

Power Valve Regulator Valve Series VEX1

Large Capacity Relief Regulator

3 port large capacity poppet exhausting regulator equipped with a relief port the same size as the connection port.

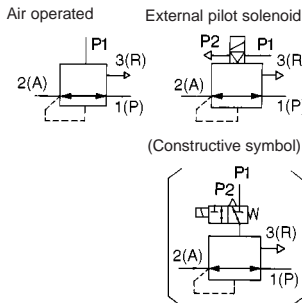


Air operated



External pilot solenoid

Symbol



Specifications

Model	VEX110□-01-02	VEX120□-01-02	VEX130□-02-03-04	VEX150□-04-06-10	VEX170□-10-12	VEX190□-14-20										
Operating style	Air operated, External pilot															
Fluid	Air, Inert gas															
Proof pressure	1.5MPa															
Max. operating pressure	1.0MPa															
Set press. range	Air operated	0.05 to 0.9MPa														
	Solenoid	0.05 to 0.7MPa			0.05 to 0.9MPa											
Ambient and fluid temperature	0 to 50°C(Air operated: 0 to 60°C)															
Hysteresis	0.03MPa															
Repeatability	0.01MPa															
Sensitivity	0.01MPa															
Mounting	Free															
Lubrication	Not required (Use turbine oil No.1 ISO VG32, if lubricated)															
Port size Rc(PT)	Port	01	02	01	02	02	03	04	04	06	10	10	12	14	20	
	P											1	1	1 1/4	1 1/2	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 1/4	2	2	2
Effective area	R											1 1/4	1 1/4	2	2	2
	mm ²	16	25	16	25	36	60	70	130	160	180	300	330	590	670	
Weight (kg)	Cv	0.9	1.4	0.9	1.4	2.0	3.3	3.9	7.2	8.9	10	17	18	33	37	
	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					

Solenoid Specifications

Model	VEX1101, 1201, 1301				VEX1501, 1701, 1901			
Pilot valve	VK334-□□□				VO307-□□□			
Electrical entry	Grommet, DIN connector				Grommet, Grommet terminal, Conduit terminal, DIN connector			
Coil rated voltage V	AC(50/60Hz)	100V, 110V, 200V, 220V, 240V						
	DC	6V, 12V, 24V, 48V						
Allowable voltage	±10% of rated voltage				-15 to +10% of rated voltage			
Coil insulation	Class B (130°C)							
Temperature rise	55°C or less (Rated voltage)				50°C or less (Rated voltage)			
Apparent power	AC	Inrush	9.5VA/50Hz, 8VA/60Hz			12.7VA(50Hz), 10.7VA(60Hz)		
		Holding	7VA/50Hz, 5VA/60Hz			7.6VA(50Hz), 5.4VA(60Hz)		
Power consumption	DC	4W(Without light) 4.3W(With light)				4.8W		
Manual override	Non-locking push style							

Options

Parts name		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 ⁽¹⁾	G	G27-10-01		G36-10-01	G46-10-01		—



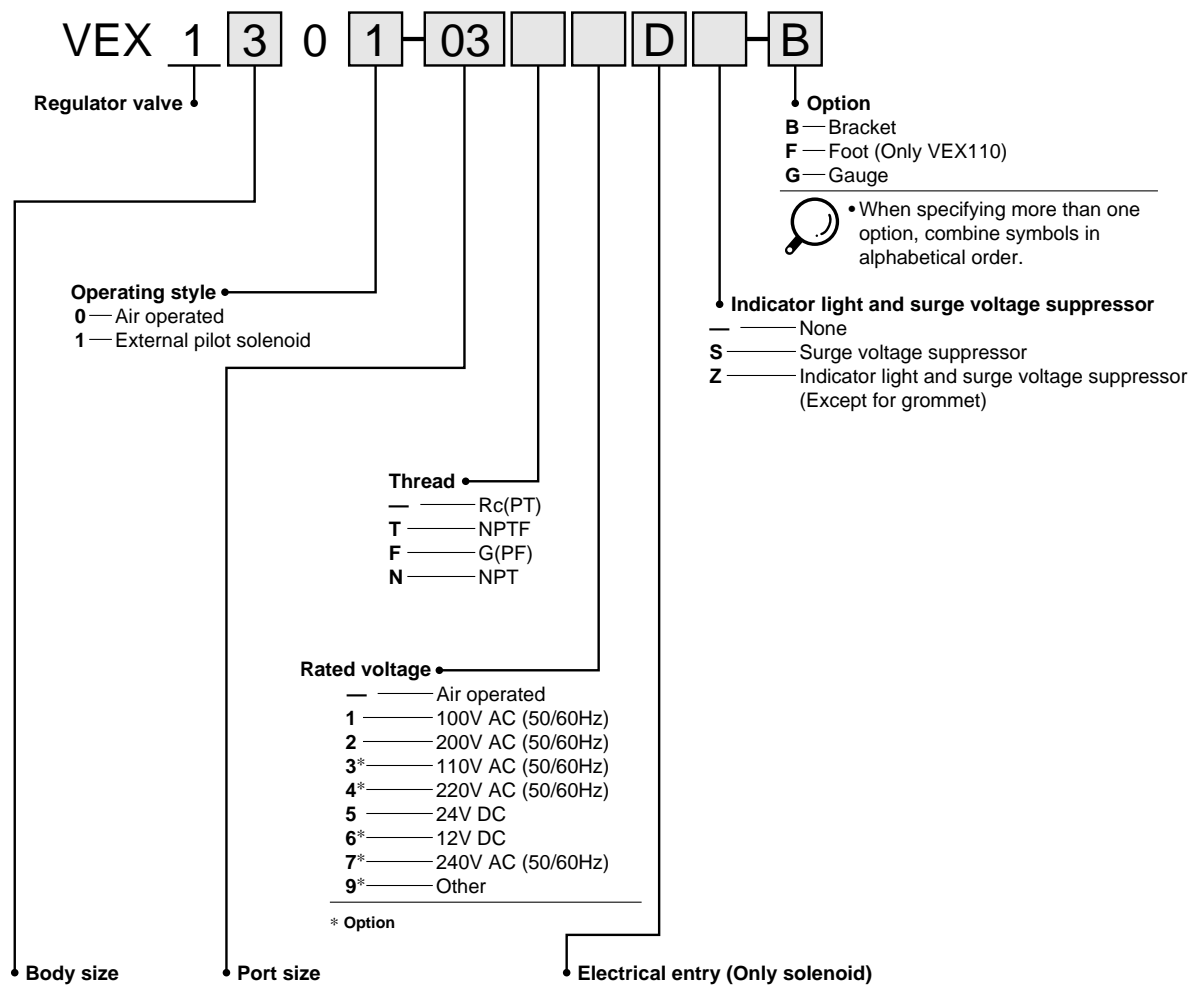
Note 1) When requiring the gauge except mentioned above, specify the model number. Option is packed with it.

(Refer to Best Pneumatics 4.)

Example: VEX1300-03

G36-4-01

How to Order



Body size	Port size Rc(PT)			Electrical entry		
	Port	P, A port	R port			
Body ported	1	01	1/8	1/8	G — Grommet (300mm lead wire) H — Grommet (600mm lead wire) D — DIN connector DO — DIN connector (Without connector)	
		02	1/4	1/4		
	3	03	3/8	3/8		
		04	1/2	1/2		
	5	04	1/2	1/2		
		06	3/4	3/4		
	7	10	1	1		G — Grommet (300mm lead wire) H — Grommet (600mm lead wire) E — Grommet terminal T — Conduit terminal D — DIN connector
		12	1 1/4	1 1/4		
	9	14	1 1/2	2		
		20	2	2		
	Base mounted	—	Without subplate			G — Grommet (300mm lead wire) H — Grommet (600mm lead wire) D — DIN connector DO — DIN connector(Without connector)
		2	01	1/8		
02		1/4	1/4			

Model

Model	Operating style		Port size Rc(PT)	
	Air operated	External pilot solenoid	P,A port	R port
Regulator valve	VEX1100	VEX1101	1/8, 1/4	1/8, 1/4
	VEX1200	VEX1201	1/8, 1/4	1/8, 1/4
	VEX1300	VEX1301	1/4, 3/8, 1/2	1/4, 3/8, 1/2
	VEX1500	VEX1501	1/2, 3/4, 1	1/2, 3/4, 1
	VEX1700	VEX1701	1, 1 1/4	1 1/4
	VEX1900	VEX1901	1, 1 1/2	2

⚠ Caution

Refer to p.0-33 to 0-36 for Safety Instructions and common precautions.

VEX

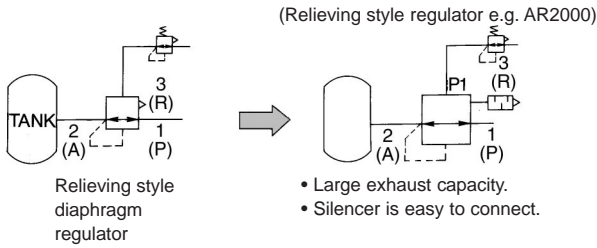
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Applications

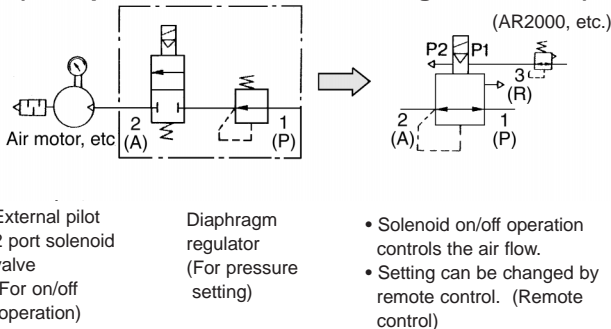
① Relief regulator

(Rapid tank internal pressure setting)



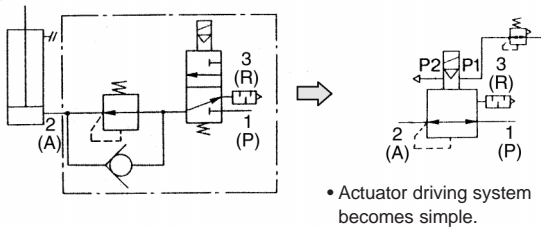
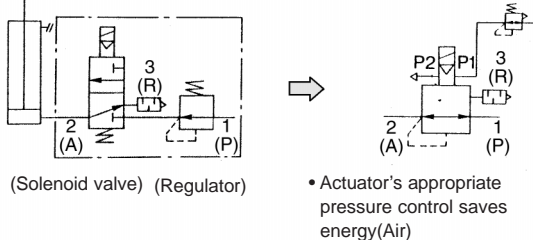
② Air blow

(As 2 port directional control regulator valve)

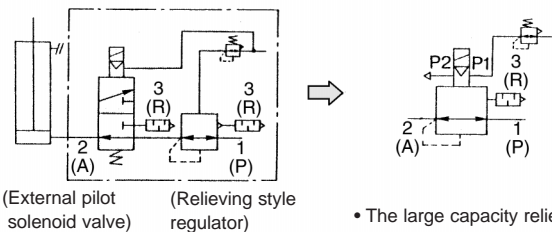


③ Constant pressure supply and driving

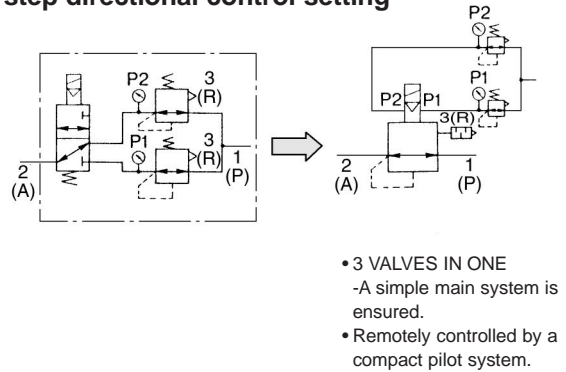
(As 3 port directional control regulator valve)



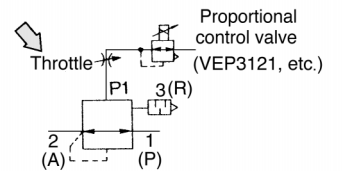
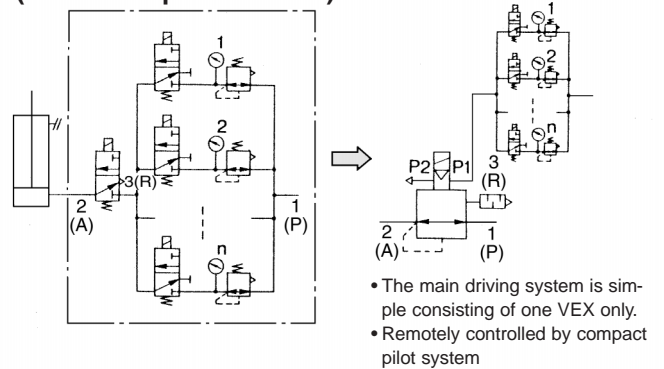
④ Balance and driving



⑤ 2 step directional control setting



⑥ Multiple step pressure control (Toward stepless control)



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

⚠ Caution

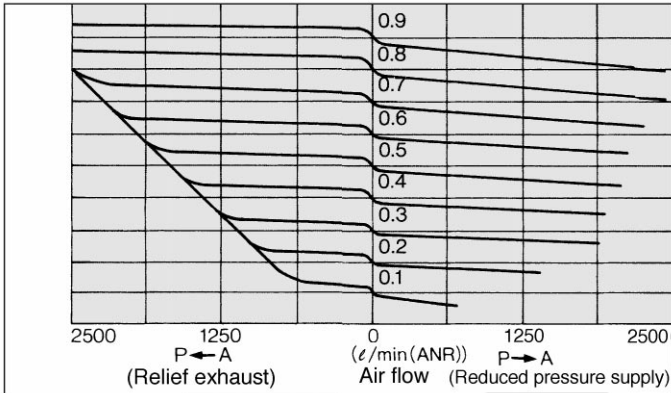
- When the VEX outlet side capacity is small, install a speed controller AS2000, etc. in the pilot pipe to lower the pilot pressure for vibration prevention. (Meter-in)

⚠ Caution

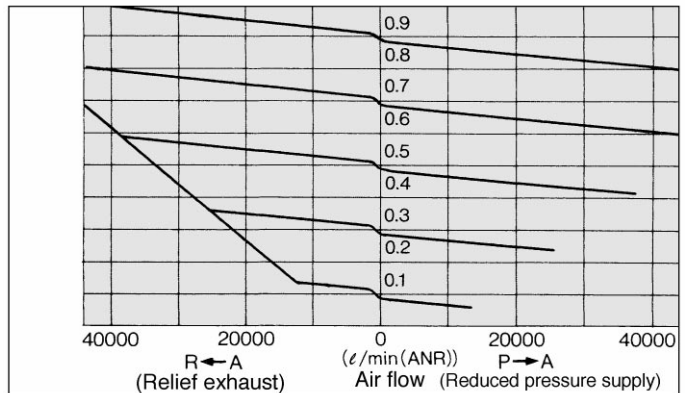
- Relieving style regulator such as AR2000, etc. should be used as pilot regulator in the application.
- Sensitive regulator such as ARP3000, etc. should be used as pilot regulator at low pressure side at especially ⑤ 2 step directional control setting.

Flow Characteristics

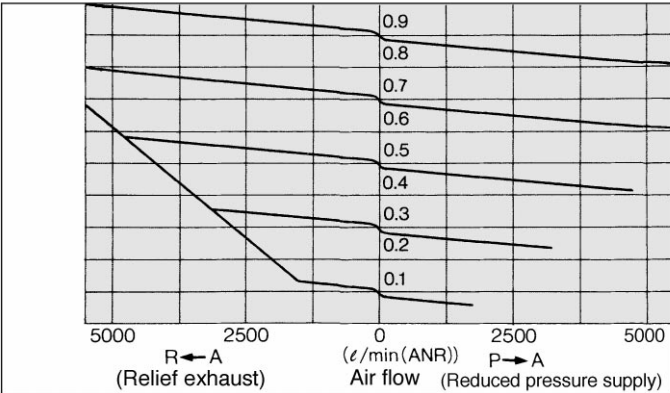
VEX110□, 120□ A port pressure MPa P Port pressure 1.0 MPa



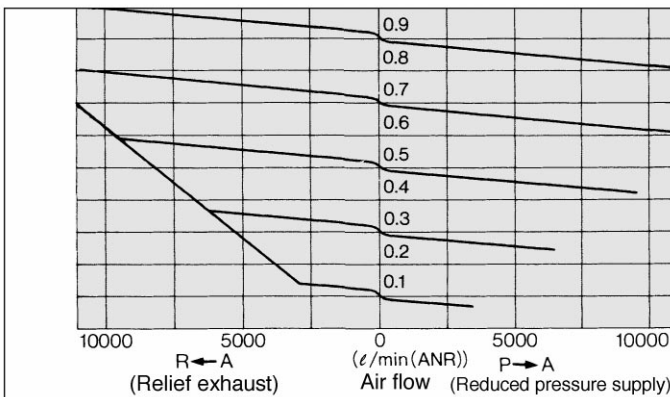
VEX190□ A port pressure MPa P Port pressure 1.0 MPa



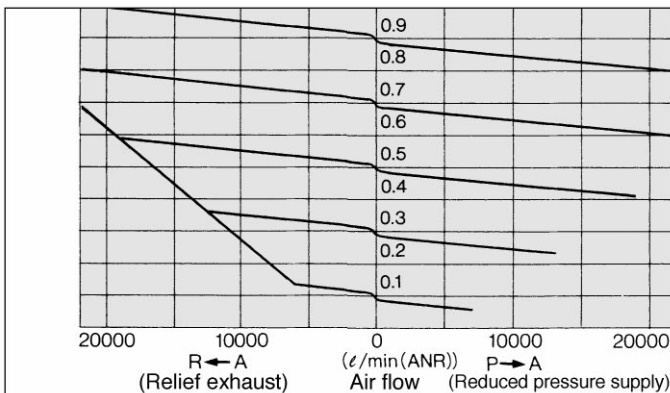
VEX130□ A port pressure MPa P Port pressure 1.0 MPa



VEX150□ A port pressure MPa P Port pressure 1.0 MPa

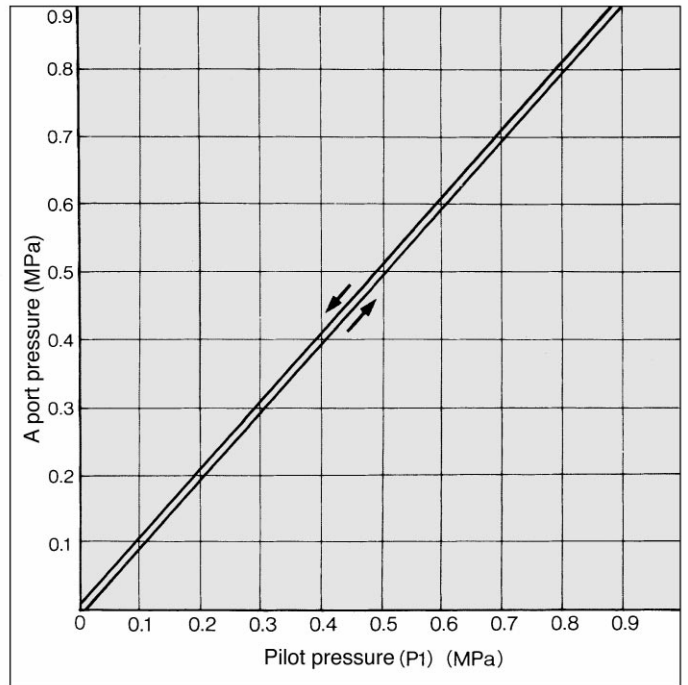


VEX170□ A port pressure MPa P Port pressure 1.0 MPa

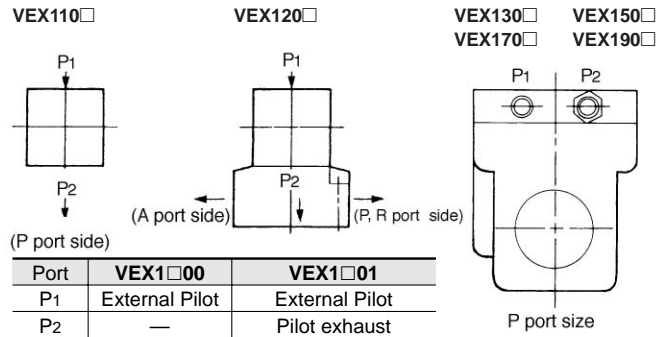


Setting Pressure Characteristics

A port pressure is set in accordance with pilot pressure



External Pilot Piping



VEX

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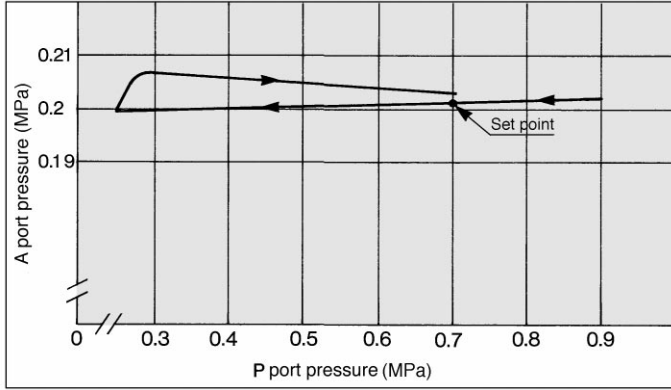
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Pressure Characteristics

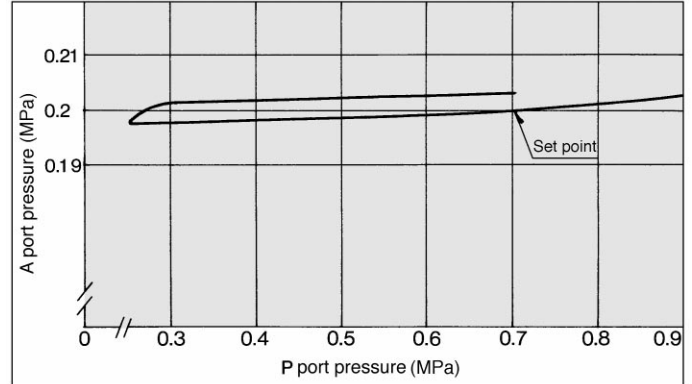
Shown the change of secondary pressure (A port) to the change of supply pressure (P port).

As per JIS B8372 (Pneumatic regulator)

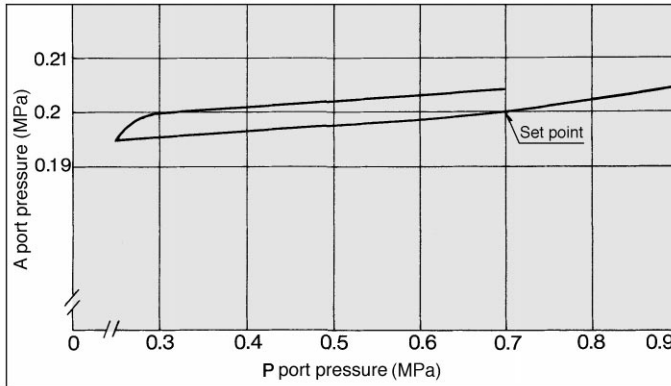
VEX110□, 120□



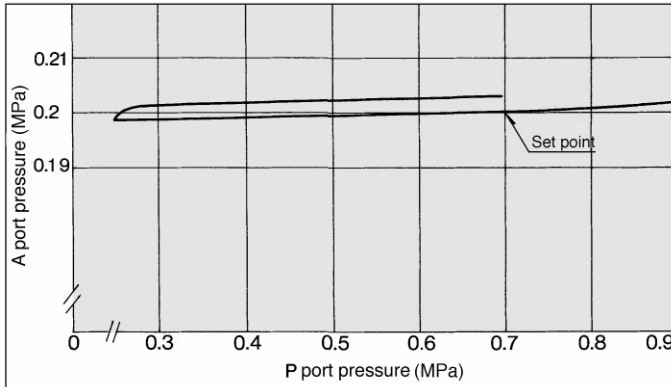
VEX190□



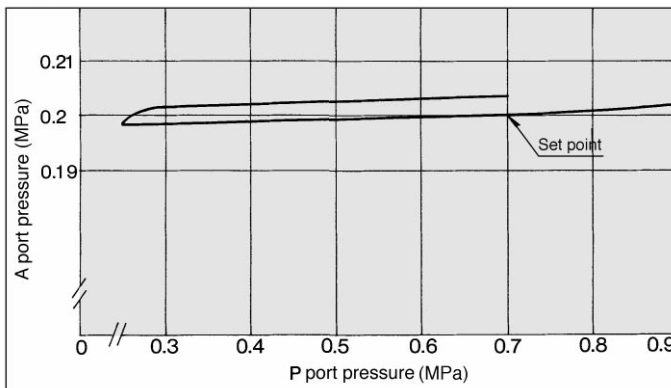
VEX130□



VEX150□

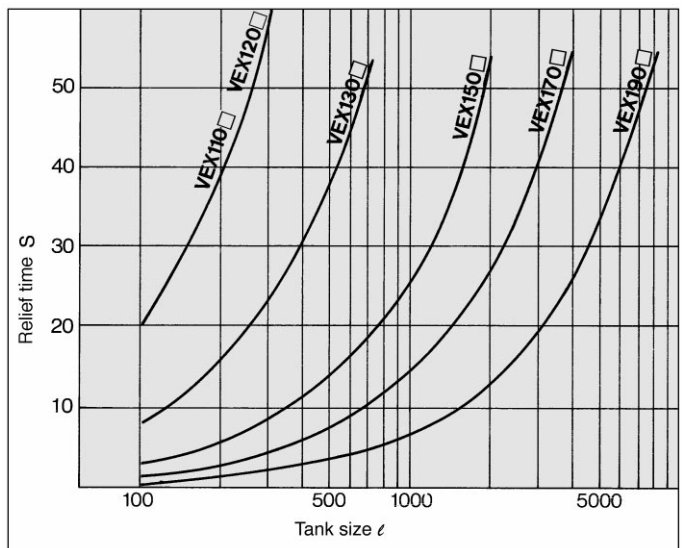


VEX170□

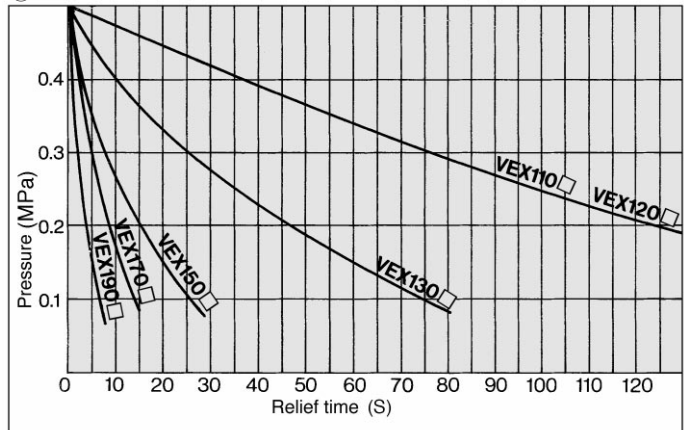


Relief Time

① Relief time from 0.5MPa to 1MPa



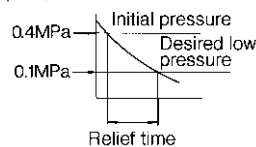
② Relief time from 1000 l tank



③ Relief time from an arbitrary pressure

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

a) In graph ②,



From the above, the relief time is 26-3=23S

b) Then, the relief time for the 2000l tank is found by conversion as shown below.

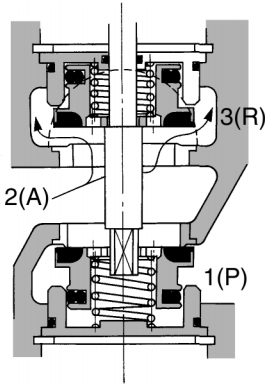
$$t = \frac{\text{Tank capacity}}{1000} \times \left[\text{Relief time that is read} \right]$$

$$= \frac{2000}{1000} \times 23 = 46$$

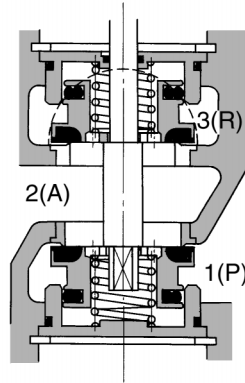
The result is 46S.

Construction/Operation Principles/Component Parts

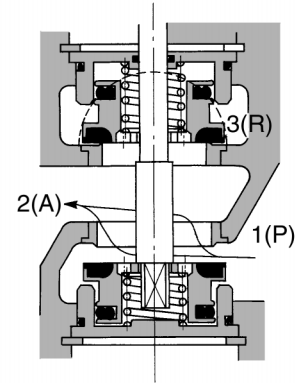
[1] When A port pressure is high.



[2] Setting pressure condition

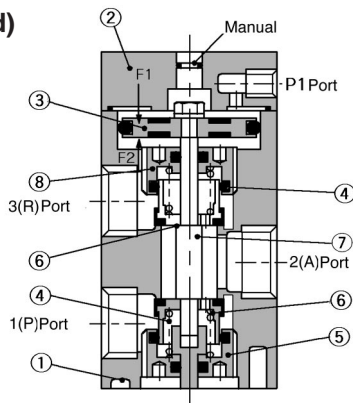


[3] When A port pressure is low. Pressure reducing supply.

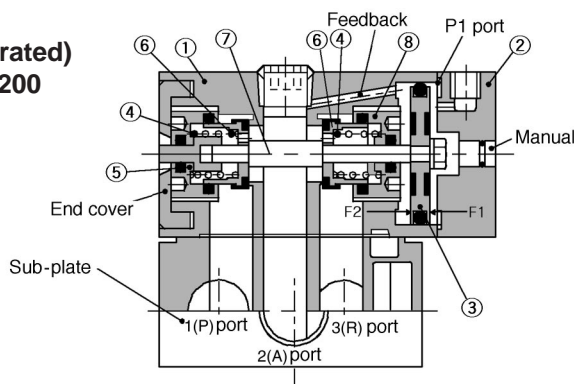


- The balance between the acting force F_1 of the pilot pressure(P1 port)over the upper surface of the pressure regulating piston ③ and the acting force F_2 of the pressure at A port leading to a space under the piston through the feed back flow root closes a couple of poppet valves ⑥ and sets A port pressure that corresponds to P1 port pressure. The poppet valves are backed up by spring ④- in the pressure balance structure by means of A port pressure.(DRW(2))
- When A port pressure exceeds P1 port pressure, F_2 becomes larger than F_1 ,and the pressure regulating piston moves upward, opening the upper poppet valves. Thus air is released from A port to R port. (DRW(1)) When A port pressure lowers enough to restore the balance, the regulator valve returns again to the DRA (2) condition.
- When A port pressure is lower than P1 port pressure, F_1 becomes larger than F_2 , and the pressure regulating piston moves downwards,opening the lower poppet valves.Thus air is supplied from P port to A port.(DRW(3)) When A port pressure rises enough to restore the balance, the regulator valve returns again to the DRW(2) condition.

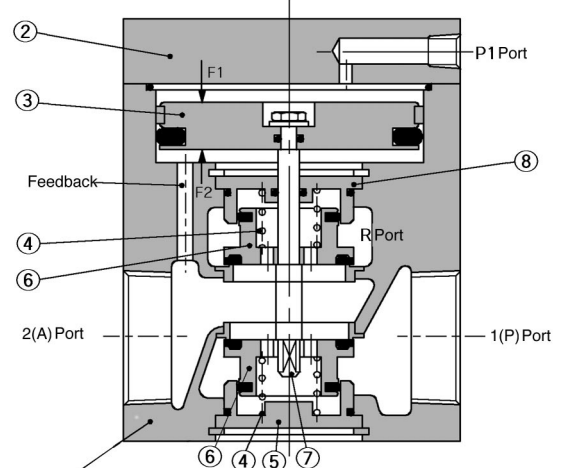
(Air operated)
VEX1100



(Air operated)
VEX1200



(Air operated)
VEX1300/1500/1700/1900



Component Parts

No.	Description	Material
①	Body	Aluminium alloy die cast
②	Cover	Aluminium alloy die cast
③	Piston	Aluminium alloy
④	Spring	Stainless steel
⑤	Valve guide	Aluminium alloy
⑥	Poppet valve	Aluminium alloy, NBR
⑦	Shaft	Stainless steel
⑧	Valve guide	Aluminium alloy

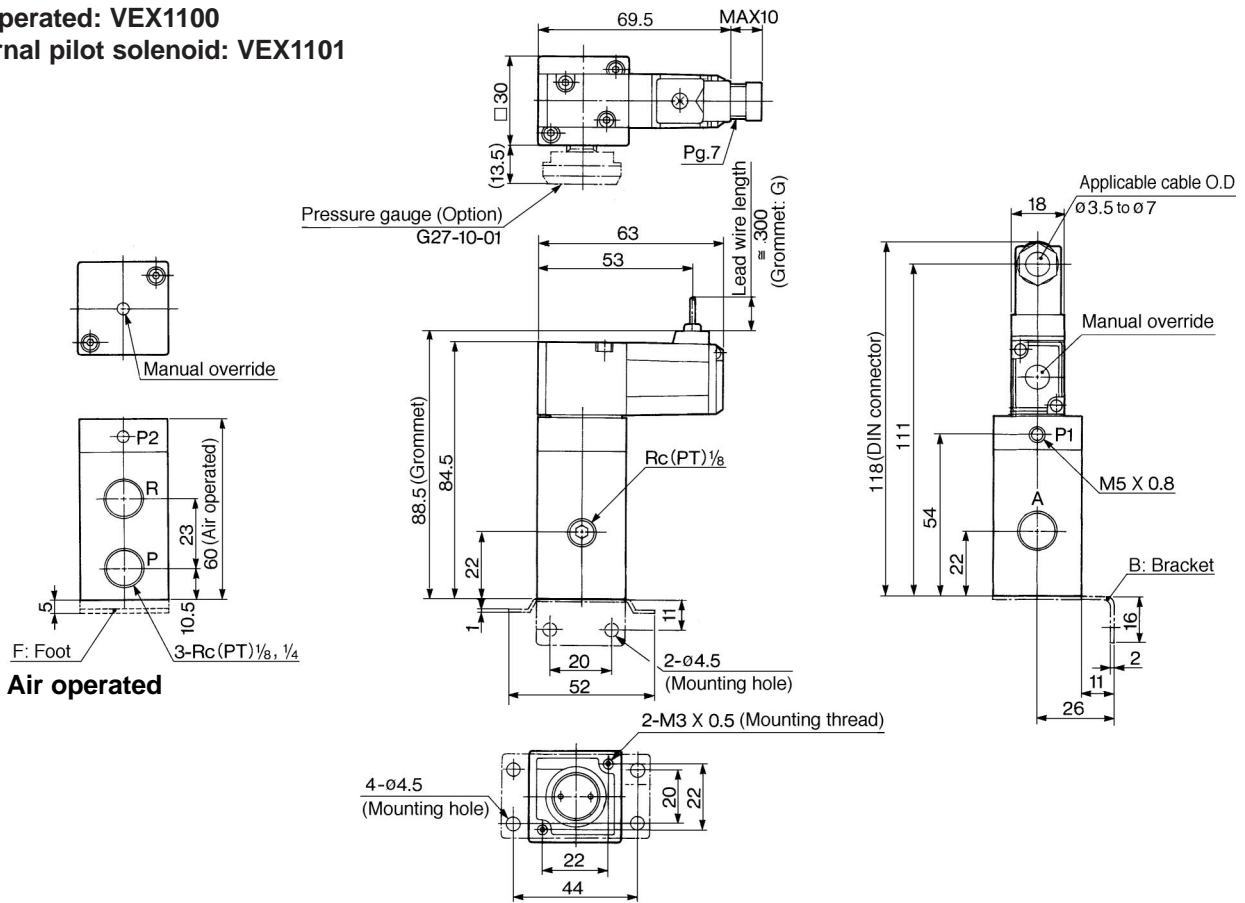
VEX

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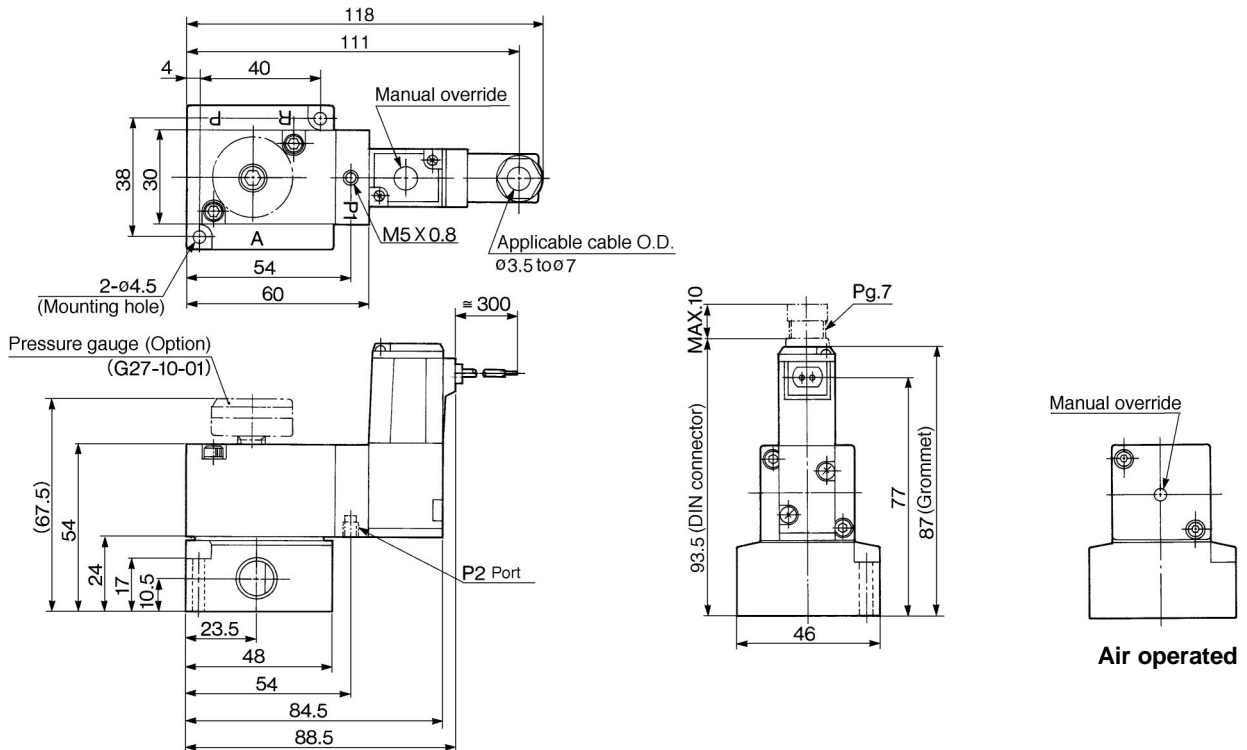
Dimensions

Air operated: VEX1100
External pilot solenoid: VEX1101



Air operated

Air operated: VEX1200
External pilot solenoid: VEX1201

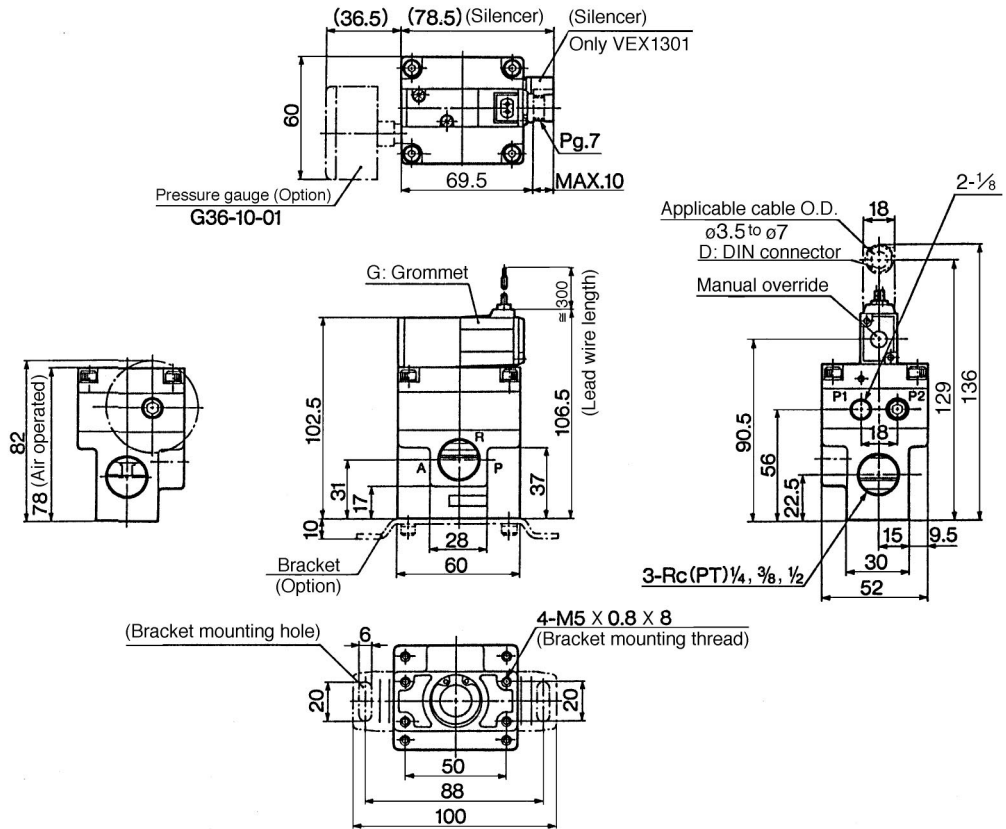


Air operated

Dimensions

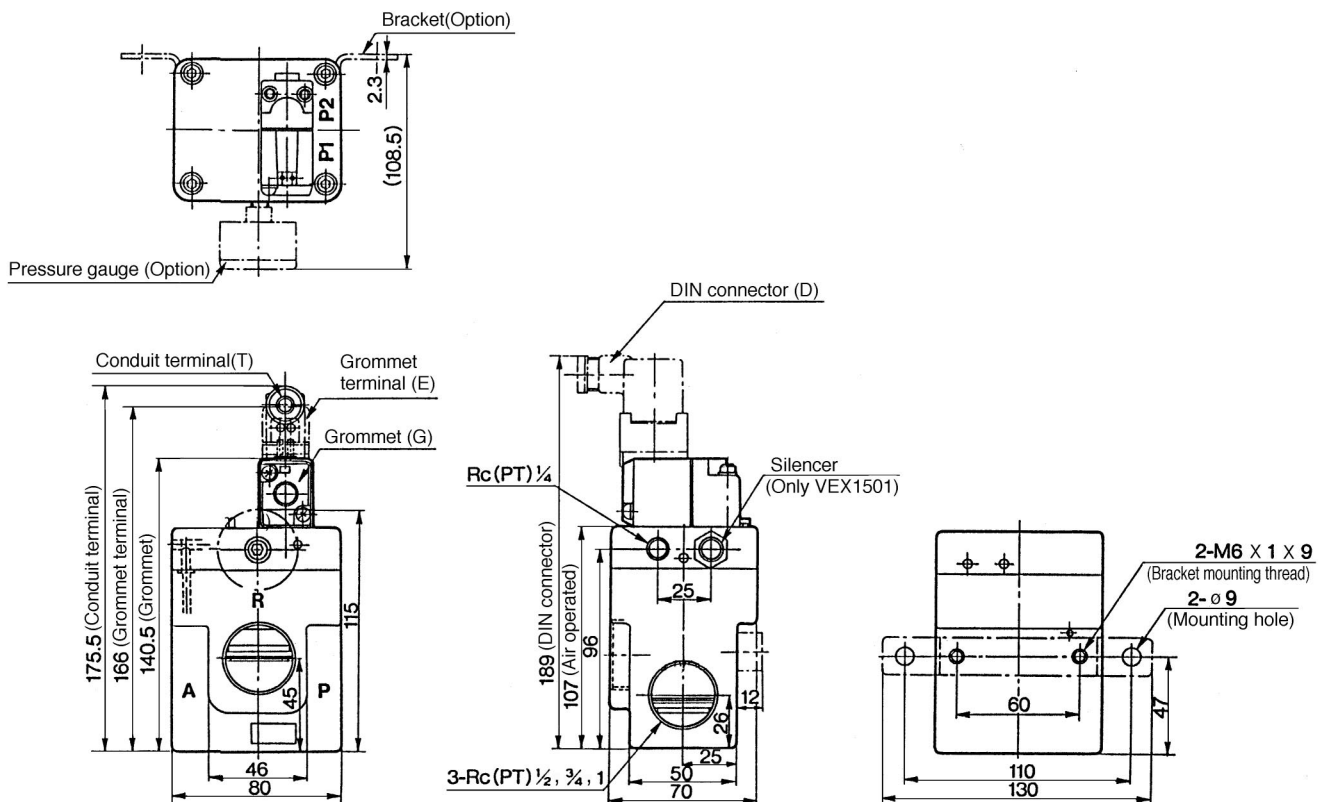
Air operated: VEX1300

External pilot solenoid: VEX1301



Air operated: VEX1500

External pilot solenoid: VEX1501



VEX

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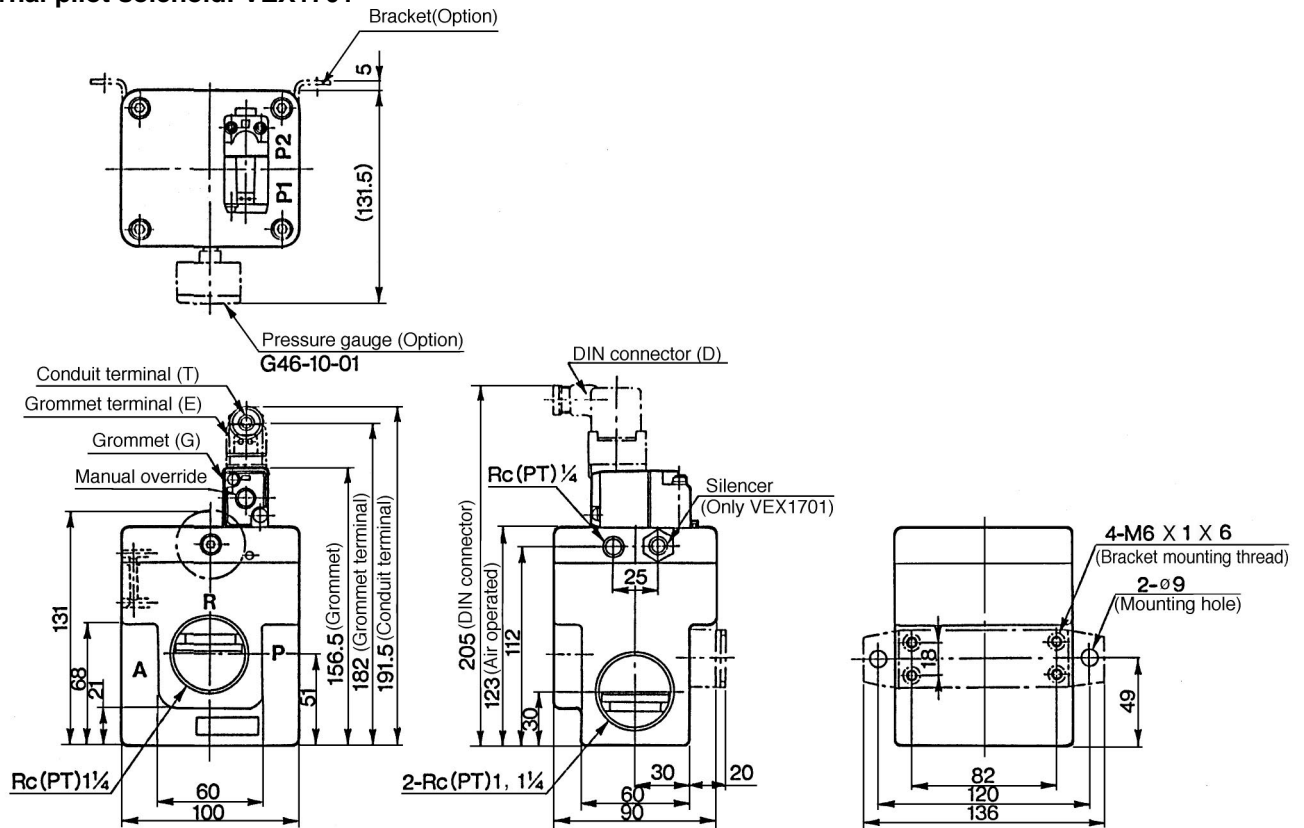
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VEX1

Dimensions

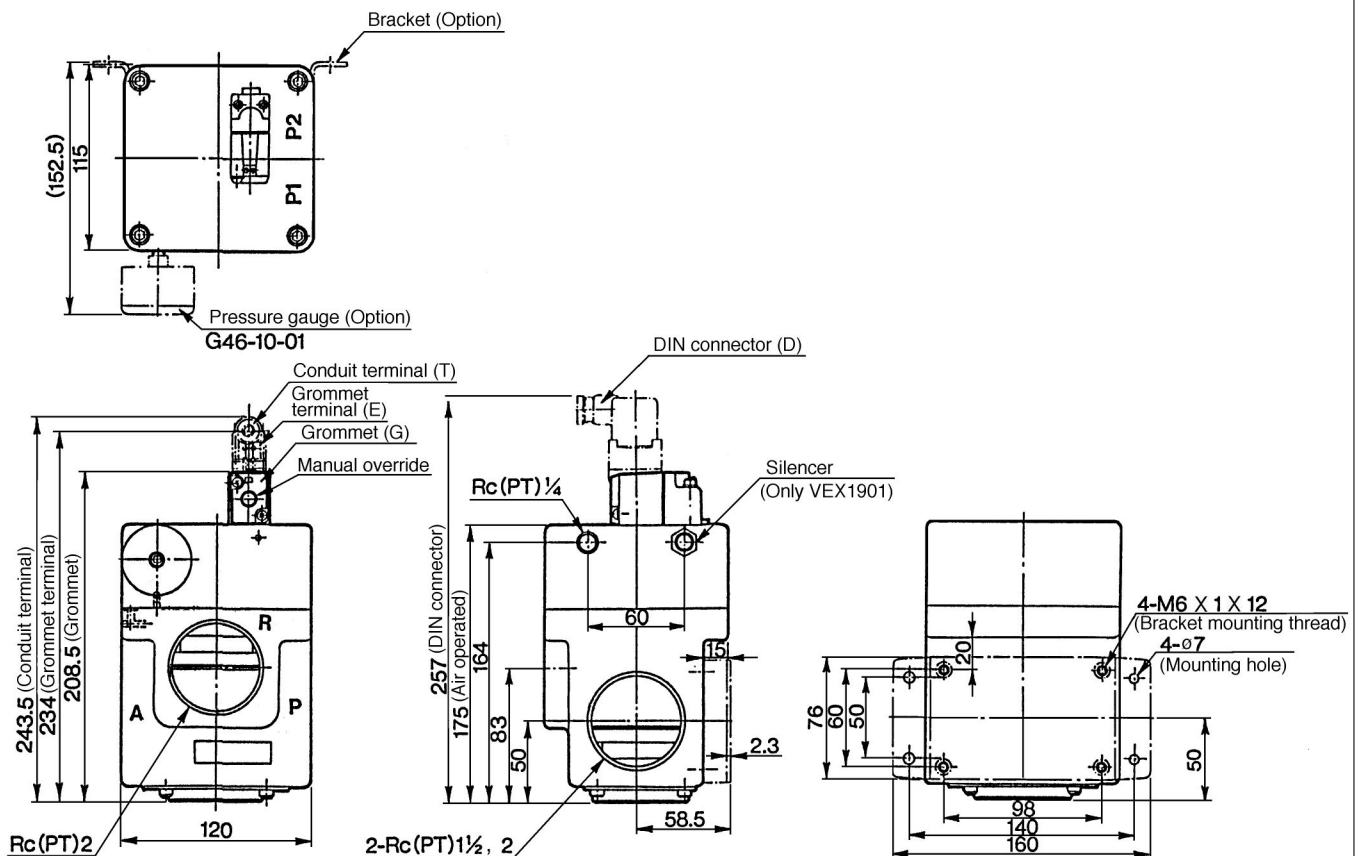
Air operated: VEX1700

External pilot solenoid: VEX1701

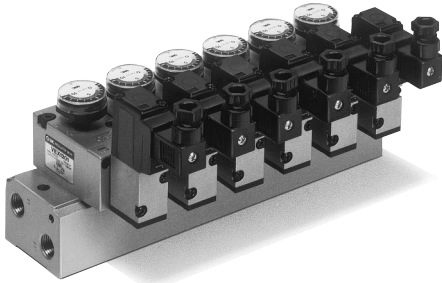


Air operated: VEX1900

External pilot solenoid: VEX1901



Series VEX1 Manifold



Specifications

Valve stations	2 to 8 ⁽¹⁾
Passage specifications	Common SUP,EXH
Port size P, A, R port	Rc(PT), NPTF,G(PF),NPT 1/4
Applicable valve	VEX1200, VEX1201 ⁽²⁾
Applicable blank plate	VEX1-17 (With gasket,bolt)

Note 1) When there are 5 stations or more, pressurize from P ports on both sides and exhaust from R ports on both sides.

Note 2) Manifold base P1 (pilot port) is not used for VEX1200 (air operated) and VEX1201 (external pilot solenoid operated) because both are of an individual external pilot.

How to Order

VVEX2-1-6-02

Series VEX1
Manifold

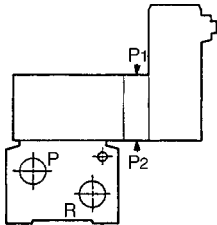
Stations	
2	2 stations
⋮	⋮
8	8 stations

Port thread	
—	Rc(PT)
T	NPTF
F	G(PF)
N	NPT

P, A, R port size	
02	Rc(PT)1/4

External Pilot Piping

Valve port	Style	Air operated	External pilot solenoid valve
Valve	VEX1200	VEX1200	VEX1201
P1	External pilot	External pilot	External pilot
P2	—	—	Pilot exhaust



How to Order Manifold

Please order the appropriate regulator valve and/or blank plate with manifold base.

(Ex.) VVEX2-1-5-02N.....1 5 stations manifold base, port thread NPT

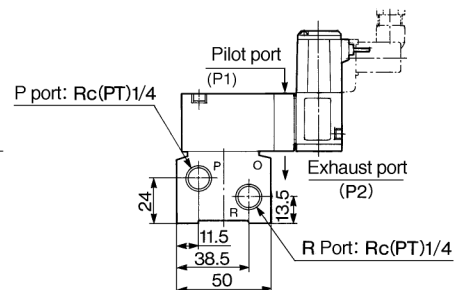
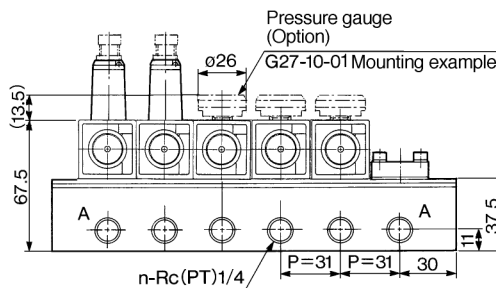
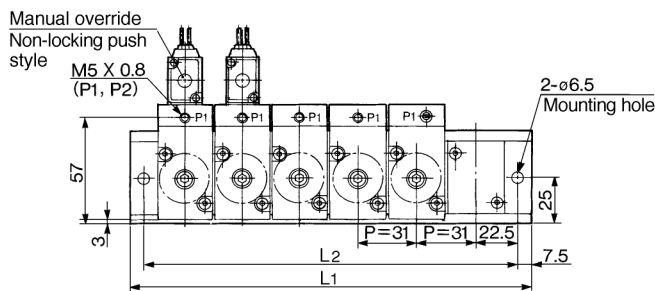
* VEX1201-5DOZ-G...4 Regulator valve, External pilot solenoid valve, 24V DC, DIN connector (without connector), with indicator light and surge voltage suppressor, Option...With pressure gauge ⁽¹⁾

* VEX1-17.....1 Blank plate

Note 1) In case of manifold, pressure gauge: Only G27-10-01(O.D.φ26)

Dimensions

VVEX2-1-1- Station -02



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