

Vacuum Generator Complex Type VQ



31.5 mm wide Vacuum Generator Complex Type for the control of large vacuum flow (Stand-alone type)

Safety instructions for this product

Safety instructions, Common safety instructions for each product category and Detailed safety instructions for each product are in the end of this catalog and our website.

Model Designation (Example)

VQ (1)	T15 (2)	C (3)	-	O (4)	O (5)	S (6)	-	D24 (7)	-	NW (8)	 (9)
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(1) Vacuum Generator Complex Type VQ

(2) Nozzle bore

Code	Vacuum characteristics		Nozzle bore (mm)	Supply pressure (MPa)	Vacuum level (kPa)	Suction flow (l/min [ANR])	Air consumption (l/min [ANR])
H15	Single nozzle type	High-vacuum type	1.5	0.5	-93	63 [63]	100
L15		Large-flow type			-66	95 [95]	
E15		High-vacuum at Low air supply pressure type		0.35	-92	42 [42]	70
H20		High-vacuum type	2.0	0.5	-93	96 [97.5]	200
L20		Large-flow type			-66	143 [160]	
E20		High-vacuum at Low air supply pressure type		0.35	-92	70 [70]	150
T15	Twin nozzle type		0.7	0.5	-93	24 [24]	23
			1.5			40 [40]	100
T20			1.0			36 [36]	46
			2.0			70 [70]	200
D07	Two-stage nozzle type		0.7	0.5	-93	52 [52]	23
D10			1.0			75 [75]	46
D12			1.2			85 [85]	70

*1. Suction flow values on the left represent those of vacuum port dia. 8 mm and those in [] are of vacuum port dia. 10 mm.

*2. The values in the table are representative values. Suction flow can vary by vacuum port dia. and tube length.

*3. Twin nozzle type is not CE marked.

(3) Suction valve type

Code	C	O	D
Valve type	Normally closed (N.C.)	Normally open (N.O.)	Double-piloted (Self-holding function)

*1. Normally-closed (code: C) only when a twin-nozzle type is selected in (2).

*2. Normally-closed (code: C) or Normally-open (code: O) only when a 2 -stage nozzle type is selected in (2).

(4) Vacuum port size (V)

Code	8	O
Tube O.D. (mm)	ø8	ø10

(5) Air supply port size (PS)

Code	6	8	O
Tube O.D. (mm)	ø6	ø8	ø10

* Dia. 6 mm tube fitting is selectable only when 2 -stage nozzle type is selected in (2).

(6) Exhaust port (EX)

Code	S	J
Exhaust port	Open to air (Silencer vent)	Tube exhaust (ø12 mm Push-in fitting)

(7) Solenoid valve specification

Code	D24	D24MC	A100
Voltage	24 VDC	24 VDC (Minus Common)	100VAC

*1. For twin nozzle type, only 24 VDC can be selected.

*2. 100VAC type is not CE marked.

(8) Pressure sensor

Code	Specifications
No code	Without Pressure sensor
NW	□30x30 mm square display, 2 points SW output, NPN open collector
PW	□30x30 mm square display, 2 points SW output, PNP open collector

(9) -S3 spec. (Metal option)

Code	No code	-S3(*)
Metal material	Standard spec.	No copper-based metallic materials used in flow paths.
Seal rubber material	Standard spec.	HNBR or FKM
Release-ring color	Black	Dark blue

* -S3 specification is only for tube exhaust type (for air flow) and is not available for electronic components and electric wires.

* Exhaust port of pilot valve: dia. 6 mm Push-in fitting

Characteristics

Exhaust noise of Silencer vent type is 78 dB [A]. (Measured by representative models.)

31.5 -mm wide vacuum unit suitable for the control of large vacuum flows.

3 types of nozzles, each of which has unique features, are offered.

- Nozzle bore for Single nozzle type (1.5, 2.0 mm)
- Nozzle bore for Two-stage nozzle type (0.7, 1.0, 1.2 mm)
- Nozzle bore for Twin nozzle type (1.5, 2.0 mm)

Various valve types.

- Single-nozzle type: Normally open, Normally closed, Double-piloted type
- Two-stage nozzle type: Normally open, Normally closed type
- Twin-nozzle type: Normally closed type

3 -color LCD dual display with high visibility.

Power-save mode can reduce power consumption by 30%.

Minus common spec. is selectable.

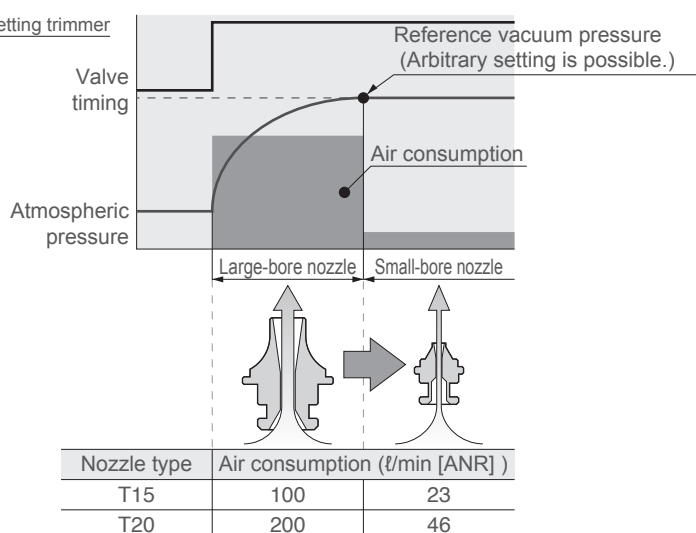
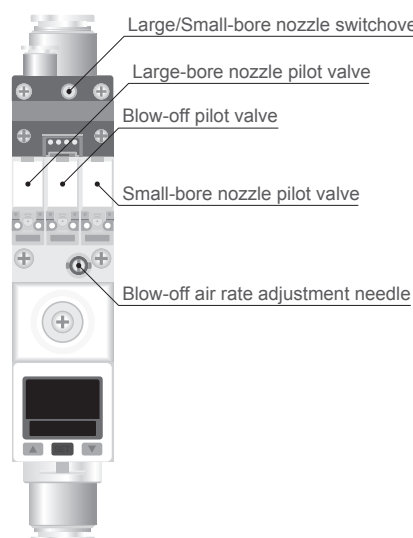
Suitable for applications where negative side of power supply is used as common reference potential.



● Twin nozzle type

Twin nozzle type is suitable for applications with long suction time and conveyance time.

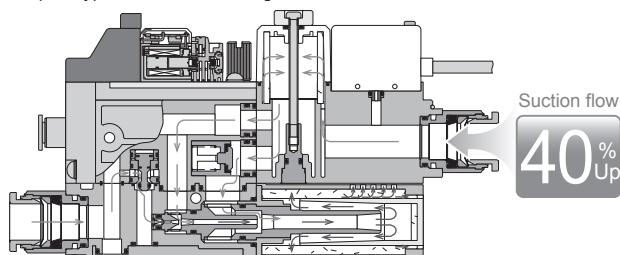
- The large-bore nozzle controls vacuum generation from the start to a prescribed reference vacuum pressure level, followed by the small-bore nozzle for maintaining a vacuum level. This combination allows for energy saving by reducing substantial air consumption.
- One signal controls vacuum generation just like the conventional models.



● Two-stage nozzle type

The two-stage nozzle type's vacuum suction rate has been increased by approximately 40% compared to conventional single nozzle type.

40% increase in suction flow when compared to PISCO Vacuum Generator complex type with the same single nozzle size.



● -S3 spec (Metal option)

No copper-based metallic materials used in flow paths.

Seal rubber material is HNBR or FKM, both of which have good ozone resistance.

Vacuum Generator Complex Type VQ

Specifications

Fluid medium	Air (JIS B 8392-1 : Compliant with [Class 1.2.1 to 2.4.3])	
Operating press. range	0.3 to 0.7 MPa	
Operating temp. range	5 to 50°C (No freezing)	
Operating humid. range	35 to 85 %RH (No dew condensation)	
Vibration resist. /Shock resist.	50 m/s ² max / 150 m/s ² max	
Protective structure	IEC standard IP40 equiv.	
Lubrication	Not required	
Proof pressure	Air supply circuit	1.05 MPa
	Vac. circuit	0.2 MPa

* Proof pressure is the level of pressure at which the product would not be damaged. It does not mean the pressure where the product works normally.

Solenoid valve specifications

Rated voltage	24 VDC ±10%	100 VAC ±10%
Power consumption	0.55 W (with LED)	1.0 VA (with LED)
Surge protection	Varistor	Bridge diode
Operation indicator	Current application: Red LED ON	
Manual override	Push-turn locking	

Suction main valve specifications

■ Single nozzle type

Operation type		Indirect operation by pilot valve		
Valve type		Normally closed	Normally open	Double-piloted (*1)
Response time (Standard)	OFF→ON	24 VDC: 15 msec 100 VAC: 15 msec	24 VDC: 15 msec 100 VAC: 15 msec	24 VDC: 10 msec 100 VAC: 12 msec
	ON→OFF	24 VDC: 18 msec 100 VAC: 24 msec	24 VDC: 10 msec 100 VAC: 16 msec	— —
Response time (Metal option)	OFF→ON	24 VDC: 20 msec 100 VAC: 20 msec	24 VDC: 20 msec 100 VAC: 20 msec	24 VDC: 18 msec 100 VAC: 20 msec
	ON→OFF	24 VDC: 25 msec 100 VAC: 31 msec	24 VDC: 15 msec 100 VAC: 21 msec	— —

*1. Excitation time of the solenoid must be 50 msec or more.

*2. The response time at supply air of 0.5 MPa with rated voltage (100%)

■ Two-stage nozzle type

Operation type		Indirect operation by pilot valve	
Valve type		Normally closed	Normally open
Response time (Standard)	OFF→ON	24 VDC: 10 msec	24 VDC: 18 msec
		100 VAC: 10 msec	100 VAC: 18 msec
	ON→OFF	24 VDC: 10 msec 100 VAC: 16 msec	24 VDC: 10 msec 100 VAC: 16 msec
Response time (-S3 spec.)	OFF→ON	24 VDC: 15 msec	24 VDC: 35 msec
		100 VAC: 15 msec	100 VAC: 35 msec
	ON→OFF	24 VDC: 15 msec 100 VAC: 21 msec	24 VDC: 15 msec 100 VAC: 21 msec

* The response time at supply air is when 0.5 MPa with rated voltage (100%).

■ Twin nozzle type

Operation type		Indirect operation by pilot valve	
Valve type		Normally closed	
Response time (Standard)	OFF→ON	24 VDC: 15 msec	
Response time (Metal option)	OFF→ON	24 VDC: 20 msec	

* The response time at supply air of 0.5 MPa with rated voltage (100%)

Vacuum filter specifications

Element material	PVFM (Polyvinyl formal)
Filtering accuracy (*)	5 μm
Filter area	1,507 mm ²

* Based on PISCO measuring condition.

Blow-off main valve specifications

Operation type		Indirect operation by pilot valve	
Valve type		Normally closed	
Response time (Standard)	OFF→ON	24 VDC: 10 msec	100 VAC: 10 msec
	ON→OFF	24 VDC: 10 msec	100 VAC: 16 msec
Response time (Metal option)	OFF→ON	24 VDC: 12 msec	100 VAC: 12 msec
	ON→OFF	24 VDC: 10 msec	100 VAC: 16 msec

*2 The response time at supply air of 0.5 MPa with rated voltage (100%)

Valve lead wire color

24 VDC Specifications	Black	Gray	Blue	Brown
Twin nozzle type	Suction (—)	Blow-off (—)	Minus (—)	24 VDC (+common)
Two-stage nozzle type	Suction (—)	Blow-off (—)		24 VDC (+common)
Single nozzle type	Suction (—)	Blow-off (—)		24 VDC (+common)
24 VDC (Minus Common)	Black	Gray	Blue	Brown
Two-stage nozzle type	Suction (+)	Blow-off (+)		0V (-common)
Single nozzle type	Suction (+)	Blow-off (+)		0V (-common)
100 VAC Specifications	Black	Gray	Blue	Brown
Two-stage nozzle type	Suction (~)	Blow-off (~)		common (~)
Single nozzle type	Suction (~)	Blow-off (~)		common (~)

Blow-off function

Blow-off air rate	0 to 50 l/min [ANR] (Supply pressure: 0.5MPa)
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* Blow-off air rate varies according to the vacuum port dia. and tube length (piping resistance and others) on vacuum side.

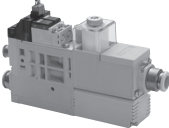
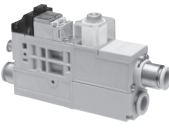
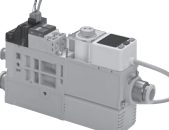
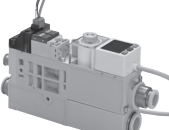
Pressure sensor

Model		VUS-33R-N2	VUS-33R-P2
Pressure range		Compound pressure	
Rated pressure range		-100 kPa to 100 kPa	
Proof pressure		500 kPa	
Fluid medium		Air, non-corrosive gas, incombustible gas	
Power requirement		12 to 24 VDC (Ripple ± 10% max.)	
Current consumption		40 mA max. (At no load)	
Switch output	Switch output	NPN open collector	PNP open collector
	No. of press. setting	2 points output (SW 1, SW 2)	
	Max. load current	125 mA	
	Max. supply voltage	30 VDC	24 VDC
	Int. voltage drop	1.5 V max	
Repeatability		±0.2%F.S. ±1 digit max	
Hysteresis	One point set mode	Adjustable	
	Hysteresis mode		
	Window comparator mode		
Response time		Selectable from 50 ms, 250 ms, 500 ms, 1,000 ms, 2,000 ms, 3,000 ms	
Output short circuit protection		Incorporated	
Digital display		Main display: 3 colors (Red, Green, Orange) Sampling rate: 1, 2 or 5 times/sec. (Adjustable)	
Indication accuracy		±2%F.S. ±1 digit max (Ambient temperature: 25 ±3°C)	
Operation indicator		Orange (1 & 2 indicator) OUT 1, OUT 2	
Weatherability	Protective structure	IEC standard IP40 equiv.	
	Ambient temp. range	Operation: 0 to 50°C, Storage: -10 to 60°C (No dew condensation or freezing)	
	Ambient humidity range	Operation/Storage: 35 to 85%RH (No dew condensation)	
	Withstand voltage	1000 VAC 1 min. (between case and lead wire)	
	Insulation resistance	50 MΩ min. (500 VDC) (between case and lead wire)	
	Vibration resist.	Total amplitude 1.5 mm or 100 m/s ² 10 Hz-150 Hz-10 Hz scan for 1 min., 2 hours in each direction of X, Y, and Z.	
Shock resist.		100 m/s ² , 3 times in each direction of X, Y, and Z.	
Temp. charact.		±2%F.S. max (Standard temp. at 25°C, Range: 0 to +50°C)	
Lead wire		Oil-resistance cable (0.15 mm ²)	

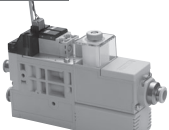
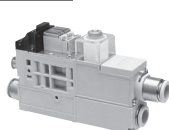
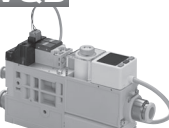
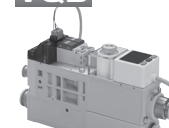
RoHS2 (2011/65/EU+EU2015/863) compliant



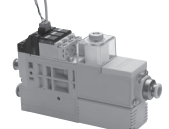
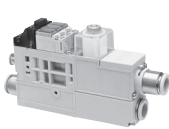
Single nozzle type

Type	Model code	Type	Model code
Without Pressure sensor, Silencer vent VQ	VQ23-45S-7	Without Pressure sensor, Tube exhaust VQ	VQ23-45J-79
			
Type	Model code	Type	Model code
2 switch outputs Pressure sensor, Silencer vent VQ	VQ23-45S-7-8	2 switch outputs Pressure sensor, Tube exhaust VQ	VQ23-45J-7-89
			

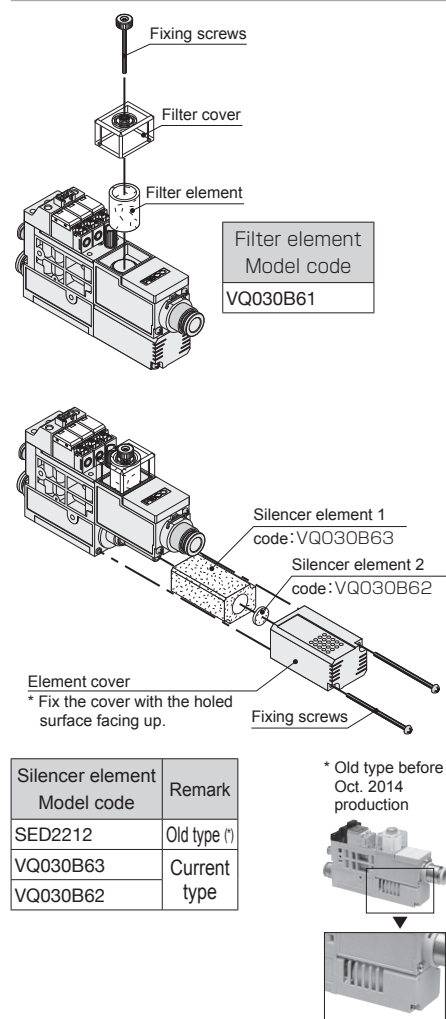
Two-stage nozzle type

Type	Model code	Type	Model code
Without Pressure sensor, Silencer vent VQD	VQD23-45S-7	Without Pressure sensor, Tube exhaust VQD	VQD23-45J-79
			
Type	Model code	Type	Model code
2 switch outputs Pressure sensor, Silencer vent VQD	VQD23-45S-7-8	2 switch outputs Pressure sensor, Tube exhaust VQD	VQD23-45J-7-89
			

Twin nozzle type

Type	Model code	Type	Model code
Without Pressure senso, Silencer vent VQT	VQT2C-45S-D24	Without Pressure sensor, Tube exhaust VQT	VQT2C-45J-D249
			
Type	Model code	Type	Model code
2 switch outputs Pressure sensor, Silencer vent VQT	VQT2C-45S-D24-8	2 switch outputs Pressure sensor, Tube exhaust VQT	VQT2C-45J-D24-89
			

Replacement element



Vacuum

Notes

*1. Please select each code referring to the example of model designation. [2]: Code of vacuum characteristics and nozzle bore, [3]: Suction valve type code, [4]: Vacuum port size code, [5]: Supply air port size code, [7]: Solenoid valve spec. code, and [8]: Pressure sensor code.

*2. 100 VAC type and twin nozzle type are not CE marked.

CAD data is available at PISCO website.

 Packaging specifications
1 pc. / bag

 Options
[9] : -S3 ⇒ -S3 spec. (Metal option)

Weight List

Model code	Exhaust port.		Weight (g)
VQ ² ³ - ⁴ ⁵ S- ⁷ ⁸	Open to air (Silencer vent)		329
VQT ² ³ - ⁴ ⁵ S- ⁷ ⁸			377
VQD ² ³ - ⁴ ⁵ S- ⁷ ⁸			329
VQ ² ³ - ⁴ ⁵ J- ⁷ ⁸	Tube exhaust		352
VQT ² ³ - ⁴ ⁵ J- ⁷ ⁸			400
VQD ² ³ - ⁴ ⁵ J- ⁷ ⁸			352
Model code for vacuum port Cartridge	Applicable Tube O.D. (mm)	Code: ⁴	Weight (g)
CJC18-08	ø8	8	20
CJC18-10	ø10	0	19
Model code for air supply port Cartridge	Applicable Tube O.D. (mm)	Code: ⁵	Weight (g)
CJC18-06	ø6	6	21
CJC18-08	ø8	8	20
CJC18-10	ø10	0	19
Pressure sensor	Code: ⁸		Weight (g)
With 2 switch outputs, NPN open collector output	-NW		57
With 2 switch outputs, PNP open collector output	-PW		57

■ Use the following formula to calculate the weight of Vacuum Generator VQ.

Ex.) VQ H20 C - 0 8 J - D24 - NW

^[2] ^[4] ^[5] ^[8]

352 + 19 + 20 + 57 = 448 g

^[2]. Nozzle type/vacuum characteristics: H20 ⇒ 352 g

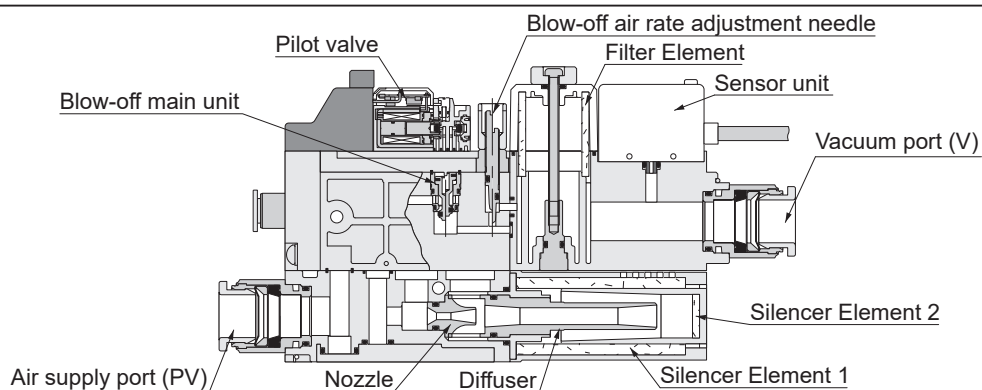
^[4]. Vacuum port Cartridge: 0 ⇒ 19 g

^[5]. Air supply port Cartridge: 8 ⇒ 20 g

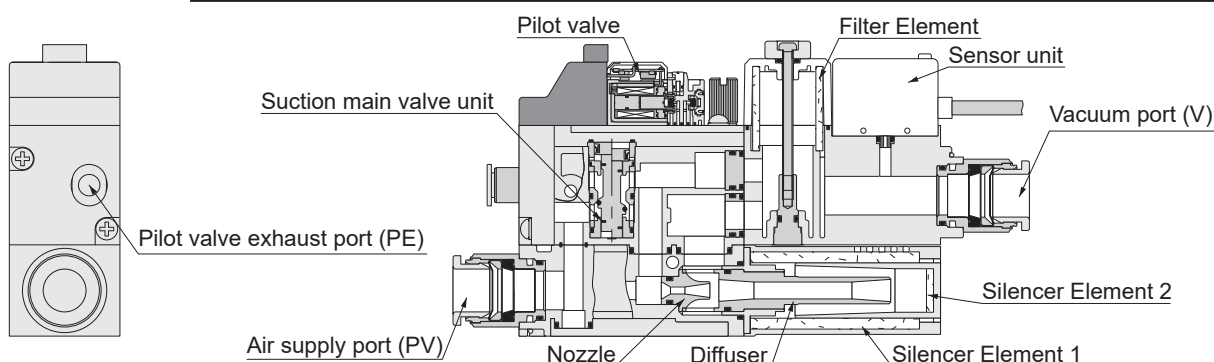
^[8]. Pressure sensor: NW ⇒ 57 g

Sectional Drawings (Single nozzle type)

● Blow-off circuit

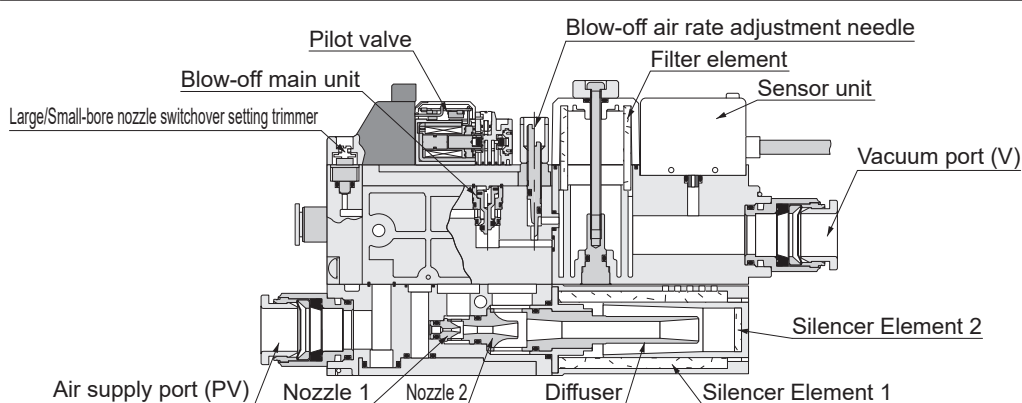


● Vacuum circuit

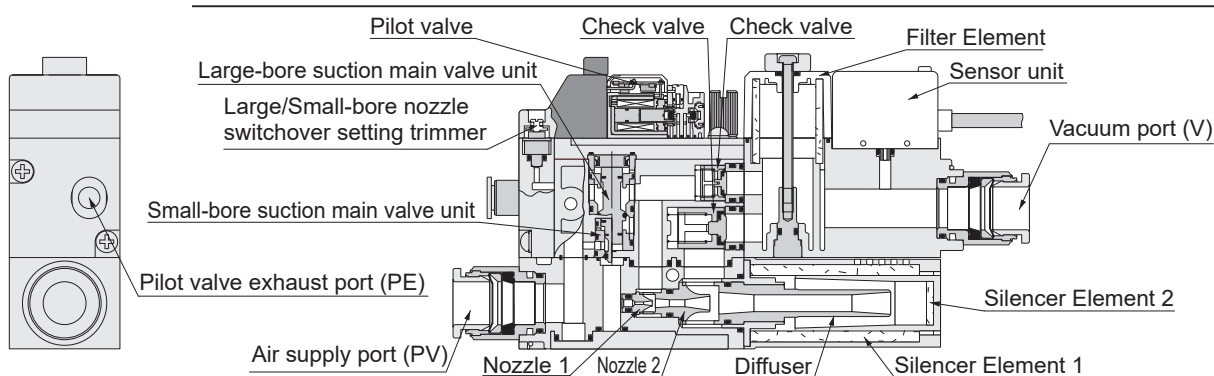


Sectional Drawings (Twin nozzle type)

● Blow-off circuit

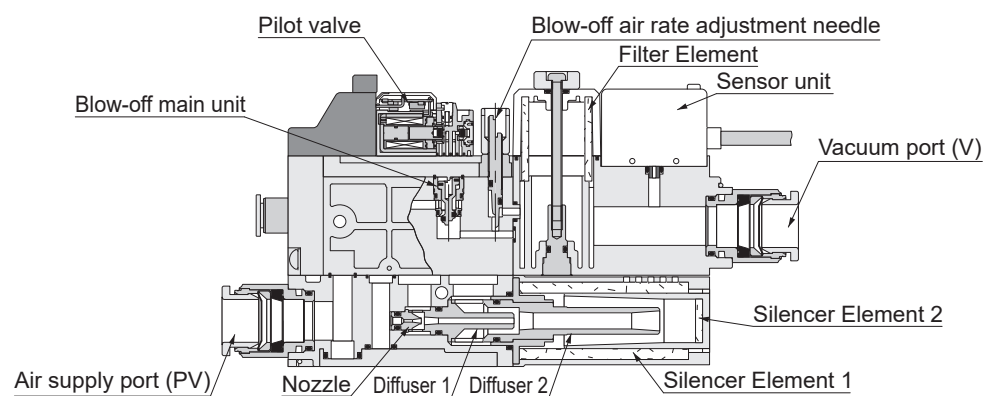


● Vacuum circuit

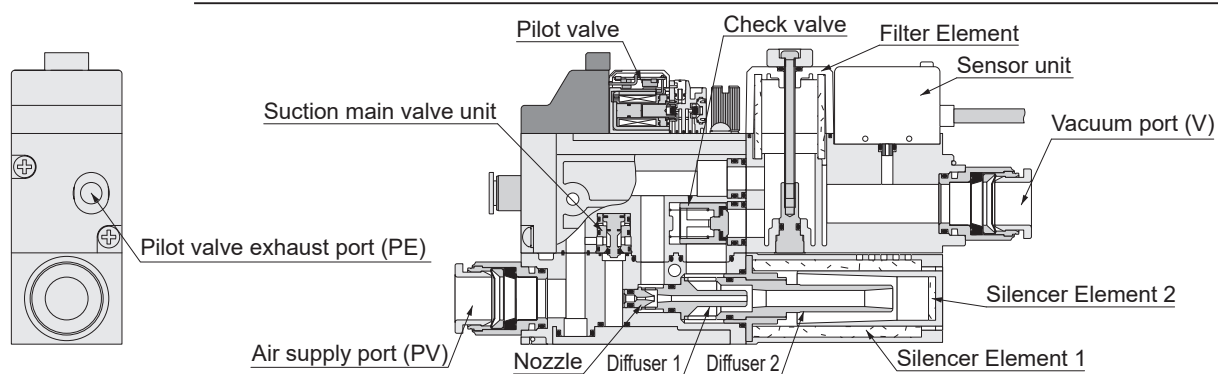


■ Sectional Drawing (Two-stage nozzle type)

● Blow-off circuit



● Vacuum circuit

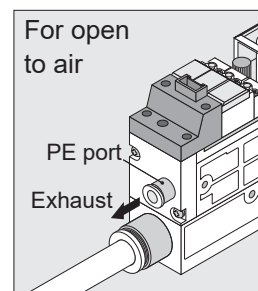
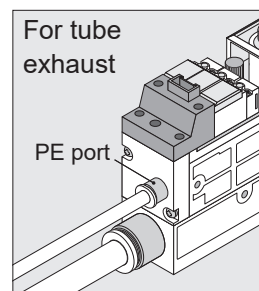


■ Piping for pilot valve exhaust port (PE port)

For tube exhaust, insert the tube into Push-in Fitting and exhaust air where suitable.

When tube exhaust is not required, piping is not needed.

However, since exhaust air will be emitted from the port, do not block it with a plug, etc.



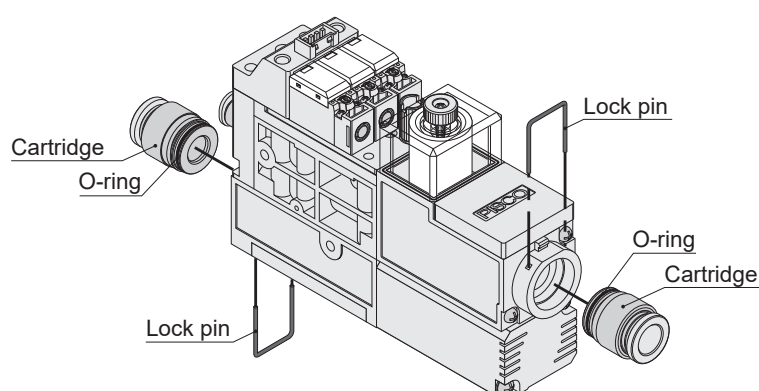
■ How to replace Cartridge Fitting

● Replace Cartridge Fitting following the instructions below.

(1) Pull out the lock pin with a flat head screwdriver or similar tool.

(2) Pull out the cartridge and replace it.

(3) After removing dust adhered to the seal part, properly insert the lock pin.



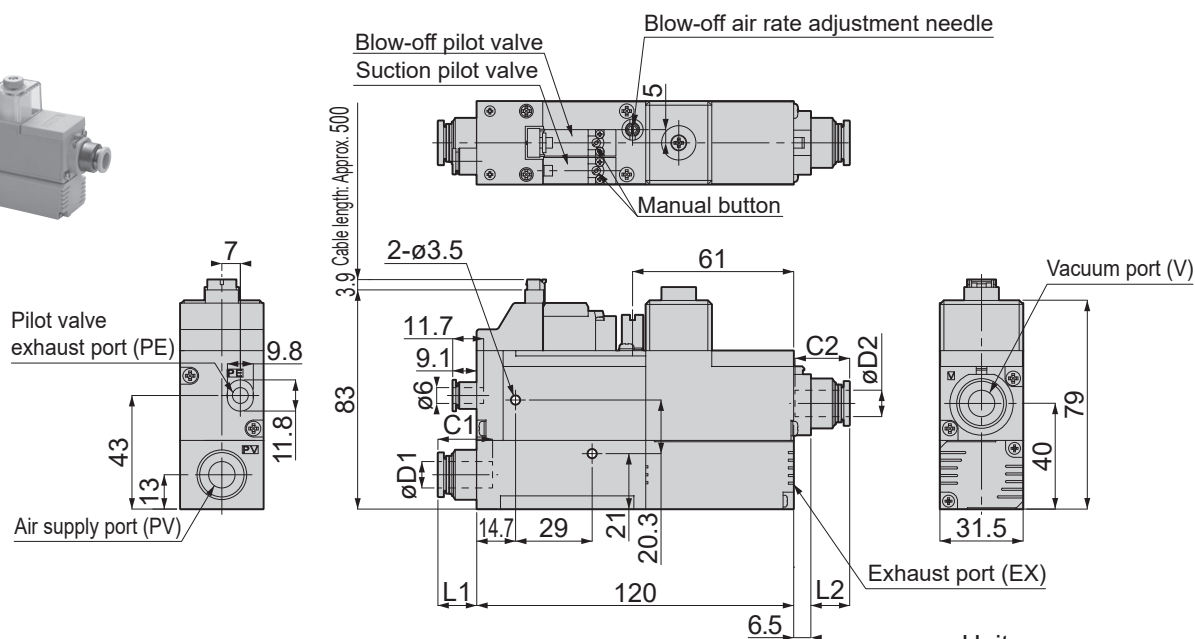
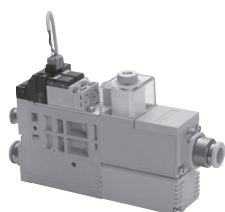
Refer to PISCO User's Manual for the handling and maintenance of the main unit and sensor.

■ Dimensional Drawings

VQ Single nozzle type, Silencer vent, Without Pressure sensor



Model code: VQ□□-□□S-□



Unit: mm

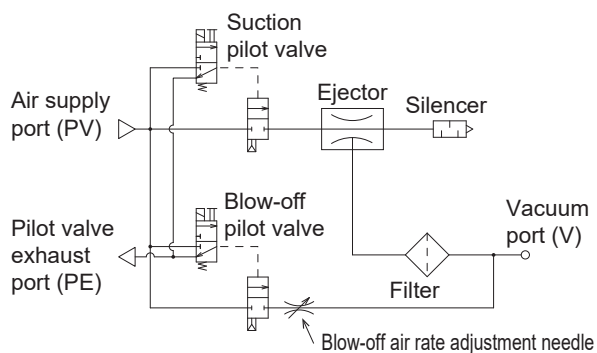
	Tube O.D. øD1	L1	Tube end C1
Air supply port	8	12.2	18.2
	10	14.7	20.7

	Tube O.D. øD2	L2	Tube end C2
Vacuum port	8	12.2	18.2
	10	14.7	20.7

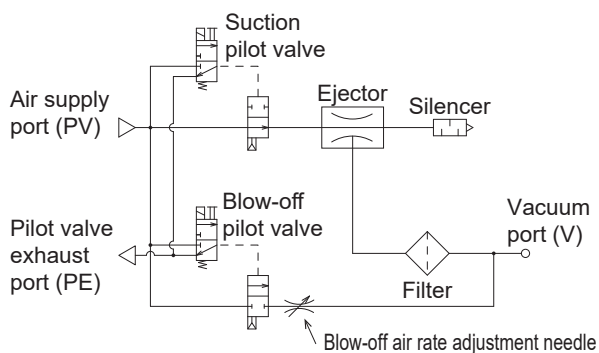
*100 VAC type is not CE marked.

Circuit diagram

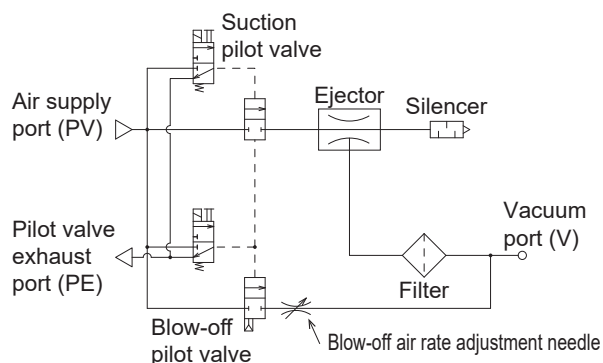
Normally closed



Normally open



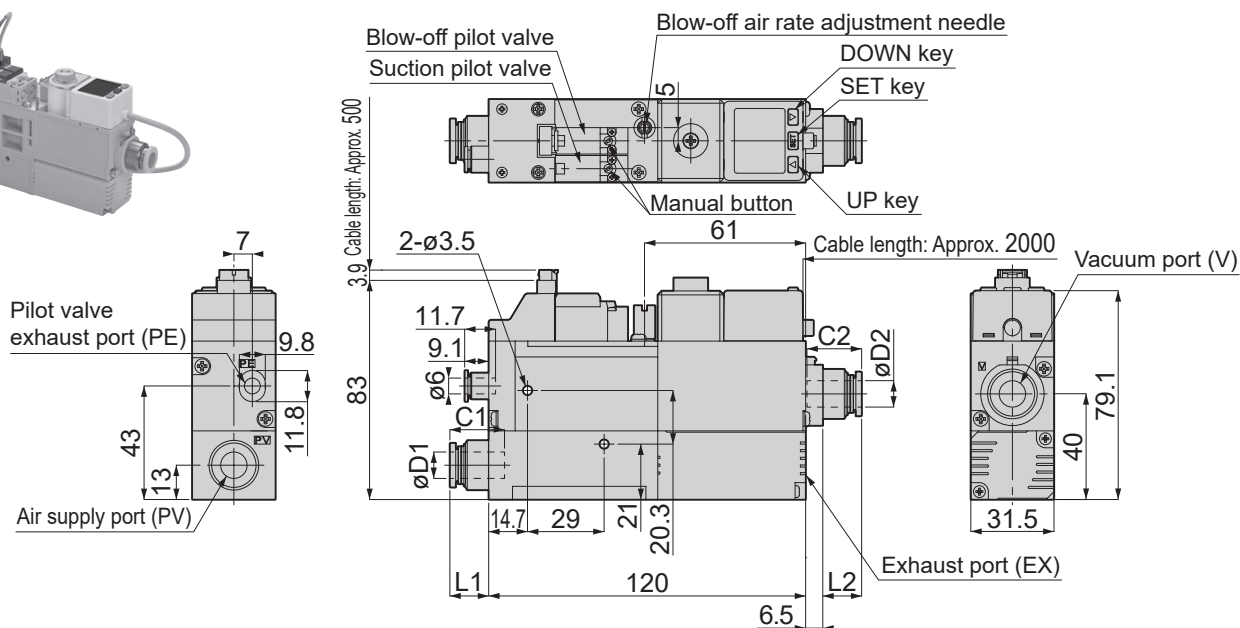
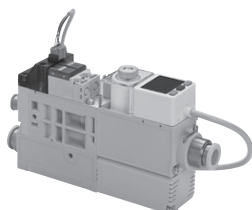
Double-piloted



VQ Single nozzle type, Silencer vent, With Pressure sensor



Model code: VQ□□-□□S-□□



Unit: mm

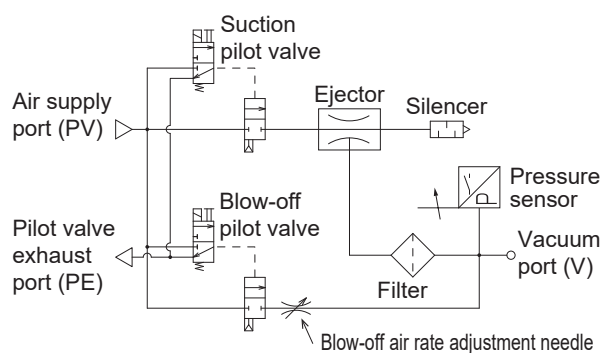
	Tube O.D. øD1	L1	Tube end C1
Air supply port	8	12.2	18.2
	10	14.7	20.7

	Tube O.D. øD2	L2	Tube end C2
Vacuum port	8	12.2	18.2
	10	14.7	20.7

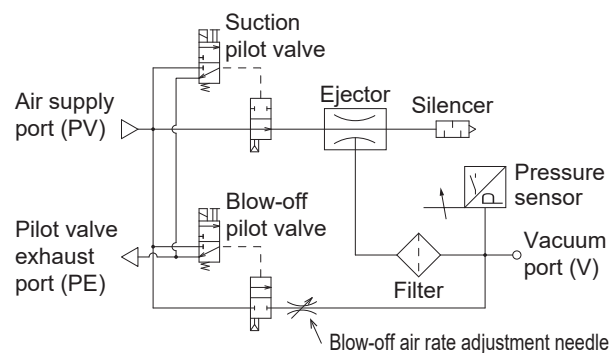
*100 VAC type is not CE marked.

Circuit diagram

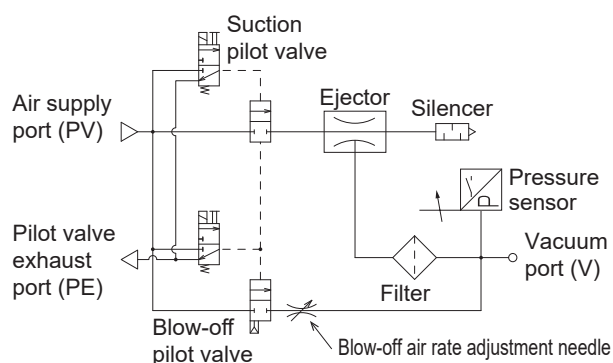
Normally closed



Normally open



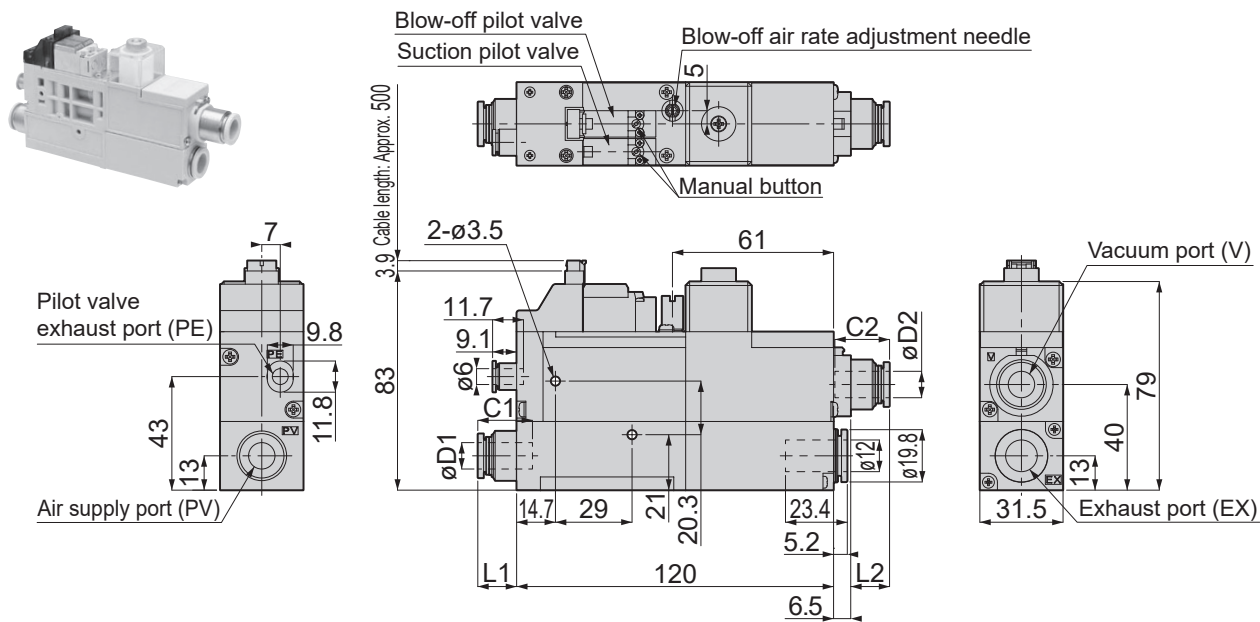
Double-piloted



VQ Single nozzle type, Tube exhaust, Without Pressure sensor



Model code: VQ□□-□□J-□□



Unit: mm

	Tube O.D. øD1	L1	Tube end C1
Air supply port	8	12.2	18.2
	10	14.7	20.7

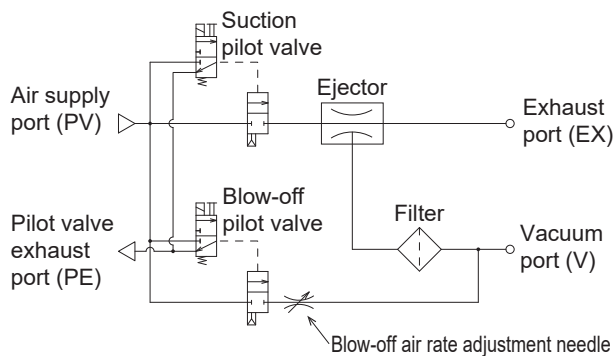
	Tube O.D. øD2	L2	Tube end C2
Vacuum port	8	12.2	18.2
	10	14.7	20.7

*1. 100 VAC type is not CE marked.

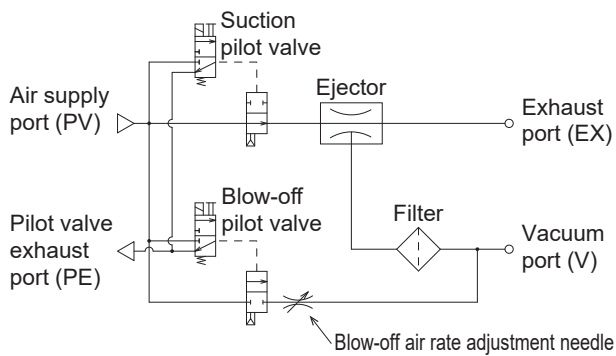
*2. For -S3 spec. (Metal option), add "-S3" at the end of the model code.

Circuit diagram

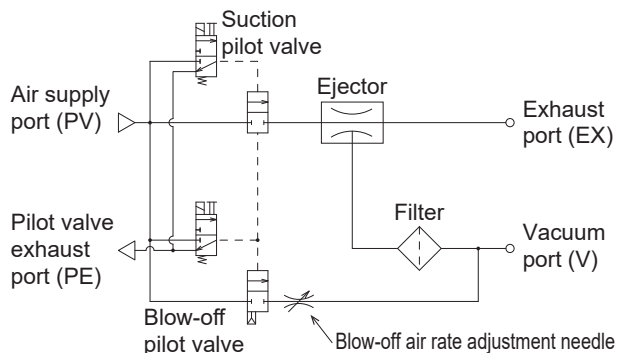
Normally closed



Normally open



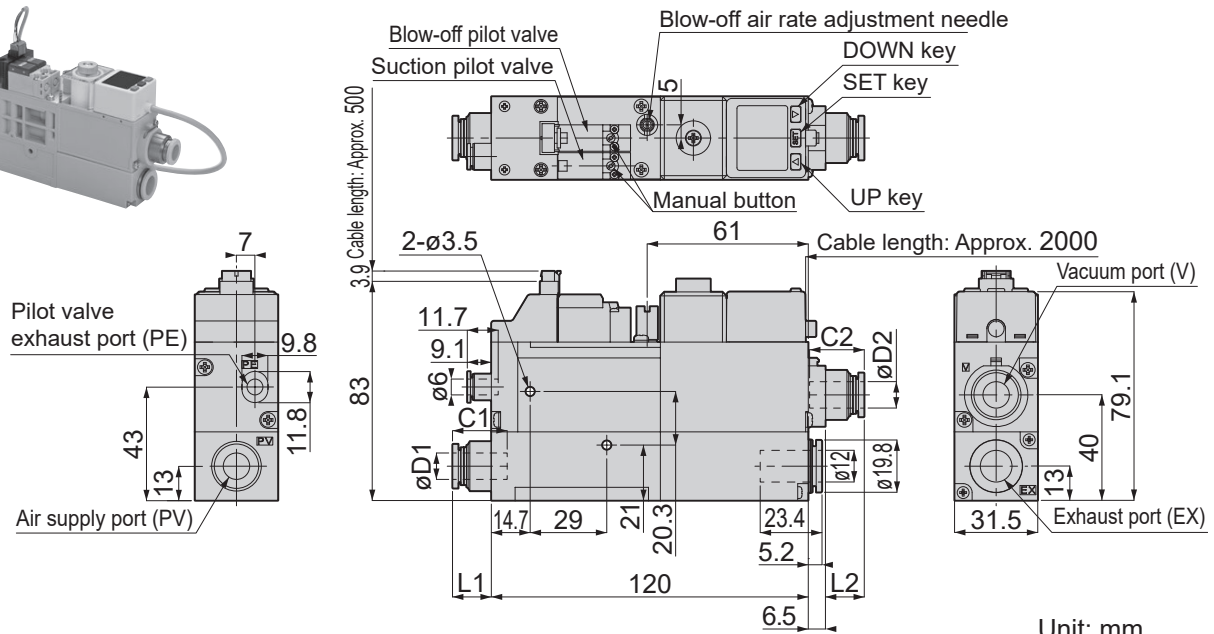
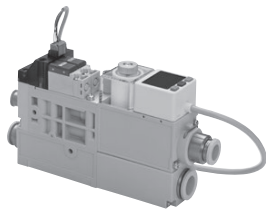
Double-piloted



VQ Single nozzle type, Tube exhaust, With Pressure sensor



Model code: VQ□□-□□J-□□□



	Tube O.D. øD1	L1	Tube end C1
Air supply port	8	12.2	18.2
	10	14.7	20.7

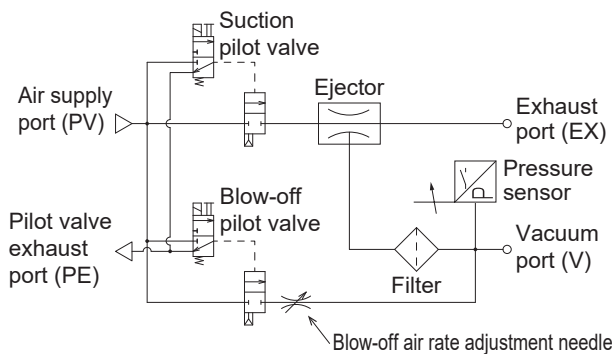
	Tube O.D. øD2	L2	Tube end C2
Vacuum port	8	12.2	18.2
	10	14.7	20.7

*1. 100 VAC type is not CE marked.

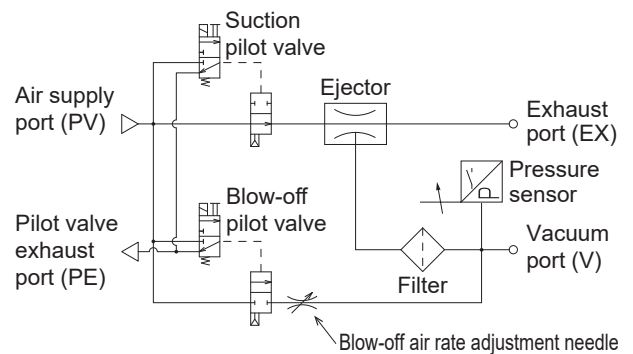
*2. For -3 spec. (Metal option), add "-3S" at the end of the model code.

Circuit diagram

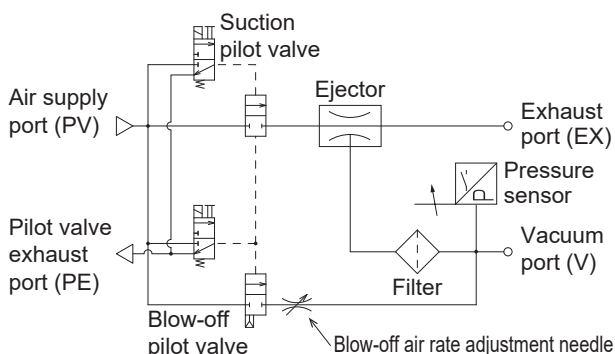
Normally closed



Normally open



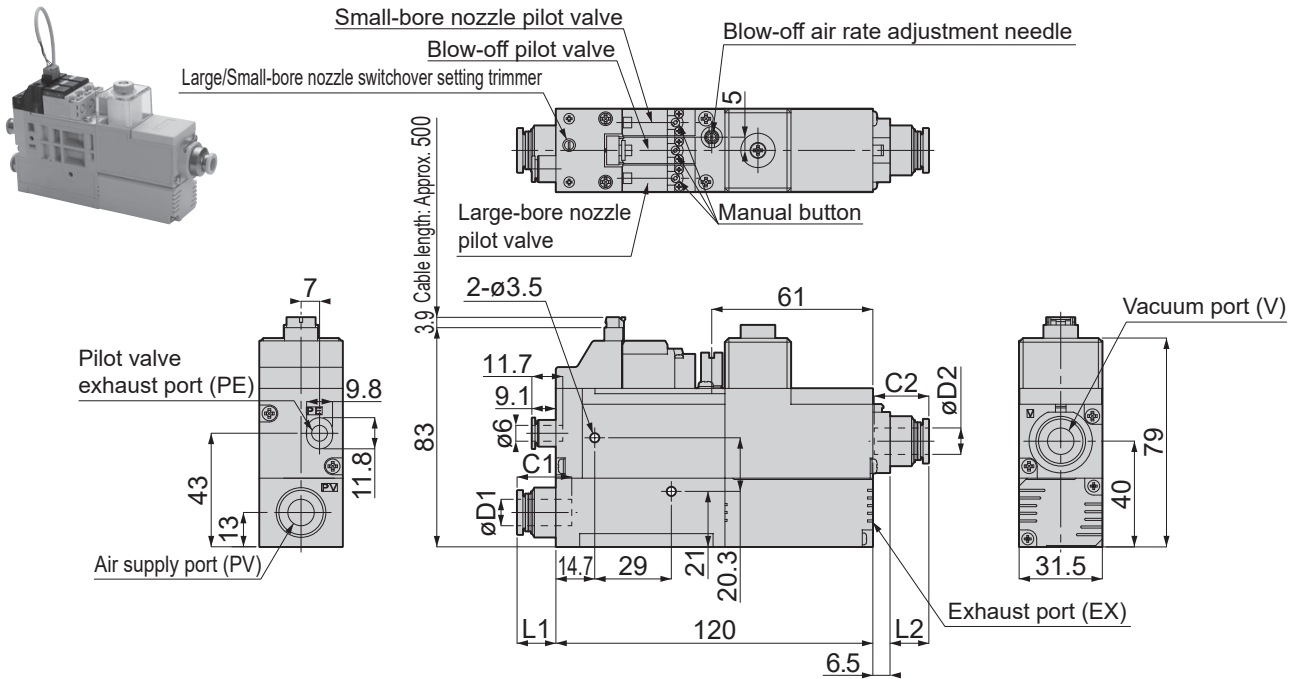
Double-piloted



VQT Twin nozzle type, Silencer vent, Without Pressure sensor



Model code: VQT ☐ C- ☐ ☐ S-D24



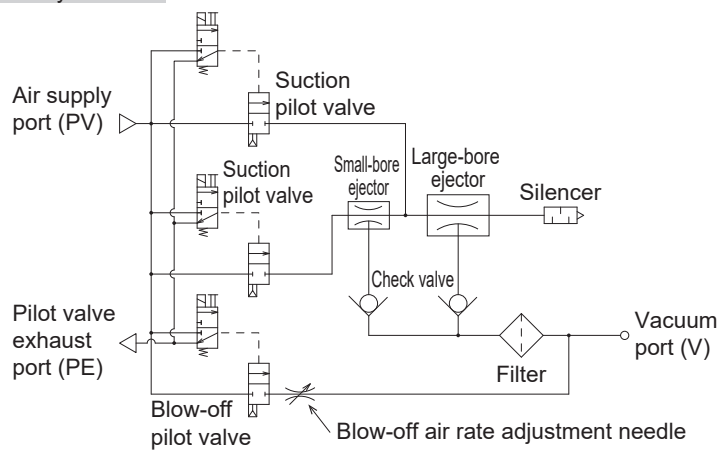
Unit: mm

	Tube O.D. øD1	L1	Tube end C1
Air supply port	8	12.2	18.2
	10	14.7	20.7

	Tube O.D. øD2	L2	Tube end C2
Vacuum port	8	12.2	18.2
	10	14.7	20.7

Circuit diagram

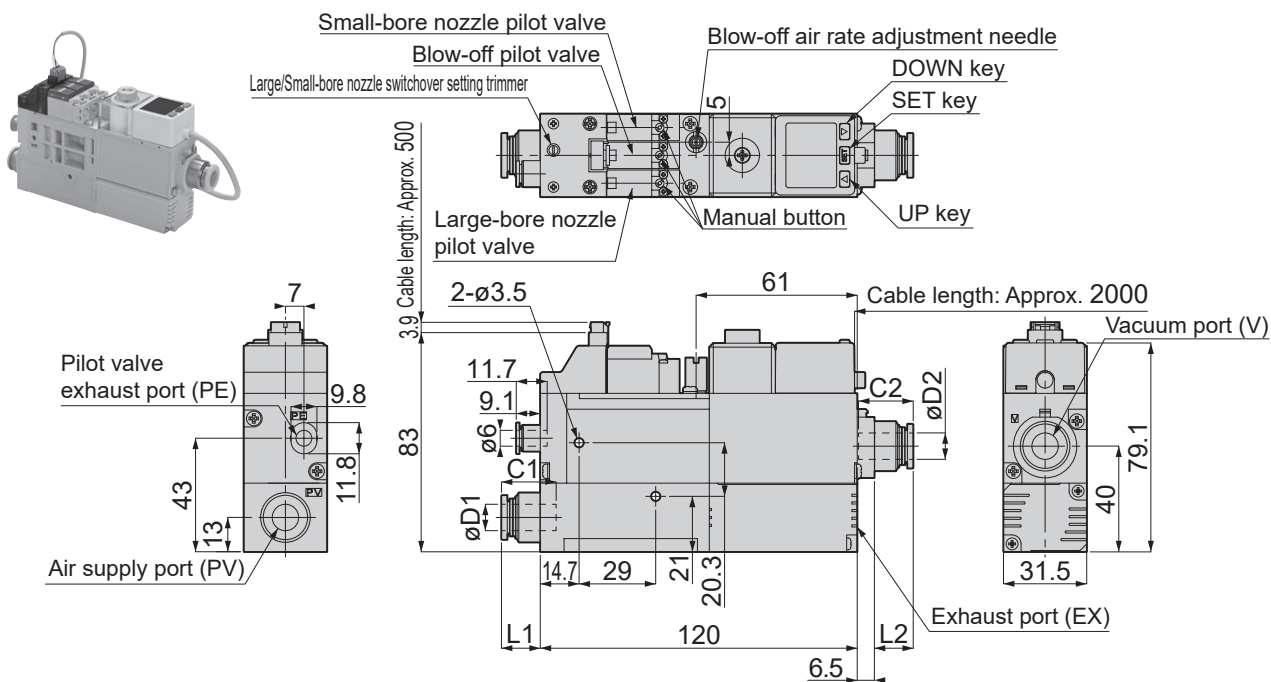
Normally closed



VQT Twin nozzle type, Silencer vent, With Pressure sensor



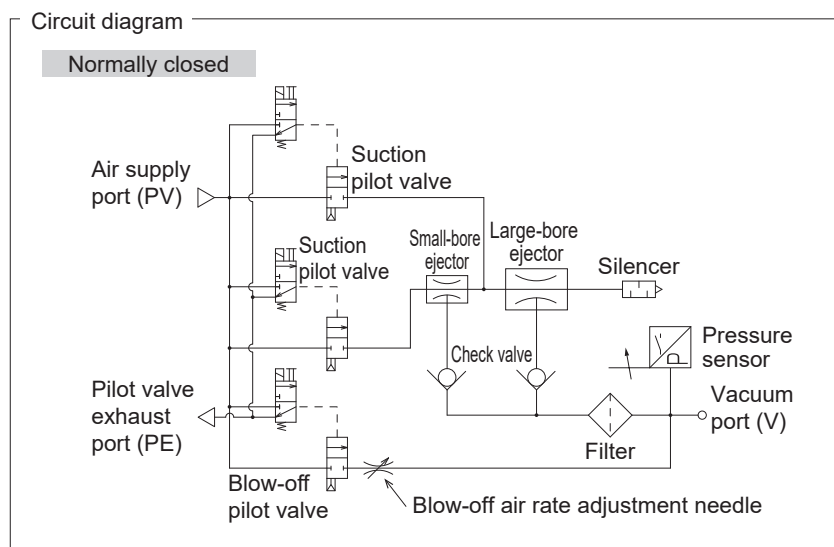
Model code: VQT ☐ C- ☐ ☐ S-D24 ☐



Unit: mm

	Tube O.D. $\phi D1$	L1	Tube end C1
Air supply port	8	12.2	18.2
	10	14.7	20.7

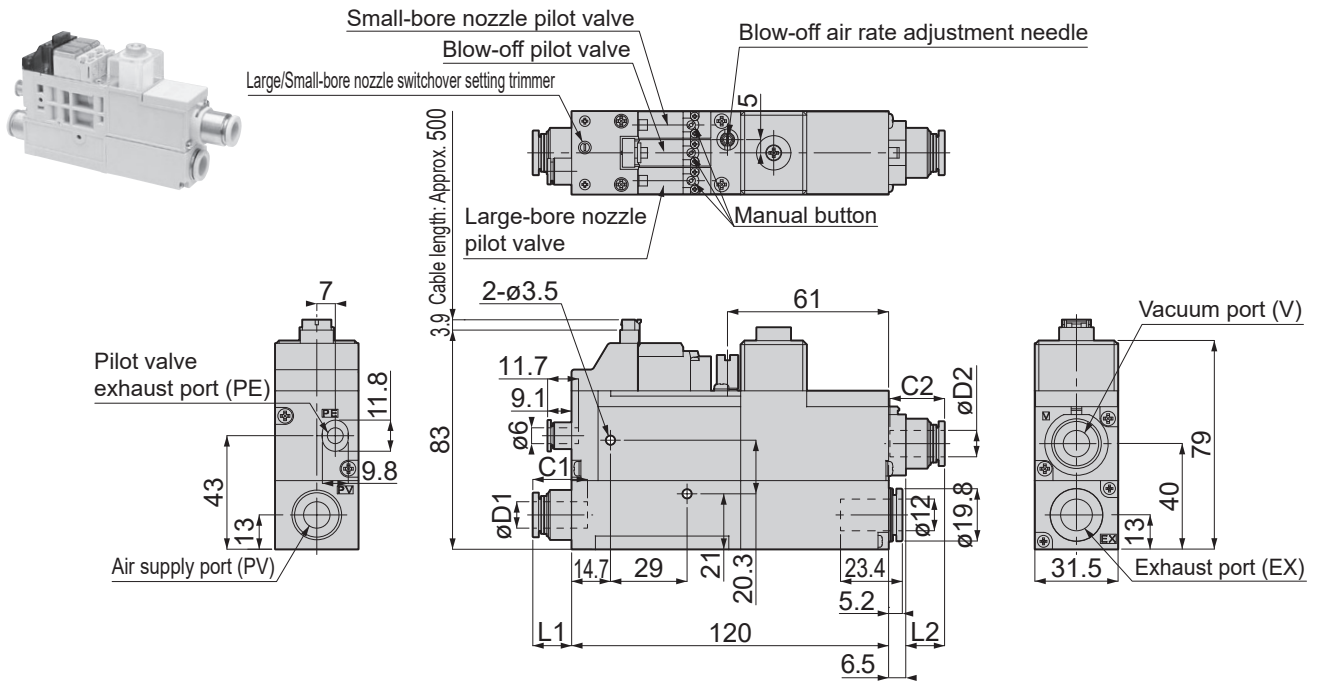
	Tube O.D. $\phi D2$	L2	Tube end C2
Vacuum port	8	12.2	18.2
	10	14.7	20.7



VQT Twin nozzle type, Tube exhaust, Without Pressure sensor



Model code: VQT ☐ C- ☐ ☐ J-D24 ☐



Unit: mm

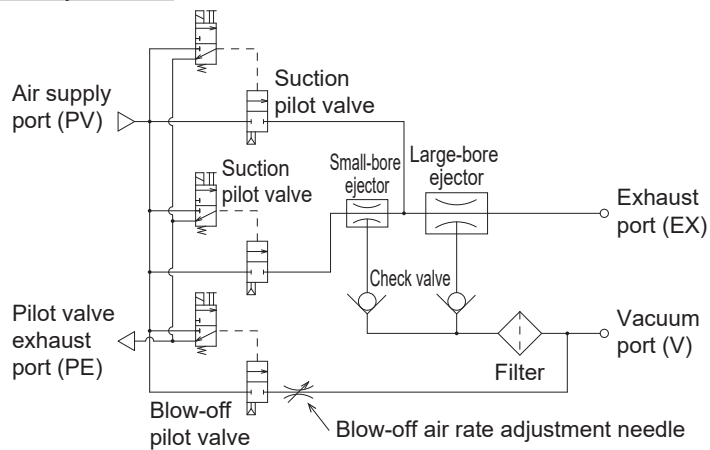
	Tube O.D. $\phi D1$	L1	Tube end C1
Air supply port	8	12.2	18.2
	10	14.7	20.7

	Tube O.D. $\phi D2$	L2	Tube end C2
Vacuum port	8	12.2	18.2
	10	14.7	20.7

*For -S3 spec. (Metal option), add "-S3" at the end of the model code.

Circuit diagram

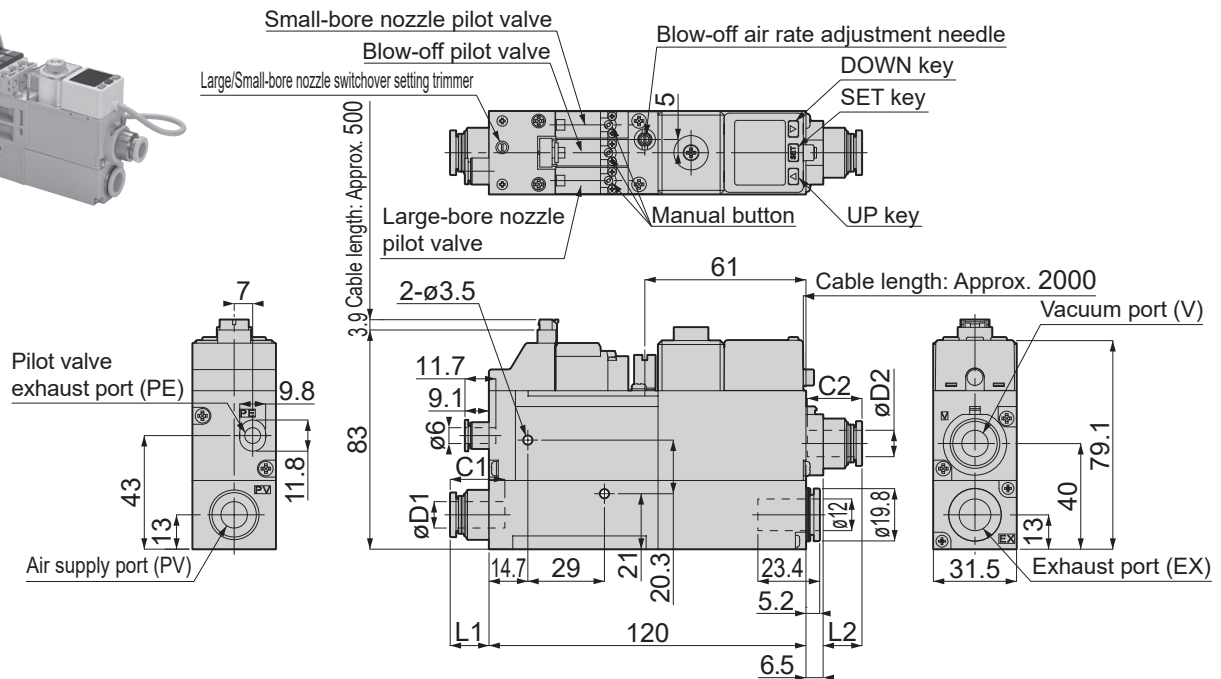
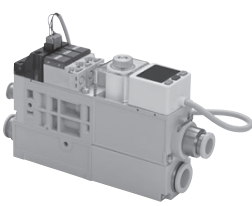
Normally closed



VQT Twin nozzle type, Tube exhaust, With Pressure sensor



Model code: VQT □ C-□□ J-D24 □□

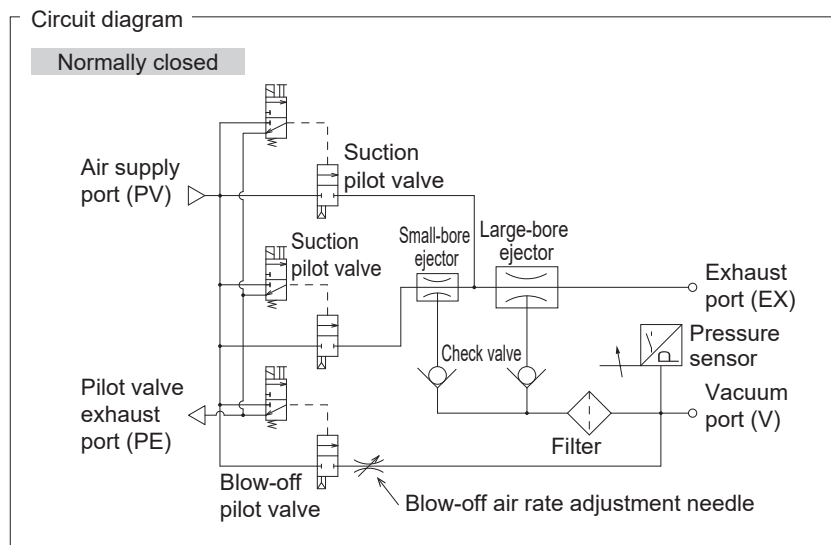


Unit: mm

	Tube O.D. øD1	L1	Tube end C1
Air supply port	8	12.2	18.2
	10	14.7	20.7

	Tube O.D. øD2	L2	Tube end C2
Vacuum port	8	12.2	18.2
	10	14.7	20.7

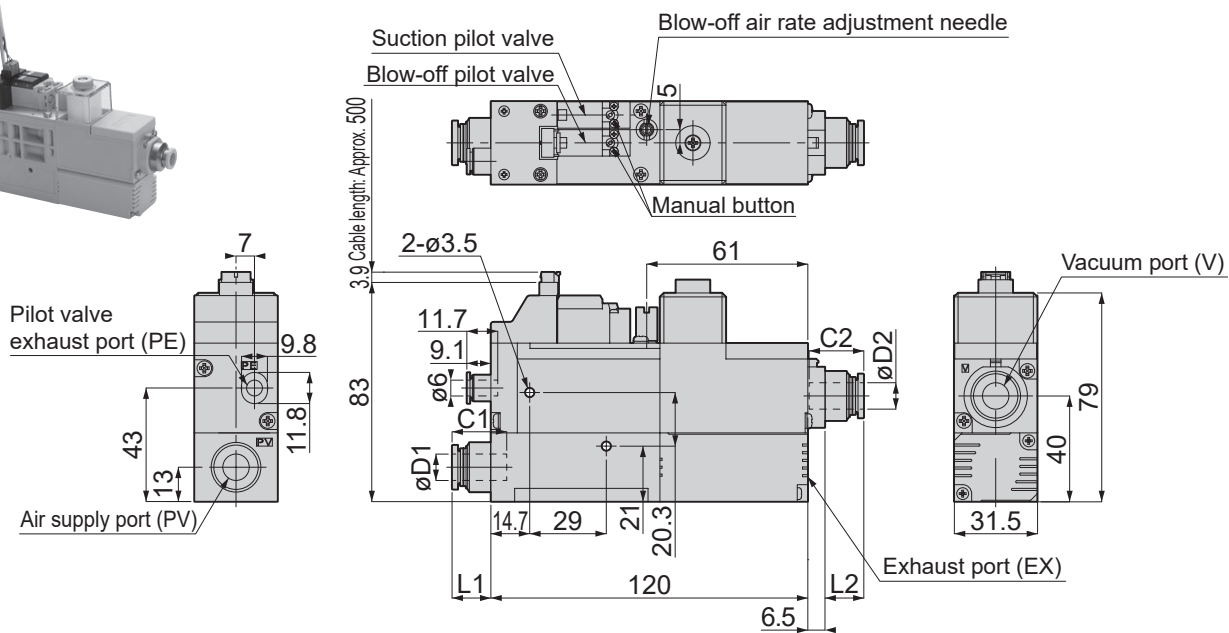
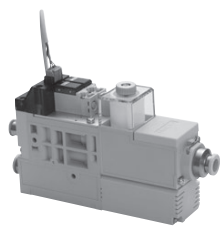
*For -S3 spec. (Metal option), add "-S3" at the end of the model code.



VQD Two-stage nozzle type, Silencer vent, Without Pressure sensor



Model code: VQD□□-□□S-□



Unit: mm

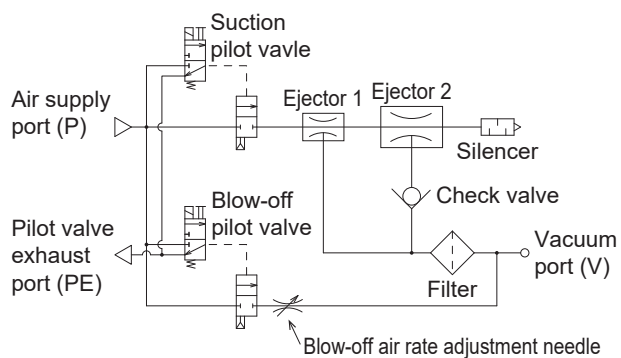
	Tube O.D. øD1	L1	Tube end C1
Air supply port	6	11.1	17
	8	12.2	18.2
	10	14.7	20.7

	Tube O.D. øD2	L2	Tube end C2
Vacuum port	8	12.2	18.2
	10	14.7	20.7

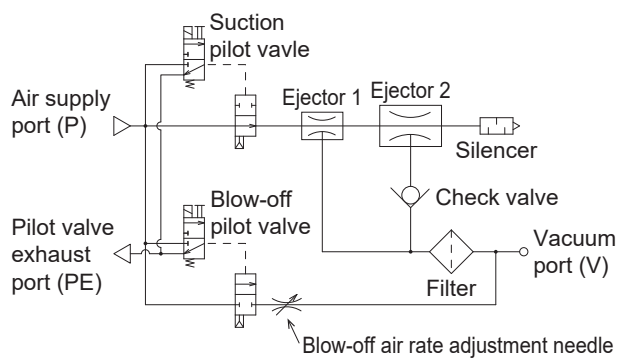
*100 VAC type is not CE marked.

Circuit diagram

Normally closed



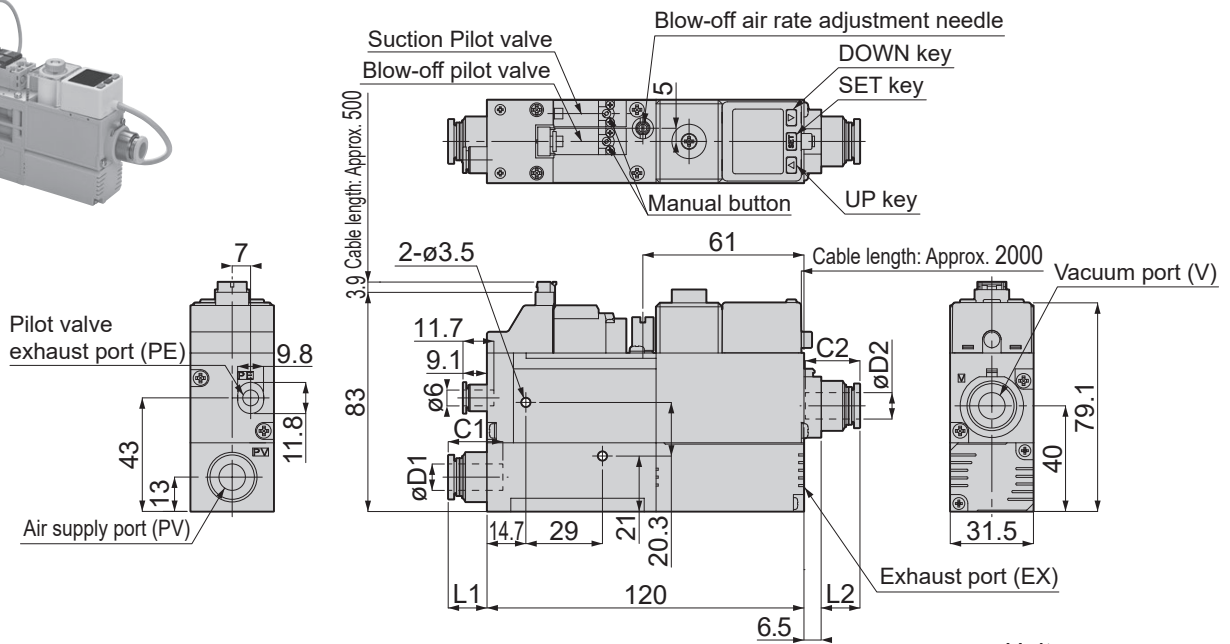
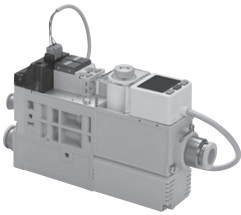
Normally open



VQD Two-stage nozzle type, Silencer vent, With Pressure sensor



Model code: VQD - S-



Unit: mm

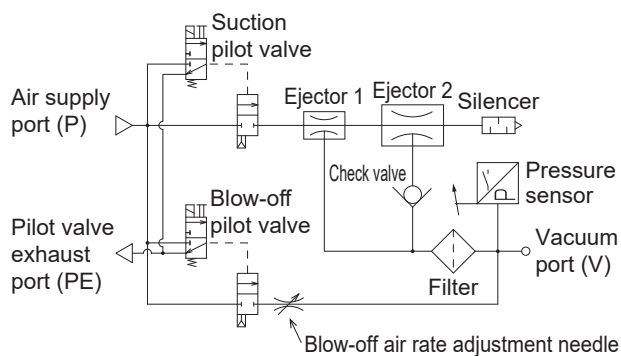
	Tube O.D. $\phi D1$	L1	Tube end C1
Air supply port	6	11.1	17
	8	12.2	18.2
	10	14.7	20.7

	Tube O.D. $\phi D2$	L2	Tube end C2
Vacuum port	8	12.2	18.2
	10	14.7	20.7

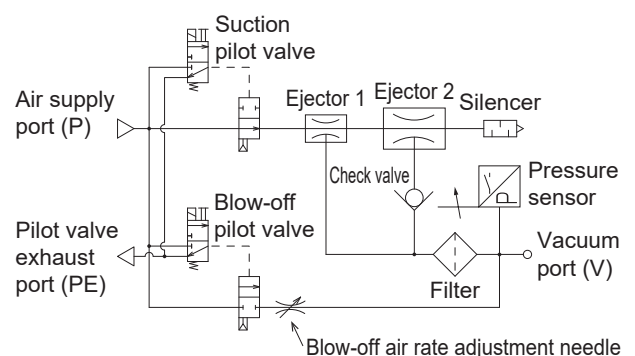
*100 VAC type is not CE marked.

Circuit diagram

Normally closed



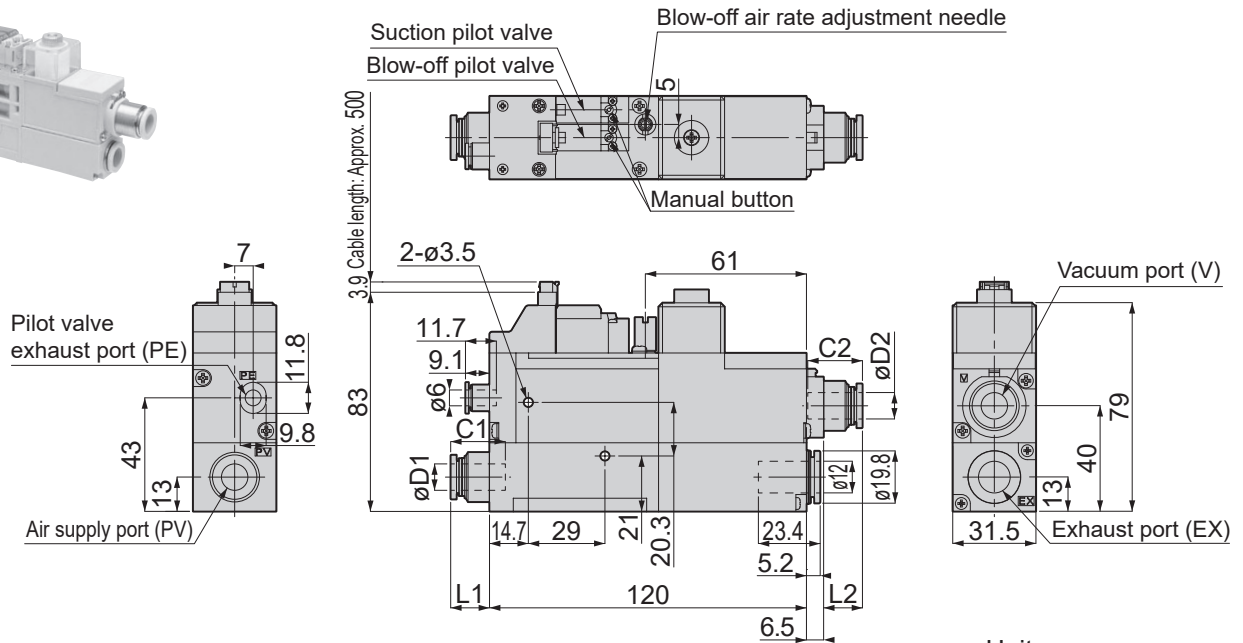
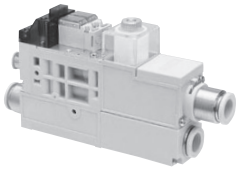
Normally open



VQD Two-stage nozzle type, Tube exhaust, Without Pressure sensor



Model code: VQD - J-



Unit: mm

	Tube O.D. ϕ D1	L1	Tube end C1
Air supply port	6	11.1	17
	8	12.2	18.2
	10	14.7	20.7

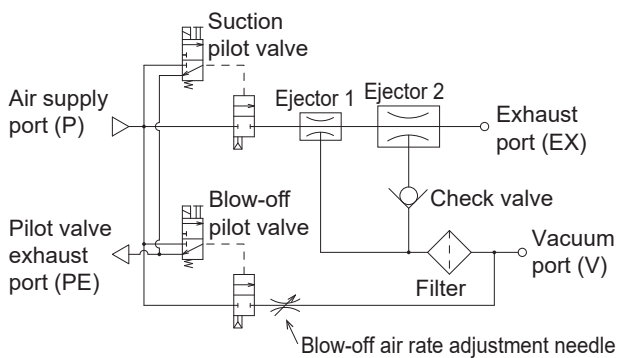
	Tube O.D. ϕ D2	L2	Tube end C2
Vacuum port	8	12.2	18.2
	10	14.7	20.7

*1. 100 VAC type is not CE marked.

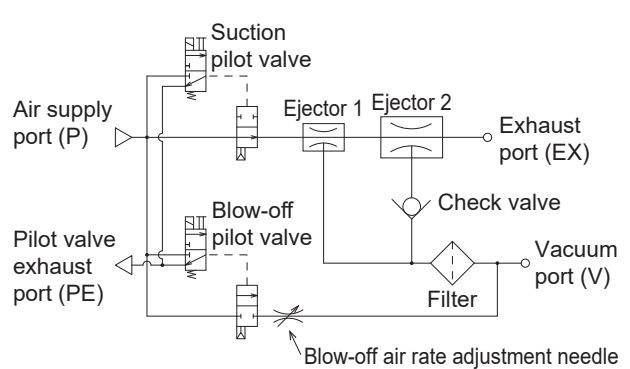
*2. For -S3 spec. (Metal option), add "-S3" at the end of the model code.

Circuit diagram

Normally closed



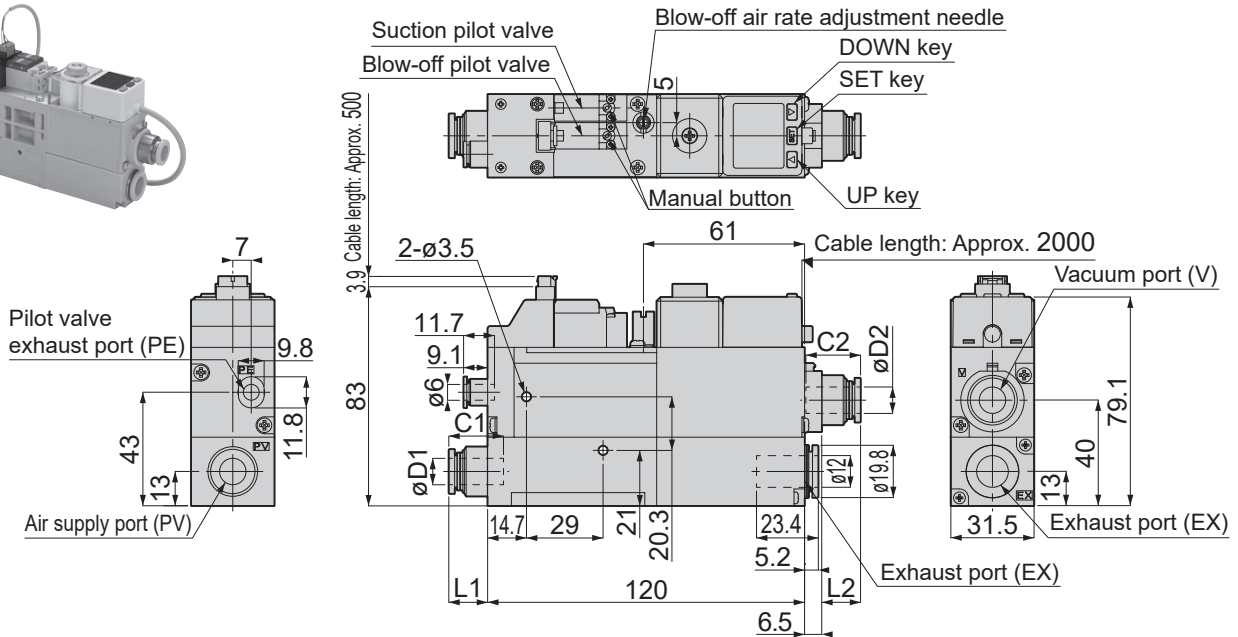
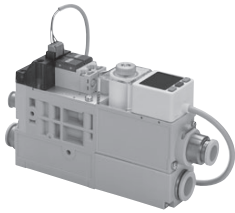
Normally open



VQD Two-stage nozzle type, Tube exhaust, With Pressure sensor



Model code: VQD - J-



Unit: mm

	Tube O.D. ϕ D1	L1	Tube end C1
Air supply port	6	11.1	17
	8	12.2	18.2
	10	14.7	20.7

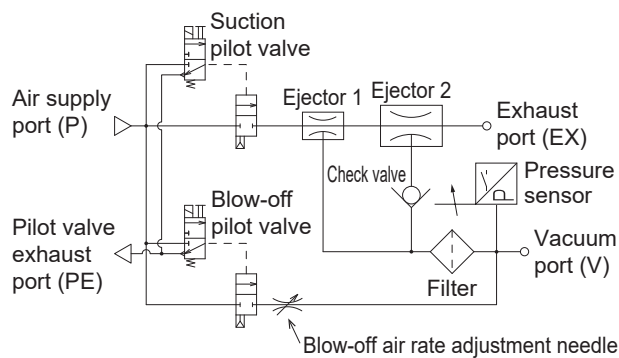
	Tube O.D. ϕ D2	L2	Tube end C2
Vacuum port	8	12.2	18.2
	10	14.7	20.7

*1. 100 VAC type is not CE marked.

*2. For -S3 spec. (Metal option), add "-S3" at the end of the model code.

Circuit diagram

Normally closed



Normally open

