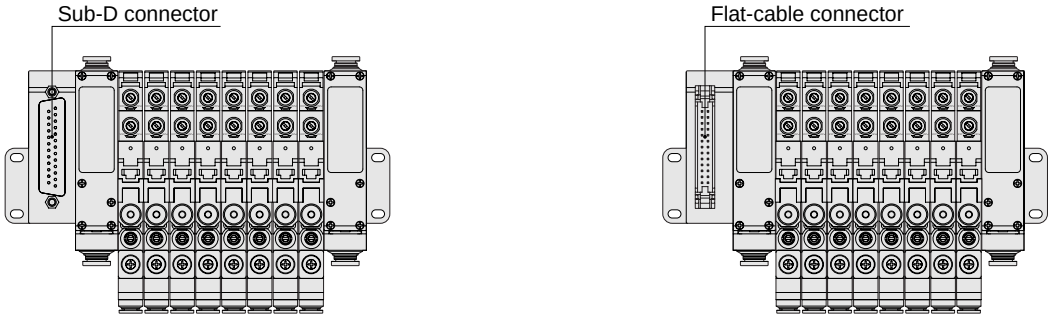
Ejector unit dedicated to Manifold use

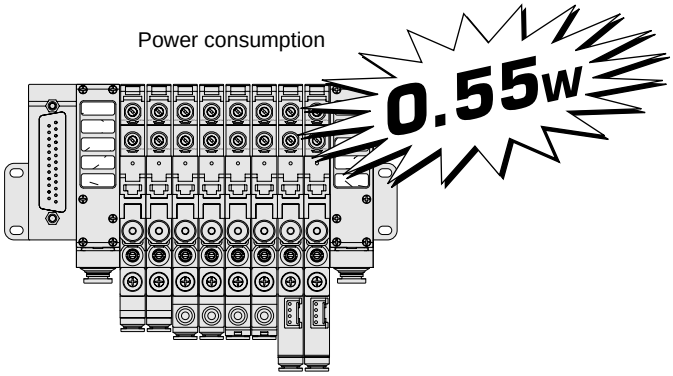
Vacuum Generator VZ Type

Package: 1pc. in a bag

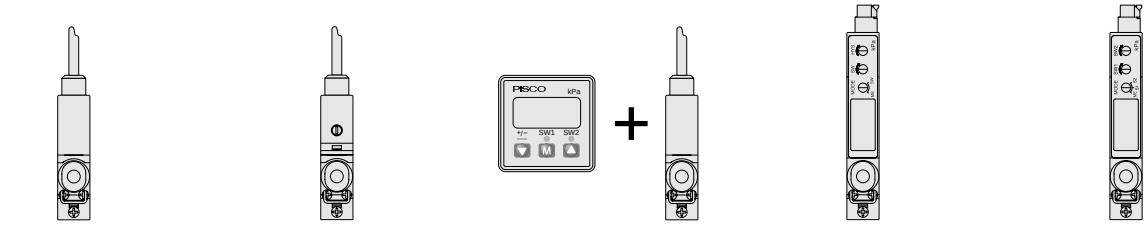
- Small in size and lightweight. Designed for dedicated use in combination with manifold, these VZ type vacuum generators are compatible with both ejector and vacuum pump systems.
- Featuring a built-in air pressure release valve, the VZ type vacuum generator is not only capable of releasing large quantities of air, but it can also substantially reduce vacuum release time.
- Wiring for the supply valve and air release valve is effectively concentrated in one bundle, which contributes to time saving.



- The supply valve is offered in both single- and double-solenoid types allowing you to choose the type that suits your needs.
- Valve power consumption is held down to 0.55W, making substantial power savings a reality.



- A rich variety of vacuum sensors is offered to meet the needs of a wide range of applications.



Analog sensor | One-point switch output sensor | Sensor with separated display | One-point switch output sensor with LED display | Two-point switch output sensor with LED display

- Since the number of manifold can be increased as required, it is possible to quickly respond to any change in specifications.
- Maintenance has been made easier than ever, thanks to a specially designed construction.
- One-touch fitting and female screw are standard for all piping, allowing you to flexibly meet your piping requirements.
- The nozzle diemeter comes in three different dimensions: ø0.5mm, ø0.7mm and ø1.0mm.

Specifications

■Common to all units

Unit	Ejector system-compatible unit	Vacuum pump system-compatible unit
Fluid admitted	Air	
Service pressure range	44 ~ 102psi (0.3 ~ 0.7MPa)	
Service temperature range	41 ~ 122°F (5 ~ 50°C)	
Working vacuum range	—	0 ~ -29.5in. Hg (-100 ~ 0kPa)

■Ejector characteristics

Model	Nozzle dia. (in./mm)	Pressure supply (psi/MPa)	Final vacuum (in. Hg/-kPa)	Suction flow (SCFM/l/min(ANR))	Air consumption (SCFM/l/min(ANR))
VZH05	0.02/0.5	72.5/0.5	-26.7/90.4	0.25/7	0.41/11.5
VZL05			-19.6/66.5	0.42/12	
VZH07	0.03/0.7	72.5/0.5	-27.5/93.1	0.46/13	0.81/23
VZL07			-19.6/66.5	0.85/24	
VZE07		50.8/0.35	-26.7/90.4	0.37/10.5	0.60/17
VZH10	0.04/1.0	72.5/0.5	-27.5/93.1	0.85/24	1.62/46
VZE10		50.8/0.35	-26.7/90.4	0.71/20	1.20/34

■Solenoid valve specifications (Pilot valve)

Item	Vacuum making & supply solenoid valve	Vacuum release solenoid valve
Operating system	Direct operation	
Valve construction	Elastic seal, poppet valve	
Voltage rating	DC24V	
Allowable voltage range	DC21.6 ~ 26.4V	
Surge limiting circuit	Surge absorber	
Power consumption	0.55W (with LED)	
Operational indication	Red LED lighting up when coil excitation is in operation.	The LED lamp appears yellowish green when the coil is excited.
Manual operation	Push & Lock type	
Wiring method	Sub-D connector, Flat cable connector	

■Solenoid valve specifications (Changing valve)

Item		Vacuum making & supply solenoid valve		Vacuum release solenoid valve
Operating system		Pilot valve-activated indirect action		
Valve construction		Elastic seal, poppet valve		
Voltage rating		Single	Double	Single
Valve function		Normally closed		
Proof pressure		152psi (1.05MPa)		
Lubrication		Not required		
Effective sectional area (Cv factor)		4.5mm² (0.24)		3.5mm² (0.19)
Response time	OFF→ON	10msec	10msec	10msec
	ON→OFF	15msec	10msec	15msec

■Vacuum sensor

Item \ Vacuum sensor specification	Fitted with an LED display		No display	Separated type	Analog
	2-point switch output	1-point switch output	1-point switch output	Switch-fitted pressure indicator	
Current consumption	40mA		20mA	50mA	20mA
Pressure detection	Diffused semiconduction pressure switch				(*1)
Service pressure range	0 ~ -29.5in. Hg (-100 ~ 0kPa)				
Pressure setting range	0 ~ -29.2in. Hg (-99 ~ 0kPa)			-999 ~ 999counts	0 ~ -29.5in. Hg (-100 ~ 0kPa)
Proof pressure	29psi (0.2MPa)				29psi (0.2MPa)
Stronge temperature range	-4 ~ 176°F (-20 ~ 80°C)			-4 ~ 158°F (-20 ~ 70°C)	
Operating temperature range	32 ~ 122°F (0 ~ 50°C)			14 ~ 140°F (-10 ~ 60°C)	14 ~ 122°F (-10 ~ 50°C) / 14 ~ 140°F (-10 ~ 60°C)
Operating humidity range	35 ~ 85%RH				
Supply voltage	DC12 ~ 24V ±10% Ripple (P-P) 10% max.		DC10.8 ~ 30V (ripple voltage included)		
Protective structure	IEC standard IP40 equiv.				
Number of switch output points	2	1	1	2	
Switching action accuracy	±0.3%F.S. max. (at Ta=25°C/77°F)				
Differential accuracy	Fixed	Variable	Fixed	Variable	
Switch output	NPN Open collector output				
Analog output: Output voltage		1 ~ 5V		1 ~ 5V	
Analog output: Zero-point voltage		1 ±0.1V		1 ±0.1V	
Analog output: Span voltage		4 ±0.1V		4 ±0.1V	
Analog output: Output current		1mA max.		0.5mA max.	1mA max.
Analog output: LIN/HYS		±0.5%F.S. max.		±0.5%F.S. max.	
Indication	0 ~ 29.2in. Hg (0 ~ -99kPa) (2-digit Red LED display)			3-digit red LED display	
No. of indications	About 4 times/sec			About 4 times/sec	
Indication accuracy	±3%F.S. ±2digit			±1%F.S.	
Resolution	1digit			1digit	
Operational indication	SW1: Red LED lighting up when pressure is above setting.			SW1: (*2)	
	SW2: (*3)			SW2: (*4)	

(*1) Diffused semiconduction pressure switch
(*2) SW1: Green LED lighting up when pressure is above setting.
(*3) SW2: Green LED lighting up when pressure is above setting.
(*4) SW2: Red LED lighting up when pressure is above setting.

■Vacuum release function

Item		Vacuum release valve (ejector system, vacuum pump system)
Vacuum release air flow		Air supply pressure is 72.5psi (0.5MPa)
Air pressure release valve (*1)	Operating system	Air pressure-activated indirect action
	Valve construction	Elastic seal, poppet valve
	Valve type	Normally open
	Lubrication	Not required
	Orifice dia.	0.14in. (3.5mm)

(*1) The air pressure release valve is only available for Ejector system-compatible unit.

■Vacuum filter

Element material	PVF (Polyvinyl formal)
Filtering capacity	10μm
Element surface area	660mm²
Replacement element Model Designation	VZ010B66

Model Designation of ejector system-compatible unit (Example)

VZ [H ①] [05 ②] [D ③] - [4 ④] [1 ⑤] [1 ⑥] - D24 - [V1 ⑦] - M [08 ⑧] - [F ⑨] [26 ⑩]

①. Vacuum characteristics
- **H:** High-vacuum Middle-flow type
- **L:** Middle-vacuum Large-flow type
- **E:** High-vacuum Small-flow type
- **K:** When fitted with a combination of different vacuum generator types (details are given in the specification order form)

②. Nozzle diameter
- **05:** Nozzle diameter: 0.02in. (0.5mm)
- **07:** Nozzle diameter: 0.03in. (0.7mm)
- **10:** Nozzle diameter: 0.04in. (1.0mm)
- **00:** When fitted with a combination of different vacuum generator types (details are given in the specification order form)

③. Valve type
- **No code:** Normally closed type
- **D:** Double solenoid type (retention type)
- **K:** When fitted with a combination of different vacuum generator types (details are given in the specification order form)

④. Vacuum port (V)
- **4:** ø4mm tube fitting
- **6:** ø6mm tube fitting
- **5:** M5×0.8 female screw
- **0:** When fitted with a combination of different vacuum generator types (details are given in the specification order form)

⑤. Air supply port (PV)
- **4:** ø4mm tube fitting
- **6:** ø6mm tube fitting
- **8:** ø8mm tube fitting
- **1:** ø10mm tube fitting

⑥. Exhaust port (R)
- **S:** Open to air type
- **6:** Tube fitting concentrated exhaust type (diameter: 6mm)
- **8:** Tube fitting concentrated exhaust type (diameter: 8mm)
- **1:** Tube fitting concentrated exhaust type (diameter: 10mm)

⑦. Vacuum switch (NPN Open collector)
- **No code:** Without vacuum switch
- **DW:** Pressure sensor with LED display (two-point switch output)
- **DA:** Pressure sensor with LED display (analog and 1-point switch output)
- **S:** No-display 1-point switch output sensor
- **V1:** Negative pressure analog sensor
- **V2:** Separated type LED pressure display + negative pressure analog sensor
- **R1:** Compound pressure analog sensor
- **R2:** Separated type LED pressure display + compound pressure analog sensor
- **K:** When fitted with a combination of different vacuum generator types (details are given in the specification order form)

⑧. No. of manifold

Code	02	03	04	05	06	07	08	09	10	11	12
No. of manifold	2	3	4	5	6	7	8	9	10	11	12

⑨. Wiring type
- **F:** Flat cable connector
- **D:** Sub-D connector

⑩. Designation of the number of connector pins
- **No code:** No. of station; 2~4, 10-pin flat cable connectors
  No. of station; 5~9, 20-pin flat cable connectors
  No. of station; 10~12, 26-pin flat cable connectors
  No. of station; 2~4, 9-pin Sub-D connectors
  No. of station; 5~12, 25-pin Sub-D connectors
- **20:** 20-pin flat cable connectors (Maximum no. of station; 9)
- **26:** 26-pin flat cable connectors (Maximum no. of station; 12)
- **25:** 25-pin Sub-D connectors (Maximum no. of station; 12)

Model Designation of vacuum pump system-compatible unit (Example)

VZP − 4 6 1 − D24 − DW − M 05 − D 25
①②③ ④ ⑤ ⑥ ⑦

①. Vacuum port (V)
- **4:** ø4mm tube fitting
- **6:** ø6mm tube fitting
- **5:** M5×0.8 female screw
- **0:** When fitted with a combination of different vacuum generator types (details are given in the specification order form)

②. Air supply port (PS)
- **4:** ø4mm tube fitting
- **6:** ø6mm tube fitting
- **8:** ø8mm tube fitting

③. Vacuum supply port (PV)
- **4:** ø4mm tube fitting
- **6:** ø6mm tube fitting
- **8:** ø8mm tube fitting
- **1:** ø10mm tube fitting

④. Vacuum switch (NPN Open collector)
- **No code:** Without vacuum switch
- **DW:** Pressure sensor with LED display (two-point switch output)
- **DA:** Pressure sensor with LED display (analog and 1-point switch output)
- **S:** No-display 1-point switch output sensor
- **V1:** Negative pressure analog sensor
- **V2:** Separated type LED pressure display + negative pressure analog sensor
- **R1:** Compound pressure analog sensor
- **R2:** Separated type LED pressure display + compound pressure analog sensor
- **K:** When fitted with a combination of different vacuum generator types (details are given in the specification order form)

⑤. No. of manifold

Code	02	03	04	05	06	07	08	09	10	11	12
No. of manifold	2	3	4	5	6	7	8	9	10	11	12

⑥. Wiring type
- **F:** Flat cable connector
- **D:** Sub-D connector

⑦. Designation of the number of connector pins
- **No code:** No. of station; 2~4, 10-pin flat cable connectors
  No. of station; 5~9, 20-pin flat cable connectors
  No. of station; 10~12, 26-pin flat cable connectors
  No. of station; 2~4, 9-pin Sub-D connectors
  No. of station; 5~12, 25-pin Sub-D connectors
- **20:** 20-pin flat cable connectors (Maximum no. of station; 9)
- **26:** 26-pin flat cable connectors (Maximum no. of station; 12)
- **25:** 25-pin Sub-D connectors (Maximum no. of station; 12)

Model Designation of ejector system-compatible manifold alone (Example)

VZM − 8 ① S ② − 04 ③ − F ④ 20 ⑤

①. Air supply port (PV)
- **4:** ø4mm tube fitting
- **6:** ø6mm tube fitting
- **8:** ø8mm tube fitting
- **1:** ø10mm tube fitting

②. Exhaust port (R)
- **S:** Open to air type
- **6:** Tube fitting concentrated exhaust type (diameter: 6mm)
- **8:** Tube fitting concentrated exhaust type (diameter: 8mm)
- **1:** Tube fitting concentrated exhaust type (diameter: 10mm)

③. No. of manifold

Code	02	03	04	05	06	07	08	09	10	11	12
No. of manifold	2	3	4	5	6	7	8	9	10	11	12

④. Wiring type
- **F:** Flat cable connector
- **D:** Sub-D connector

⑤. Designation of the number of connector pins
- **No code:** No. of station; 2~4, 10-pin flat cable connectors
  No. of station; 5~9, 20-pin flat cable connectors
  No. of station; 10~12, 26-pin flat cable connectors
  No. of station; 2~4, 9-pin Sub-D connectors
  No. of station; 5~12, 25-pin Sub-D connectors
- **20:** 20-pin flat cable connectors (Maximum no. of station; 9)
- **26:** 26-pin flat cable connectors (Maximum no. of station; 12)
- **25:** 25-pin Sub-D connectors (Maximum no. of station; 12)

Model Designation of vacuum pump system-compatible manifold alone (Example)

VZPM − 8 ① 6 ② − 08 ③ − F ④ 26 ⑤

①. Air supply port (PS)
- **4:** ø4mm tube fitting
- **6:** ø6mm tube fitting
- **8:** ø8mm tube fitting

②. Vacuum supply port (PV)
- **4:** ø4mm tube fitting
- **6:** ø6mm tube fitting
- **8:** ø8mm tube fitting
- **1:** ø10mm tube fitting

③. No. of manifold

Code	02	03	04	05	06	07	08	09	10	11	12
No. of manifold	2	3	4	5	6	7	8	9	10	11	12

④. Wiring type
- **F:** Flat cable connector
- **D:** Sub-D connector

⑤. Designation of the number of connector pins
- **No code:** No. of station; 2~4, 10-pin flat cable connectors
  No. of station; 5~9, 20-pin flat cable connectors
  No. of station; 10~12, 26-pin flat cable connectors
  No. of station; 2~4, 9-pin Sub-D connectors
  No. of station; 5~12, 25-pin Sub-D connectors
- **20:** 20-pin flat cable connectors (Maximum no. of station; 9)
- **26:** 26-pin flat cable connectors (Maximum no. of station; 12)
- **25:** 25-pin Sub-D connectors (Maximum no. of station; 12)

Model Designation of ejector system-compatible mounting valve unit (Example)

VZV D ① − D24

①. Valve type
- **No code:** Normally closed type
- **D:** Double solenoid type (retention type)

Model Designation of vacuum pump system-compatible mounting valve unit (Example)

VZPV − D24

Model Designation of ejector system-compatible mounting unit (Example)

VZ L ① 07 ② − 6 ③ − R1 ④

①. Vacuum characteristics
- **H:** High-vacuum Middle-flow type
- **L:** Middle-vacuum Large-flow type
- **E:** High-vacuum Small-flow type

②. Nozzle diameter
- **05:** Nozzle diameter: 0.02in. (0.5mm)
- **07:** Nozzle diameter: 0.03in. (0.7mm)
- **10:** Nozzle diameter: 0.04in. (1.0mm)

③. Vacuum port (V)
- **4:** ø4mm tube fitting
- **6:** ø6mm tube fitting
- **5:** M5 ×0.8 female screw

④. Vacuum switch (NPN Open collector)
- **No code:** Without vacuum switch
- **DW:** Pressure sensor with LED display (two-point switch output)
- **DA:** Pressure sensor with LED display (analog and 1-point switch output)
- **S:** No-display 1-point switch output sensor
- **V1:** Negative pressure analog sensor
- **V2:** Separated type LED pressure display + negative pressure analog sensor
- **R1:** Compound pressure analog sensor
- **R2:** Separated type LED pressure display + compound pressure analog sensor
- **K:** When fitted with a combination of different vacuum generator types (details are given in the specification order form)

Model Designation of vacuum pump system-compatible mounting unit (Example)

VZP − 5 − DW
① ②

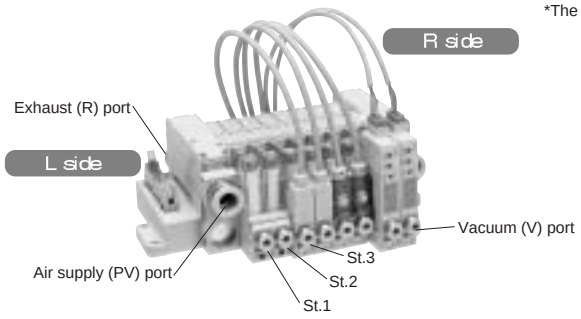
①. Vacuum port (V)
- **4:** ø4mm tube fitting
- **6:** ø6mm tube fitting
- **5:** M5 ×0.8 female screw

②. Vacuum switch (NPN Open collector)
- **No code:** Without vacuum switch
- **DW:** Pressure sensor with LED display (two-point switch output)
- **DA:** Pressure sensor with LED display (analog and 1-point switch output)
- **S:** No-display 1-point switch output sensor
- **V1:** Negative pressure analog sensor
- **V2:** Separated type LED pressure display + negative pressure analog sensor
- **R1:** Compound pressure analog sensor
- **R2:** Separated type LED pressure display + compound pressure analog sensor

Specification order form (Example)

Ejector system-compatible unit type		Vacuum characteristics ①	Nozzle diameter ②	Valve type ③	—	Vacuum port (V) ④	Air supply port (PV) ⑤	Exhaust port (R) ⑥	—	Voltage (V)	—	Vacuum switch specification ⑦	—	No. of manifold ⑧	Connector specification ⑨	Number of connector pins ⑩
VZ		K	00	K	—	0	1	1	—	**D24**	—	K	—	08	F	20
Vacuum pump system-compatible unit type					—	Vacuum port (V) ①	Air supply port (PS) ②	Vacuum supply port (PV) ③	—	Voltage (V)	—	Vacuum switch specification ④	—	No. of manifold ⑤	Connector specification ⑥	Number of connector pins ⑦
VZP					—				—	**D24**	—		—			
L side	St. 1	H	05		—	4			—		—		—			
	St. 2	H	05		—	4			—		—		—			
	St. 3	H	05		—	4			—		—	V1	—			
	St. 4	L	07	D	—	4			—		—	V1	—			
	St. 5	L	07	D	—	4			—		—	S	—			
Station No.	St. 6	L	07	D	—	4			—		—	S	—			
	St. 7	E	10		—	4			—		—	DA	—			
	St. 8	E	10		—	4			—		—	DA	—			
	St. 9				—				—		—		—			
	St. 10				—				—		—		—			
	St. 11				—				—		—		—			
R side	St. 12				—				—		—		—			

*The station No. is in the order of St.1, St.2, St.3…St.12 from L side with the vacuum port in foreground.



Vacuum Generator VZ Type Specification Order Form

To: PISCO

From:

Signature:

Name (Print):

Order No:

Date:

Desiring Delivery Date: Quantity: units

Ejector system-compatible unit type		Vacuum characteristics ①	Nozzle diameter ②	Valve type ③	—	Vacuum port (V) ④	Air supply port (PV) ⑤	Exhaust port (R) ⑥	—	Voltage (V)	—	Vacuum switch specification ⑦	—	No. of manifold ⑧	Connector specification ⑨	Number of connector pins ⑩
VZ					—				—	D24	—		—			
Vacuum pump system-compatible unit type					—	Vacuum port (V) ①	Air supply port (PS) ②	Vacuum supply port (PV) ③	—	Voltage (V)	—	Vacuum switch specification ④	—	No. of manifold ⑤	Connector specification ⑥	Number of connector pins ⑦
VZP					—				—	D24	—		—			
L side	St. 1				—				—		—		—			
	St. 2				—				—		—		—			
	St. 3				—				—		—		—			
	St. 4				—				—		—		—			
	St. 5				—				—		—		—			
Station No.	St. 6				—				—		—		—			
	St. 7				—				—		—		—			
	St. 8				—				—		—		—			
	St. 9				—				—		—		—			
	St. 10				—				—		—		—			
	St. 11				—				—		—		—			
R side	St. 12				—				—		—		—			

Detailed Safety Instructions

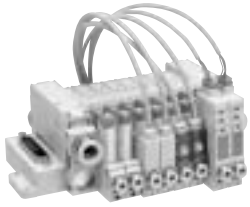
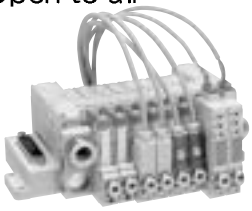
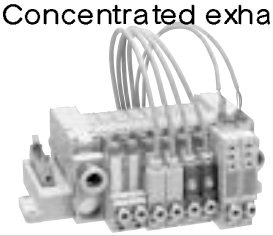
Before using the PISCO device, be sure to read the "Safety Instructions", "Common Safety Instructions for Products Listed in This Manual" on page 15 to 17 and "Common Safety Instructions for Vacuum" on page 139 to 140.

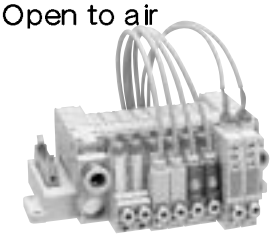
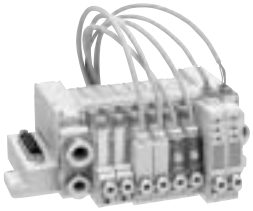
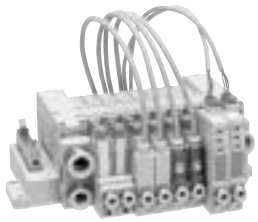
⚠ Warning

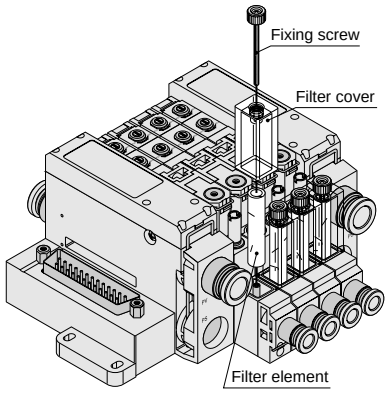
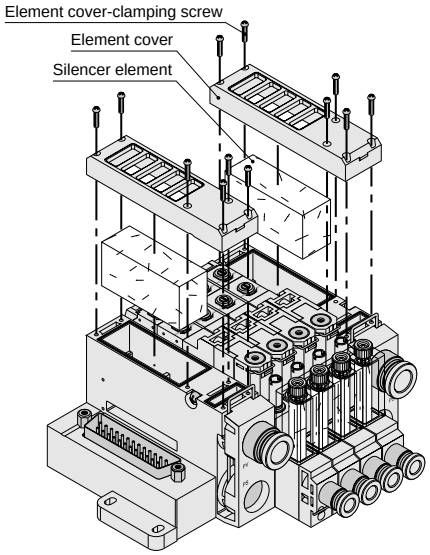
1. When activating solenoid valves, be sure to confirm that leak currents are 1mA or less. Leak currents may lead to errors.
2. Vacuum pump system-compatible units (VZP) are designed to tolerate some leaks. We therefore recommend that additional appropriate safety measures be taken when the state of vacuum is to be retained for a prolonged period of time.
3. Heat will be generated in the coil when electricity is supplied continuosly to the pilot valve for an extended period of time. As this can cause burns and possibly have adverse impacts to peripheral equipment, we recommend that the user consult the nearest PISCO sales office in cases when electricity must be supplied to the pilot valve for a prolonged period of time.
4. With the double-solenoid type (VZ□D…), the switch-over 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 switch-over operations manually as required.
5. When mounting/removing units onto/from a manifold, be sure to turn off the air supply and discharge residual air pressure completely.
6. Do not use solenoid valves in vibration-prone working conditions. Using them in such conditions can lead to errors and/or malfunctions. (Be sure to use solenoid valves in places where vibrations occur at an acceletion of 49m/s^2 or less.)
7. When using the double-solenoid type valve (VZ□D…) in vibration-prone conditions, install the valve so that the direction of vibration is at a right angle to the switch-over valve (main valve).

⚠ Caution

1. Do not pull or bend valve and vacuum switch lead wires excessively. Doing so may result in lead wires being snapped off and connector components broken.
2. Compressed air contains various drains (water, oxidized oils, tar and other foreign matter). Because these drains considerably lower product quality, we recommend that the quality of compressed air be improved by dehumidifying it via a cooler or dryer.
3. Do not use lubricators.
4. Rust, dirt and other foreign matter left in the pipes can cause malfunctions. We therefore recommend that a filter of 5μm or less be placed in front of and close to the supply port. Flushing the interior of the piping prior to operation and/or at regular intervals is also recommended.
5. Do not use the solenoid valves in corrosive and/or flammable gases. Do not use this equipment for the handling of fluids.
6. When mounting a cartridge joint or ejector top plug, be sure to remove extraneous matter from the seal and fix the fastening pin firmly in place. Before conducting this operation, please carefully read the explanation given herein so that you understand all procedural cautions.
7. The performance capability of silencer-fitted manifold may deteriorate due to foreign matter trapped in the elements. We therefore recommend that inspections and maintenance be carried out at regular intervels.
8. When mounting each unit onto a manifold, be sure to remove extraneous matter from the seal, and fix each unit firmly in place using appropriate screws. Before using the manifold, please carefully read the explanation given herein so that you understand all procedural cautions.
9. When wiring Sub-D connectors and flat cable connectors, please carefully study the wiring diagram so that you completely understand the wiring details.
10. The vacuum producing capacity of a manifold-fitted solenoid valve may be reduced due to operational conditions. Please read the operating instructions carefully before using said manifold.

Ejector system-compatible unit		
Sub-D connector specifications		Flat cable connector specifications
VZ Concentrated exhaust 	VZ Open to air 	VZ Concentrated exhaust 
Model	Model	Model
VZ□□-□□□-D24-□-M□-D□	VZ□□-□□S-D24-□-M□-D□	VZ□□-□□□-D24-□-M□-F□

Ejector system-compatible unit	Vacuum pump system-compatible unit	
Flat cable connector specifications	Sub-D connector specifications	Flat cable connector specifications
VZ Open to air 	VZP 	VZP 
Model	Model	Model
VZ□□-□□S-D24-□-M□-F□	VZP-□□□-D24-□-M□-D□	VZP-□□□-D24-□-M□-F□

Filter element for replacement	Silencer element for replacement (ejector system-compatible unit)
	
Model	Model
VZ010B66	VZ010B67
	*2 pcs./set