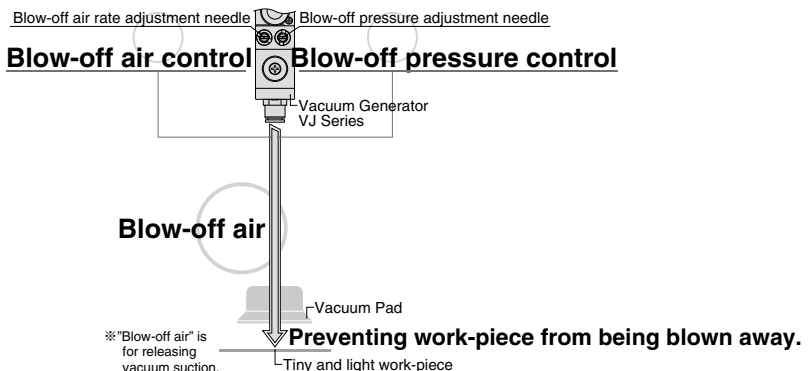


Complex Vacuum Generator with Blow-off Air and Relief Pressure Adjustment **Vacuum Generator VJ Series**

- Pressure adjusting function is added to the conventional blow-off air control function to prevent work-pieces from being blown away.
- A relief mechanism built into the blow-off circuit which breaks the vacuum (extra pressure is relieved) realizes shorter blow-off time.



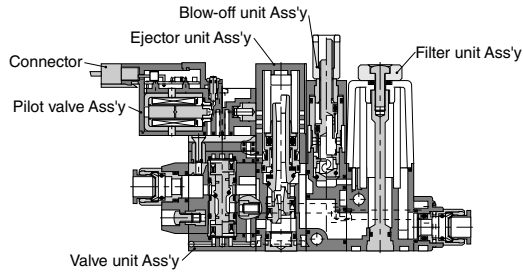


■ Characteristics

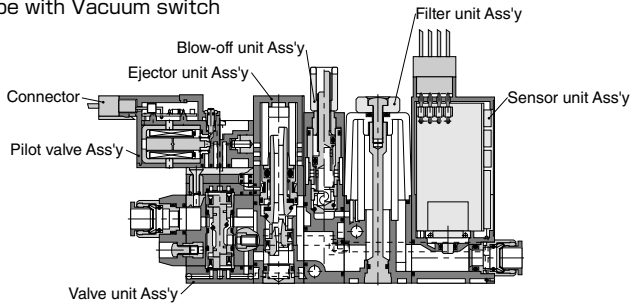
- *Wide variety of combinations can cope with various needs. External Vacuum Controller for Vacuum Pump Series is for available (P.318). Less wiring is achieved.*
- *For the pipe lead-out direction of concentrated piping of manifold-type, two types are available; front lead-out type and rear lead-out type.*
- *3 types for supply valve*
 - *Double solenoid type (Vacuum retention type, selectable for saving energy)*
 - *Normally closed type*
 - *Normally open type*
- *Improved visibility by vacuum switch with LED display. 2 types of vacuum switch with LED display: ① 2 switch output, ② 1 switch output and 1 analog output.*
- *Standard nozzle bore: 05(ϕ 0.5mm), 07(ϕ 0.7mm), 10(ϕ 1.0mm) and 12(ϕ 1.2mm).*

Construction

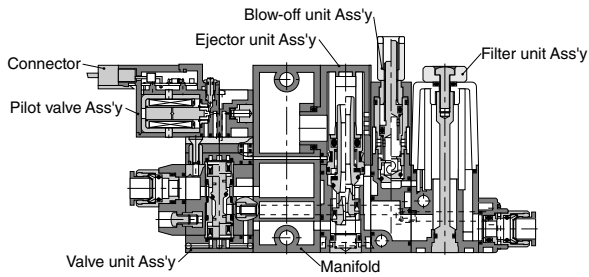
Stand-alone type without Vacuum switch



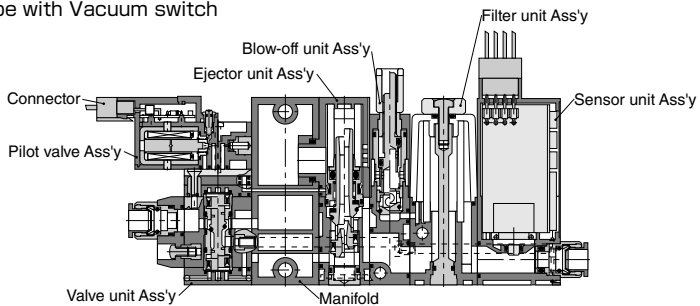
Stand-alone type with Vacuum switch



Manifold type without Vacuum switch



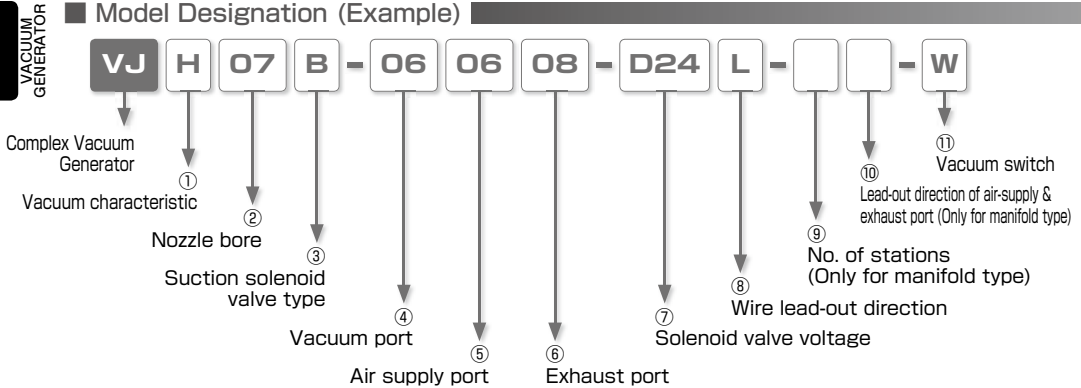
Manifold type with Vacuum switch



Vacuum Generator Series

Vacuum Generator VJ

Model Designation (Example)



① Vacuum characteristics

Code	Performance	Code	Performance	Code	Performance
H	High-vacuum type (Rated supply pressure : 0.5MPa)	L	Large-flow type (Rated supply pressure : 0.5MPa)	E	High-vacuum at low air pressure type (Rated supply pressure: 0.35MPa)
K	Combination of different vacuum characteristics on mounting units on a manifold (Details should be described on Specification Order Form separately)				

② Nozzle bore

Code	Nozzle bore	H type	L type	E type	Air consumption
		Vacuum level, Suction flow	Vacuum level, Suction flow	Vacuum level, Suction flow	
05	0.5mm	-90.4kPa 7l/min(ANR)	-66.5kPa 11l/min(ANR)	-	11.5l/min(ANR)
07	0.7mm	-93.1kPa 13l/min(ANR)	-66.5kPa 26l/min(ANR)	-90.4kPa 10.5l/min(ANR)	23l/min(ANR) (17l/min(ANR))
10	1.0mm	-93.1kPa 27l/min(ANR)	-66.5kPa 40l/min(ANR)	-90.4kPa 21l/min(ANR)	46l/min(ANR) (34l/min(ANR))
12	1.2mm	-93.1kPa 38l/min(ANR)	-	-90.4kPa 27l/min(ANR)	70l/min(ANR) (47l/min(ANR))
00	Combination of different nozzle on mounting units on a manifold (Details should be described on Specification Order Form separately)				

※ Supply pressure is 0.5MPa for H and L type and 0.35MPa for E type.

※ Air consumption values in () represents that of E type.

※ The values in the table are reference values only. Suction flow varies according to the vacuum system conditions; vacuum port dia. or tube length. are reference values only. Suction flow changes according to the vacuum system conditions; vacuum port dia. or tube length.

③ Suction solenoid valve type

Code	Valve unit	Code	Valve unit	Code	Valve unit
A	Double solenoid type (Vacuum retention type)	B	Normally closed type	C	Normally open type
K	Combination of different vacuum characteristics on mounting units on a manifold (Details should be described on Specification Order Form separately)				

④ Vacuum port (Applicable tube size)

Code	04	06	08
Tube dia.(mm)	ø4	ø6	ø8

00 : With manifold types, when port size differs with each station. (Details should be described in Specification order form.)

⑤ Air supply port (Applicable tube size)

Code	04	06	08	10
Tube dia.(mm)	ø4(※1)	ø6	ø8(※2)	ø10(※2)

※ 1. Stand-alone type only

※ 2. Manifold type only.

⑥ Exhaust port (Applicable tube size)

	Open to air (Silencer vent)	Tube exhaust (Push-in fitting)	
Code	S	08	10
Tube dia.(mm)	-	ø8	ø10(※1)

※ 1. Manifold type only

⑦ Solenoid valve type

Code	D24	A100
Working voltage	DC24V	AC100V

⑧ Wire lead-out direction

Code	L	S	K
lead-out direction	Top	Side	Different directions on mounting units (Specification Order Form required)

⑨ No. of stations (Only for manifold type)

Code	02	03	04	05	06	07	08	09	10
No. of manifolds	2	3	4	5	6	7	8	9	10

⑩ Lead-out direction of air-supply & exhaust port (Only for manifold type)

Code	A	B
lead-out direction	Vacuum port side	Solenoid valve side

⑪ Vacuum switch

Code	W	A	K	No code
Switch type	2 switch output	1 switch output and 1 analog output	Different vacuum switches on mounting units (Specification Order Form required)	Without vacuum switch



Order Example

1 Vacuum Generator Stand-alone type

VJ H 05 A - 04 06 S - D24 L - W

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑩

- ① Vacuum characteristics : H → High-vacuum type
- ② Nozzle bore : 05 → ø0.5mm
- ③ Suction solenoid valve type : A → Double solenoid type (Vacuum retention type)
- ④ Vacuum port : 04 → ø4mm Push-In Fitting
- ⑤ Air supply port : 06 → ø6mm Push-In Fitting
- ⑥ Exhaust port : S → Open to air (Silencer vent)
- ⑦ Solenoid valve type : D24 → DC24VDC
- ⑧ Wire lead-out direction : L → Top
- ⑩ Vacuum switch : W → 2 switch output

2 Vacuum Generator Manifold type

VJ H 05 A - 04 10 10 - D24 L - 04 A - W

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

- ① Vacuum characteristics : H → High-vacuum type
- ② Nozzle bore : 05 → ø0.5mm
- ③ Suction solenoid valve type : A → Double solenoid type (Vacuum retention type)
- ④ Vacuum port : 04 → ø4mm Push-In Fitting
- ⑤ Air supply port : 10 → ø10mm Push-In Fitting
- ⑥ Exhaust port : 10 → ø10mm Push-In Fitting
- ⑦ Solenoid valve type : D24 → 24VDC
- ⑧ Wire lead-out direction : L → Top
- ⑨ No. of stations : 04 → 4 stations
- ⑩ Lead-out direction of air-supply & exhaust port : A → Vacuum port side
- ⑪ Vacuum switch : W → 2 switch output

3 Vacuum Generator Manifold type

(Different mounting units on a manifold)

VJ K 00 K - 00 10 10 - D24 L - 05 A - K

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

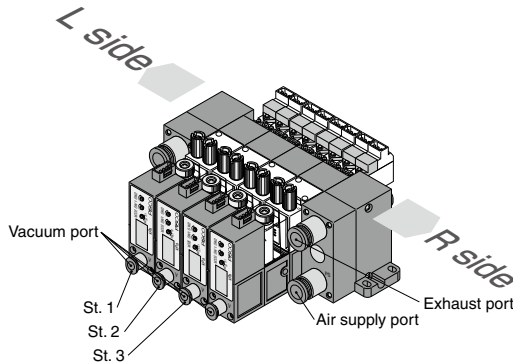
- ① Vacuum characteristics : K → St.1、 St.2、 St.3 : H type
St.4 : E type
St.5 : H type
- ② Nozzle bore : 00 → St.1、 St.2、 St.3 : ø0.7mm
St.4 : ø1.0mm
St.5 : ø1.2mm
- ③ Suction solenoid valve type : K → St.1、 St.2、 St.3 : Double solenoid type
St.4、 St.5 : Normally closed type
- ④ Vacuum port : 00 → St.1、 St.2、 St.3 : ø6mm Push-In Fitting
St.4、 St.5 : ø8mm Push-In Fitting
- ⑤ Air supply port : 10 → ø10mm Push-In Fitting
- ⑥ Exhaust port : 10 → ø10mm Push-In Fitting
- ⑦ Solenoid valve type : D24 → 24VDC
- ⑧ Wire lead-out direction : L → Top
- ⑨ No. of stations : 05 → 5 stations
- ⑩ Lead-out direction of air-supply & exhaust port : A → Vacuum port side
- ⑪ Vacuum switch : K → St.1、 St.2、 St.3 : 2 switch output
St.4 : Without vacuum switch
St.5 : 1 switch output and 1 analog output

■ Specification Order Form (example of 3: Vacuum Generator Manifold type in the left page.)

Manifold model code	VJ	Vacuum characteristics	Nozzle bore	Suction solenoid valve type	Vacuum port	Air supply port	Exhaust port	Solenoid valve type	Wire lead-out direction	No. of stations	Lead-out direction of air-supply & exhaust port	Vacuum switch
		①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪
		K	00	K	— 00	10	10	— D24	L	— 05	A	— K
Mounting unit model code	L	St.1	H	07	A	06						W
	↑	St.2	St.1									
		St.3	St.1									
		St.4	E	10	B	08						
		St.5	H	12	B	08						A
		St.6										
		St.7										
		St.8										
	↓	St.9										
	R	St.10										

※ When the top-mounting units for St. 1, St. 2 and St. 3 are of the same specifications as in the above example of specification order form, fill up the St. 1 space (uppermost) only, while entering "St. 1" in each of the St. 2 and St. 3 grids on the Vacuum characteristics column (1).

■ Example of Manifold Type



※ Station no. is arranged St.1, St.2 ... St.10 from L side.

Vacuum Generator **VJ** Series Specification Order Form

To: NIHON PISCO CO., Ltd. _____

Name : _____

Order No. : _____

Date : _____

Requested EX-W PISCO Date : _____ Quantity : _____

Manifold model code	Vacuum characteristics ①	Nozzle bore ②	Suction solenoid valve type ③	Vacuum port ④	Air supply port ⑤	Exhaust port ⑥	Solenoid valve type ⑦	Wire lead-out direction ⑧	No. of stations ⑨	Lead-out direction of air supply & exhaust port ⑩	Vacuum switch ⑪
Mounting unit model code	L	St.1									
	↑	St.2									
		St.3									
		St.4									
	St.	St.5									
		St.6									
		St.7									
		St.8									
	↓	St.9									
	R	St.10									

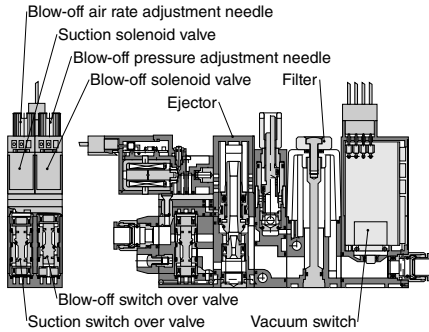
※ Refer to the example in the previous page to fill in the form.

※ When the combination of mounting unit spec. is different, a separate Specification Order Form is required.

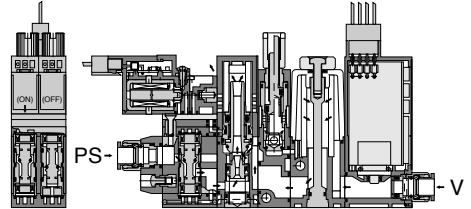
Mechanism of VJ

Example) VJ□□A-□□□-□□-□□-□ (Valve unit type: Double solenoid type (Vacuum retention type))

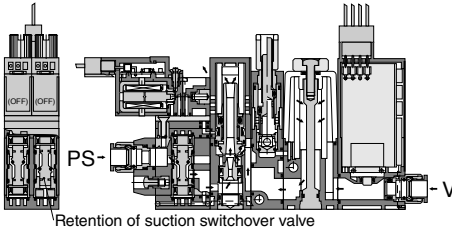
① At vacuum generation suspended



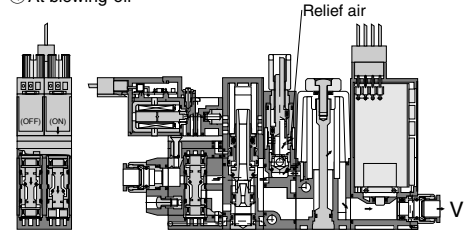
② At vacuum generating



③ At vacuum retention

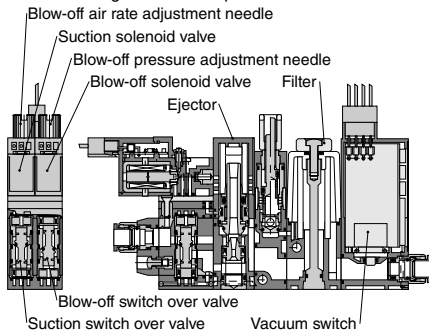


④ At blowing-off

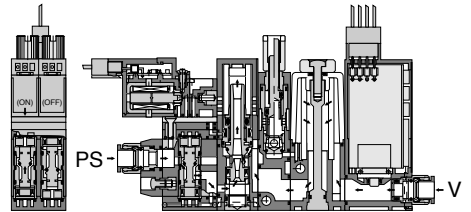


Example) VJ□□B-□□□-□□-□□-□ (Valve unit type: Normally closed)

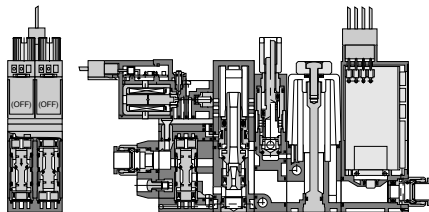
① At vacuum generation suspended



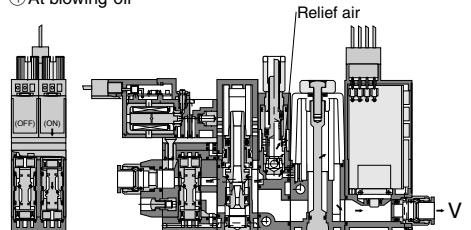
② At vacuum generating



③ At vacuum retention



④ At blowing-off



Specification (Supply pressure)

Fluid medium	Air
Operating pressure range	0.3 ~ 0.7 MPa
Rated supply pressure	H and L type : 0.5 MPa、E type : 0.35 MPa
Operating temp. range	5 ~ 50°C

Ejector characteristics

Model code	Nozzle bore (mm)	Final vacuum (-kPa)	Suction flow (l/min(ANR))	Air consumption (l/min(ANR))
VJH05...	0.5	90.4	7	11.5
VJL05...		66.5	11	
VJH07...	0.7	93.1	13	23
VJL07...		66.5	26	
VJE07...		90.4	10.5	
VJH10...	1.0	93.1	27	46
VJL10...		66.5	40	
VJE10...		90.4	21	
VJH12...	1.2	93.1	38	70
VJE12...		90.4	27	47

※ Secure supply pressure as listed when the vacuum generator is in operation. (Take pressure drop into account.)

※ The values in the table are reference values only. Suction flow varies according to the vacuum system conditions; vacuum port dia. or tube length.

※ The above characteristics are the values measured at the rated supply pressure which is 0.5MPa for H and L type and 0.35MPa for E type.

Solenoid valve (Suction solenoid valve / Blow-off solenoid valve)

■ Pilot valve

Item	Suction solenoid valve		Blow-off solenoid valve	
Operating system	Direct operation			
Valve construction	Elastic seal, Poppet valve			
Rated voltage	DC24V	AC100V	DC24V	AC100V
Allowable voltage range	DC24V ±10%	AC100V ±10%	DC24V ±10%	AC100V ±10%
Surge protection circuit	Diode	Diode bridge	Diode	Diode bridge
Power consumption	1.2W (with LED)	1.5VA (with LED)	1.2W (with LED)	1.5VA (with LED)
Manual operation	Non-lock push button			
Operation indicator	During coil excitation, Red LED is on			
Wiring type	Connector wire (cable length: 500mm)			
	Red : DC24V Black : COM	Blue	Red : DC24V Black : COM	Blue

■ Switchover valve

Item	Suction main valve		Blow-off main valve	
Operating system	Pneumatic operation by pilot valve			
Valve construction	Elastic seal, Poppet valve			
Proof pressure	1.05MPa			
Valve type	Double solenoid (retention type) / Normally closed / Normally open		Normally closed	
Min. excitation time	50msec (Double solenoid type only)		-	
Lubrication	Not required			
Effective sectional area	Air supply port diameter	ø4mm : 3.5mm ²	1mm ²	
		ø6mm : 5mm ²		

Vacuum switch with LED display

Specification	2 switch output (-NW)	1 switch output and 1 analog output (-NA)
Current consumption	40mA or less	
Pressure detection	Diffused metaloxide semiconductive pressure transducer	
Operating pressure range	0 ~ -100kPa	
Pressure setting range	0 ~ -99kPa	
Proof pressure	0.2MPa	
Operating temp. range	0 ~ 50°C (No freezing)	
Operating humidity range	35 ~ 85%RH (No dew condensation)	
Power requirement	12 ~ 24VDC ± 10%, ripple P-P: 10% or less	
Protective structure	IEC standard IP40	
No. of pressure setting	2	1
Operating accuracy	±3%F.S. max. (at Ta=25°C)	
Differential response	Fixed (2%F.S. max.)	Variable (About 0-15% of setting value)
Switch output	NPN open collector output / 30V 80mA or less / Residual voltage: 0.8V or less	
Analog output	Output voltage	1 ~ 5V
	Zero-point voltage	1±0.1V
	Span voltage	4±0.1V
	Output current	Output current: 1mA max. (load resistance 50kΩ max.)
	LIN/HYS	±0.5%F.S. max.
Response time	About max. 2m · sec.	
Indication	2-digit red LED display	
Display frequency	About 4 times/sec.	
Indication accuracy	±3%F.S. ±2 digit	
Sensor resolution	1 digit	
Operation indication	SW1: Red LED turns ON, when pressure is above the setting. SW2: Green LED turns ON, when pressure is above the setting.	Red LED turns ON, when pressure is above the setting.
Function	1. MODE selector switch (ME / S1 / S2)	1. MODE selector switch (ME / SW)
	2. S1 setting trimmer (2/3-turn trimmer)	2. SW setting trimmer (2/3- turn trimmer)
	3. S2 setting trimmer (2/3- turn trimmer)	3. HYS setting trimmer (About 0-15% of setting value)

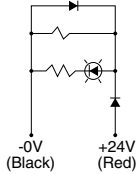
Filter specification

Element material	PVF (Polyvinyl formal)	
Filtering capacity	10µm	
Filter area	1,130mm ²	
Replacement filter	Vacuum filter	VGFE 10
Model code	Blow-off filter	VJFF

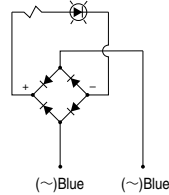
Blow-off function

Blow-off air rate	0 ~ 50/min(ANR) (Supply pressure: 0.5Mpa)
Blow-off Release Valve structure	Elastic seal, Poppet valve
Relief pressure setting range	0.005 ~ 0.05MPa

■ Circuit diagram (Solenoid valve)



24VDC Suction & Blow-off solenoid valve



AC100V Suction & Blow-off solenoid valve

■ VJ Series Weight List

① Stand-alone type

Type	Model code	Weight(g)	Remarks
Silencer vent with vacuum switch	W□□□-□□S-□□□□	164.5	Vacuum port : ø4, ø6
Silencer vent without vacuum switch	W□□□-□□S-□□□□	156.0	Vacuum port : ø4, ø6
Tube exhaust with vacuum switch	W□□□-8□S-□□□□	162.5	Vacuum port : ø8
Tube exhaust without vacuum switch	W□□□-□□8-□□□□	169.0	Vacuum port : ø4, ø6
Tube exhaust with vacuum switch	W□□□-8□8-□□□□	175.5	Vacuum port : ø8
Tube exhaust without vacuum switch	W□□□-□□8-□□□□	160.5	Vacuum port : ø4, ø6
Tube exhaust with vacuum switch	W□□□-8□8-□□□□	167.0	Vacuum port : ø8

② Manifold intermediate block

	Weight(g)	Remarks
Manifold intermediate block	18.5	Per station

③ Manifold side block

	Weight(g)	Remarks
Silencer vent	118.0	Cartridge qty: 2pcs (PS port) PV and EX ports have plugs.
Tube exhaust	112.0	Cartridge qty: 4pcs (PS and EX ports) PV port has a plug.

④ Cartridge (Supply and Exhaust ports)

Model code	Weight(g)	Remarks
CJC14-06	11.5	For ø6mm
CJC14-08	10.0	For ø8mm
CJC14-10	13.0	For ø10mm

■ Total weight can be calculated by the following calculation formula.

Total weight of manifold type = (① Stand-alone type + ② Manifold intermediate block) x station qty + ③ Manifold Side block +

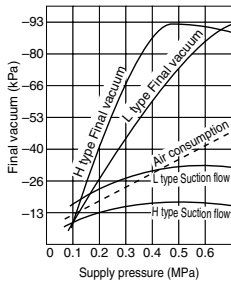
④ Cartridge x qty

Characteristics

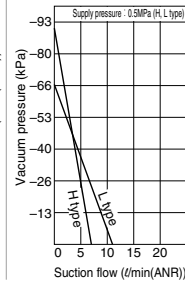
Supply pressure - Final vacuum, Suction Flow, Air Consumption

VJH05, VJL05

Vacuum characteristics

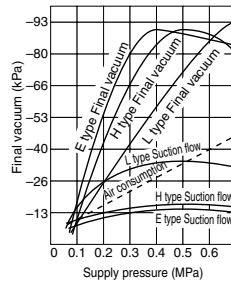


Flow characteristics

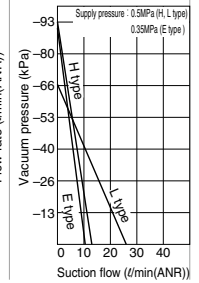


VJH07, VJL07, VJE07

Vacuum characteristics

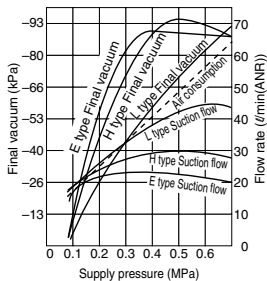


Flow characteristics

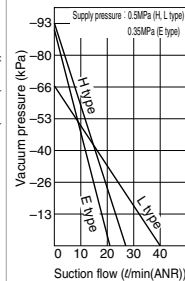


VJH10, VJL10, VJE10

Vacuum characteristics

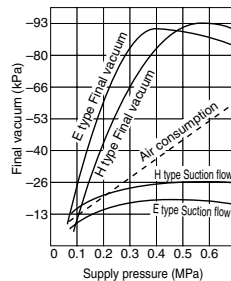


Flow characteristics

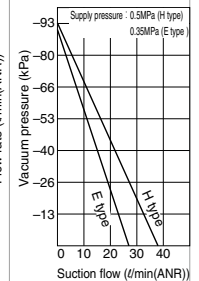


VJH12, VJL12, VJE12

Vacuum characteristics



Flow characteristics



1. In the characteristics shown above, supply pressures refer to those when vacuum is generated.
2. In the characteristics shown above, an odd noise may be heard when supply pressures are immediately before the peak of vacuum levels (H (High vacuum) type: 0.4~0.45MPa, and E (High-vacuum at low air supply pressure type) type: 0.29~0.32MPa). The sounding of this odd noise means the characteristics are unstable. If nothing is done, the sound may become even noisier. This situation can also adversely affect the sensor, resulting in a malfunction or trouble. So reset the supply pressure.

(Ex. 1: When the vacuum generator H type is in operation with the original pressure of 0.5MPa, the odd noise began to be heard due to a drop in supply pressure to 0.43MPa. Reset the supply pressure for the vacuum generator in operation at 0.5MPa.)

3. Piping design and equipment selection should be made with an effective sectional area being 3 times as large as the nozzle diameter as a standard. Satisfactory vacuum characteristics are not obtained unless sufficient supply air flow is secured. (For example, the odd noise is heard even when pressure is at the set value, suction flow is insufficient, the final vacuum does not satisfy the required level, etc.)

(Example2. There is the odd noise from the vacuum generator H type, though the supply pressure is 0.5MPa. → Insufficient supplied air rate is the cause. The supplied air rate is reduced before the vacuum generator by a pipe resistance, and a proper air rate is not obtained. Select tubes and pneumatic apparatuses with the target effective cross-section areas obtaining the necessary air flow rate.)

(Example3. When $\phi 1.0\text{mm}$ of nozzle bore is selected, the effective cross-section size should be more than 2.35mm^2 . (cross-section $0.5^2 \times \pi = 0.785\text{mm}^2 \times 3 = 2.35\text{mm}^2$). Select tubes and pneumatic apparatuses with the effective cross-section area more than 2.3mm^2 .)

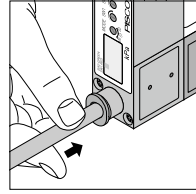
How to insert and disconnect

1. How to insert and disconnect tubes

① Tube insertion

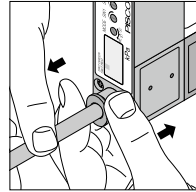
Insert a tube into Push-In Fitting of the vacuum generator VK up to the tube end. Lock-claws bite the tube to fix it and the elastic sleeve seals around the tube.

Refer to "2. Instructions for Tube Insertion" under "Common Safety Instructions for Fittings" .



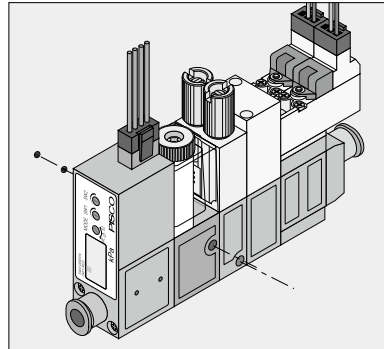
② Tube disconnection

The tube is disconnected by pushing release-ring to release Lock-claws. Make sure to stop air supply before the tube disconnection.



2. How to fix the product

In order to fix the vacuum generator VK, tighten M3 threads through the fixing holes on the resin body with tightening torque 0.3 to 0.35Nm. Refer to the outer dimensional drawings for the hole pitch.



Applicable Tube and Related Products

Polyurethane Tube

(Piping products catalog P.596)

■ Polyurethane Tube is for the general pneumatic piping and suitable for a compact piping.

Nylon Tube

(Piping products catalog P.608)

■ Nylon Tube is for the general pneumatic piping and suitable for a high-pressure fluid up to 1.5MPa (NB tube: 1.0MPa).

Vacuum Tube

(Piping products catalog P.612)

■ Vacuum Tube is a ultra-soft tube and suitable for piping of vacuum generators or actuators.

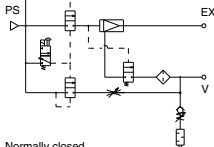
Vacuum Pads

- Vacuum Pad Standard Series . . . P.428
- Vacuum Pad Sponge Series . . . P.468
- Vacuum Pad Bellows Series . . . P.488
- Vacuum Pad Multi-Bellows Series . . . P.508
- Vacuum Pad Oval Series P.526
- Vacuum Pad Soft Series P.550
- Vacuum Pad Soft Bellows Series . . . P.578
- Vacuum Pad Skidproof Series . . . P.604
- Vacuum Pad Ultrathin Series . . . P.624
- Vacuum Pad Mark-free Series . . . P.642
- Vacuum Pad Long Stroke Series . . P.658

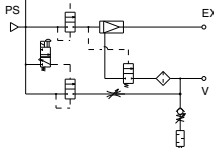
Standard Size List

Tube exhaust / Wire lead-out direction: top or side

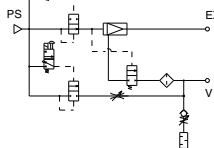
Double solenoid



Normally closed



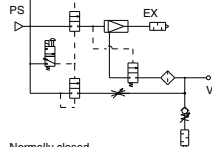
Normally open



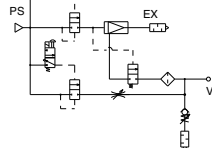
Type	Page to refer	Vacuum port	Air supply port		Exhaust port
			4mm	6mm	
VJ	177	4mm	●	●	8mm
			●	●	With Silencer
		6mm	●	●	8mm
			●	●	With Silencer
8mm	●	●	8mm		
	●	●	With Silencer		

Silencer vent / Wire lead-out direction: top or side

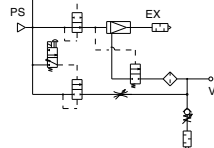
Double solenoid



Normally closed



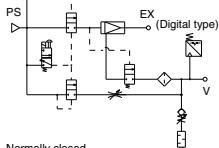
Normally open



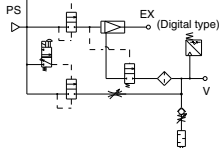
Type	Page to refer	Vacuum port	Air supply port		Exhaust port
			4mm	6mm	
VJ	178	4mm	●	●	8mm
			●	●	With Silencer
		6mm	●	●	8mm
			●	●	With Silencer
8mm	●	●	8mm		
	●	●	With Silencer		

Tube exhaust with vacuum switch, Wire lead-out direction: top or side

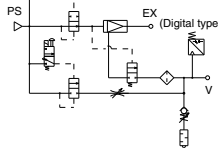
Double solenoid



Normally closed



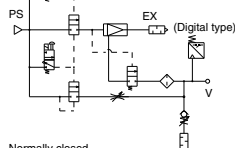
Normally open



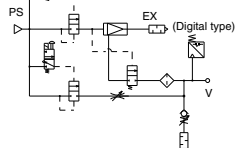
Type	Page to refer	Vacuum port	Air supply port		Exhaust port
			4mm	6mm	
VJ	179	4mm	●	●	8mm
			●	●	With Silencer
		6mm	●	●	8mm
			●	●	With Silencer
8mm	●	●	8mm		
	●	●	With Silencer		

Silencer vent with vacuum switch, Wire lead-out direction: top or side

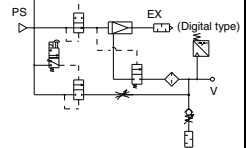
Double solenoid



Normally closed



Normally open



Type	Page to refer	Vacuum port	Air supply port		Exhaust port
			4mm	6mm	
VJ	180	4mm	●	●	8mm
			●	●	With Silencer
		6mm	●	●	8mm
			●	●	With Silencer
8mm	●	●	8mm		
	●	●	With Silencer		

Vacuum Generator Series

Vacuum Generator VJ

VACUUM GENERATOR

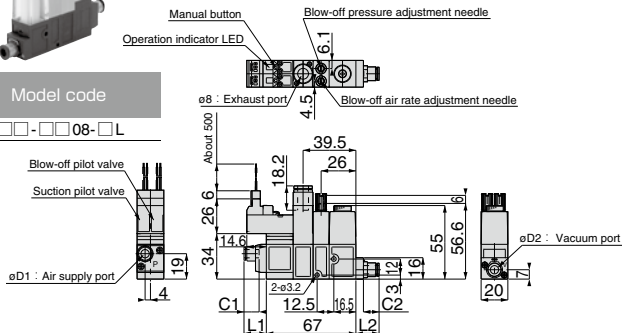
VJ Tube exhaust, Wire lead-out direction: Top

Chart P.174



Model code

VJ□□□-□□08-□L



Unit : mm

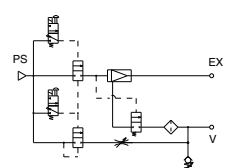
Air supply port applicable tube O.D. : øD1	C1	L1
4	11.2	14.6
6	11.7	17.1

Unit : mm

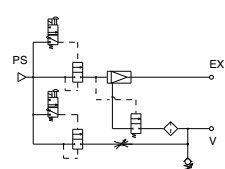
Vacuum port applicable tube O.D. : øD2	C2	L2
4	10.9	14.3
6	11.7	17.2
8	21.7	25.8

Circuit diagram

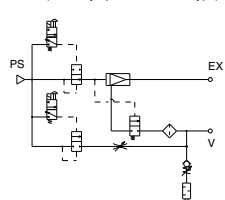
VJA...(Double solenoid stand-alone type)



VJB...(Normally closed stand-alone type)



VJC...(Normally open stand-alone type)



177

VH-VS

VU

VUM

VY

VB

VM-VC

VRL

VG

VK

VJ

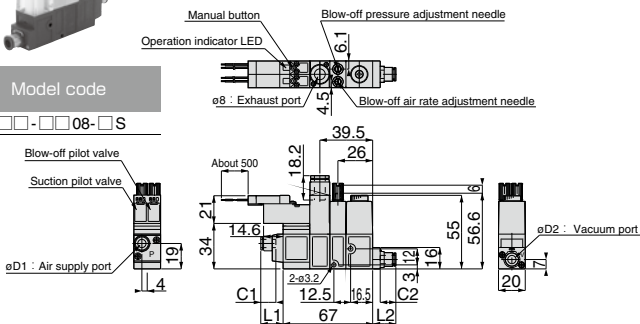
VJ Tube exhaust, Wire lead-out direction: Side

Chart P.174



Model code

VJ□□□-□□08-□S



Unit : mm

Air supply port applicable tube O.D. : øD1	C1	L1
4	11.2	14.6
6	11.7	17.1

Unit : mm

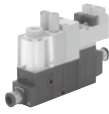
Vacuum port applicable tube O.D. : øD2	C2	L2
4	10.9	14.3
6	11.7	17.2
8	21.7	25.8

Circuit diagram

Please refer to the above circuit.

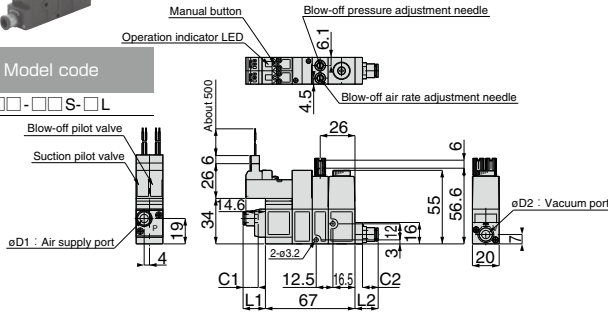
VJ Silencer vent, Wire lead-out direction: Top

Chart P.174



Model code

VJ□□□-□□S-□L

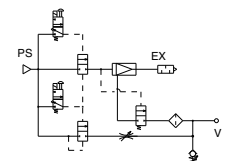


Unit : mm		
Air supply port applicable tube O.D. : φD1	C1	L1
4	11.2	14.6
6	11.7	17.1

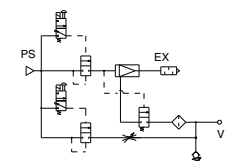
Unit : mm		
Vacuum port applicable tube O.D. : φD2	C2	L2
4	10.9	14.3
6	11.7	17.2
8	21.7	25.8

Circuit diagram

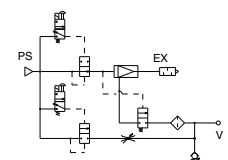
VJA...(Double solenoid stand-alone type)



VJB...(Normally closed stand-alone type)



VJC...(Normally open stand-alone type)



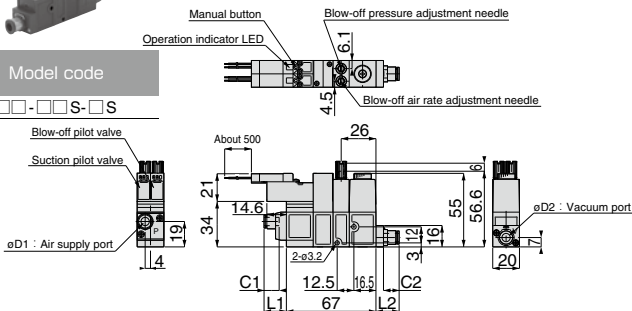
VJ Silencer vent, Wire lead-out direction: Side

Chart P.174



Model code

VJ□□□-□□S-□S



Unit : mm		
Air supply port applicable tube O.D. : φD1	C1	L1
4	11.2	14.6
6	11.7	17.1

Unit : mm		
Vacuum port applicable tube O.D. : φD2	C2	L2
4	10.9	14.3
6	11.7	17.2
8	21.7	25.8

Circuit diagram

Please refer to the above circuit.

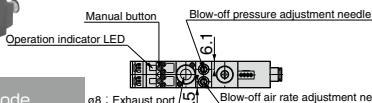
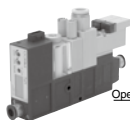
Vacuum Generator Series

Vacuum Generator VJ

VACUUM GENERATOR

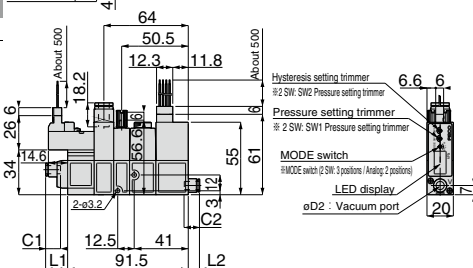
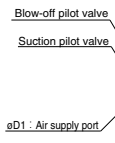
VJ Tube exhaust with vacuum switch, Wire lead-out direction: Top

Chart P.174



Model code

VJ□□□-□□08-□L-□

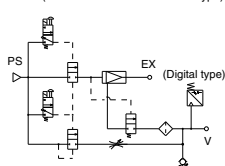


Air supply port applicable tube O.D. : øD1	Unit : mm	
	C1	L1
4	11.2	14.6
6	11.7	17.1

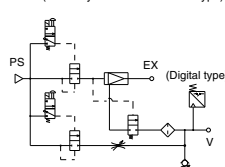
Vacuum port applicable tube O.D. : øD2	Unit : mm	
	C2	L2
4	10.9	5.8
6	11.7	8.7
8	18.2	17.3

Circuit diagram

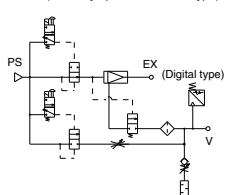
VJA... (Double solenoid stand-alone type)



VJB... (Normally closed stand-alone type)



VJC... (Normally open stand-alone type)



179

VH- VS

VU

VUM

VY

VB

VM- VC

VRL

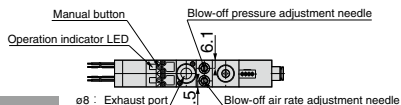
VG

VK

VJ

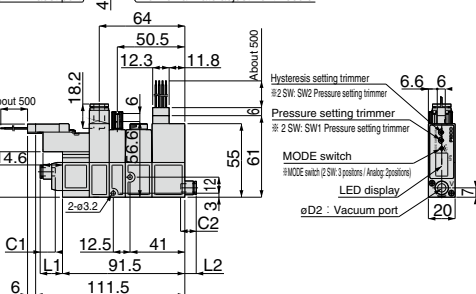
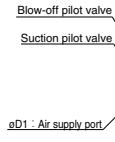
VJ Tube exhaust with vacuum switch, Wire lead-out direction: Side

Chart P.174



Model code

VJ□□□-□□08-□S-□



Air supply port applicable tube O.D. : øD1	Unit : mm	
	C1	L1
4	11.2	14.6
6	11.7	17.1

Vacuum port applicable tube O.D. : øD2	Unit : mm	
	C2	L2
4	10.9	5.8
6	11.7	8.7
8	18.2	17.3

Circuit diagram

Please refer to the above circuit.

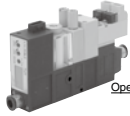
Chart P.174

Characteristic chart page

VJ

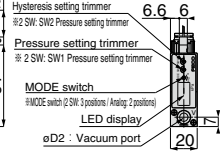
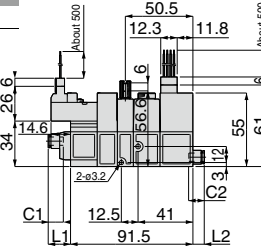
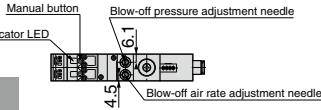
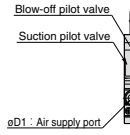
Silencer vent with vacuum switch, Wire lead-out direction: Top

Chart
P.174



Model code

VJ□□□-□□S-□L-□



Unit : mm

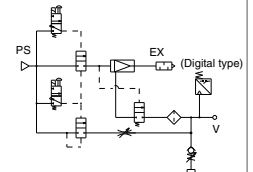
Air supply port applicable tube O.D. : ϕ D1	C1	L1
4	11.2	14.6
6	11.7	17.1

Unit : mm

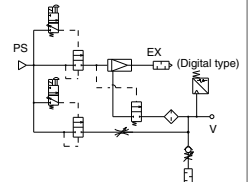
Vacuum port applicable tube O.D. : ϕ D2	C2	L2
4	10.9	5.8
6	11.7	8.7
8	18.2	17.3

Circuit diagram

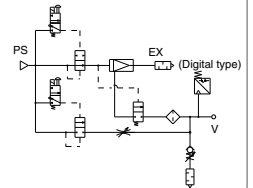
VJA...(Double solenoid stand-alone type)



VJB...(Normally closed stand-alone type)



VJC...(Normally open stand-alone type)



VJ

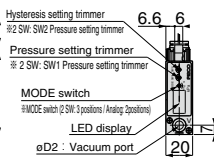
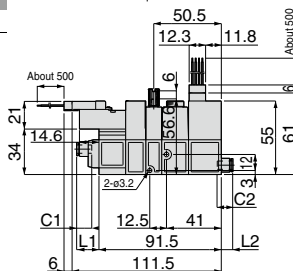
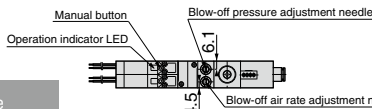
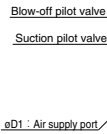
Silencer vent with vacuum switch, Wire lead-out direction: Side

Chart
P.174



Model code

VJ□□□-□□S-□S-□



Unit : mm

Air supply port applicable tube O.D. : ϕ D1	C1	L1
4	11.2	14.6
6	11.7	17.1

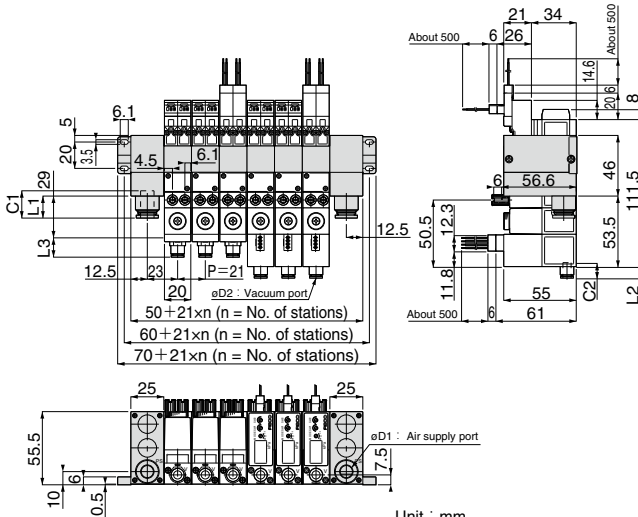
Unit : mm

Vacuum port applicable tube O.D. : ϕ D2	C2	L2
4	10.9	5.8
6	11.7	8.7
8	18.2	17.3

Circuit diagram

Please refer to the above circuit.

VJ Manifold type, Silencer vent, Concentrated wire lead-out direction: Vacuum port side

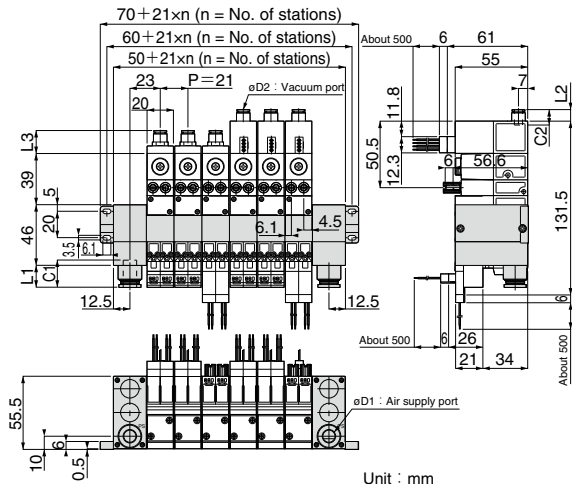


Model code
 VJ□□□-□□S-□□-□A-□

Air supply port applicable tube O.D. : $\phi D1$	Unit : mm	
	C1	L1
6	16.95	11.55
8	18.2	13.1
10	20.7	16.7

Vacuum port applicable tube O.D. : $\phi D2$	Unit : mm		
	C2	L2	L3
4	10.9	5.8	14.3
6	11.7	8.7	17.2
8	18.2	17.3	23

VJ Manifold type, Silencer vent, Concentrated wire lead-out direction: Supply port side



Model code
 VJ□□□-□□S-□□-□B-□

Air supply port applicable tube O.D. : $\phi D1$	Unit : mm	
	C1	L1
6	16.95	11.55
8	18.2	13.1
10	20.7	16.7

Vacuum port applicable tube O.D. : $\phi D2$	Unit : mm		
	C2	L2	L3
4	10.9	5.8	14.3
6	11.7	8.7	17.2
8	18.2	17.3	23

⚠ Detailed Safety Instructions

Before using PISCO products, be sure to read "Safety Instruction" and "Safety Instruction Manual" on page 35-39 and "Common Safety Instructions for Vacuum Series" on page 47-49.

Warning

1. Make sure that the leakage current is less than 1mA, when operating a valve unit. Leakage current larger than that may cause malfunction.
2. Vacuum generator with vacuum retention function permits some vacuum leakage. Provide an appropriate safety measure when vacuum retention for long period of time is required.
3. The coil in a pilot solenoid valve generates heat under the following ① - ③ conditions. The heat may cause dropping life cycle, malfunctions and burn or may affect negatively on peripheral machines.
Contact us when the power is applied to the vacuum generator under the following conditions:
 - ① The power is continuously ON for over 2 hours.
 - ② High-cycle operation.
 - ③ Even when intermittent running of the generator is carried out, the total operation time per day is longer than non-operation time.
4. Regarding double-solenoid types (VJ □□ A··), the switchover valve (main valve) is placed in neutral after the supply of pilot air has been suspended (the same is true when the valve is being operated for the first time after shipment). When resuming the supply of pilot air, be sure to send a signal to the pilot valve, or conduct switchover operations manually as required.

Caution

1. Do not give an excessive tensile strength and bending on a lead wire. Otherwise, breaking wire or damage on connector may be caused.
2. When manifold type is selected, dropping the performance or having an effect to other vacuum ports can be caused depending on number of stations or a combination of mounting units. Contact us for any unclear points.
3. Compressed air contains many kinds of drains such as water, oxidized oil, tar and other foreign substances. Dehumidify the compressed air by using an after-cooler or a dryer and improve the air quality, since those drains seriously impair the performance of the vacuum generator.
4. Do not use lubricators.
5. Since pipe rust cause malfunctions, a filter finer than 5µm should be placed right before the air supply port.
6. Do not use the vacuum generator under the condition of corrosive and / or inflammable gas. Also do not use these gasses as fluid medium.
7. Do not operate a blow-off valve during vacuum generating.
8. When replacing vacuum port cartridge, first remove any foreign substances clinging to them and the surrounding areas, then firmly insert pins into cartridges.
9. When replacing a supply port block, make sure not to lose the seal rubber and remove the foreign substances stuck around the block. Tighten the screw to fix the block with 0.27-0.3Nm of the tightening torque.

△ Safety Rules for Use

■ 1. Safety Rules for Manifold Type

The increase of manifold station may cause troubles such as performance drop by a shortage of air supply and insufficient capability to exhaust, and exhaust air leak to the vacuum port. Allowable station numbers of simultaneous operation differs by nozzle size, vacuum performance, and other conditions. Please contact us for details.

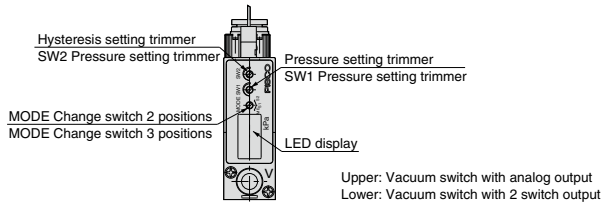
■ 2. LED Digital Vacuum Pressure Sensor (Vacuum Switch)

(1) Pressure Setting Method

- ① Turn on the power (Make sure the correct wiring and apply DC power to the vacuum pressure sensor).
- ② -1 Set the indicator switch at Pressure Setting Mode (ME → S1 / S2 and SW)
- ② -2 (Vacuum switch with analog output)
Fully turn the hysteresis setting trimmer (HYS) in the counterclockwise direction in order to minimize the hysteresis adjustment in advance.
- ③ Adjust the pressure adjusting trimmer (S1 / S2 and SW) with a flathead screwdriver to set at the desired value.
- ④ Set the indicator switch at ME and apply pressure and check the actual operation.
(Vacuum switch with 2 switch output)
Switch output 1 (S1): Red LED turns ON at the pressure with more than the setting.
Switch output 2 (S2): Green LED turns ON at the pressure with more than the setting.
(Vacuum switch with analog output)
Switch output (SW): Red LED turns ON at the pressure with more than the setting.

(2) Differential response setting

- ① Differential response setting can be adjusted by the hysteresis setting trimmer (HYS).
- ② Differential response setting range is regulated within about 0-15% of the set value. Differential response setting becomes large when the trimmer is turned in the clockwise direction.
- ③ Differential response setting adjustment
Set the indicator switch at ME (pressure indication mode). Increase or decrease the supply pressure gradually around the set pressure value and read the value at ON/OFF of the switch LED. Differences in displayed values are taken as differential response.
- ④ Hysteresis adjustment is useful for the following cases:
 - Increase differential response when pressure pulsates with output repeatedly showing small on/off movements.
 - When an allowable range is to be set for the lowering of pressure.

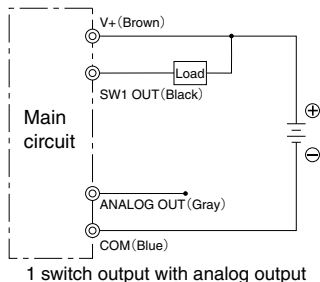
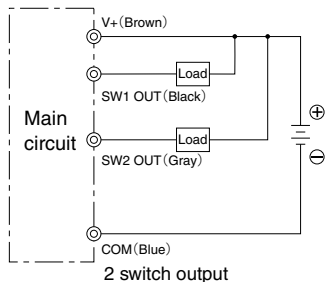


Safety Instructions for LED Digital Vacuum Pressure Sensor

- ① Do not use the vacuum switch in the environment or gasses containing corrosive substance. It may cause a sensor trouble.
- ② Wiring or ways by which noise or other disturbance is caused may cause a sensor trouble.
- ③ Since the sensors are not explosive-proof, do not use them in an inflammable or explosive gas, fluid or atmosphere.
- ④ Since the sensors are not drip / dust proof, do not use them in locations where they may be exposed to water or oil drops or dust.

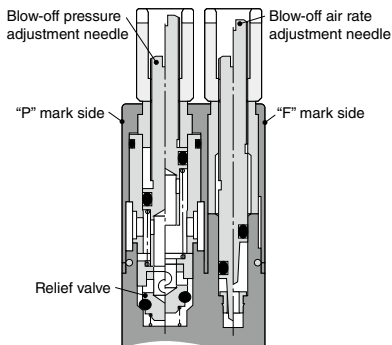
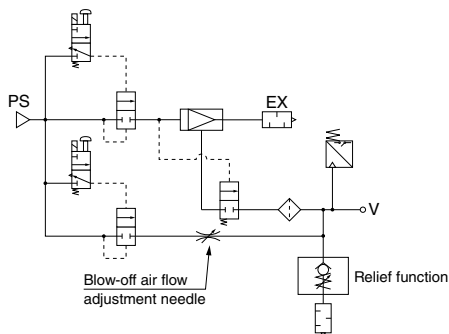
- ⑤ Do not use the sensor in an atmosphere exceeding the range of application temperature or causing heat as sensor malfunction may result.
- ⑥ Make sure to turn off the power before wiring. Check the wire colors, and do not short-circuit output terminals, power supply terminals and COM terminals when wiring. Short-circuits may cause a sensor trouble.
- ⑦ Do not give an excessive tensile strength and bending on a lead wire. Otherwise, breaking wire or damage on connector may be caused.
- ⑧ Do not keep applying 0.2MPa or more of positive pressure to the vacuum pressure sensor constantly during a blow-off air supply. Otherwise, damaging to the sensor may be caused.
- ⑨ When adjusting pressure and differential response, use a flathead screwdriver (accessory). Do not apply an excessive force on the trimmer and slowly turn it within its rotation limits. Otherwise, there is a risk of damaging the trimmer and the circuit board.
- ⑩ Supply a stable DC power to the product.
- ⑪ Add a surge absorption circuit to relays or solenoid valves, etc. which are to be connected with output terminal and source terminal. Do not apply a current exceeding 80mA.
- ⑫ Ground the FG terminal when using a unit power source such as switching current.
- ⑬ Output terminals (lead wire color: black and gray) and other terminals should not be short-circuited.
- ⑭ Avoid strong external impacts and excessive force to the sensor body.

(3) Wire connecting method



3. Adjusting Method of Relief Valve

(1) Circuit diagram / Construction

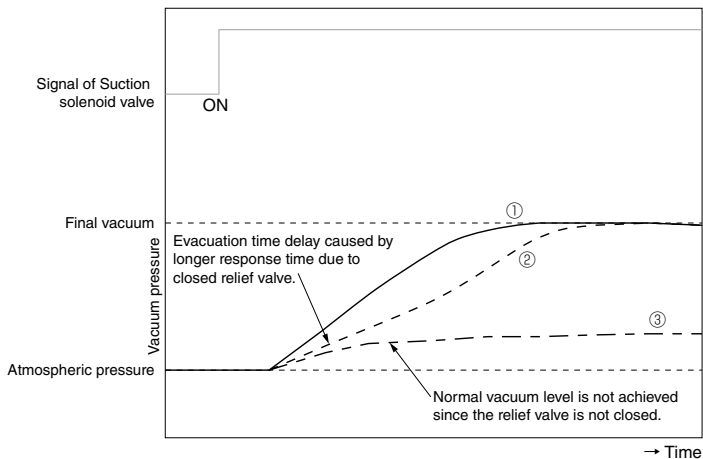


- (2) Adjust and set the amount of pressure by referring to the following "Table 1. Open limit of the blow-off pressure relief needle".

Table 1. Open limit of the blow-off pressure adjustment needle

Vacuum characteristics	H : High-vacuum type				L : Large-flow type			E : High-vacuum at low air supply pressure type		
	0.5	0.7	1.0	1.2	0.5	0.7	1.0	0.7	1.0	1.2
Nozzle bore (mm)	0.5	0.7	1.0	1.2	0.5	0.7	1.0	0.7	1.0	1.2
Max. open limit (rotations)	6.5	7.5	8.5	9.0	7.5	8.0	9.0	7.5	8.0	8.5

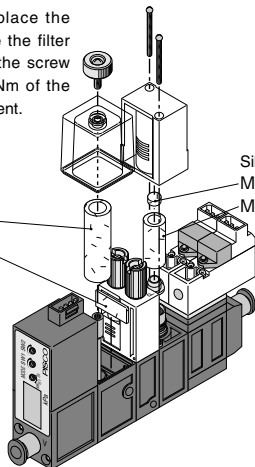
- ※ In case of External Vacuum Controller "VJP Series" (VJP□), open limit of of the blow-off pressure needle differs according to the performance of a vacuum pump. Adjust the needle within the condition under which the startup time and vacuum level are not affected.
 - ※ Table 1 represents the referential values at rated supply pressure. Open limit of the blow-off pressure needle can change by factors such as supply pressure, vacuum characteristics and volume of piping at vacuum side. Values in table 1 are only reference values.
- (3) Reconfirm if the vacuum characteristics and the evacuation time are not influenced and abnormal after setting the blow-off pressure.
- ※ Be noted that the evacuation time may become longer or normal final vacuum level may not be obtained when the pressure adjustment needle opening exceeds the limit indicated in Table 1. (Please refer to the following (5) Others.)
- (4) Adjust the desired blow-off air rate by blow-off air rate adjustment needle.
- ※ Increase the amount of blow-off air if shorter blow-off air time is required.
 - ※ Decrease the amount of blow-off air flow in order to avoid a work from being blown away.
- (5) Others
- 1) When the pressure adjustment needle opening is adequate, a vacuum rising becomes like ① in the below graph.
 - 2) If the pressure adjustment needle opening exceeds the limit, a vacuum rising becomes like ② in the below graph and evacuation time becomes longer.
 - 3) If the pressure adjustment needle is opened more from ② of below graph, a vacuum rising becomes like ③ in the below graph and proper vacuum level cannot be obtained.



■ Replacement Element

- Remove the fixing screw to replace the filter element. Make sure to place the filter seal rubber properly and tighten the screw to fix the filter cover with 0.3-0.5Nm of the tightening torque after the replacement.

Vacuum filter element
Model code : VGFE10
Model code : VJFF



Silencer element
Model code : SEE0602
Model code : VJEF

■ How to detach silencer element

- Remove 2 fixing screws by a proper screwdriver.
- Detach the element cover and replace silencer elements (Model code: SEE0602 & VJEF).

■ How attach silencer elements

- Tighten 2 fixing screws firmly with 0.18-0.2Nm of the tightening torque by a proper screwdriver.

SAFETY Instructions


This safety instructions aim to prevent personal injury and damage to properties by requiring proper use of PISCO products.


Be certain to follow ISO 4414 and JIS B 8370


ISO 4414 : Pneumatic fluid power...Recommendations for the application of equipment to transmission and control systems.

JIS B 8370 : General rules and safety requirements for systems and their components.

This safety instructions is classified into "Danger", "Warning" and "Caution" depending on the degree of danger or damages caused by improper use of PISCO products.

 **Danger** Hazardous conditions. It can cause death or serious personal injury.

 **Warning** Hazardous conditions depending on usages. Improper use of PISCO products can cause death or serious personal injury.

 **Caution** Hazardous conditions depending on usages. Improper use of PISCO products can cause personal injury or damages to properties.

Warning

1. Selection of pneumatic products

- ① A user who is a pneumatic system designer or has sufficient experience and technical expertise should select PISCO products.
- ② Due to wide variety of operating conditions and applications for PISCO products, carry out the analysis and evaluation on PISCO products. The pneumatic system designer is solely responsible for assuring that the user's requirements are met and that the application presents no health or safety hazards. All designers are required to fully understand the specifications of PISCO products and constitute all systems based on the latest catalog or information, considering any malfunctions.

2. Handle the pneumatic equipment with enough knowledge and experience

- ① Improper use of compressed air is dangerous. Assembly, operation and maintenance of machines using pneumatic equipment should be conducted by a person with enough knowledge and experience.

3. Do not operate machine / equipment or remove pneumatic equipment until safety is confirmed.

- ① Make sure that preventive measures against falling work-pieces or sudden movements of machine are completed before inspection or maintenance of these machine.
- ② Make sure the above preventive measures are completed. A compressed air supply and the power supply to the machine must be off, and also the compressed air in the systems must be exhausted.
- ③ Restart the machines with care after ensuring to take all preventive measures against sudden movements.

Disclaimer

1. PISCO does not take any responsibility for any incidental or indirect loss, such as production line stop, interruption of business, loss of benefits, personal injury, etc., caused by any failure on use or application of PISCO products.
2. PISCO does not take any responsibility for any loss caused by natural disasters, fires not related to PISCO products, acts by third parties, and intentional or accidental damages of PISCO products due to incorrect usage.
3. PISCO does not take any responsibility for any loss caused by improper usage of PISCO products such as exceeding the specification limit or not following the usage the published instructions and catalog allow.
4. PISCO does not take any responsibility for any loss caused by remodeling of PISCO products, or by combinational use with non-PISCO products and other software systems.
5. The damages caused by the defect of Pisco products shall be covered but limited to the full amount of the PISCO products paid by the customer.



SAFETY INSTRUCTION MANUAL

PISCO products are designed and manufactured for use in general industrial machines. Be sure to read and follow the instructions below.

Danger

1. Do not use PISCO products for the following applications.
 - ① Equipment used for maintaining / handling human life and body.
 - ② Equipment used for moving / transporting human.
 - ③ Equipment specifically used for safety purposes.

Warning

1. Do not use PISCO products under the following conditions.
 - ① Beyond the specifications or conditions stated in the catalog, or the instructions.
 - ② Under the direct sunlight or outdoors.
 - ③ Excessive vibrations and impacts.
 - ④ Exposure / adhere to corrosive gas, inflammable gas, chemicals, seawater, water and vapor. *
 - * Some products can be used under the condition above(④), refer to the details of specification and condition of each product.
2. Do not disassemble or modify PISCO products, which affect the performance, function, and basic structure of the product.
3. Turn off the power supply, stop the air supply to PISCO products, and make sure there is no residual air pressure in the pipes before maintenance and inspection.
4. Do not touch the release-ring of push-in fitting when there is a working pressure. The lock may be released by the physical contact, and tube may fly out or slip out.
5. Frequent switchover of compressed air may generate heat, and there is a risk of causing burn injury.
6. Avoid any load on PISCO products, such as a tensile strength, twisting and bending. Otherwise, there is a risk of causing damage to the products.
7. As for applications where threads or tubes swing / rotate, use Rotary Joints, High Rotary Joints or Multi-Circuit Rotary Block only. The other PISCO products can be damaged in these applications.
8. Use only Die Temperature Control Fitting Series, Tube Fitting Stainless SUS316 Series, Tube Fitting Stainless SUS316 Compression Fitting Series or Tube Fitting Brass Series under the condition of over 60°C (140° F) water or thermal oil. Other PISCO products can be damaged by heat and hydrolysis under the condition above.
9. As for the condition required to dissipate static electricity or provide an antistatic performance, use EG series fitting and antistatic products only, and do not use other PISCO products. There is a risk that static electricity can cause system defects or failures.
10. Use only Fittings with a characteristic of spatter-proof such as Anti-spatter or Brass series in a place where flame and weld spatter is produced. There is a risk of causing fire by sparks.
11. Turn off the power supply to PISCO products, and make sure there is no residual air pressure in the pipes and equipment before maintenance. Follow the instructions below in order to ensure safety.
 - ① Make sure the safety of all systems related to PISCO products before maintenance.
 - ② Restart of operation after maintenance shall be proceeded with care after ensuring safety of the system by preventive measures against unexpected movements of machines and devices where pneumatic equipment is used.
 - ③ Keep enough space for maintenance when designing a circuit.
12. Take safety measures such as providing a protection cover if there is a risk of causing damages or fires on machine / facilities by a fluid leakage.

⚠ Caution

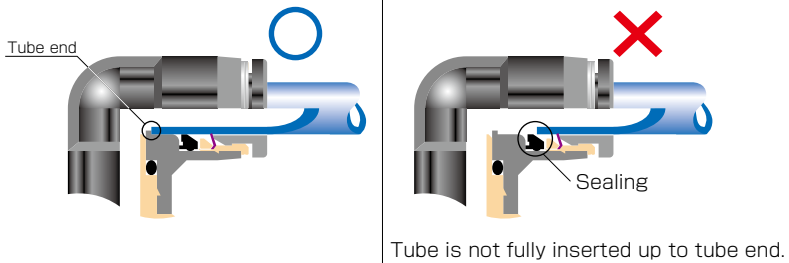
1. Remove dusts or drain before piping. They may get into the peripheral machine / facilities and cause malfunction.
2. When inserting an ultra-soft tube into push-in fitting, make sure to place an Insert Ring into the tube edge. There is a risk of causing the escape of tube and a fluid leakage without using an Insert Ring.
3. The product incorporating NBR as seal rubber material has a risk of malfunction caused by ozone crack. Ozone exists in high concentrations in static elimination air, clean-room, and near the high-voltage motors, etc. As a countermeasure, material change from NBR to HNBR or FKM is necessary. Consult with PISCO for more information.
4. Special option "Oil-free" products may cause a very small amount of a fluid leakage. When a fluid medium is liquid or the products are required to be used in harsh environments, contact us for further information.
5. In case of using non-PISCO brand tubes, make sure the tolerance of the outer tube diameter is within the limits of Table 1.

● Table 1. Tube O.D. Tolerance

mm size	Nylon tube	Polyurethane tube	inch size	Nylon tube	Polyurethane tube
ø1.8mm	—	± 0.05mm	ø1/8	± 0.1mm	± 0.15mm
ø3mm	—	± 0.15mm	ø5/32	± 0.1mm	± 0.15mm
ø4mm	± 0.1mm	± 0.15mm	ø3/16	± 0.1mm	± 0.15mm
ø6mm	± 0.1mm	± 0.15mm	ø1/4	± 0.1mm	± 0.15mm
ø8mm	± 0.1mm	± 0.15mm	ø5/16	± 0.1mm	± 0.15mm
ø10mm	± 0.1mm	± 0.15mm	ø3/8	± 0.1mm	± 0.15mm
ø12mm	± 0.1mm	± 0.15mm	ø1/2	± 0.1mm	± 0.15mm
ø16mm	± 0.1mm	± 0.15mm	ø5/8	± 0.1mm	± 0.15mm

6. Instructions for Tube Insertion

- ① Make sure that the cut end surface of the tube is at right angle without a scratch on the surface and deformations.
- ② When inserting a tube, the tube needs to be inserted fully into the push-in fitting until the tubing edge touches the tube end of the fitting as shown in the figure below. Otherwise, there is a risk of leakage.



- ③ After inserting the tube, make sure it is inserted properly and not to be disconnected by pulling it moderately.
- ※ When inserting tubes, Lock-claws may be hardly visible in the hole, observed from the front face of the release-ring. But it does not mean the tube will surely escape. Major causes of the tube escape are the followings;
- ① Shear drop of the lock-claws edge
 - ② The problem of tube diameter (usually small)
- Therefore, follow the above instructions from ① to ③, even lock-claws is hardly visible.

7. Instructions for Tube Disconnection

- ① Make sure there is no air pressure inside of the tube, before disconnecting it.
- ② Push the release-ring of the push-in fitting evenly and deeply enough to pull out the tube toward oneself. By insufficient pushing of the release-ring, the tube may not be pulled out or damaged by scratch, and tube shavings may remain inside of the fitting, which may cause the leakage later.

8. Instructions for Installing a fitting

- ① When installing a fitting, use proper tools to tighten a hexagonal-column or an inner hexagonal socket. When inserting a hex key into the inner hexagonal socket of the fitting, be careful so that the tool does not touch lock-claws. The deformation of lock-claws may result in a poor performance of systems or an escape of the tube.
- ② Refer to Table 2 which shows the recommended tightening torque. Do not exceed these limits to tighten a thread. Excessive tightening may break the thread part or deform the gasket and cause a fluid leakage. Tightening thread with tightening torque lower than these limits may cause a loosened thread or a fluid leakage.
- ③ Adjust the tube direction while tightening thread within these limits, since some PISCO products are not rotatable after the installation.

● Table 2: Recommended tightening torque / Sealock color / Gasket materials

Thread type	Thread size	Tightening torque	Sealock color	Gasket materials
Metric thread	M3 × 0.5	0.7N·m	—	SUS304 NBR
	M5 × 0.8	1.0 ~ 1.5N·m		
	M6 × 1	2 ~ 2.7N·m		
	M3 × 0.5	0.5 ~ 0.6N·m		POM
	M5 × 0.8	1 ~ 1.5N·m		
	M6 × 0.75	0.8 ~ 1N·m		
Taper pipe thread	M8 × 0.75	1 ~ 2N·m	White	—
	R1/8	7 ~ 9N·m		
	R1/4	12 ~ 14N·m		
	R3/8	22 ~ 24N·m		
Unified thread	R1/2	28 ~ 30N·m	—	SUS304, NBR
	No.10-32UNF	1.0 ~ 1.5N·m		
National pipe thread taper	1/16-27NPT	7 ~ 9N·m	White	—
	1/8-27NPT	7 ~ 9N·m		
	1/4-18NPT	12 ~ 14N·m		
	3/8-18NPT	22 ~ 24N·m		
	1/2-14NPT	28 ~ 30N·m		

※ These values may differ for some products. Refer to each specification as well.

9. Instructions for removing a fitting

- ① When removing a fitting, use proper tools to loosen a hexagonal-column or an inner hex bolt.
- ② Remove the sealant stuck on the mating equipment. The remained sealant may get into the peripheral equipment and cause malfunctions.

10. Arrange piping avoiding any load on fittings and tubes such as twist, tensile, moment load, shaking and physical impact. These may cause damages to fittings, tube deformations, bursting and the escape of tubes.



Common Safety Instructions for Vacuum Series

Before selecting or using PISCO products, read the following instructions. Read the detailed instructions for individual series.

Warning

1. If there is a risk of dropping work-pieces during vacuum suction, take a safety measure against the falling of them.
2. Avoid supplying more than 0.1MPa pressure constantly in a vacuum circuit. Since vacuum generators are not explosive-proof, there is a risk of damaging the products.
3. Pay attention to drop of vacuum pressure caused by problems of the supplied air or the power supply. Decrease of suction force may lead to a danger of falling work-piece so that safety measure against the falling of them is necessary.
4. When more than 2 vacuum pads are plumbed on a single ejector and one of them has a suction problem such as vacuum leak, there is a risk of releasing work-pieces from the other pad due to the drop of the vacuum pressure.
5. Do not use in the way by which exhaust port is blocked or exhaust resistance is increased. Otherwise, there is a risk of no vacuum generation or a drop of the vacuum pressure.
6. Do not use the product in the circumstance of corrosive gas, inflammable gas, explosive gas, chemicals, seawater and vapor or do not expose the product to those. Never allow the product to suck those things.
7. Provide a protective cover on the products when it is exposed to sunlight.
8. Carry out clogging check for silencer element in an ejector and a vacuum filter periodically. Clogged element will be a cause to impair the performance or a cause of troubles.
9. Before replacing the element, thoroughly read and understand the method of filter replacement in the catalog.
10. Make sure the correct port of the vacuum generator by this catalog or marking on the products when plumbing. Wrong plumbing can be a risk to damage the product.
11. Supply clean air without sludge or dusts to an ejector. Do not lubricate by a lubricator. There is a risk of malfunction or performance impairing by impurities and oil contained in the compressed air.
12. Do not apply extreme tension, twist or bending forces on a lead wire. Otherwise, it may cause a wire breaking.
13. Locknut needs to be tightened firmly by hand. Do not use any tool to tighten. In case of using tools to tighten the locknut, it may damage the locknut or the product. Inadequate tightening may loosen the locknut and the initial setting can be changed.
14. Do not force the product to rotate or swing even its resin body is rotatable. It may cause damage to the product and a fluid leakage.
15. Do not supply an air pressure or a dry air to the products over the necessary amount. There is a risk of deteriorating rubber materials and malfunction due to oil.
16. Keep the product away from water, oil drops or dusts. These may cause malfunction. Take a proper measure to protect the product before the operation.

17. Do not use the product in the environment of inflammable or explosive gas / fluid. It can cause a fire or an explosion hazard.
18. Do not use the product in the circumstance of corrosive gas, inflammable gas, explosive gas, chemicals, seawater and vapor or do not expose the product to those. Otherwise, it may be a cause of malfunction.
19. Do not clean or paint the products by water or a solvent.

⚠ Caution

1. Operating pressure range in the catalog is the values during ejector operation. Secure the described value of the supplied air, taking a drop of the pressure into consideration. Insufficient pressure, which does not satisfy the spec, may cause abnormal noise, unstable performance and may negatively affect sensors, bringing troubles at last.
2. Effective cross-section area of the air supply side needs to be three times as large as effective cross-section area of the nozzle bore. When arranging piping or selecting PISCO products, secure required effective cross-section area. Insufficient supply pressure may be a cause to impair performance.
3. A Shorter distance of plumbing with a wider bore is preferable at vacuum system side. A long plumbing with a small bore may result in slow response time at the time of releasing work-piece as well as in failure to secure adequate suction flow rate.
4. Plumb a vacuum switch and an ejector with vacuum switch at the end of vacuum system as much as possible. A long distance between a vacuum switch and a vacuum system end may increase plumbing resistance which may lead to a high vacuum level at the sensor even when no suctioning and a malfunction of vacuum switch. Make sure to evaluate the products in an actual system.
5. Refer to "4. Instructions for Installing a fitting" and "5. Instructions for Removing a fitting" under "Common Safety Instructions for Fittings" , when installing or removing Fittings.
6. Refer to "Common Safety Instructions for Pressure Sensors" and "Detailed Safety Instructions" for the handling of digital vacuum switch sensor.
7. Refer to "Common Safety Instructions for Mechanical Vacuum Sensor" for the handling of mechanical vacuum switch.
8. The material of plastic filter cover for VG, VK, VJ, VZ and VX series is PCTG. Avoid the adherence of Chemicals below to the products, and do not use them under those chemical environments.

● Table Chemical Name

Chemical Name
Thinner
Carbon tetrachloride
Chloroform
Acetate
Aniline
Cyclohexane
Trichloroethylene
Sulfuric acid
Lactic acid
Water soluble cutting oil (alkaline)

* There are more chemicals which should be avoided. Contact us for the use under chemical circumstance.

VACUUM GENERATOR
EXTERNAL VACUUM CONTROLLER
VACUUM PAD
VACUUM ACCESSORIES
48
VH-VS
VU
VUM
VY
VB
VM-VC
VRL
VG
VK
VJ
VX
VQ
VZ
VN

9. The material of plastic filter cover for VQ and VFU series is PA. Avoid the adherence of chemicals below to the products, and do not use them under those chemical environments.

● Table Chemical Name

Chemical Name
Methanol
Ethanol
Nitric acid
Sulfuric acid
Hydrochloric acid
Lactic acid
Acetone
Chloroform
Aniline
Trichloroethylene
Hydrogen peroxide

* There are more chemicals which should be avoided. Contact us for the use under chemical circumstance.