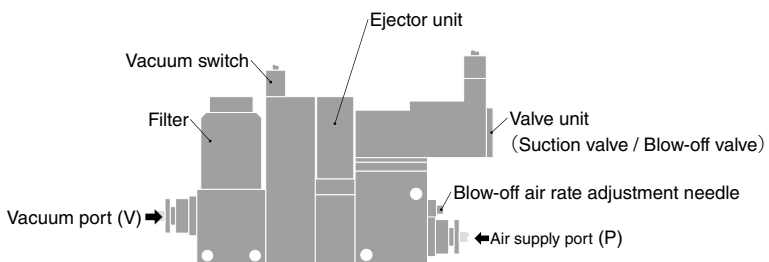


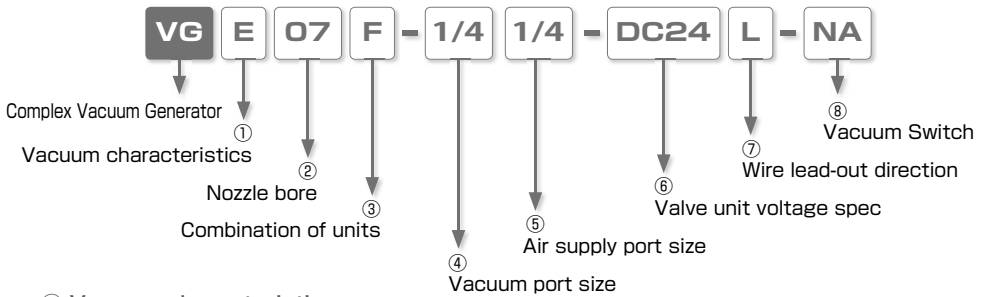
Complex Ejector focusing on basic performance Vacuum Generator **VG Series**

- *Vacuum switch and blow-off valve are united. Select the best combination in accordance with applications.*
- *There are 3 output types: 1 switch output and 1 analog output type, 2-point switch output type, and cost saving 1 analog output type.*



Vacuum Generator VG

Model Designation (Example)



① Vacuum characteristics

Code	Performance	Code	Performance	Code	Performance
H	High-vacuum type	L	Large-flow type	E	High-vacuum at low air supply pressure type

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	-26.8 inHg (-90kPa) 0.24scfm (7l/min(ANR))	-19.7 inHg (-66kPa) 0.42scfm (12l/min(ANR))	—	0.41scfm (11.5l/min(ANR))
07	0.7mm	-27.6 inHg (-93kPa) 0.46scfm (13l/min(ANR))	-19.7 inHg (-66kPa) 0.92scfm (26l/min(ANR))	-26.8 inHg (-90kPa) 0.37scfm (10.5l/min(ANR))	0.81scfm (23l/min(ANR)) (0.60scfm (17l/min(ANR)))
10	1.0mm	-27.6 inHg (-93kPa) 0.95scfm (27l/min(ANR))	-19.7 inHg (-66kPa) 1.41scfm (40l/min(ANR))	-26.8 inHg (-90kPa) 0.74scfm (21l/min(ANR))	1.62scfm (46l/min(ANR)) (1.20scfm (34l/min(ANR)))

※ Supply pressure is 72.5psi (0.5MPa) for H and L type and 50.8psi (0.35MPa) for E type.

※ The flow rate in SCFM is a reference value converted by multiplying l/min(ANR) by 0.035.

※ The values of air consumption in () are for E type.

※ The values in the table are representative values. Suction flow can vary by vacuum port dia. or tube length.

③ Combination of units

Code	Filter	Vacuum switch	Suction valve	Blow-off valve
A	○	—	—	—
B	○	○	—	—
E	○	—	○	○
F	○	○	○	○

④ Vacuum port size

Joint type	Push-In Fitting			
Code	5/32	1/4	4	6
Size	ø5/32"	ø1/4"	ø4mm	ø6mm

⑤ Air supply port size

Joint type	Push-In Fitting			
Code	5/32	1/4	4	6
Size	ø5/32"	ø1/4"	ø4mm	ø6mm

⑦ Wire lead-out direction

Code	S	L
lead-out direction	Side	Top

⑥ Valve unit voltage spec

Code	DC24	AC100
Voltage	DC24V	AC100V

⑧ Vacuum Switch (For Unit combination of B and F only)

Code	NW	NA	A
Sensor	2 Switch outputs	1 analog output and 1 switch output	1 analog output

Specification

Fluid medium	Air
Operating pressure range	36 ~ 101.5 psi (0.25 ~ 0.7 MPa)
Operating temp. range	40 ~ 122°F (5 ~ 50°C) (No freezing)
Lubrication	Not required

Suction Valve Specification

Valve type	Pilot operated poppet valve	
Rated voltage	DC24V ±10%	AC100V ±10%
Power consumption	1.2W (with LED)	1.5VA (with LED)
Surge protection	Surge absorber	Bridge diode
Operation indicator	Red LED lights up during coil excitation	
Effective sectional area	Cv : 0.271 (5 mm ²)	
Manual operation	Push button (non-lock)	

Blow-off Valve Specification

Valve type	Direct operating poppet	
Rated voltage	DC24V ±10%	AC100V ±10%
Power consumption	1.2W (with LED)	1.5VA (with LED)
Surge protection	Surge absorber	Bridge diode
Operation indicator	Red LED lights up during coil excitation	
Effective sectional area	Cv : 0.008 (0.15 mm ²)	
Manual operation	Push button (non-lock)	

Vacuum Switch Specification

Model type	VG.....-NA	VG.....-NW	VG.....-A	
Model code	FGSE11	FGSE12	FGSE13	
Output Specification	1 switch output 1 analog output	2 switch output	1 analog output	
Power requirements	DC12 ~ 24V ±10% 24VDC ±Ripple (P-P) Max. 10%			
Current consumption (when 24VDC supplied)	Max. 17mA (1 switch: ON)	Max. 25mA (2 switches: ON)	Max. 15mA (Output current: 0mA)	
Fluid medium	Air / Inert gas			
Operating pressure range	0 ~ -29.5 inHg (0 ~ -100kPa)			
Proof pressure	29psi (200kPa)			
Operating temp. range	32 ~ 122°F (0 ~ 50°C) (No freezing)			
Operating humidity range	35 ~ 85%RH (No dew condensation)			
Durability (※)	10 million cycles (0 ~ rated pressure)			
Switch output	No. of pressure setting	1	2	
	Switch output	NPN open collector output		
	Pressure setting range	0 ~ -100 kPa		
	Operating accuracy	±3%F.S. (at 25°C)		
	Differential response	Variable (about 1-15% of set value)	2% F.S. Max	
	Switch capacity	30V DC 80mA Max.		
	Residual voltage	Max. 0.8V		
Analog output	Output voltage	1 ~ 5V	1 ~ 5V	
	Zero point voltage	1 ±0.1V	1 ±0.2V	
	Span voltage	4 ±0.1V	4 ±0.2V	
	Lin / HYS	±0.5%F.S.以下	±0.5%F.S.以下	

* Allowable range: ± 3%F.S. of zero point voltage, Span voltage for analog output, or of switch output accuracy.



Vacuum Generator VG

Filter Specification

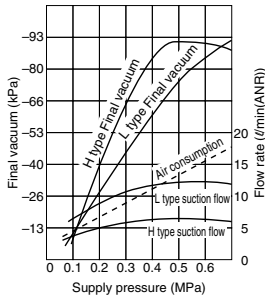
Element material	PVF (Polyvinyl formal)
Filtering capacity	10µm
Element model code	VGFE10

Characteristics

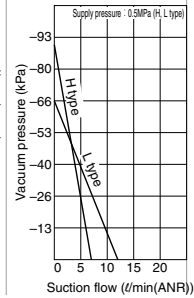
Supply pressure - Final vacuum / Suction Flow / Air Consumption

VG05, VGL05

Vacuum characteristics

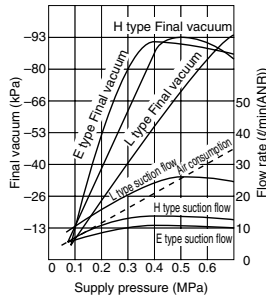


Flow characteristics

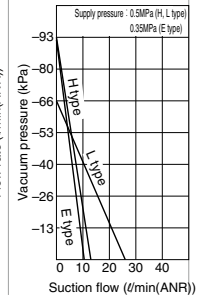


VG07, VGL07, VGE07

Vacuum characteristics

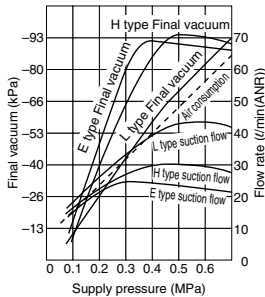


Flow characteristics

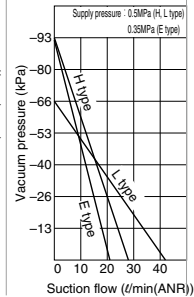


VG10, VGL10, VGE10

Vacuum characteristics



Flow characteristics



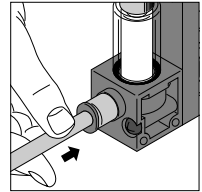
■ How to insert and disconnect

1. How to insert and disconnect tubes

① Tube insertion

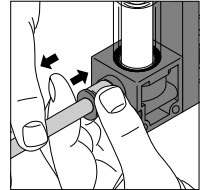
Insert a tube into Push-In Fitting of the vacuum generator VG up to the tube end. Lock-claws bite the tube to fix it and the elastic sleeve seals around the tube.

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



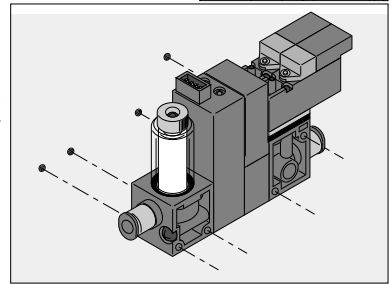
② Tube disconnection

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



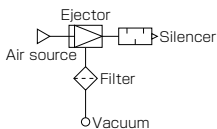
2. How to install the product

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



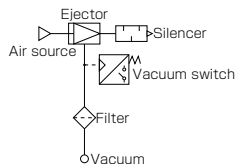
Standard Size List

Unit combination : Built-in Filter Type



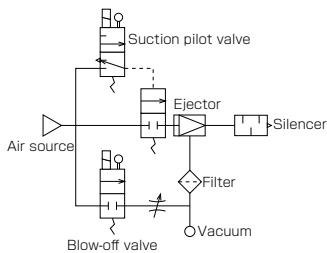
Type	Air supply port	Vacuum port			
		5/32"	1/4"	4mm	6mm
VG A Type	5/32"	●			
	1/4"		●		
	4mm			●	
	6mm				●

Unit combination: Vacuum Switch (digital type) / Built-in Filter Type



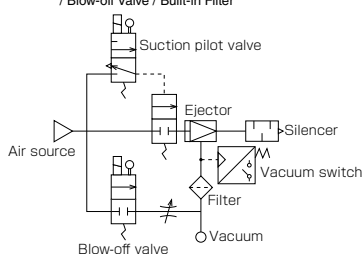
Type	Air supply port	Vacuum port			
		5/32"	1/4"	4mm	6mm
VG B Type	5/32"	●			
	1/4"		●		
	4mm			●	
	6mm				●

Unit combination: Suction Valve / Blow-off Valve / Built-in Filter Type



Type	Air supply port	Vacuum port			
		5/32"	1/4"	4mm	6mm
VG E Type	5/32"	●			
	1/4"		●		
	4mm			●	
	6mm				●

Unit combination: Vacuum Switch (digital type) / Suction Valve / Blow-off Valve / Built-in Filter

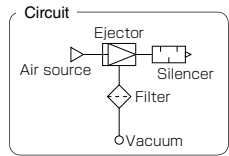
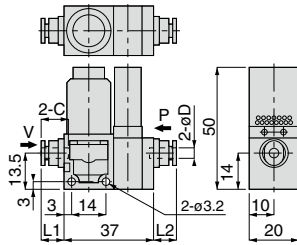


Type	Air supply port	Vacuum port			
		5/32"	1/4"	4mm	6mm
VG F Type	5/32"	●			
	1/4"		●		
	4mm			●	
	6mm				●

VG A Type Built-in Filer Type

A-Type

RoHS compliant



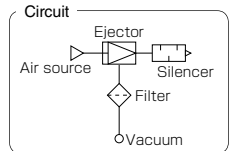
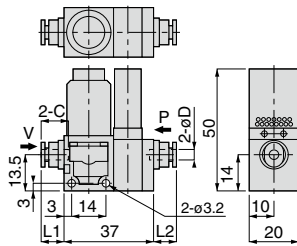
Unit : mm

Model code	Tube O.D. øD	L1	L2	C	Nozzle Bore (mm)	Final vacuum (-kPa)	Suction flow (l/min(ANR))	Air consumption (l/min(ANR))
VGH05A-5/32 5/32	5/32"	9.6	9.1	10.9	0.5	90	7	11.5
VGH07A-1/4 1/4	1/4"	17.5	17	17	0.7	93	13	23
VGH10A-1/4 1/4					1		27	46
VGL05A-5/32 5/32	5/32"	9.6	9.1	10.9	0.5	66	12	11.5
VGL07A-1/4 1/4	1/4"	17.5	17	17	0.7		26	23
VGL10A-1/4 1/4					1		40	46
VGE07A-1/4 1/4	1/4"	17.5	17	17	0.7	90	10.5	17
VGE10A-1/4 1/4					1		21	34

VG A Type Built-in Filer Type

A-Type

RoHS compliant

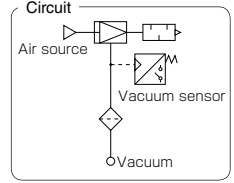
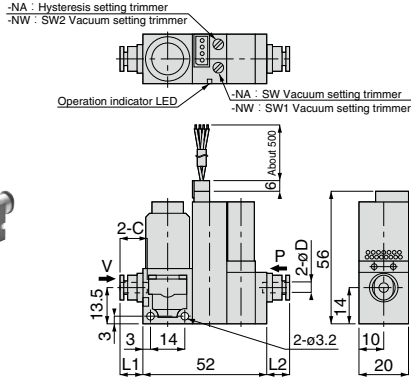


Unit : mm

Model code	Tube O.D. øD	L1	L2	C	Nozzle Bore (mm)	Final vacuum (-kPa)	Suction flow (l/min(ANR))	Air consumption (l/min(ANR))	Weight (g)	CAD file name
VGH05A-44	4	9.6	9.1	10.9	0.5	90	7	11.5	47	VVG-001
VGH07A-66	6	12.1	11.6	11.7	0.7	93	13	23	49	
VGH10A-66					1		27	46	48	
VGL05A-44	4	9.6	9.1	10.9	0.5	66	12	11.5	46	
VGL07A-66	6	12.1	11.6	11.7	0.7		26	23	48	
VGL10A-66					1		40	46	47	
VGE07A-66	6	12.1	11.6	11.7	0.7	90	10.5	17	48	
VGE10A-66					1		21	34		



Vacuum Sensor (digital type) / Built-in Filter Type



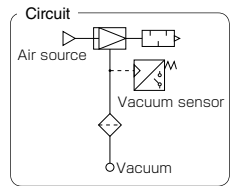
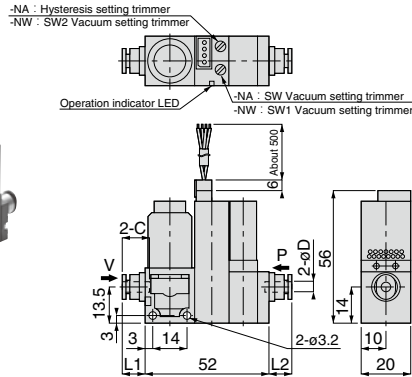
※ 1 analog output type does not have Operation indicator LED and Vacuum Setting Trimmer.

Unit : mm

Model code	Tube O.D. øD	L1	L2	C	Nozzle Bore (mm)	Final vacuum (-kPa)	Suction flow (l/min(ANR))	Air consumption (l/min(ANR))
VGH05B-5/32 5/32-□	5/32"	9.6	9.1	10.9	0.5	90	7	11.5
VGH07B-1/4 1/4-□	1/4"	17.5	17	17	0.7	93	13	23
VGH10B-1/4 1/4-□	1/4"	17.5	17	17	1		27	46
VGL05B-5/32 5/32-□	5/32"	9.6	9.1	10.9	0.5	66	12	11.5
VGL07B-1/4 1/4-□	1/4"	17.5	17	17	0.7		26	23
VGL10B-1/4 1/4-□	1/4"	17.5	17	17	1	40	46	
VGE07B-1/4 1/4-□	1/4"	17.5	17	17	0.7	90	10.5	17
VGE10B-1/4 1/4-□	1/4"	17.5	17	17	1		21	34



Vacuum Sensor (digital type) / Built-in Filter Type



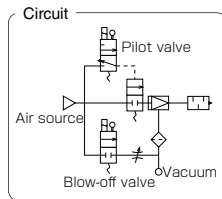
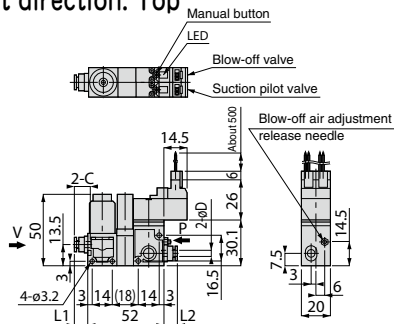
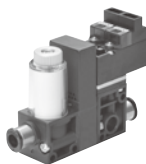
※ 1 analog output type does not have Operation indicator LED and Vacuum Setting Trimmer.

Unit : mm

Model code	Tube O.D. øD	L1	L2	C	Nozzle Bore (mm)	Final vacuum (-kPa)	Suction flow (l/min(ANR))	Air consumption (l/min(ANR))	Weight (g)	CAD file name
VGH05B-44-□	4	9.6	7.6	10.9	0.5	90	7	11.5	74	VVG-001
VGH07B-66-□	6	12.1	10.1	11.7	0.7	93	13	23	75	
VGH10B-66-□	6	12.1	10.1	11.7	1		27	46	75	
VGL05B-44-□	4	9.6	7.6	10.9	0.5	66	12	11.5	73	
VGL07B-66-□	6	12.1	10.1	11.7	0.7		26	23	75	
VGL10B-66-□	6	12.1	10.1	11.7	1	40	46	74		
VGE07B-66-□	6	12.1	10.1	11.7	0.7	90	10.5	17	75	
VGE10B-66-□	6	12.1	10.1	11.7	1		21	34	74	

Vacuum Generator VG

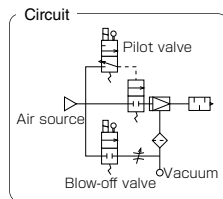
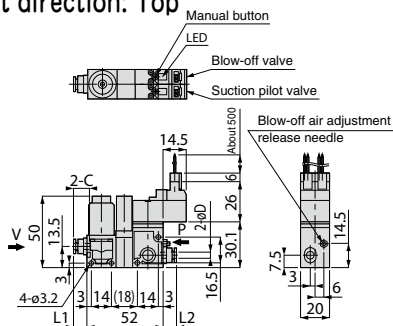
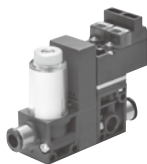
VG E-L Type Suction Pilot Valve / Blow-off Valve / Built-in Filter Type Cable lead-out direction: Top RoHS compliant



Unit : mm

Model code	Tube O.D. øD	L1	L2	C	Nozzle Bore (mm)	Final vacuum (-kPa)	Suction flow (l/min(ANR))	Air consumption (l/min(ANR))
VGH05E-5/32-□L	5/32"	9.6	7.6	10.9	0.5	90	7	11.5
VGH07E-1/4-□L	1/4"	17.5	15.5	17	0.7	93	13	23
VGH10E-1/4-□L	1/4"				1		27	46
VGL05E-5/32-□L	5/32"	9.6	7.6	10.9	0.5	66	12	11.5
VGL07E-1/4-□L	1/4"	17.5	15.5	17	0.7		26	23
VGL10E-1/4-□L	1/4"				1		40	46
VGE07E-1/4-□L	1/4"	17.5	15.5	17	0.7	90	10.5	17
VGE10E-1/4-□L	1/4"				1		21	34

VG E-L Type Suction Pilot Valve / Blow-off Valve / Built-in Filter Type Cable lead-out direction: Top RoHS compliant

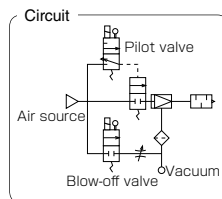
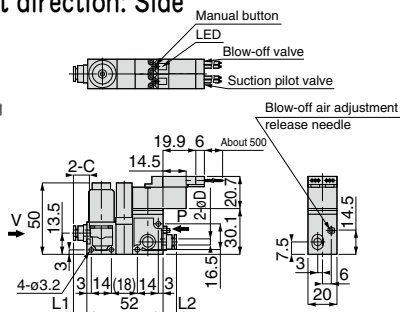


Unit : mm

Model code	Tube O.D. øD	L1	L2	C	Nozzle Bore (mm)	Final vacuum (-kPa)	Suction flow (l/min(ANR))	Air consumption (l/min(ANR))	Weight (g)	CAD file name
VGH05E-44-□L	4	9.6	7.6	10.9	0.5	90	7	11.5	99	VVG-001
VGH07E-66-□L	6	12.1	10.1	11.7	0.7	93	13	23	100	
VGH10E-66-□L					1		27	46	101	
VGL05E-44-□L	4	9.6	7.6	10.9	0.5	66	12	11.5	99	
VGL07E-66-□L	6	12.1	10.1	11.7	0.7		26	23	101	
VGL10E-66-□L					1		40	46	100	
VGE07E-66-□L	6	12.1	10.1	11.7	0.7	90	10.5	17	101	
VGE10E-66-□L					1		21	34	100	

VG E-S Type Suction Pilot Valve / Blow-off Valve / Built-in Filter Type
Cable lead-out direction: Side

RoHS compliant

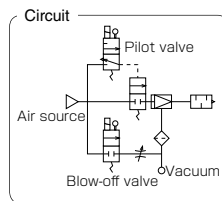
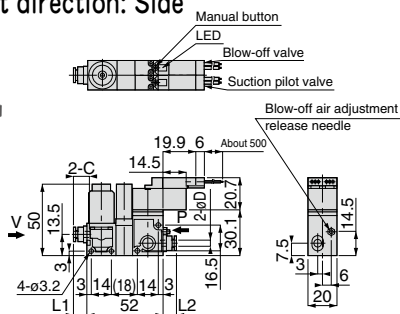
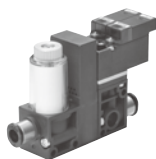


Unit : mm

Model code	Tube O.D. ϕ D	L1	L2	C	Nozzle Bore (mm)	Final vacuum (-kPa)	Suction flow (l/min(ANR))	Air consumption (l/min(ANR))
VGH05E-5/32 5/32-□S	5/32"	9.6	7.6	10.9	0.5	90	7	11.5
VGH07E-1/4 1/4-□S	1/4"	17.5	15.5	17	0.7	93	13	23
VGH10E-1/4 1/4-□S	1/4"	17.5	15.5	17	1		27	46
VGL05E-5/32 5/32-□S	5/32"	9.6	7.6	10.9	0.5	66	12	11.5
VGL07E-1/4 1/4-□S	1/4"	17.5	15.5	17	0.7		26	23
VGL10E-1/4 1/4-□S	1/4"	17.5	15.5	17	1		40	46
VGE07E-1/4 1/4-□S	1/4"	17.5	15.5	17	0.7	90	10.5	17
VGE10E-1/4 1/4-□S	1/4"	17.5	15.5	17	1		21	34

VG E-S Type Suction Pilot Valve / Blow-off Valve / Built-in Filter Type
Cable lead-out direction: Side

RoHS compliant



Unit : mm

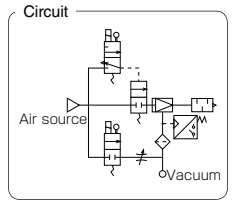
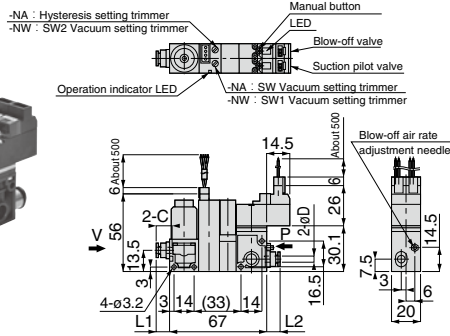
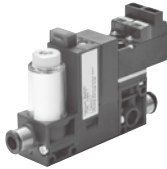
Model code	Tube O.D. ϕ D	L1	L2	C	Nozzle Bore (mm)	Final vacuum (-kPa)	Suction flow (l/min(ANR))	Air consumption (l/min(ANR))	Weight (g)	CAD file name
VGH05E-44-□S	4	9.6	7.6	10.9	0.5	90	7	11.5	99	VVG-001
VGH07E-66-□S	6	12.1	10.1	11.7	0.7	93	13	23	100	
VGH10E-66-□S					1		27	46	101	
VGL05E-44-□S	4	9.6	7.6	10.9	0.5	66	12	11.5	99	
VGL07E-66-□S	6	12.1	10.1	11.7	0.7		26	23	101	
VGL10E-66-□S					1		40	46	100	
VGE07E-66-□S	6	12.1	10.1	11.7	0.7	90	10.5	17	101	
VGE10E-66-□S					1		21	34	100	

Vacuum Generator Series

Vacuum Generator VG



Vacuum Sensor (digital type) / Suction Pilot Valve / Blow-off Valve / Built-in Filter Type Cable lead-out direction: Top



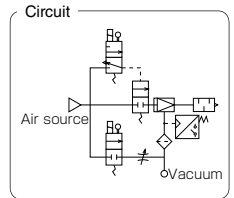
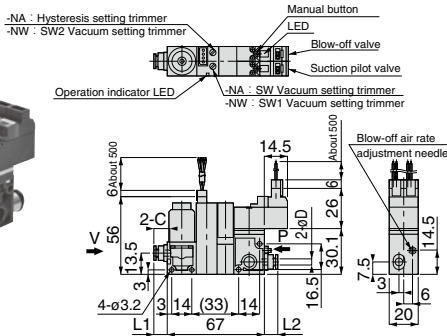
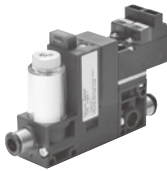
* 1 analog output type does not have Operation indicator LED and Vacuum Setting Trimmer.

Unit : inch

Model code	Tube O.D. øD	L1	L2	C	Nozzle Bore (mm)	Final vacuum (-kPa)	Suction flow (l/min(ANR))	Air consumption (l/min(ANR))
VGH05F-5/32-□L-□	5/32"	9.6	7.6	10.9	0.5	90	7	11.5
VGH07F-1/4-□L-□	1/4"	17.5	15.5	17	0.7	93	13	23
VGH10F-1/4-□L-□	1/4"	17.5	15.5	17	1	93	27	46
VGL05F-5/32-□L-□	5/32"	9.6	7.6	10.9	0.5	66	12	11.5
VGL07F-1/4-□L-□	1/4"	17.5	15.5	17	0.7	66	26	23
VGL10F-1/4-□L-□	1/4"	17.5	15.5	17	1	66	40	46
VGE07F-1/4-□L-□	1/4"	17.5	15.5	17	0.7	90	10.5	17
VGE10F-1/4-□L-□	1/4"	17.5	15.5	17	1	90	21	34



Vacuum Sensor (digital type) / Suction Pilot Valve / Blow-off Valve / Built-in Filter Type Cable lead-out direction: Top



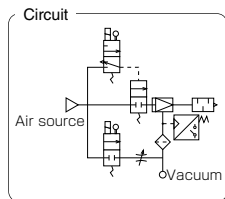
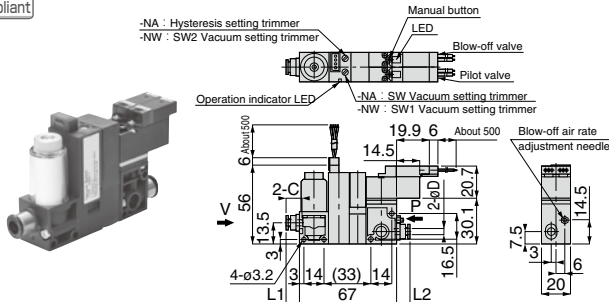
* 1 analog output type does not have Operation indicator LED and Vacuum Setting Trimmer.

Unit : mm

Model code	Tube O.D. øD	L1	L2	C	Nozzle Bore (mm)	Final vacuum (-kPa)	Suction flow (l/min(ANR))	Air consumption (l/min(ANR))	Weight (g)	CAD file name
VGH05F-44-□L-□	4	9.6	7.6	10.9	0.5	90	7	11.5	125	VVG-001
VGH07F-66-□L-□	6	12.1	10.1	11.7	0.7	93	13	23	128	
VGH10F-66-□L-□	6	12.1	10.1	11.7	1	93	27	46	127	
VGL05F-44-□L-□	4	9.6	7.6	10.9	0.5	66	12	11.5	127	
VGL07F-66-□L-□	6	12.1	10.1	11.7	0.7	66	26	23	127	
VGL10F-66-□L-□	6	12.1	10.1	11.7	1	66	40	46	127	
VGE07F-66-□L-□	6	12.1	10.1	11.7	0.7	90	10.5	17	128	
VGE10F-66-□L-□	6	12.1	10.1	11.7	1	90	21	34	128	



Vacuum Sensor (digital type) / Suction Pilot Valve / Blow-off Valve / Built-in Filter Type
Cable lead-out direction: Side



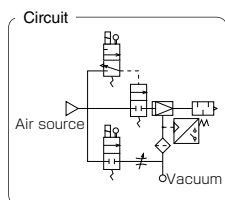
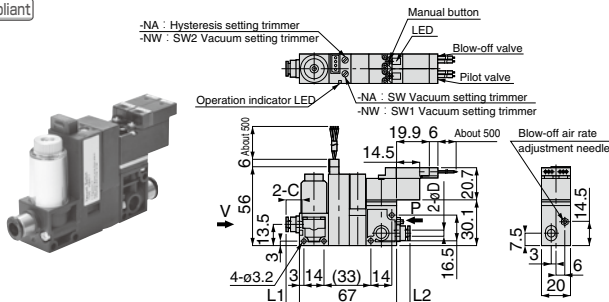
* 1 analog output type does not have Operation indicator LED and Vacuum Setting Trimmer.

Unit : mm

Model code	Tube O.D. øD	L1	L2	C	Nozzle Bore (mm)	Final vacuum (-kPa)	Suction flow (ℓ/min(ANR))	Air consumption (ℓ/min(ANR))
VGH05F-5/32-□S-□	5/32"	9.6	7.6	10.9	0.5	90	7	11.5
VGH07F-1/4-□S-□	1/4"	17.5	15.5	17	0.7	93	13	23
VGH10F-1/4-□S-□	1/4"	17.5	15.5	17	1		27	46
VGL05F-5/32-□S-□	5/32"	9.6	7.6	10.9	0.5	66	12	11.5
VGL07F-1/4-□S-□	1/4"	17.5	15.5	17	0.7		26	23
VGL10F-1/4-□S-□	1/4"	17.5	15.5	17	1		40	46
VGE07F-1/4-□S-□	1/4"	17.5	15.5	17	0.7	90	10.5	17
VGE10F-1/4-□S-□	1/4"	17.5	15.5	17	1		21	34



Vacuum Sensor (digital type) / Suction Pilot Valve / Blow-off Valve / Built-in Filter Type
Cable lead-out direction: Side



* 1 analog output type does not have Operation indicator LED and Vacuum Setting Trimmer.

Unit : mm

Model code	Tube O.D. øD	L1	L2	C	Nozzle Bore (mm)	Final vacuum (-kPa)	Suction flow (ℓ/min(ANR))	Air consumption (ℓ/min(ANR))	Weight (g)	CAD file name
VGH05F-44-□S-□	4	9.6	7.6	10.9	0.5	90	7	11.5	125	VVG-001
VGH07F-66-□S-□	6	12.1	10.1	11.7	0.7	93	13	23	128	
VGH10F-66-□S-□	6	12.1	10.1	11.7	1		27	46	127	
VGL05F-44-□S-□	4	9.6	7.6	10.9	0.5	66	12	11.5	127	
VGL07F-66-□S-□	6	12.1	10.1	11.7	0.7		26	23		
VGL10F-66-□S-□	6	12.1	10.1	11.7	1		40	46		
VGE07F-66-□S-□	6	12.1	10.1	11.7	0.7	90	10.5	17	128	
VGE10F-66-□S-□	6	12.1	10.1	11.7	1		21	34		

⚠ Detailed Safety Instructions

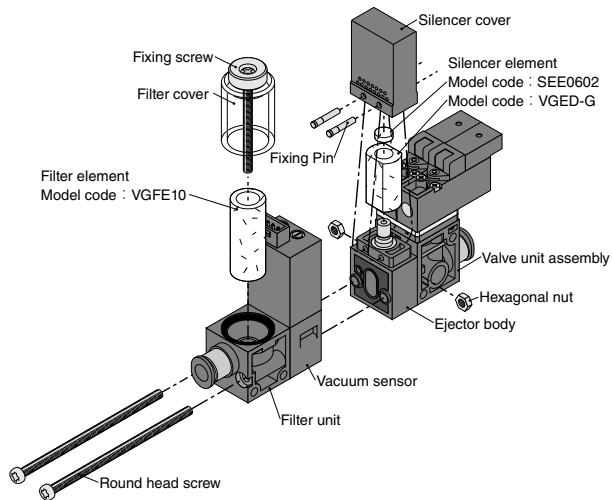
Before using PISCO products, be sure to read "Safety Instructions" and "Safety Instruction Manual", "Common Safety Instructions for Vacuum Series" and "Common Safety Instructions for Vacuum Generator VG & VK".

Warning

1. Attention should be paid when pipe resistance is large or a large amount of blow-off air rate is required. Insufficient blow-off air may cause troubles. Make sure to evaluate PISCO products by actual system.
2. The coil in a pilot valve generates heat under the following ① - ③ conditions. Heating may be a cause of dropping life cycle, malfunctions and burn or may affect negatively on peripheral machines due to the heat. 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.

Replacement Element

Remove the fixing screws to replace filter elements. Make sure not to lose the filter seal ring after the replacement and tighten the screws with tightening torque 0.18-0.22Nm.



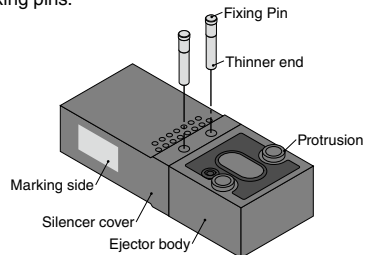
Replacement of Silencer Elements

Replace elements after removing 2 round head screws and 2 fixing pins.

※ Make sure not to lose 2 hexagonal nuts.

Procedures After Replacing Silencer Element

As the right figure shows, attach the silencer cover to the ejector body and insert thinner end of 2 fixing pins into the holes from the side with protrusion of the ejector body. Make sure all seal materials of each unit are fit before assembling the units. Use a screwdriver to appropriately tighten the round head screw and the hexagonal nut with 0.35-0.4Nm of the tightening torque.



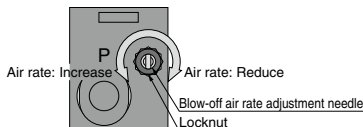
Adjusting Method of Blow-off Air

Adjusting Method of Blow-off Air

- Turn the release needle in the clockwise direction to reduce blow-off air and counter-clockwise to increase.

※ After adjustment of the blow-off air rate, make sure to tighten the locknut to prevent the setting from changing with attentions to the following ① and ②.

- ① Without turning the needle, finger-tighten the lock nut clockwise until it touches needle-guide. Then tighten the nut by turning 20 ~ 30° more by using proper tool.
- ② Be careful not to damage the thread by over tightening.



Attaching / Detaching Individual Plug-in Connector

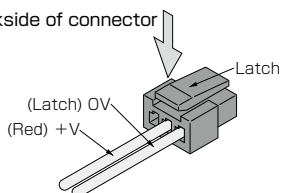
Attaching / Detaching Individual Plug-in Connector

- Insert the connector into the socket until it stops.

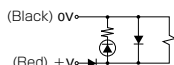
Connector Detaching Method

- Pull out the connector while pushing the latch to the arrowed direction.

Backside of connector

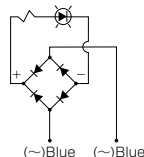


DC24V



Note () is the lead color.

AC 100V



Manual of Vacuum Sensor

1. Pressure Adjustment

- ① Turn on the power (Apply DC power to the vacuum sensor after making sure the correct wiring).
- ② Fully turn the hysteresis setting trimmer (HYS) in the counter-clockwise direction in order to minimize the hysteresis setting. (Vacuum sensor with analog output (Code: -NA) only)
Note) When vacuum level is not stable, minimized hysteresis make the output unstable.
- ③ Adjust the vacuum setting trimmer (S1 / S2 and SW) to meet the required value.
Note) Use a vacuum gauge or check in the actual system for setting pressure.
- ④ Apply the air pressure and check the operation.

(In case of Vacuum sensor with analog output (Code: -NA))

Switch output (SW): Operation indicator (Red LED) turns ON more than the set pressure.

(Vacuum sensor with 2 switch output (Code: -NW))

Switch output 1 (S1): Operation indicator (Red LED) turns ON more than the set pressure.

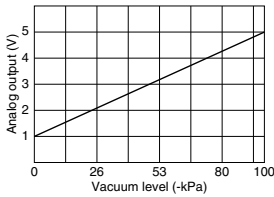
Switch output 2 (S2): Operation indicator (Green LED) turns ON more than the set pressure.

2. Differential response setting (Vacuum sensor with analog output (Code: -NA) only)

- 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 Confirmation of Hysteresis
Gradually increase and decrease the supply pressure around the set pressure value and read the value from a vacuum gauge when operation indicator lamp turns ON/OFF. The difference in the displayed values is 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.

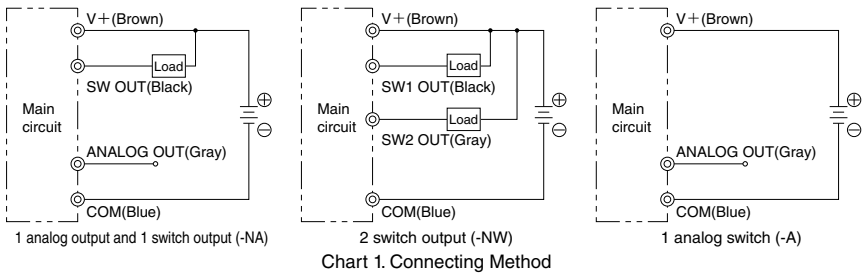
3. Output Characteristics of 1 analog switch (Code: -A).

■ Analog output characteristics



4. Wiring / Piping

- (1) Be sure to shut off the power supply before wiring.
- (2) In conducting the wiring, distinguish the wire colors and confirm the terminal output.
- (3) Refer to Chart 1. Connecting Method for wiring.
- (4) Do not give excessive tension or bending to the drawer cable.
- (5) The cable can be connected or disconnected from connector. In case of disconnection, please hold connector and pull out the cable while pushing stop bar. Avoid connection and disconnection unless it is absolutely necessary, for it will put burdens on the sensor board.



5. Safety Instructions

- ① Do not use the vacuum generator in location where it may be exposed to water, oil drop or dust, since it is not the drip/dust proof.
- ② Do not use the vacuum generator in location where it may be exposed to inflammable or explosive gas, liquid or atmosphere, since it is not an explosive-proof.
- ③ Do not use the sensor in atmosphere exceeding the range of application temperature or causing heat as the vacuum generator malfunction may result.
- ④ When the positive pressure such as blow-off air is applied to the sensor, do not apply the pressure more than 0.2MPa constantly.
- ⑤ Do not use it in an ambience of gas containing a corrosive substance.
- ⑥ 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.
- ⑦ Supply a stable DC power to the product.
- ⑧ Add a surge absorption circuit to relays or solenoid valves, etc. which are to be connected with output terminal and source terminal. Avoid any use which involves over 80mA in current.
- ⑨ Ground FG terminal when using a unit power source such as switching current.
- ⑩ Output terminals (lead wire color: black and gray) and other terminals should not be short circuited.
- ⑪ Do not apply excessive external impact on the sensor.
- ⑫ Wiring or ways by which noise is caused may cause troubles.
- ⑬ When adjusting pressure and the hysteresis setting, use the accompanied flathead screwdriver. Do not apply an excessive force on the trimmer and slowly turn it within its rotation limits.



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.



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

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.



Common Safety Instructions for Vacuum Generator VG and VK Series

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

Warning

1. For the operation of the valve, make sure that the leakage current is less than 1mA. Leakage current larger than that may cause malfunction.
2. The Vacuum Generator with retention function or check valve function permits some vacuum leakage, so provide an appropriate safety measure when vacuum retention for long period of time is required.
3. Long continuous power supply to the valve may raise the temperature of the coil. Heat may cause damaging product life, malfunction, and burns or may adversely affect the peripheral machines. Consult PISCO about such applications.

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 5 μ m should be placed right before the air supply port.
6. Do not use the vacuum generator under the condition of corrosive and/or flammable gases. Also do not use these gasses as a fluid medium.
7. Do not operate blow-off solenoid valve during vacuum generating.
8. When replacing vacuum port cartridge, first remove any foreign matter clinging to them and the surrounding areas, then firmly insert pins into cartridges.
9. For handling and setting of vacuum switch, please read instruction manual carefully.
10. For adjustment of vacuum blow-off air flow or blow-off time of air-timer operated blow-off valve on VK Series, read the instructions carefully.