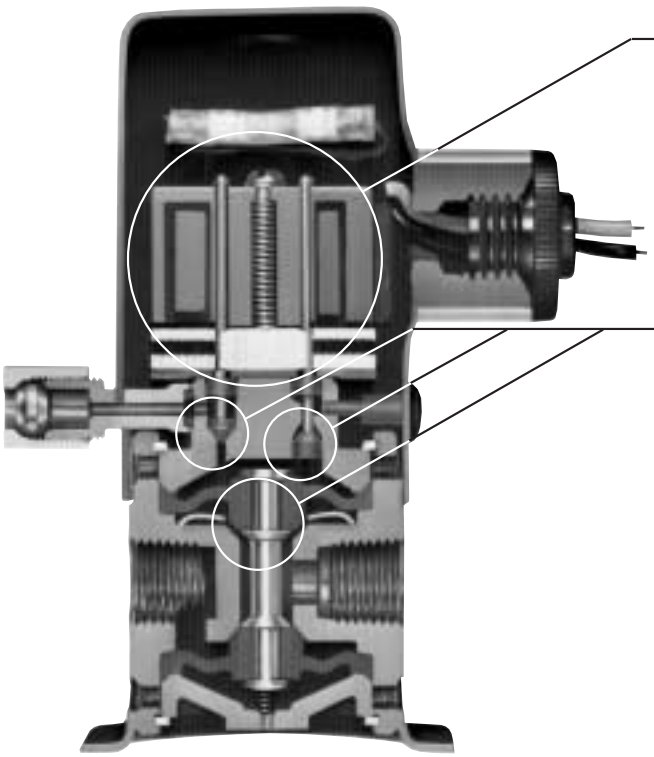
KOGANEI

VALVES GENERAL CATALOG

ROUND TYPE VACUUM VALVES
INDEX

⚠ Caution Before use, be sure to read the “Safety Precautions” on p. 31.

Seven Features of the Koganei Vacuum Valve



Koganei Original Solenoid Construction

① No burning damage to solenoid
No need to stock solenoids as spare parts.

② Starting and energizing current values are extremely small.
Allows for more compact size peripheral electrical equipment.

Poppet and Diaphragm Construction

③ No sliding parts
No valve sticking, for reliable operations.

④ Extremely few cases of vacuum leakage
Good vacuum response enables excellent pick-up by a vacuum pad and compact vacuum pump to install.

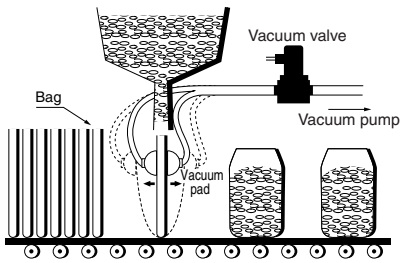
⑤ Dust-resistant
Can be used by installing just an ordinary air filter, even in dusty locations.

⑥ Can be used without lubrication.
Optimum valve for equipment incapable of using oil.

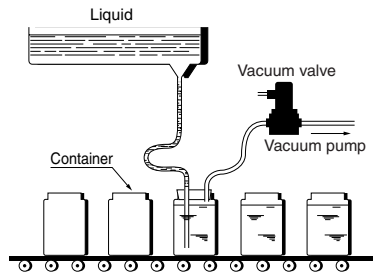
⑦ Compact and lightweight, with any mounting direction acceptable
Can be easily mounted to control panel, and allows for more compact equipment.

Application Examples

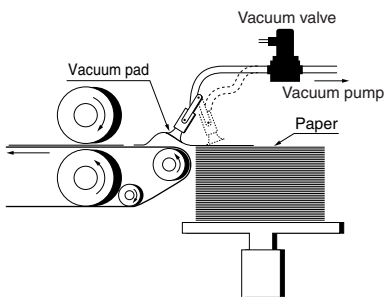
■ Opening bags



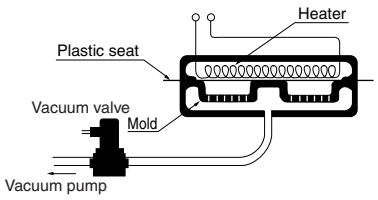
■ Quick charging of liquids



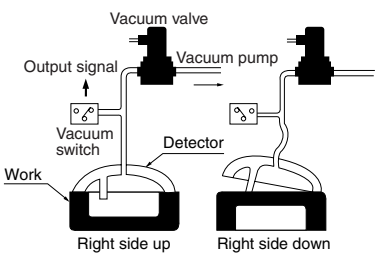
■ Paper feeding for printers



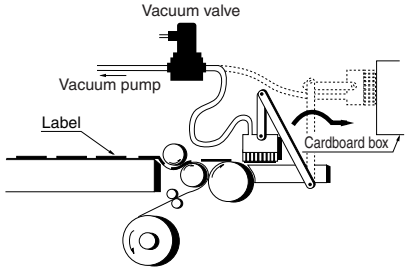
■ Vacuum forming machines



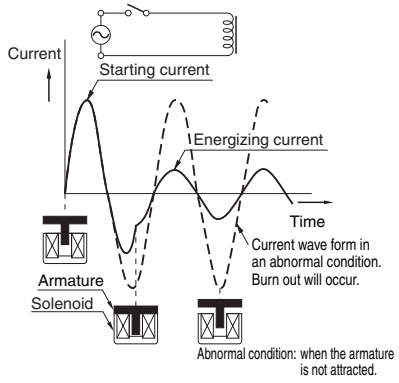
■ Discriminating product facing



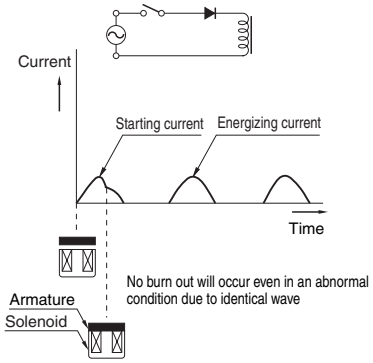
■ Labeling on cardboard boxes



AC Solenoid (General)



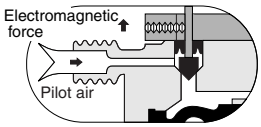
Half-wave Rectification Solenoid (Koganei)



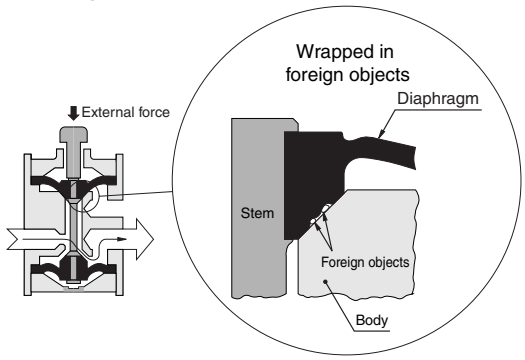
Koganei's ingenious self-developed solenoid

A silicon diode is installed on the end of the solenoid for half-wave rectification of the alternating current. The solenoid, therefore, possesses midway characteristics between the AC solenoid and DC solenoid. In addition, since the armature is designed to move as short a distance as possible, the starting current (inrush current) and energizing current are virtually identical and low current. As a result, the solenoid is not damaged even in abnormal conditions in which the armature fails to move, and the capacity of related electrical equipment can remain low.

Poppet



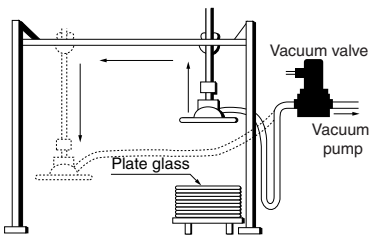
Diaphragm



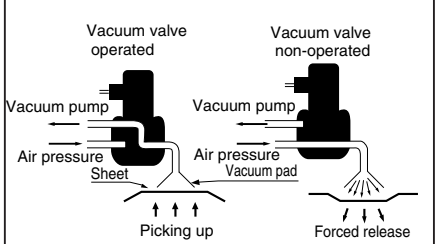
Poppet and diaphragm construction

The synthetic rubber poppet and diaphragm are built into the stem and move as one-piece. The poppet and diaphragm do not have any sliding surfaces, therefore no sticking occurs even without lubrication. In addition, the units have the elasticity of synthetic rubber to wrap in small foreign objects and keep vacuum leaks to an extremely low level.

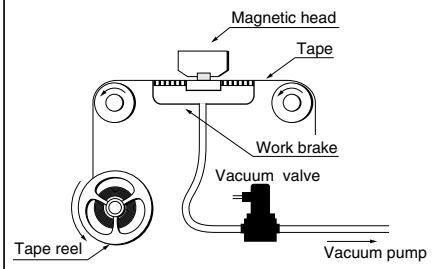
■ Vacuum lifting



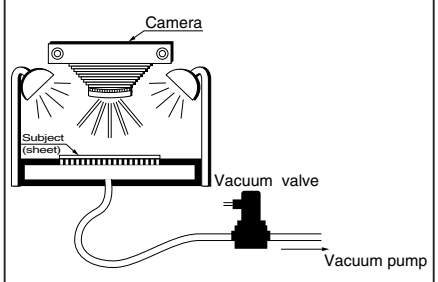
■ Reducing sheet transfer time
(both vacuum and positive pressure)



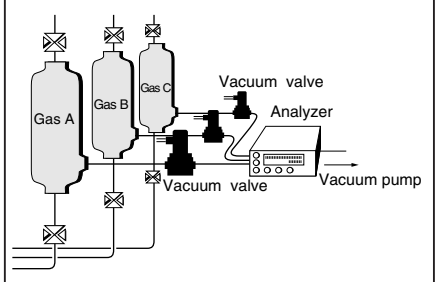
■ Tape speed controlling



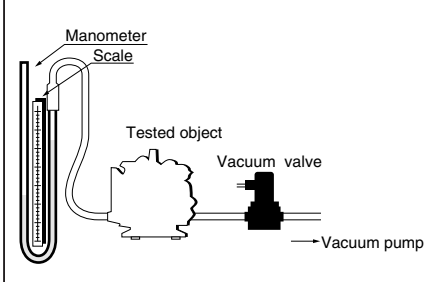
■ Holding subject (sheets)



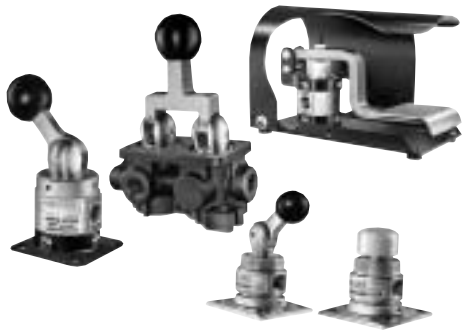
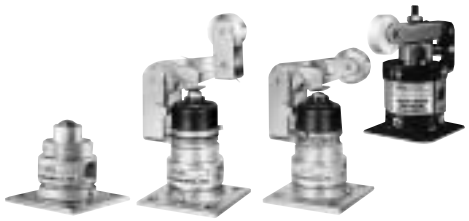
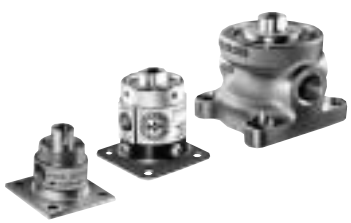
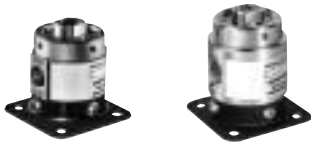
■ Inducing gas into analyzers



■ Airtightness inspecting



<Product Range>

Products	Shape	Operation type		Port size Rc	Port	Function	Effective area (Cv) mm²	Model	Page
Solenoid vacuum valve		Single solenoid	Direct acting	1/4	2, 3	●NC ●NO	2.5 (0.12)	**V062E1**	961
					3			**SV062E1** (Both vacuum and pressure type)	
					2		5.5 (0.27)	**V126E1**	
			Indirect acting { External air pilot }		3		15 (0.76)	**VA250AE1**	964
				3/8				**VA2503AE1**	
				1/2			55 (2.7)	**VA500AE1**	967
			Indirect acting { External vacuum pilot }	1/4			15 (0.76)	**VV250AE1**	964
				3/8				**VV2503AE1**	
				1/2			55 (2.7)	**VV500AE1**	967
		Double solenoid (Continuously energizing type)	Indirect acting { External air pilot }	1/4	3	●NC/ NO	15 (0.76)	**VA250AE2**	964
				3/8				**VA2503AE2**	
				1/2			55 (2.7)	**VA500AE2**	967
Manual vacuum valve and foot vacuum valve		Push button	Spring return	1/8	3	●NC	5.5 (0.27)	**V125P**	970
				1/4	2, 3		15 (0.76)	**V250P**	
				3/8				**V2503P**	
			With holding mechanism	1/8	3		5.5 (0.27)	**V125HO**	
		Lever	Holding type			●NC/ NO		**V125V**	
				1/4			15 (0.76)	**V250V**	
				3/8				**V2503V**	
				1/4	5	—		**V250-4H**	
				3/8				**V2503-4H**	
		Foot	Pedal type	1/4	2, 3	●NC		**V250F**	
Mechanical operated vacuum valve		Ball-cam		1/8	3	●NC	5.5 (0.27)	**V125B**	973
				1/4			15 (0.76)	**V250B**	
				3/8				**V2503B**	
		Roller-cam	Nylon roller	1/4	2, 3	●NC		**V250C**	
				3/8				**V2503C**	
			Steel roller	1/8	3		5.5 (0.27)	**V125MC**	
			One way steel roller					**V125MOC**	
Piloted vacuum valve		Air pilot (single)		1/8	3	●NC	5.5 (0.27)	**VA125A**	976
				1/4			15 (0.76)	**VA250A**	
				3/8				**VA2503A**	
				1/2			55 (2.7)	**VA500A**	
		Vacuum pilot (single)		1/4			15 (0.76)	**VV250A**	
				3/8				**VV2503A**	
				1/2			55 (2.7)	**VV500A**	
		Double air pilot		1/4	2, 3	●NC/ NO	15 (0.76)	**250A2**	979
				3/8				**2503A2**	
				1/2			55 (2.7)	**500A2**	
				3/4			140 (7)	**750A2**	
				1			280 (14)	**1000A2**	

Safety Precautions (Solenoid Vacuum Valve Series)

Warnings

1. When mounting a valve inside a control panel or when an operation requires long energizing periods, provide heat radiation measures to ensure that the ambient temperature always remains within the temperature range specifications. For long term continuous energizing, consult us.
2. Always check the Catalog, etc., when carrying out wiring and piping of products to ensure that the connections are correctly done. Wrong wiring or piping could result in abnormal operation to the actuator, etc.
3. The solenoid valve's silicon diode could be damaged by surge voltage when a large induction load is used on the same power supply. Either change to a separate power supply, or mount a surge absorber to protect the unit. Solenoids with surge suppression are also available. Consult us.

Caution

For locations subject to water or to large amounts of dust, use a cover, etc., to protect the valves. Also, install a muffler, etc., to the R port to prevent dust from entering. Intrusion of water or dust could result in short-term functional shutdowns, sudden drops in performance, or a reduced operating life.

Attention

1. Use clean air that does not contain degraded compressor oil, etc., and install a filter, etc., close to solenoid valves to remove dust or collected liquid.
2. Ensure that the piping port on the supply side is at the same area or larger than the solenoid valve's effective area.
3. When using an indirect acting valve, use a stop valve between it and the pressure source. When the stop valve is opened before the pressure reaches the minimum operating pressure, the indirect acting valve could fall into a neutral position. (All solenoid valves in the 250 series and up are indirect acting valves.)
4. When connecting 2 or more AC type solenoid valves to the same power supply, connect leads with the same lead wire color.
5. Since a diode is connected to the AC type solenoid valve, the solenoid may sometimes not turn on with the solid state-type relay (SSR) with zero-cross function. For this reason, pay attention before use to the ratings and precautions for use of the solid state-type relay.

Voltage Types and Current

Rated voltage V		Current A[Note]	
		50Hz	60Hz
AC	230※	0.063	0.055
	220※	0.058	0.072
	200	0.070	0.065
	115※	0.13	0.11
	110※	0.12	0.16
	100	0.14	0.13
	48※	0.41	0.37
	24※	0.93	0.83

Note: The starting current and energizing current values are virtually identical, and fall within these values.

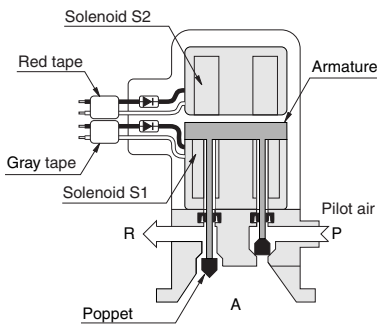
Rated voltage V		Current A
DC	200※	0.04
	110※	0.08
	100※	0.09
	48※	0.19
	24	0.40
	12※	0.75
	6※	1.50

For ※ items, consult us for the delivery.

Wiring Instructions of Double Solenoid (E2)Type

This valve has 2 solenoids built into the top and mid section, and the lead wires are color-coded with vinyl tape. Energizing the red tape side (the upper side, solenoid S2) opens the valve, and energizing the gray tape side (the lower side, solenoid S1) closes the valve. This solenoid is a continuous energizing holding type.

Solenoid S1 energized



Solenoid Vacuum Valves Direct Acting Type

2-,3-port, Single Solenoid

Specifications

Item \ Basic model		V062E1	SV062E1	V126E1
Media		Vacuum	Vacuum, air	Vacuum
Operation type		Direct acting		
Number of ports		2, 3 ports	3 ports (Both vacuum and pressure type)	2 ports
Valve function		Normally closed (NC, standard), Normally open (NO, optional)		
Effective area〔Cv〕	mm²	2.5〔0.12〕		5.5〔0.27〕
Port size	Rc	1/4		
Lubrication		Not required		
Operating pressure range	kPa {mmHg} [in.Hg]	0～−100 {0～−750} [0～−29.53]		
Operating temperature range	°C [°F]	5～60 [41～140]		
Voltage type	V	Standard AC100 (50/60Hz), AC200 (50/60Hz) For other voltage, see p.960.		
Voltage fluctuations	%	±10		
Current[Note] A	100V	50Hz→0.14, 60Hz→0.13		
	200V	50Hz→0.070, 60Hz→0.067		
Insulation type		B type		
Lead wire length	mm [in.]	Approximately 300 [11.8]		
Mounting direction		Any		
Mass	kg [lb.]	0.3 [0.66]		

Note: The starting current and energizing current values are virtually identical, and fall within these values.

Handling

1. When using in dusty ambient atmospheres, install a filter between the vacuum pad and the solenoid valve, and at the R port.
2. See p.983 for how to use SV062E1.

Solenoid Vacuum Valve Order Codes

		Basic model	Option: Valve function 2-port	Option: Valve function Normally open (NO)	Option: Mounting base	Solenoid option: Conduit type	Voltage
Direct piping	2-, 3-port	**V062E1**	**-2**	**-11**	**-21**	**-37**	**AC100V AC200V**
	3-port	**SV062E1**					
	2-port	**V126E1**					

●**Blank:** 3-port
(**SV062E1:** 3-port only
V126E1: Blank and 2-port only)

Manifold Order Codes

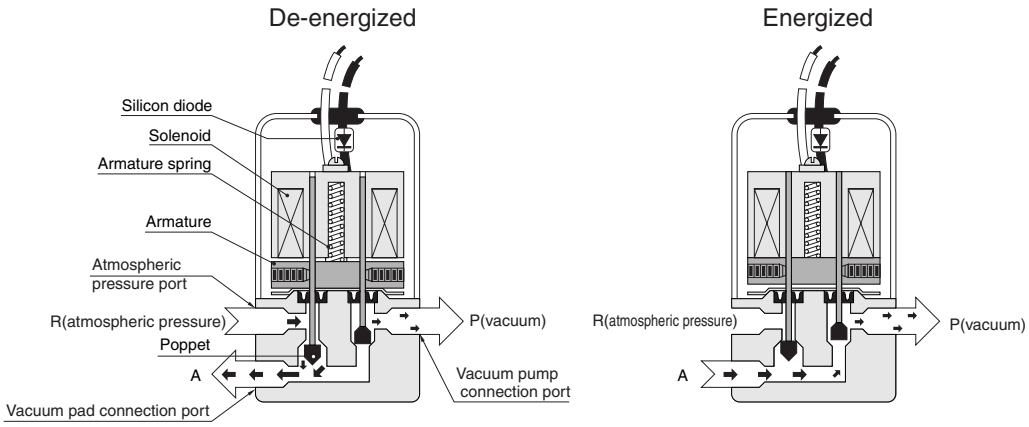
Manifold model			Station	Valve model: Basic model	Option: 2-port	Solenoid option: Conduit type	Voltage
MM	**1 ⋮ 10**	**A**	**stn.□ ⋮ stn.□**	**MV062E1**	**-2**	**-37**	**AC100V AC200V**

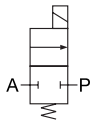
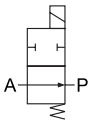
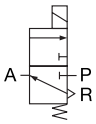
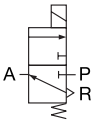
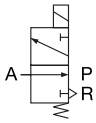
●**Blank:** Side port only
A: With bottom piping port

●Valve mounting location from the left-hand side

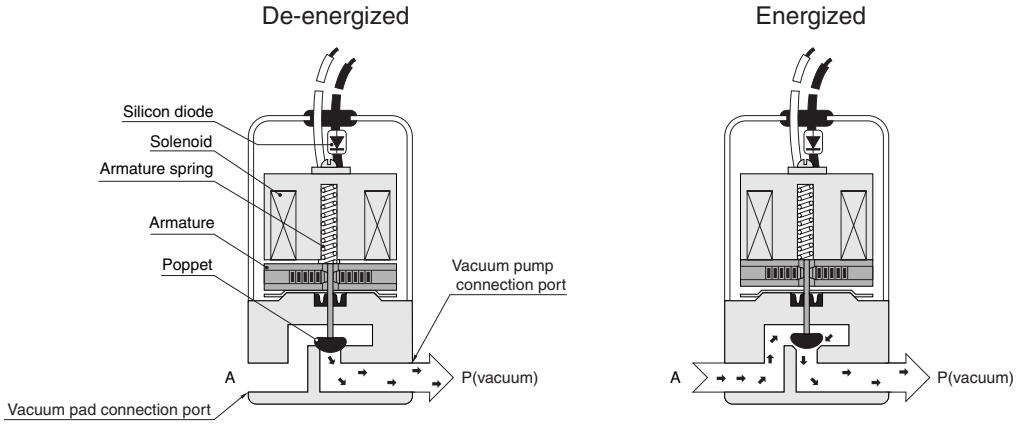
●Enter **-BP** when closing a station with a block-off plate without mounting a valve.

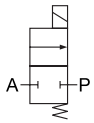
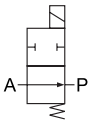
V062E1



2-port NC	2-port NO	3-port NC	3-port NC	3-port NO
				
V062E1-2	**V062E1-2-11**	**V062E1**	**SV062E1**	**V062E1-11**

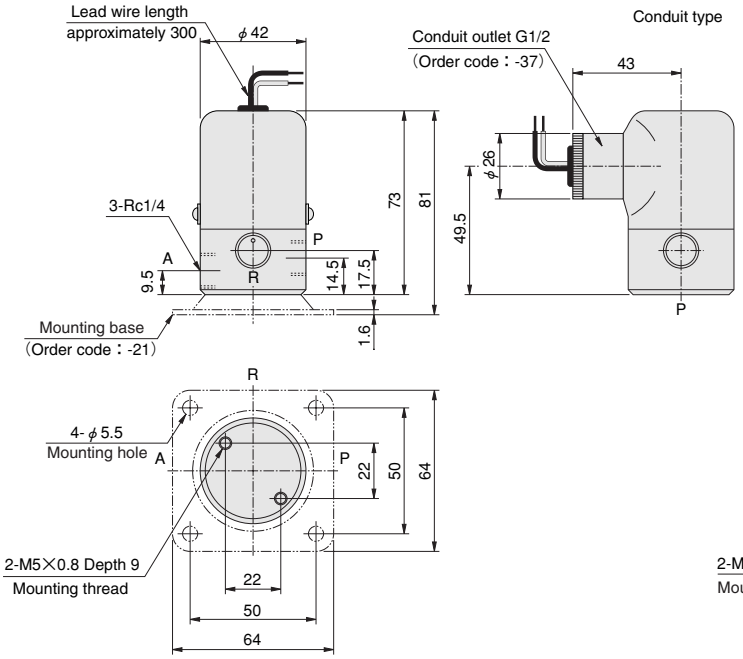
V126E1



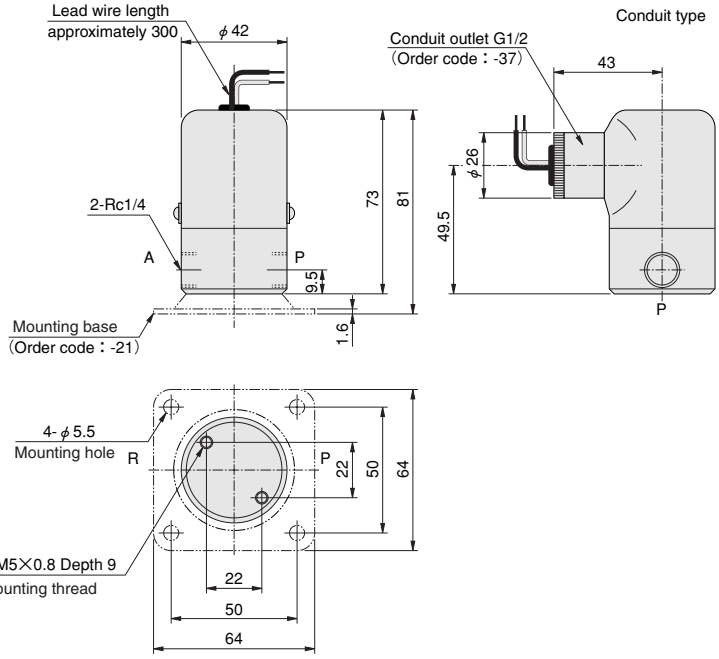
2-port NC	2-port NO
	
V126E1	**V126E1-11**

Dimensions of Solenoid Vacuum Valve (mm)

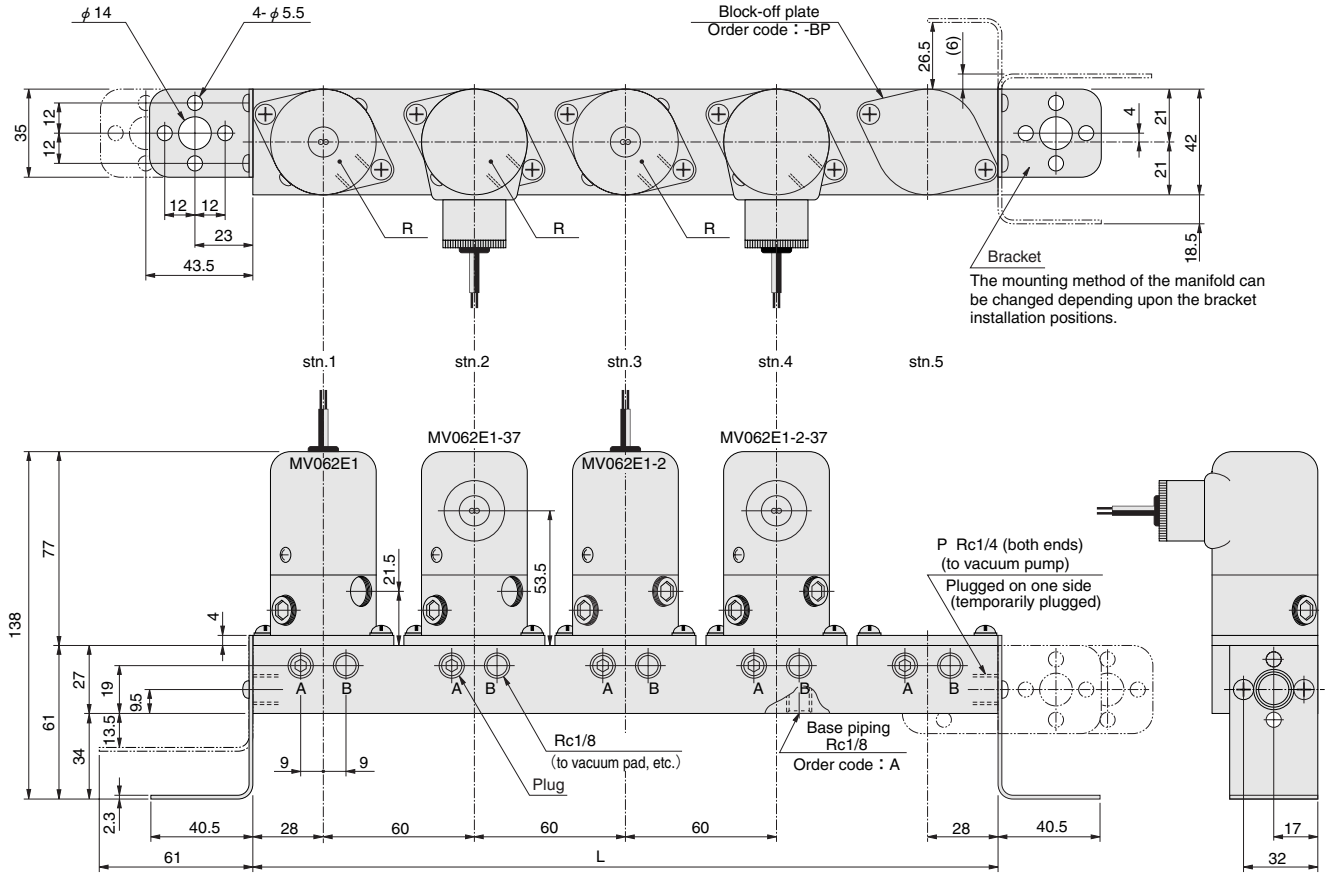
V062E1
SV062E1



V126E1



Manifold Dimensions (mm)

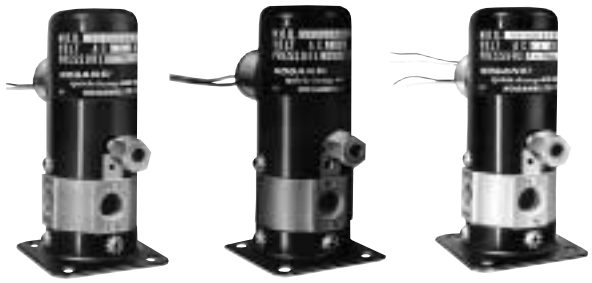


■L dimensions for each unit

Number of units	MM1	MM2	MM3	MM4	MM5	MM6	MM7	MM8	MM9	MM10
L	56	116	176	236	296	356	416	476	536	596

Solenoid Vacuum Valves 250 Series

3-port, External Pilot Type



Specifications

Item \ Basic model	VA250AE1	VA2503AE1	VV250AE1	VV2503AE1	VA250AE2	VA2503AE2
Media	Vacuum, air					
Operation type	Indirect acting					
Number of ports	3 ports (Cannot be used as a 2-port valve in terms of construction)					
Valve function	Single solenoid Normally closed (NC, standard), Normally open (NO, optional)				Double solenoid Normally closed (NC), Normally open (NO)	
Effective area〔Cv〕 mm²	15〔0.76〕					
Port size Rc	1/4	3/8	1/4	3/8	1/4	3/8
Lubrication	Not required					
Operating pressure range kPa{mmHg} [in.Hg]	0～−100 {0～−750} [0～−29.53]		−51～−100 {−380～−750} [−14.96～−29.53]		0～−100 {0～−750} [0～−29.53]	
External pilot pressure	Recommended pilot air pressure 0.2～0.3MPa [29～44psi.] MAX.0.7MPa [102psi.]		Pilot vacuum −51～−100kPa [−14.96～−29.53in.Hg]		Recommended pilot air pressure 0.2～0.3MPa [29～44psi.] MAX.0.7MPa [102psi.]	
External pilot port size	φ6 [0.236in.] flareless fitting (For nylon tube)					
Operating temperature range °C [°F]	5～60 [41～140]					
Voltage type V	Standard AC100 (50/60Hz), AC200 (50/60Hz) For other voltages, see p.960.					
Voltage fluctuations %	±10					
Current[Note] A AC100V	50Hz→0.14, 60Hz→0.13					
Current[Note] A AC200V	50Hz→0.070, 60Hz→0.065					
Energizing type	Continuous energizing					
Insulation type	B type					
Wiring connection type	Conduit					
Lead wire length mm [in.]	Approximately 300 [11.8]					
Mounting direction	Any					
Mass kg [lb.]	0.5 [1.1]				0.6 [1.3]	

Note: The starting current and energizing current values are virtually identical, and fall within these values.

Handling Instructions and Precautions

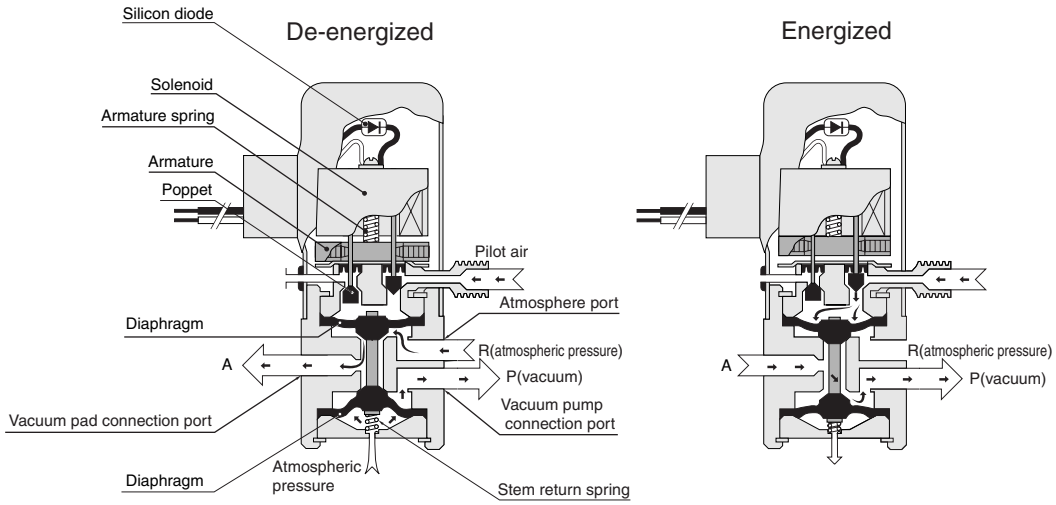
1. When using in dusty atmospheres, install a filter between the vacuum pad and the solenoid valve, and at the R port.
2. For the wiring instructions of VA250AE2, see p.960.
3. Maintain the pilot vacuum at −51kPa {−380mmHg} [−14.96in.Hg] or more for VV250AE1.

Solenoid Vacuum Valve Order Codes

		Basic model	Option: Valve function Normally open (NO)	Option: With barbed fitting for pilot	Voltage
Single solenoid	Air pilot	**VA250AE1**	**-11**		**AC100V AC200V**
Single solenoid	Air pilot	**VA2503AE1**	**-11**		**AC100V AC200V**
Single solenoid	Vacuum pilot	**VV250AE1**	**-11**	**-62**	**AC100V AC200V**
Single solenoid	Vacuum pilot	**VV2503AE1**	**-11**	**-62**	**AC100V AC200V**
Double solenoid	Air pilot	**VA250AE2**			**AC100V AC200V**
Double solenoid	Air pilot	**VA2503AE2**			**AC100V AC200V**

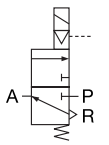
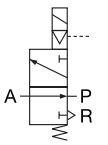
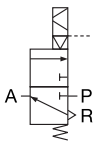
- For inner diameter φ6 [0.236in.] rubber tube
- Single solenoid only
- **Blank:** Normally closed (NC)
  E2: Both normally closed (NC) and normally open (NO)

External air pilot type (VA250AE1)

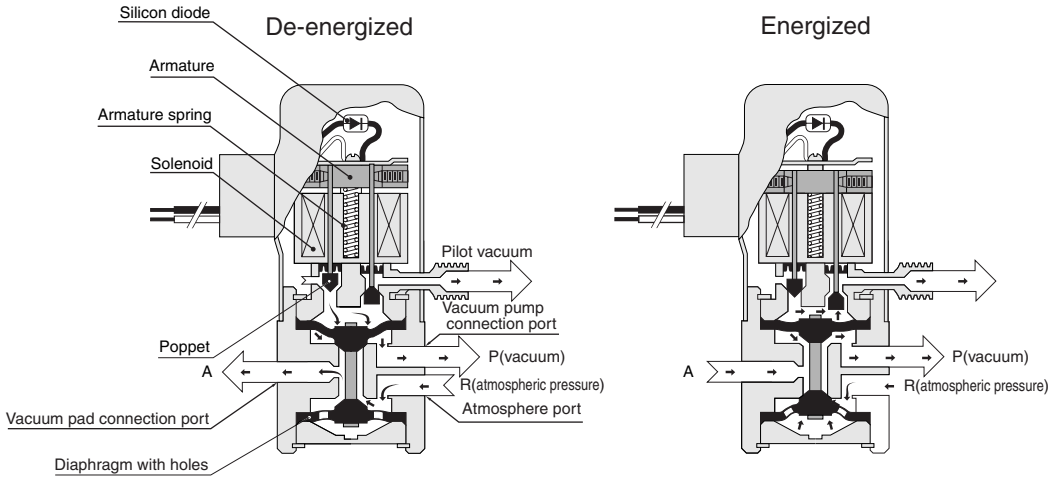


Explanation of operation

- When de-energized, the armature is separated from the solenoid by the armature spring. The right-side poppet directly connected to the armature closes, while the left-side poppet opens, making the pressure on the upper surface of the upper diaphragm atmospheric pressure. Therefore, the lower diaphragm is pulled up by the stem return spring and the vacuum (main) applied to the upper surface of the lower diaphragm, closing the P port, and connecting the A port and R port.
- When energized, the armature is attracted to the solenoid, opening the right-side poppet and closing the left-side poppet, bringing pilot air to the upper surface of the upper diaphragm. The diaphragm is therefore pushed downward, closing the R port, and connecting the P port and A port.

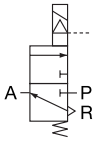
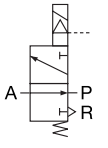
NC	NO	NC/NO
		
VA250AE1 VA2503AE1	**VA250AE1-11 VA2503AE1-11**	**VA250AE2 VA2503AE2**

External vacuum pilot type (VV250AE1)



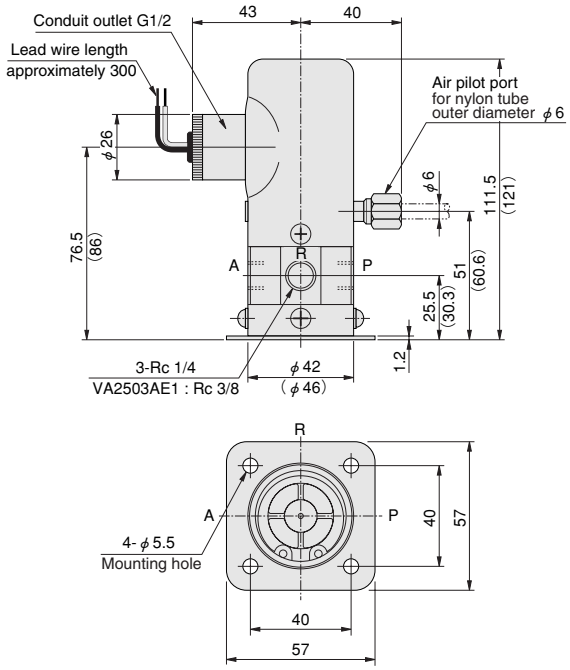
Explanation of operation

- When de-energized, the armature is separated from the solenoid by the armature spring. The right-side poppet directly connected to the armature closes, and the left-side poppet opens, and the upper diaphragm is pulled downward by the vacuum (main) applied to the bottom surface of the upper diaphragm, closing the P port, and connecting the A port and R port.
- When energized, the armature is attracted to the solenoid, opening the right-side poppet and closing the left-side poppet, applying pilot vacuum to the upper surface of the upper diaphragm. The diaphragm is therefore pulled up, closing the R port, and connecting the P port and A port.

NC	NO
	
VV250AE1 VV2503AE1	**VV250AE1-11 VV2503AE1-11**

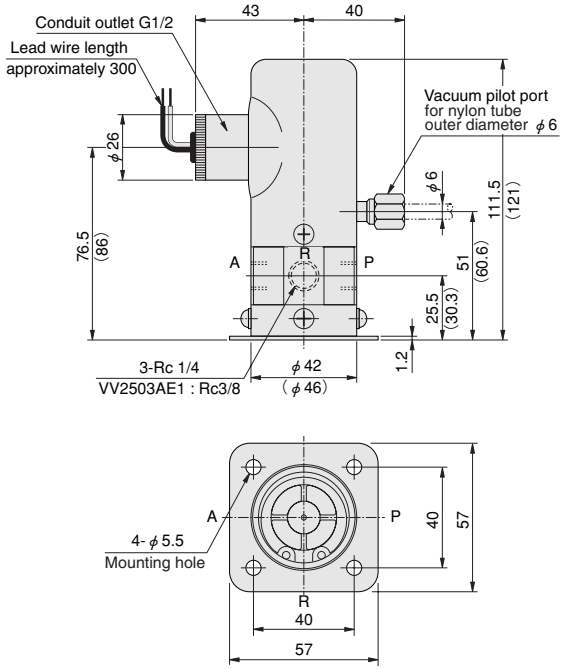
Dimensions (mm)

VA250AE1
VA2503AE1



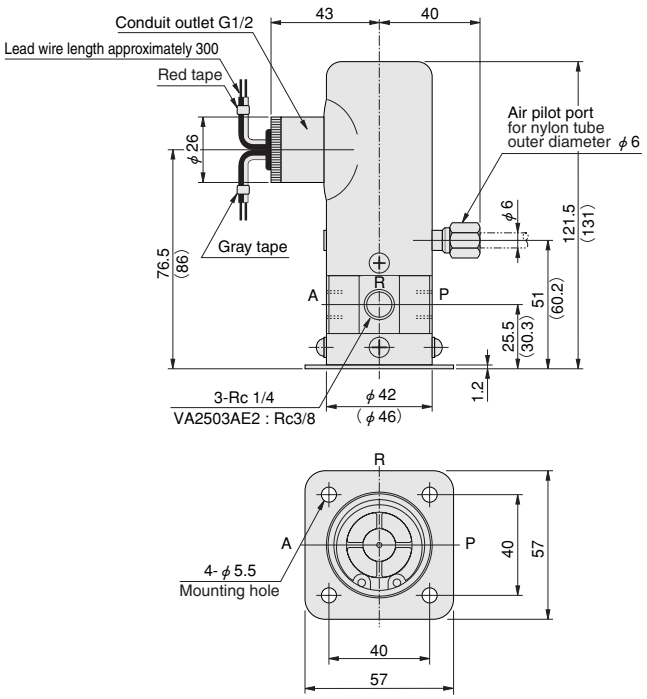
Dimensions in parentheses ( ) are
for the VA2503AE1.

VV250AE1
VV2503AE1



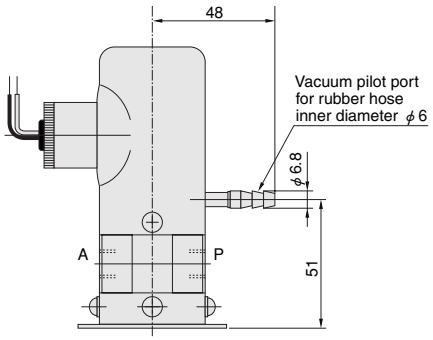
Dimensions in parentheses ( ) are
for the VV2503AE1.

VA250AE2
VA2503AE2



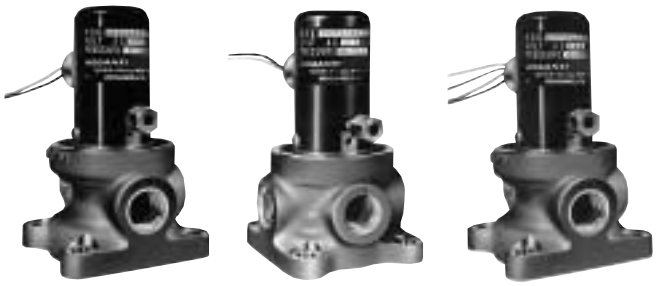
Dimensions in parentheses ( ) are
for the VA2503AE2.

Option
-62



Solenoid Vacuum Valves 500 Series

3-port, External Pilot Type



Specifications

Item \ Basic model		VA500AE1	VV500AE1	VA500AE2
Media		Vacuum, air		
Operation type		Indirect acting		
Number of ports		3 ports		
Valve function		Single solenoid Normally closed (NC, standard), Normally open (NO, optional)		Double solenoid Normally closed (NC), Normally open (NO)
Effective area〔Cv〕	mm²	55〔2.7〕		
Port size	Rc	1/2		
Lubrication		Not required		
Operating pressure range	kPa{mmHg} [in.Hg]	0～−100 {0～−750} [0～−29.53]	−51～−100 {−380～−750} [−14.96～−29.53]	0～−100 {0～−750} [0～−29.53]
External pilot pressure		Recommended pilot air pressure 0.2～0.3MPa [29～44psi.] MAX.0.5MPa [73psi.]	Pilot vacuum −51～−100kPa [−14.96～−29.53in.Hg]	Recommended pilot air pressure 0.2～0.3MPa [29～44psi.] MAX.0.7MPa [102psi.]
External pilot port size		φ6 [0.236in.] flareless fitting (For nylon tube)		
Operating temperature range	°C [°F]	5～60 [41～140]		
Voltage type	V	Standard AC100 (50/60Hz), AC200 (50/60Hz), For other voltages, see p.960.		
Voltage fluctuations	%	±10		
Current[Note] A	AC100V	50Hz → 0.14, 60Hz → 0.13		
	AC200V	50Hz → 0.070, 60Hz → 0.065		
Energizing type		Continuous energizing		
Insulation type		B type		
Wiring connection type		Conduit		
Lead wire length	mm [in.]	Approximately 300 [11.8]		
Mounting direction		Any		
Mass	kg [lb.]	0.85 [1.87]		0.95 [2.09]

Note: The starting current and energizing current values are virtually identical, and fall within these values.

Solenoid Vacuum Valve Order Codes

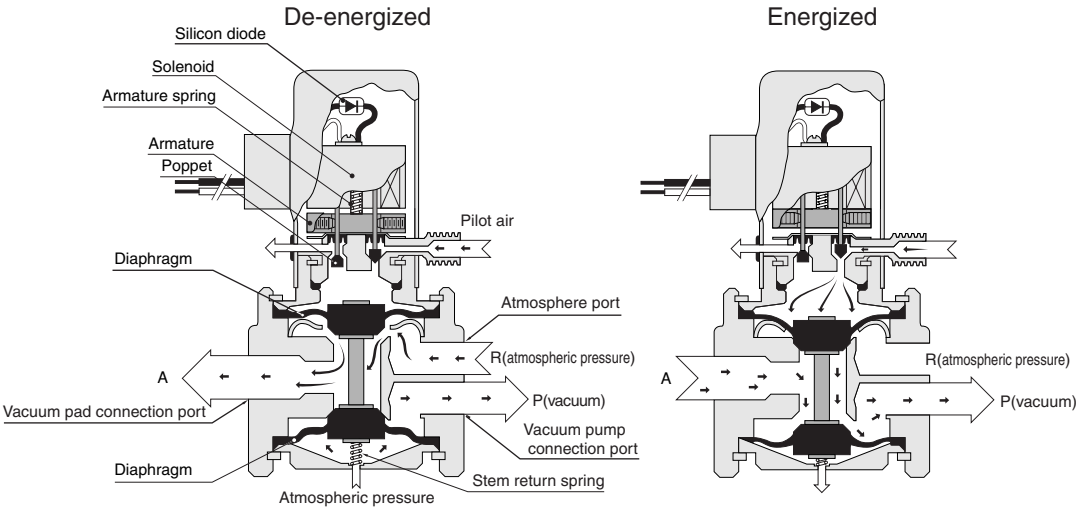
		Basic model	Option: Valve function Normally open (NO)	Option: With barbed fitting for pilot	Voltage
Single solenoid	Air pilot	**VA500AE1**	**-11**		**AC100V** **AC200V**
	Vacuum pilot	**VV500AE1**		**-62**	
Double solenoid	Air pilot	**VA500AE2**			

- For inner diameter φ6 [0.236in.] rubber tube
- Single solenoid only
- **Blank:** Normally closed (NC)
  E2: Both normally closed (NC) and normally open (NO)

Handling Instructions and Precautions

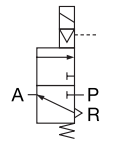
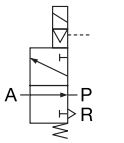
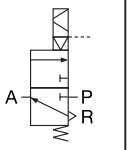
1. When using in dusty atmospheres, install a filter between the vacuum pad and the solenoid valve, and at the R port.
2. For the wiring instructions of VA500AE2, see p.960.
3. Maintain pilot vacuum at −51kPa {−380mmHg} [−14.96in.Hg] or more for the VV500AE1.

External air pilot type (VA500AE1)

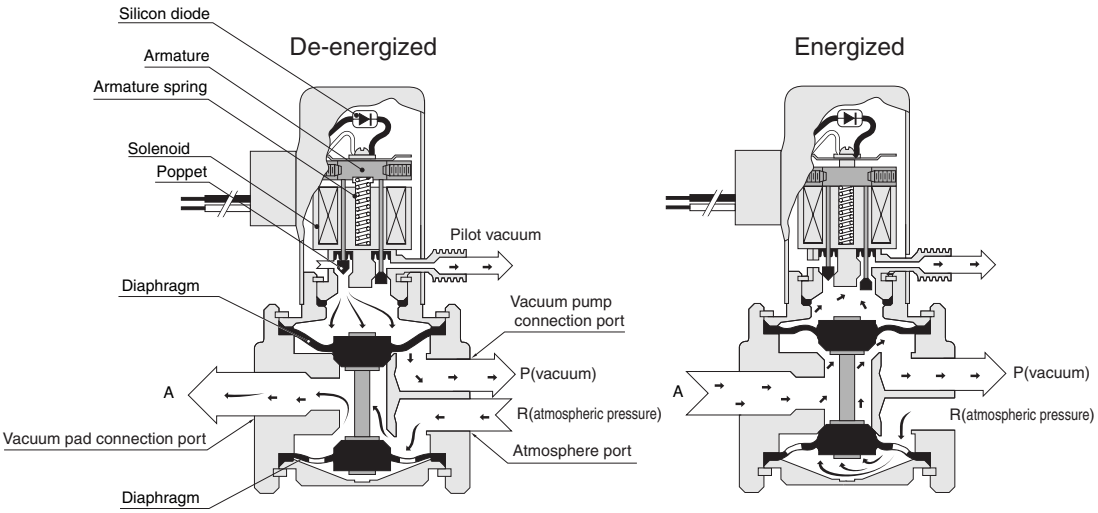


Explanation of operation

- When de-energized, the armature is separated from the solenoid by the armature spring. The right-side poppet directly connected to the armature closes, while the left-side poppet opens, making the pressure on the upper surface of the upper diaphragm atmospheric pressure. Therefore, the lower diaphragm is pulled up by the stem return spring and the vacuum (main) applied to the upper surface of the lower diaphragm, closing the P port, and connecting the A port and R port.
- When energized, the armature is attracted to the solenoid, opening the right-side poppet and closing the left-side poppet, bringing pilot air to the upper surface of the upper diaphragm. The diaphragm is therefore pushed downward, closing the R port, and connecting the P port and A port.

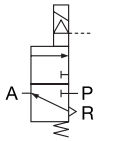
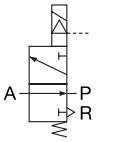
NC	NO	NC/NO
		
VA500AE	**VA500AE-11**	**VA500AE2**

External vacuum pilot type (VV500AE1)



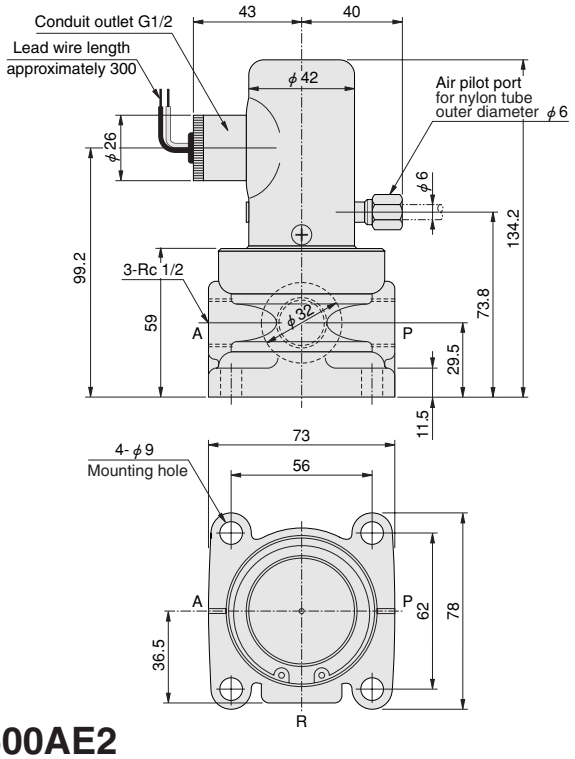
Explanation of operation

- When de-energized, the armature is separated from the solenoid by the armature spring. The right-side poppet directly connected to the armature closes, and the left-side poppet opens, and the upper diaphragm is pulled downward by the vacuum (main) applied to the bottom surface of the upper diaphragm, closing the P port, and connecting the A port and R port.
- When energized, the armature is attracted to the solenoid, opening the right-side poppet and closing the left-side poppet, applying pilot vacuum to the upper surface of the upper diaphragm. The diaphragm is therefore pulled up, closing the R port, and connecting the P port and A port.

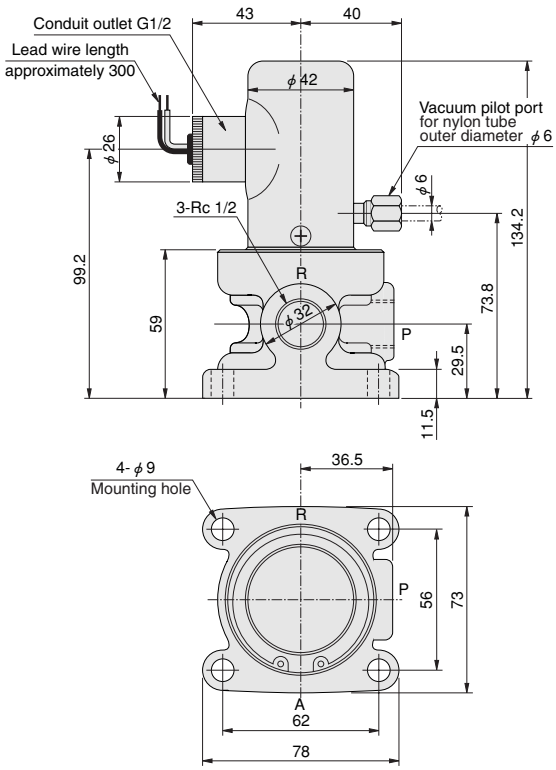
NC	NO
	
VV500AE1	**VV500AE1-11**

Dimensions (mm)

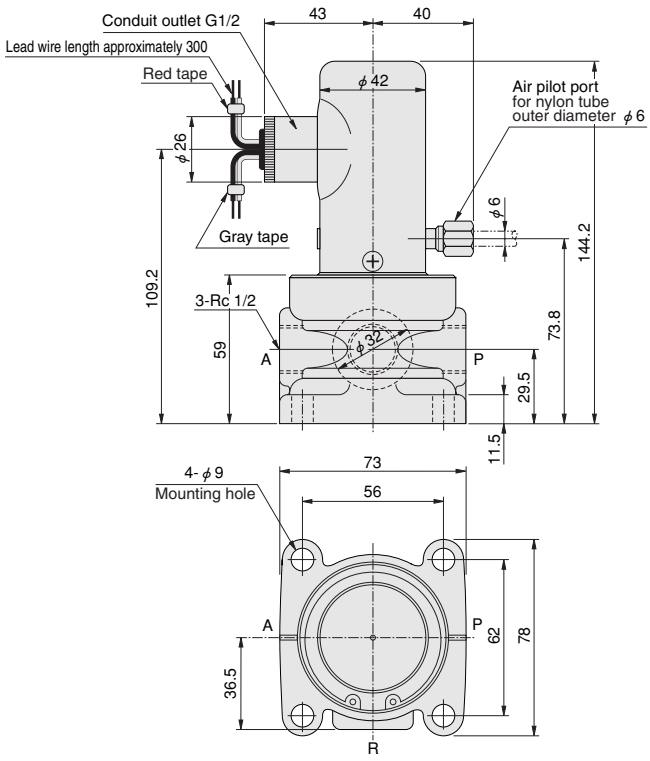
VA500AE1



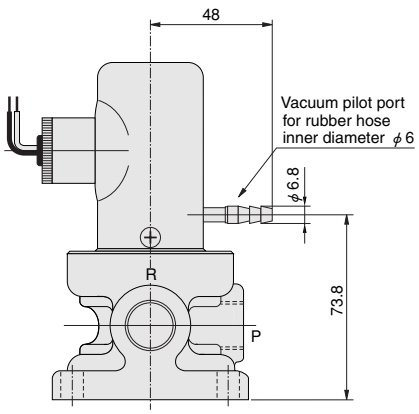
VV500AE1



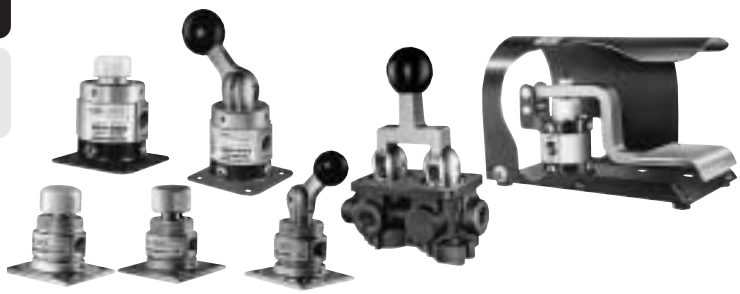
VA500AE2



Option -62



Manual Vacuum Valves and Foot Vacuum Valve



Specifications

Item \ Basic model	V125P	V250P	V2503P	V125HO	V125V	V250V	V2503V	V250-4H	V2503-4H	V250F
Media	Vacuum									
Operation type	Push button				Lever					Foot
	Spring return			Spring return (with holding mechanism)	Holding type			Holding type 3-position		Spring return
Number of ports	3 ports	2, 3 ports		3 ports	3 ports			5-port exhaust center type		2, 3 ports
Valve function	Normally closed (NC)				Normally closed (NC), Normally open (NO)			——		Normally closed (NC)
Effective area〔Cv〕 mm²	5.5〔0.27〕	15〔0.76〕		5.5〔0.27〕	15〔0.76〕					
Port size Rc	1/8	1/4	3/8	1/8	1/4	3/8		1/4	3/8	1/4
Lubrication	Not required									
Operating pressure range kPa{mmHg} [in.Hg]	0～−100 {0～−750} [0～−29.53]									
Operating temperature range °C [°F]	5～60 [41～140]									
Mounting direction	Any									
Mass kg [lb.]	0.1 [0.22]	0.2 [0.44]	0.25 [0.55]	0.1 [0.22]	0.1 [0.22]	0.25 [0.55]	0.3 [0.66]	0.6 [1.3]	0.6 [1.3]	1.0 [2.2]

Order Codes

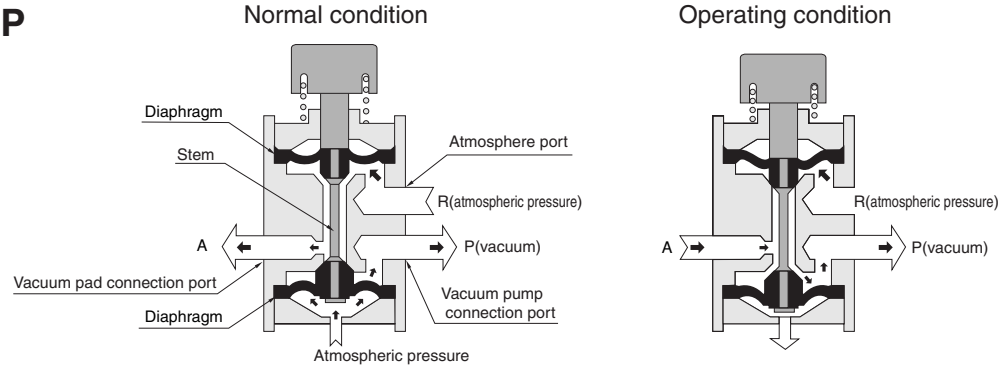
		Basic model	Option: Valve function (2-port)	Option: Mounting method (With lock nuts for panel mounting)
Push button	3-port	V125P		-22
	2-, 3-port	V250P	-2	
	2-, 3-port	V2503P	-2	
	3-port	V125HO		-22
Lever	3-port	V125V		-22
	3-port	V250V		-22
	3-port	V2503V		-22
	5-port	V250-4H		-22
	5-port	V2503-4H		-22
Foot	2-, 3-port	V250F	-2	

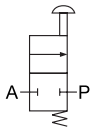
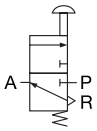
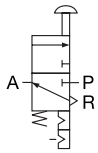
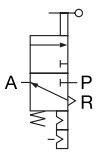
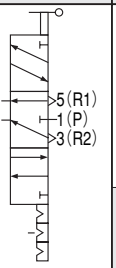
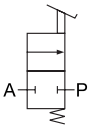
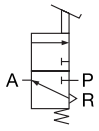
●**Blank:** Base mounting type

●**Blank:** 3-port
V250-4H and V2503-4H are 5-port.

Operating Principles and Symbols

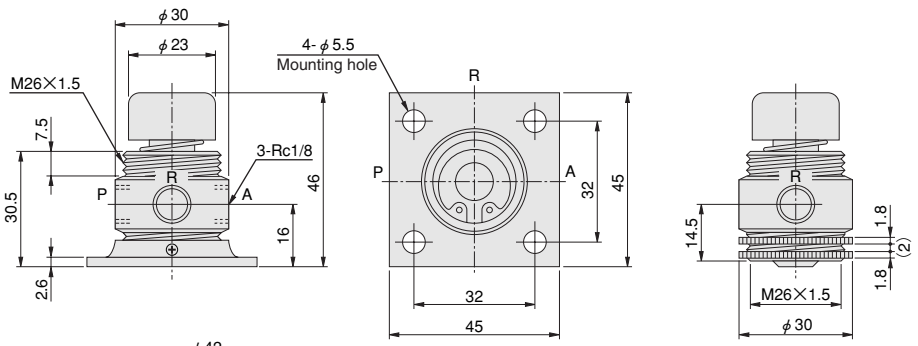
V125P



2-port NC	3-port NC	3-port NC	3-port NC/NO	5-port 3-position, exhaust center	2-port NC	3-port NC
						
V250P-2 V2503-2	**V125P V250P V2503P**	**V125HO**	**V125V V250V V2503V**	**V250-4H V2503-4H**	**V250F-2**	**V250F**

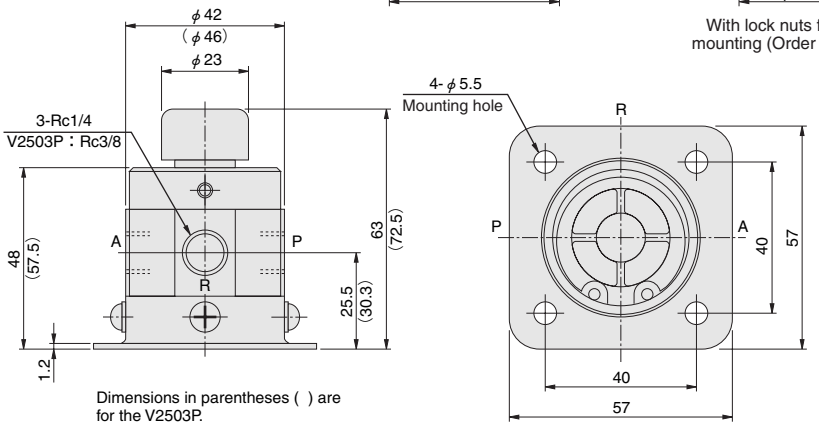
Dimensions (mm)

V125P



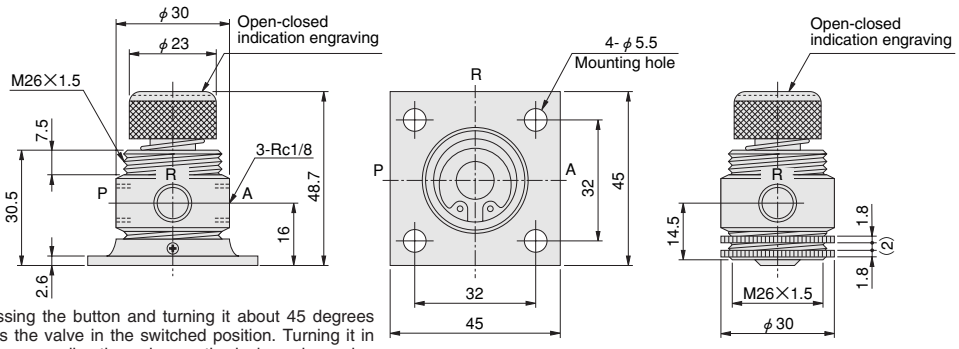
With lock nuts for panel mounting (Order code: -22)

V250P V2503P



Dimensions in parentheses ( ) are for the V2503P.

V125HO

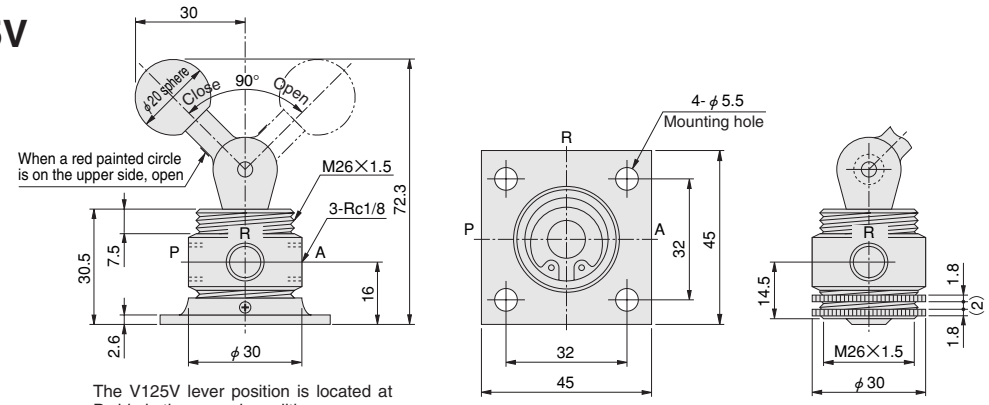


Pressing the button and turning it about 45 degrees locks the valve in the switched position. Turning it in the reverse direction releases the lock, and a spring restores the button to its normal position.

With lock nuts for panel mounting (Order code: -22)

Dimensions (mm)

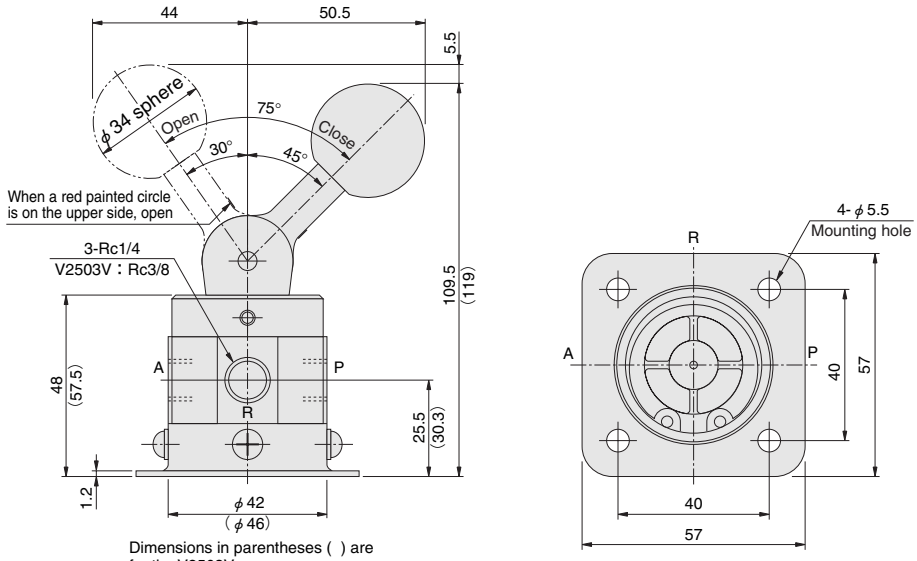
V125V



The V125V lever position is located at P side in the normal condition.

With lock nut for panel mounting (Order code: -22)

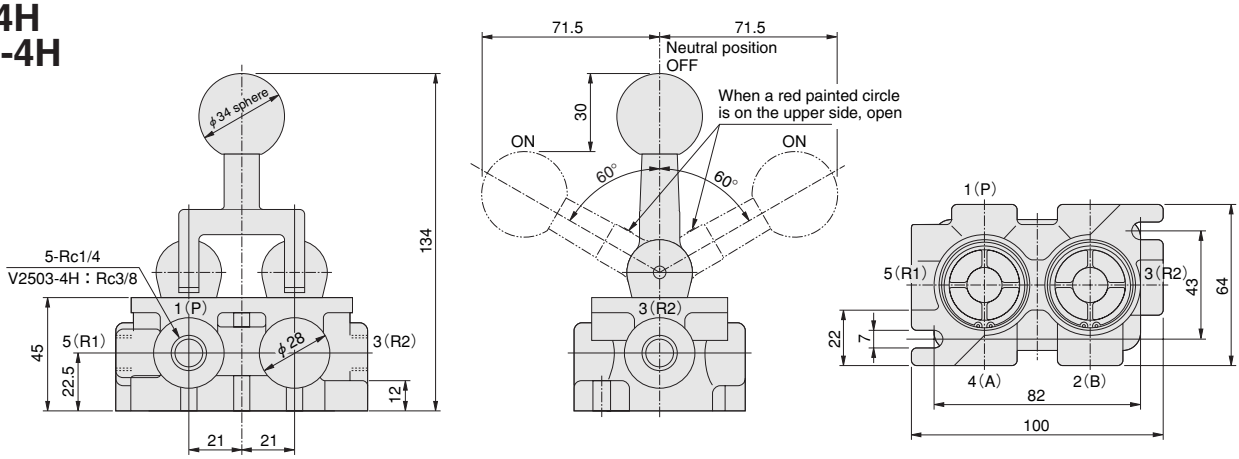
V250V
V2503V



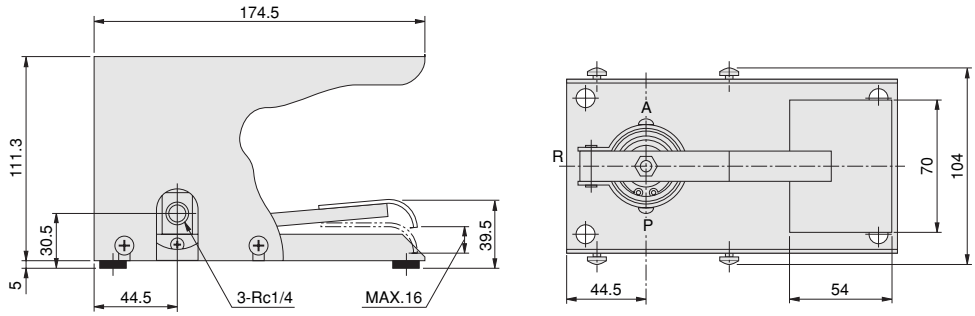
Dimensions in parentheses ( ) are for the V2503V.

The V250V lever position is located at P side in the normal condition.

V250-4H
V2503-4H



V250F



Mechanical Operated Vacuum Valves

Specifications

Item \ Basic model	V125B	V250B	V2503B	V125MC	V125MOC	V250C	V2503C
Media	Vacuum						
Operation type	Ball-cam			Roller-cam			
	—			Steel roller	One way steel roller	Nylon roller	
Number of ports	3 ports (Cannot be used as 2-port and normally open (NO) in terms of construction)					2, 3 ports	
Valve function	Normally closed (NC)						
Effective area〔Cv〕 mm²	5.5〔0.27〕	15〔0.76〕		5.5〔0.27〕		15〔0.76〕	
Port size Rc	1/8	1/4	3/8	1/8		1/4	3/8
Lubrication	Not required						
Operating pressure range kPa{mmHg} [in.Hg]	0～−100 {0～−750} [0～−29.53]						
Minimum operating force kgf [lbf.]	2 [4.4]	3 [6.6]		1.5 [3.3]			
Operating temperature range °C [°F]	5～60 [41～140]						
Mounting direction	Any						
Mass kg [lb.]	0.1 [0.22]	0.2 [0.44]	0.25 [0.55]	0.15 [0.33]		0.3 [0.66]	0.35 [0.77]

Order Codes

		Basic model	Option: Valve function (2-port)	Option: Mounting method (With lock nuts for panel mounting)
Ball-cam	3-port	**V125B**		**-22**
	3-port	**V250B**		
	3-port	**V2503B**		
Roller-cam	3-port	**V125MC**		**-22**
	3-port	**V125MOC**		
	2-, 3-port	**V250C**	**-2**	
	2-, 3-port	**V2503C**		

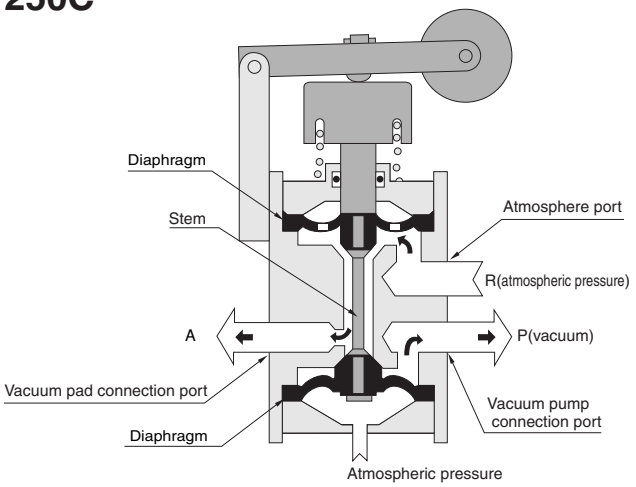
●**Blank:** Base mounting type

●**Blank:** 3-port

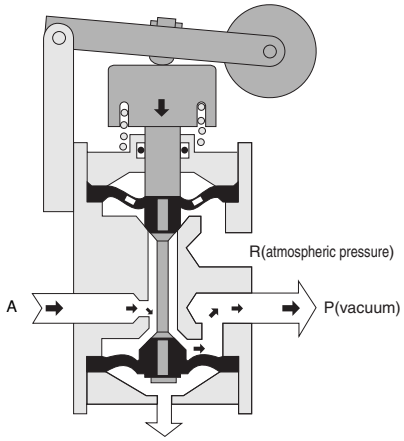
Operating Principles and Symbols

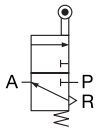
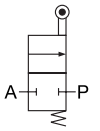
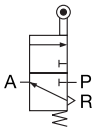
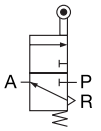
V250C

Normal condition



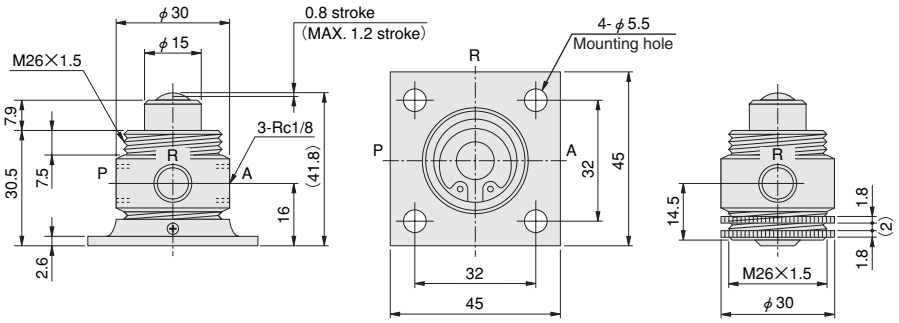
Operating condition



3-port NC	2-port NC	3-port NC	3-port NC
			
V125B V250B V2503B	**V250C-2 V2503C-2**	**V125MC V250C V2503C**	**V125MOC**

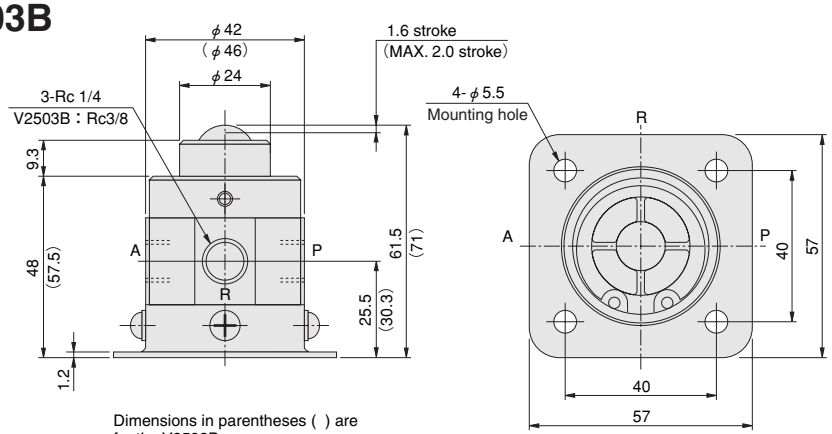
Dimensions (mm)

V125B



With lock nuts for panel mounting
(Order code: -22)

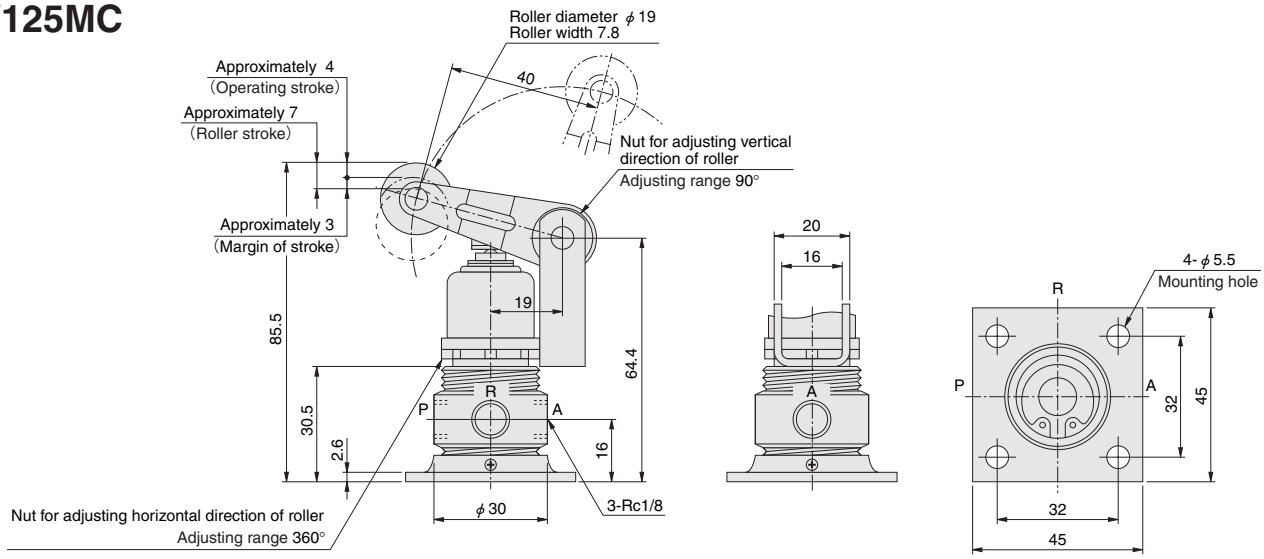
V250B
V2503B



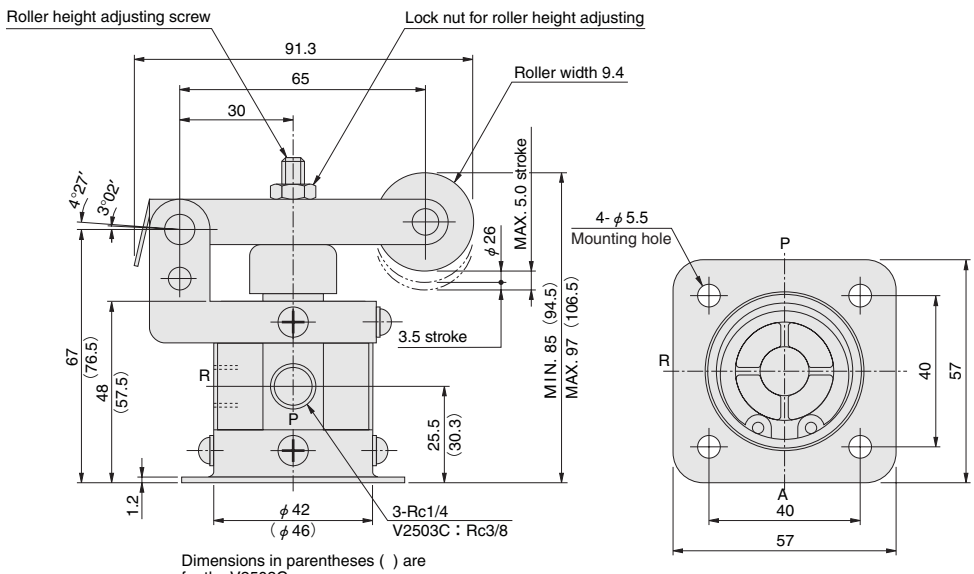
Dimensions in parentheses ( ) are for the V2503B.

Dimensions (mm)

V125MC

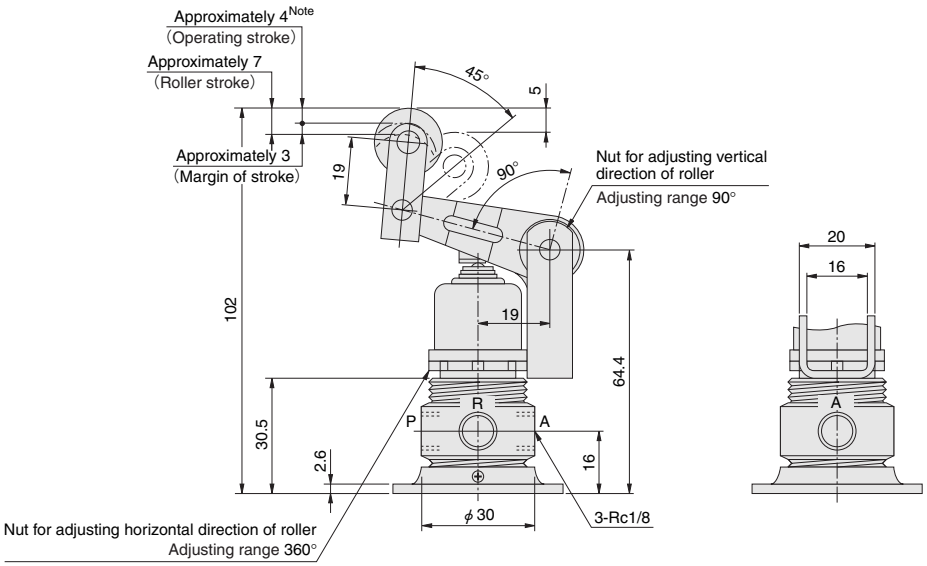


V250C
V2503C



Dimensions in parentheses ( ) are for the V2503C.

V125MOC



Note: Pushing the button more than necessary can shorten the operating life.

Piloted Vacuum Valves

Single Pilot Type

Specifications

Item \ Basic model	VA125A	VA250A	VA2503A	VA500A	VV250A	VV2503A	VV500A
Media	Vacuum						
Operation type	Air pilot				Vacuum pilot		
Number of ports	3 ports (Cannot be used as 2-port and normally open (NO) in terms of construction)						
Valve function	Normally closed (NC)						
Effective area〔Cv〕 mm^2	5.5〔0.27〕	15〔0.76〕		55〔2.7〕	15〔0.76〕		55〔2.7〕
Port size Rc	1/8	1/4	3/8	1/2	1/4	3/8	1/2
Lubrication	Not required						
Operating pressure range kPa {mmHg} [in.Hg]	0～−100 {0～−750} [0～−29.53]				−51～−100 {−380～−750} [−14.96～−29.53]		
External pilot pressure	Recommended air pressure 0.2～0.3MPa [29～44psi.] MAX. 0.7MPa [102psi.]			Recommended air pressure 0.2～0.3MPa [29～44psi.] MAX. 0.5MPa [73psi.]	Vacuum −51～−100MPa {−380～−750 (mmHg)} [−14.96～−29.53in.Hg]		
Operating temperature range °C [°F]	5～60 [41～140]						
Mounting direction	Any						
Mass kg [lb.]	0.08 [0.18]	0.17 [0.37]	0.22 [0.49]	0.45 [0.99]	0.17 [0.37]	0.2 [0.44]	0.45 [0.99]

Order Codes

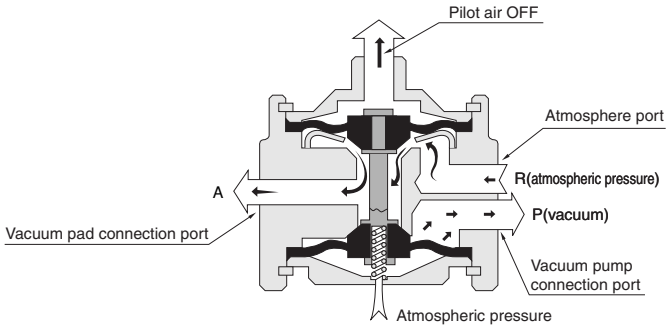
		Basic model	Option: Mounting type — With lock nuts for panel mounting
Air pilot	3-port	**VA125A**	**-22**
	3-port	**VA250A**	
	3-port	**VA2503A**	
	3-port	**VA500A**	
Vacuum pilot	3-port	**VV250A**	
	3-port	**VV2503A**	
	3-port	**VV500A**	

●**Blank:** Base mounting type

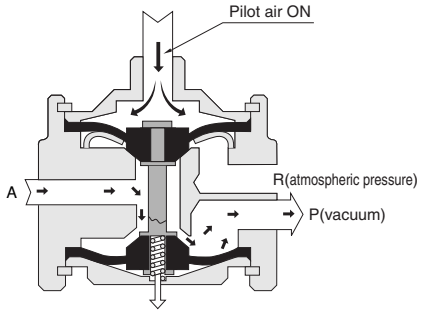
Operating Principles and Symbols

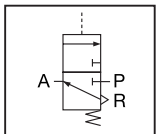
VA500A

Normal condition



Operating condition

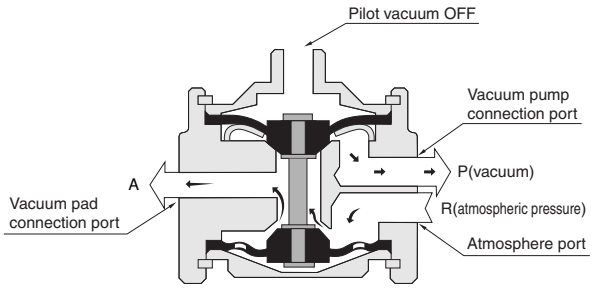




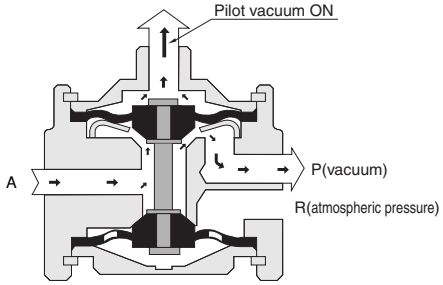
VA125A
VA250A
VA2503A
VA500A

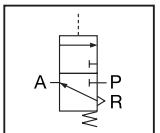
VV500A

Normal condition



Operating condition

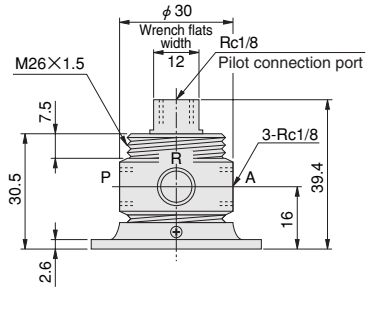


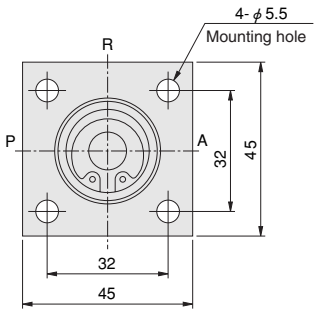


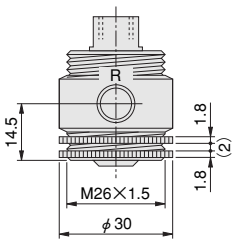
VV250A
VV2503A
VV500A

Dimensions (mm)

VA125A



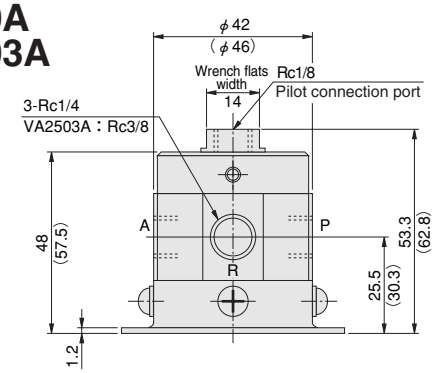




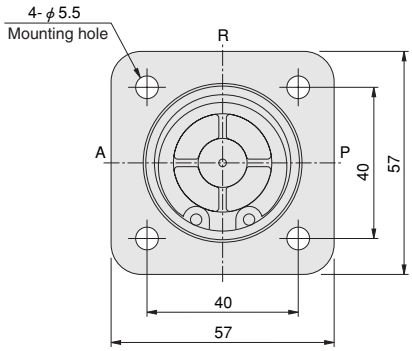
With lock nuts for panel mounting
(Order code: -22)

Dimensions (mm)

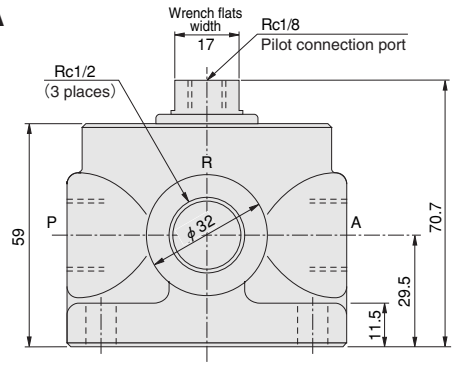
VA250A
VA2503A

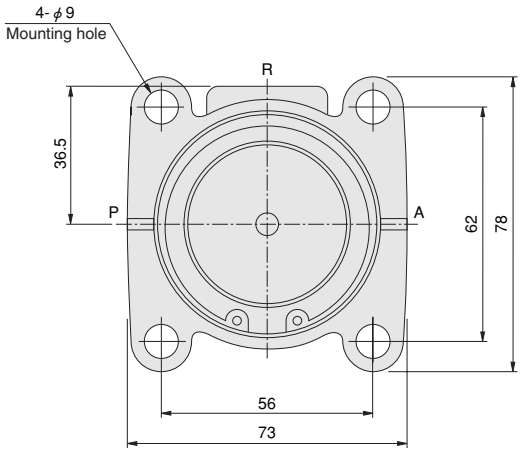


Dimensions in parentheses ( ) are for the VA2503A.

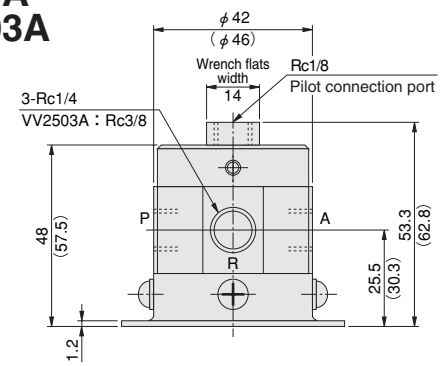


VA500A

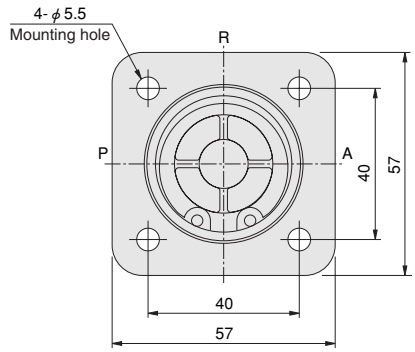




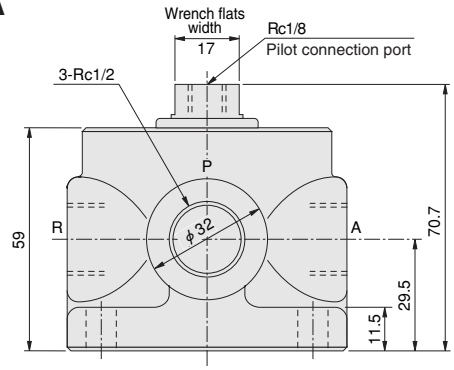
VV250A
VV2503A

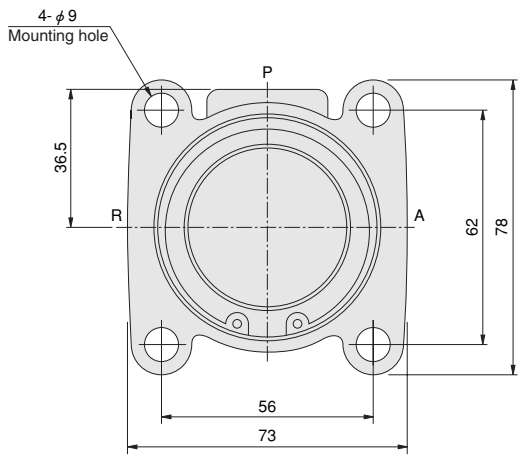


Dimensions in parentheses ( ) are for the VV2503A.



VV500A





Piloted Vacuum Valves

Double Air Pilot Type

Specifications

Item \ Basic model	250A2	2503A2	500A2	750A2	1000A2
Media	Vacuum				
Operation type	Air pilot				
Number of ports	2, 3 ports				
Valve function	NC/NO				
Effective area〔Cv〕 mm²	15〔0.76〕		55〔2.7〕	140〔7〕	280〔14〕
Port size Rc	1/4	3/8	1/2	3/4	1
Lubrication	Not required				
Operating pressure range kPa {mmHg} [in.Hg]	0～－100 {0～－750} [0～－29.53]				
External pilot pressure	Recommended air pressure 0.2～0.3MPa [29～44psi.] MAX. 0.7MPa [102psi.]		Recommended air pressure 0.2～0.3MPa [29～44psi.] MAX.0.5MPa [73psi.]	Recommended air pressure 0.2～0.3MPa [29～44psi.] MAX. 0.7MPa [102psi.]	
Operating temperature range °C [°F]	5～60 [41～140]				
Mounting direction	Any				
Mass kg [lb.]	0.2 [0.44]	0.25 [0.55]	0.45 [0.99]	1.8 [4.0]	2.7 [6.0]

Remark: In addition to the above, the Rc 1/8 type of 125 A2 is available.

Order Codes

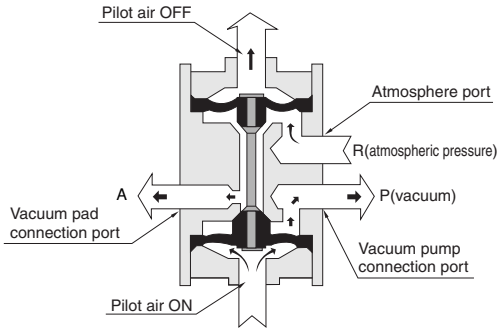
		Basic model	Option: Valve function 2-port (NC/NO)
Double air pilot	2-, 3-port	**250A2**	**-2**
	2-, 3-port	**2503A2**	
	2-, 3-port	**500A2**	
	2-, 3-port	**750A2**	
	2-, 3-port	**1000A2**	

●**Blank:** 3-port (NC/NO)

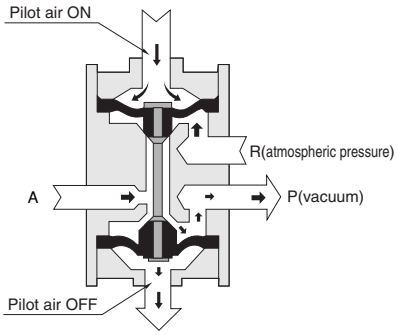
Operating Principles and Symbols

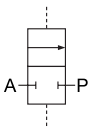
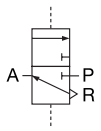
Diaphragm type (250A2, 500A2)

Normal condition



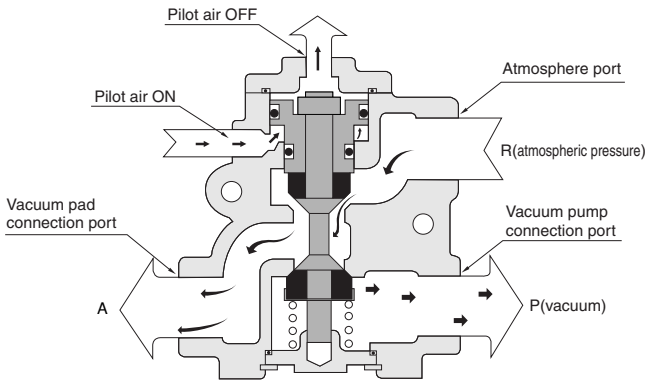
Operating condition



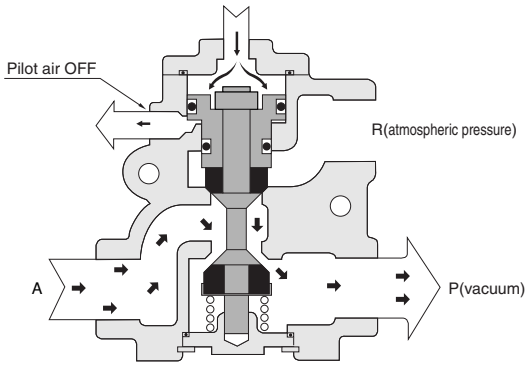
2-port NC/NO	3-port NC/NO
	
250A2-2 2503A2-2 500A2-2	**250A2 2503A2 500A2**

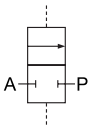
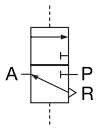
Piston poppet type (750A2, 1000A2)

Normal condition



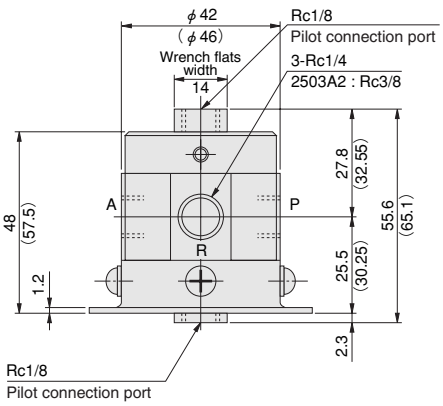
Operating condition

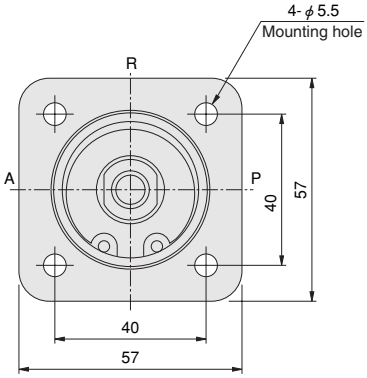


2-port NC/NO	3-port NC/NO
	
750A2-2 1000A2-2	**750A2 1000A2**

Dimensions (mm)

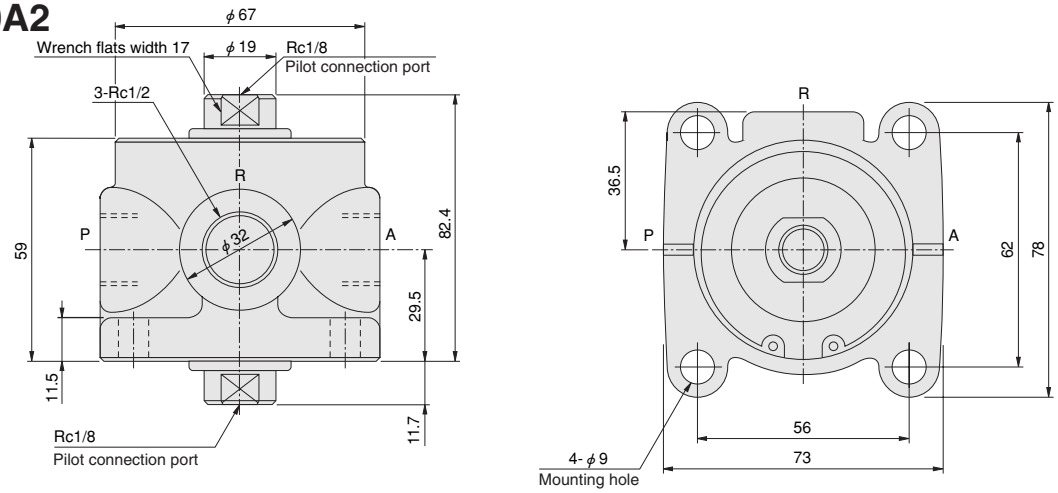
250A2
2503A2



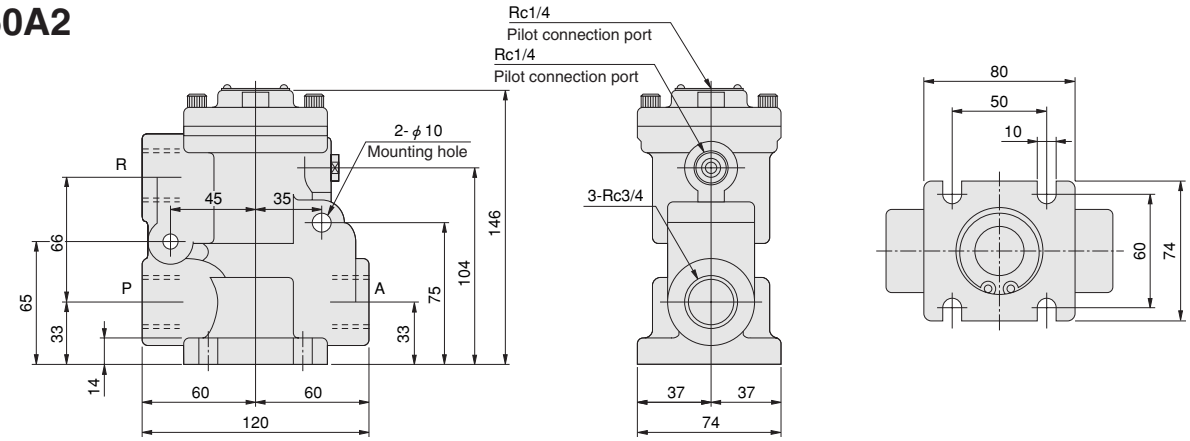


Dimensions (mm)

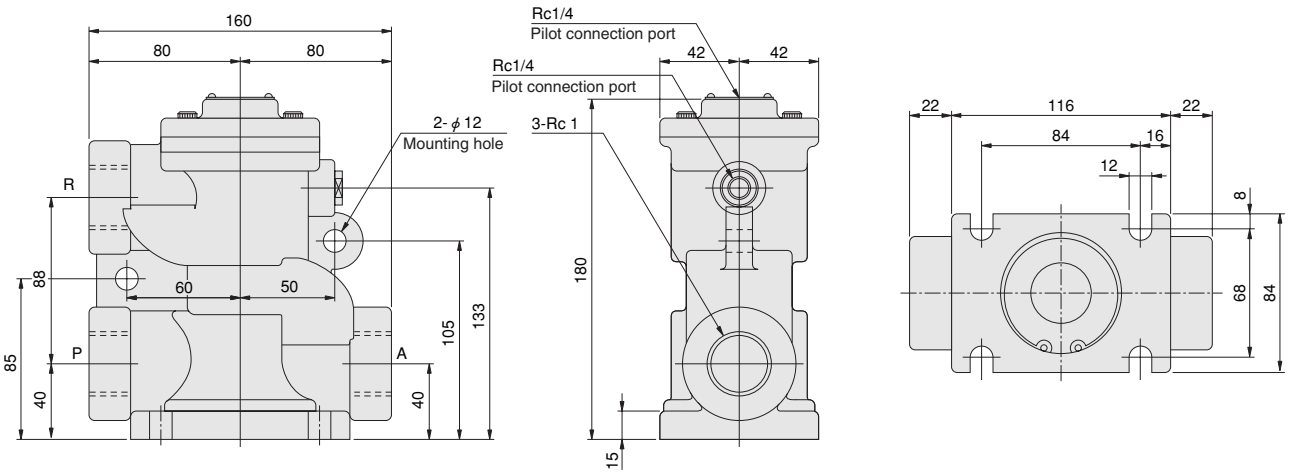
500A2



750A2



1000A2



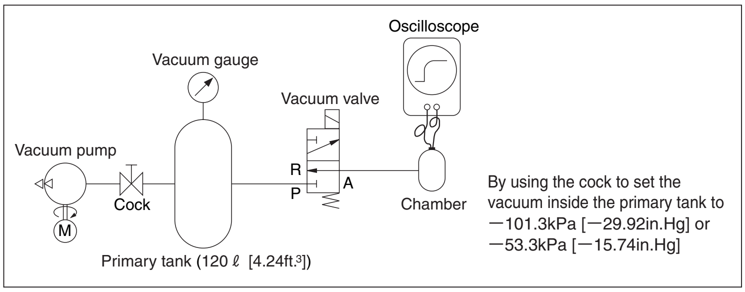
Vacuum Valve Selection Table (Exhaust and Air Supply Response Times)

s

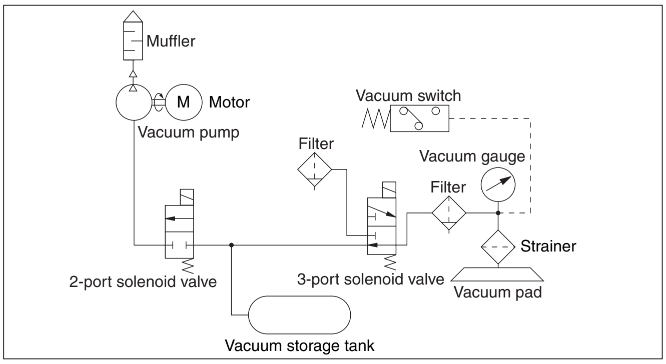
Vacuum kPa [in.Hg] / Model	50cc [3.05in.³] chamber				200cc [12.2in.³] chamber				1 ℓ [61in.³] chamber				3 ℓ [183in.³] chamber				5.5 ℓ [336in.³] chamber				10.5 ℓ [641in.³] chamber			
	Exhaust[Note]		Air supply		Exhaust		Air supply		Exhaust		Air supply		Exhaust		Air supply		Exhaust		Air supply		Exhaust		Air supply	
	0 ↓ −81.3 [−24.01]	0 ↓ −42.6 [−12.58]	−81.3 [−24.01] ↓ 0 0	−42.6 [−12.58] ↓ 0 0	0 ↓ −81.3 [−24.01]	0 ↓ −42.6 [−12.58]	−81.3 [−24.01] ↓ 0 0	−42.6 [−12.58] ↓ 0 0	0 ↓ −81.3 [−24.01]	0 ↓ −42.6 [−12.58]	−81.3 [−24.01] ↓ 0 0	−42.6 [−12.58] ↓ 0 0	0 ↓ −81.3 [−24.01]	0 ↓ −42.6 [−12.58]	−81.3 [−24.01] ↓ 0 0	−42.6 [−12.58] ↓ 0 0	0 ↓ −81.3 [−24.01]	0 ↓ −42.6 [−12.58]	−81.3 [−24.01] ↓ 0 0	−42.6 [−12.58] ↓ 0 0	0 ↓ −81.3 [−24.01]	0 ↓ −42.6 [−12.58]	−81.3 [−24.01] ↓ 0 0	−42.6 [−12.58] ↓ 0 0
V062E1	0.2	0.08	0.18	0.1	0.7	0.35	0.5	0.38	3.0	1.5	2.5	1.8	9.0	3.2	6.0	4.0	20.0	8.0	14.0	10.0	—	—	—	—
V126E1	0.12	0.05	—	—	0.4	0.2	—	—	1.8	0.9	—	—	5.0	1.7	—	—	11.0	3.5	—	—				
VA125A	0.1	0.06	0.13	0.12	0.35	0.15	0.3	0.2	1.6	0.7	1.3	0.8	3.8	1.4	2.6	1.8	9.0	3.4	6.0	4.0				
VA250AE1	0.05	0.03	0.09	0.04	0.1	0.05	0.08	0.07	0.5	0.23	0.16	0.18	1.1	0.4	0.7	1.0	2.4	1.0	1.7	1.0				
VA500AE1	0.04	0.03	0.14	0.14	0.07	0.05	0.14	0.14	0.25	0.1	0.15	0.18	0.5	0.2	0.4	0.3	1.1	0.4	0.6	0.5	2.0	0.8	1.0	0.8
1000A2	—																0.26	0.14	0.26	0.2	0.4	0.2	0.4	0.3

Note: The exhaust vacuum in the chamber is a 80% rating value of the vacuum inside of the primary tank.

The above table shows the time it takes from the point in time where the vacuum valve is switched ON to reach the specified vacuum inside of the chamber, and the time from switching the vacuum valve OFF to supply air into the chamber.



Standard Vacuum Circuit



Inspection Standard for Vacuum Leaks (Koganei standards)

● **Inspection procedure**

Open valve A, and set the vacuum in the tank to −100kPa {−750mmHg} [−29.53in.Hg]. Afterward, close valve A, let set for 10 minutes, and then check the vacuum inside of the tank both during OFF and ON.

● **Inspection standard**

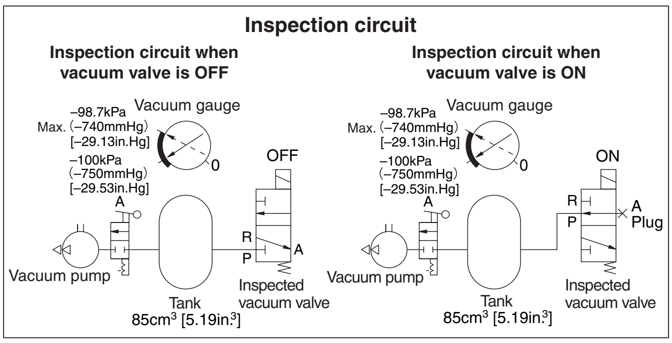
Let set for 10 minutes, then check to see that the vacuum leaks inside the tank meets the standard of 1.3kPa {10mmHg} [0.38in.Hg] or less.

For details, consult us.

● **Remark**

In fact, most Koganei vacuum valves can hold initial vacuum even after being left set for 10 minutes.

Inspection circuit



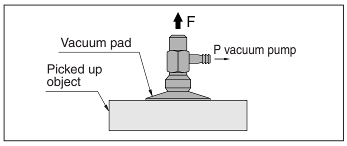
Calculation of Picking-up Force, and Graph

(Theoretical values)

When using a vacuum pad to hold picking-up an object, the picking-up force is shown by the following formula.

$W = P \times A \times 0.1$

W: Picking-up force (N)
P: Vacuum (kPa)
A: Pad area (cm²)



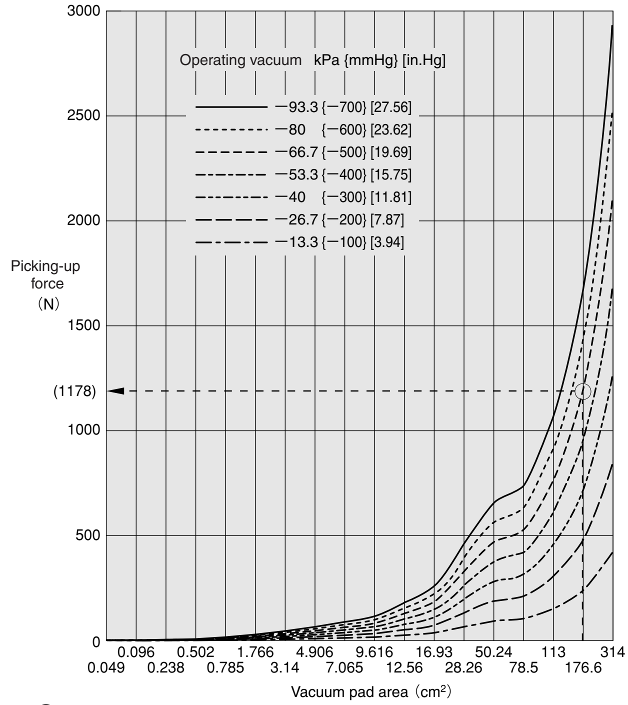
<Conventional units>

$W' = \frac{p'}{760} \times 1.033 \times A'$

W': Picking-up force (kgf)
P': Vacuum (mmHg)
A': Pad area (cm²)

$W'' = \frac{p''}{29.92} \times 14.7 \times A''$

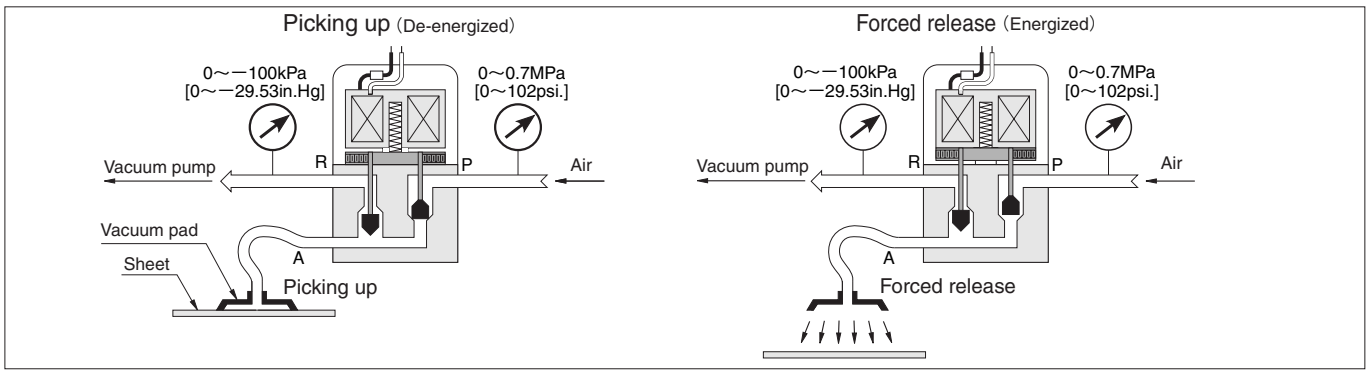
W'': Picking-up force [lbf.]
P'': Vacuum [in.Hg]
A'': Pad area [in.²]



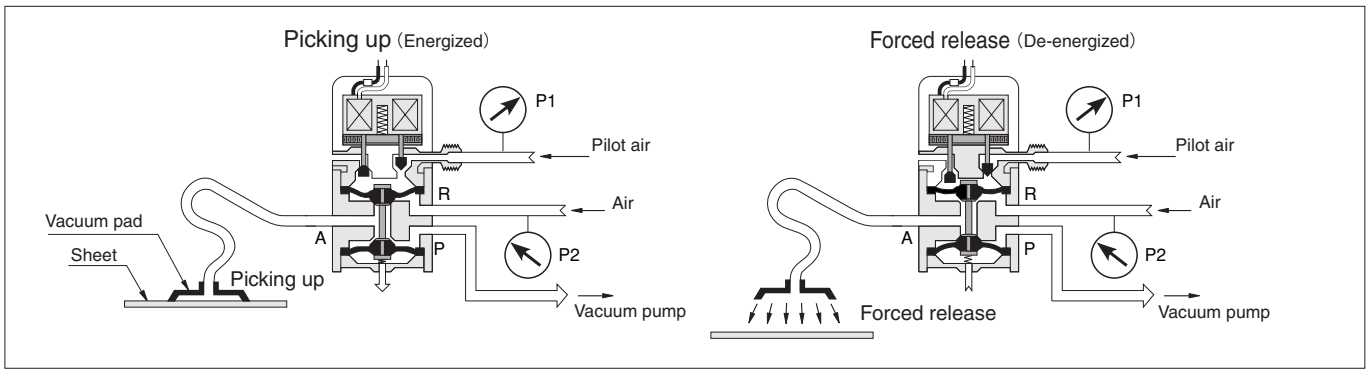
● **How to read the graph**

When the vacuum is −66.7kPa [−19.7in.Hg], and the vacuum pad area is 176.6cm² [27.37in.²], the picking-up force is 1178N [265lbf.].

■ How to Use Both Vacuum and Pressure Type (SV062E1)

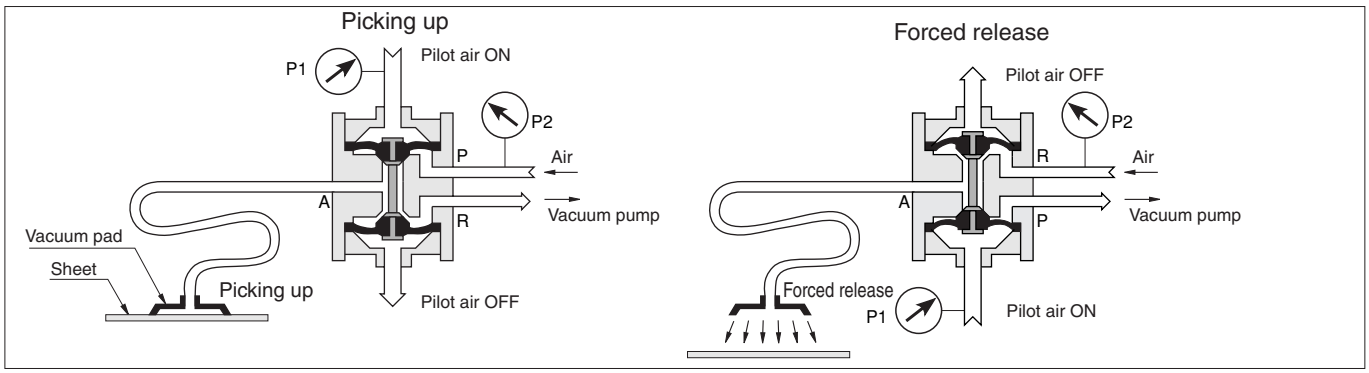


■ Application of External Air Pilot Type (VA250AE1/ VA2503AE1/ VA500AE1)



Note: Use as $P_1 \geqslant 2P_2$.

■ Application of External Double Air Pilot Type (250A2 / 500A2, etc.)



Note: Use as $P_1 \geqslant 2P_2$.

■ Pressure Unit Comparison Table