

Thank you for purchasing PISCO product. Please be sure to read this User's Manual before using this item in order to make sure the safety. Please keep this manual handy with care, so that you can refer to it whenever necessary. Please refer to the enclosed User's manual for the handling of sensor. PISCO products catalogues include Common Safety Instructions for PISCO products and Vacuum equipment. Please confirm the Safety Instructions as well before using this item.

⚠ Safety Instructions

- Warnings
- 1 . Mishandling of compressed air is dangerous. Conduct assembly and maintenance of devises with pneumatic equipment by persons with enough knowledge and experience.
- 2 . Carry out maintenance and checks of equipment only after turning power off, shutting air off and making certain that the pressure in the piping has dropped to zero.
- 3 . Since this item is not of explosion-proof structure, do not use it in surroundings containing flammable and/or explosive gases and/or fluids. Avoid use where constant pressure of 0.1MPa (14.5psi) or above is in the vacuum circuit.
- 4 . The coil generates heat when the solenoid valve is energized in the following ① to ③ conditions. The heat may possibly lead to shorter operating life or system failure of the product. There are also possibilities of bad influence to peripherals or of burn injury by heat.  
If the product is energized in the following conditions, please consult with Pisco in such a case.
  - ① Continuous energizing for about 2 hours or more.
  - ② High cycle energizing.
  - ③ The total energizing time of a day exceeds the total non-energizing time even if it is intermittent energizing.

- Cautions
- 1 . Do not use the equipment other than the service pressure range. Operating it other than the specified pressure range may cause damage or deformation.
- 2 . The leakage current of valve controlling unit is Max. 1mA, otherwise there may be a possibility of malfunction by the leakage current.

Specifications

Type	Ejector unit	Vacuum pump compatible unit
Fluid admitted	Air	
Service pressure range	0.3 ~ 0.7MPa	
Service temperature range	5 ~ 50℃	
Working vacuum range	—	-100 ~ 0kPa

Ejector characteristics

Model		Nozzle diameter (mm)	Supply Pressure (MPa)	Final vacuum (-kPa)	Suction flow (l/min[ANR])	Air consumption (l/min[ANR])
Single nozzle	VQH15	1.5	0.5	93	63	100
	VQL15			66	95	
	VQE15		0.35	92	42	70
	VQH20	2.0	0.5	93	110	200
	VQL20			66	180	
	VQE20		0.35	92	84	150
Twin nozzle	VQT15	0.7 (Small-caliber)	0.5	93 (93)	40 (24)	100 (23)
	VQT20	1.0 (Small-caliber)			70 (36)	200 (46)
2-stage nozzle	VQD07	0.7	0.5	93	52	23
	VQD10	1.0			75	46
	VQD12	1.2			85	70

\* Numerical values in parentheses ( ) for twin-nozzle type vacuum generators are for small-caliber nozzle.

Solenoid valve specifications

Pilot valve	
Operating system	Direct operation
Valve construction	Elastic seal, poppet valve
Voltage rating	24VDC 100VAC
Allowable voltage range	24VDC ±10% 100VAC ±10%
Surge limiting circuit	Surge absorber Bridge diode
Power consumption	0.55W 1.0VA
Manual operation	Lock type push-button
Operating indication	Red LED lights up during coil excitation

Switch-over valve (Switch-over valves for twin-nozzle units)			
Item	Valves for small-caliber nozzle	Valves for Large-caliber nozzle	Blow-off valve
Operating system	Pneumatic operation by pilot valve		
Valve construction	Elastic seal, poppet valve		
Valve type	Normally closed		
Lubrication	Not required		
Effective sectional area (Cv factor)	3.5mm² (0.19)	16.5mm² (0.89)	3.5mm² (0.19)

Switch-over valve (Switch-over valves for 2-stage nozzle units)		
Item	Suction valve	Blow-off valve
Operating system	Pneumatic operation by pilot valve	
Valve construction	Elastic seal, poppet valve	
Valve type	Normally closed, Normally open	Normally closed
Lubrication	Not required	
Effective sectional area (Cv factor)	3.5mm² (0.19)	

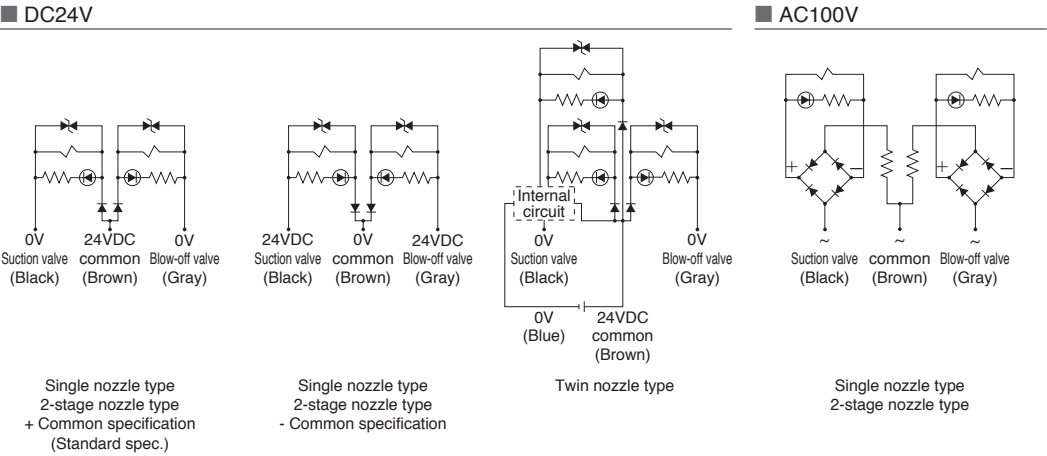
Switch-over valve (Switch-over valves for single-nozzle units)		
Item	Suction valve	Blow-off valve
Operating system	Pneumatic operation by pilot valve	
Valve construction	Elastic seal, poppet valve	
Valve type	Normally closed, Normally open, Double solenoid	Normally closed
Lubrication	Not required	
Effective sectional area (Cv factor)	16.5mm² (0.89)	3.5mm² (0.19)
Min. excitation time	50msec or more (when double solenoid is used)	

Switch-over valve (Switch-over valves for single-nozzle units)		
Item	Suction valve	Blow-off valve
Operating system	Pneumatic operation by pilot valve	
Valve construction	Elastic seal, poppet valve	
Valve type	Normally closed, Normally open	Normally closed
Lubrication	Not required	
Effective sectional area (Cv factor)	16.5mm² (0.89)	3.5mm² (0.19)

Blow-off function	
Blow-off air flow	0 ~ 50l/min[ANR] (Air supply pressure: 0.5MPa)

Filter specifications	
Element material	PVF (polyvinyl formal)
Filtering capacity	10μm
Filter surface area	1,507mm²
Replacement element type	VQ030B61

- Circuit diagram (Solenoid valve)
- Caution
  - 1 . Do not pull or bend the connector cable with excessive force and also avoid repeat action on the cable. Doing so may result in the products broken and the cables being snapped off.



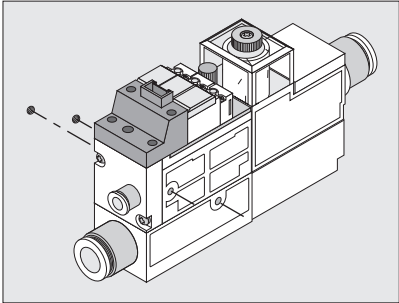
How to fit and release tubing

- Warning
- 1 . Before removing tubing from the unit, be sure to turn off the air supply and discharge residual air pressure completely.
- 2 . Install the piping by checking the supply port, vacuum port and exhaust port in the catalogue.

- (1). Tube insertion
- Simply insert a tubing to the tube end of the fitting built-in Vacuum Generator VQ. The lock-claws automatically fix the tubing, and elastic sleeve seals the tube surrounding. Please refer to "2. Cautions on the fitting of tube" in Common Safety Instructions for Quick-Fitting in PISCO PRODUCTS catalogue.
- (2). Tube Release
- In case of releasing the tube, push the release ring to open the lock-claws and the tube can be released. Before releasing the tube, make certain that the pressure inside the tube is zero pressure.

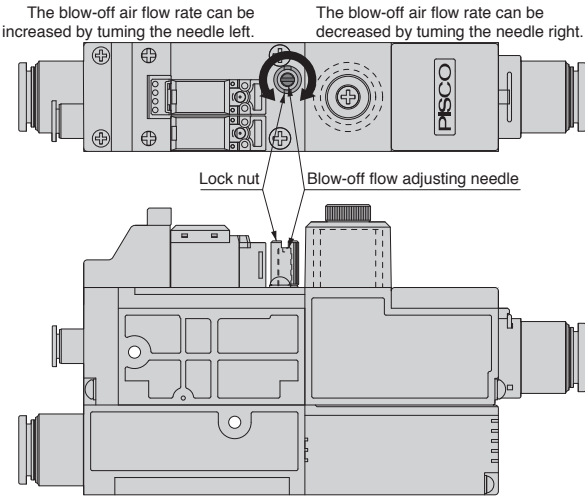
How to fix Vacuum Generator VQ

- Caution
  - 1 . Do not apply excessive vibration to the unit. Using it in such condition can lead to malfunctions and/or errors.
- Fix the generator by M3 thread with the tightening torque of 0.3 ~ 0.35N-m using 2 installation holes on the resin body. Please look up an appearance drawing of the product catalog for the positions of installation holes.



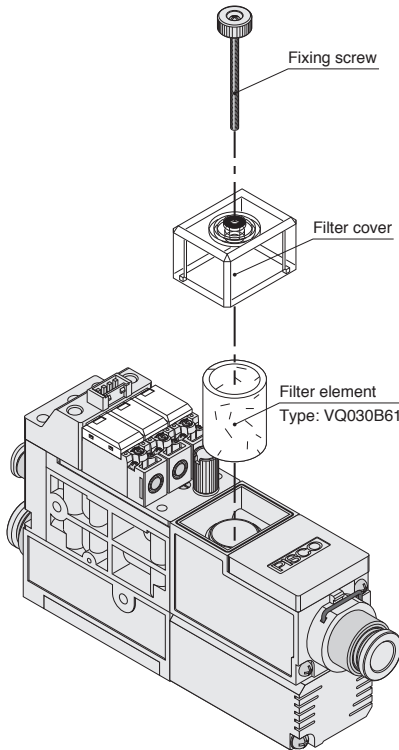
How to adjust blow-off flow

- Caution
  - 1 . Please use a flat-tip screwdriver for adjusting blow-off flow and tightening lock nut.
  - 2 . After the flow has been adjusted, be sure to fix the lock nut firmly at a tightening torque of 0.1 ~ 0.2N-m.
- Turning the blow-off flow adjustment needle clockwise to decrease the flow rate of air, while turning the needle counterclockwise to increase the flow.



How to replace the filter element

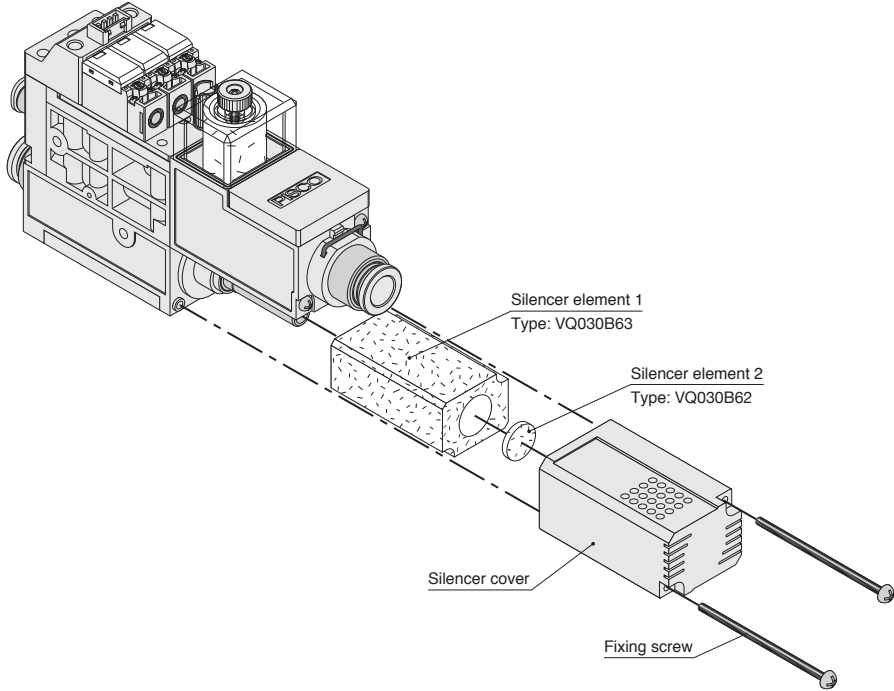
- Changing the filter element is serviced by loosing the fixing screw of the filter cover. After replacing the filter element, with confirming that the filter packing is in place, put the filter cover back on and tighten the fixing screw with 0.3 to 0.5N-m of torque.



How to replace the silencer elements

- Caution
- 1 . Please make sure that the lock pin is inserted correctly after replacing the silencer element.

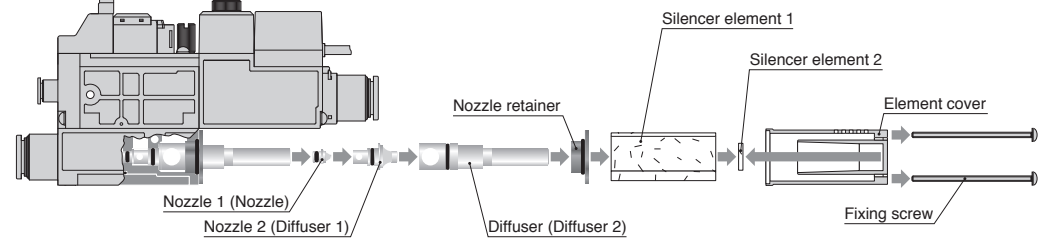
- Changing the silencer element can be serviced by the following procedure.
- ① Using an appropriate Phillips screwdriver, remove the 2 fixing screws.
  - ② After removing the silencer cover, remove the silencer element.
  - ③ After installing new silencer element (type: SED2212), put the silencer cover back on and fix it by 2 fixing screws with 0.4 to 0.4N-m of tightening torque.



How to install, remove and wash the nozzle and diffuser

- Warning
  - 1 . Before supplying air to the unit, do not direct the nozzle outlet at human body. The nozzle may jump out, causing injury.
- Caution
  - 1 . Do not damage the nozzle, diffuser interior or seal and the seal of main body. Otherwise, the unit performance may deteriorate.

- Please follow the following procedure to exchange or to clean the nozzle.
- ①. Removing the 2 fixing screws by an appropriate Phillips screwdriver and remove the silencer cover.
  - ②-1. Single nozzle type: Pull out the nozzle by the following order: nozzle retainer, diffuser, nozzle 1.
  - ②-2. Twin nozzle type: Pull out the nozzle by the following order: nozzle retainer, diffuser, nozzle 2, nozzle 1.
  - ②-3. 2-stage nozzle type: Pull out the nozzle by the following order: nozzle retainer, diffuser 2, diffuser 1, nozzle.
  - ③-1. Single nozzle type: Remove any foreign matter attached to the interior of nozzle 1, diffuser and sealings by air blow or wiping.
  - ③-2. Twin nozzle type: Remove any foreign matter attached to the interior of nozzle 1, nozzle 2, diffuser and sealings by air blow or wiping.
  - ③-3. 2-stage nozzle type: Remove any foreign matter attached to the interior of nozzle, diffuser 1, diffuser 2 and sealings by air blow or wiping.
  - ④-1. Single nozzle type: Install back in the following order: nozzle 1, diffuser, nozzle retainer.
  - ④-2. Twin nozzle type: Install back in the following order: nozzle 1, nozzle 2, diffuser, nozzle retainer.
  - ④-3. 2-stage nozzle type: Install back in the following order: nozzle, diffuser 1, diffuser 2, nozzle retainer.
  - ⑤. Put the silencer element and the silencer cover back in place, tighten the fixing screw by the screwdriver with tightening torque of 0.4 to 0.5N-m.



※Description in parenthesis ( ) is the product with 2-stage nozzle.

\* Please make inquiry about other details to the following.