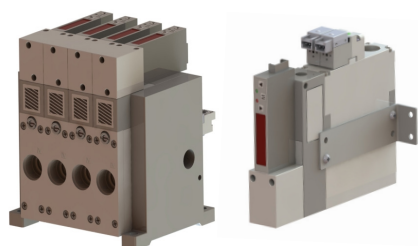


# EK Series

## Compact vacuum ejector (Medium)



- **High-flow multi-stage ejector**
  - Compact, manifold (centralized, separate supply and exhaust)
- **Various vacuum flux**
  - From minimum 40N ℓ /min to maximum 120N ℓ /min
- **Energy savings through performance upgrades**
  - Improved performance based on supply standards of 0.35MPa and 0.4MPa ※ Existing standard supply pressure 0.5MPa (based on EM/EL series)
- **Excellent long-term current carrying characteristics**
  - (Energy - saving type valve application option)
- **Prevents work pieces from falling in the event of a momentary power outage**
  - (Latching type valve application option)

## How to order

EK 40 - M 10 - 5 S - V1 - NL C -    

1                      2                      3                      4                      5                      6                      7                      8                      9                      10

### 1 Nozzle diameter / Vacuum flux

	EK40	Ø0.7, 40 ℓ/min
	EK60	Ø1.0, 60 ℓ/min
	EK75	Ø1.3, 75 ℓ/min
	EK90	Ø1.5, 90 ℓ/min
	EK110	Ø1.3, 110 ℓ/min
	EK120	Ø1.5, 120 ℓ/min

### 2 Body & Exhaust Type

<b>S</b>	Single Individual SUP/ EXH	Silencer exhaust
<b>MA</b>	Manifold Individual SUP/ EXH	Silencer exhaust
<b>M</b>	Manifold Concentrated SUP/Individual EXH	Silencer exhaust
<b>MB</b>	Manifold Concentrated SUP/ EXH	Both side port EXH
<b>MR</b>	Manifold Concentrated SUP/ EXH	Right side port EXH
<b>ML</b>	Manifold Concentrated SUP/ EXH	Left side port EXH

※ 1) Based on the front of the vacuum V port

※ 2) Manifold concentrated EXH silencer may be purchased separately (Rc(PT) 3/4)  
(Model name : SN500-06, SNB500-06)

### 3 Manifold Number of Station

01	1 station	Single type, Manifold type
02	2 stations	Manifold type
~	~	
10	10 stations	

※ 1) Based on the front of the vacuum V port

#### ■ Manifold type (MA, M, MB, ML, MR) Max. stations

Model	EK40	EK60	EK75	EK90	EK110	EK120
Stations	10	10	8	6	4	2

### 4 Voltage specifications

5	DC24V
---	-------

※) Please inquire separately for AC110V and DC12V

### 5 PCB TYPE

<b>Blank</b>	Standard(0.85W)
<b>D</b>	Non - polar(0.85W)
<b>S</b>	Power - saving(0.45W)

※) The latching valve is fixed at 1.0W

### 6 Electromagnetic valve Specification

Index	For SUP	For Destroy
<b>V1</b>	N.C	N.C
<b>V2</b>	N.O	N.C
<b>V3</b>	N.O	None
<b>V4</b>	N.C	None
<b>V5</b>	Latching	N.C
<b>V6</b>	Latching	None

※ 1) Based on the front of the vacuum V port

### 7 Vacuum Switch Type

Blank	No switch
<b>NL</b>	Digital display, negative pressure, grommet type, NPN 2 points + analog output
<b>NK</b>	Digital display, negative pressure, connector type, NPN 2 points + analog output
<b>PK</b>	Digital display, negative pressure, connector type, PNP 2 points + analog output
<b>CNK</b>	Digital display, compound pressure, connector type, NPN 2 points + analog output
<b>CPK</b>	Digital display, compound pressure, connector type, PNP 2 points + analog output
<b>N1</b>	LED lighting, negative pressure, connector type NPN 1 point + analog output
<b>N2</b>	LED lighting, negative pressure, connector type NPN 2 point + analog output

※) Based on the front of the vacuum V port

### 8 Vacuum sensor wiring length

Blank	0.6m
<b>C</b>	2.0m or 3.0m

※) The digital display connector type is 3.0m, the digital display grommet type and LED lighting are 2.0m.

### 9 Check Valve

Blank	Without check valve
<b>H</b>	With check valve

### 10 Bracket

Blank	Without bracket
<b>B</b>	With bracket

※1) For single product (S) option only.

※2) Bracket (1EA) is included separately.

# Compact vacuum ejector (Medium) EK Series

## Specifications

### Ejector

Fluid		Air					
Operating pressure range MPa		0.15 ~ 0.7					
Performance by model	Model	EK40	EK60	EK75	EK90	EK110	EK120
	Standard supply pressure MPa	0.35	0.4				
	Vacuum pressure kPa (mmHg)	-85 (-638)					
	Suction flux ℓ/min (ANR)	40	60	75	90	110	120
	Consumption flux ℓ/min (ANR)	25	55	95	100	170	180
	Noise level dB	60	60	80	80	85	85
	Max. Manifold stations	10	10	8	6	4	2
Operating temperature range ℃		5 ~ 50					
Filter Opening Width		PE, 100 <sub>μ</sub> m					
Port size	Index	Single	Manifold				
		S	MA	M	MB	MR	ML
	SUP (P)	Rc(PT) 1/8 (Indiv.)	Rc(PT) 1/8 (Indiv.)	Rc(PT) 1/4 (Conc.)			
	VAC (V)	Rc(PT) 1/8 (Indiv.)					
	EXH (R)	Silencer exhaust		Rc(PT) 3/4 (Conc.)			
Weight (g)		Single	Manifold				
		기본 (제곱)	Bracket (1EA)	MA (2EA)	M (2EA)	MB (2EA)	ML, MR (2EA)
		305	15	180	175	160	170
		*M type 10st. ex : (305 x 10)+(175) = 3,225 g					
Attachment direction		Free					

### Valve

Configuration device	For SUP	For Destroy	For SUP
Control method	N/C, N/O Standard	N/C Standard	Latching
Operating pressure range	0 ~ 0.7 MPa		
Rated voltage	DC24V(Standard)		
Voltage fluctuations	$\pm 10\%$ of Rating voltage		
Operation method	Electronic valve		
Effective cross section	SUP(P->A) : 0.28 mm <sup>2</sup> , EXH(A->R) : 0.3 mm <sup>2</sup>		SUP(P->A), EXH(A->R) : 0.2 mm <sup>2</sup>
Power consumption	Standard PCB : 0.85 W Saving PCB : 0.45W		SET : 0.85W RESET : 0.7W
Surge voltage protection	Diode		
Response time	Less than 10ms (0.5MPa)		Less than 5ms
Lubrication	Unnecessary		
Manual operation	Push type		-
Wiring method	2PIN connector		3PIN connector

### Vacuum Switch

Index	VMS-□□-□□	VPS-□-□-□□□
Display Type	LED(R, G) light	LED 3 Digit
Vacuum level set at factory	-53.5kPa[-400mmHg]/1 point	
Power supply	DC12~24V	
Output method	NPN/PNP open collector 30V, 200mA	NPN/PNP open collector 30V, 80mA
Output score	1 point output+hysteresis(analog) or 2 points output	2 point output + analog output
Current consumption	30mA	50mA or less
Set pressure range	0kPa~ -101kPa	
pressure within warranty	0.2MPa(Twice of rated voltage)	
Fluid	Air, non-corrosive	
Operating temperature range	0~60°C	
Temperature properties	$\pm 3\%$ F.S or less	
Hysteresis setting	Setting pressure 0.5~10% F.S	3% F.S(fixed)
Response time	2.5ms or less	2.0ms or less
Repeated error	Within $\pm 1\%$ F.S	Within $\pm 0.2\%$ F.S
Lead wire	Connector type	Connector or grommet type
Function[VMS]	Hysteresis setting trimmer (210° ) Pressure setting trimmer (210° )	-

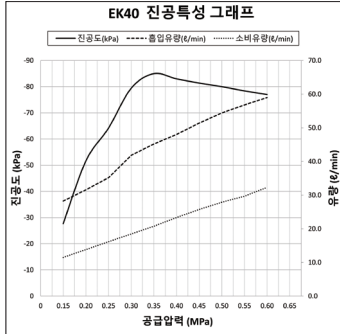
### Color of lead wire

VMS	Brown	DC(+)
	Black	Output 1
	White	Output 2(or Analogue output)
	Blue	DC(-)
VPS	Brown	DC(+)
	Black	Output 1
	White	Output 2
	Blue	DC(-)
	Yellow	Analogue output

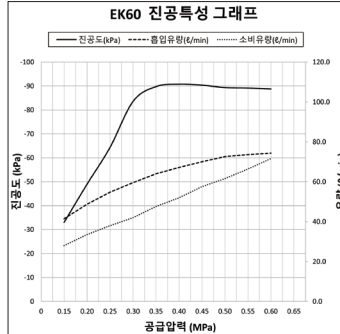
## Characteristic graph

### Vacuum characteristics graph

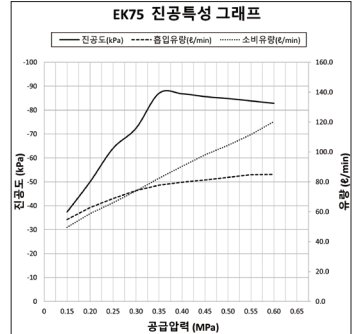
- Nozzle Dia. Ø0.7 (supply : 0.35MPa)



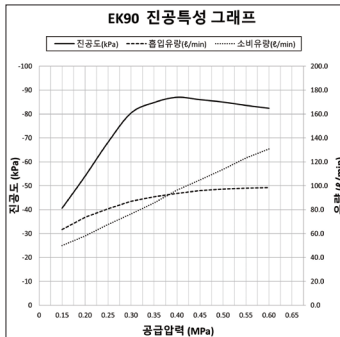
- Nozzle Dia. Ø1.0 (supply : 0.4MPa)



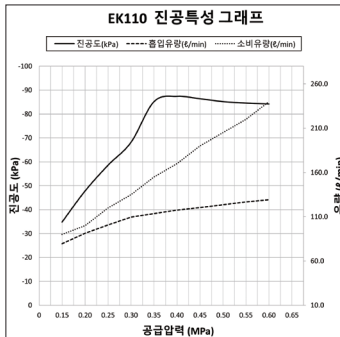
- Nozzle Dia. Ø1.3 (supply : 0.4MPa)



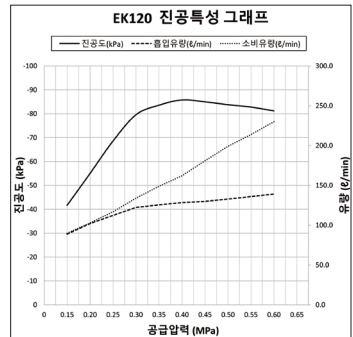
- Nozzle Dia. Ø1.5 (supply : 0.4MPa)



- Nozzle Dia. Ø1.3 (supply : 0.4MPa)



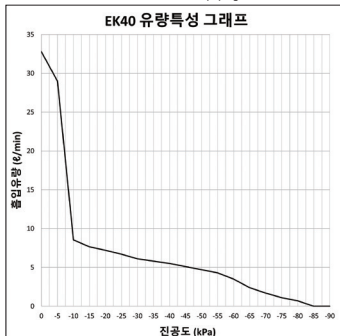
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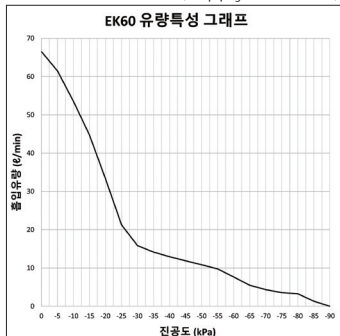
Note) The graph above is a representative value, and the flux characteristics may change depending on piping conditions, etc.

### Flux characteristic graph

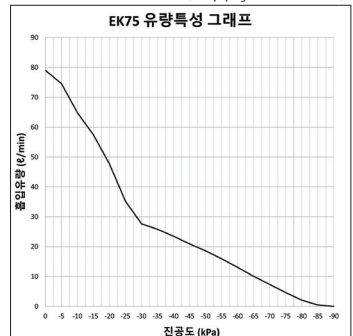
- Nozzle Dia. Ø0.7 (supply : 0.35MPa)



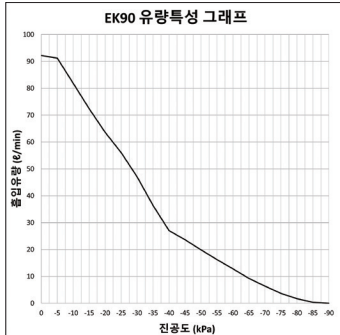
- Nozzle Dia. Ø1.0 (supply : 0.4MPa)



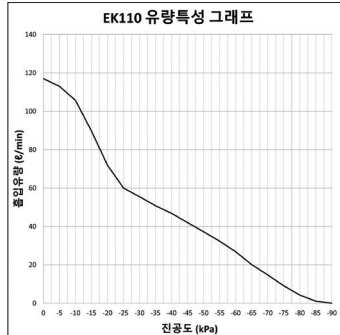
- Nozzle Dia. Ø1.3 (supply : 0.4MPa)



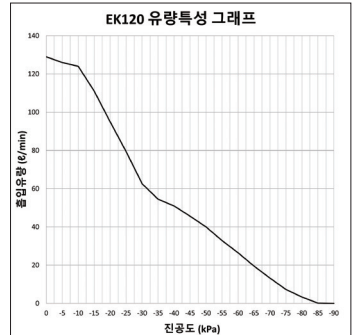
- Nozzle Dia. Ø1.5 (supply : 0.4MPa)



- Nozzle Dia. Ø1.3 (supply : 0.4MPa)

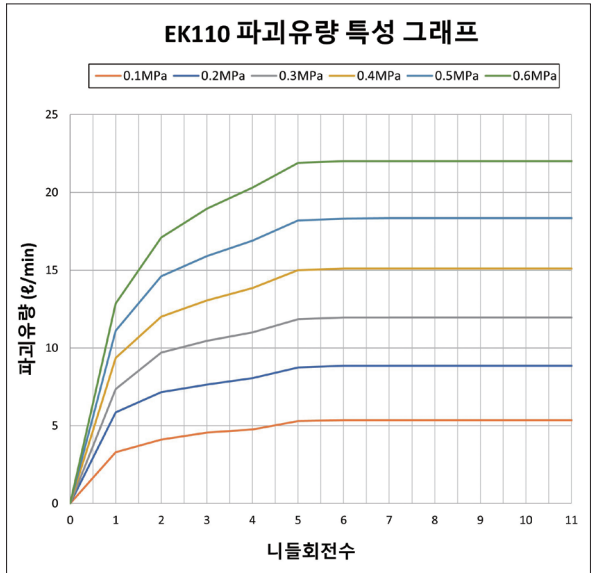
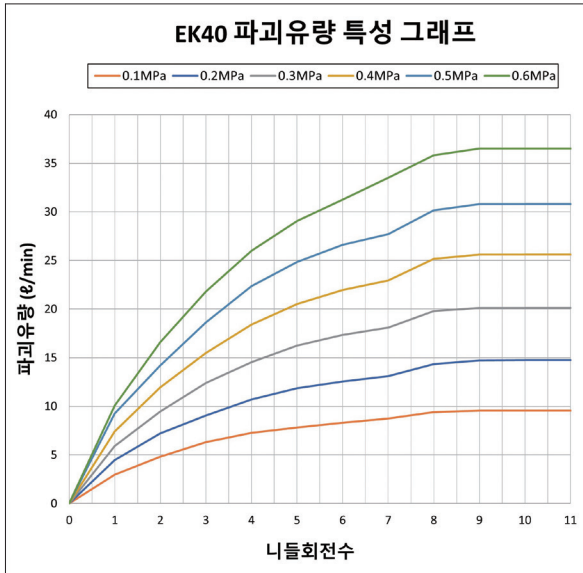


- Nozzle Dia. Ø1.5 (supply : 0.4MPa)



Note) The graph above is a representative value, and the flux characteristics may change depending on piping conditions, etc.

## Destructive rate characteristic graph



Note) The above graph is representative, and the flow characteristics may vary depending on piping conditions.

### How to Interpret Flow Characteristic Diagrams

The flow characteristic represents the relationship between the vacuum pressure of the ejector and the suction flow rate, indicating that as the suction flow rate changes, the vacuum pressure also changes. Typically, it represents the relationship at the standard operating pressure of the ejector. In the diagram, Pmax represents the maximum vacuum pressure, and Qmax represents the maximum suction flow rate. These values are typically specified as specifications in catalogs and similar documents.

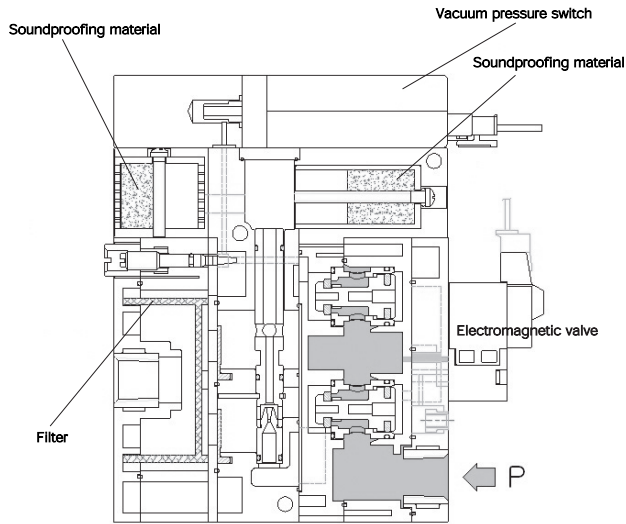
### How to change vacuum pressure

- 1) When the suction inlet of the ejector is blocked and sealed, the suction flow rate becomes 0, and the vacuum pressure becomes maximum (Pmax).
- 2) Gradually opening the suction inlet to allow air to flow (creating air leakage) increases the suction flow rate, and the vacuum pressure decreases (state of P1 and Q1).
- 3) Then, fully opening the suction inlet increases the suction flow rate to maximum (Qmax), but at this point, the vacuum pressure decreases and almost approaches 0 (atmospheric pressure). In this way, as the suction flow rate changes, the vacuum pressure also changes.

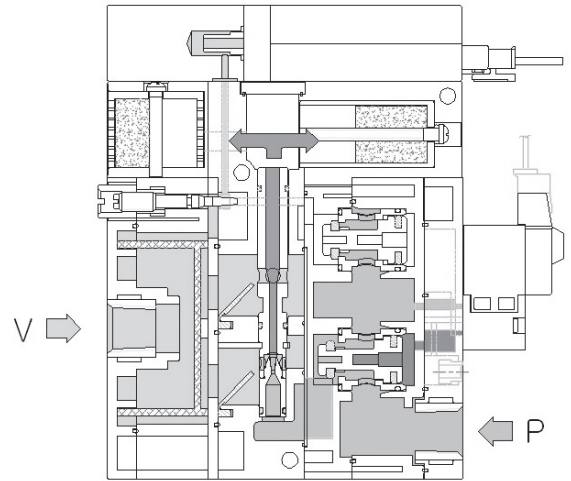
In other words, when there is no leakage in the vacuum port (vacuum piping), the vacuum pressure becomes maximum, but as the leakage increases, the vacuum pressure decreases, converging to a value close to 0 when the leakage amount equals the maximum suction flow rate. Care should be taken, especially in applications where the required vacuum force for adsorption on permeable workpieces or workpieces with leakage is not very high.

## Operating principle

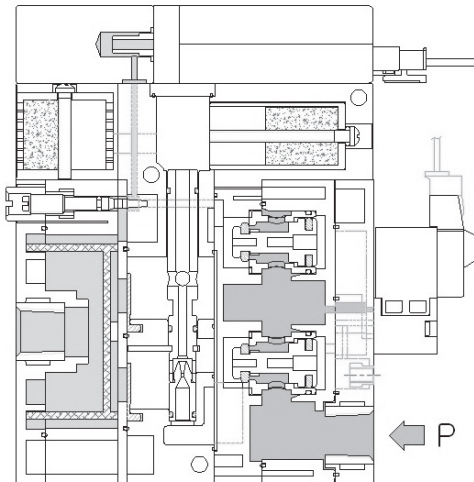
### Ready state



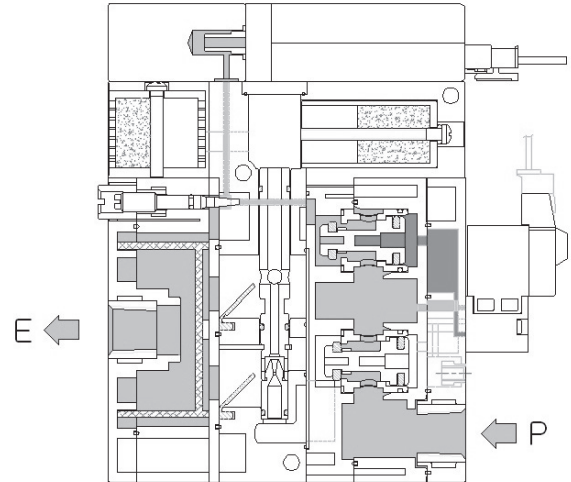
### Vacuum generation state



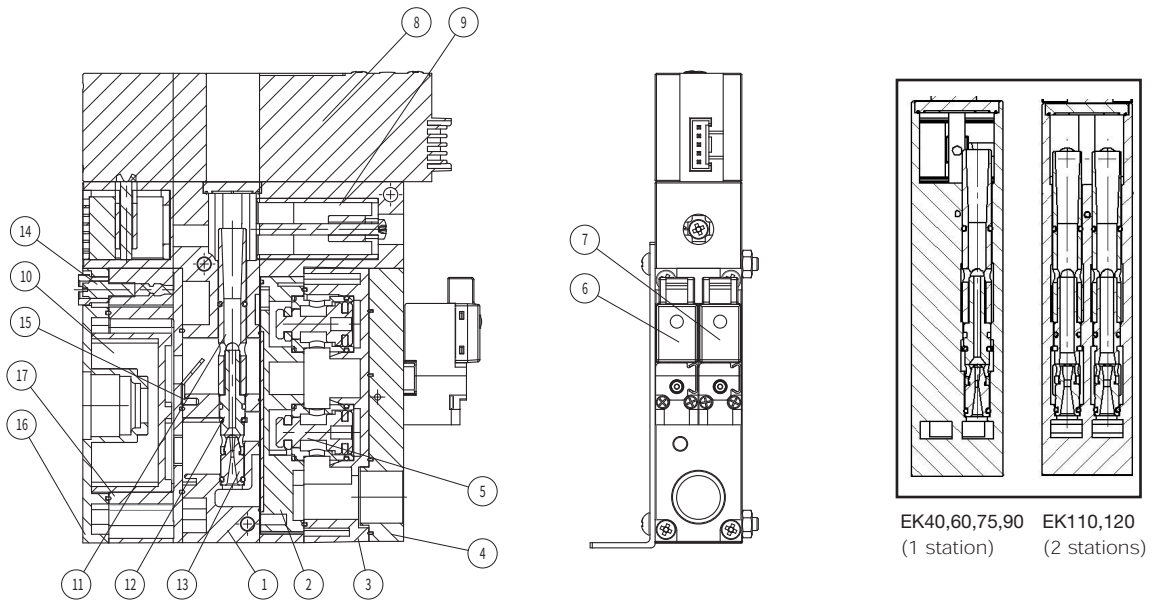
### Vacuum maintenance state



### Vacuum destruction state



## Structure diagram

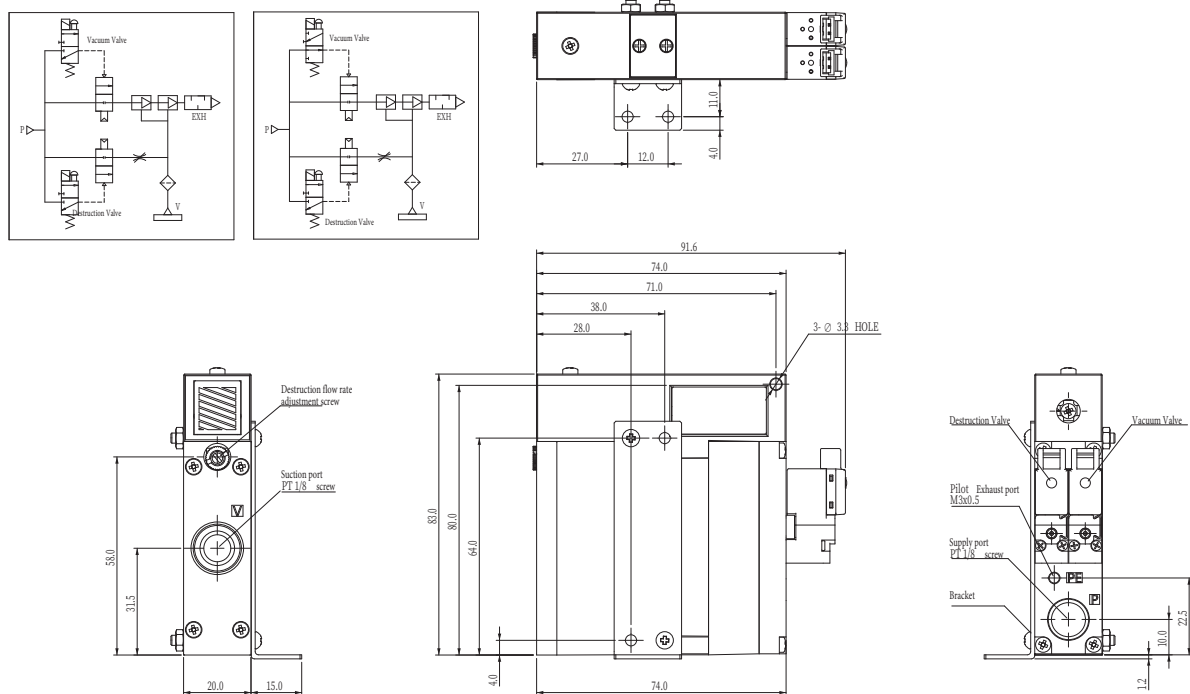


## Component parts

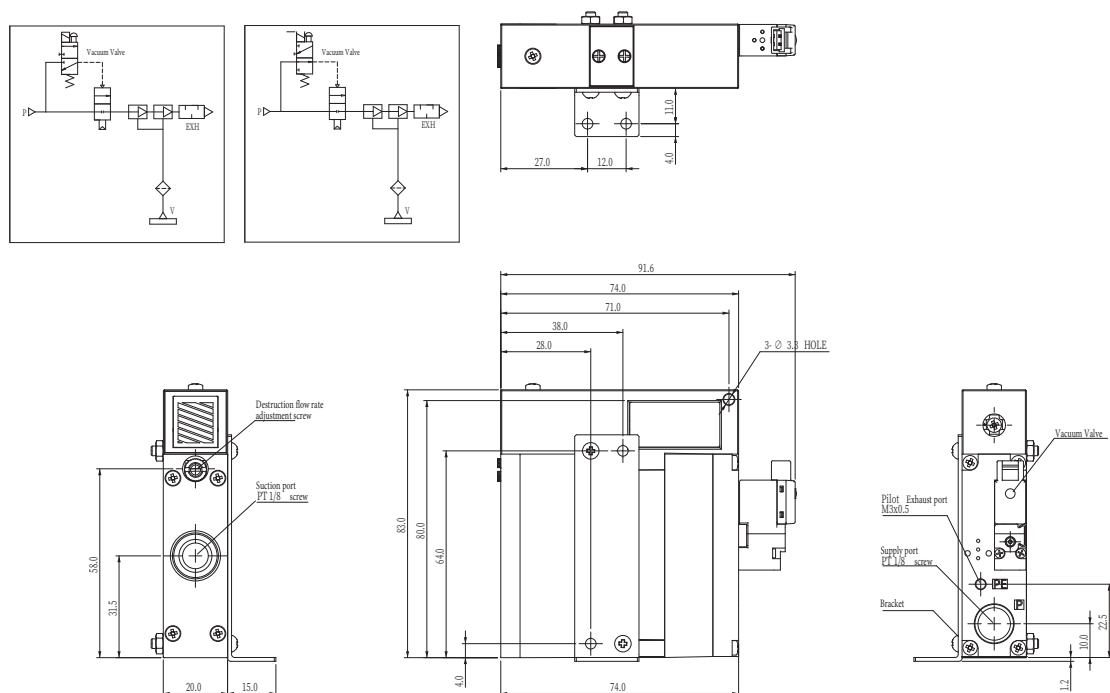
No.	Part Name		Material	Note
①	Diffuser body		Zn	
②	Operator body (top)		PA	
③	Operator body (bottom)		PA	
④	Valve unit body		PPS	
⑤	Poppet valve Ass'y		-	
⑥	Electromagnetic valve	Normal Close	-	DR100-*H
⑦	Electromagnetic valve	Normal Close	-	DR100-*H
		Normal Open	-	DR120-*H
		Latching type	-	LV290
⑧	Vacuum pressure switch		-	VPS-*-*B, VMS-*-*B
⑨	Soundproofing material		PVA Sponge	Replacement parts
⑩	Vacuum suction filter		PE	Replacement parts
⑪	Defuser		Al	0.7, 1.0(Y), 1.3, 1.5(W)
⑫	Secondary nozzle			0.7(Y), 1.0(B)
⑬	Primary nozzle			1.3(W), 1.5(R)
⑭	Flow adjustment screw		Al	
⑮	Vacuum counter pad		NBR	
⑯	Filter cover		PA	
⑰	Filter body		PA	

## Dimensional drawing

### EK□-S01-□□-V1(V2)-□B



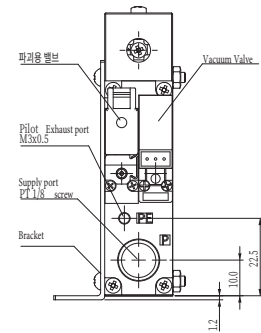
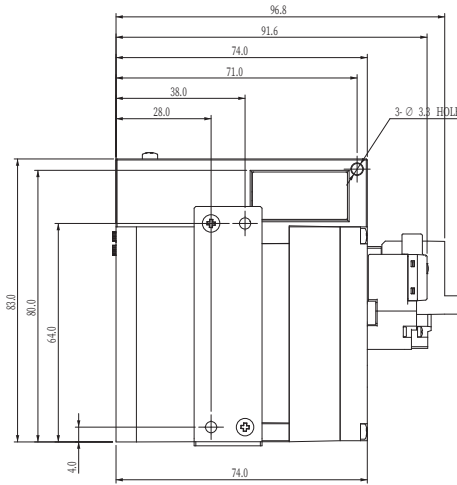
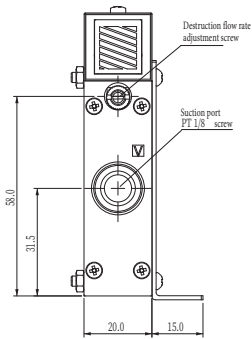
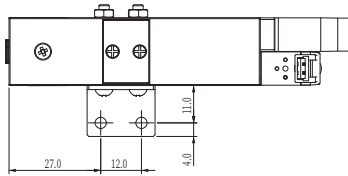
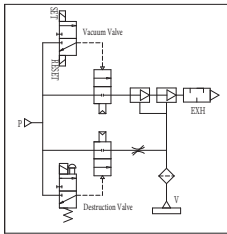
### EK□-S01-□□-V3(V4)-□B



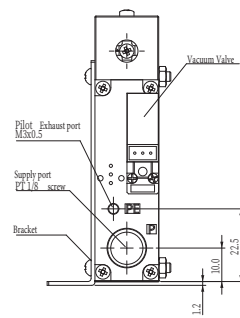
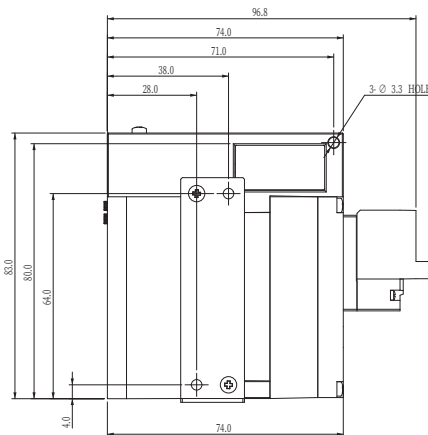
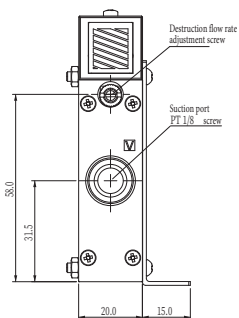
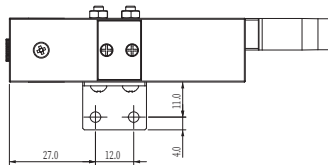
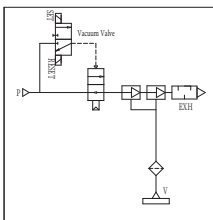
# Compact vacuum ejector (Medium) **EK Series**

## Dimensional drawing

EK□-S01-□□-V5-□B



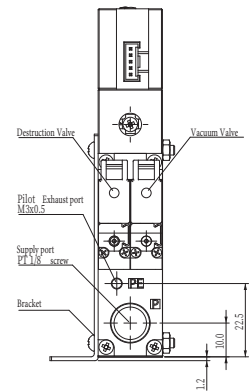
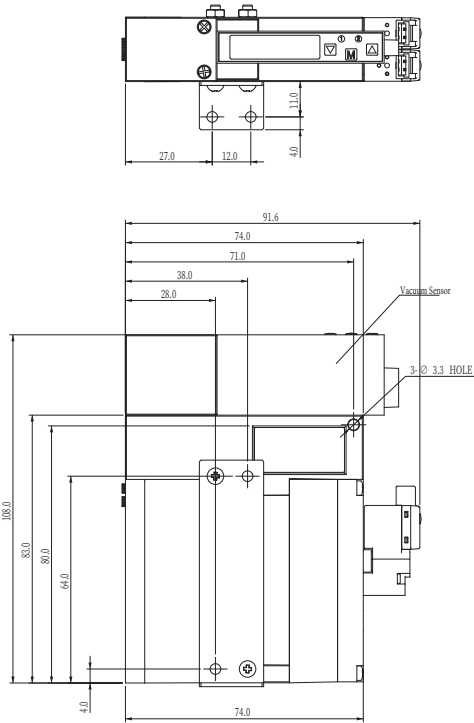
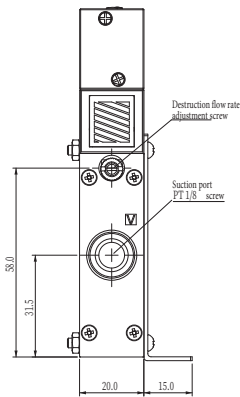
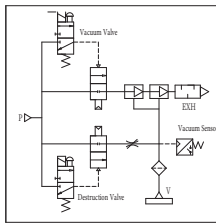
EK□-S01-□□-V6-□B



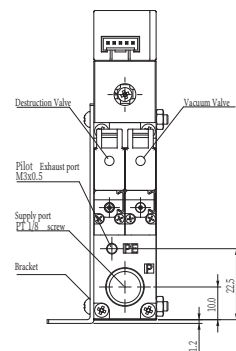
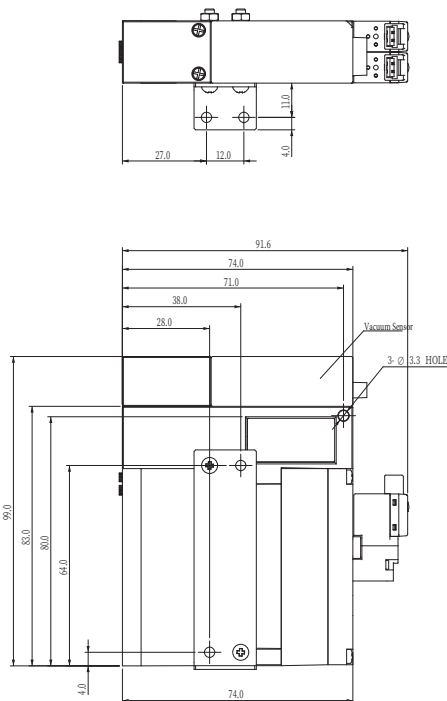
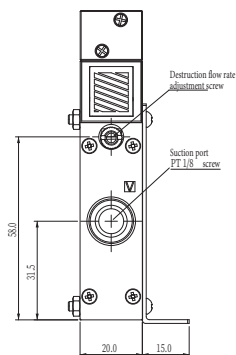
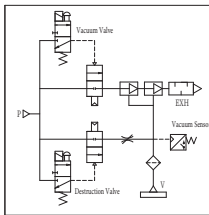


## Dimensional drawing

EK□-S01-□□-V1(V2)-NL(NK,PK)□-□B

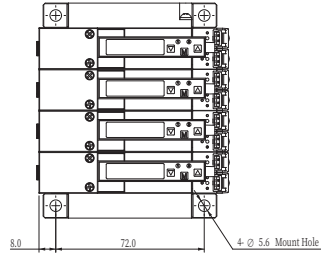
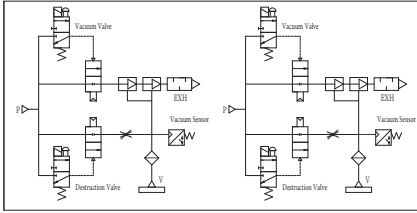


EK□-S01-□□-V1(V2)-N1(N2)□-□B



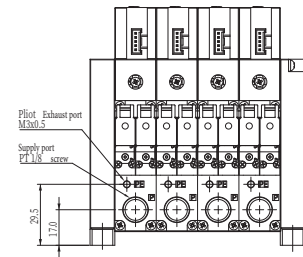
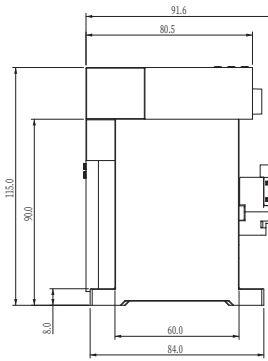
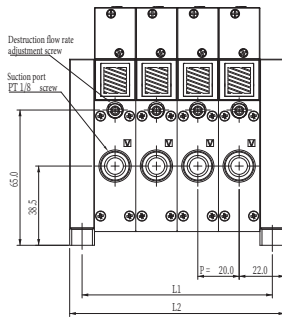
## Dimensional drawing

EK□-MA04-□□-V1(V2)-NL(NK,PK)□-□

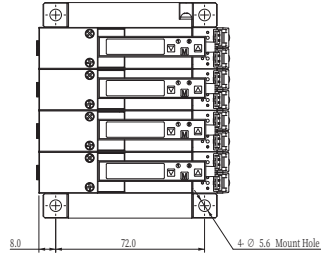
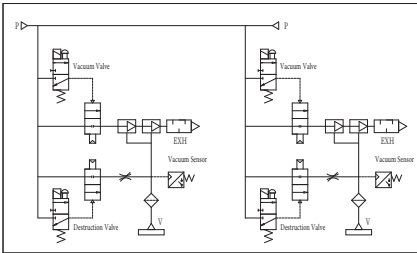


Dimensions

S	1	2	3	4	5	6	7	8	9	10
L1	33.6	54.4	75.2	96	116.8	137.6	158.4	179.2	200	220.8
L2	45.6	66.4	87.2	108	128.8	149.6	170.4	191.2	212	232.8

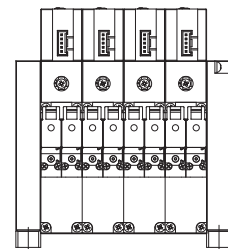
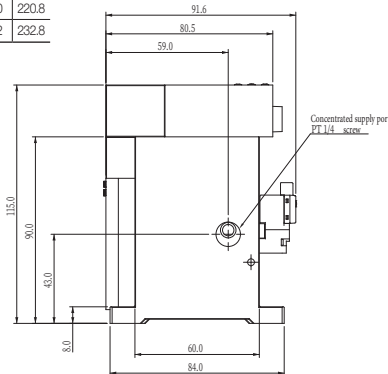
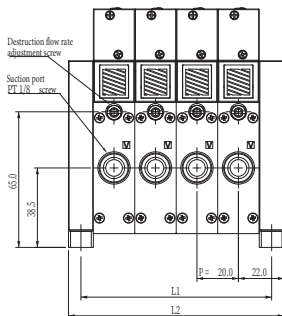


EK□-M04-□□-V1(V2)-NL(NK,PK)□-□



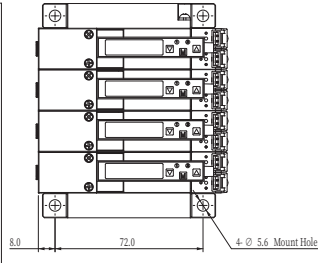
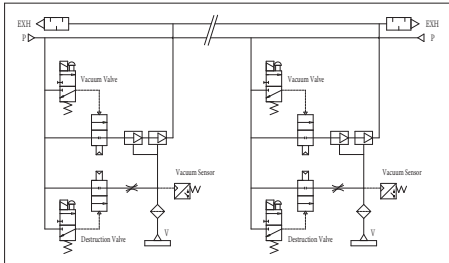
Dimensions

S	1	2	3	4	5	6	7	8	9	10
L1	33.6	54.4	75.2	96	116.8	137.6	158.4	179.2	200	220.8
L2	45.6	66.4	87.2	108	128.8	149.6	170.4	191.2	212	232.8



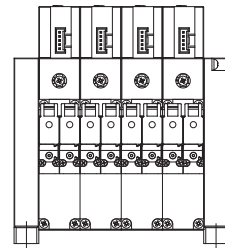
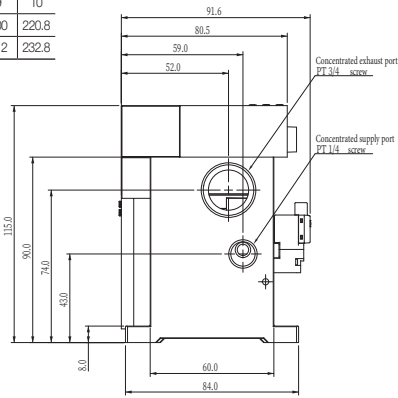
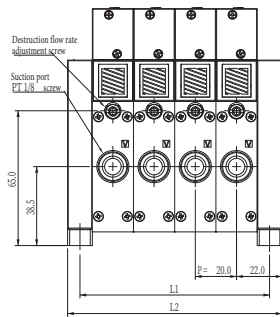
## Dimensional drawing

EK□-MB04-□□-V1(V2)-NL(NK,PK)□-□

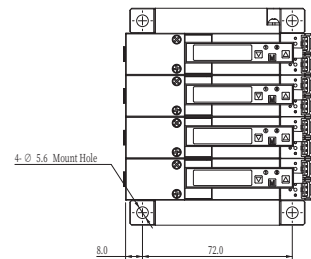
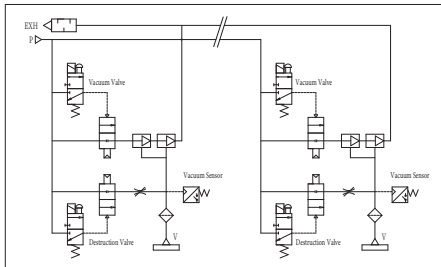


Dimensions

S	1	2	3	4	5	6	7	8	9	10
L1	33.6	54.4	75.2	96	116.8	137.6	158.4	179.2	200	220.8
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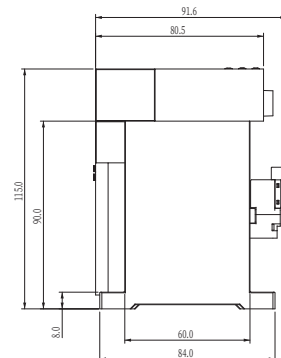
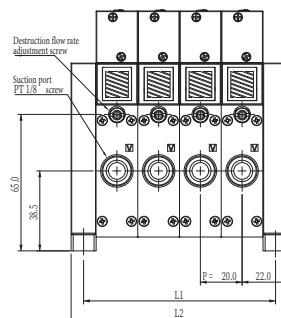
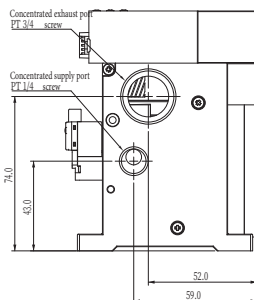


EK□-ML04-□□-V1(V2)-NL(NK,PK)□-□



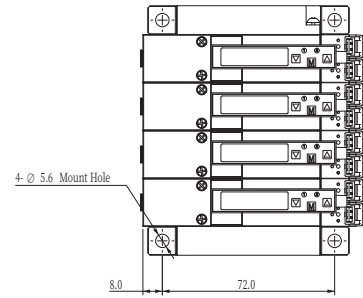
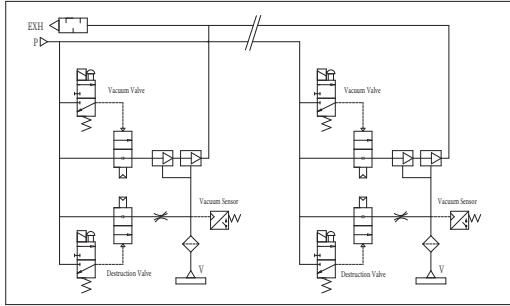
Dimensions

S	1	2	3	4	5	6	7	8	9	10
L1	33.6	54.4	75.2	96	116.8	137.6	158.4	179.2	200	220.8
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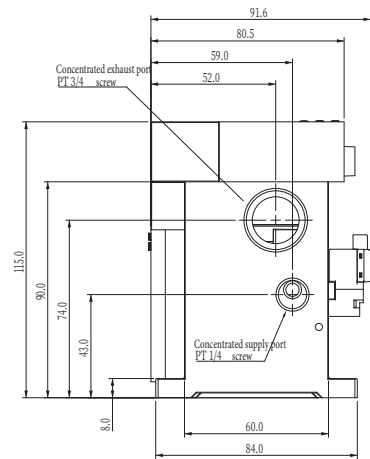
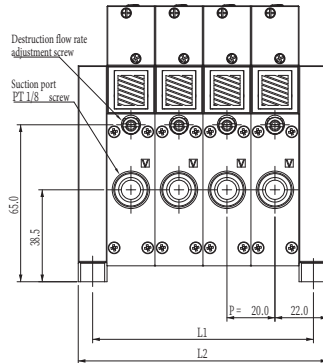
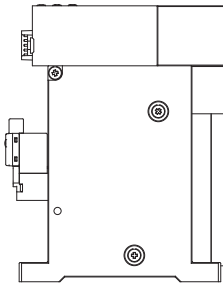
## Dimensional drawing

EK□-MA04-□□-V1(V2)-NL(NK,PK)□-□

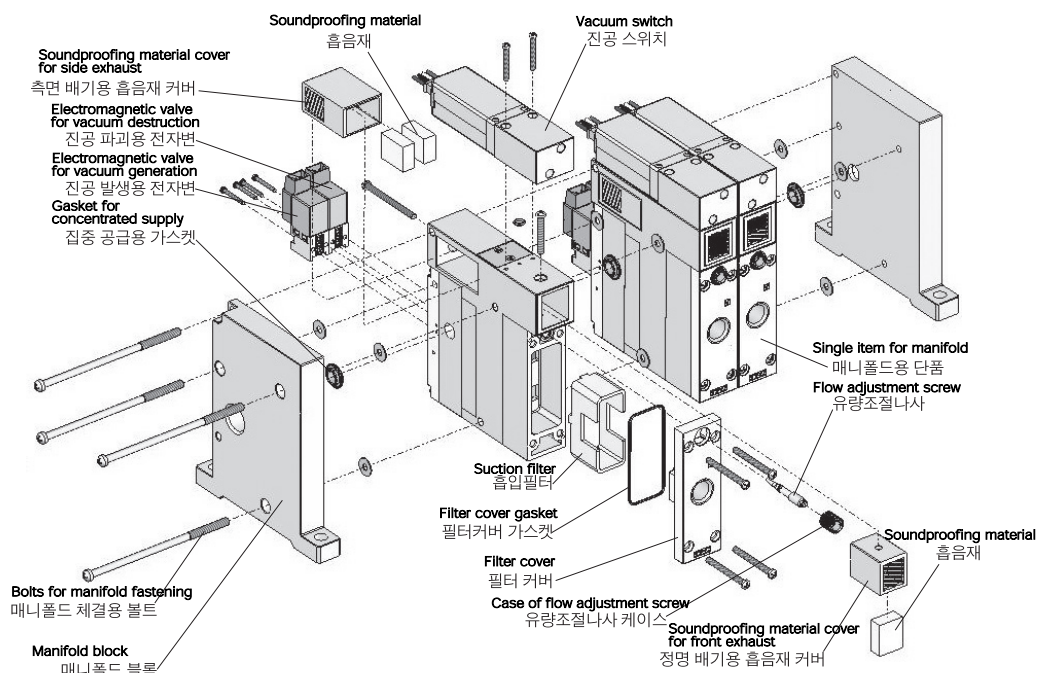


Dimensions

S	1	2	3	4	5	6	7	8	9	10
L1	33.6	54.4	75.2	96	116.8	137.6	158.4	179.2	200	220.8
L2	45.6	66.4	87.2	108	128.8	149.6	170.4	191.2	212	232.8



## Equipment assembly and disassembly configuration



## Precautions when using ejector

- If satisfactory performance is not achieved due to an increase in the number of manifold years, or if problems persist despite the following inspection, please contact us.

### When vacuum performance deteriorates due to insufficient supply air

- ※Countermeasure: ① Check the amount of supplied air, etc.  
 ② Keep the piping length as short as possible.  
 ③ Use the fitting size as large as possible.  
 ④ If the supply air port is a one-sided specification, use it on both sides.

### When vacuum performance deteriorates due to insufficient exhaust port capacity

Silencer attached type: Performance deteriorates as exhaust resistance increases due to insufficient capacity of the silencer.

- ※ Countermeasure: ① If the silencer is designed for one side, use it on both sides.  
 ② Please provide individual exhaust for each station.  
 ③ Avoid installation in a location where the exhaust port is blocked by external influences from the product.

Piping exhaust type: As piping resistance increases, performance deteriorates.

- ※ Countermeasure: ① If the piping exhaust is of a single-sided design, use it of both sides.  
 ② Keep the piping length as short as possible.  
 ③ Please provide individual exhaust for each station.  
 ④ Please reduce the number of manifold stations.

### In case of malfunction due to excessive supply pressure

Maximum operating pressure (7.1kgf/cm<sup>2</sup>): If more than the maximum operating pressure is supplied, valve switching will not work and leaks will occur.

- ※ Countermeasure: ① Be sure to attach a filter regulator to the front of the ejector.  
 ② When the operating pressure is adjusted below 7kgf/cm<sup>2</sup>, the responsiveness of the valve is restored and it operates normally.  
 ③ If a leak occurs, reassemble the gasket and use it.

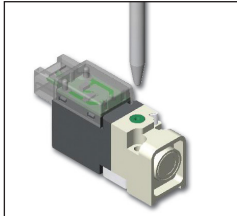
## ⚠ Precautions for each product

Be sure to read this carefully before use. Please check the preface for usage precautions and common precautions.

### ⚠ Caution

#### ● Manual (Non-Lock Push type) operation

If you operate the manual, the installed device will operate, so be sure to check whether it is dangerous before using it.



#### ⚠ Caution

- When operating the manual, do not use tools with very sharp ends.
- Do not apply excessive force when pressing the manual key.

#### ● Lead wire length of the plug connector

The lead wire length of the plug connector is approximately 300 mm.

#### ● Surge voltage protection circuit

-> PCB circuit (H, V type plug connector type)

(1) DC Type

- Basic type (with lamp) → This is the basic type and can be used on either side, but be careful about the polarity of the lamp points.
- Non-polar type (with lamp) → Since it is a non-polar type, it can be used on either side.
- Energy-saving type (with lamp and voltage protection circuit) → Use with caution in polarity.

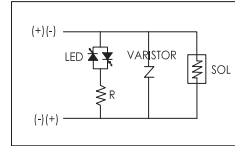


· Latching type - The latching type solenoid valve is used to prevent malfunction even in momentary power failure. Please apply continuous energization to the SET coil and instantaneous energization (10 ms or more) to the RESET coil. The latching type valve is shipped in the RESET state (A → R), but it may be in the SET position due to external shock or vibration during transportation, so please check the position with the power source before use.

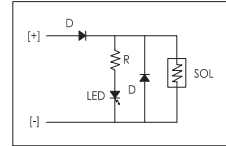


### ● Caution

Basic precautions refer to DV Series (based on DC Type)

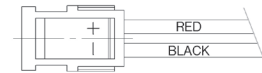


DC non-polar circuit diagram

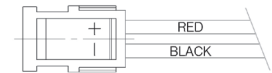


DC Polarity Schematic

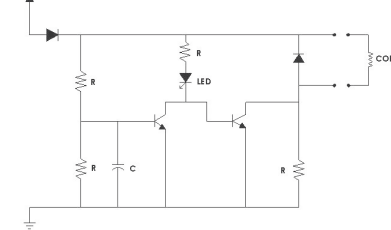
#### N.C.N.O connector



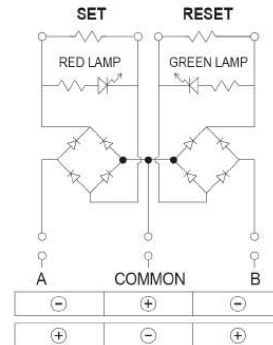
#### N.C.N.O connector



#### Power saving type



#### Latching type (lamp, surge voltage protection circuit)



#### Latching connector

