

Variety of modularized units enable selections of integrated type ejector units suitable for the application.

VSK Series

- Nozzle diameter: $\varnothing 0.5$, $\varnothing 0.7$, $\varnothing 1.0$, $\varnothing 1.2$



Features

- Vacuum switches with LED displays and inexpensive easy-to-use mechanical vacuum switches are available.
- Vacuum switches with LED displays are used for 2- or 1-point switch output + analog output, enabling selections suiting use.
- Modules and a wide range of combinations enable you to choose the optimum module for your work purpose.
- The solenoid valve or air timer vacuum break valve can be used. A switching valve ensures that short-time vacuum break air blow and break air can be fine-tuned.
- For nozzles 05 ($\varnothing 0.5\text{mm}$), 07 ($\varnothing 0.7\text{mm}$), 10 ($\varnothing 1.0\text{mm}$), 12 ($\varnothing 1.2\text{mm}$) are available as standard.

Specifications

Descriptions	VSK
Working fluid	Compressed air
Working pressure range MPa	0.25 to 0.7
Ambient temperature range °C	5 to 50
Lubrication	Not required

Ejector characteristics

Model no.	Nozzle diameter (mm)	Supply pressure (MPa)	Ultimate vacuum (-kPa)	Suction flow (ℓ/min. (ANR))	Air consumption flow (ℓ/min. (ANR))
VSK-*H05...	0.5	0.5	91	7	11.5
		0.35	73		9
VSK-*L05...	0.7	0.5	67	11	11.5
VSK-*H07...		0.5	93	13	23
		0.35	73		17
VSK-*L07...		0.5	67	26	23
VSK-*E07...		0.35	91	10.5	17
		1.0	0.5	93	27
0.35	73		34		
VSK-*L10...	0.5		67	40	46
VSK-*E10...	0.35		91	21	34
VSK-*H12...	1.2	0.5	93	38	70
		0.35	73	36	47
		0.5	67	50	70
		0.35	91	27	47

Note: Ensure the above supply pressure when the vacuum ejector operates. (Consider the pressure drop.)

Valve (for vacuum generator/break) specifications

Descriptions	Solenoid valve (for vacuum generator/break)			
	Vacuum generator valve		Vacuum break valve	
Structure	Vacuum generator valve		Vacuum break valve	
Rated voltage	24 VDC	100 VAC	24 VDC	100 VAC
Tolerable voltage fluctuation range	21.6 to 26.4 VDC (24 VDC ±10%)	90 to 110 VAC (100 VAC ±10%)	21.6 to 26.4 VDC (24 VDC ±10%)	90 to 110 VAC (100 VAC ±10%)
Surge protective circuit	Surge absorber	Bridge diode	Surge absorber	Bridge diode
Power consumption	0.8W	1VA	0.8W	1VA
Operator type	Pilot type			
Insulation type	Class B or equivalent			
Manual operation	Push lock type			
Operating display	Red LED turns ON during coil energized			
Connection method / lead wire length	Connector type: 500mm			
Pressure resistance	1.05MPa			
Operation class	N.C.	N.O.	N.C.	N.O.
Effective sectional area	3.5mm ²	3.5mm ²	3.5mm ²	3.5mm ²

Lead wire colors

Vacuum generating valve only		Vacuum generating valve and break valve combination	
24 VDC	100 VAC	24 VDC	100 VAC
Red (+)	Blue	Black (-: Solenoid valve for supply)	White (Common)
Black (-)		Red (+: Common)	Blue (Solenoid valve for supply)
		White (-: Solenoid valve for vacuum release)	Black (Solenoid valve for break)

Vacuum switch with LED display

Descriptions	Vacuum switch with LED display			
	With 2 point switch output (-NW)	With analog output (-NA)	With 2 point switch output (-PW)	With analog output (-PA)
Specifications	With 2 point switch output (-NW) With analog output (-NA) With 2 point switch output (-PW) With analog output (-PA)			
Current consumption	40mA or less			
Pressure detection method	Carrier diffusion type semiconductor pressure switch			
Working pressure range	-100 to 0kPa			
Set pressure range	-99 to 0kPa			
Withstanding pressure	0.2MPa			
Storage temperature range	-20 to 70°C (atmospheric pressure, humidity 60%RH or less)			
Working temperature range	0 to 50°C (no freezing)			
Working humidity range	35 to 85%RH (no dew condensation)			
Power voltage	12 to 24 VDC±10% Ripple (P-P) 10% or less			
Protective structure	IEC standards IP40 or equivalent			
Number of pressure setting points	2	1	2	1
Operation precision	±3%F.S. max. (at Ta = 25°C)			
Hysteresis	Fixed (2%F.S. or less)	Variable (Approx. 0 to 15% F.S.)	Fixed (2%F.S. or less)	Variable (Approx. 0 to 15% F.S.)
Switch output	NPN open collector output 30V 80mA or less Residual voltage 0.8V or less		PNP open collector output Power voltage 80mA or less Residual voltage 0.8V or less	
Analog output	Output voltage	-	1 to 5V	-
	Zero point voltage	-	1±0.1 V	-
	Span voltage	-	4±0.1 V	-
	Output current	-	1mA or less (load resistance 5kΩ or more)	-
	LIN/HYS	-	±0.5%F.S. or less	-
Responsiveness	Approx. 2m sec or less			
Display	0 to -99kPa (2-digit red LED display)			
Number of displays	Approx. 4 times/sec			
Display accuracy	±3%F.S. ±2digit			
Resolution	1digit			
Operating display	SW1: Red LED ON when above set pressure SW2: Green LED ON when above set pressure	Red LED ON when above set pressure	SW1: Red LED ON when above set pressure SW2: Green LED ON when above set pressure	Red LED ON when above set pressure
Function	1. MODE switch (ME or S1 or S2) 2. S1 setting trimmer (2/3 rotation trimmer) 3. S2 setting trimmer (2/3 rotation trimmer)	1. MODE switch (ME or SW) 2. SW setting trimmer (2/3 rotation trimmer) 3. HYS setting trimmer (Approx.0 to 15% of set value)	1. MODE switch (ME or S1 or S2) 2. S1 setting trimmer (2/3 rotation trimmer) 3. S2 setting trimmer (2/3 rotation trimmer)	1. MODE switch (ME or SW) 2. SW setting trimmer (2/3 rotation trimmer) 3. HYS setting trimmer (Approx.0 to 15% of set value)

Mechanical vacuum switch specifications

Descriptions	Mechanical vacuum switch
Pressure detection method	Diaphragm - micro switch
Set pressure range	-20 to -80kPa
Setting method	Stepless by rotating nut
Switch terminal	Common, N.O. or N.C.
Precision	±4kPa
Hysteresis	16kPa or less
Microswitch	QJ type (AM8100) MATSUSHITA or J-7 OMRON
Microswitch rating	7A 250V AC

Air timer type vacuum break valve specifications

Descriptions	Air timer type vacuum break valve
Structure	Delayed with timer air cylinder, poppet type, 2 way valve
Vacuum break time	Approx. 0.3 to 3 seconds immediately after vacuum generating solenoid valve closes
vacuum break air flow rate	0 to 0.4 l/min (ANR) (at supply pressure: 0.5 MPa)
Time setting method	Controlled with timer air cylinder's speed control valve

Vacuum filter specifications

Descriptions	Vacuum filter
Element material	Poly-vinyl formal
Filtration	10μ
Filter area	1130mm ²
Replacement filter element model no.	VSG-E

Vacuum retention (unit combination symbol: B, D, F, H, K, M, S, T, W)

Descriptions	Vacuum retention
Vacuum leakage allowable volume	1.3kPa/10min. or less

Note: Carefully review the above specifications when vacuum must be held for a long time.

Weight

Unit combination symbol	Discrete weight (g)		Weight for manifold (g)	
	VSK-A...	VSK-B...	VSKM...-S...	VSKM...-T...
A	60	60	75.5	77.5
B	60	60	75.5	77.5
C	78.5	78.5	94	96
D	78.5	78.5	94	96
E	84.5	84.5	100	102
F	84.5	84.5	100	102
G	81	81	96.5	98.5
H	81	81	96.5	98.5
J	99.5	99.5	115	117
K	99.5	99.5	115	117
L	105.5	105.5	121	123
M	105.5	105.5	121	123
P	134	134	149.5	151.5
Q	152.5	152.5	168	170
R	158.5	158.5	174	176
S	128.5	128.5	144	146
T	147	147	162.5	164.5
W	153	153	168.5	170.5

	Manifold type	Weight (g)
Side block	VSKM... - ... S1...	72.5
	VSKM... - ... S2...	84
	VSKM... - ... S3...	72.5
	VSKM... -	61
Intermediate block	VSKM- - (without plug)	20.5
	VSKM- ... P- (with plug)	22

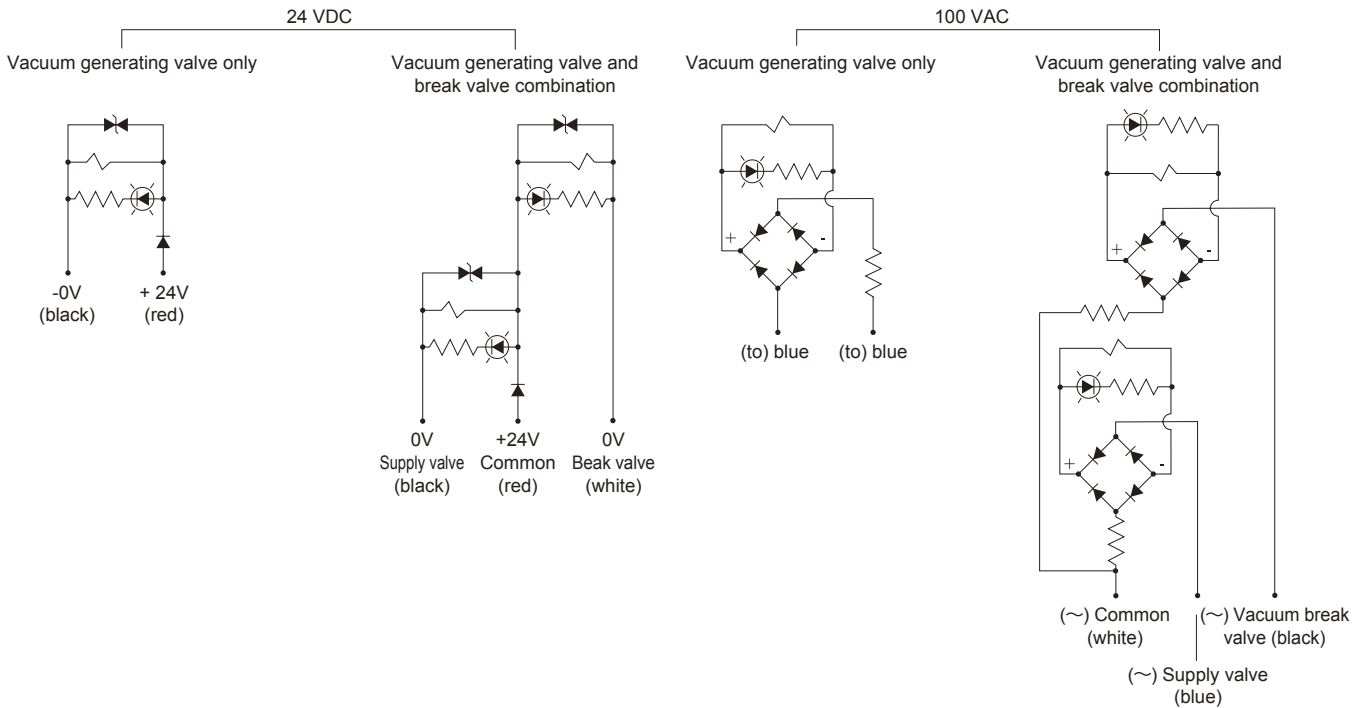
Block plate	Weight (g)
VSKM... -MB	6

Silencer	Weight (g)
Discrete atmospheric release	2

Discrete cartridge	Weight (g)
ø4 push-in joint	3.5
ø6 push-in joint	3.5
ø8 push-in joint	10
Plug cartridge	1.5

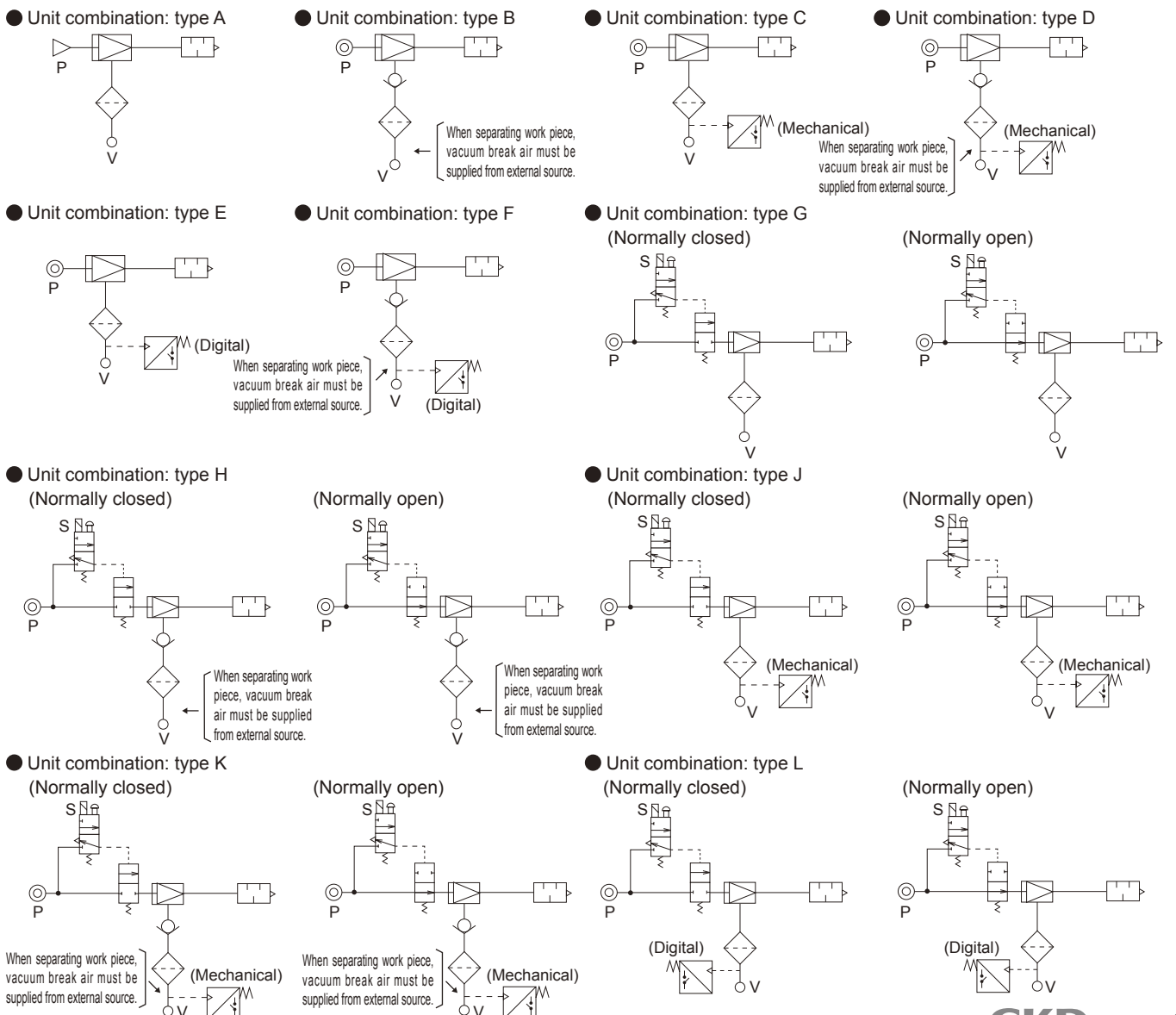
Cartridge for manifold	Weight (g)
ø6 push-in joint	20.5
ø8 push-in joint	20
ø10 push-in joint	19
ø12 push-in joint	26
ø8 elbow push-in joint	25
ø10 elbow push-in joint	31.5
ø12 elbow push-in joint	37.5
Rc1/4 cartridge	43.5
Rc3/8 cartridge	34.5
Rc1/2 cartridge	38
Plug cartridge	6

Electric circuit (solenoid valve)



Ejector system
VSY

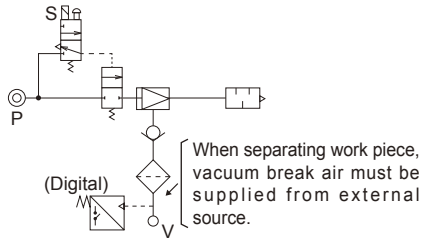
Circuit diagram (unit combination)



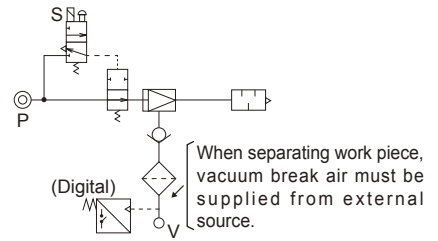
VSH·VSU
VSB·VSC
VSG
VSK
VSKM
VSJ
VSJM
VSX
VSXM
VSQ
VSZM

Circuit diagram (unit combination)

- Unit combination: type M
(Normally closed)

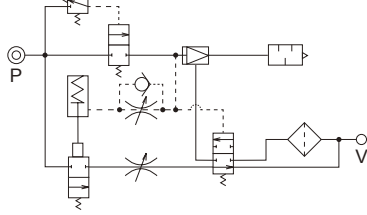


(Normally open)

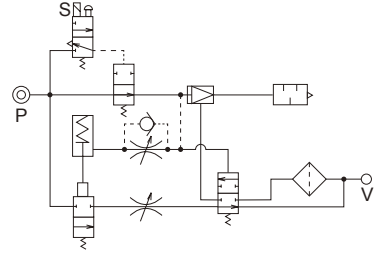


Ejector system

- Unit combination: type P
(Normally closed)

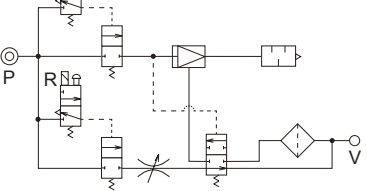


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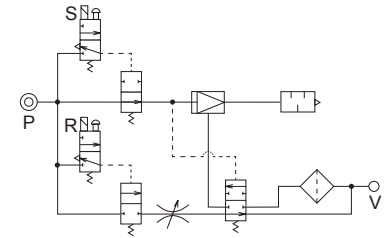


VSX

- Unit combination: type S
(Normally closed)

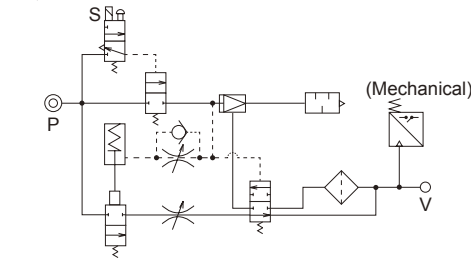


(Normally open)

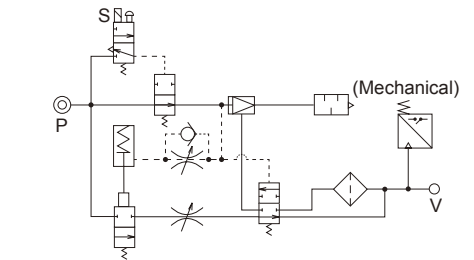


VSG

- Unit combination: type Q
(Normally closed)



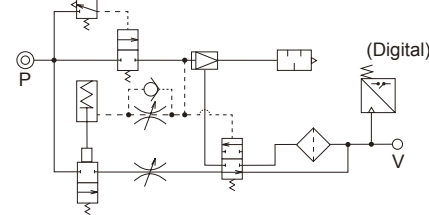
(Normally open)



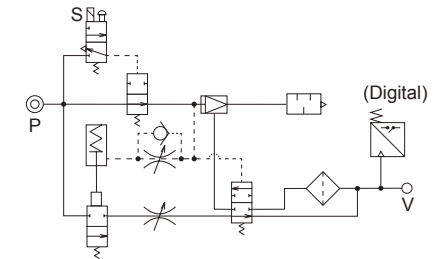
VSK
VSKM

VSJ
VSJM

- Unit combination: type R
(Normally closed)



(Normally open)

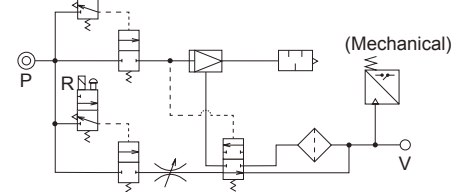


VSX
VSXM

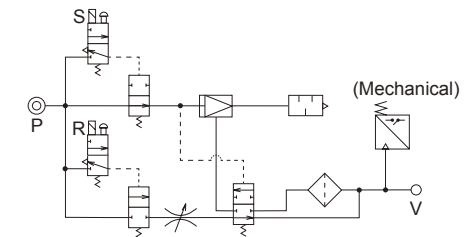
VSQ

VSZM

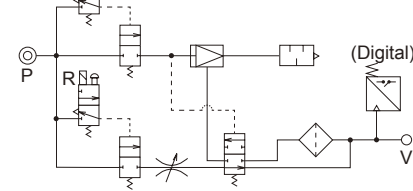
- Unit combination: type T
(Normally closed)



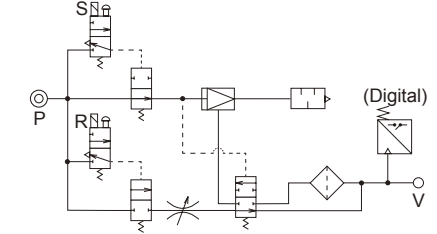
(Normally open)



- Unit combination: type W
(Normally closed)



(Normally open)



How to order

● Discrete type model No.

VSK - A H 07 W - 4 6 8L - 3 B - NW

A Port position

B Vacuum characteristics

C Nozzle diameter

D Unit combination

E Vacuum port

F Air supply port

G Exhaust port

H Solenoid valve voltage

I Valve type

J Vacuum switch specifications

Symbol	Descriptions
A Port position	
A	Discrete type connection port 2 planes
B	Discrete type connection port 1 plane
B Vacuum characteristics Note 1	
H	High vacuum/medium flow type
L	Medium vacuum/large flow rate type
E	High vacuum/small flow rate type
C Nozzle diameter Note 1, Note 2	
05	ø0.5
07	ø0.7
10	ø1.0
12	ø1.2
D Unit combination Note 3, Note 4	
Refer to Table 1 for unit combinations.	
E Vacuum port (V) Note 2	
4	ø4 push-in joint
6	ø6 push-in joint
8	ø8 push-in joint
F Air supply port (P) Note 2	
4	ø4 push-in joint
6	ø6 push-in joint
8	ø8 push-in joint
G Exhaust port (EX)	
S	Atmospheric release with silencer
8	ø8 push-in joint straight common exhaust
8L	ø8 push-in joint elbow common exhaust
H Solenoid valve voltage Note 3	
1	100 VAC
3	24 VDC
I Valve type Note 3	
A	Normally open type
B	Normally closed type
J Vacuum switch specifications Note 4	
NW	2-point NPN output with LED display
NA	1-point NPN output + analog output with LED display
PW	2-point PNP output with LED display
PA	1-point PNP output + analog output with LED display

⚠ Note on model no. selection

Note 1: **E** and **C** 05 combination can not be selected.

Note 2: **C** 10,12 cannot be selected when **E** or **F** is 4.

Note 3: If the **D** unit combination is "A, B, C, D, E or F", the **H** solenoid valve voltage and **I** valve unit type can not be selected.

Note 4: **J** vacuum switch is selectable only when the **D** unit combination is "E, F, L, M, R or W."

Appendix Table 1 (common with manifold type)

Unit combination							
Symbol	Filter	Vacuum generating valve	Check valve (Vacuum holding)	Mechanical vacuum pressure switch	Vacuum switch with LED display	Air timer type vacuum break valve	Vacuum break valve
A	●						
B	●		●				
C	●			●			
D	●		●	●			
E	●				●		
F	●		●		●		
G	●	●					
H	●	●	●				
J	●	●		●			
K	●	●	●	●			
L	●	●			●		
M	●	●	●		●		
P	●	●				●	
Q	●	●		●		●	
R	●	●			●	●	
S	●	●	● *1				●
T	●	●	● *1	●			●
W	●	●	● *1		●		●
Z	For mixed specifications (indicate details in specifications.) (Applicable for manifold type.)						

*1: Built-in vacuum self-holding valve

How to order

● Manifold type model No.

VSKM - H 07 W - T4 20 S2 - 3 B - 10 - NW

● Discrete type for manifold model no.

VSKM - H 07 W - T4 - - - 3 B - - - NW

● Model No. for independent manifold base.

VSKM - - - - T4 20 S2 - - - - 10

① Vacuum switch specifications

① Station no.

Type		
Manifold	Discrete for manifold	Only manifold
●	●	
●	●	
●	●	
●		●

Ejector system

VSJ

VSH • VSU
VSB • VSC

VSG

VSK
VSKM

VSJ
VSJM

V SX
V SXM

VSQ

VSZM

A Vacuum characteristics

B Nozzle diameter

C Unit combination

D Vacuum port

E Air supply port

F Exhaust port

G Solenoid valve voltage

H Valve type

⚠ Note on model no. selection

Note 1: A E and B 05 cannot be combined.

Note 2: Indicate "Mixed manifold specifications" when selecting mixed specifications.

Note 3: If C unit combination is "A, B, C, D, E or F", G solenoid valve voltage and H valve unit type can not be selected.

Note 4: Only if C unit combination is "E, F, L, M, R or W", select ① vacuum switch specifications.

Note 5: For A Z, only B 00 can be selected. For B 00, only A Z can be selected.

Note 6: When installing a masking block, select (D) CX and state installation and quantity with manifold specifications.

Note 7: The number of stations operated simultaneously differs with nozzle diameter and port size combination. Consult with CKD for details.

Note 8: The (C) Unit combination "A, B, C, D, E, or F" cannot be used for manifold model.

Table 2

E Air supply port								
Port shape		Straight joint			Elbow joint			
Symbol	R side only	16	18	10	12	48	40	42
	Both sides	26	28	20	22	58	50	52
	L side only	36	38	30	32	68	60	62
Joint size (mm)		ø6	ø8	ø10	ø12	ø8	ø10	ø12

Appendix Table 3

F Exhaust port											
Port shape		Atmospheric release silensor	Common exhaust type								
			Straight joint			Elbow joint			Tapered female screw for pipe		
Symbol	R side only	S1	18	10	12	48	40	42	72	73	74
	Both sides	S2	28	20	22	58	50	52	82	83	84
	L side only	S3	38	30	32	68	60	62	92	93	94
Joint size (mm)		-	ø8	ø10	ø12	ø8	ø10	ø12	Rc1/4	Rc3/8	Rc1/2

Symbol	Descriptions	Manifold	Discrete for manifold	Only manifold
A Vacuum characteristics Note 1, Note 2, Note 5				
H	High vacuum/medium flow type	●	●	
L	Medium vacuum/large flow rate type	●	●	
E	High vacuum/small flow rate type	●	●	
Z	For mixed specifications (indicate details in specifications.)	●		
B Nozzle diameter Note 1, Note 2, Note 5				
05	ø0.5	●	●	
07	ø0.7	●	●	
10	ø1.0	●	●	
12	ø1.2	●	●	
00	For mixed specifications (indicate details in specifications.)	●		
C Unit combination Note 2, Note 3, Note 4, Note 8				
Refer to the Appendix Table 1 (common for discrete type) for details on unit combinations.				
D Vacuum port (V) Note 2, Note 6				
PP	Plug port position side surface	●		●
S4	ø4 push-in joint port position side	●		●
S6	ø6 push-in joint port position side	●		●
S8	ø8 push-in joint port position side	●		●
T4	ø4 push-in joint port position top	●	●	
T6	ø6 push-in joint port position top	●	●	
T8	ø8 push-in joint port position top	●	●	
00	Discrete for manifold with side port position	●	●	
CX	For mixed joints (indicate details in specifications.)	●		
E Air supply port (P)				
Refer to Appendix Table 2 for details on the air supply port.				
F Exhaust port (EX)				
Refer to Appendix Table 3 for details on the exhaust port.				
G Solenoid valve voltage Note 3				
1	100 VAC	●	●	
3	24 VDC	●	●	
H Valve type Note 2, Note 3				
A	Normally open type	●	●	
B	Normally closed type	●	●	
Z	For mixed specifications (indicate details in specifications.)	●		
I Number of manifold stations Note 7				
2	2 station	●		●
to	to			
10	10 station			
J Vacuum switch specifications Note 2, Note 4				
NW	2-point NPN output with LED display	●	●	
NA	1-point NPN output + analog output with LED display	●	●	
PW	2-point PNP output with LED display	●	●	
PA	1-point PNP output + analog output with LED display	●	●	
Z	For mixed specifications (indicate details in specifications.)	●		

Model no.

- Nozzle kit

VSK - H 07 - NK

A Vacuum characteristics

B Nozzle diameter

Symbol	Descriptions
A Vacuum characteristics Note 1	
H	High vacuum/medium flow type
L	Medium vacuum/large flow rate type
E	High vacuum/small flow rate type
B Nozzle diameter Note 1	
05	ø0.5
07	ø0.7
10	ø1.0
12	ø1.2

Note on model no. selection

Note 1: **A B**, E05 combination can not be selected.

- Vacuum filter element

VSG-E

- Discrete silencer element

VSK-SE

- Silencer kit for manifold

VSKM-SK

- Masking block for manifold

VSKM-MB

Ejector system

VSY

VSH•VSU
VSB•VSC

VSG

VSK
VSKM

VSJ
VSJM

VSX
VSXM

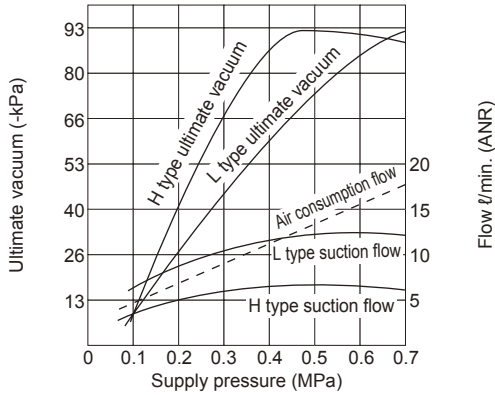
VSQ

VSZM

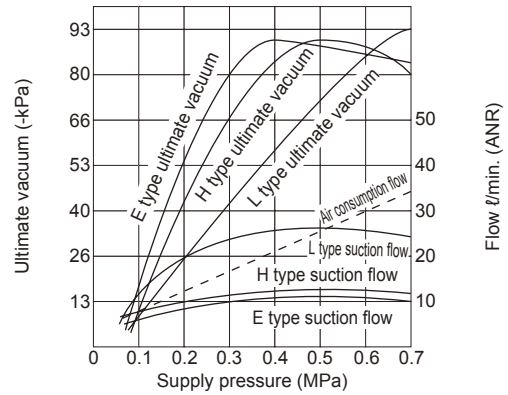
Vacuum characteristics

Supply pressure - ultimate vacuum, suction flow, air consumption flow

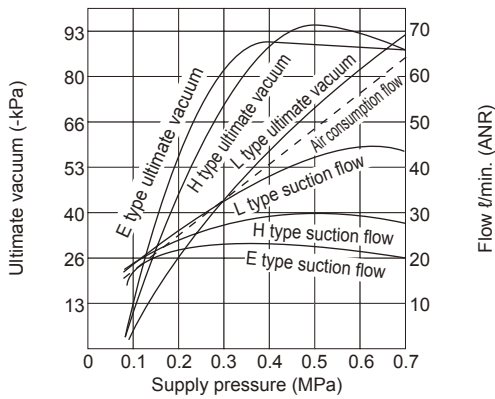
● VSK-*H05, VSK-*L05



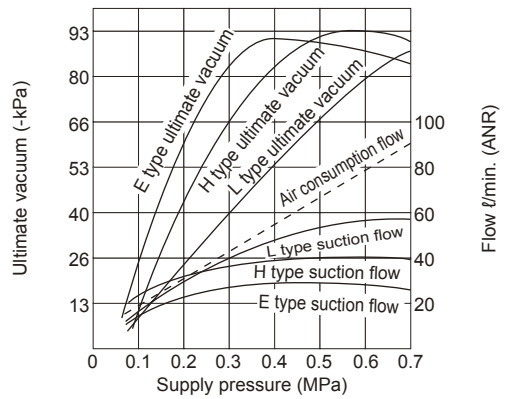
● VSK-*H07, VSK-*L07, VSK-*E07



● VSK-*H10, VSK-*L10, VSK-*E10



● VSK-*H12, VSK-*L12, VSK-*E12

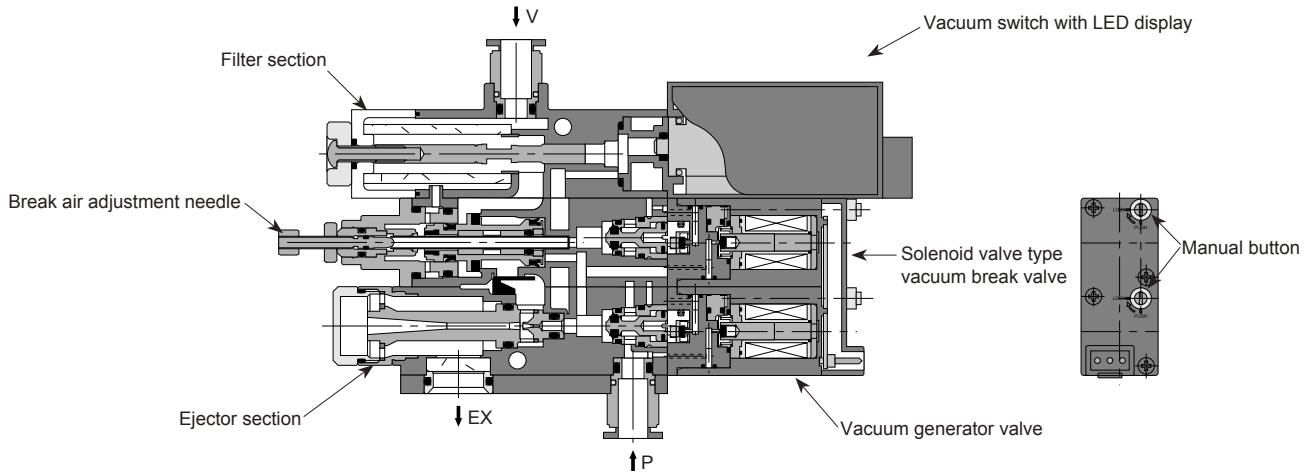


- The supply pressure above applies at vacuum generation.
- An abnormal popping may sound at the supply pressure (H (high vacuum medium flow) type: 0.4 to 0.45 MPa, E (high vacuum low flow) type: 0.29 to 0.32 MPa) just before the ultimate vacuum peaks. This abnormal noise is because characteristics are unstable and increases with instability. This may adversely affect the sensor, etc. Reset supply pressure.
(Example1: When the H vacuum ejector operates with a base pressure of 0.5 MPa, an abnormal noise sounds when supply pressure drops to 0.43MPa due to a pressure drop. →Reset the supply pressure to 0.5MPa when the vacuum ejector operates.)
- Select piping and components using a sectional area 3 times larger than the nozzle diameter. Satisfactory vacuum cannot be attained if a sufficient air flow cannot be ensured. (Popping occurs at the set pressure if the intake flow is insufficient, the ultimate vacuum cannot be attained, etc.)
(Example 2: An abnormal noise sounds even when using the H vacuum ejector at a working pressure of 0.5MPa. → The air flow is insufficient. (The air flow is restricted preceding the vacuum ejector due to piping resistance, etc., keeping a satisfactory air flow from being attained. →Select piping components that provide the required effective section.))
(Example 3: When using the vacuum ejector with a 1.0 mm nozzle diameter, cross-sectional area is $0.5^2 \times \pi = 0.785\text{mm}^2 \times 3 = 2.35\text{mm}^2$. Select piping and devices that ensure an effective section of 2.3mm² or more.)

Internal structure drawing

2-side type piping type: VSK-A

- VSK-A** W (With solenoid valve type vacuum break valve, normally closed)



Ejector system

VSY

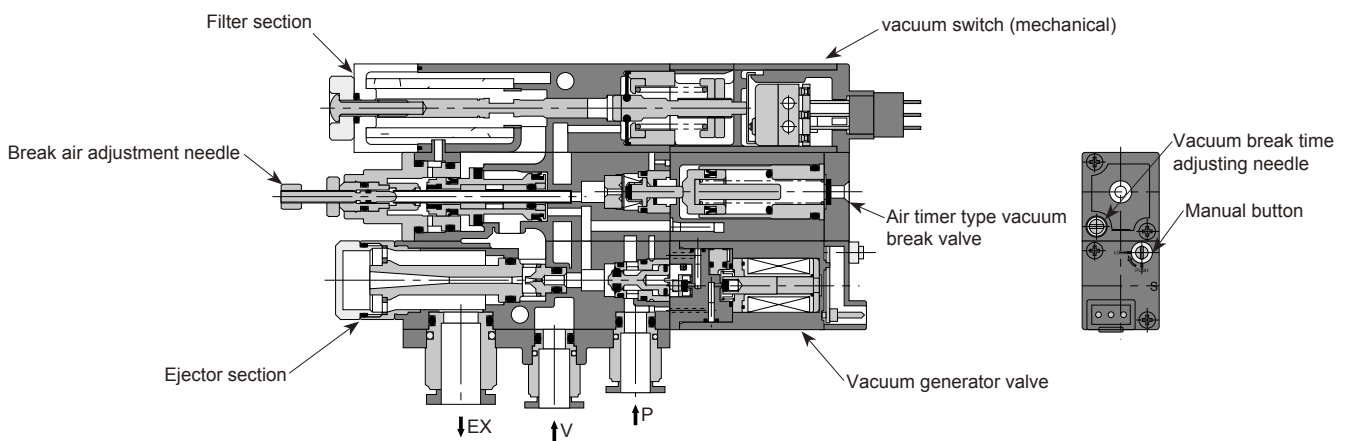
VSH·VSU
VSB·VSC

VSG

VSK
VSKM

1-side type piping type: VSK-B

- VSK-B** Q (With air timer type vacuum break valve, normally closed)



VSJ
VSJM

VSX
VSXM

VSQ

VSZM

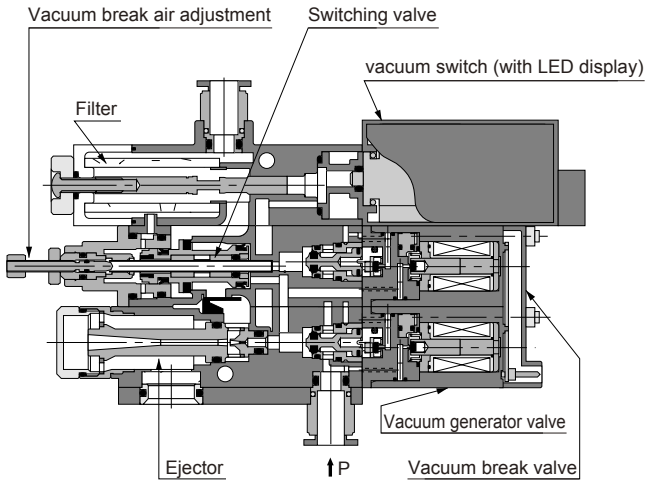
Operation explanation drawing

2-side type piping type: VSK-A

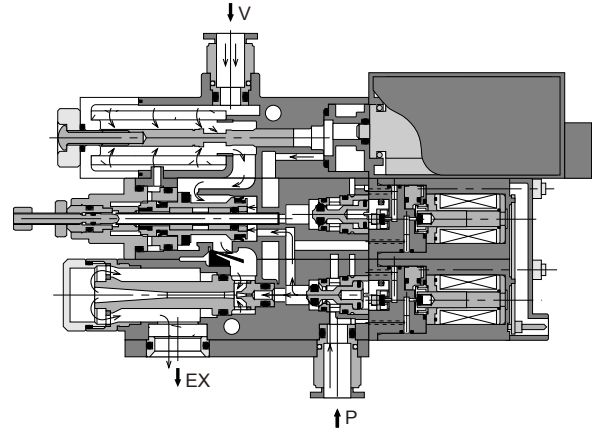
Example) VSK-A** W.....B

Vacuum generator valve (normally closed), solenoid valve type vacuum release valve, filter, vacuum switch with LED display

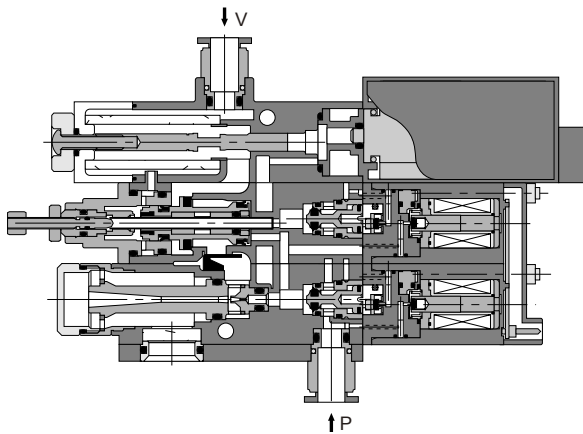
① Stopped condition



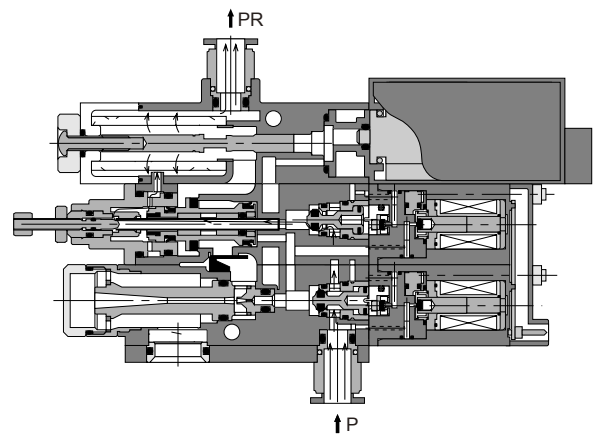
② At vacuum generation



③ Vacuum holding condition

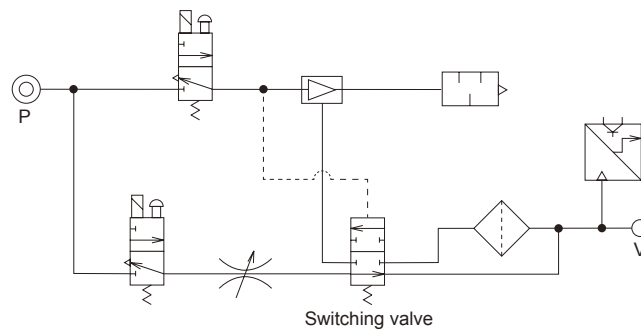


④ At vacuum break



VSK-A circuit diagram

Example) VSK-A** W.....B



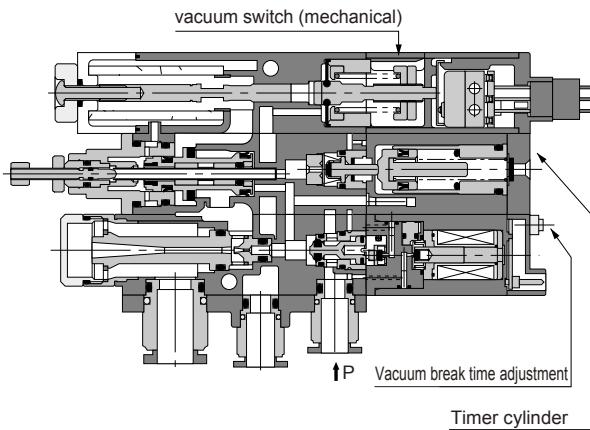
Operation explanation drawing

1-side type piping type: VSK-B

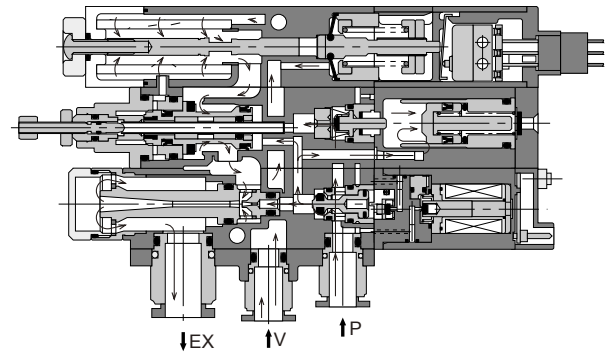
Example) VSK-B** Q.....B

Vacuum generator valve (normally closed), air timer type vacuum break valve, filter, mechanical vacuum switch

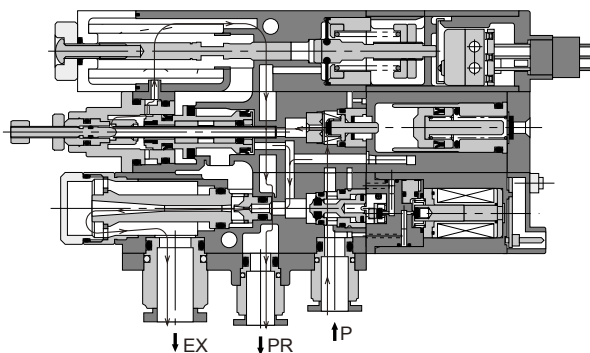
① Stopped condition



② At vacuum generation



③ At vacuum break (immediately after vacuum generator valve turns OFF)

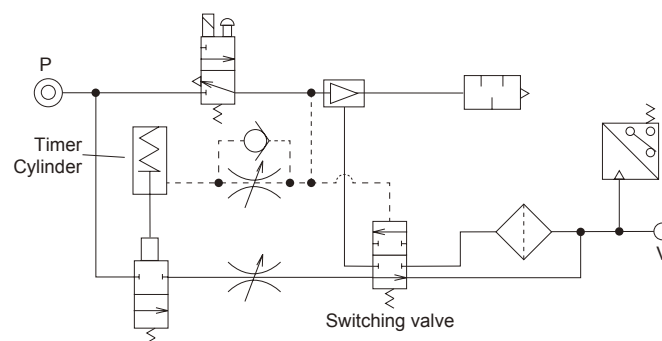


* Air timer break

If the electric signal is cut off after a vacuum is generated with the electric signal, compressed air is automatically fed to the vacuum circuit for a set time, during which pads are retracted from the work piece. When vacuum release operation ends, the vacuum circuit is closed.

VSK-B circuit diagram

Example) VSK-B** Q.....B



Ejector system

VSY

VSH•VSU
VSB•VSC

VSG

VSK
VSKM

VSJ
VSJM

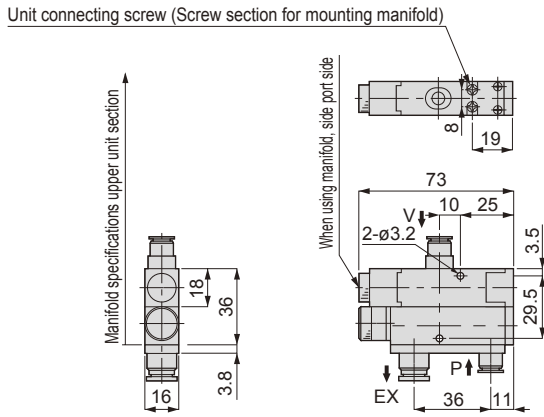
VSX
VSXM

VSQ

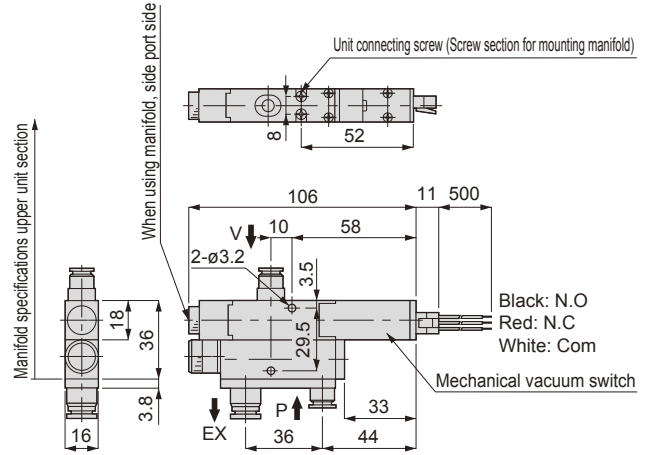
VSZM

Dimensions (piping method 2-side type VSK-A)

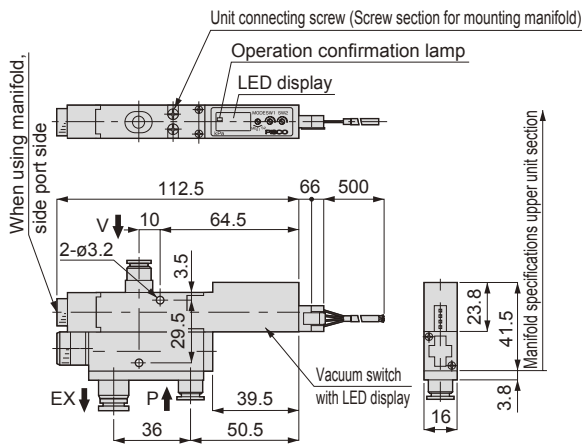
● Unit combination: Type A, B



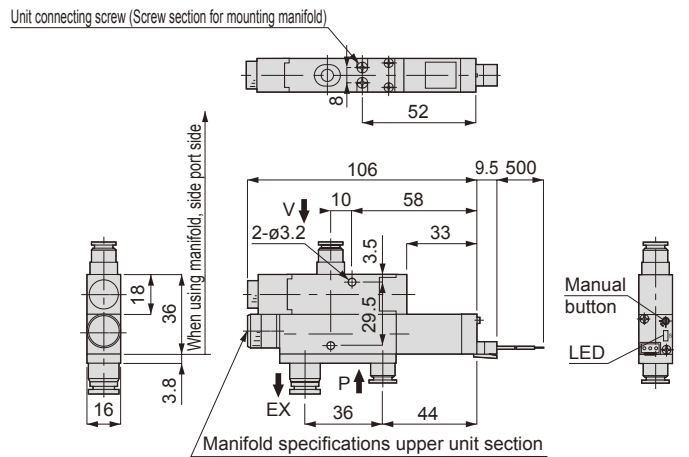
● Unit combination: Type C, D



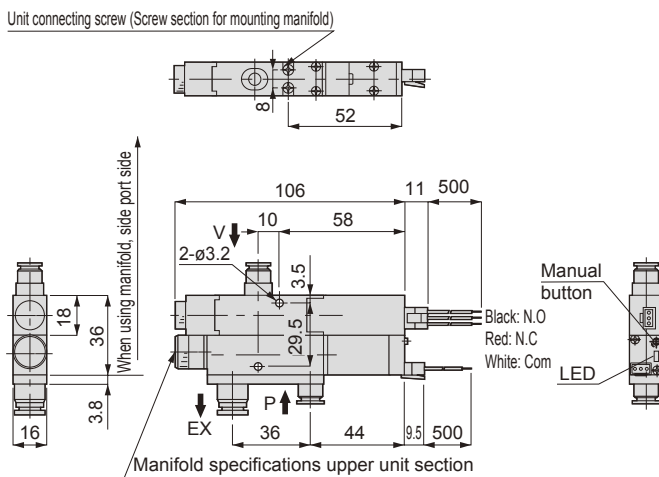
● Unit combination: Type E, F



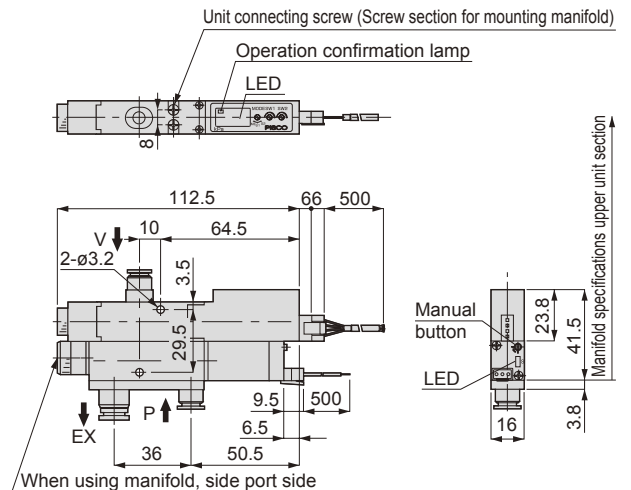
● Unit combination: Type G, H



● Unit combination: Type J, K



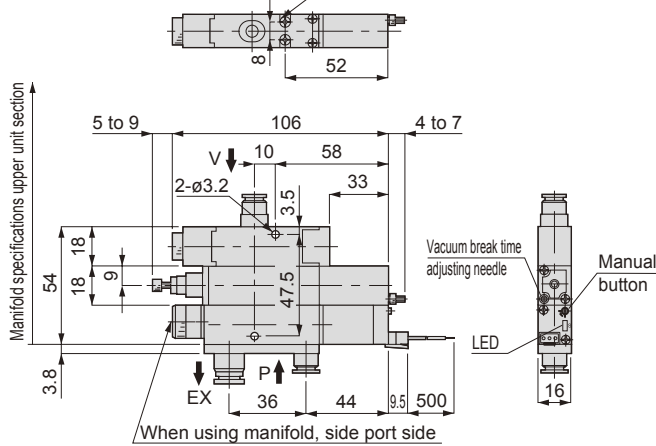
● Unit combination: Type L, M



Dimensions (piping method 2-side type VSK-A)

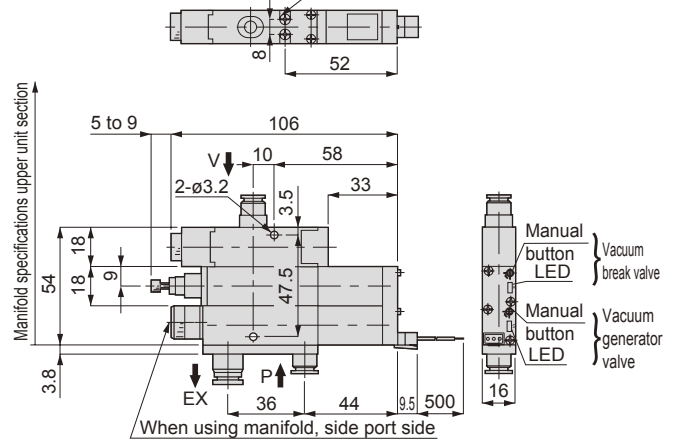
● Unit combination: type P

Unit connecting screw (Screw section for mounting manifold)



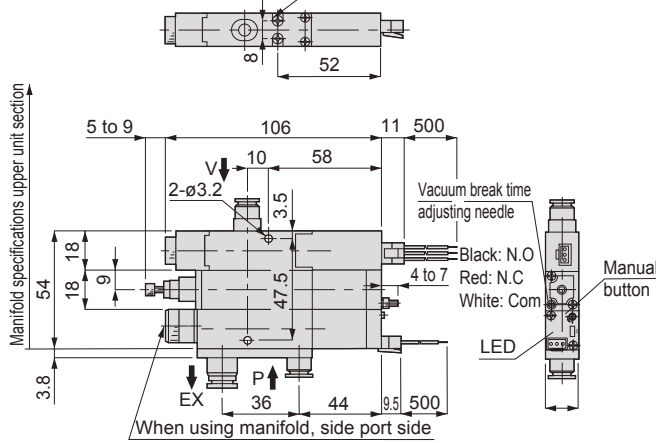
● Unit combination: type S

Unit connecting screw (Screw section for mounting manifold)



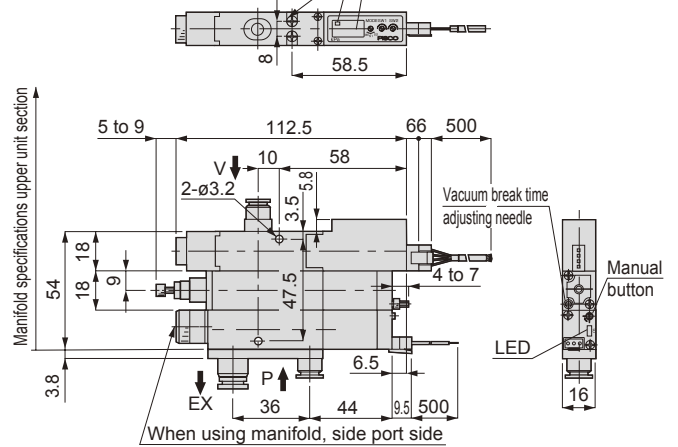
● Unit combination: type Q

Unit connecting screw (Screw section for mounting manifold)



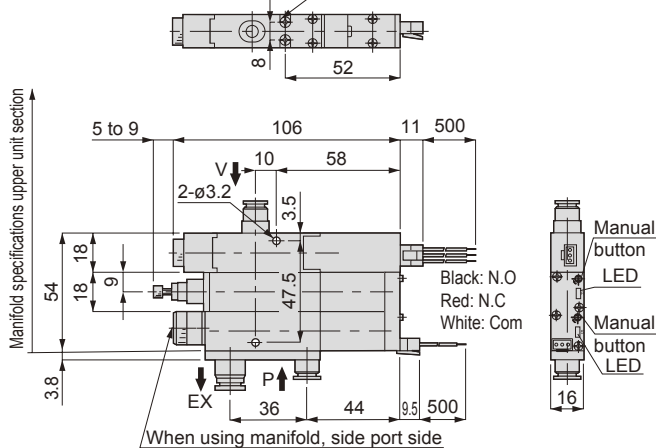
● Unit combination: type R

Unit connecting screw (Screw section for mounting manifold) Operation confirmation lamp LED display



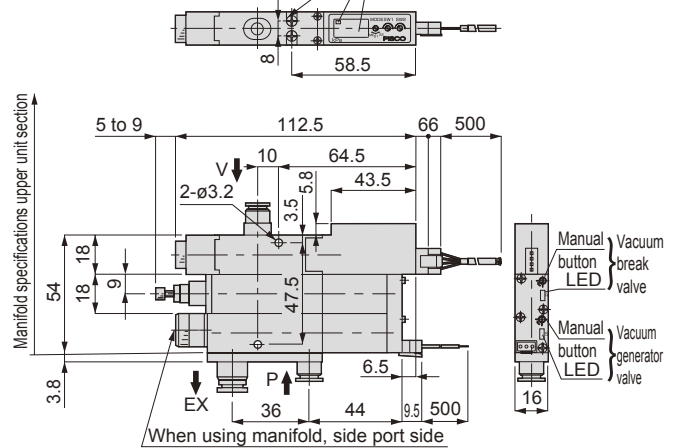
● Unit combination: type T

Unit connecting screw (Screw section for mounting manifold)



● Unit combination: type W

Unit connecting screw (Screw section for mounting manifold) Operation confirmation lamp LED display



Ejector system

VSY

VSH·VSU
VSB·VSC

VSG

VSK
VSKM

VSJ
VSJM

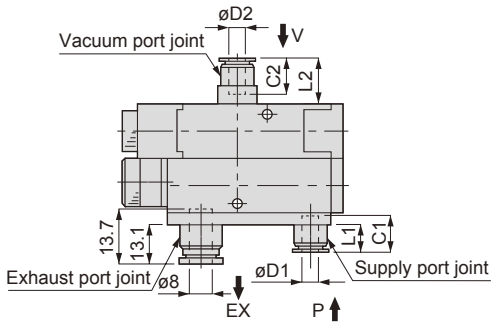
VSX
VSXM

VSQ

VSZM

Dimensions (piping method 2-side type VSK-A)

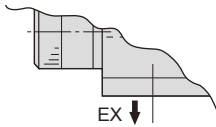
● Joint section dimension



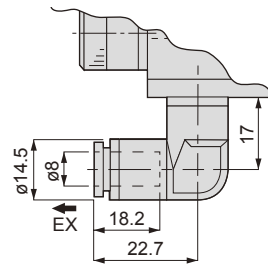
Unit: mm

	O.D. $\phi D1$	O.D. $\phi D2$	L1	L2	C1	C2
P port	4	-	6.1	-	11.2	-
	6	-	8.9	-	11.9	-
	8	-	17.3	-	18.2	-
V port	-	4	-	11.6	-	11.2
	-	6	-	14.4	-	11.9
	-	8	-	22.8	-	18.2

● Silencer (exhaust)



● Exhaust joint (elbow type)



Ejector system

VSY

VSH·VSU
VSB·VSC

VSG

VSK
VSKM

VSJ
VSJM

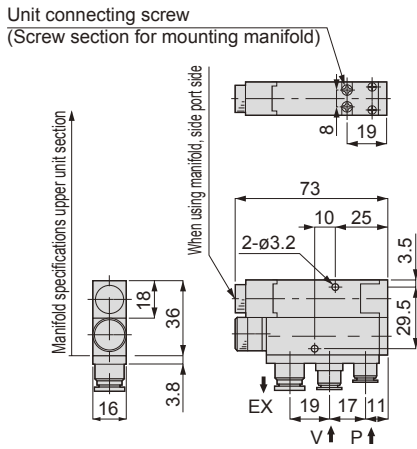
VSX
VSXM

VSQ

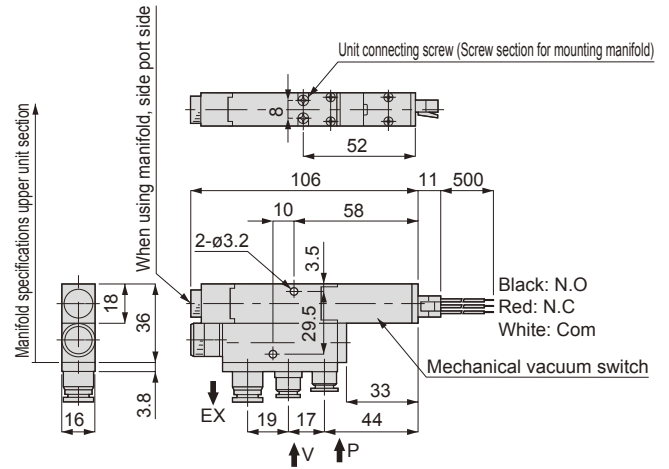
VSZM

Dimensions (piping method 1-side type VSK-B)

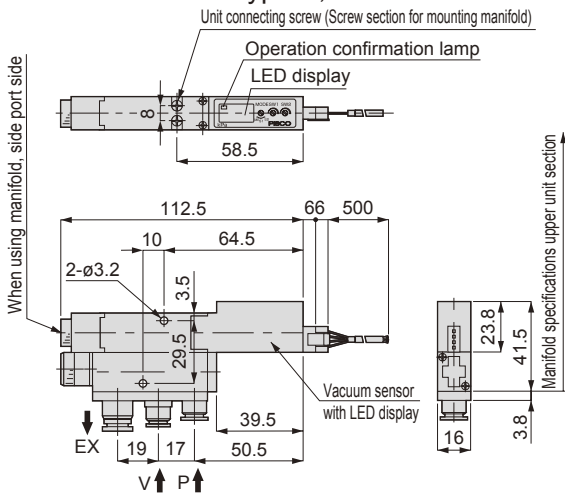
● Unit combination: Type A, B



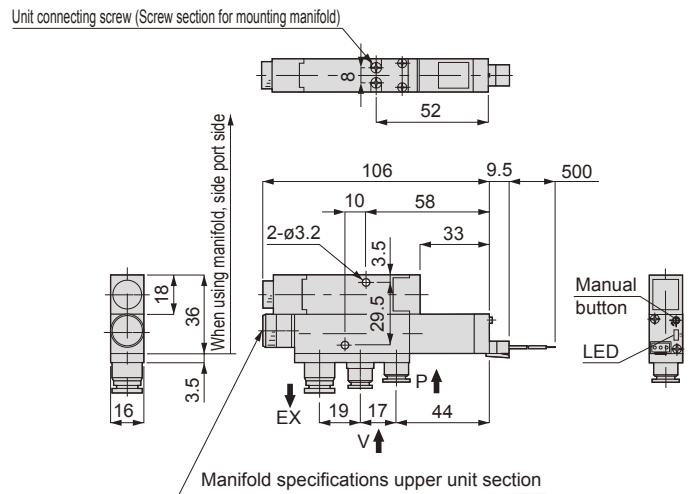
● Unit combination: Type C, D



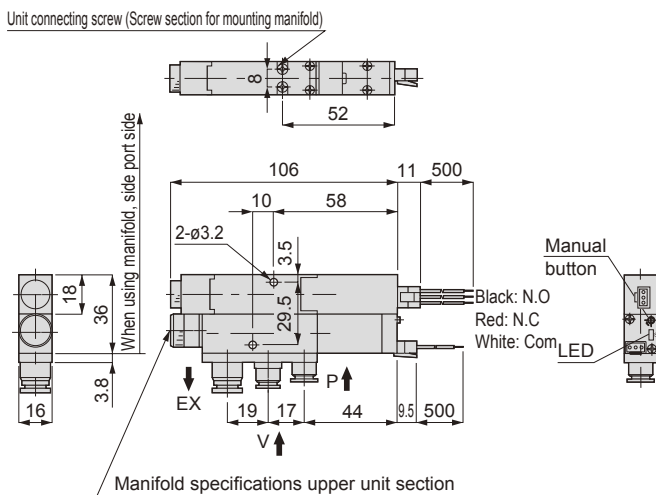
● Unit combination: Type E, F



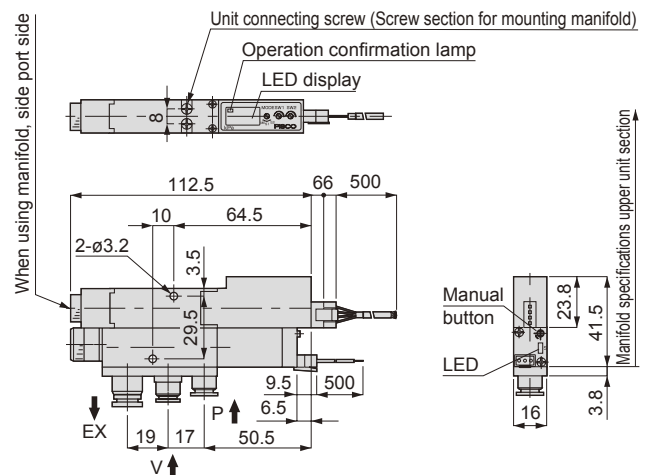
● Unit combination: Type G, H



● Unit combination: Type J, K



● Unit combination: Type L, M



Ejector system

VSY

VSH·VSU
VSB·VSC

VSG

VSK
VSKM

VSJ
VSJM

VSX
VSXM

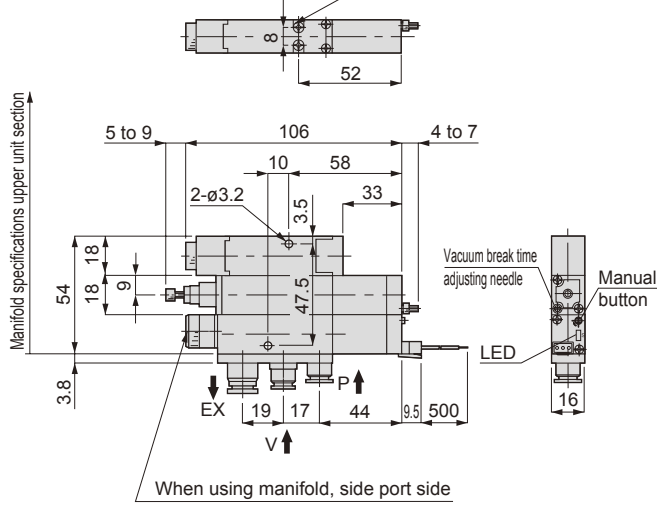
VSQ

VSZM

Dimensions (piping method 1-side type VSK-B)

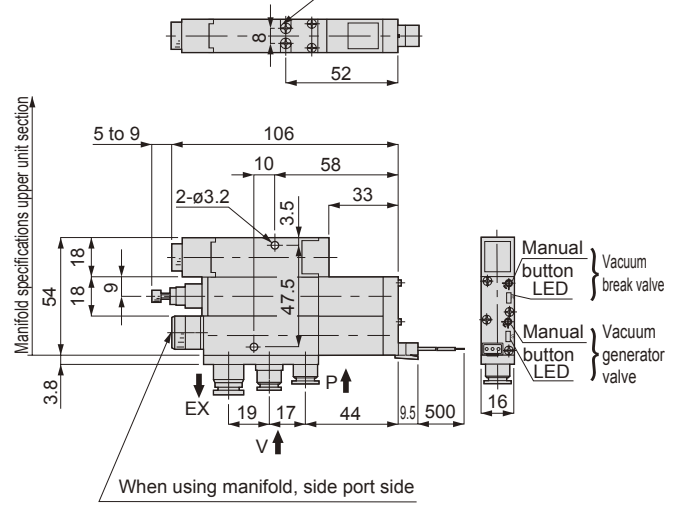
● Unit combination: type P

Unit connecting screw (Screw section for mounting manifold)



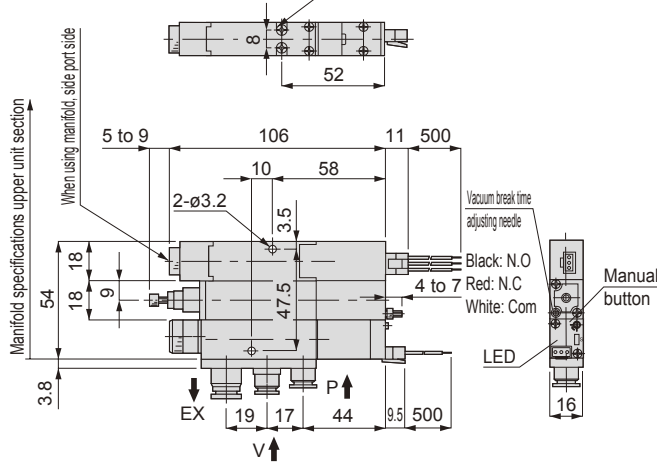
● Unit combination: type S

Unit connecting screw (Screw section for mounting manifold)



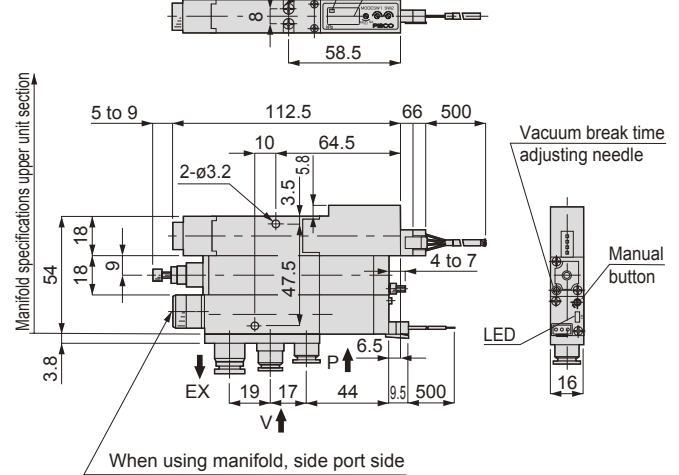
● Unit combination: type Q

Unit connecting screw (Screw section for mounting manifold)



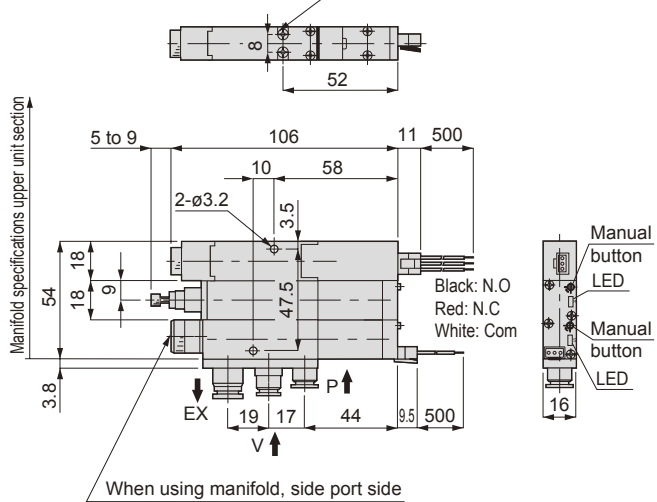
● Unit combination: type R

Unit connecting screw (Screw section for mounting manifold) Operation confirmation lamp LED display



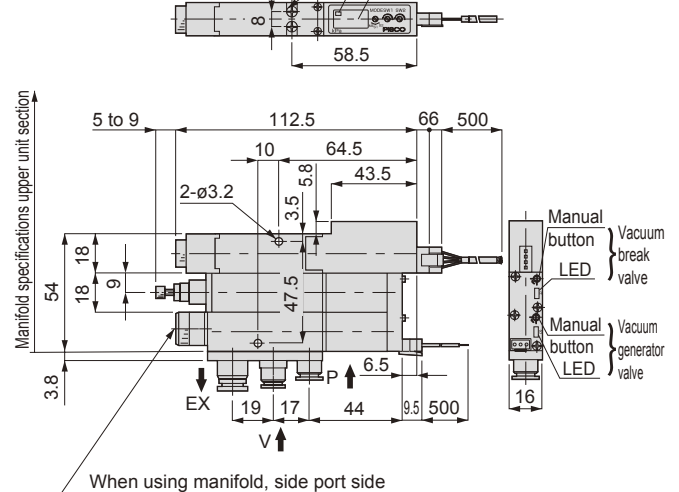
● Unit combination: type T

Unit connecting screw (Screw section for mounting manifold)



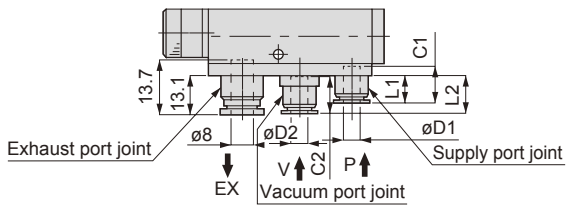
● Unit combination: type W

Unit connecting screw (Screw section for mounting manifold) Operation confirmation lamp LED display



Dimensions (piping method 1-side type VSK-B)

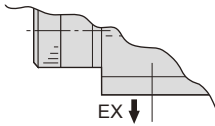
● Joint section dimension



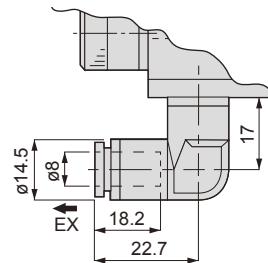
Unit: mm

	O.D. øD1	O.D. øD2	L1	L2	C1	C2
P port	4	-	6.1	-	11.2	-
	6	-	8.9	-	11.9	-
	8	-	17.3	-	18.2	-
V port	-	4	-	9.8	-	11.2
	-	6	-	12.6	-	11.9
	-	8	-	21	-	18.2

● Silencer (exhaust)



● Exhaust joint (elbow type)



Ejector system

VSJ

VSH•VSU
VSB•VSC

VSG

VSK
VSKM

VSJ
VSJM

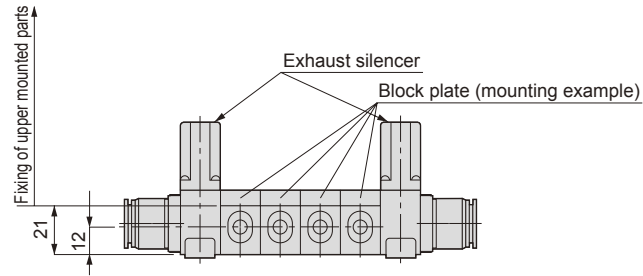
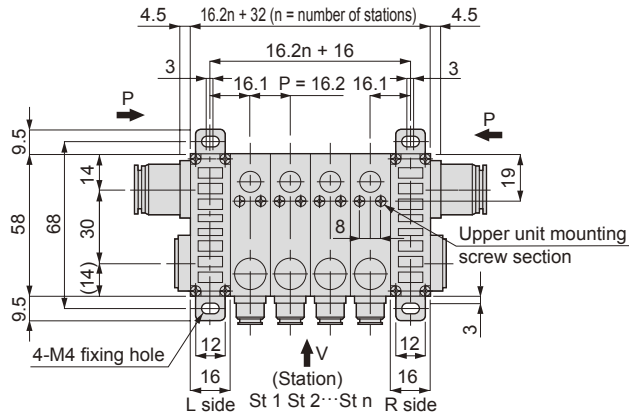
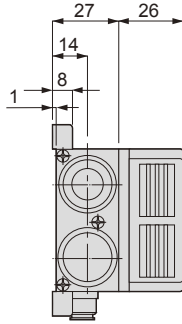
VSX
VSXM

VSQ

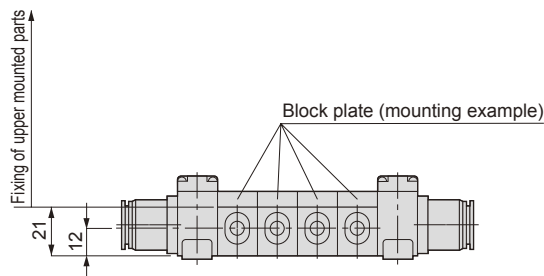
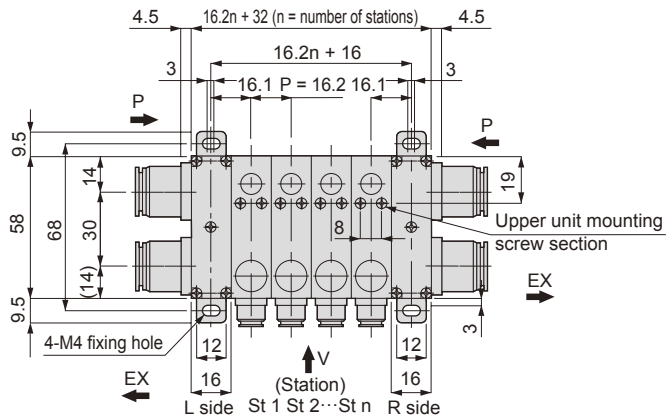
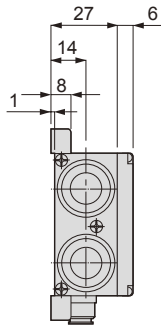
VSZM

Dimensions (manifold type VSKM)

● Manifold (open air exhaust)

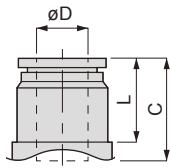


● Manifold (common exhaust type)



Dimensions (manifold type VSKM)

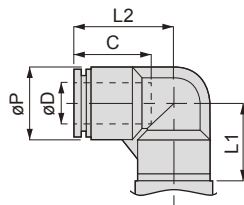
- Supply port joint dimensions
 - Straight type



Unit: mm

O.D. øD	L	C
6	11.1	17
8	12.2	18.2
10	14.7	20.7
12	18.8	23.3

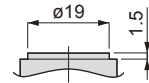
- Elbow type



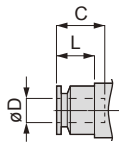
Unit: mm

O.D. øD	øP	C	L1	L2
8	14.5	18.2	17	22.7
10	17.7	20.2	21	26.2
12	21	23.4	23	29.4

- Plug type



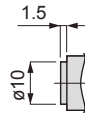
- Vacuum port joint dimensions
 - Straight type



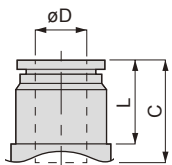
Unit: mm

O.D. øD	L	C
4	6.1	11.2
6	8.9	11.9
8	17.3	18.2

- Plug type



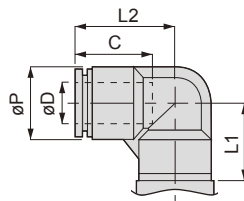
- Exhaust port joint dimensions
 - Straight type



Unit: mm

O.D. øD	L	C
8	12.2	18.2
10	14.7	20.7
12	18.8	23.3
16	23.9	24.8

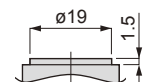
- Elbow type



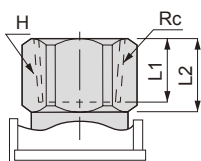
Unit: mm

O.D. øD	øP	C	L1	L2
8	14.5	18.2	17	22.7
10	17.7	20.2	21	26.2
12	21	23.4	23	29.4

- Plug type



- Female thread type



Unit: mm

Rc	Opposite side H	L1	L2
Rc1/4	22	11	14
Rc3/8	22	12	14
Rc1/2	24	13	17

Ejector system

VSY

VSH•VSU
VSB•VSC

VSG

VSK
VSKM

VSJ
VSJM

VSX
VSXM

VSQ

VSZM

Safety precautions

Refer to Intro 13 for the general precautions of the vacuum system components.

CAUTION

- The cartridge joint, timer cylinder, and element can be removed for maintenance by pulling out the set pin. Check that the set pin is securely inserted after parts are installed.
- Do not remove the gripper at the main unit connection. Removing and reattaching it too often may weaken the connection and damage the main unit.
- The working temperature range of the vacuum ejector unit VSK is 5 °C to 50 °C. Do not use this ejector at other temperature condition.
- Compressed air contains a lot of drainage (water, oxidized oil, tar, and substance) that may adversely affect the VSK's performance. Dehumidify air with After Cooler or Dryer and improve air quality.
- Do not use a lubricator.
- Rust, etc., in piping can result in operation faults. Install a 5µm or smaller filter before the supply port.
- Avoid using this vacuum ejector unit in environments with corrosive gas or flammable gas. Do not use this unit for fluids.
- Avoid suck dust, salt, iron chips, and etc.
- Do not operate the vacuum release solenoid valve when generating a vacuum.

Ejector system

VSY

VSH•VSU
VSB•VSC

VSG

VSK
VSKM

VSJ
VSJM

VSX
VSXM

VSQ

VSZM

Precautions for using the manifold

- Increasing the number of manifold stations may adversely affect performance or cause problems due to the causes below. Consult with CKD for details.
 1. Drop in vacuum performance due to insufficient air supply.

Countermeasure: ① Check the air supply capacity, etc.

② Keep piping as short as possible.

③ Increase joint size.

④ If using single-end supply, supply from both ends of the manifold.
 2. Drop in exhaust port capacity causing vacuum performance to drop or exhaust air to be discharged from another station's vacuum port.

→The number of manifold stations depends on nozzle size and vacuum performance, etc. Check with a CKD sales Office.

Cause When using a silencer (open air), insufficient silencer capacity causes exhaust resistance to increase and performance to drop.

Countermeasure: ① If using a single-end silencer, change to double-end silencer.

② Provide separate exhaust for each station. (Custom made)

③ Avoid exhaust at walls.

④ Reduce the number of stations.

Cause When using a common exhaust, performance drops when piping resistance is large.

Countermeasure: ① If using a single-end exhaust, change to double-end exhaust.

② Keep piping as short as possible.

③ Increase exhaust joint size.

④ Provide separate exhaust for each station. (Custom made)

⑤ Reduce the number of stations.
- When unit combination G, J, or L is selected, methods not moving all units simultaneously will cause the ejector exhaust in the moving ejector to flow into the unit's vacuum port. This can cause problems with exhaust, so contact CKD.

How to use

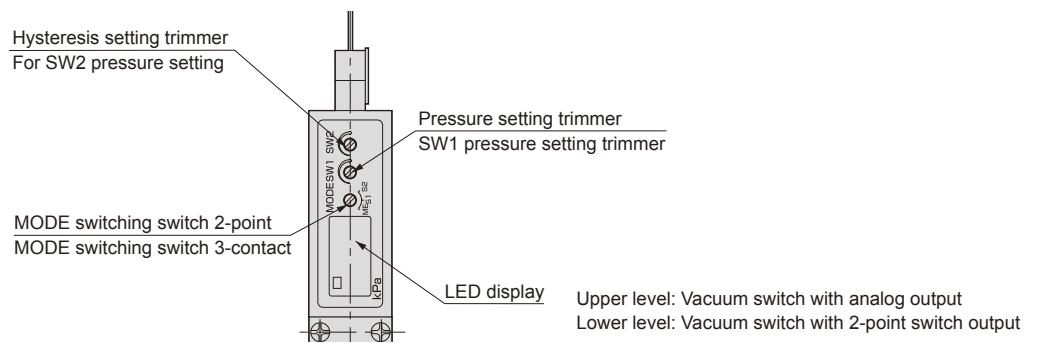
1. Vacuum switch with LED display

(1) How to set pressure

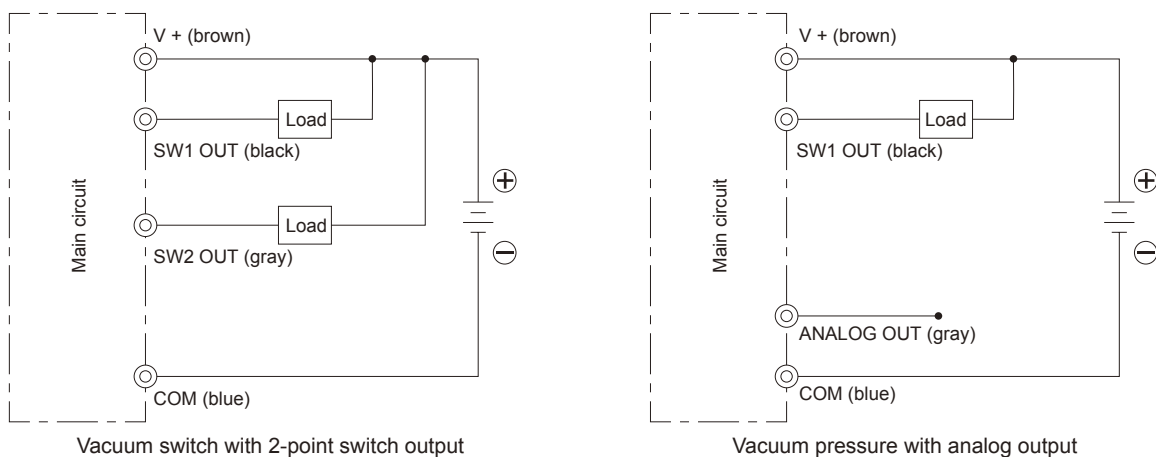
- ① Energizing (check wiring and supply DC power.)
- ② Set the display change switch to pressure setting mode. (ME→S1 or S2, SW)
- ② -2 (only vacuum switch with analog output)
Turn the hysteresis setting trimmer (HYS) fully in the CCW direction to set hysteresis to a minimum.
- ③ Turn the pressure setting trimmer (S1 or S2, SW) with a small screwdriver, setting it to the required setting.
- ④ Set the display change switch to ME, apply pressure and check that the sensor operates practically.
(vacuum switch with 2-point switch output)
Switch output 1 (S1): The operation (LED red) turns on when set pressure is exceeded.
Switch output 2 (S2): The operation (LED green) turns on when set pressure is exceeded.
(vacuum switch with analog output)
Switch output (SW): The operation (LED red) turns on when set pressure is exceeded.

(2) Setting hysteresis

- ① Hysteresis is adjusted using the hysteresis setting trimmer (HYS)
- ② Hysteresis is adjusted from 0 to 15% of the setting. Hysteresis increases when the trimmer is turned to CW.
- ③ Checking hysteresis
Set the display change switch to pressure display mode (ME) and gradually increase and decrease pressure near the set pressure. Read values at which the operation indicator turned on and off. The difference in displayed values is hysteresis.
- ④ Example of hysteresis adjustment
 - If pressure has a pulse and output is thin and intermittent, use large hysteresis.
 - To set the tolerable range for pressure drops.



(3) Connection method



Ejector system

VSY

VSH·VSU
VSB·VSC

VSG

VSK
VSKM

VSJ
VSJM

VSX
VSXM

VSQ

VSZM

How to use

2. Precautions for vacuum switch with LED display

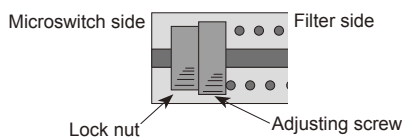
- ① Do not use this vacuum switch in fluids or in an atmosphere with corrosive substances. The switch could be damaged.
- ② Do not use wiring or applications that may cause noise (surge), etc., to be applied. The switch could be damaged.
- ③ Do not use this vacuum switch in an atmosphere containing fluids or flammable or explosive gasses. This device is not explosion-proof, so faults may occur.
- ④ Do not use this vacuum switch where it may be exposed to water, oil, or dust. This device is not drip-proof, so faults may occur.
- ⑤ Do not use this vacuum switch for applications that generate heat exceeding the working temperature. The switch could be damaged.
- ⑥ Turn power off before wiring. Check the lead wire color during wiring, and check that the output terminal, power terminal, and COM terminal are not short-circuited. The switch may fail if these terminals are short-circuited.
- ⑦ Do not apply excessive tension or bend the connector cable excessively. Wires and connector section may break.
- ⑧ Check that pressure exceeding 0.2 MPa is not constantly applied during a vacuum release. Constant application of this pressure may damage the switch.
- ⑨ When setting pressure or hysteresis, use a small screwdriver, and gently turn the trimmer within its rotation range. Do not force it. The trimmer or PCB may be damaged if excessive force is applied during adjustment.
- ⑩ Use stabilized DC power.
- ⑪ Insert a surge voltage absorption circuit in the relay or solenoid valve, etc., connected to the output terminal or power terminal. Avoid uses in which current exceeds 80mA.
- ⑫ Ground the FG terminal when using unit power, such as switching power.
- ⑬ Do not short-circuit the output terminal (black or gray lead) with other terminals.
- ⑭ Do not apply excessive external impact or force to the switch.

3. Mechanical vacuum switch

■ The vacuum ejector VSK vacuum switch uses a connector leads. Refer to the following drawing and wire.

■ To adjust pressure, twist off the cover with a screwdriver, etc., and adjust with the setting screw. The set vacuum degree increases when the screw is turn to the right (CW). The adjustment screw is fixed with a lock nut. Loosen the lock nut before adjusting the screw. After adjustment, fix the adjustment screw with the fingers, etc., and tighten the lock nut. When removing the cover, hold it lightly so it does not pop off.

* If the switch fails, contact a CKD Sales Office.



Lead wire colors	
White	Common
Red	N.C.
Black	N.O.

4. Precautions for mechanical vacuum switch with LED display.

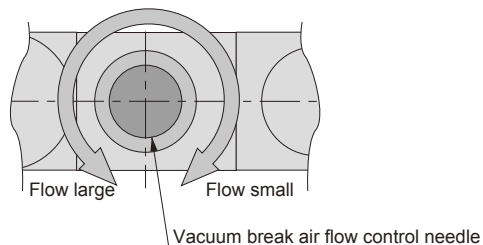
■ Keep vacuum piping as short as possible when using the vacuum ejector VSK with the vacuum switch.

■ If vacuum piping is too long, piping resistance increases when vacuum is generated. The vacuum at the sensor may be high even when no suction exists. This may cause switch faults. If piping must be long, install a discrete sensor, such as a pad, near the end of piping.

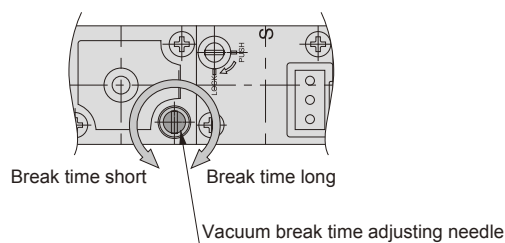
How to use

5. How to adjust the vacuum break valve

- Vacuum break air (solenoid valve type vacuum release valve, air timer type vacuum release valve)
 - Turning the vacuum release air adjustment needle to right (CW) decreases the release air flow and turning it to left (CCW) increases it.

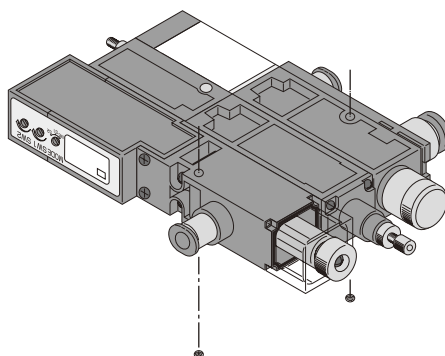


- Break time for air timer type vacuum break valve
 - To adjust break time for the air timer type vacuum break valve, turn the vacuum break time adjustment needle. When turned right (CW), the break time will increase, and when turned left (CCW), it decreases.



6. Fixing method

Fix the vacuum ejector VSK with M3 screws using the fixing holes on the resin body. (Refer to external dimension drawings for fixing hole pitch)



Ejector system

VSY

VSH•VSU
VSB•VSC

VSG

VSK
VSKM

VSJ
VSJM

VSX
VSXM

VSQ

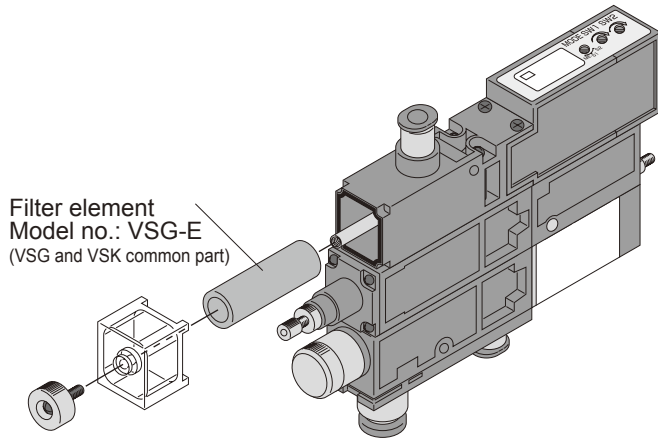
VSZM

How to use

7. Replacing the element

- Discrete type
 - Filter element

Ejector system



VSY

VSH·VSU
VSB·VSC

VSG

- Manifold type
 - Silencer kit

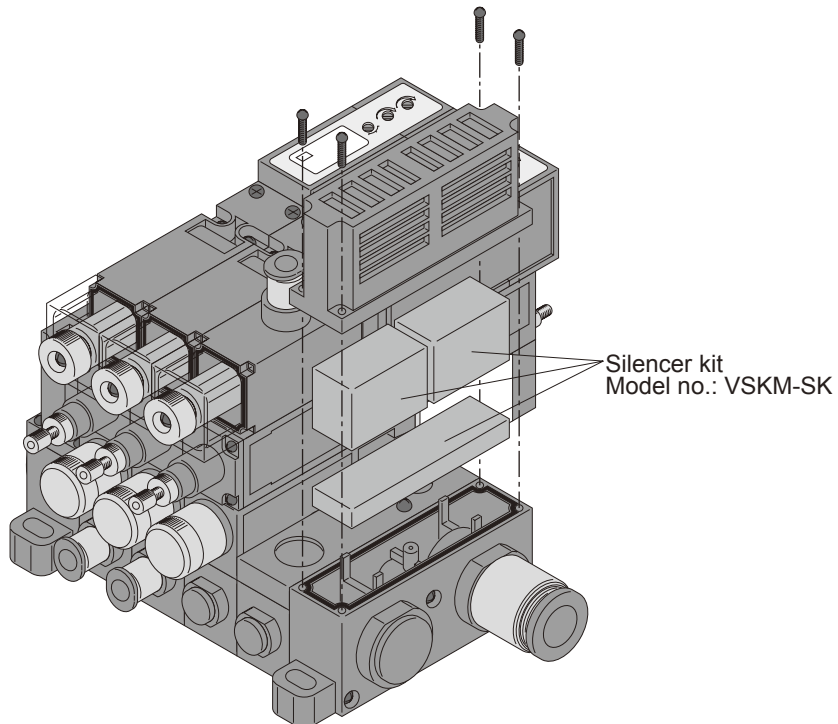
VSK
VSKM

VSJ
VSJM

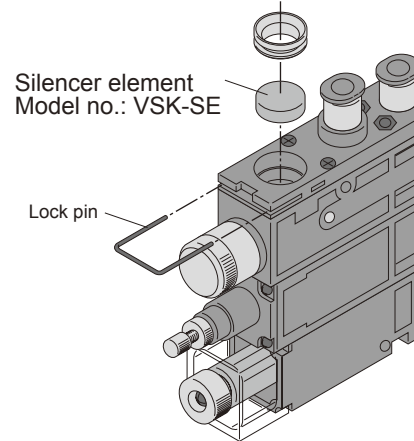
VSX
VSXM

VSQ

VSZM



- Silencer element



Preparing the VSKM mixed manifold specification sheet

● Mixed manifold model No. (Example)

VSKM - ^A Z ^B 00 ^C Z - ^D CX ^E 28 ^F S2 - ^G 3 ^H Z - ^I 5 - ^J Z

● Mixed manifold specifications (Example)

Ejector system	Vacuum ejector model no.						Layout position										Quantity	
	A	B	C	D	H	J	1	2	3	4	5	6	7	8	9	10		
VSKM -	H	07	G	S8	A		<input type="radio"/>	<input type="radio"/>										2
VSKM -	E	10	W	S6	B	NW			<input type="radio"/>									1
VSKM -	E	10	W	T6	B	NW					<input type="radio"/>							1
VSKM -																		
VSKM -																		
Masking block model No.																		
VSKM -	MB			S6						<input type="radio"/>								1

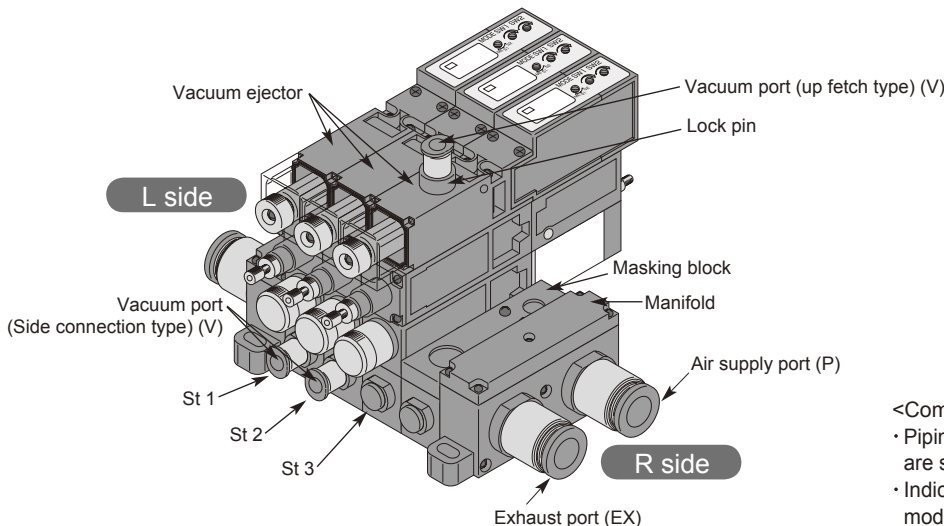
(Specifications when only output port size joints are mixed)

● Mixed manifold model No. (Example)

VSKM - ^A H ^B 07 ^C W - ^D CX ^E 28 ^F S2 - ^G 3 ^H B - ^I 5 - ^J NW

● Mixed manifold specifications (Example)

Ejector system	Vacuum ejector model no.						Layout position										Quantity	
	A	B	C	D	H	J	1	2	3	4	5	6	7	8	9	10		
VSKM -	H	07	W	S8	B	NW	<input type="radio"/>	<input type="radio"/>										2
VSKM -	H	07	W	S6	B	NW			<input type="radio"/>	<input type="radio"/>								2
VSKM -	H	07	W	T6	B	NW					<input type="radio"/>							1
VSKM -																		
VSKM -																		
Masking block model No.																		
VSKM -	MB																	



<Completing the form>

- Piping locations start from the vacuum port, and are set in order from the left.
- Indicate the total number of designated product models required at the far right in the table.

VSKM mixed manifold specification sheet

Issue / /

Customer name

Person in charge

Order No.

Contact _____ Quantity _____ Sets _____ Delivery / /

Slip No. _____ Order No. _____

Mixed manifold model No.

VSKM - - - - -

A Vacuum characteristics Note 1, Note 2, Note 3

H	High vacuum/medium flow type
L	Medium vacuum/large flow rate type
E	High vacuum/small flow rate type
Z	For mixed specifications (Indicate details in specification sheet.)

B Nozzle diameter Note 1, Note 2, Note 3

05	ø0.5
07	ø0.7
10	ø1.0
12	ø1.2
00	For mixed specifications (Indicate details in specification sheet.)

C Unit combination Note 2, Note 4, Note 5

Refer to Appendix Table 1 on page 43.

D Vacuum port (V) Note 2, Note 6

PP	Plug port position side surface
S4	ø4 push-in joint port position side
S6	ø6 push-in joint port position side
S8	ø8 push-in joint port position side
T4	ø4 push-in joint port position top
T6	ø6 push-in joint port position top
T8	ø8 push-in joint port position top
CX	For mixed joint (Indicate details in specification sheet.)

E Air supply port (P)

Refer to Appendix Table 2 on page 44 for details on the air supply port.

F Exhaust port (EX)

Refer to Appendix Table 3 on page 44 for details on the exhaust port.

G Solenoid valve voltage Note 4

1	100 VAC
3	24 VDC

H Valve type Note 2, Note 4

A	Normally open type
B	Normally closed type
Z	For mixed specifications (Indicate details in specification sheet.)

I Station no.

2 to 10	2 stations to 10 stations
----------------	---------------------------

J Vacuum switch specifications Note 2, Note 5

NW	NPN output 2 point
NA	NPN output 1 point + analog output
PW	2-point NPN output
PA	1-point NPN output + analog output
Z	For mixed specifications (Indicate details in specification sheet.)

⚠ Note on model no. selection

- Note 1: **A** E and **B** 05 can not be combined.
- Note 2: Indicate "Mixed manifold specification sheet" when selecting mixed specifications.
- Note 3: Only **B** 00 is selectable for **A** Z.
Only **A** Z is selectable for **B** 00.
- Note 4: If the **C** unit combination is A, B, C, D, E, F, the **G** solenoid valve voltage and **H** vacuum supply valve type can not be selected.
- Note 5: **J** vacuum sensor specifications are selectable only when the **C** unit combination is E, F, L, M, R, W.
- Note 6: When installing a masking block, select **D** CX and state installation and quantity with manifold specifications.

Mixed manifold specification sheet

Vacuum ejector model no. A B C D H J	Layout position										Quantity
	1	2	3	4	5	6	7	8	9	10	
VSKM - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> - <input type="text"/> <input type="text"/>											
VSKM - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> - <input type="text"/> <input type="text"/>											
VSKM - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> - <input type="text"/> <input type="text"/>											
VSKM - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> - <input type="text"/> <input type="text"/>											
VSKM - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> - <input type="text"/> <input type="text"/>											
Masking block model No.											
VSKM - MB - <input type="text"/>											

Ejector system
 VSY
 VSH·VSU
 VSB·VSC
 VSG
 VSK
 VSKM
 VSJ
 VSJM
 VSX
 VSXM
 VSQ
 VSZM