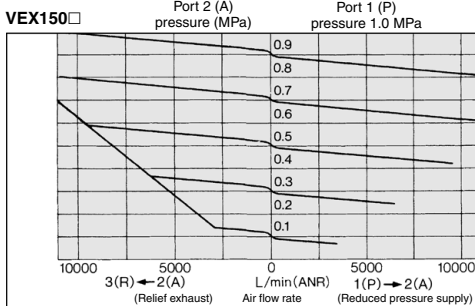
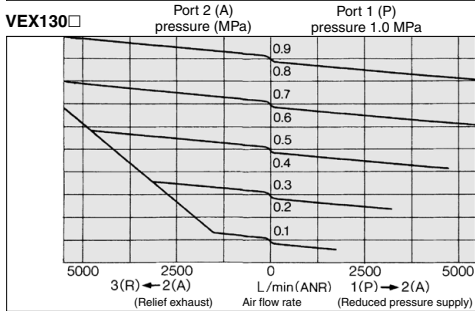
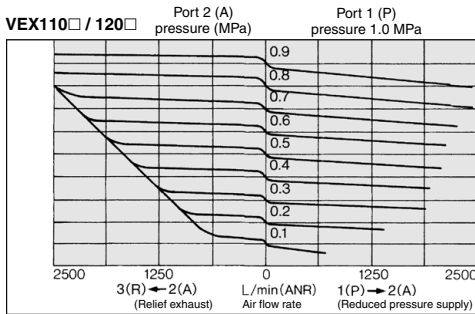
⚠ Caution

- 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)

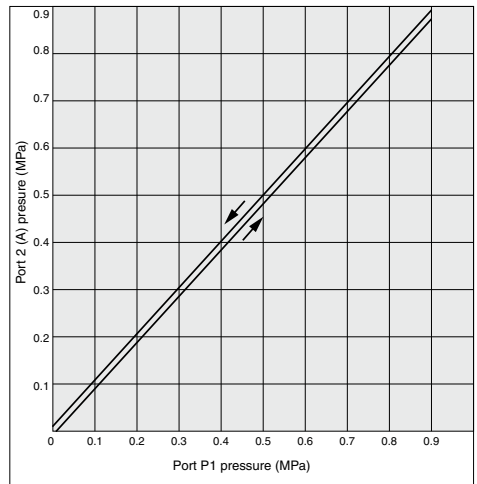
- Relieving type regulator such as AR2000, etc. should be used as pilot regulator in the application. (When the non-relieving type is used, pressure cannot be changed from high to low.)
- A sensitive regulator such as the ARP30, etc. should be used as a pilot regulator on the low pressure side, particularly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

Flow Characteristics

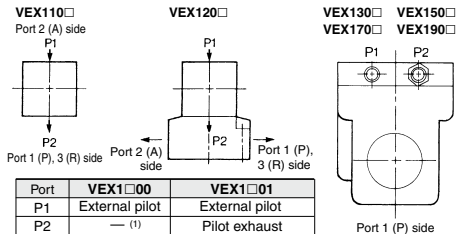


Setting Pressure Characteristics

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



External Pilot Piping



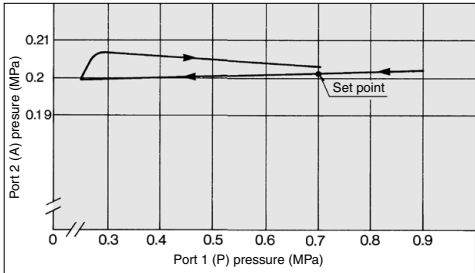
Note 1) Port P2 is not compatible with VEX1□00.

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.

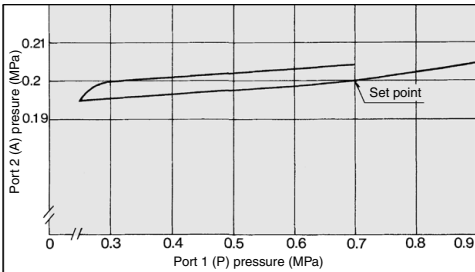
Pressure Characteristics

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).

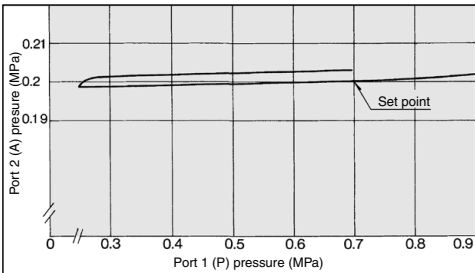
VEX110□ / 120□



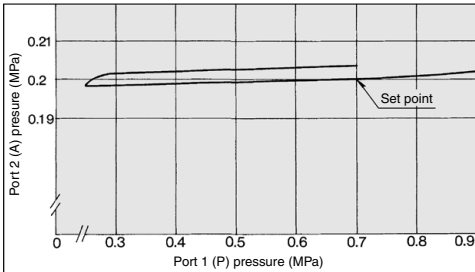
VEX130□



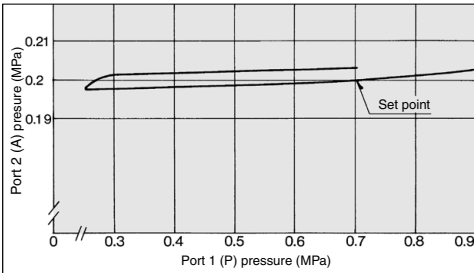
VEX150□



VEX170□

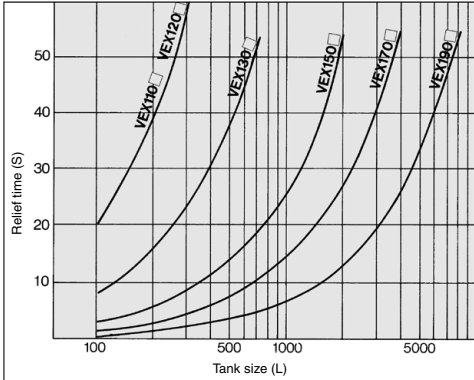


VEX190□

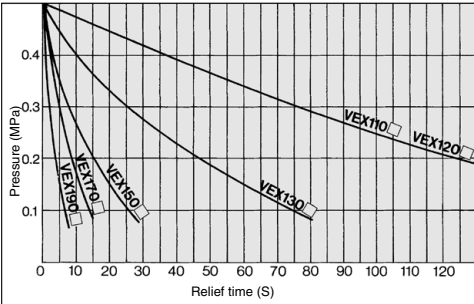


Relief Time

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

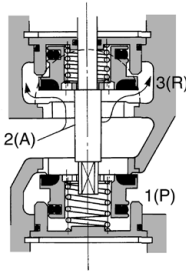
[Example] VEX 1500 lowers 2000 L tank from 0.4 MPa to 0.1 MPa:

- a) In graph 2. —→ b) The relief time for the 2000 L tank is found by conversion as shown below.
- Initial pressure: 0.4 MPa
Desired low pressure: 0.1 MPa
Relief time
- $$t = \frac{\text{Tank capacity}}{1000} \times \left[\text{Relief time that is read} \right]$$
$$= \frac{2000}{1000} \times 23$$
$$= 46$$

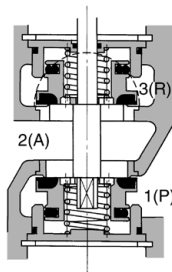
From above, the relief time is 26 – 3 = 23 s
The result is 46 s.

Construction/Working Principle/Component Parts

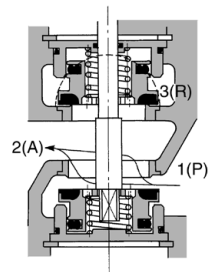
**(1) When Port 2 (A) pressure is high
Relief exhausting**



(2) Setting pressure condition

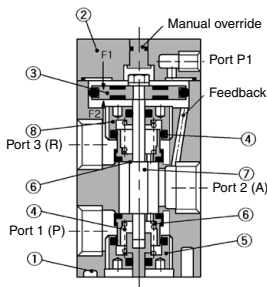


**(3) When Port 2 (A) pressure is low
Pressure reducing supply**

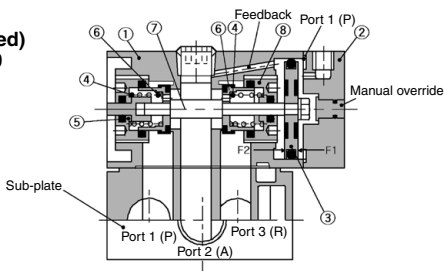


- The balance between the acting force F1 of the pilot pressure (port P1) over the upper surface of the pressure regulating piston ③ and the acting force F2 of the pressure at port 2 (A) leading to a space under the piston through the feed back flow root closes a couple of poppet valves ⑥ and sets port 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 pressure, 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.

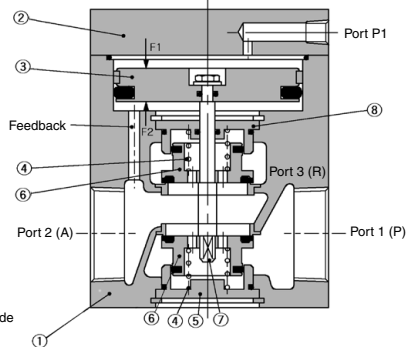
**(Air operated)
VEX1100**



**(Air operated)
VEX1200**



**(Air operated)
VEX1300/1500/1700/1900**

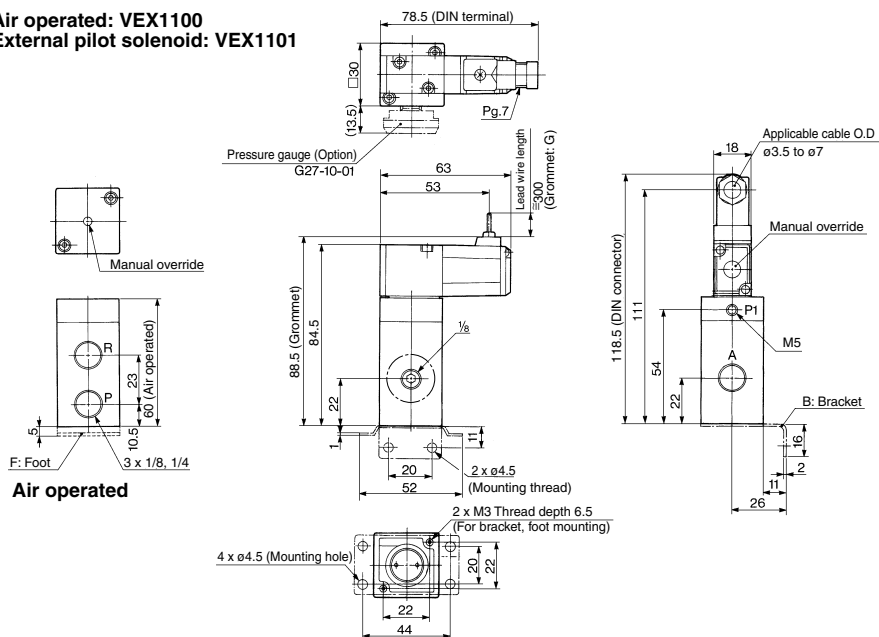


No.	Description	Material
1	Body	Aluminum alloy casted
2	Cover	Aluminum alloy casted
3	Regulation piston	Aluminum alloy
4	Spring	Stainless steel
5	Valve guide	Aluminum alloy
6	Poppet valve	Aluminum alloy, Rubber
7	Shaft	Stainless steel
8	Valve guide	Aluminum alloy

Series VEX1

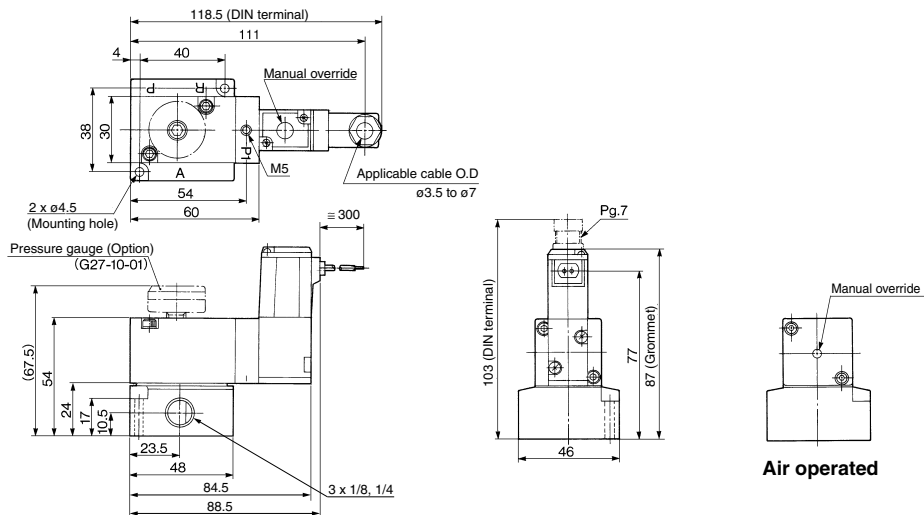
Dimensions

Air operated: VEX1100
External pilot solenoid: VEX1101



Air operated

Air operated: VEX1200
External pilot solenoid: VEX1201



Air operated

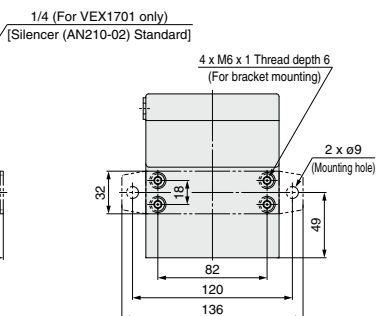
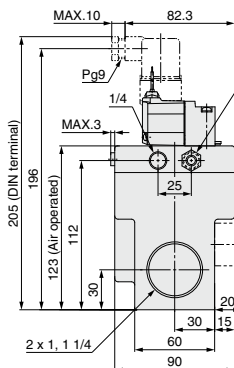
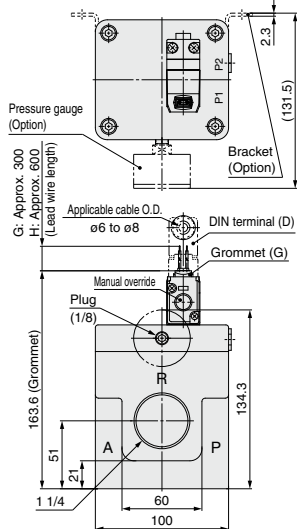
⚠ Caution

How to Use DIN Terminal

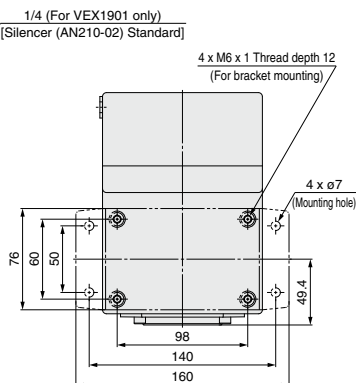
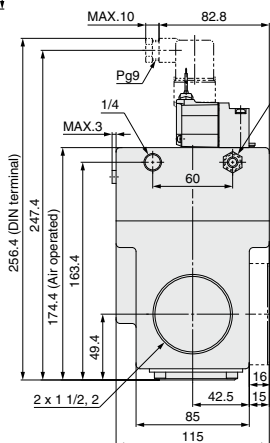
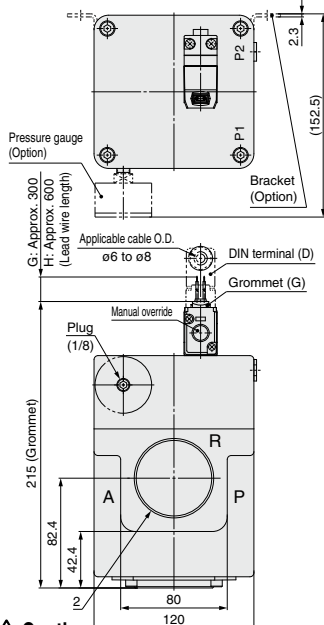
Refer to page 1988 for series VK300.

Dimensions

Air operated: VEX1700 External pilot solenoid: VEX1701



Air operated: VEX1900 External pilot solenoid: VEX1901



How to Use DIN Terminal

Refer to page 2005 for series VT307.