Ejector System/16 mm Width Integrated Type Vacuum Ejector Unit

VSK Series

RoHS

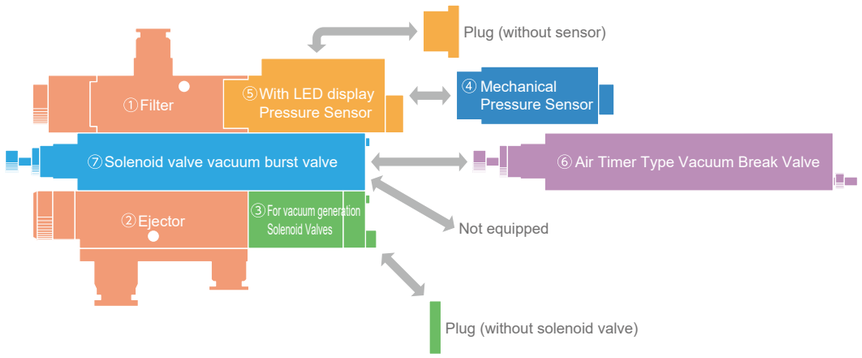
Integrated type vacuum ejector unit with modularized abundant units, allowing selection according to the purpose of use.

Abundant vacuum characteristic variations

Nozzle Diameter \ Vacuum Characteristics	Suction Flow Rate (L/min (ANR))			Air Consumption (L/min (ANR))			Ultimate Vacuum Pressure (-kPa)		
	H	L	E	H	L	E	H	L	E
0.5 mm	7	12		11.5			91	67	
0.7 mm	13	26	10.5	23		17	93	67	91
1.0 mm	27	40	21	46		34	93	67	91
1.2 mm	38	50	27	70		47	93	67	91

* Rated supply pressure; H, L⇒0.5 MPa, E⇒0.35 MPa

Modularization of each unit and abundant unit combinations allow selection of the optimal unit according to the purpose of use.



Unit Combination Code	A	B	C	D	E	F	G	H	J	K	L	M	P	Q	R	S	T	W
① Filter Section + ② Ejector Section	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
③ Vacuum Generation Solenoid Valve	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	○	○
Check Valve (Vacuum Holding Function)	–	○	–	○	–	○	–	○	–	○	–	○	–	–	–	–	–	–
④ Mechanical Pressure Sensor	–	–	○	○	–	–	–	–	○	○	–	–	–	○	–	–	○	–
⑤ Pressure Sensor with LED Display	–	–	–	–	○	○	–	–	–	–	○	○	–	–	○	–	–	○
⑥ Air Timer Type Vacuum Break Valve	–	–	–	–	–	–	–	–	–	–	–	–	○	○	○	–	–	–
⑦ Solenoid Valve-type Break Valve	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	○	○

Vacuum break valve can be selected from solenoid valve-type and air timer type, and furthermore, a switching valve is incorporated, enabling short-time vacuum break air blow and fine adjustment of break air.

* Air Timer Break
After generating vacuum with an electrical signal, when the electrical signal turns off, compressed air is automatically sent into the vacuum circuit for a fixed period of time. During this time, retract the pad from the workpiece. When the breaking operation finishes, the vacuum circuit becomes closed.

2 types of pressure switches available.

Pressure sensor with LED display (2 types: 2-point switch output, 1-point switch output + analog output) and a low-cost, easy-to-use mechanical-type are available. Model selection according to the application is possible.

Manual button is push & lock type, convenient for maintenance.

Solution Examples

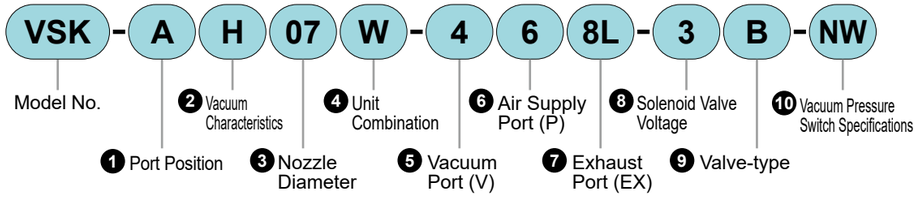
Packaging machines, assembly equipment, and various other transport devices.

An all-mighty model where unit configuration can be selected according to desired functions, usable for various applications.

Vacuum Components
Ejector System
VSB
VSC
VSG
VSK/ VSKM
VSJ/ VSJM
VSN/ VSNM
VSX/ VSXM
VSQ
VSZM
Ending

Model No. Notation

●Single Unit Type Model No.



1 Port Position

Code	Content
A	Single Unit Type Connection Port 2 faces
B	Single Unit Type Connection Port 1 face

2 Vacuum Characteristics

Code	Content
H	High Vacuum/Medium Flow Type
L	Medium Vacuum/High Flow Type
E	High Vacuum/Low Flow Type

Note) The combination of ❷ 'E' and Nozzle Diameter ❸ '05' cannot be selected.

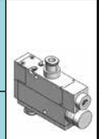
3 Nozzle Diameter

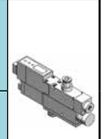
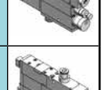
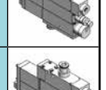
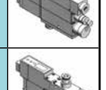
Code	Content
05	ø0.5
07	ø0.7
10	ø1.0
12	ø1.2

Note1) The combination of Vacuum Characteristics ❷ 'E' and ❸ '05' cannot be selected.

Note2) If ❺ Vacuum Port (V) or ❻ Air Supply Port (P) is '4', then '10' and '12' for item ❸ cannot be selected.

4 Unit Combination

Filter	Vacuum Generation Valve	Check Valve (Vacuum holding)	Mechanical Vacuum Pressure Switch	Vacuum pressure with digital display Switch	Air timer type vacuum burst Valve	For Vacuum Breaking Valve	Code	
●							A	
●		●					B	
●			●				C	
●		●	●				D	
●				●			E	
●		●		●			F	
●	●						G	
●	●	●					H	
●	●		●				J	
●	●	●	●				K	

Filter	Vacuum Generation Valve	Check Valve (Vacuum holding)	Mechanical Vacuum Pressure Switch	Vacuum pressure with digital display Switch	Air timer type vacuum burst Valve	For Vacuum Breaking Valve	Code	
●	●			●			L	
●	●	●		●			M	
●	●				●		P	
●	●			●	●		Q	
●	●			●	●		R	
●	●	Note1)				●	S	
●	●	Note1)	●			●	T	
●	●	Note1)		●		●	W	

Note1) Vacuum self-holding valve is built-in.

Note1) If ❹ is 'A', 'B', 'C', 'D', 'E', or 'F', then Solenoid Valve Voltage ❽ and Valve Type ❾ cannot be selected.

Note2) Select Vacuum Pressure Switch Specification ❿ only when ❹ is 'E', 'F', 'L', 'M', 'R', or 'W'.

5 Vacuum Port (V)

Code	Content
4	ø4 Push-in fitting
6	ø6 Push-in fitting
8	ø8 Push-in fitting

Note) If ❺ or Air Supply Port (P) ❻ is '4', then '10' and '12' for Nozzle Diameter ❸ cannot be selected.

6 Air Supply Port (P)

Code	Content
4	ø4 Push-in fitting
6	ø6 Push-in fitting
8	ø8 Push-in fitting

Note) If Vacuum Port (V) ❺ or ❻ is '4', then '10' and '12' for Nozzle Diameter ❸s cannot be selected.

7 Exhaust Port (EX)

Code	Content
S	Atmospheric Release with Silencer
8	ø8 Push-in fitting straight centralized exhaust
8L	*8 Push-in fitting elbow centralized exhaust

8 Solenoid Valve Voltage

Code	Content
1	100 VAC
3	24 VDC

Note) If Unit Combination ❹ is 'A', 'B', 'C', 'D', 'E', or 'F', then ❽ and Valve Type ❾ cannot be selected.

9 Valve-type

Code	Content
A	Normally Open
B	Normally Closed

Note) If Unit Combination ❹ is 'A', 'B', 'C', 'D', 'E', or 'F', then Solenoid Valve Voltage ❽ and ❾ cannot be selected.

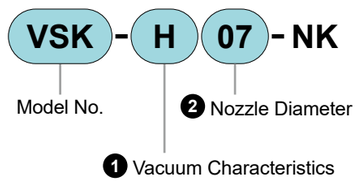
10 Vacuum Pressure Switch Specifications

Code	Content
NW	NPN Output 2 points with Digital Display
NA	NPN Output 1 point + Analog Output with Digital Display
PW	PNP Output 2 points with Digital Display
PA	PNP Output 1 point + Analog Output with Digital Display

Note) Select item ❿ only when Unit Combination ❹ is 'E', 'F', 'L', 'M', 'R', or 'W'.

Maintenance Part Model No. * For details on the maintenance parts, P. 189.

●Nozzle Kit



1 Vacuum Characteristics

Code	Content
H	High Vacuum/Medium Flow Type
L	Medium Vacuum/High Flow Type
E	High Vacuum/Low Flow Type

Note) The combination of ❶ 'E' and Nozzle Diameter ❷ '05' cannot be selected.

2 Nozzle Diameter

Code	Content
05	ø0.5
07	ø0.7
10	ø1.0
12	ø1.2

Note) The combination of ❶ Vacuum Characteristics 'E' and ❷ '05' cannot be selected.

●Filter Element

VSG-E

●Silencer Element for Single Unit

VSK-SE

●Silencer Kit for Manifold

VSKM-SK

●Masking Block for Manifold

VSKM-MB

Note) The combination of ❶ 'E' and Nozzle Diameter ❷ '05' cannot be selected.

Model No. Notation

In manifold types, exhaust air may flow around to non-operating ejectors and be output from the vacuum port. If exhaust air flow-around affects usage, please consult us.

●Manifold model No.

VSKM	-	H	07	W	-	T4	20	S2	-	3	B	-	10	-	NW
Model No.		❶	❷	❸		❹	❺	❻		❼	❽		❾		❿

●Manifold single unit model No.

VSKM	-	H	07	W	-	T4	—	3	B	—	NW
Model No.						❹					

●Manifold base only model No.

VSKM	—	PP	20	S2	—	10
Model No.		❹ Vacuum Port (V)	❻ Exhaust Port (EX)		❽ Valve-type	❿ Vacuum Pressure Switch Specifications

❷ Nozzle Diameter
❶ Vacuum Characteristics
❸ Unit Combination
❺ Air Supply Port (P)
❼ Solenoid Valve Voltage
❾ Number of Manifold Stations

❶ Vacuum Characteristics

Code	Content
H	High Vacuum/Medium Flow Type
L	Medium Vacuum/High Flow Type
E	High Vacuum/Low Flow Type
Z	For mixed specifications(Provide details in the specification sheet.)

Note1) The combination of ❶ 'E' and Nozzle Diameter ❷ '05' cannot be selected.
Note2) For mixed specifications, please be sure to fill out the 'Mixed Manifold Specification Sheet'.
Note3) When ❶ is 'Z', only Nozzle Diameter ❷ '00' can be selected. When ❷ is '00', only ❶ 'Z' can be selected.
Note4) For the 'Manifold Only' option, Nozzle Diameter ❷ 'Z' cannot be selected. For the 'Manifold Base Only' option, the vacuum characteristics cannot be selected.

❷ Nozzle Diameter

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

Note1) The combination of ❶ Vacuum Characteristics 'E' and ❷ '05' cannot be selected.
Note2) For mixed specifications, please be sure to fill out the 'Mixed Manifold Specification Sheet'.
Note3) When ❶ is 'Z', only ❷ '00' can be selected. When ❷ is '00', only ❶ 'Z' can be selected.
Note4) When ❹ Vacuum Port (V) is 'S4' or 'T4', ❷ '10' and '12' cannot be selected.
Note5) For the 'Manifold Only' option, ❷ 'Z' cannot be selected. For the 'Manifold Base Only' option, the nozzle diameter cannot be selected.

❸ Unit Combination

Filter	Vacuum Generation Valve	Check Valve (Vacuum holding)	Mechanical Vacuum Pressure Switch	Vacuum Pressure Switch with Digital Display	Air Timer Type Vacuum Breaking Valve	Vacuum Breaking Valve	Code
●							A
●		●					B
●			●				C
●		●	●				D
●				●			E
●		●		●			F
●	●						G
●	●	●					H
●	●		●				J
●	●	●	●				K
●	●			●			L
●	●	●		●			M
●	●				●		P

Filter	Vacuum Generation Valve	Check Valve (Vacuum holding)	Mechanical Vacuum Pressure Switch	Vacuum Pressure Switch with Digital Display	Air Timer Type Vacuum Breaking Valve	Vacuum Breaking Valve	Code
●	●		●		●		Q
●	●			●	●		R
●	●	*1				●	S
●	●	*1	●			●	T
●	●	*1		●		●	W
For mixed specifications (Provide details in the specification sheet.) <Applicable to Manifold Type>							Z

*1: Vacuum self-holding valve is built-in.

Note1) For mixed specifications, be sure to fill out the "Mixed Manifold Specification Sheet".
Note2) When ❸ is 'A', 'B', 'C', 'D', 'E', or 'F', Solenoid Valve Voltage ❼ and Valve Type ❽ cannot be selected.
Note3) Select Vacuum Pressure Switch Specification ❿ only when ❸ is 'E', 'F', 'L', 'M', 'R', or 'W'.
Note4) For the manifold type model number, 'A', 'B', 'C', 'D', 'E', or 'F' cannot be selected for item ❸.
Note5) For the 'Manifold Only' option, the unit combination cannot be selected.

❹ Vacuum Port (V)

Code	Content	Type: Manifold Type	Type: Manifold Single Unit	Type: Manifold Only
PP	Plug Port Position Side			●
S4	ø4 Push-in fitting Port Position Side	●		●
S6	ø6 Push-in fitting Port Position Side	●		●
S8	ø8 Push-in fitting Port Position Side	●		●
T4	ø4 Push-in fitting Port Position Top	●	●	
T6	ø6 Push-in fitting Port Position Top	●	●	
T8	ø8 Push-in fitting Port Position Top	●	●	
00	For Manifold Single Unit with Port Position Side		●	
CX	For Fitting Mix (Provide details in the specification sheet.)	●		

Note1) For mixed specifications, be sure to fill out the "Mixed Manifold Specification Sheet".
Note2) To mount a masking block, select Nozzle Diameter ❷ 'CX' and specify the mounting position and quantity on the manifold specification sheet.
Note3) When ❹ is 'S4' or 'T4', Nozzle Diameter ❷ '10' and '12' cannot be selected.

❺ Air Supply Port (P)

Shape	Size	Position	Code
Straight Fitting	ø6	R Side Only	16
	ø8		18
	ø10		10
	ø12		12
	ø6	Both Sides	26
	ø8		28
	ø10		20
	ø12		22
	ø6	L Side Only	36
	ø8		38
	ø10		30
	ø12		32
Elbow Fitting	ø8	R Side Only	48
	ø10		40
	ø12		42
	ø8	L Side Only	58
	ø10		50
	ø12		52
	ø8	Both Sides	68
	ø10		60
	ø12		62

Note) For manifold single unit, air supply port cannot be selected.

❻ Exhaust Port (EX)

Centralized Exhaust Port			
Shape	Size	Position	Code
Straight Fitting	ø8	R Side Only	18
	ø10		10
	ø12		12
	ø8	L Side Only	28
	ø10		20
	ø12		22
	ø8	Both Sides	38
	ø10		30
	ø12		32
Elbow Fitting	ø8	R Side Only	48
	ø10		40
	ø12		42
	ø8	L Side Only	58
	ø10		50
	ø12		52
	ø8	Both Sides	68
	ø10		60
	ø12		62
Tapered Pipe Female Thread	Rc1/4	R Side Only	72
	Rc3/8		73
	Rc1/2		74
	Rc1/4	L Side Only	82
	Rc3/8		83
	Rc1/2		84
	Rc1/4	Both Sides	92
	Rc3/8		93
	Rc1/2		94
Atmospheric Release-type Silencer		R Side Only	S1
		L Side Only	S2
		Both Sides	S3

Note) For manifold single unit, exhaust port cannot be selected.

❼ Solenoid Valve Voltage

Code	Content
1	100 VAC
3)	24 VDC

Note1) When ❸ Unit Combination is 'A', 'B', 'C', 'D', 'E', or 'F', ❼ and Valve Unit Type ❽ cannot be selected.
Note2) For the 'Manifold Only' option, the solenoid valve voltage cannot be selected.

❽ Valve-type

Code	Content
A	Normally Open
B	Normally Closed
Z	For Mixed Specifications (Provide details in the specification sheet.)

Note1) For mixed specifications, be sure to fill out the "Mixed Manifold Specification Sheet".
Note2) When ❸ is 'A', 'B', 'C', 'D', 'E', or 'F', Solenoid Valve Voltage ❼ and Valve Unit Type ❽ cannot be selected.
Note3) For the 'Manifold Only' option, ❽ 'Z' cannot be selected.

❾ Number of Manifold Stations

Code	Content
2	2 stations
to	to
10	10 stations

Note1) The number of stations that can operate simultaneously differs depending on the combination of nozzle diameter and port size. Please inquire for details.
Note2) For manifold single unit only, the number of manifold stations cannot be selected.

❿ Vacuum Pressure Switch Specifications

Code	Content
NW	NPN Output 2 points with Digital Display
NA	NPN Output 1 point + Analog Output with Digital Display
PW	PNP Output 2 points with Digital Display
PA	PNP Output 1 point + Analog Output with Digital Display
Z	For Mixed Specifications (Provide details in the specification sheet.)

Note1) For mixed specifications, be sure to fill out the "Mixed Manifold Specification Sheet".
Note2) Select item ❿ only when ❸ Unit Combination is 'E', 'F', 'L', 'M', 'R', or 'W'.
Note3) For the 'Manifold Only' option, ❿ 'Z' cannot be selected. For the 'Manifold Base Only' option, the vacuum pressure switch specification cannot be selected.

Specifications

Item	VSK
Operating Fluid	Air
Operating Pressure MPa	0.25 to 0.7
Ambient Temperature/Fluid Temperature °C	5 to 50
Lubrication	Not required

Ejector Characteristics

Model No.	Nozzle Diameter (mm)	Rated Supply Pressure (MPa)	Ultimate Vacuum Pressure (-kPa)	Suction Flow Rate (L/min (ANR))	Air Consumption (L/min (ANR))
VSK-□H05...	0.5	0.5	91	7	11.5
VSK-□L05...		0.5	67	11	11.5
VSK-□H07...	0.7	0.5	93	13	23
VSK-□L07...		0.5	67	(24) 26	23
VSK-□E07...		0.35	91	10.5	17
VSK-□H10...	1.0	0.5	93	27	46
VSK-□L10...		0.5	67	40	46
VSK-□E10...		0.35	91	21	34
VSK-□H12...	1.2	0.5	93	38	70
VSK-□L12...		0.5	67	50	70
VSK-□E12...		0.35	91	27	47

Note) Values in ( ) are for Vacuum Port: ø4 mm Push-in fitting.

Valve (for Vacuum Generation, Breaking) Specifications

Item	Solenoid Valve (for Vacuum Generation, Breaking)				
Configuration	Vacuum Generation Valve		Vacuum Breaking Valve		
Rated Voltage V	24 VDC	100 VAC	24 VDC	100 VAC	
Voltage Fluctuation Range V	DC 21.6 to 26.4 (DC 24 ±10%)	AC 90 to 110 (AC 100 ±10%)	DC 21.6 to 26.4 (DC 24 ±10%)	AC 90 to 110 (AC 100 ±10%)	
Surge Suppressor	Varistor	Bridge Diode	Varistor	Bridge Diode	
Power Consumption	0.8 W	1 VA	0.8 W	1 VA	
Valve-type and Operation Method	Pilot operated poppet valve				
Insulation Class	Equivalent to Class B				
Manual Override	Locking push-type				
Operation Indicator	Red LED lights up when coil is energized				
Method and Lead Wire Length	Connector type: 500 mm				
Proof Pressure MPa	1.05				
Operation Classification	N.C.	N.O.	N.C.	N.O.	N.C.
Effective Area mm²	3.5	3.5	3.5	3.5	0.6

Lead Wire Color

For Vacuum Generation Valve Only		For Combination of Vacuum Generation and Breaking Valves	
24 VDC	100 VAC	24 VDC	100 VAC
Red(+) Black(-)	Blue	Black(-: supply solenoid valve)	White(Common)
		Red(+: COMMON)	Blue(Supply Solenoid Valve)
		White(-: burst solenoid valve)	Black(Breaking Solenoid Valve)

Vacuum Pressure Switch with Digital Display Specifications

Item		Vacuum Pressure Switch with Digital Display			
Specifications		With 2-point Switch Output (-NW)	With Analog Output (-NA)	With 2-point Switch Output (-PW)	With Analog Output (-PA)
Current Consumption mA		≤ 40			
Pressure Sensing Element		Diffused Semiconductor Pressure Switch			
Working pressure kPa		-100 to 0			
Set Pressure kPa		-99 to 0			
Proof Pressure MPa		0.2			
Storage Temperature °C		-20 to 70 (Atmospheric pressure, ≤ 60% RH humidity)			
Operating Temperature °C		0 to 50 (However, no freezing)			
Operating Humidity		35 to 85% RH (No condensation)			
Power Supply Voltage V		DC 12 to 24 ±10% Ripple(P-P) ≤ 10%			
Protection Structure		Equivalent to IEC Standard IP40			
Number of Output Points		2	1	2	1
Repeatability		±3% F.S. max(at Ta = 25°C)			
Differential		Fixed (≤ 2% F.S.)	Variable (Approx. 0 to 15% F.S.)	Fixed (≤ 2% F.S.)	Variable (Approx. 0 to 15% F.S.)
Switch Output		NPN Transistor Open Collector Output 30 V 80 mA Residual Voltage 0.8 V		PNP Transistor Open Collector Output Power Supply Voltage 80 mA Residual Voltage 0.8 V	
Analog Output	Output Voltage V	-	1 to 5	-	1 to 5
	Zero Point Voltage V	-	1±0.1	-	1±0.1
	Span Voltage V	-	4±0.1	-	4±0.1
	Output Current mA	-	≤ 1 (Load resistance ≥ 5 kΩ)	-	≤ 1 (Load resistance ≥ 5 kΩ)
	Linearity/Hysteresis	-	±0.5% F.S. or less	-	±0.5% F.S. or less
Response time ms		Approx. ≤ 2			
Display kPa		-99 to 0 (2-digit Red LED display)			
Display Update Rate		Approx. 4 times/sec			
Display Accuracy		±3% F.S. ±2 digit			
Resolution		1 digit			
Operation Indicator		SW1: Red LED lights up at or above set pressure SW2: Green LED lights up at or above set pressure	Red LED lights up at or above set pressure	SW1: Red LED lights up at or above set pressure SW2: Green LED lights up at or above set pressure	Red LED lights up at or above set pressure
Functions		1. MODE Switch(ME or S1 or S2) 2. S1 Setting Trimmer(2/3 turn trimmer) 3. S2 Setting Trimmer(2/3 turn trimmer)	1. MODE Switch(ME or SW) 2. SW Setting Trimmer(2/3 turn 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 turn trimmer) 3. S2 Setting Trimmer(2/3 turn trimmer)	1. MODE Switch(ME or SW) 2. SW Setting Trimmer(2/3 turn trimmer) 3. HYS Setting Trimmer(Approx. 0 to 15% of set value)

Mechanical Vacuum Pressure Switch Specifications

Item		Mechanical Vacuum Pressure Switch
Pressure Detection Method		Diaphragm - Microswitch
Set Pressure	kPa	-80 to -20
Setting Method		Infinitely adjustable by rotating nut
Switch Terminals		Common, N.O., N.C.
Repeatability	kPa	±4
Differential	kPa	≤ 16
Microswitch Used		QJ Type (AM8100) Panasonic or J-7 Omron
Electrical Capacity		7A 250 VAC
Factory Set Pressure	kPa	Approx. -50

Air Timer Type Vacuum Break Valve Specifications

Item		Air Timer Type Vacuum Breaking Valve
Structure		Delayed type by timer air cylinder, poppet type, 2-way valve
Breaking Time		Approx. 0.3 to 3 seconds immediately after vacuum generation valve closes
Break Air Flow Rate	L/min (ANR)	0 to 40 (supply pressure: At 0.5 MPa)
Time Setting Method		Control by speed controller of timer air cylinder

Vacuum Filter Specifications

Item		Vacuum Filter
Element Material		Polyvinyl formal
Filtration Rating	μm	10
Filtration area	mm²	1,130

Weight Table

Unit Combination Code	Weight (g) for single unit		Weight (g) for manifold	
	VSK-A...	VSK-B...	VSKM...-S...	VSKM...-T...
A	60	60	76	78
B	60	60	76	78
C	79	79	94	96
D	79	79	94	96
E	85	85	100	102
F	85	85	100	102
G	81	81	97	99
H	81	81	97	99
J	100	100	115	117
K	100	100	115	117
L	106	106	121	123
M	106	106	121	123
P	134	134	150	152
Q	153	153	168	170
R	159	159	174	176
S	129	129	144	146
T	147	147	163	165
W	153	153	169	171

Manifold Type		Weight (g)
Side Block	VSKM...-...S1...	73
	VSKM...-...S2...	84
	VSKM...-...S3...	73
	VSKM...-.....	61
Intermediate Block	VSKM-.....-.....(Without plug)	21
	VSKM-...P-.....(With plug)	22

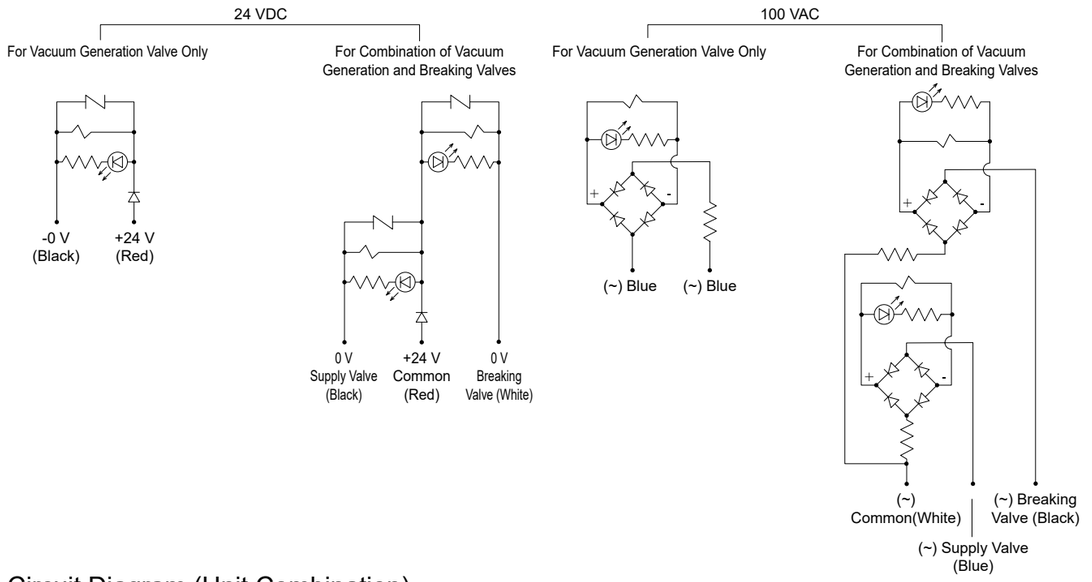
Block Plate	Weight (g)
VSKM...-MB	6

Silencer	Weight (g)
Single Unit Atmospheric Release	2

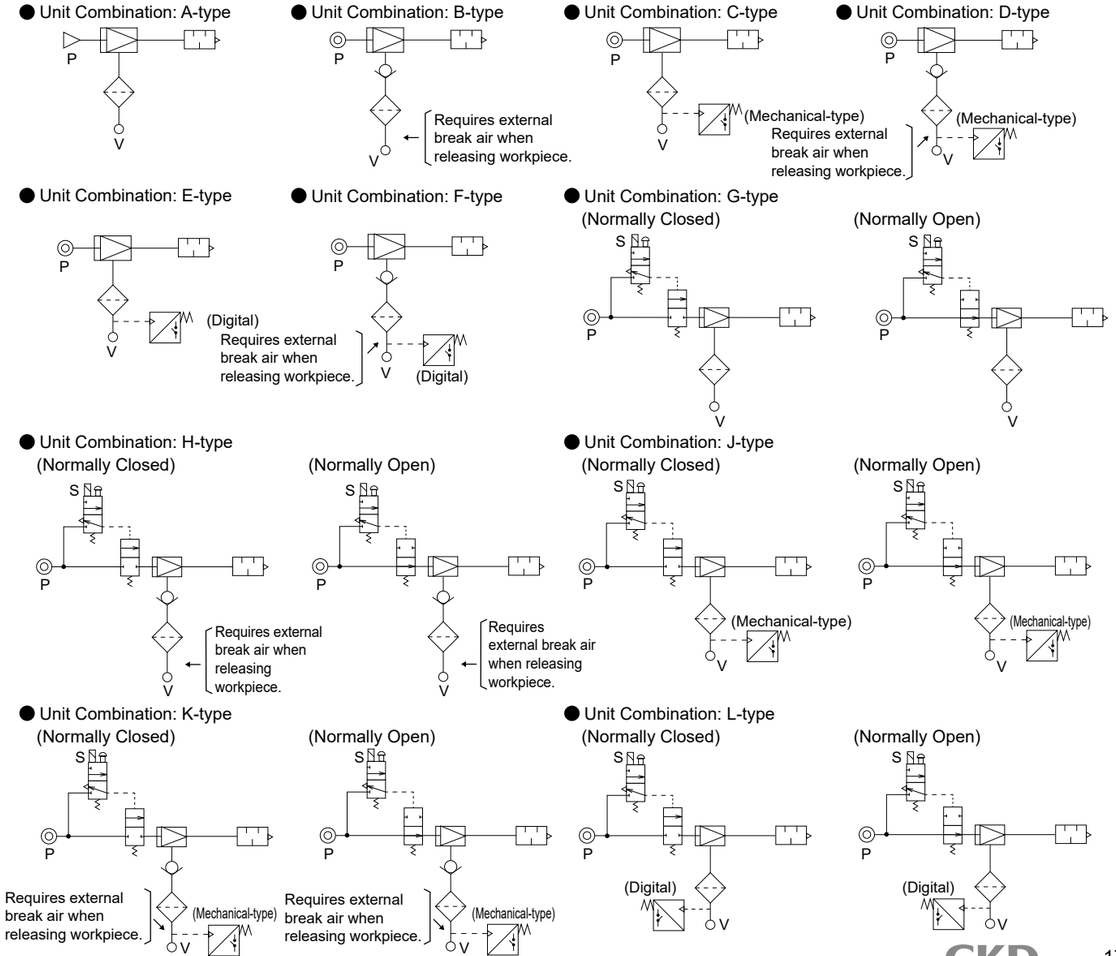
Cartridge for Single Unit	Weight (g)
ø4 Push-in fitting	3.5
ø6 Push-in fitting	3.5
ø8 Push-in fitting	10
Plug Cartridge	1.5

Cartridge for Manifold	Weight (g)
ø6 Push-in fitting	21
ø8 Push-in fitting	20
ø10 Push-in fitting	19
ø12 Push-in fitting	26
ø8 Elbow Push-in fitting	25
ø10 Elbow Push-in fitting	32
ø12 Elbow Push-in fitting	38
Rc1/4 Cartridge	44
Rc3/8 Cartridge	35
Rc1/2 Cartridge	38
Plug Cartridge	6

Electrical Circuit(Solenoid Valve)

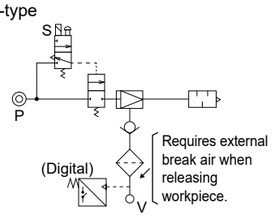


Circuit Diagram (Unit Combination)

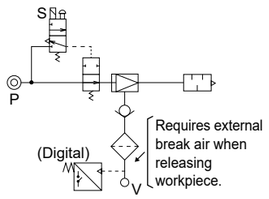


Circuit Diagram (Unit Combination)

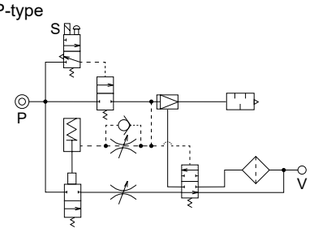
● Unit Combination: M-type
(Normally Closed)



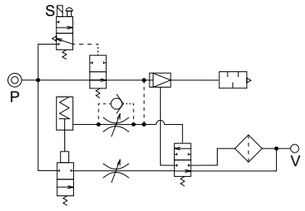
(Normally Open)



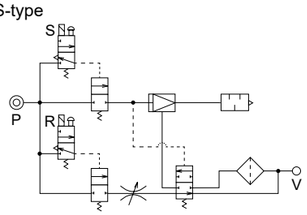
● Unit Combination: P-type
(Normally Closed)



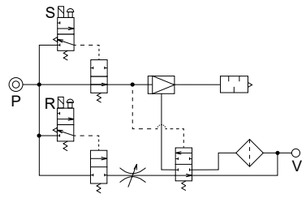
(Normally Open)



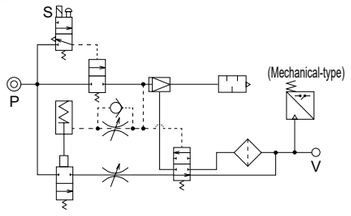
● Unit Combination: S-type
(Normally Closed)



(Normally Open)



● Unit Combination: Q-type
(Normally Closed)



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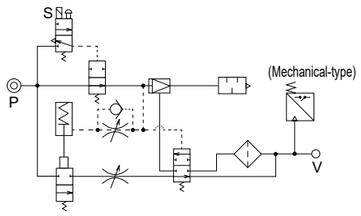
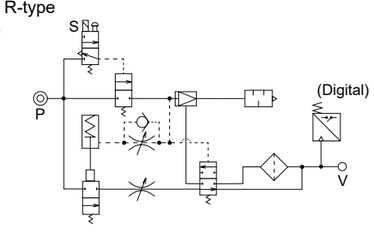
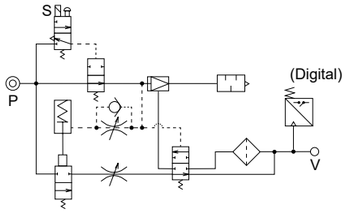


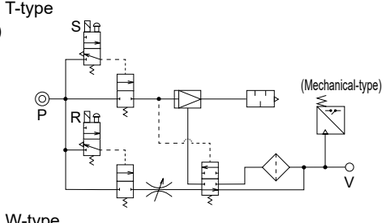
● Unit Combination: R-type
(Normally Closed)



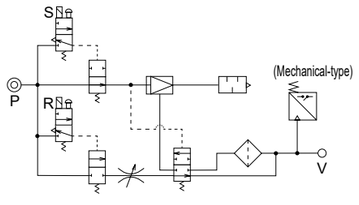
(Normally Open)



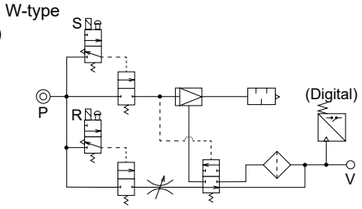
● Unit Combination: T-type
(Normally Closed)



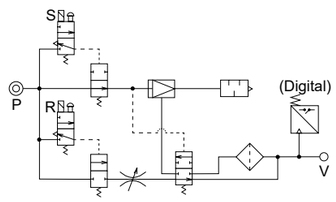
(Normally Open)



● Unit Combination: W-type
(Normally Closed)



(Normally Open)

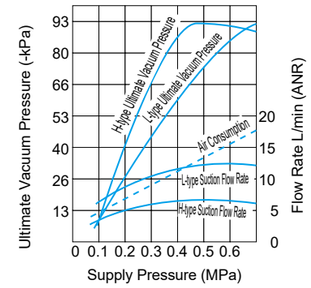


Vacuum Characteristics, Flow Characteristics

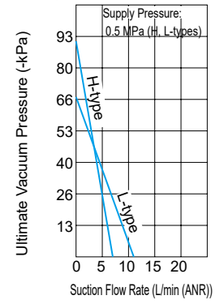
Supply Pressure - Ultimate Vacuum Pressure, Suction Flow Rate, Air Consumption

●VSK-□H05, VSK-□L05

Vacuum Characteristics

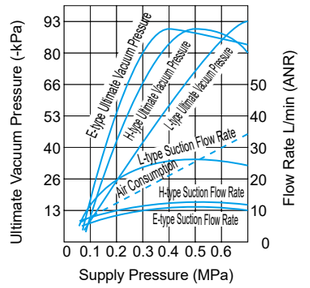


Flow Characteristics

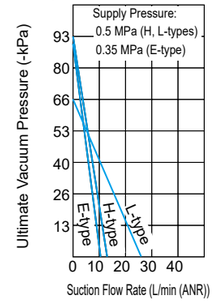


●VSK-□H07, VSK-□L07, VSK-□E07

Vacuum Characteristics



Flow Characteristics



●VSK-□H10, VSK-□L10, VSK-□E10

Vacuum Characteristics

Flow Characteristics

●VSK-□H12, VSK-□L12, VSK-□E12

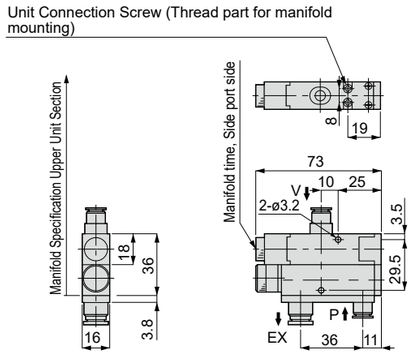
Vacuum Characteristics

Flow Characteristics

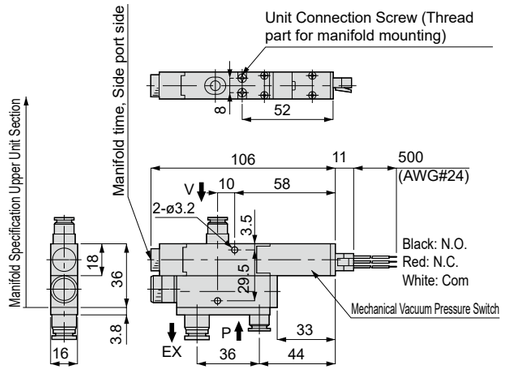
1. The supply pressure in the characteristics above is during vacuum generation.
2. Abnormal noise (gurgling sound) may occur at a supply pressure slightly below the peak ultimate vacuum pressure in the characteristics above. In this state with abnormal noise, characteristics are unstable and noise level increases. Also, it may affect sensors, etc., causing trouble, so reset the supply pressure.
   (Ex. 1: For an H-type vacuum ejector with source pressure 0.5 MPa, during ejector operation, the supply pressure drops to 0.43 MPa due to pressure drop, causing abnormal noise.) → Reset the supply pressure during ejector operation to 0.5 MPa.)
3. Select piping or equipment using an effective cross-sectional area approximately 3 times the nozzle diameter cross-sectional area as a guideline. If sufficient supply air flow rate is not secured, satisfactory vacuum characteristics cannot be obtained. (Gurgling sound occurs even at the set pressure. (Insufficient suction flow rate, failure to reach ultimate vacuum pressure, etc.)
   (Ex. 2: For an H-type vacuum ejector, abnormal noise occurs even though the pressure during ejector operation is 0.5 MPa.) → Insufficient supply air flow rate. (Supply air flow rate is restricted before the vacuum ejector due to piping resistance, etc., preventing the supply air flow rate required for satisfactory characteristics from being obtained.) → Select piping equipment that can secure the necessary effective cross-sectional area.))
   (Ex. 3: For a vacuum ejector with a 1.0 mm nozzle diameter, cross-sectional area $0.5^2 \times \pi = 0.785\ mm^2 \times 3 = 2.35\ mm^2$. Therefore, select piping and equipment to secure an effective cross-sectional area of 2.3 mm^2 or more.)

External Dimensions Diagram (Piping Method 2-Face-type VSK-A)

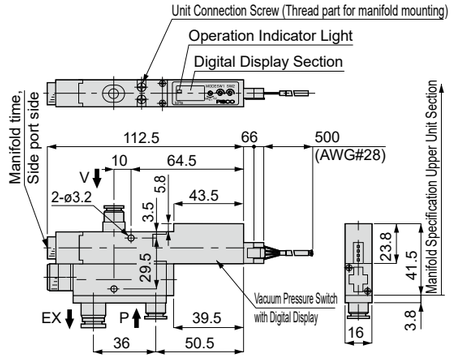
● Unit Combination: A,



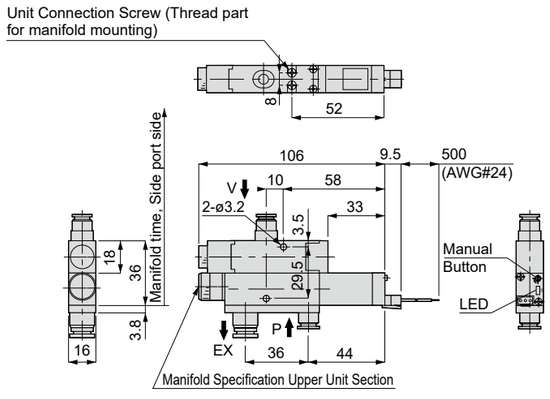
●B type unit combination: C, D types



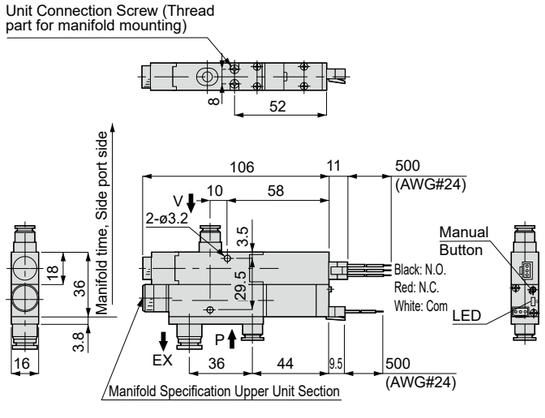
● Unit Combination: E,



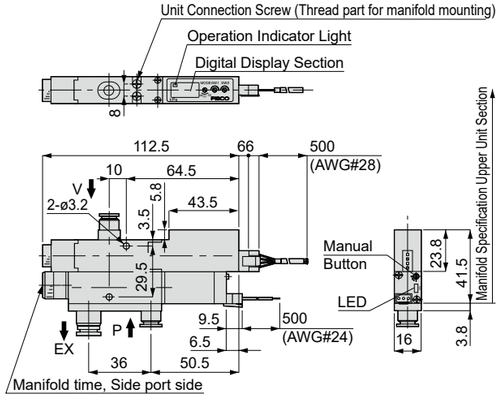
●F type unit combination: G, H-types



● Unit Combination: J,

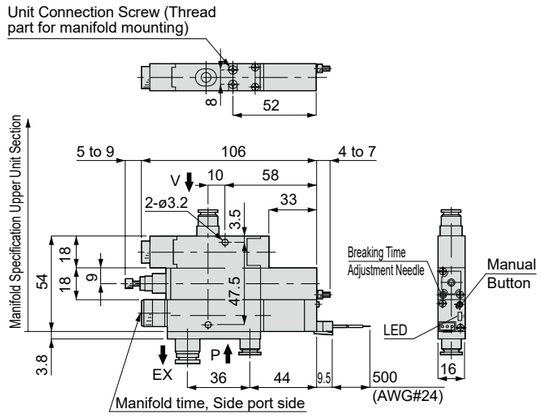


●K type unit combination: L, M types

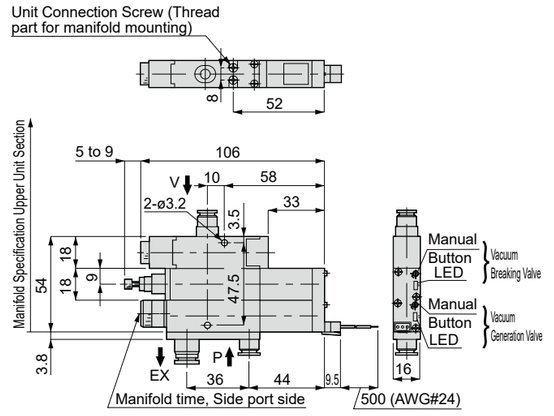


External Dimensions Diagram (Piping Method 2-Face-type VSK-A)

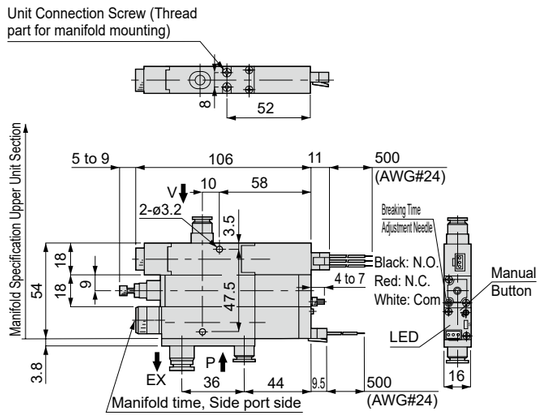
● Unit Combination: P type



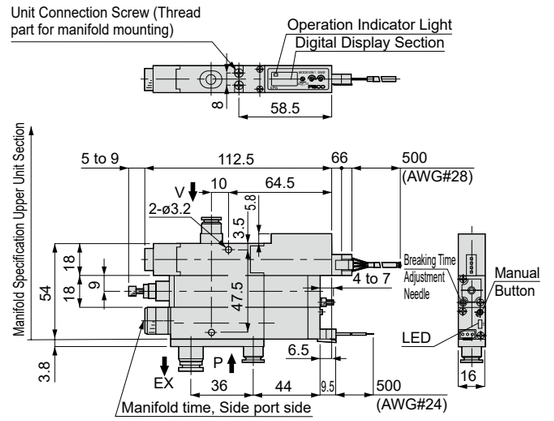
● Unit Combination: S-type



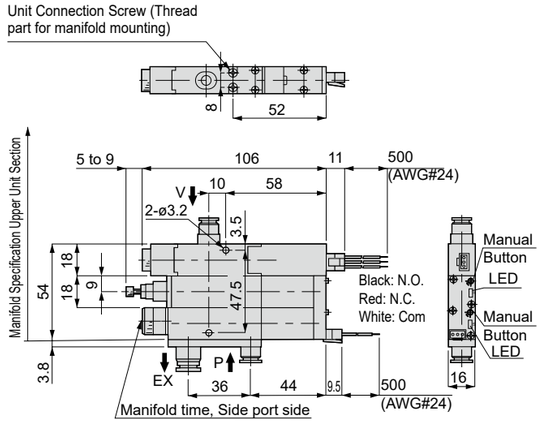
● Unit Combination: Q type



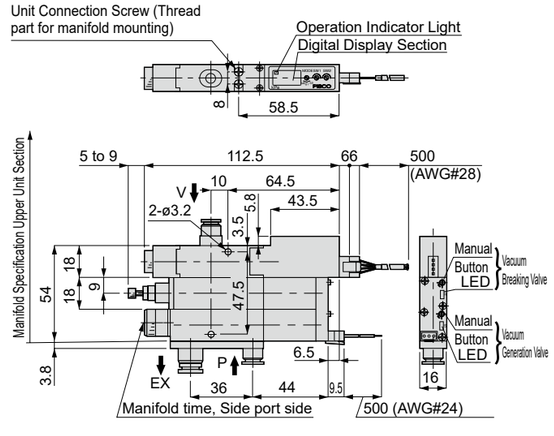
● Unit Combination: R-type



● Unit Combination: T type

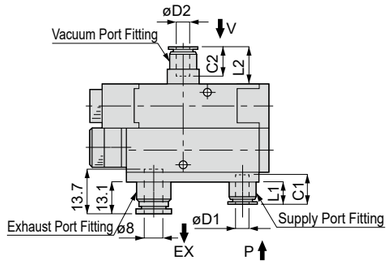


● Unit Combination:: W-type



External Dimensions Diagram (Piping Method 2-Face-type VSK-A)

●Fitting dimensions



Unit: mm

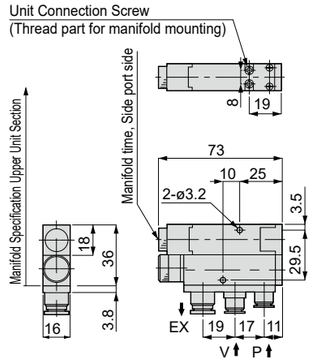
	Bore size øD1	Bore size øD2	L1	L2	C1	C2
P Port	4	-	6.1	-	11.2	-
	6	-	8.9	-	11.9	-
	8	-	17.3	-	18.2	-
V Port	-	4	-	11.6	-	11.2
	-	6	-	14.4	-	11.9
	-	8	-	22.8	-	18.2

●Silencer(atmospheric release)

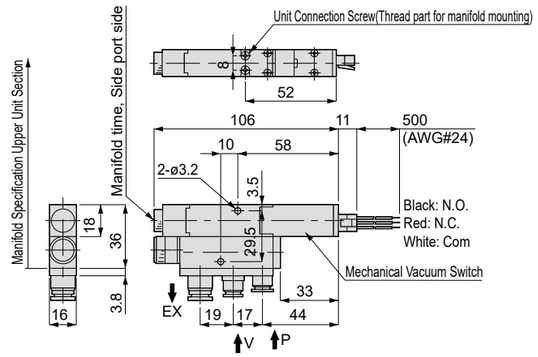
●Exhaust fitting (elbow)

External Dimensions Diagram (Piping Method 1-Face-type VSK-B)

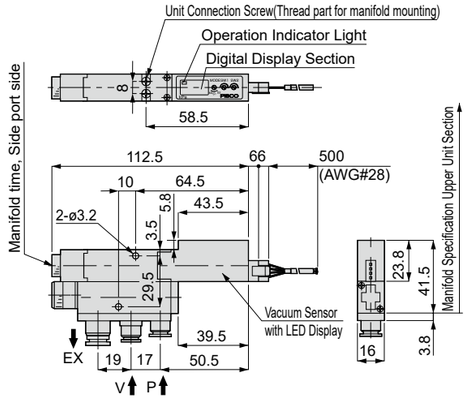
● Unit Combination: A,B type



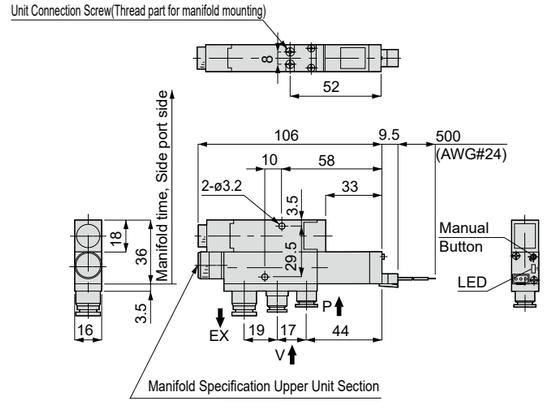
● Unit Combination: C, D types



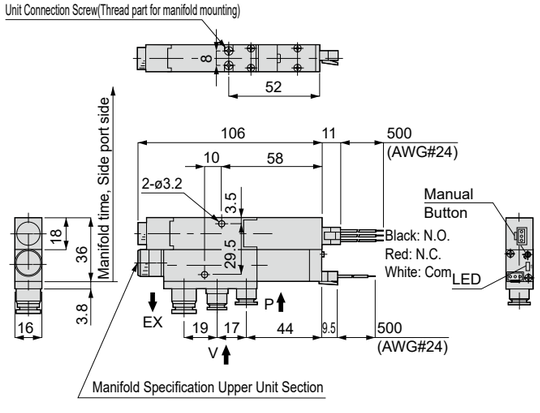
● Unit Combination: E,F type



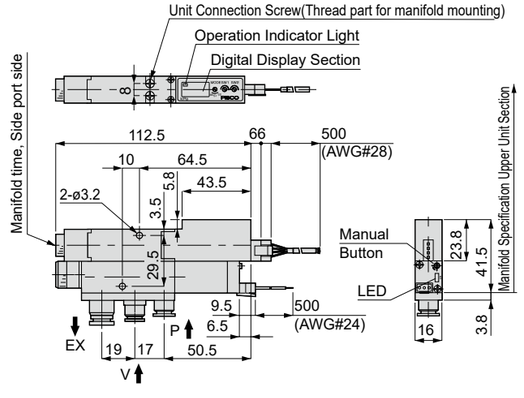
● Unit Combination: G, H-types



● Unit Combination: J,K type

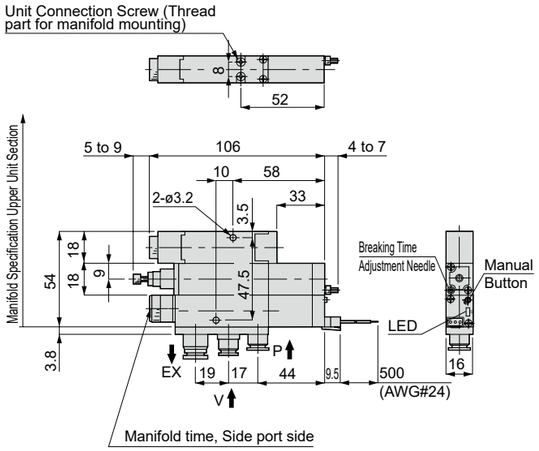


● Unit Combination: L, M types

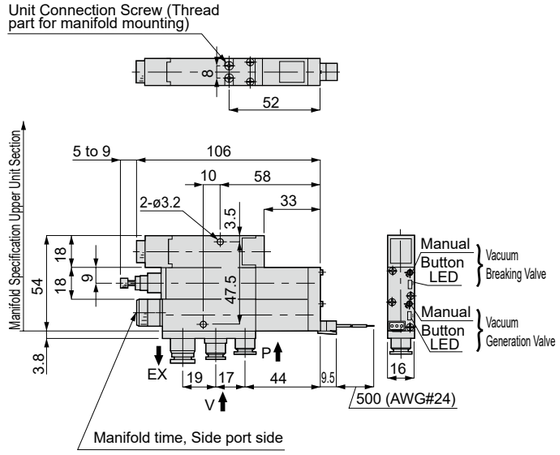


External Dimensions Diagram (Piping Method 1-Face-type VSK-B)

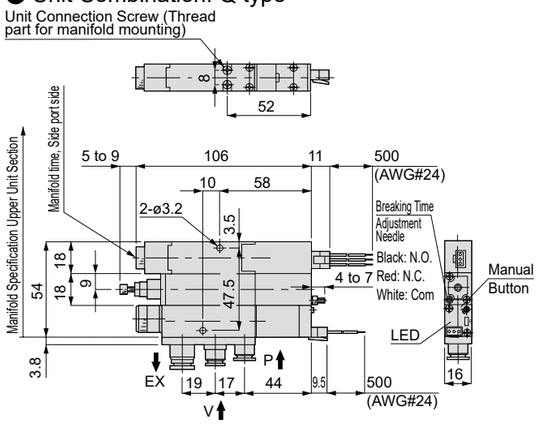
● Unit Combination: P type



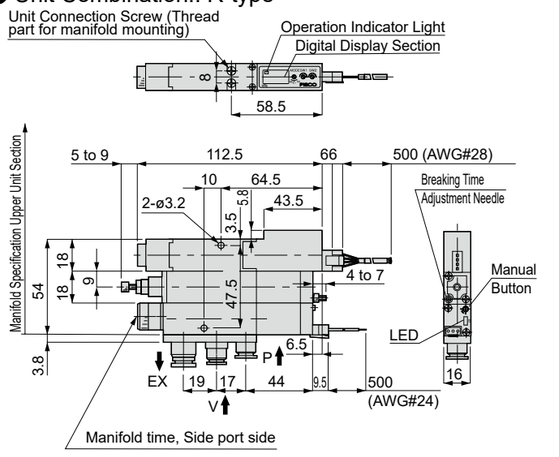
● Unit Combination: S-type



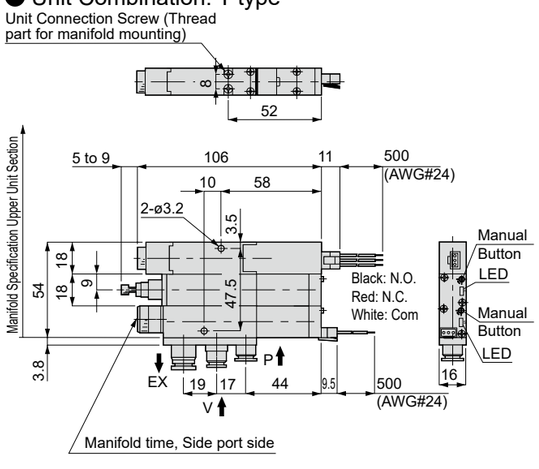
● Unit Combination: Q type



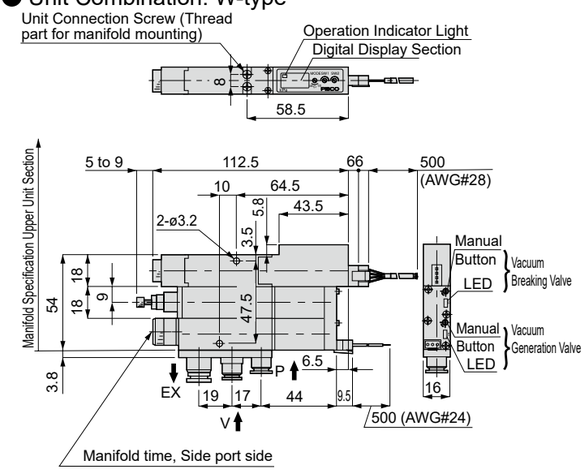
● Unit Combination:: R-type



● Unit Combination: T type

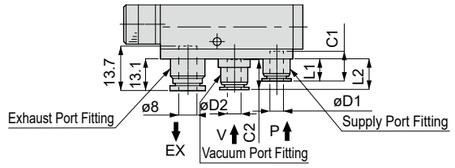


● Unit Combination: W-type



External Dimensions Diagram (Piping Method 1-Face-type VSK-B)

●Fitting dimensions



Unit: mm

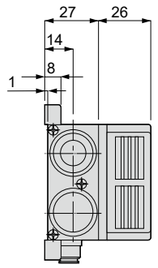
	Bore size øD1	Bore size øD2	L1	L2	C1	C2
P Port	4	-	6.1	-	11.2	-
	6	-	8.9	-	11.9	-
	8	-	17.3	-	18.2	-
V Port	-	4	-	9.8	-	11.2
	-	6	-	12.6	-	11.9
	-	8	-	21	-	18.2

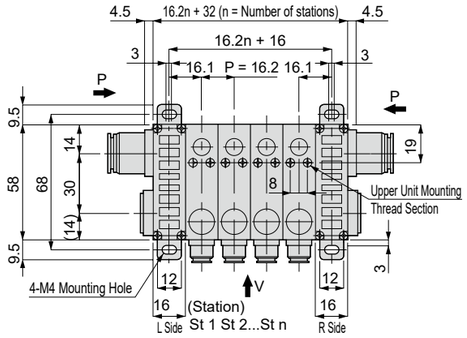
●Silencer (atmospheric release)

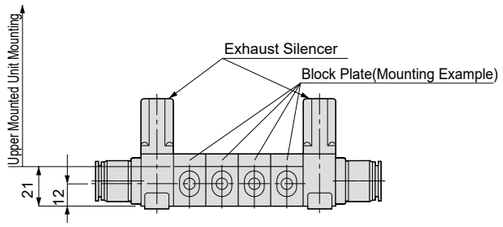
●Exhaust fitting (elbow)

External Dimensions Diagram (Manifold Type VSKM)

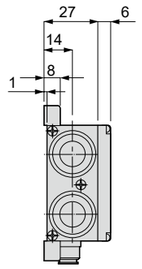
●Manifold (atmosphere release)

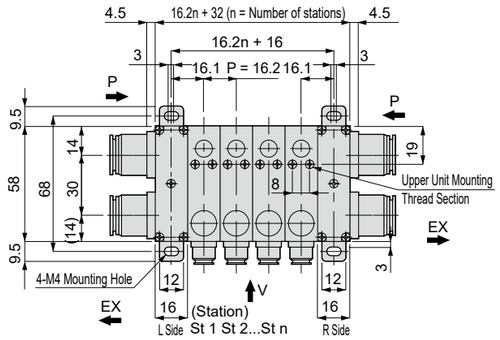


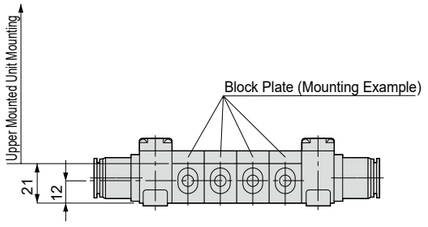




●Manifold (common exhaust)



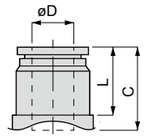




External Dimensions Diagram (Manifold Type VSKM)

●Supply Port Fitting Section Dimensions

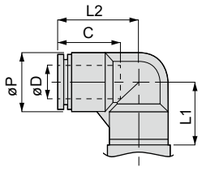
• Straight Type



Unit: mm

Bore size øD	L	C
6	11.1	17
8	12.2	18.2
10	14.7	20.7
12	18.8	23.3

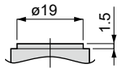
• Elbow Type



Unit: mm

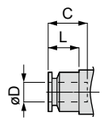
Bore size øD	øP	C	L1	L2
8	14.5	18.1	17	22.7
10	17.5	20.2	21	26.2
12	21	23.4	23	29.4

• Plug Type



●Vacuum Port Fitting Section Dimensions

• Straight Type



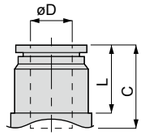
Unit: mm

Bore size øD	L	C
4	6.1	11.2
6	8.9	11.9
8	17.3	18.2

• Plug Type

●Exhaust Port Fitting Section Dimensions

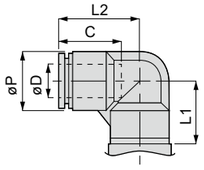
• Straight Type



Unit: mm

Bore size øD	L	C
8	12.2	18.2
10	14.7	20.7
12	18.8	23.3

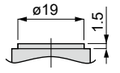
• Elbow Type



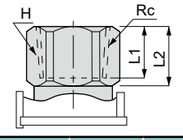
Unit: mm

Bore size øD	øP	C	L1	L2
8	14.5	18.1	17	22.7
10	17.5	20.2	21	26.2
12	21	23.4	23	29.4

• Plug Type



●Female Thread Type

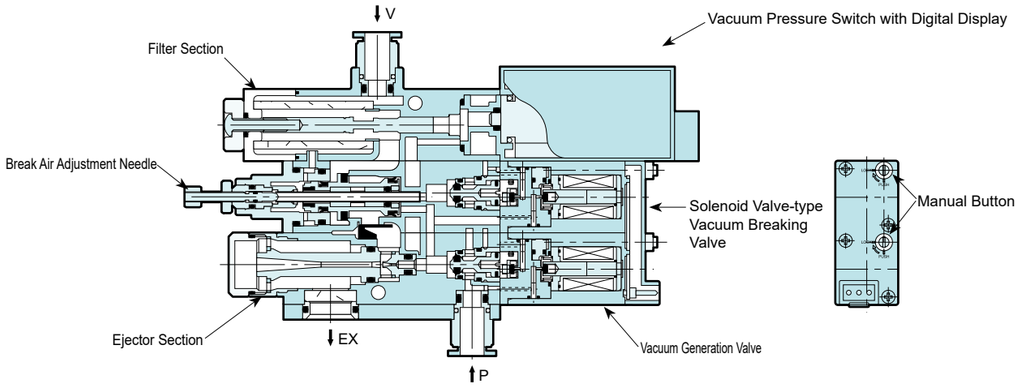


Unit: mm

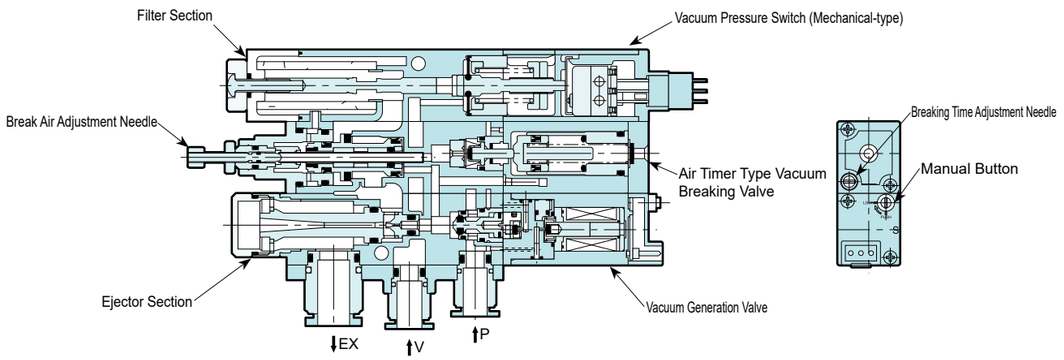
Rc	Width across flats H	L1	L2
Rc1/4	22	11	14
Rc3/8	22	12	14
Rc1/2	24	13	17

Internal Structure Diagram

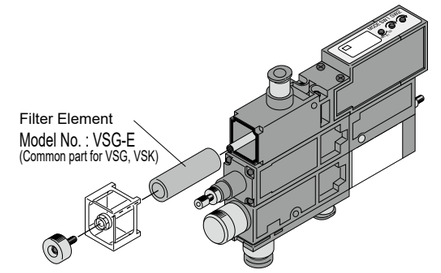
Piping Direction 2-Face-type VSK-A
●VSK-A□□W (With Solenoid Valve-type Vacuum Breaking Valve, Normally Closed)

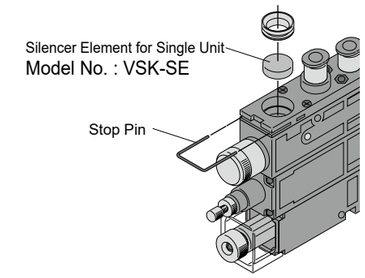


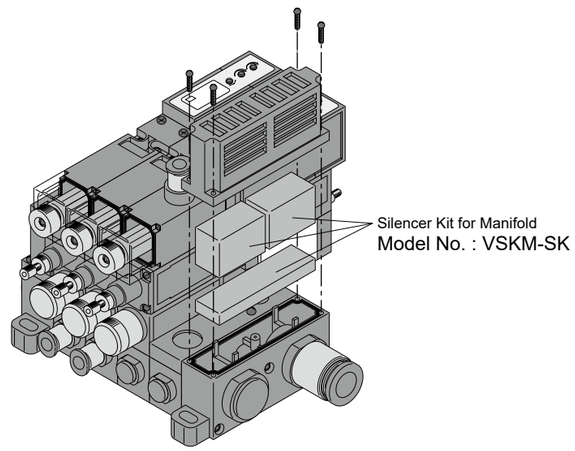
Piping Direction 1-Face-type VSK-B
●VSK-B□□Q(With Air Timer Type Vacuum Breaking Valve, Normally Closed)

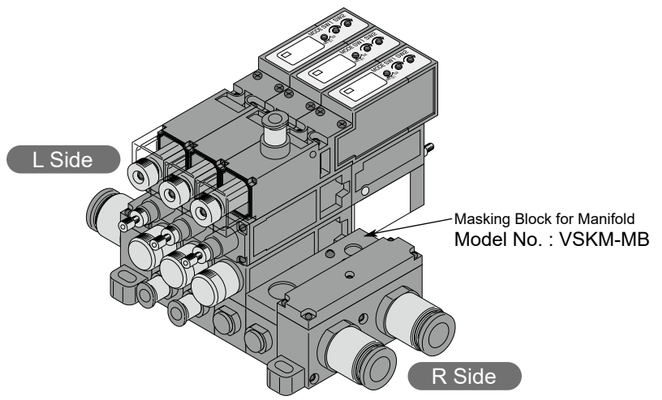


Maintenance Parts









To Use This Product Safely

Be sure to read this before use.
For general pneumatic components precautions, Intro P. 15 for details.

Individual Precautions: VSK Series

Design / Selection

Caution

■Fittings By removing the stop pin, it is possible to detach the cartridge tube, timer cylinder and element for maintenance. After mounting, confirm that the stop pin is securely inserted.

■Do not remove the gripper on the body coupling part. Detachment/reattachment is possible a few times, but reduced connection strength may potentially cause main body damage.

■Unit Combination: For G, J, L-types, in manifold type vacuum ejectors where operating and non-operating ejectors coexist, exhaust air during vacuum generation may flow around to non-operating ejectors and be output from the vacuum port. This can cause problems, such as blowing away lightweight workpieces, so do not use under conditions where this could be an issue.

Precautions for Manifold Use

■Increased manifold stations may cause degraded performance or malfunction due to the following reasons. Please inquire for details.

1. Degradation of vacuum performance due to insufficient supply air
   Countermeasures: ①Check supply air capacity, etc.
   ②Keep piping as short as possible
   ③Increase fitting size
   ④If supplying from one side, supply from both sides of the manifold

2. Insufficient exhaust port capacity leading to degradation of vacuum performance, or exhaust air exiting from the vacuum ports of other stations.
   → The number of stations for which performance can be maintained in a manifold depends on nozzle size, vacuum performance, etc. Please inquire.
   Cause: For silencer type (atmospheric release), insufficient silencer capacity increases exhaust resistance, degrading performance.
   Countermeasures: ①If using one-sided silencer, use double-sided silencers.
   ②Use individual exhaust for each station. (Special Order)
   ③Avoid locations where the exhaust section faces a wall.
   ④Reduce the number of stations.
   Cause: For centralized exhaust type, high piping resistance degrades performance.
   Countermeasures: ①If exhausting from one side, use both sides.
   ②Keep piping length as short as possible.
   ③Increase exhaust fitting size.
   ④Use individual exhaust for each station. (Special Order)
   ⑤Reduce the number of stations.

For precautions regarding mounting, installation, adjustment, operation, and maintenance, please refer to the CKD Equipment Product Site(https: //www.ckd.co.jp/kiki/en/) → 'model No.' → Instruction Manual.

How to Create a VSKM Mixed Manifold Specification Sheet

●Mix manifold model No.(example)

VSKM- ❶Z ❷00 ❸Z - ❹CX ❺28 ❻S2 - ❼3 ❽Z - ❾5 - ❿Z

●Mix manifold specifications sheet(example)

Vacuum Ejector Model No. ❶ ❷ ❸ ❹ ❺ ❻ ❼	Arrangement Position 1	2	3	4	5	6	7	8	9	10	Quantity
VSKM- H 07 G - S8 - 3 A -	○	○									2
VSKM- E 10 W - S6 - 3 B - NW			○								1
VSKM- E 10 W - T6 - 3 B - NW					○						1
VSKM-											
VSKM-											
Masking Block Model No.											
VSKM- MB - S6				○							1

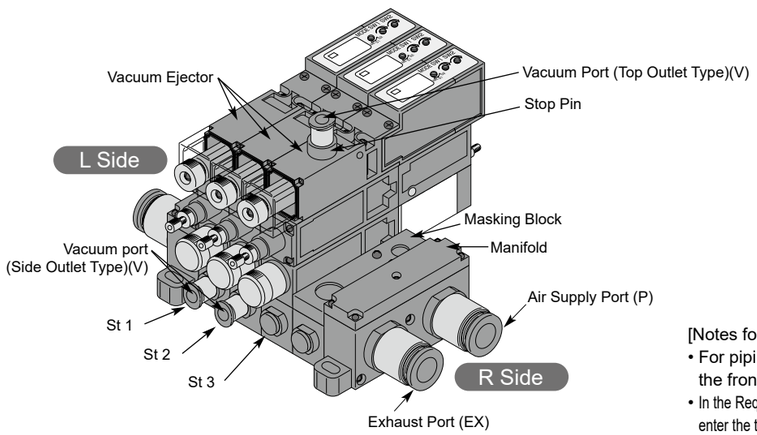
[For Fitting Mix Specification with Output Port Size Only]

●Mix manifold model No.(example)

VSKM- ❶H ❷07 ❸W - ❹CX ❺28 ❻S2 - ❼3 ❽B - ❾5 - ❿NW

●Mix manifold specifications sheet(example)

Vacuum Ejector Model No. ❶ ❷ ❸ ❹ ❺ ❻ ❼	Arrangement Position 1	2	3	4	5	6	7	8	9	10	Quantity
VSKM- H 07 W - S8 - 3 B - NW	○	○									2
VSKM- H 07 W - S6 - 3 B - NW			○	○							2
VSKM- H 07 W - T6 - 3 B - NW					○						1
VSKM-											
VSKM-											
Masking Block Model No.											
VSKM- MB -											



[Notes for Filling Out]
- For piping position, place the vacuum port at the front and install sequentially from the left.
- In the Required Quantity column at the right end of the table, enter the total quantity of the specified product model No.s.

VSKM Mixed Manifold Specification Sheet

Date of Issue
Company
Attn:
Order No.

Contact Person Quantity Set Delivery Date (Month/Day)

Voucher No. Order Received No.

●Mix manifold model No.

VSKM- ❶ ❷ ❸ - ❹ ❺ ❻ - ❼ ❽ - ❾ - ❿

❶ Vacuum Characteristics Note1, 2, 3)

H	High Vacuum/Medium Flow Type
L	Medium Vacuum/High Flow Type
E	High Vacuum/Low Flow Type
Z	For mixed specifications(Provide details in the specification sheet)

❷ Nozzle Diameter Note1, 2, 3)

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

❸ Unit Combination Note2, 4, 5)

For the Unit Combination, please refer to item ❹ on P. 170.

❹ Vacuum port(V) Note2), Note6)

PP	Plug Port Position Side
S4	ø4 Push-in fitting Port Position Side
S6	ø6 Push-in fitting Port Position Side
S8	ø8 Push-in fitting Port Position Side
T4	ø4 Push-in fitting Port Position Top
T6	ø6 Push-in fitting Port Position Top
T8	ø8 Push-in fitting Port Position Top
CX	For fitting mix(Provide details in the specification sheet)

❺ Air Supply Port (P)

For Air Supply Port, refer to ❺ on P. 173.

❻ Exhaust Port (EX)

For Exhaust Port, refer to ❻ on P. 173.

❼ Solenoid valve voltage Note4)

1	100 VAC
3	24 VDC

❽ Valve Note2), Note4)

A	Normally Open Type
B	Normally Closed Type
Z	For mixed specifications(Provide details in the specification sheet)

❾ Number of Manifold Stations

2 to 10	2 to 10 Stations

❿ Vacuum pressure switch specifications Note2), Note5)

NW	NPN Output 2 points
NA	NPN Output 1 point + Analog Output
PW	PNP Output 2 points
PA	PNP Output 1 point + Analog Output
Z	For mixed specifications (Provide details in the specification sheet)

Notes for model No. Selection

Note1) The combination of ❶ Vacuum Characteristics 'E' and Nozzle Diameter ❷ '05' cannot be selected.
Note2) For mixed specifications, please be sure to fill out the 'Mixed Manifold Specification Sheet'.
Note3) When ❶ is 'Z', only ❷ '00' can be selected. When ❷ is '00', only ❶ 'Z' can be selected.
Note4) When ❸ Unit Combination is 'A', 'B', 'C', 'D', 'E', or 'F', Solenoid Valve Voltage ❼ and Vacuum Supply Valve Type ❽ cannot be selected.
Note5) Select Vacuum Sensor Specification ❿ only when ❸ Unit Combination is 'E', 'F', 'L', 'M', 'R', or 'W'.
Note6) To mount a masking block, select 'CX' for ❹ Vacuum Port (V) and specify the mounting position and quantity on the manifold specification sheet.

●Mix manifold specifications sheet

Vacuum Ejector Model No. ❶ ❷ ❸ ❹ ❺ ❻ ❼	Arrangement Position 1	2	3	4	5	6	7	8	9	10	Quantity
VSKM-											
VSKM-											
VSKM-											
VSKM-											
VSKM-											
Masking Block Model No.											
VSKM- MB -											