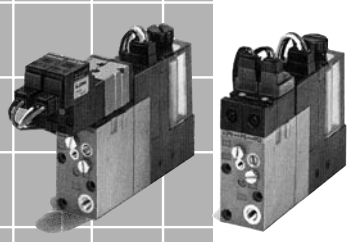
Vacuum Module: *Series ZX*

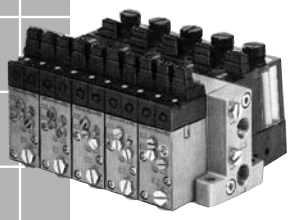
Vacuum Ejector System/External Vacuum Supply System

Suitable for handling electronic components and precision components up to 100g

Modular Design

Customized application function through selection of module components.





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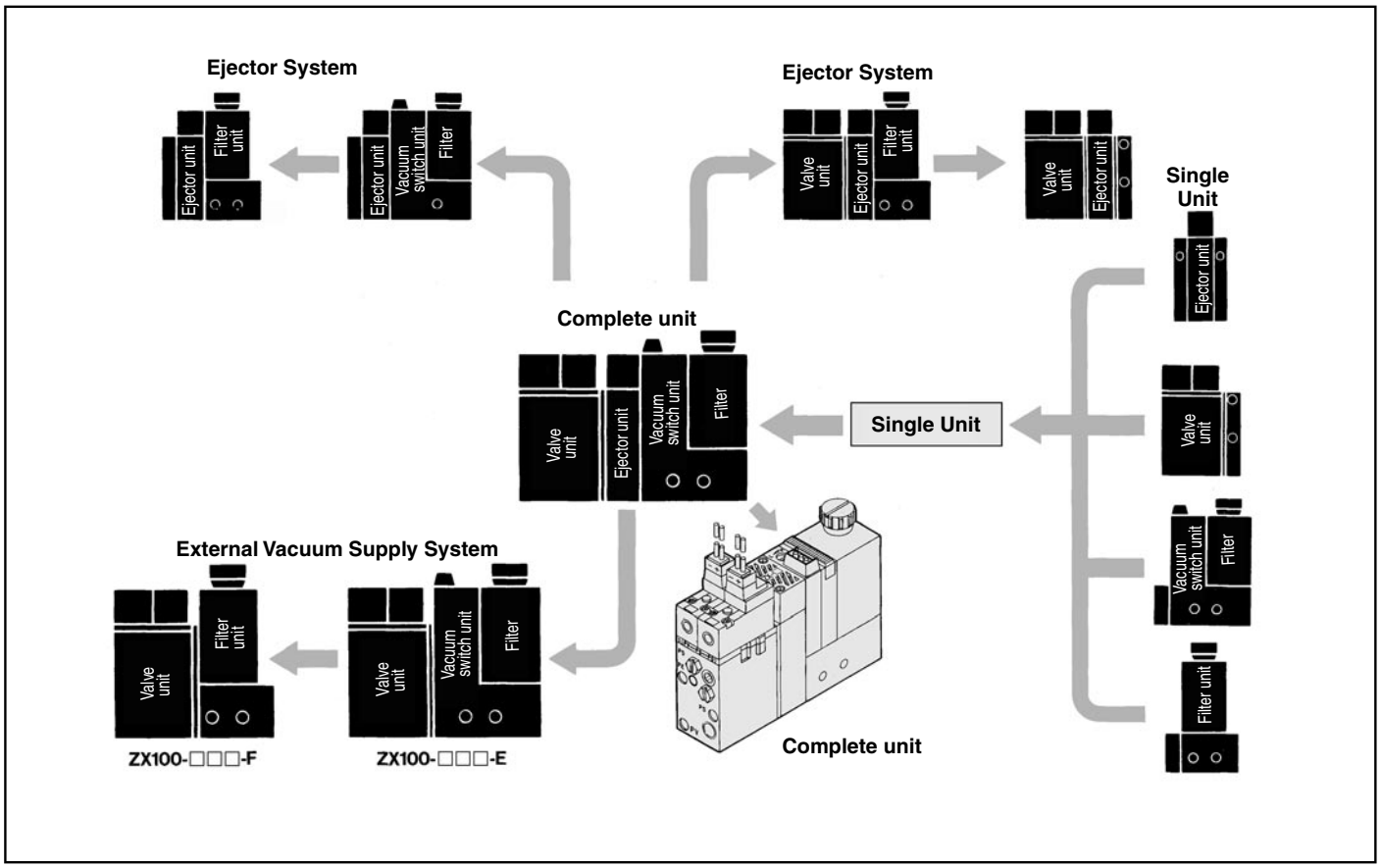
Vacuum Module
Vacuum Ejector System/External Vacuum Supply System
Series ZX

For electronic components and precision components up to 100g

Modular Design
Customized application function through selection of module components.

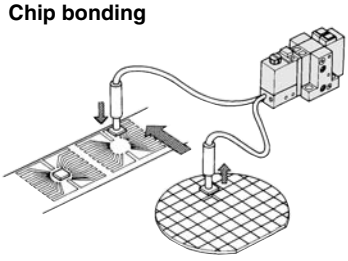
Compact size and light weight (120g with complete unit); well suitable for actuator mounting

Ejector nozzle size: ø5 to ø10 (Suction flow: 5 to 22 ℓ/min

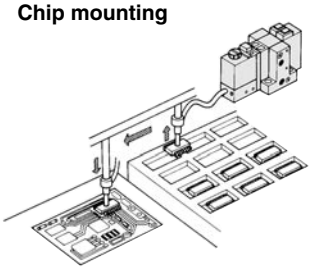


Applications Examples

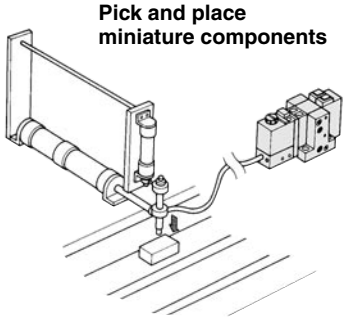
Chip bonding



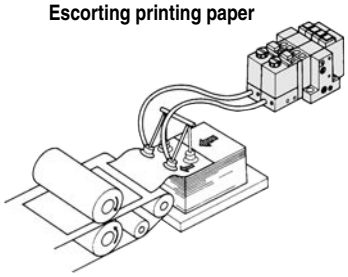
Chip mounting



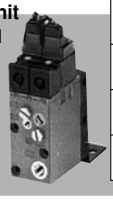
Pick and place miniature components



Escorting printing paper

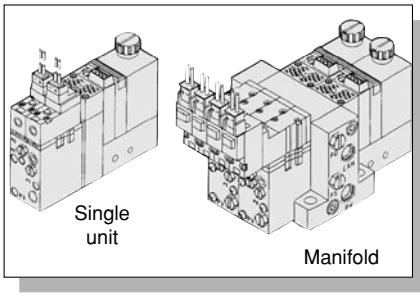


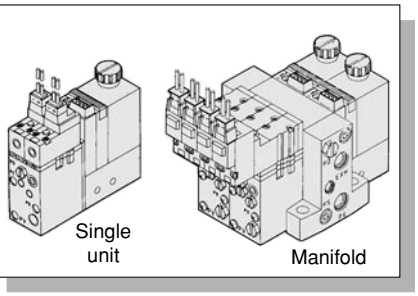
Modular Components Introduction

Components	Characteristics	Standard Specifications: Ejector System (P.3.1-4 to 3.1-39)			External Vacuum Supply System (P.3.1-40 to 3.1-65)
Ejector unit Series ZX1 	Nozzle dia. ø(mm)	0.5	0.7	1.0	———
	Max. suction flow (ℓ/min)	5	10	22	
	Air consumption (ℓ/min)	13	23	46	
	Max. vacuum pressure	–84kPa			
	Exhaust release	Built-in silencer/Manifold exhaust Individual exhaust port: RC(PT)1/8			
Valve unit ZX1-V□ 	Components	Supply valve/Release valve			
	Function	Normally closed/Normally open			
	Operation	Solenoid valve/Air operated valve			
	Supply voltage	24, 12, 6, 5, 3V DC			
Vacuum switch unit Series ZS 	Type	Vacuum switch	Adsorption confirmation switch		Vacuum switch / Adsorption confirmation switch
	Pressure setting range	0 to –101kPa	–20kPa to –101kPa		0 to –101kPa / –20kPa to –101kPa
	Hysteresis	3% or less			4mmHg
	Applicable pad dia. (mm)	ø2 to ø25	ø0.3 to ø1.2		ø2 to ø25 / ø0.3 to ø1.2
	Supply voltage	24VDC			24VDC
Suction filter unit ZX1-F 	Operating pressure range	Vacuum to 0.5MPa			
	Filtration	30 μm			
Common specificatons	Unit: Air supply port size	M5 (Standard)/M6 (Option)			
	Unit: Vacuum pad connection port	M5 (Standard)/M6 (Option)			
	Manifold: Air supply port	Rc (PT)1/8			
	Manifold: Exhaust port	Rc (PT)1/8			
	Manifold: External pilot port	M5			
	Manifold: Number of stations	Max.8 stations			

- **Refer to p.3.1-8 to 3.1-18 for more detailed specifications for each unit.**
- **Refer to p.3.1-4 and 3.1-5 for ejector system unit.**
- **Refer to p.3.1-30 for ejector system manifold.**
- **Refer to p.3.1-38 and 3.1-41 for external vacuum supply system unit.**

Order Made P.3.1-66 to 3.1-70





- Refer to p.3.1-52 for external vacuum supply system manifold.
- Refer to p.3.1-62 to 3.1-65 for units for replacement.

Series ZX/Ejector System

How to Order

Components

Ejector unit	Valve unit N.C. style	Vacuum switch unit
Ejector unit	Valve unit N.O. style	Vacuum switch unit
Ejector unit		Vacuum switch unit
Ejector unit		Filter unit

Combination of vacuum supply and release valves

ZX1 10 1 K1 □ 5 L Z □ E C □ Q

ZX1 10 1 K3 □ 5 L Z □ E C □ Q

ZX1 10 1 □ □ □ □ □ E C □ Q

ZX1 10 1 □ □ □ □ □ F □ Q

Ejector unit nozzle dia.

05	0.5mm
07	0.7mm
10	1.0mm

Ejector exhaust

1	With silencer
2	Port exhaust Rc(PT) 1/8
3	Common exhaust (Manifold only)

Valve unit/Combination of supply valve and release valve. Refer to Table 1 on p.3.1-7.

Pilot valve

—	DC: 1W (With light: 1.05W)
Y*	DC: 0.45W (With light: 0.5W)

*24V DC and 12V DC are applicable to 0.45W.

Voltage

5	24V DC
6	12V DC
V	6V DC
S	5V DC
R	3V DC
—	Air-operated (K6, K8, J3, J4, D3, D4)

Electrical entry

L	Plug connector	Lead wire length: 0.3m
LN		W/o lead wire
LO		Without connector
M		Lead wire length: 0.3m
MN		W/o lead wire
MO		Without connector
G	Grommet	Lead wire length: 0.3m
H		Lead wire length: 0.6m
—	Air operated	

Note) In case of "K1" or "J1" (combination of supply and release valves), M type plug connector can not be used.

- Refer to Table 2 on p.3.1-5 for part number of lead wire with connector.
- Refer to p.3.1-32 for ordering the manifold.
- Refer to p.3.1-62 and 3.1-63 for ordering a unit for replacement.

Indicator light and surge voltage suppressor

—	None
Z	With indicator light and surge voltage suppressor
S	With surge voltage suppressor

Manual override

—	Non-locking push style
B	Locking slotted style (Tool)

Vacuum digital pressure switch unit

D	mmHg	21	2 outputs/Without analogue output
		22	2 outputs/With analogue output
DP	kPa	23	1 output (With trouble detection)/Without analogue
		24	1 output (With trouble detection)/With analogue

Note) Analogue output is available only for grommet style.

Vacuum switch unit/Filter unit

E	Vacuum pressure switch (General type)	With suction filter
F	Suction filter only	

Vacuum switch electrical entry

—	Grommet	Lead wire length: 0.6m
L		Lead wire length: 3m
C	Connector	Lead wire length: 0.6m
CL		Lead wire length: 3m
CN		Without connector (without lead wire)

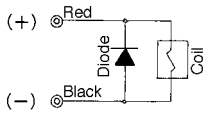
•Refer to Table 3 on p.3.1-5 for part number of lead wire with connector.

PV/V port size

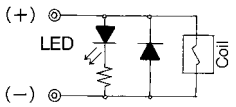
—	M5
Y	M6

⚠ Caution

Surge voltage suppressor



Indicator light and surge voltage suppressor



DC style:
Match the polarity of the connectors according to the ⊕ and ⊖ marks on the connectors. Do not interchange the polarities to prevent the diodes or the switching elements from becoming burned. If lead wires are pre-connected, the red wire is ⊕ and the black wire is ⊖.

① Valve Unit/Combination of Supply Valve and Release Valve

Components		Symbol	Supply valve					Release valve				
			Solenoid valve		Air operated		None	Solenoid valve		Air operated	External release	None
Supply valve	Release valve		N.C. (VJ114)	N.O. (VJ324)	N.C. (ZX1A)	N.O. (VJA324)		N.C. (VJ114)	N.C. (VJ314)	N.C. (VJA314)	ZX1A	
Solenoid (N.C.)	Solenoid (N.C.)	**K1**	●	–	–	–	–	●	–	–	–	–
Solenoid (N.O.)	Solenoid (N.C.)	**K3**	–	●	–	–	–	–	●	–	–	–
Air operated (N.C.)	External release	**K6**	–	–	●	–	–	–	–	–	●	–
Air operated (N.O.)	Air operated (N.C.)	**K8**	–	–	–	●	–	–	–	●	–	–
Solenoid (N.C.)	None	**J1**	●	–	–	–	–	–	–	–	–	●
Solenoid (N.O.)	None	**J2**	–	●	–	–	–	–	–	–	–	●
–		–	Without valve unit									

∗ Air operated valve: Controlled by external 3 port valve. ●Weight (g) / K1:82, K3:132, K6:58, K8:132, J1:77, J2:100

∗ External release: Directly released by external 2 port valve.

②How to Order Valve Plug Connector Ass'y

Connector ass'y part No. (DC)

VJ10 – 20 – 4A – 6

Lead wire length

–	0.3m (standard)
6	0.6m
10	1m
15	1.5m
20	2m
25	2.5m
30	3m

How to order

If ordering a vacuum module equipped with valves with 600mm or the longer lead wire, specify both the vacuum module valve and the connector ass'y part numbers.

(Ordering example)

ZX1051-K15LOZ-EC····· 1 pc.

∗ VJ10-20-4A-6·····2 pcs.

③Vacuum Switch Plug Connector Ass'y

ZS – 10 – 5A – □

Lead wire length

–	0.6m
30	3m
50	5m

Note) If ordering a vacuum switch with 5m lead wire, specify both the vacuum unit switch and the 5m lead wire connector part numbers.

(Ordering example)

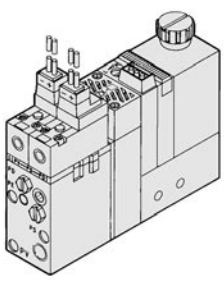
ZX1051-K15LO- ECN.....1 pc.

VJ10-20-4A-6..... 2 pcs.

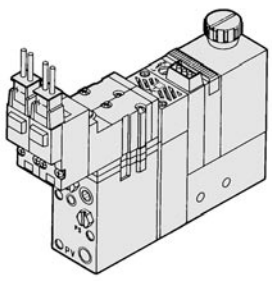
ZS-10-5A-50.....1 pc.

Ejector System/Recommended Model (The models below will have shorter deliveries)

Nozzle size (mm)	Model	Ejector exhaust	Combination		Solenoid valve rated voltage	Electrical entry (lead wire)	Indicator light and surge voltage suppressor	Vacuum switch unit	Electrical entry (vacuum switch)
			Supply valve (Pilot valve)	Release valve (Direct operated)					
ø0.5	**ZX1051-K15LZ-EC-Q**	With silencer	N.C. (VJ114)	N.C. (VJ114)	24VDC	Plug connector style	With indicator light and surge voltage suppressor	General vacuum switch (ZSE)	Connector style
	ZX1051-K35MZ-EC-Q		N.O. (VJ324)	N.C. (VJ314)					
ø0.7	**ZX1071-K15LZ-EC-Q**		N.C. (VJ114)	N.C. (VJ114)					
	ZX1071-K35MZ-EC-Q		N.O. (VJ324)	N.C. (VJ314)					
ø1.0	**ZX1101-K15LZ-EC-Q**		N.C. (VJ114)	N.C. (VJ114)					
	ZX1101-K35MZ-EC-Q		N.O. (VJ324)	N.C. (VJ314)					



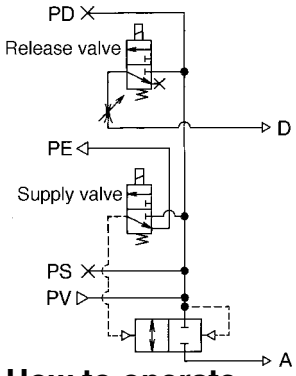
ZX1□□□-K15LZ-E□-Q



ZX1□□□-K35MZ-E□-Q

Ejector System/Combination of supply valve and release valve

Combination symbol: K1



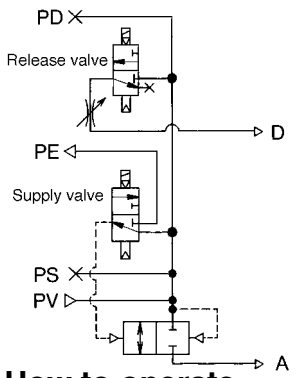
An N.C. solenoid valve is used for the supply valve. Also, an N.C. solenoid valve is used for the vacuum release valve.

Application: This combination is used for effecting control in accordance with electric signals.

How to operate

Valve / Condition	Supply valve (N.C.)	Release valve (N.C.)
	Solenoid valve	Solenoid valve
1. Adsorption of work	ON	OFF
2. Vacuum release	OFF	ON
3. Operation stop	OFF	OFF

Combination symbol: K3



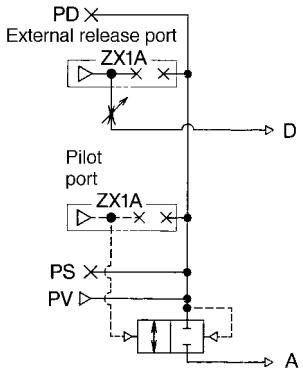
An N.O. solenoid valve is used for the supply valve. Also, an N.C. solenoid valve is used for the vacuum release valve.

Application: This combination is used for effecting control in accordance with electric signals. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This combination is used for preventing the workpieces from dropping during power outages.

How to operate

Valve / Condition	Supply valve (N.O.)	Release valve (N.C.)
	Solenoid valve	Solenoid valve
1. Adsorption of work	OFF	OFF
2. Vacuum release	ON	ON
3. Operation stop	ON	OFF

Combination symbol: K6



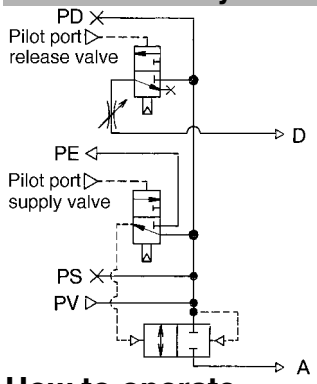
An external 3 port valve must be provided to serve as the supply valve. Also, an external 2 port valve (vacuum valve) must be provided to serve as the vacuum release valve.

Application: This combination is used for effecting control in accordance with electric signals.

How to operate

Valve / Condition	Supply valve	Release valve
	External 3 port valve	External 2 port valve
1. Adsorption of work	ON	OFF
2. Vacuum release	OFF	ON
3. Operation stop	OFF	OFF

Combination symbol: K8



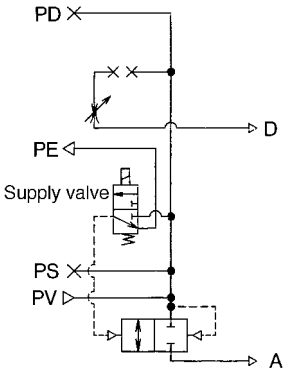
An air operated N.O. valve is used as the supply valve. An air operated N.C. valve is used for the vacuum release valve.

Application: This combination is used for effecting control in accordance with electric signals. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This combination is used for preventing the workpieces from dropping during power outages.

How to operate

Valve / Condition	Supply valve (N.O.)	Release valve (N.C.)
	Air operated valve	Air operated valve
1. Adsorption of work	OFF	OFF
2. Vacuum release	ON	ON
3. Operation stop	ON	OFF

Combination symbol: J1



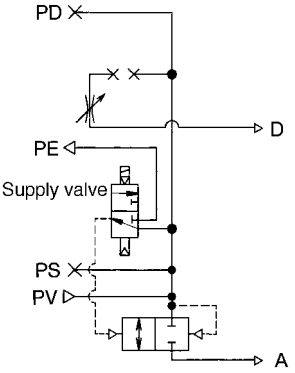
An N.C. solenoid valve is used for the supply valve. A vacuum release valve is not used.

Application: This combination is used for effecting control in accordance with electric signals. A vacuum release is effected by the intrusion of air between the silencer, pad, and the workpiece. This combination is used when there is no need to accelerate the vacuum release speed.

How to operate

Valve / Condition	Supply valve (N.C.)	Release valve (N.O.)
	Solenoid valve	None
1. Adsorption of work	ON	——
2. Vacuum release	OFF	——
3. Operation stop	OFF	——

Combination symbol: J2



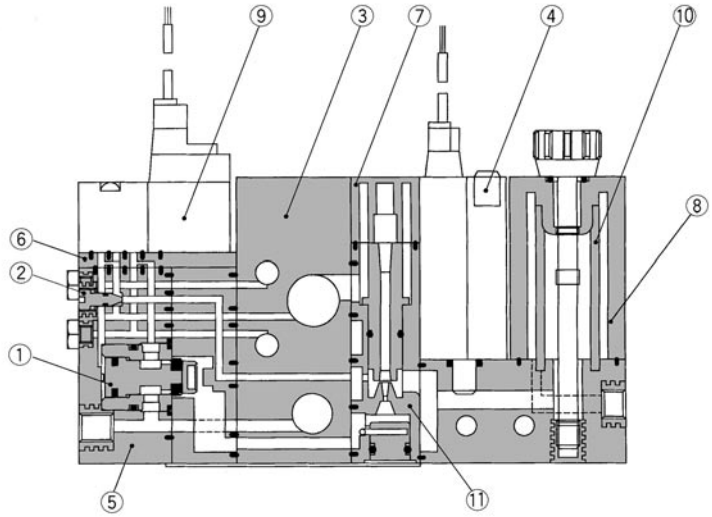
An N.O. solenoid valve is used for the supply valve. A vacuum release valve is not used.

Application: This combination is used for effecting control in accordance with electric signals. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This combination is used for preventing the workpieces from dropping during power outages. A vacuum release is effected by the intrusion of air between the silencer, pad, and the workpiece. This type is used when there is no need to accelerate the vacuum release speed.

How to operate

Valve / Condition	Supply valve (N.O.)	Release valve
	Solenoid valve	None
1. Adsorption of work	OFF	——
2. Vacuum release	ON	——
3. Operation stop	OFF	——

Ejector System/Construction



Component Parts

No.	Description	Material	Note
①	Poppet valve ass'y	—	ZX1-PV-O
②	Release flow adjusting needle	Stainless steel	
③	Manifold	Aluminum	
④	Vacuum switch	—	ZSE2, ZSP1
⑤	Valve unit	—	ZX1-VA□□□□-D-□
⑥	Interface plate	—	(PV↔PS→PD)
⑦	Silencer case		
⑧	Filter case	Polycarbonate (1)	

Replacement Parts

No.	Description	Material	Part No.
⑨	Pilot valve (Air operated)	—	Refer to Table 1, 2, and 3
⑩	Filter element	PVF	ZX1-FE
⑪	Ejector assembly	—	Refer to Table 4

Note 1) • The case is made of polycarbonate. Therefore, do not use with or expose it to the following chemicals: paint thinner, carbon tetrachloride, chloroform, acetic ester, aniline, cyclohexane, trichloroethylene, sulfuric acid, lactic acid, watersoluble cutting oil (alkalinic), etc.
• Do not expose it to direct sunlight.

Table1: How to order pilot valve

No.	Component		Model	Combination
	Supply valve	Release valve		
①	Solenoid valve N.C. (VJ114)	Solenoid valve N.C. (VJ114)	ZX1-VJ114-□□□□	K1, J1
②	Solenoid valve N.O. (VJ324)	Solenoid valve N.C. (VJ314)	ZX1-VJ3 $\frac{1}{2}$ 4□-□□□□	K3, J2
③	Air operated N.O. (VJA324)	Air operated N.C. (VJA314)	ZX1-VJA3 $\frac{1}{2}$ 4	K8
④	Air operated N.C. (ZX1A)		ZX1A-□	K6

Table2: How to order solenoid valve

ZX1—VJ114— □ — 5 L Z □ - Q

ZX1—VJ3 2 4 □ □ — 5 L Z □ - Q

Type of actuation
1 — N.C. (Normally closed)
2 — N.O. (Normally open)

Body option
— — Individual exhaust for pilot valve
M — Common exhaust for main and pilot valves

Note) In case of N.C., indicate no symbol. (Individual exhaust for pilot valve).

Pilot valve

—	DC: 1W (With light: 1.05W)
Y*	DC: 0.45W (With light: 0.5W)

*24V DC and 12V DC are applicable to 0.45W type.
Note) Screw length of VJ100 and VJ300 for series ZX is different from that of the standard model.
〈Screw length〉 VJ100: M1.7 X 15
VJ300: M1.7 X 22

Voltage
5 — 24V DC
6 — 12V DC
V — 6V DC
S — 5V DC
R — 3V DC

Electrical entry
L — Connector (0.3m)
LN — Connector (without lead wire)
LO — Without connector
M — Connector (0.3m)
MN — Connector (without lead wire)
MO — Without connector
G — Grommet (0.3m)
H — Grommet (0.6m)

Note) In case of "ZX1-VJ114", M, MN and MO cannot be used.

Indicator light and surge voltage suppressor
— — None
S — With surge voltage suppressor
Z — With indicator light and surge voltage suppressor

Manual override
— — Non-locking push style
B — Locking slotted style

Table 3: How to order air operated valve

ZX1A—M3

Port size

M3	M3	Pilot port/External release port
M5	M5	

Table 4: How to order ejector assembly

ZX1—W D 05 1

Assembly No.

Ejector unit nozzle dia.
05 — 0.5mm
07 — 0.7mm
10 — 1.0mm

Ejector style (Exhaust style)
1 — With silencer
2 — Port exhaust
3 — Common exhaust

*An adapter should be attached to the assembly to be used as a unit. PV port and V port can be connected.

Ejector Ass'y
- Combination/ ZX-WD
- Used as a unit by attaching an adapter/ ZX-W-□

⚠Caution

Turning the vacuum release flow volume adjustment needle clockwise reduces the vacuum release flow volume; the needle valve is fully closed when the needle stops turning. Turning the needle 2 full turns counterclockwise from the fully closed position renders the needle valve fully open. The needle will fall out if it is turned more than 4 full turns.

Ejector Unit

Specifications

Unit No.	ZX1-W05 $\frac{1}{2}$	ZX1-W07 $\frac{1}{2}$	ZX1-W10 $\frac{1}{2}$
Nozzle dia. ø(mm)	0.5	0.7	1.0
Max. suction flow (ℓ/min)	5	10	22
Air consumption (ℓ/min)	13	23	46
Max. vacuum pressure	–84kPa		
Max. operating pressure	0.7MPa		
Supply pressure range	0.2MPa to 0.55MPa		
Standard supply pressure	0.45MPa		
Operating temperature range	5 to 50 °C		
Ejector exhaust style*	Code ①	Built-in silencer·····For single and manifold	
	Code ②	Individual exhaust·····For single and manifold	
Weight	Built-in silencer: 35g/Individual exhaust: 45g		
Standard accessory	Bracket B		

*Codes ① and ② are corresponding to the suffixes in "How to Order" to indicate the exhaust method.

How to Order

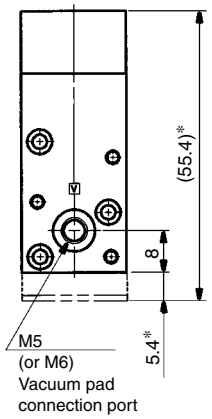
ZX1 — W [05] [1] [ ]

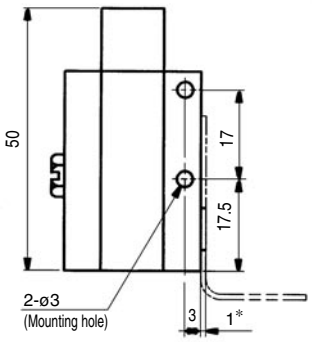
Nozzle size
05 — 0.5mm
07 — 0.7mm
10 — 1.0mm

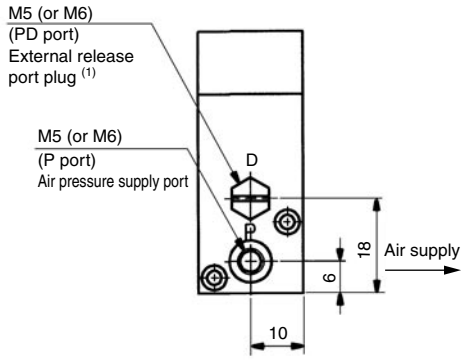
Ejector exhaust
1 — Built-in silencer
2 — Individual exhaust Rc(PT)1/8

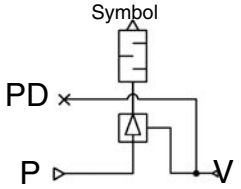
PV/V port size
— — M5
Y — M6 (Option)

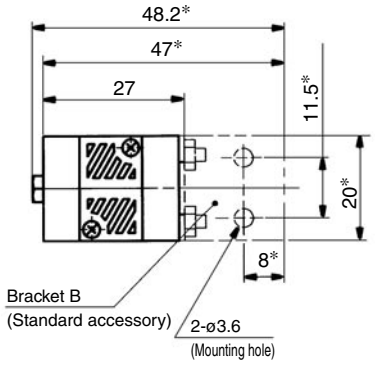
Dimensions/ZX1-W□□$\frac{1}{2}$











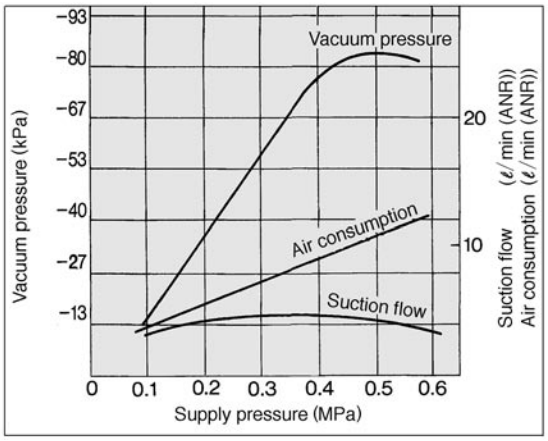
Note1) Remove the plug at external release.

Note2) Dimensions *: For mounting bracket B.

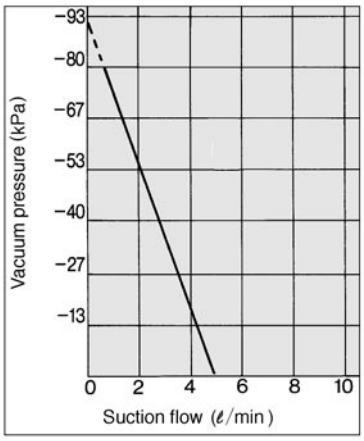
Flow Characteristics/Exhaust Characteristics [At 0.45Mpa]

ZX1-W05

Exhaust

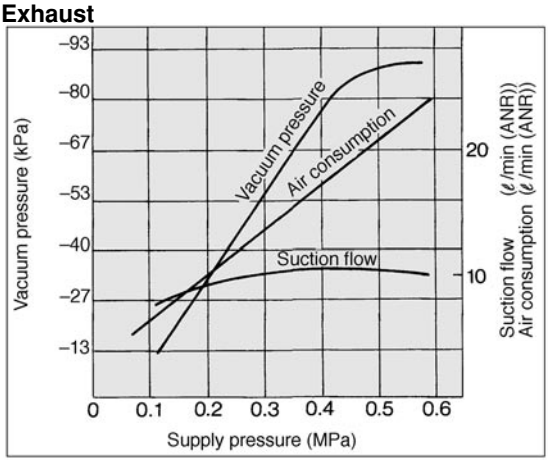


Flow

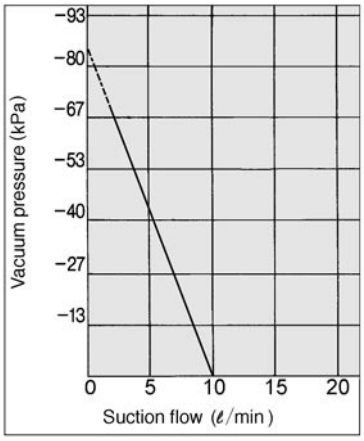


ZX1-W07

Exhaust



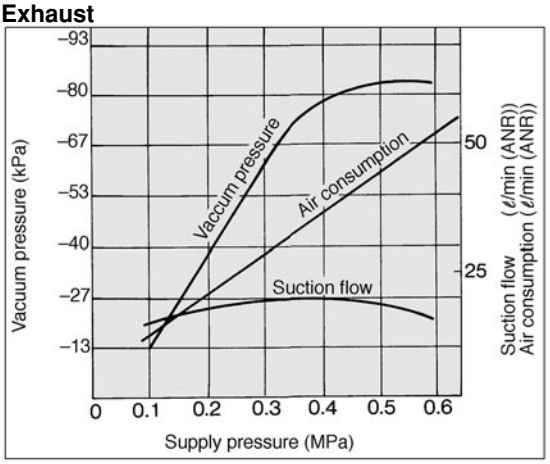
Flow



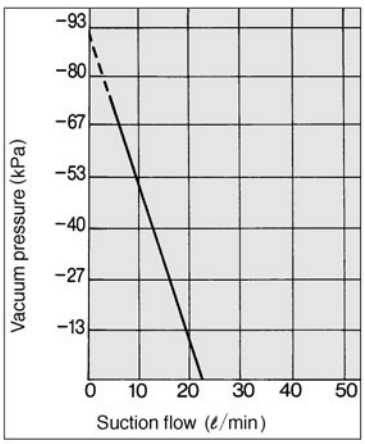
( ): mmHG.

ZX1-W10

Exhaust

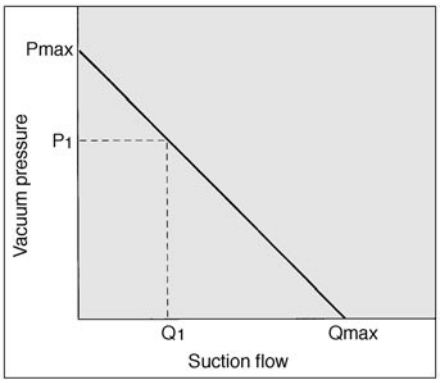


Flow



( ): mmHG.

How to Read Graphs



Flow characteristics are expressed in ejector vacuum pressure and suction flow. If suction flow rate changes a change in vacuum pressure will also be expressed. Normally this relationship is expressed in ejector standard use. In graph, Pmax is max. vacuum pressure and Qmax is max. suction flow. The valves are specified according to catalogue use. Changes in vacuum pressure are expressed in the below order.

①When ejector suction port is covered and made airtight, suction flow becomes 0 and vacuum pressure is at maximum value (Pmax).

②When suction port is opened gradually, air can flow through, (air leakage), suction flow increases, but vacuum pressure decreases. (condition P_1 and Q_1)

③When suction port is opened further, suction flow moves to maximum value (Qmax), but vacuum pressure is near 0. (atmospheric pressure).

When vaccum port (vacuum piping) has no leakage, vacuum pressure becomes maximum, and vacuum pressure decreases as leakage increases. When leakage value is the same as max. suction flow, vacuum pressure is near 0. In the case when ventirative or leaky work should be adsorbed, please note that vacuum pressure will not be high.

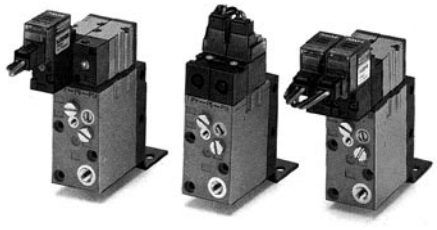
⚠ Precautions

Be sure to read before handling. Refer to p.0-20 and 0-21 for Safety Instructions and common precautions on the products mentioned in this catalogue.

⚠ Caution

Refer to P.3.0-7 for the product selection in series ZX and the sizing program.

Valve Unit/ZX1-VA



Specifications

Unit No.	ZX1-VA□□□□□							
Components	Vacuum supply valve				Vacuum release valve			
Operation	Pilot operated				Air operated			
	Direct operated		Solenoid valve		Solenoid valve		External release	Air operated
	N.C. (VJA314)	N.C. (VJ114)	N.O. (VJA324)	N.C. (ZX1A)	N.O. (VJA324)	N.C. (VJ114)	(ZX1A)	N.C. (VJ314)
Effective area mm² Flow Q (Nℓ/min)	3(163,3) Main valve				0.07 (3.8)	0.45 (24.5)	–	
Operating pressure range	0.3 to 0.6MPa							
Max. operating frequency	5Hz							
Operating temperature range	5 to 50°C							
Interface plate symbol	PV↔PS↔PD							
Standard accessory	Bracket C							

Solenoid valve/Specifications

	VJ114	VJ314, VJ324
Rated Voltage	24, 12, 6, 5, 3V DC (50/60Hz)	
Electrical entry	L plug connector, grommet	L plug connector, M plug connector, grommet
Indicator light/surge voltage suppressor	With or Without	
Manual override	Non-locking push style/Locking slotted style	

∗ Applicable to plug connector; connector ass'y with rectifier is attached.

Solenoid valve/Model

Model		Supply valve			
		Solenoid valve N.C.(VJ114)	Solenoid valve N.O.(VJ324)	Air operated N.C.(ZX1A)	None
Release valve	Solenoid valve N.C.(VJ114)	● K1 [82]	—	● K5 [73]	● D1 [77]
	Solenoid valve N.C.(VJ314)	—	● K3 [132]	—	● D2 [100]
	External release (ZX1A)	● K2 [73]	—	● K6 [58]	● D3 [41]
	Air operated N.C.(VJA314)	—	● K4 [119]	—	● D2 [100]
	None	● J1 [77]	● J2 [100]	● J3 [41]	—

[ ]: Weight (g)

How to Order/Refer to p.3.1-4 for details.

ZX1 − V A K1 ☐ 5 L Z ☐ ☐ - Q

- **System**
  - **A:** Ejector system
  - **B:** External vacuum supply system
- **Combination of supply valve and release valve**
- **Pilot valve**
- **Rated voltage**
- **Electrical entry**
- **Indicator light and surge voltage suppressor**
- **Manual override**
- **PV/V port size**

Connector Assembly for 100V AC

Connector assembly with rectifier attached.

Connector assembly with rectifier part no.

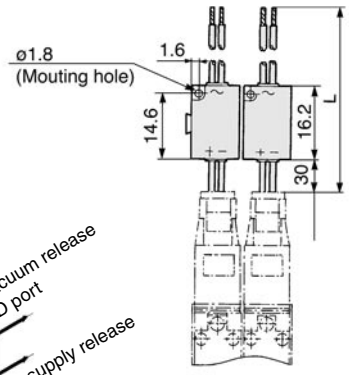
VJ10 — 36 □ A □

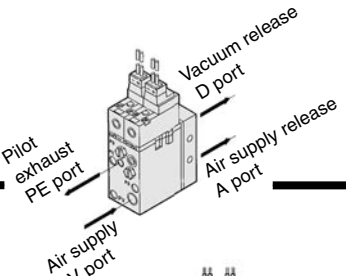
Rated voltage

Symbol	Voltage	Lead wire color
1	100V AC 50/60Hz	Blue (2 pcs.)
3	110V AC 50/60Hz (115V AC 60Hz)	Grey (2 pcs.)

Lead wire length

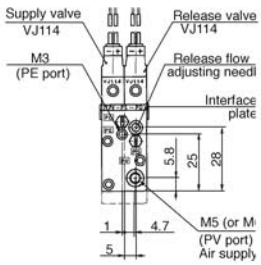
Symbol	L mm
—	300
6	600
10	1000
15	1500
20	2000
25	2500
30	3000

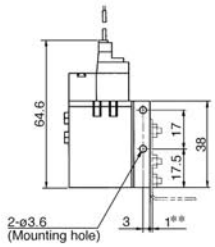


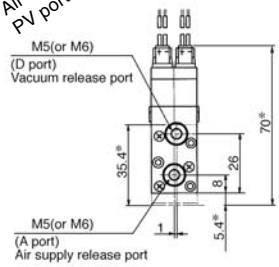


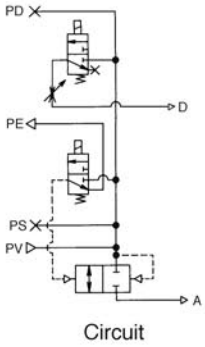
Valve Unit

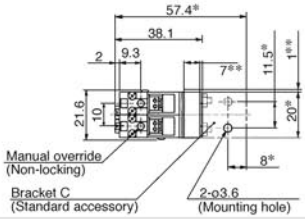
Normally Closed



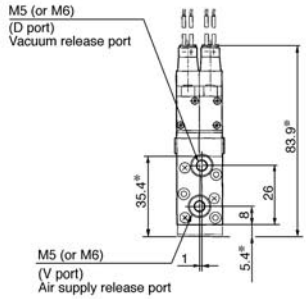


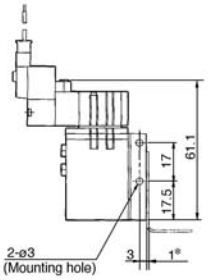


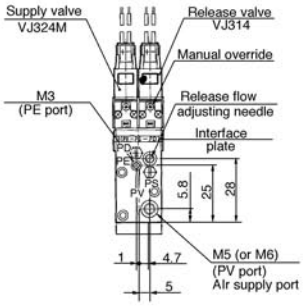


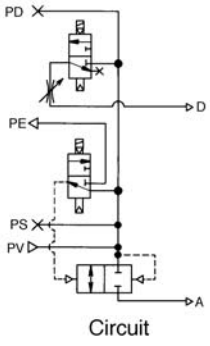


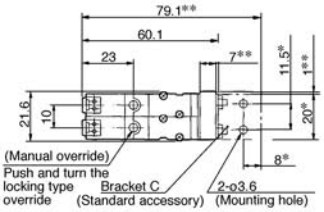
Normally Open











Note) Dimensions ∗: For mounting bracket C
∗∗: For mounting interface

Suction Filter Unit/ZX1-F

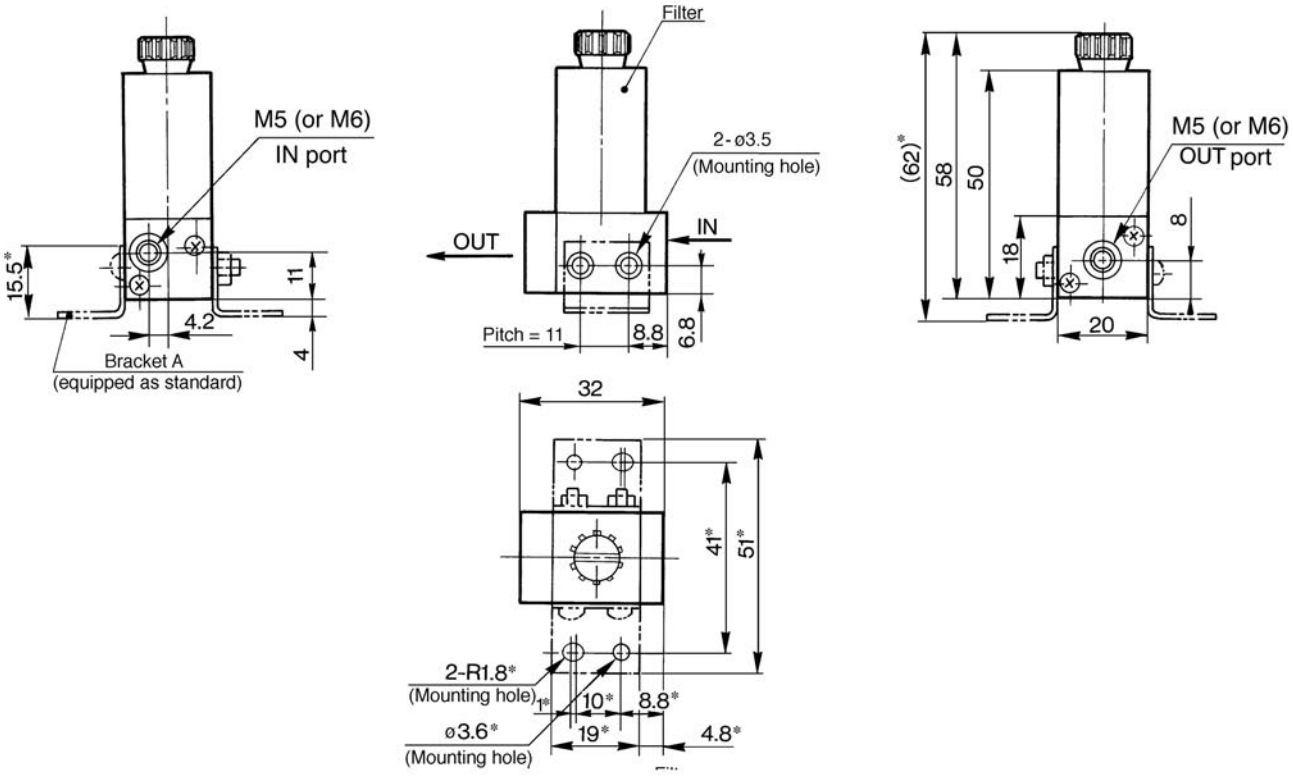
Specifications

Unit no.	ZX1-F
Operating pressure range	Vacuum to 0.5MPa
Operating temperature range	5 to 50°C
Filteration efficiency	30μm
Element	PVF
Weight	35g

Note) If not operated within the specified range of pressure and temperature, trouble may result.

Filter

Symbol



Note) Dimensions ∗: For bracket A mounting

Filter Case

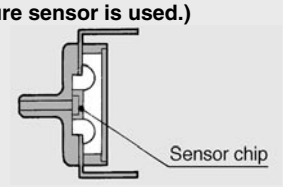
⚠ Caution

①The case is made of polycarbonate. Therefore, do not use it with or expose it to the following chemicals: paint thinner, carbon tetrachloride, chloroform, acetic ester, aniline, cyclohexane, trichloroethylene, sulfuric acid, lactic acid, water-soluble cutting oil (alkalinic), etc.
②Do not expose it to direct sunlight.

Vacuum Pressure Switch Unit/ZSE2-0X

High-speed response/10ms
Compact size: 39H X 20W X 15D
(except the connecting portion)
Improved wiring: connector style uses a carrier diffusion semiconductor pressure sensor

Pressure detector
(A carrier diffusion semiconductor pressure sensor is used.)



Vacuum Pressure Switch Specifications

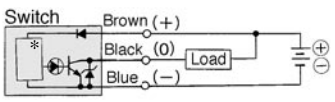
Unit no.	ZSE2-0X
Fluid	Air
Setting pressure range	0 to -101kPa
Hysteresis	3% Full span or less
Accuracy	±3% Full span (5 to 40°C) ±5% Full span (0 to 60°C)
Voltage	12 to 24V DC (Ripple ±10% or less)
Port size	M5

•Weight — 50g **•Output** — Open collector 30V/80mA **•Indicator light** — Light at ON state **•Current consumption** — 17mA or less (24V DC, at ON state)
•Operating temperature range — 0 to 60°C **•Max. operating pressure** — 0.2MPa

∗When using ejector system, instantaneous pressure up to 0.5MPa will not damage the switch.
Note) If not operated within the specified range of pressure of temperature, trouble may be result.

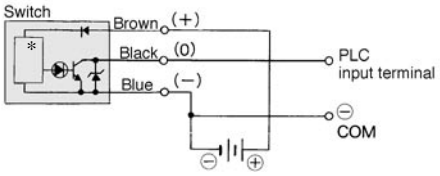
Wiring

ZSE2 connection



∗ Switch main circuit

Connection with PLC
At negative COM terminal



How to Order

ZSE2 — 0X □ — 15 □ - Q

PV/V port size
— M5
Y M6 (optional)

Electrical entry
— Grommet (0.6m)
L Grommet (3m)
C Connector (0.6m)
CL Connector (3m)
CN Without connector

•Filter case

⚠Caution

①The case is made of polycarbonate. Therefore, do not use it with or expose it to the following chemicals: paint thinner, carbon tetrachloride, chloroform, acetic ester, aniline, cyclohexane, trichloroethylene, sulfuric acid, lactic acid, watersoluble cutting oil (alkalinic), etc.
②Do not expose it to direct sunlight.

•Vacuum Pressure Setting

⚠Caution

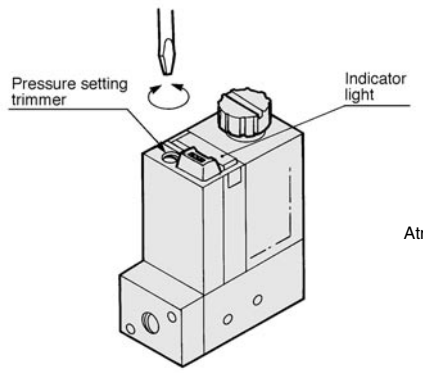
Observe the following precautions when setting the vacuum pressure.
Lightly turn the screwdriver with your fingertips. To prevent damage to the trimmer groove, do not use a screwdriver that has a large grip or a tip that does not fit in the trimmer groove.

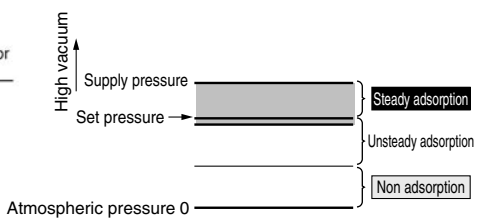
How to Set Vacuum Pressure

ZSE2

•Pressure setting trimmer selects the ON pressure. Clockwise rotation increases high vacuum set point.

•When using the switch to confirm correct adsorption, the set pressure should be as low as possible. But not so low that a false confirmation signal is given when adsorption is incomplete.



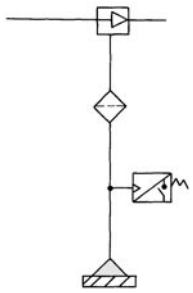


Vacuum Pressure Switch Unit/ZSE2-0X

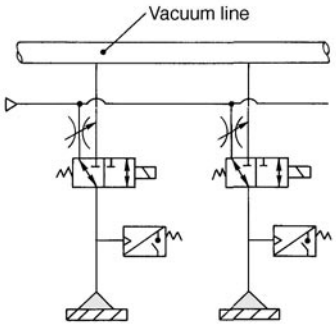
Guidelines for Use of Vacuum Pressure Switch Unit

System circuit for work adsorption

Ejector style



External vacuum supply style



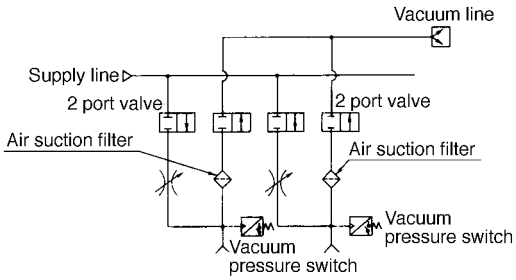
Setting pressure

To use for picking verification, set the vacuum pressure that can pick a workpiece without fail. In some situations, the switch could turn ON even if the picking is not complete.

Using a small diameter picking nozzle

A nozzle that is used for picking electronic parts or small precision parts could be even smaller than ø2. if the nozzle diameter is approximately ø1, the pressure difference between ON and OFF becomes smaller, depending on the capacity of the ejector or the vacuum pump. In such a case, it is necessary to use **the picking verification switch ZSP1**, which provides a small hysteresis and high precision. On the other hand, an ejector with a large picking capacity will not be able to detect properly, so an ejector with an appropriate capacity must be used. Furthermore, it is necessary to stabilize the pressure of the ejector and the vacuum pump.

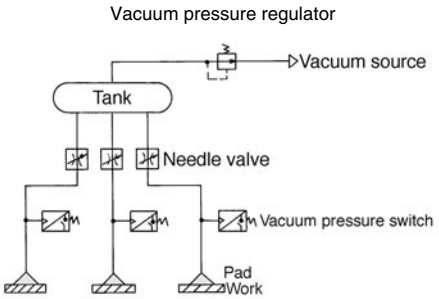
External vacuum supply system



Using multiple pressure switches with a single vacuum source

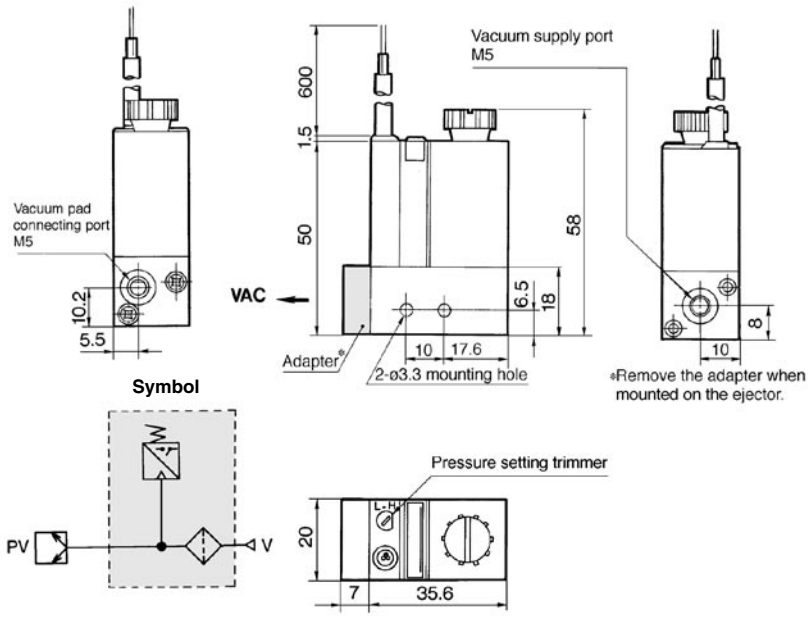
If a single vacuum source is divided so that vacuum switches can be used on individual lines, the vacuum pressure might not come within the values set with the switches because the pressure of the vacuum source fluctuates depending on the number of picks and non-picks.

Especially, because pressure fluctuation exerts a great influence when picking with a small diameter nozzle, the countermeasures described below must be provided.

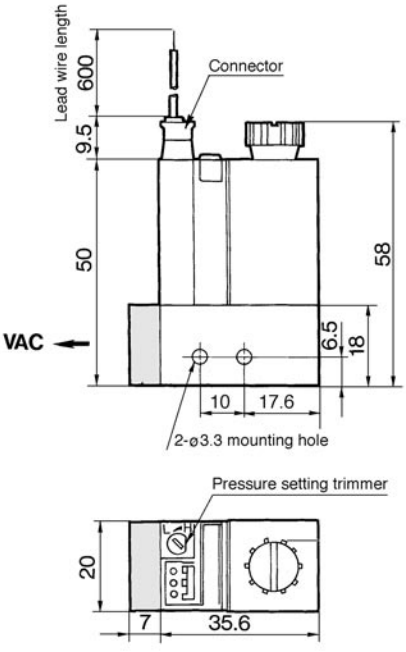


- Adjust the needle valve to reduce the pressure fluctuation between picking and non-picking.
- Stabilize the source pressure by providing a tank and a vacuum pressure reduction valve (vacuum adjustment valve).
- Provide a vacuum switching valve to individual lines. Thus, in case of an error, each valve can be turned OFF to minimize the influences on other pads.

Vacuum Pressure Switch/ZSE2-0X-15



Connector style: ZSE2-0X-15C



Vacuum Pressure Switch Unit/ZSE3-0X

Built-in failure prediction output function

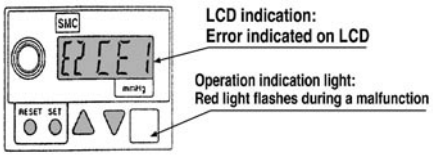
If the attainable amount of vacuum reduces due to a decrease in performance caused by clogging of the silencer of the vacuum system (ejectors), cracked pads, or the leakage of the vacuum pipes, this function quickly detects the abnormal condition and outputs a signal to halt the system.

Two independent pressure settings possible

This feature is well suited for applications that require 2 separate pressure outputs due to a change in the vacuum suction pad diameters, or for applications that require 2 pressure verifications to effect line changes in the positive pressure line.

Comprehensive self diagnosis function

- **Overcurrent detection function**
- **Overvoltage detection function**
- **Data error**



Data saving function

Even if the power is cut off, the settings are stored for 100,000 hours (approximately 11 years) in the exclusive IC (EEPROM).

•Filter Case

⚠ Caution

•The case is made of polycarbonate. Therefore, do not use it with or expose it to the following chemicals: paint thinner, carbon tetrachloride, chloroform, acetic ester, aniline, cyclohexane, trichloroethylene, sulfuric acid, lactic acid, watersoluble cutting oil (alkalinic), etc.

•Do not expose it to direct sunlight.

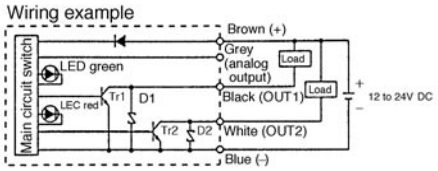
Vacuum Pressure Switch

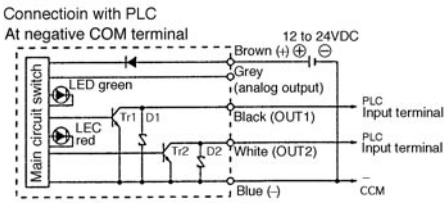
Specifications

Unit no.		ZSE3-0X
Fluid		Air, Inert gas
Setting pressure range		–101 to 0kPa
Hysteresis	Hysteresis mode	Variable (3 digit or more)
	Wind comparator mode	Fixed (3 digit)
Accuracy		±1% F.S. or less
Voltage		12 to 24V DC (Ripple±10% or less)
Port size		M5

•Weight — 50g **•Indicator light** —Light at ON state
•Current consumption — 25mA or less **•Operating temperature range** — 0 to 60°C
•Max. operating pressure —0.2MPa

Wiring





How to Order

ZSE3 — 0X — [21] [ ] - Q

Output

21	NPN open collector 2 outputs/ Without analogue output
22	NPN open collector 2 outputs/ With analogue output
23	NPN open collector 1 output/ Trouble detection/Without analogue output
24	NPN open collector 1 output/ Trouble detection/With analogue output

Electrical entry

—	Grommet (0.6m)
L	Grommet (3m)
C	Connector (0.6m)
CL	Connector (3m)
CN	Without connector

Note) analogue output is available only for grommet style.

How to Set Vacuum Pressure

Refer to p.3.0-0 on Best Pneumatics 4.

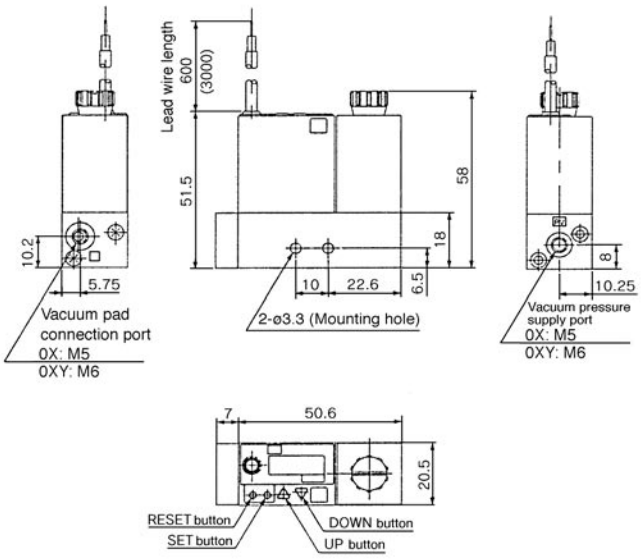
Guidelines for Use of Vacuum Pressure Switch Unit

Refer to p.3.1-14 on Best Pneumatics 3.

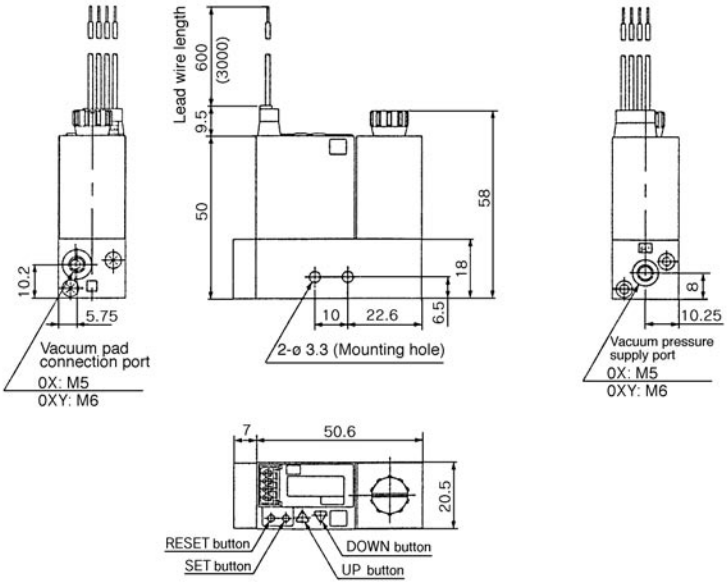
Vacuum Pressure Switch Unit/ZSE3-0X

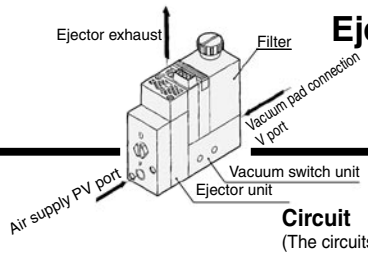
Vacuum Pressure Switch/ZSE3-0X-21, 22, 23, 24

Grommet: ZSE3-0X-□



Connector: ZSE3-0X-□C





Without Valve Unit

Configuration and Combination

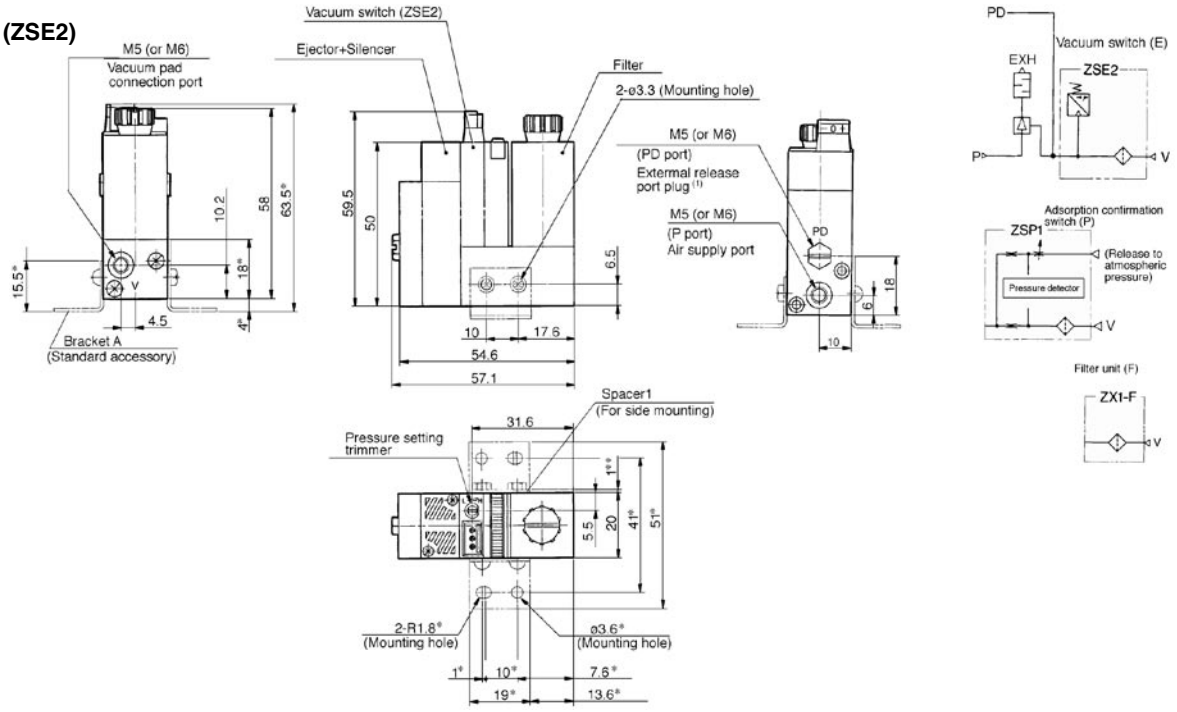
Ejector unit	+	Vacuum switch (ZSE2)
		Filter unit (F)

Model

ZX1□□□ —— **E□**
F

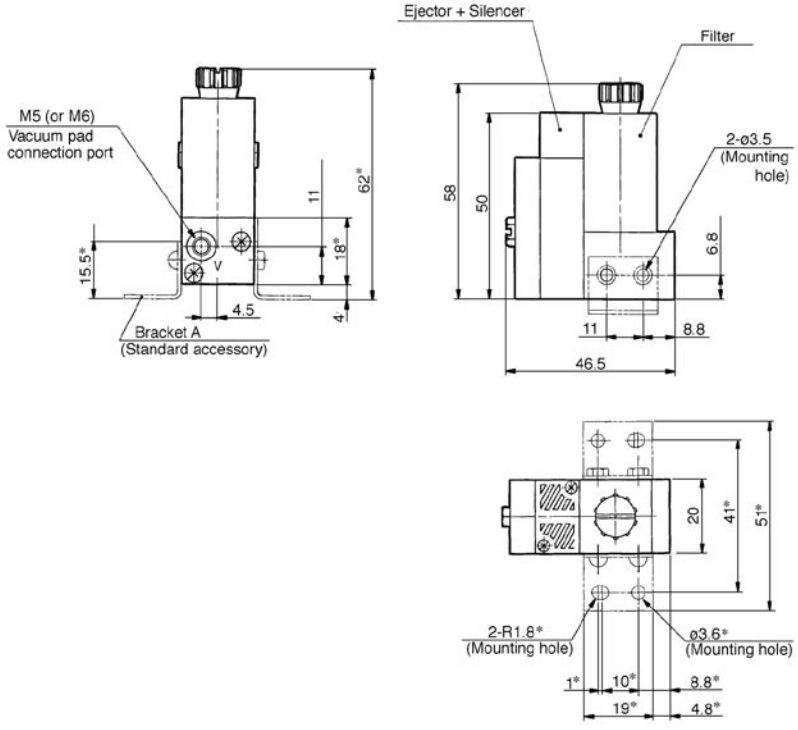
Circuit
(The circuits with other than vacuum switch are shown as below.)

Vacuum Switch (ZSE2)
ZX1□□□–E□

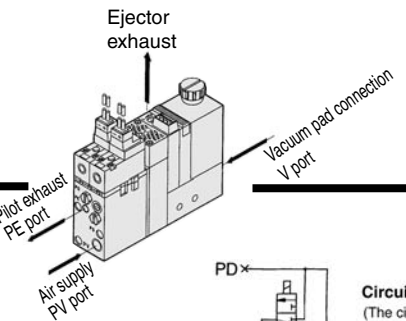


Note1) Remove the plug at external release. Note2) Dimensions ∗: For mounting brcket A ∗∗: For mounting spacer 1

Filter Unit (F)
ZX1□□□–F



Valve Unit: K1



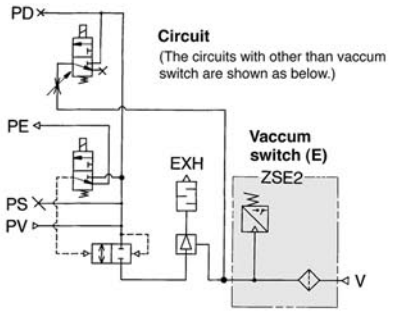
Configuration and Combination

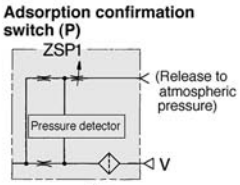
Ejector unit	+	Valve unit (K1)	+	Vacuum switch (ZSE2)
				Vacuum switch (ZSE3)
				Filter unit (F)
				Without switch and filter

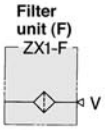
Model

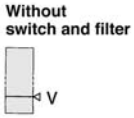
ZX1□□□ — K1□□□ —

E□
D□□
F□
None

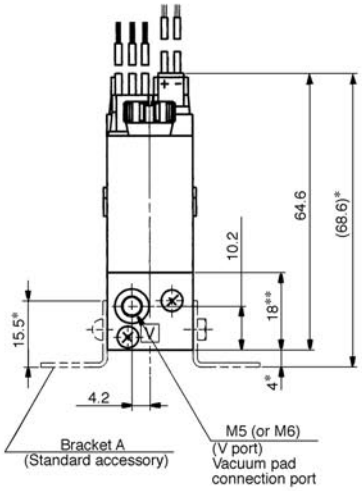


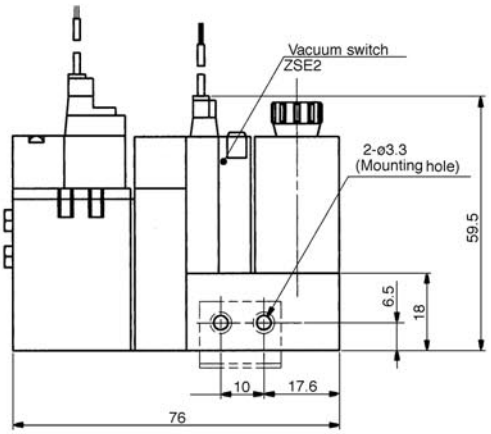


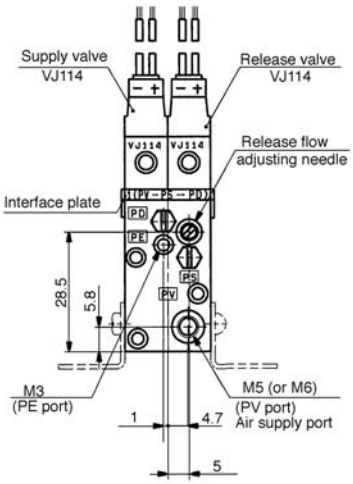


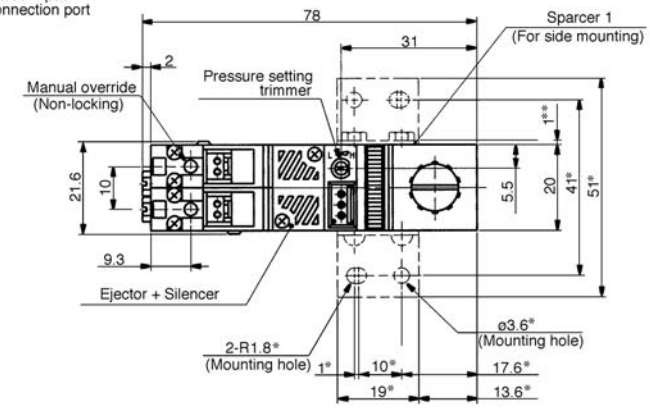


Vacuum Switch (ZSE2)
ZX1□□□–K1□□□□–E□



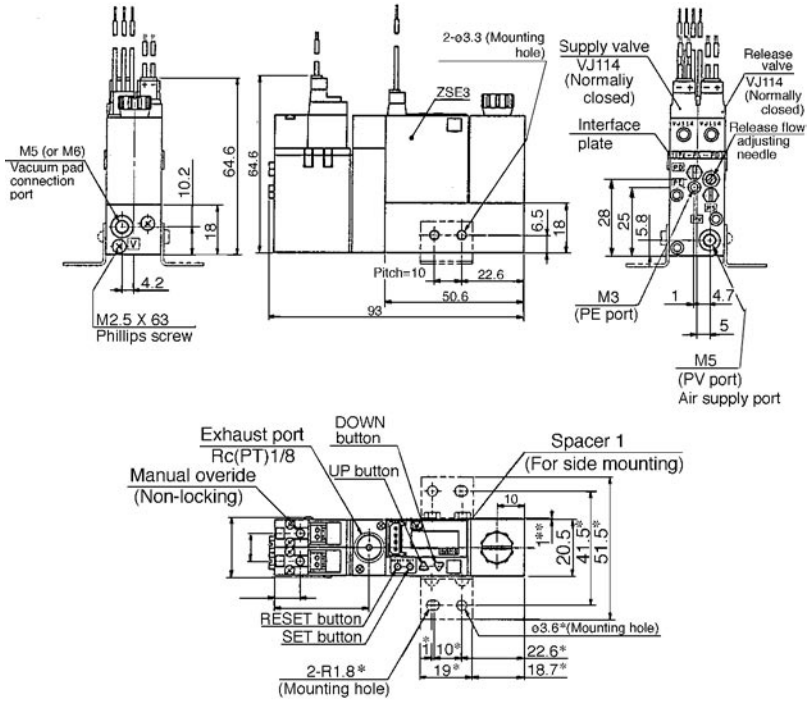




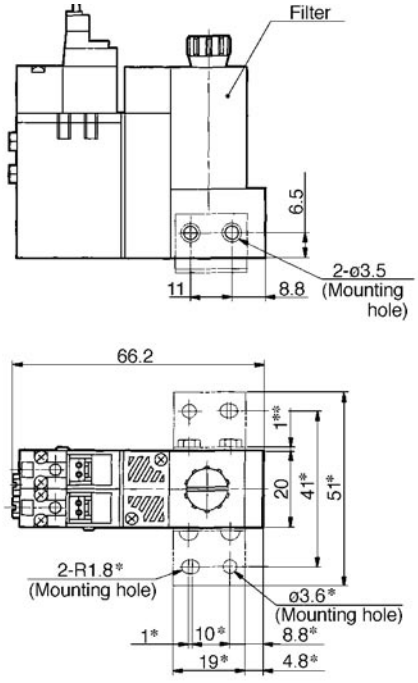


Note) Dimensions ∗: For mounting bracket A
∗∗: For mounting spacer 1

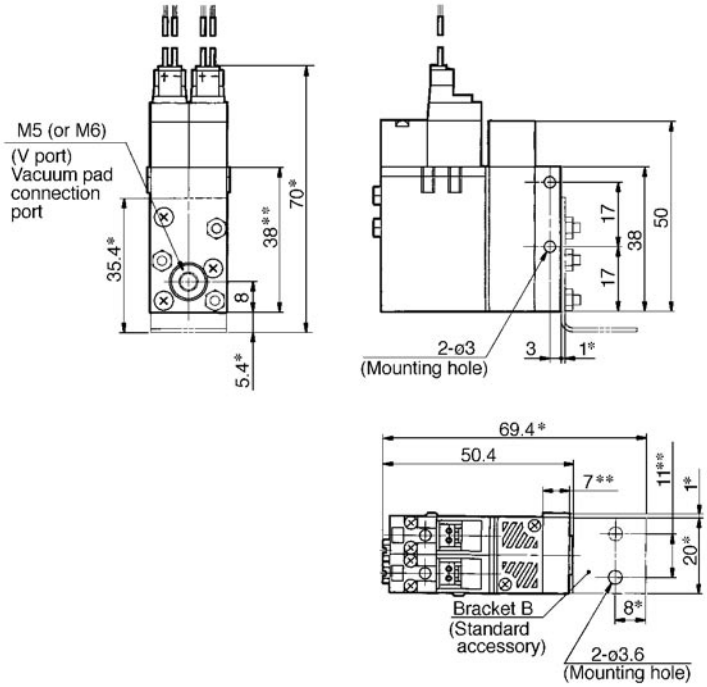
Vacuum Switch (ZSE3)
ZX1□□□–K1□□□–D□



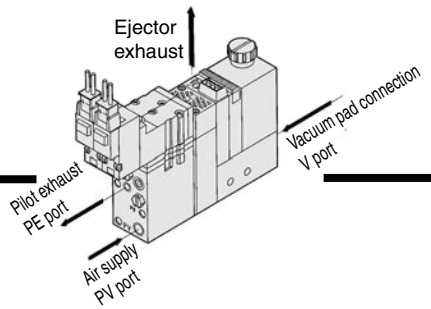
Filter Unit
ZX1□□□–K1□□□□–F



Without Switch and Filter
ZX1□□□–K1□□□□



Valve Unit: K3

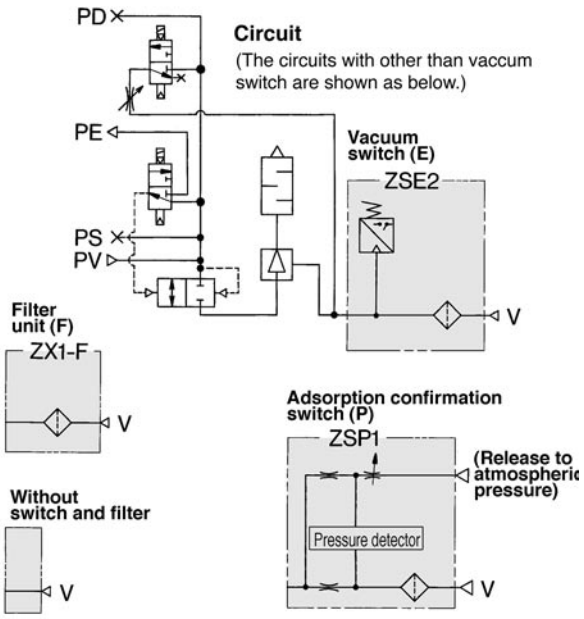


Configuration and Combination

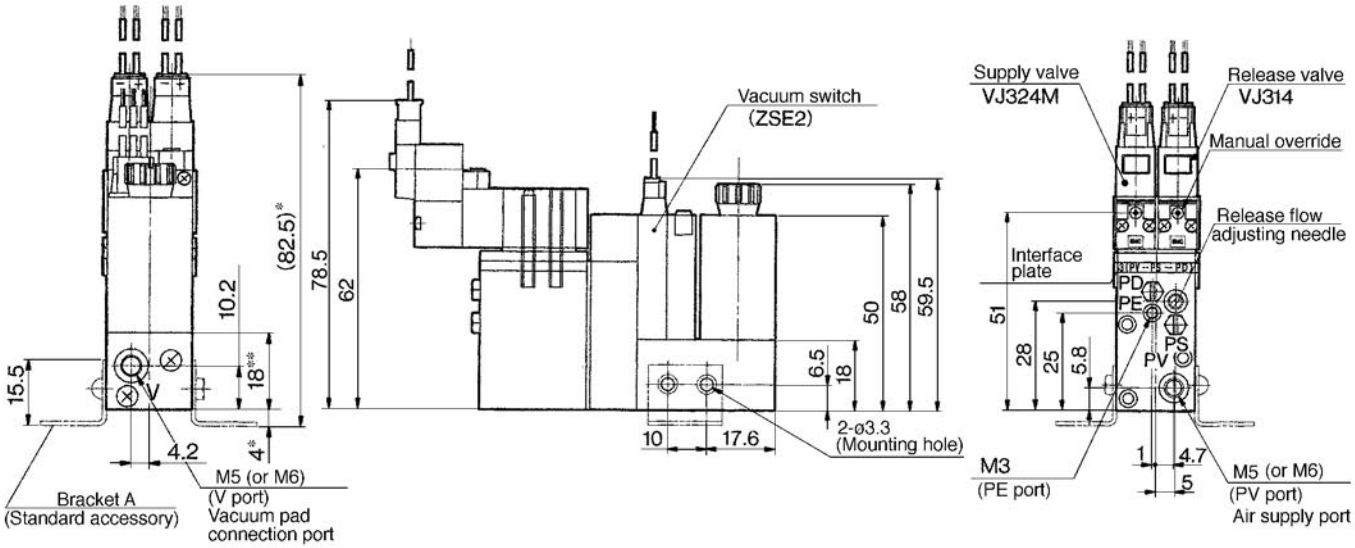
Ejector unit	+	Valve unit (K3)	+	Vacuum switch (ZSE2)
				Filter unit (F)
				Without switch and filter

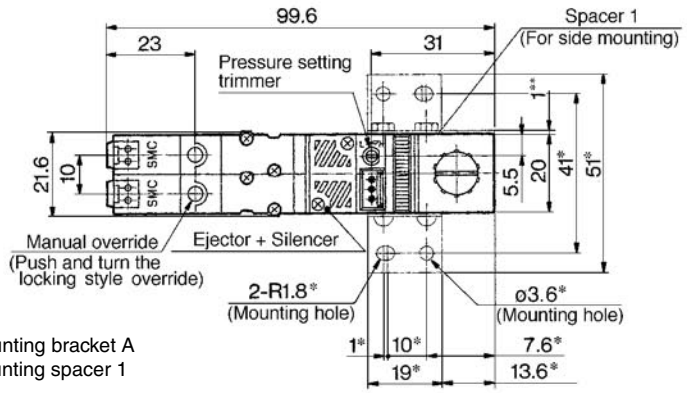
Model
ZX1□□□ —— K3□□□ ——

E□	
F	
None	



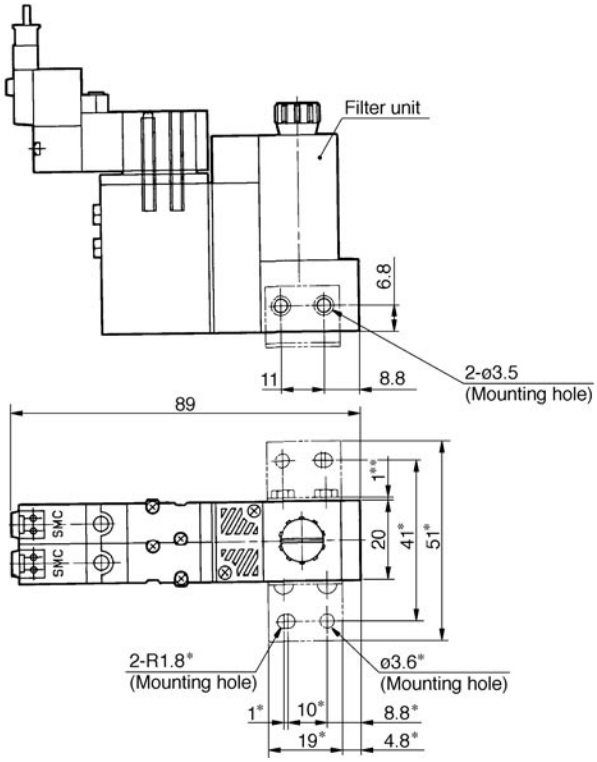
Vacuum Switch (ZSE2)
ZX1□□□–K3□□□□–E□



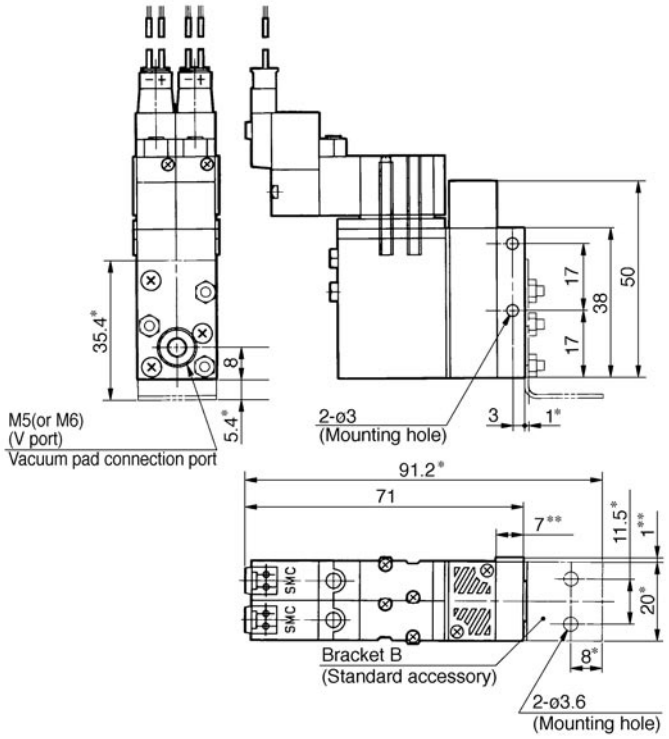


Note) Dimensions ∗: For mounting bracket A
∗∗: For mounting spacer 1

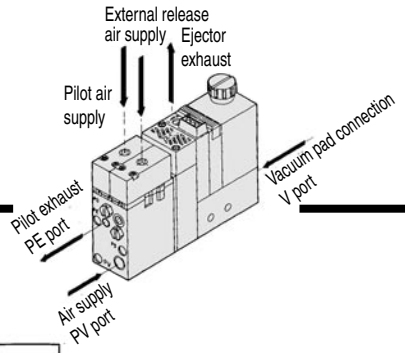
Filter Unit (F)
ZX□□□–K3□□□□–F



Without Switch and Filter
ZX1□□□–K3□□□□



Valve Unit: K6

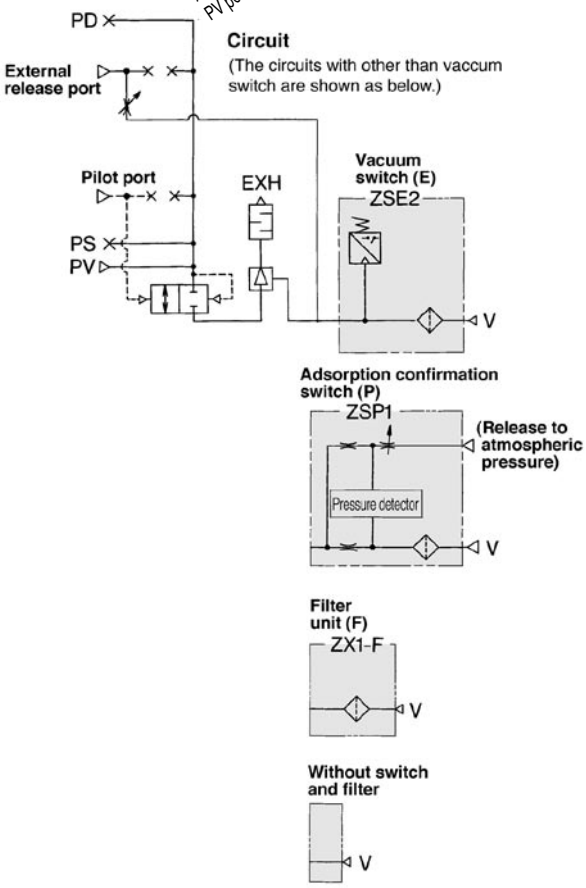


Configuration and Combination

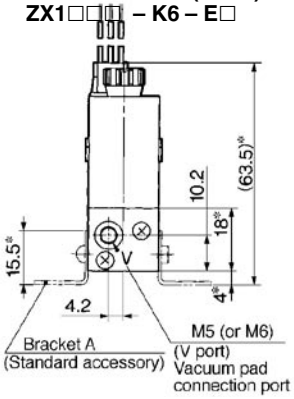
Ejector unit	+	Valve unit (K6)	+	Vacuum switch (ZSE2)
				Filter unit (F)
				Without switch and filter

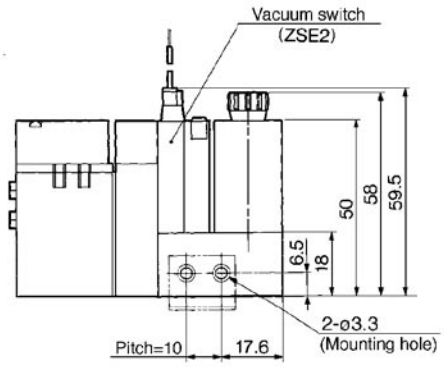
Model

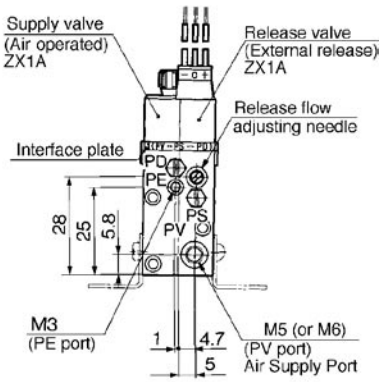
ZX1□□□ — K6 — E□
F
None

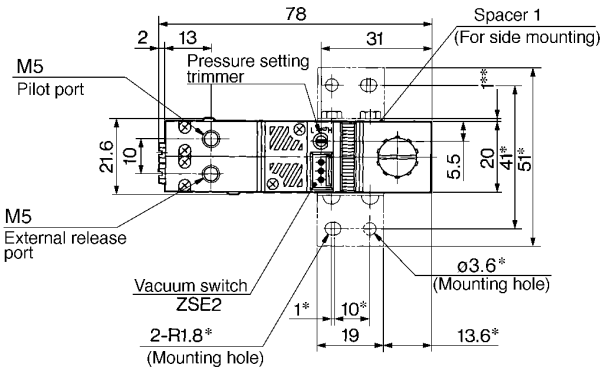


Vacuum Switch (ZSE2)
ZX1□□□ – K6 – E□



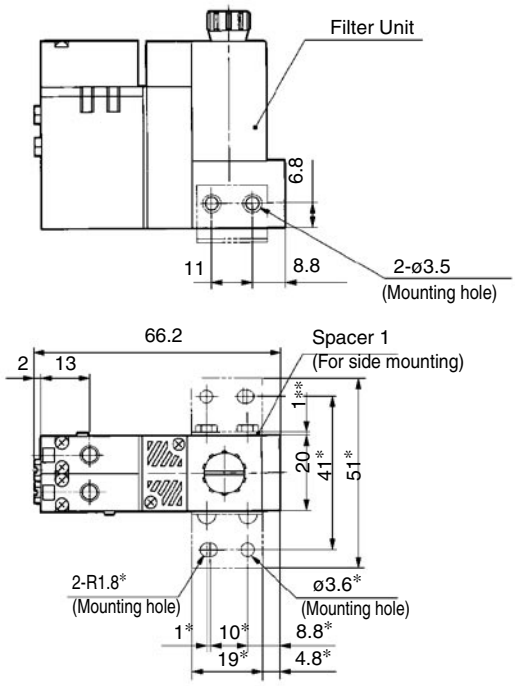




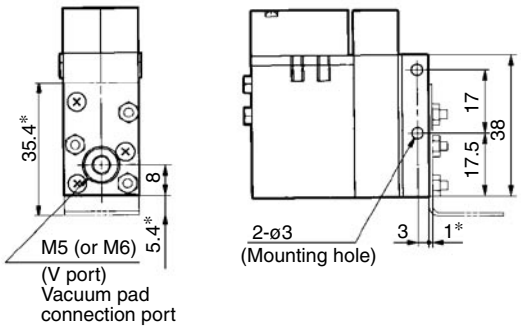


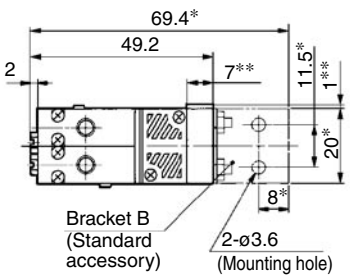
Note) Dimensions ∗: For mounting bracket B
∗∗: For mounting spacer 2.

Filter Unit (F)
ZX1□□□–K6–F

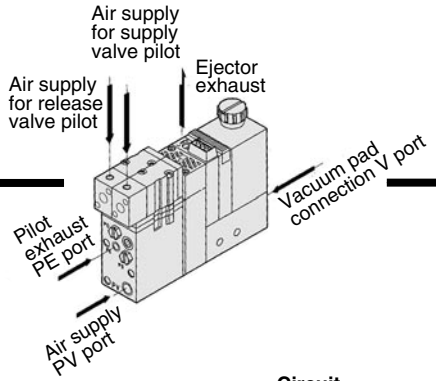


Without Switch and Filter
ZX1□□□–K6





Valve Unit: K8

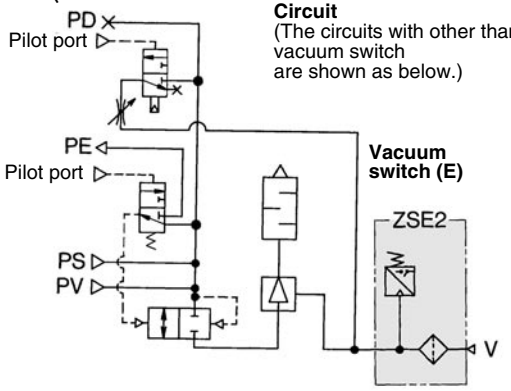


Configuration and Combination

Ejector unit	+	Valve unit (K8)	+	Vacuum switch (ZSE2)
				Filter unit (F)
				Without switch and filter

Model

ZX1□□□ —— K8 —— E□
F
None

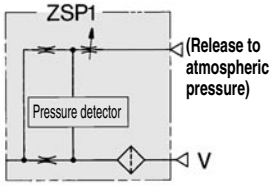


Circuit
(The circuits with other than vacuum switch are shown as below.)

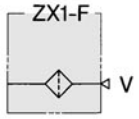
Vacuum switch (E)

Vacuum Switch (ZSE2)
ZX1□□□–K8–E□

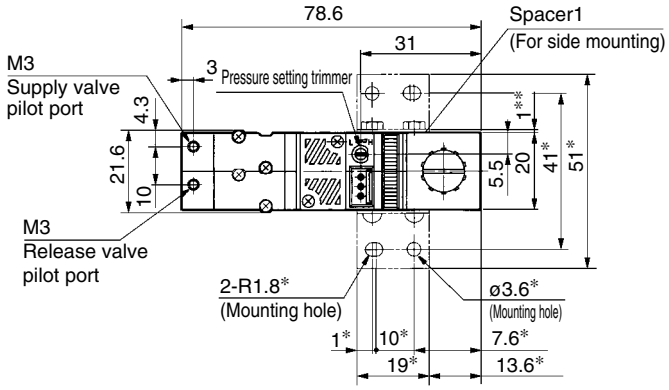
Adsorption confirmation switch (P)

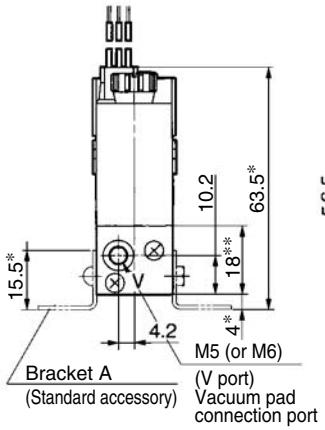


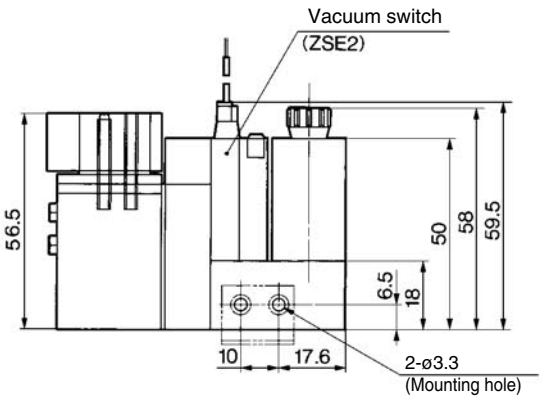
Filter unit (F)

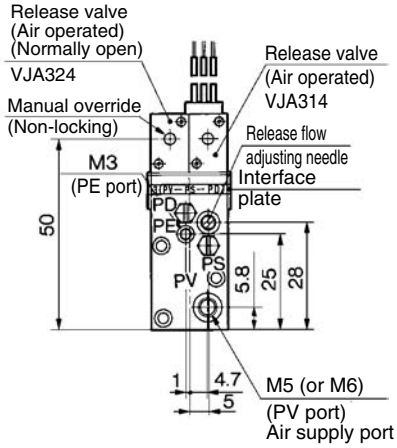


Without switch and filter



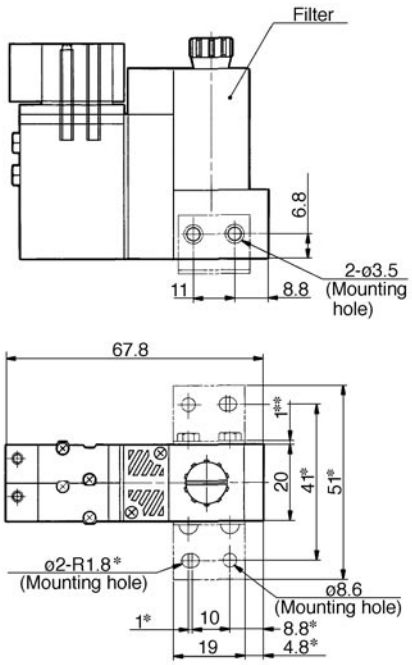




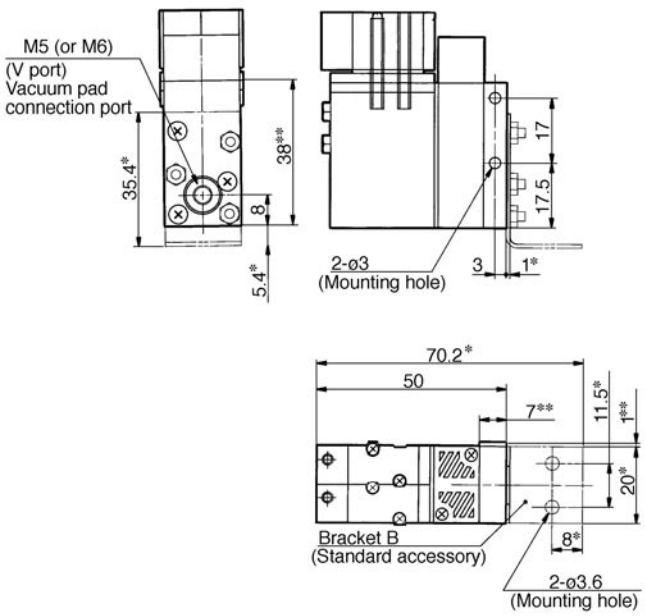


Note) Dimensios ∗: For mounting bracket A
∗∗: For mounting spacer 1.

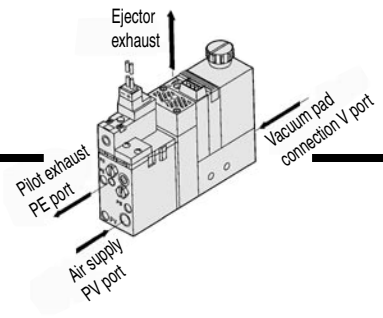
Filter Unit (F)
ZX1□□□–K8–F



Without Switch and Filter
ZX1□□□–K8



Valve Unit: J1



Configuration and Combination

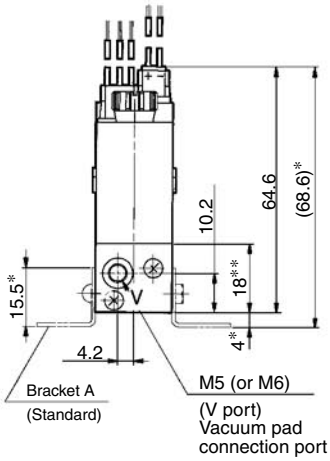
Ejector unit	+	Valve unit (J1)	+	Vacuum switch (ZSE2)
				Filter unit (F)
				Without switch and filter

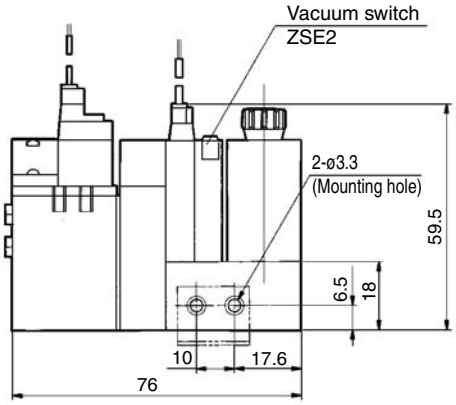
Model

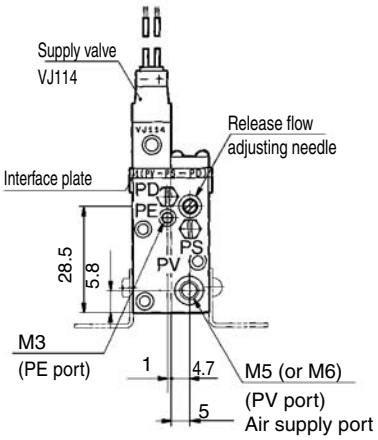
ZX1□□□ —— J1□□□ ——

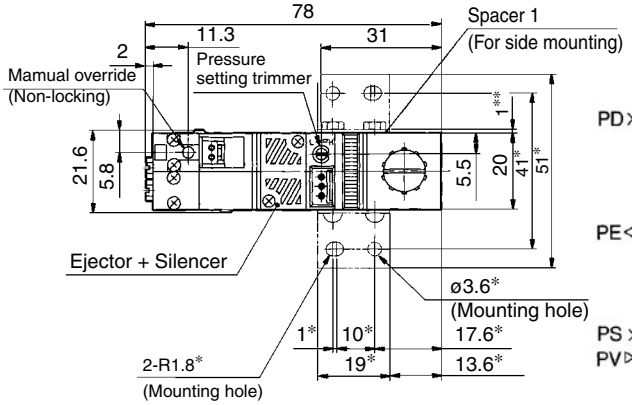
E□ Vacuum switch (ZSE2)
F Filter unit (F)
None Without switch and filter

Vacuum Switch (ZSE2)
ZX1□□□–J1□□□–E□

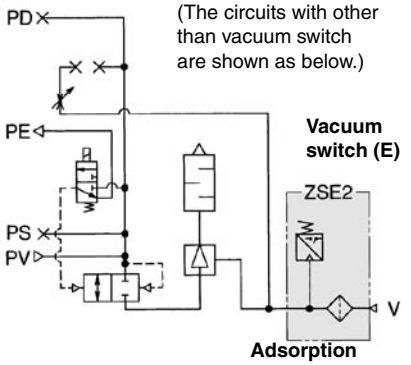




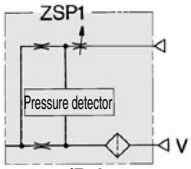




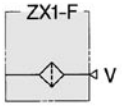
Circuit
(The circuits with other than vacuum switch are shown as below.)



Adsorption confirmation switch (P)



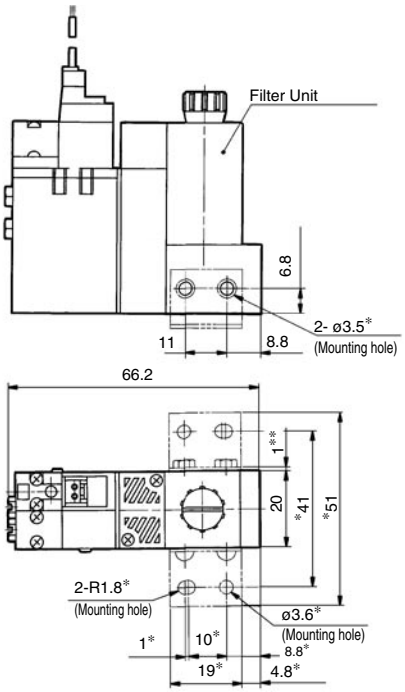
Filter unit (F) **(Release to atmospheric pressure)**



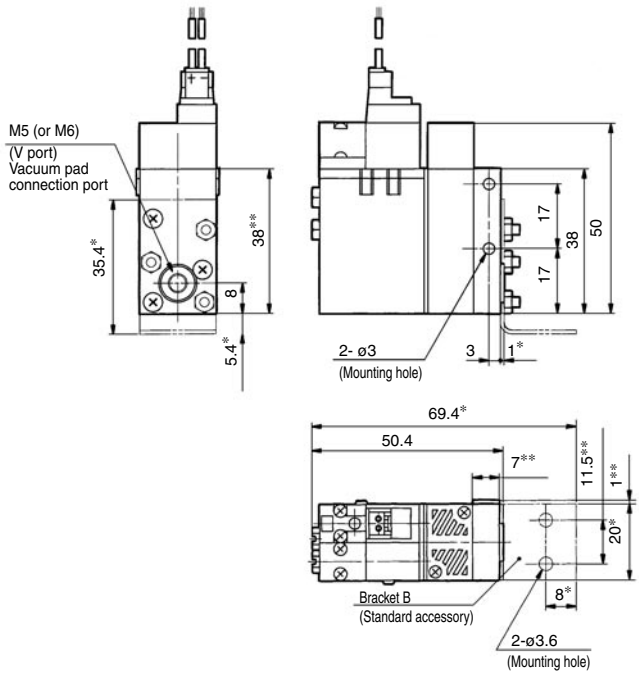
Without switch and filter

Note) Dimensios *: For mounting bracket A
**: For mounting spacer 1.

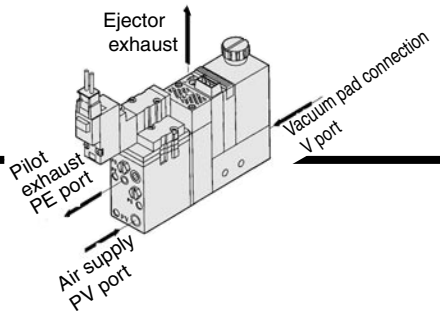
Filter Unit (F)
ZX1□□□–J1□□□□–F



Without Switch and Filter
ZX1□□□–J1□□□□



Valve Unit: J2



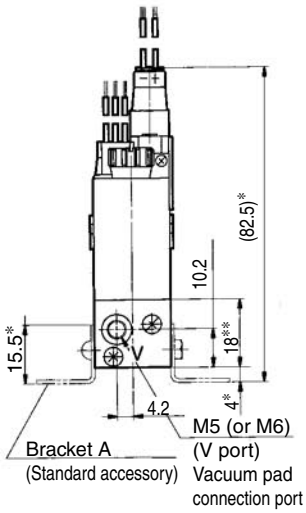
Configuration and Combination

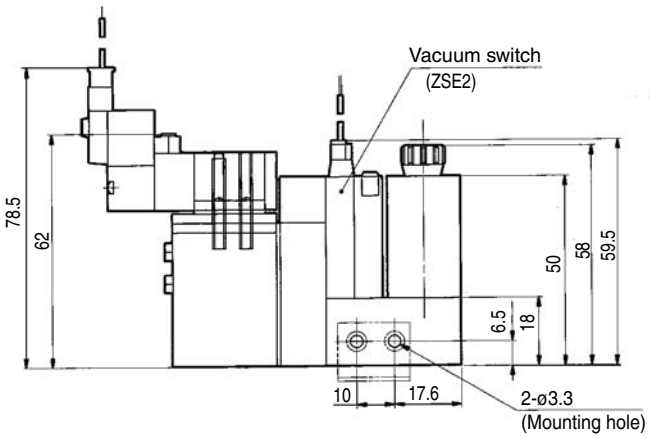
Ejector unit	+	Valve unit (J2)	+	Vacuum switch (ZSE2)
				Filter unit (F)
				Without switch and filter

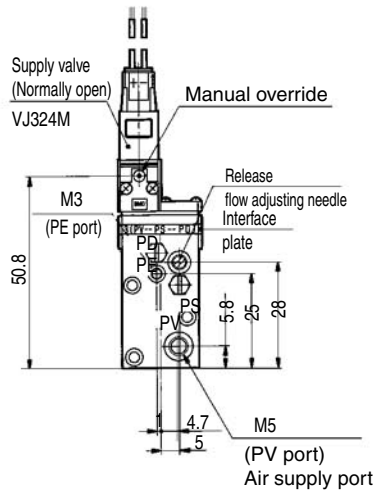
Model
ZX1□□□ —— J2□□□ ——

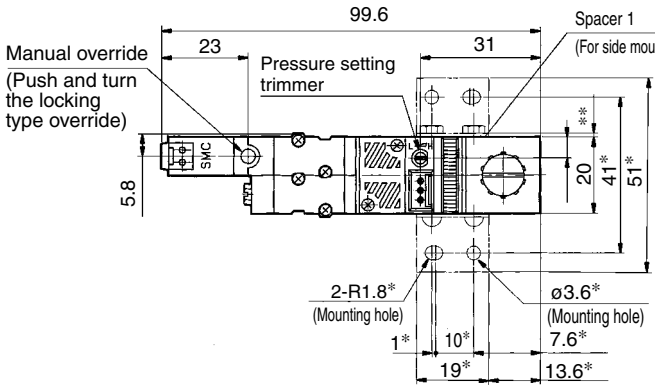
E□
F
None

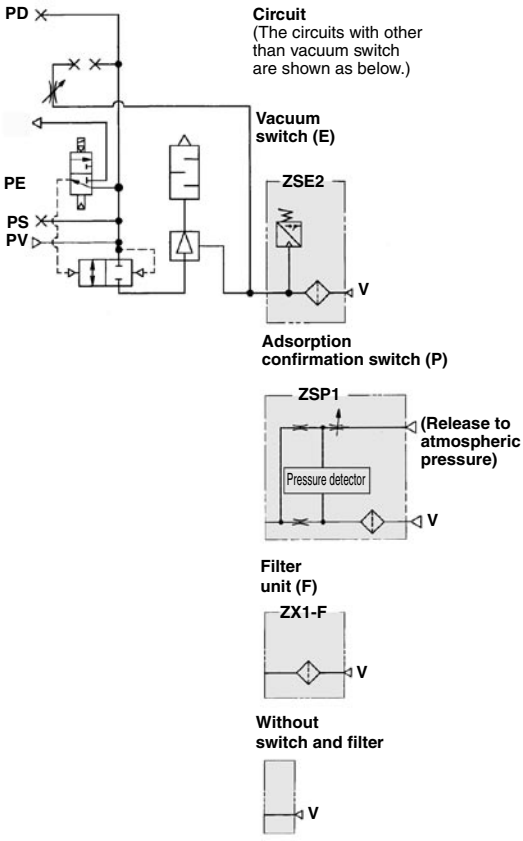
Vacuum Switch (ZSE2)
ZX1□□□–J2□□□–E□





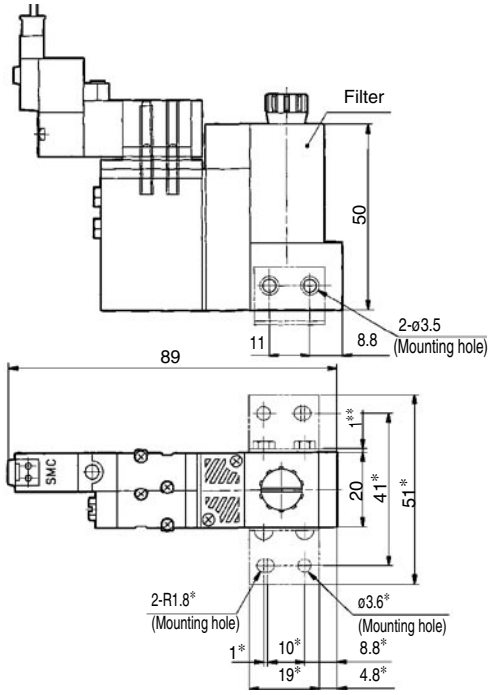




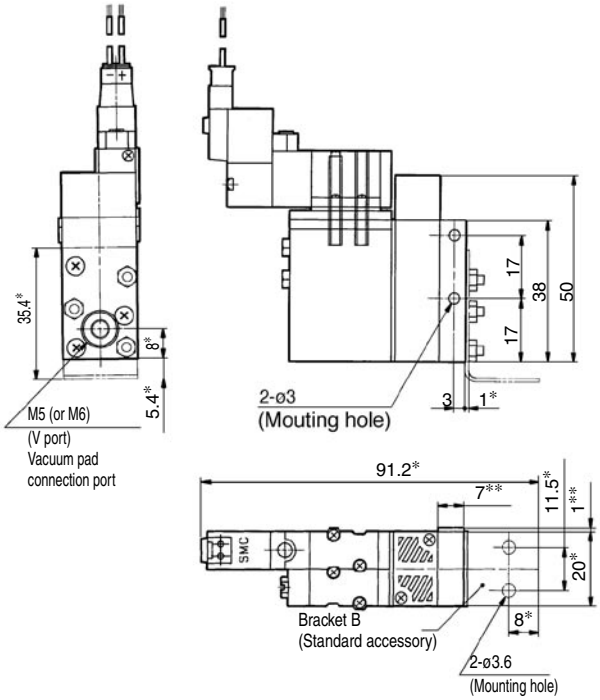


Note) Dimensions ∗: For mounting bracket A
∗∗: For mounting spacer 1

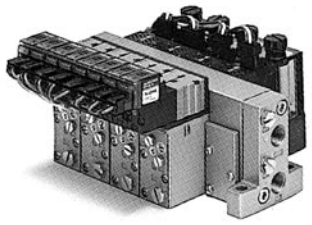
Filter Unit (F)
ZX1□□□–J2□□□□–F

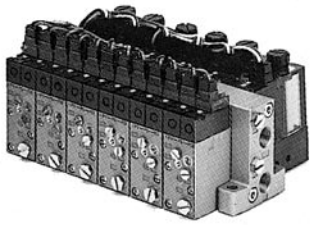


Without Switch and Filter
ZX1□□□–J2□□□□



Ejector System/Manifold





Functions

Max. number of units	Max. 8 units
Function	Supply air from PV port of manifold for common supply.

Individual spacer R1

Function	Separates air supply from manifold and makes units be used one by one.

Standard Specifications

Port	Port size	Function
PV port	1/8	Air supply
EXH port	1/8	Common exhaust
Weight	1 station: 73g (50g per additional station)	

Notes) PD port: Blank
Exhaust air from both sides for 4 or more stations of ZX1103 manifold.

Air Supply

Manifold / Port / Supply port location	Left side		Right side	
	PV	PS	PV	PS
L (Light)	○	●	●	●
R (Right)	●	●	○	●
B (Both sides)	○	●	○	●

○: Supply ●: Plugged (EXH port is released to atmospheric pressure.)
Note) Blank plugs are attached to all ports of each valve unit.

Manifold specification form

When ordering the manifold style of series ZX, use the manifold specification form on p.3.11-21

When using individual spacer R1

It functions as a single unit. Air is supplied from PV port of valve unit. PE port is released to atmospheric pressure. Other ports are plugged.
Note) When using individual spacer R1, other valves should be provided with dummy spacer R16. Functions are the same with the standard; common supply from the manifold.

How to Order Manifold

Indicate the vacuum module, blank plate and individual spacer below the manifold base part number.

⟨**Manifold base**⟩

ZZX1 [06] — [ ] [R]

Number of stations

01	1 station
02	2 stations
⋮	⋮
08	8 stations

Port thread

—	Rc(PT)
F	G(PF)
T	NPTF

Supply port location

Symbol	Port location*1	Supply
R	Right side	PV port on the right side
L	Left side	PV port on the left side
B	Both sides	PV port on both sides

*1 To the valve unit.
*2 EXH port is released to atmospheric pressure. Plugs are attached to PD ports and all ports of the valve unit.

(Ordering example)
ZXX106-R ····· 1 pc. (Manifold base)
*ZX1101-K15LZ-EC ····· 5 pcs. (Vacuum single unit)
*ZX-BM1 ····· 1 pc.(Blank plate)
First station from the valve side

⟨**Individual spacer**⟩

ZX1 — R1 — [1]

Arrangement
(First station from the right end of the valve side is station 1.)

—	All stations
1	Station 1 only
⋮	⋮
8	Station 8 only

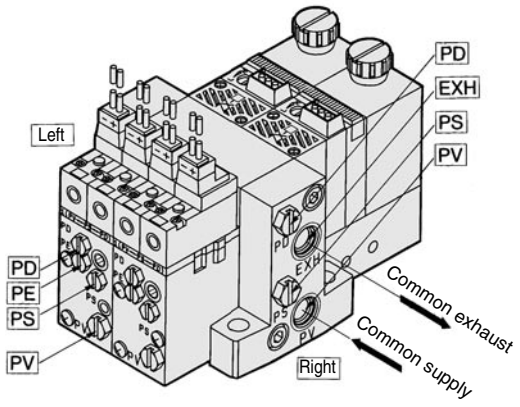
*If more than one spacer is required, specify all spacers.

(Ordering example)
If installed on station 1 and station 3:

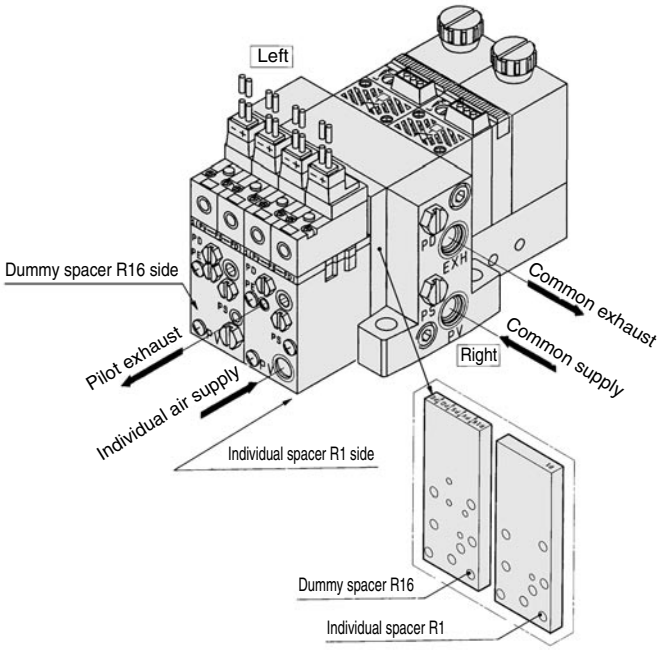
ZZX106-R ····· 1 pc.
*ZX1101- K15Z-EL ····· 6 pcs.
*ZX1-R1-1
*ZX1-R1-3
*ZX1-R16 ····· 4 pcs.

Manifold/System Circuit Example

When not using individual air pressure supply

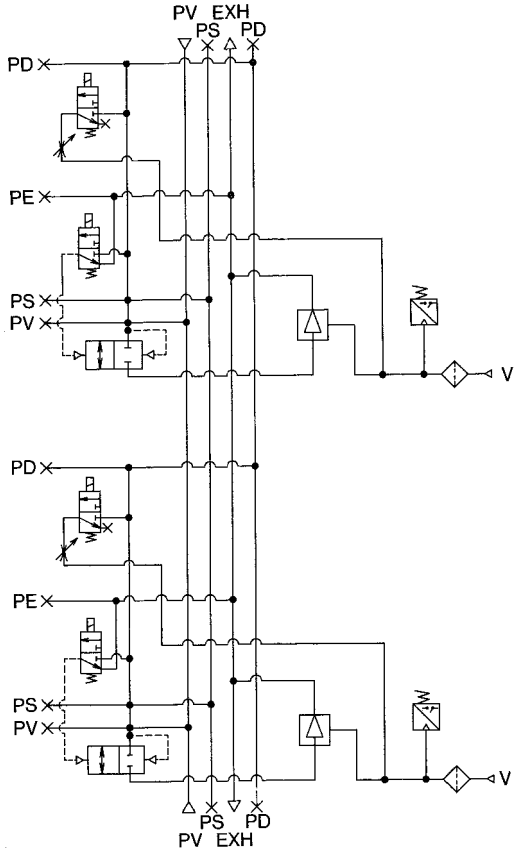


When using individual air pressure supply

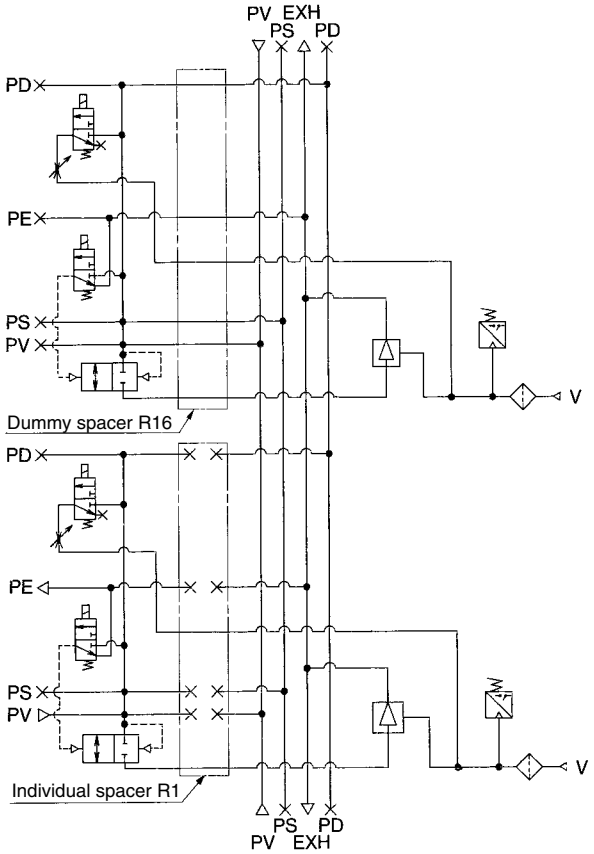


PV: Air supply port
PS: Supply valve supply pressure port
PD: Release valve supply pressure port
PE: Pilot exhaust port
EXH: Common exhaust port

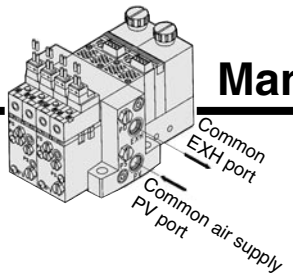
〈System Circuit Example〉

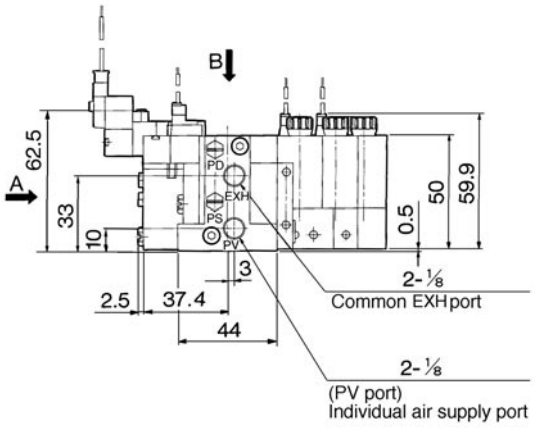


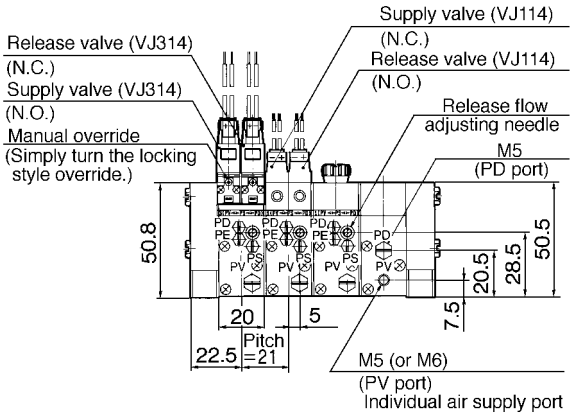
〈System Circuit Example〉

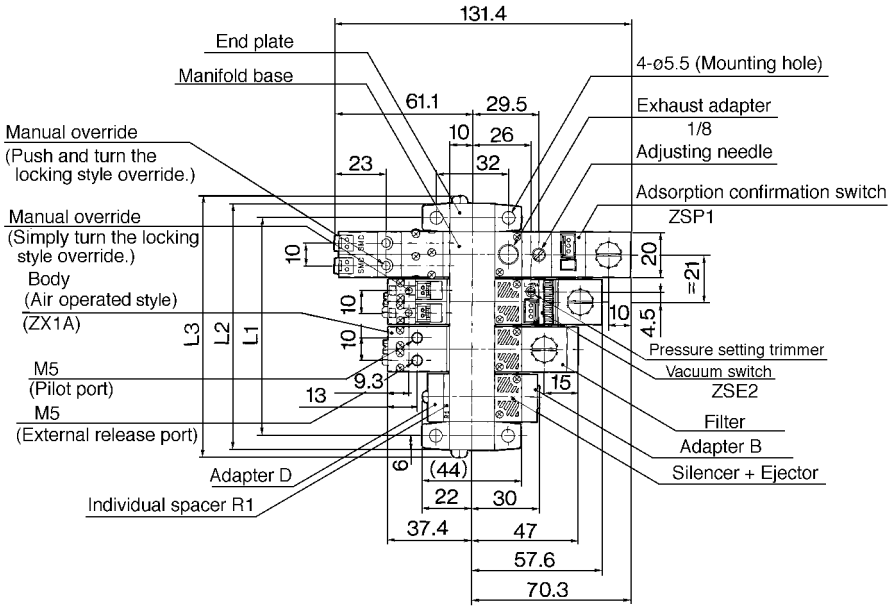


Ejector System Manifold







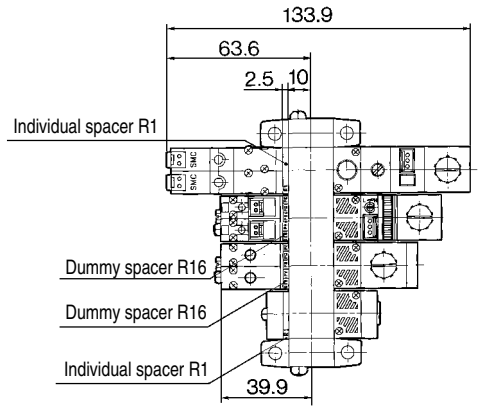


(mm)

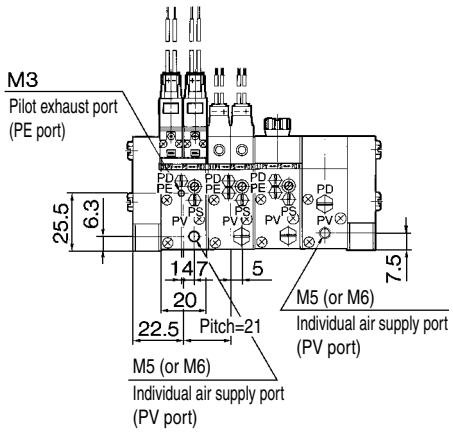
Symbol \ Stations	1	2	3	4	5	6	7	8
L1	33	54	75	96	117	138	159	180
L2	45	66	87	108	129	150	171	192
L3	50	71	92	113	134	155	176	197

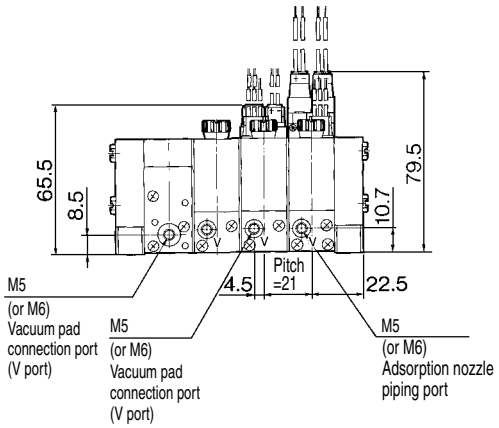
(In case of individual air pressure supply)

B cross section



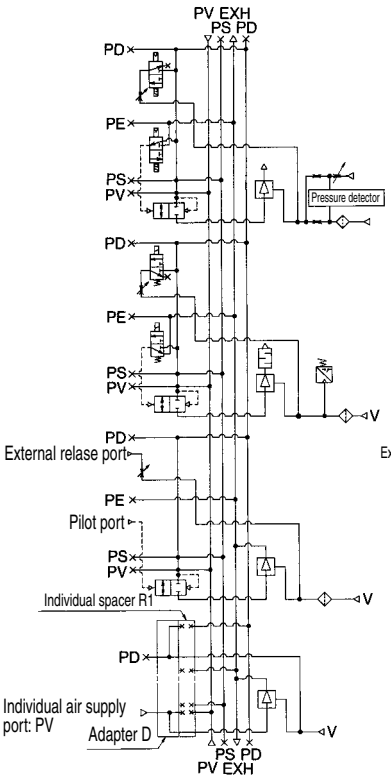
A cross section



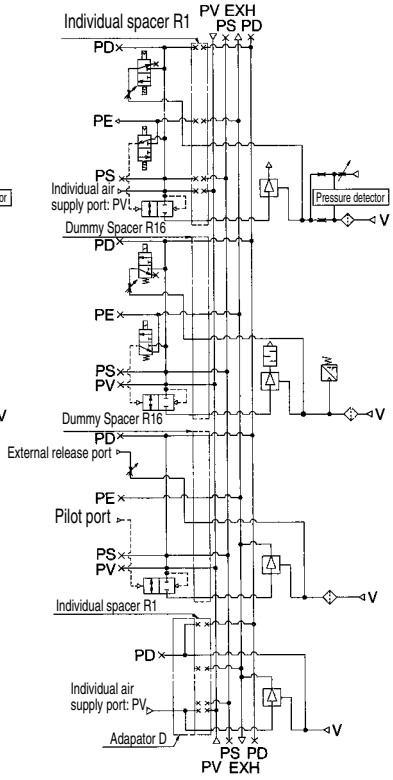


System Circuit Example

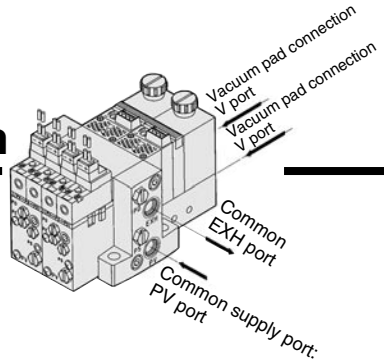
(Standard)



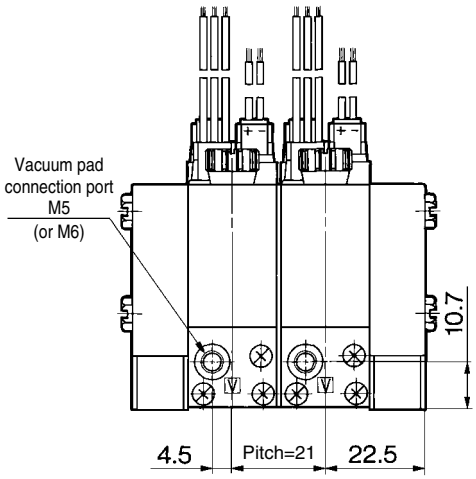
(Made to order)
(In case of individual vacuum pressure supply)

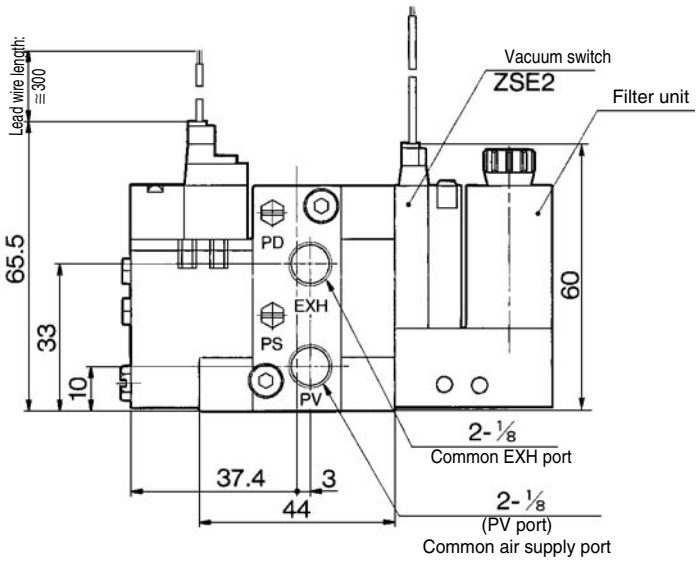


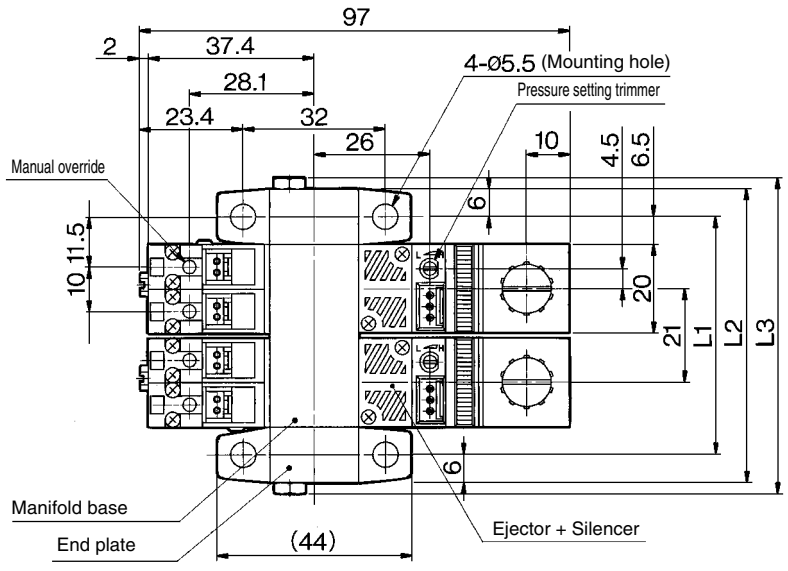
Ejector System — Manifold: K1



K1 type
ZZX1□□–□□
ZX1□□□–K1□L□–E□–□

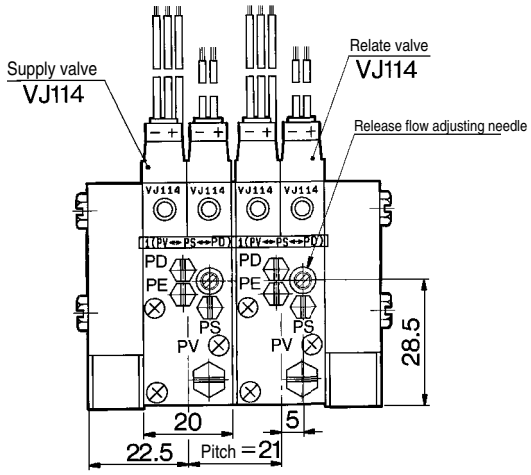




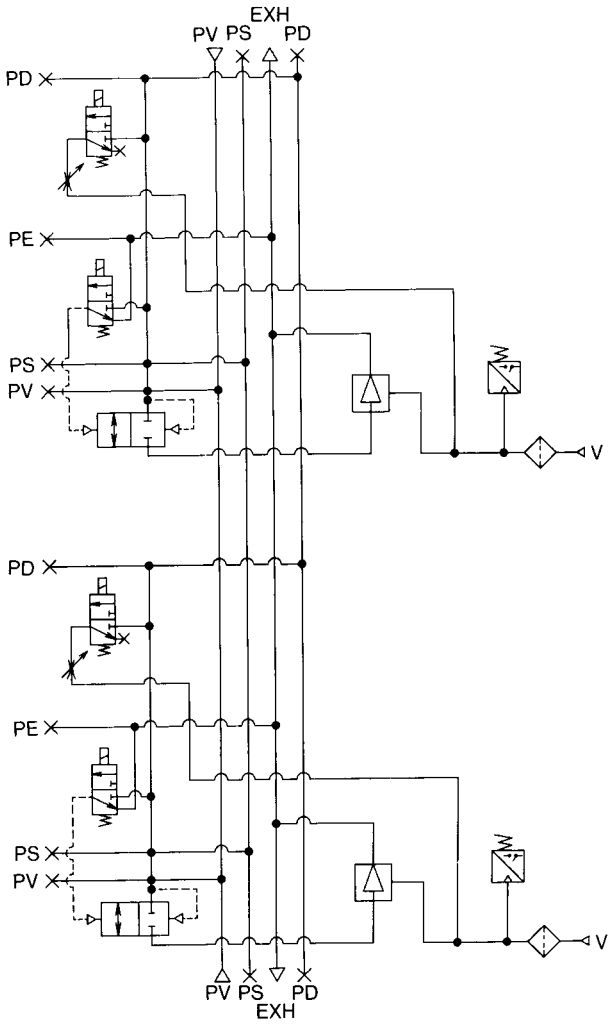


(mm)

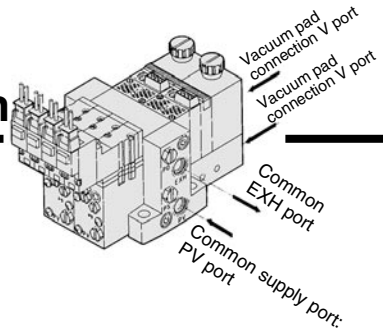
Symbol \ Stations	1	2	3	4	5	6	7	8
L_1	33	54	75	96	117	138	159	180
L_2	45	66	87	108	129	150	171	192
L_3	50	71	92	113	134	155	176	197


Supply valve
VJ114
Relate valve
VJ114
Release flow adjusting needle
VJ114
VJ114
VJ114
VJ114
1(PV→PS→PD)
1(PV→PS→PD)
PD
PE
PS
PV
PD
PE
PS
PV
28.5
20
5
22.5
Pitch =21

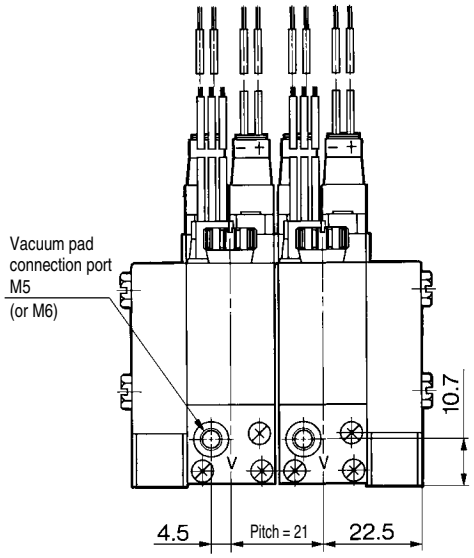
Circuit

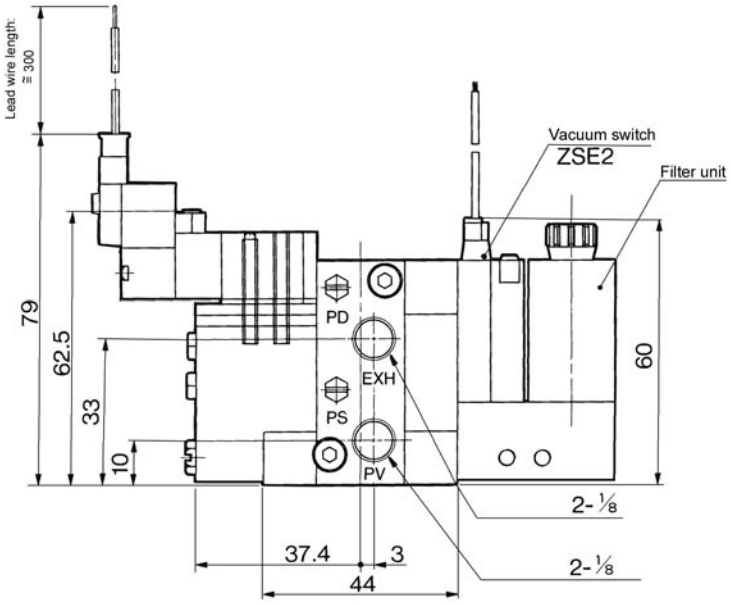

EXH
PV PS PD
PD
PE
PS
PV
V
PD
PE
PS
PV
V
PV PS PD
EXH

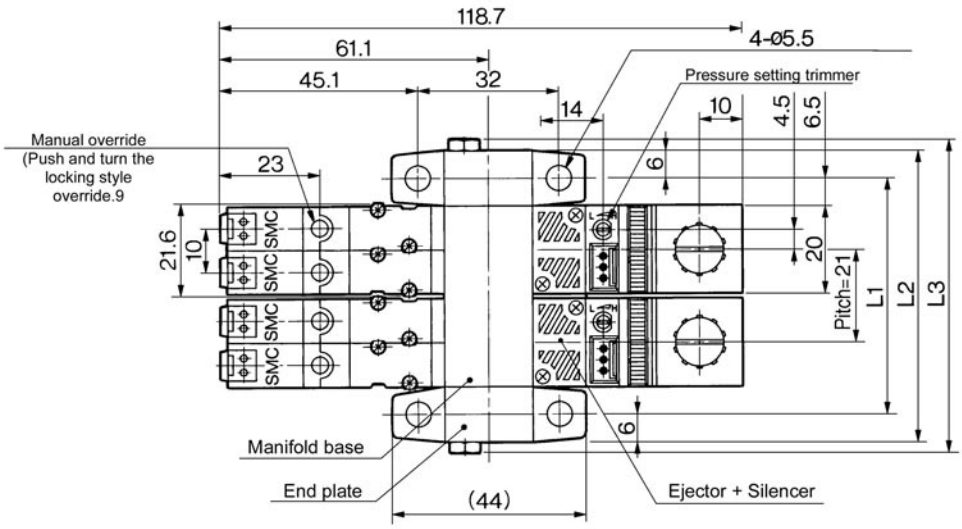
Ejector System — Manifold: K3



K3 type
ZZX1□□–□□
ZX1□□□–K3□□□–E□–□

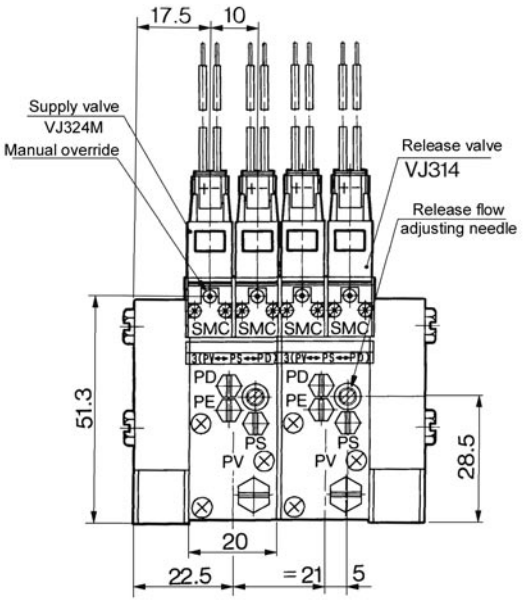




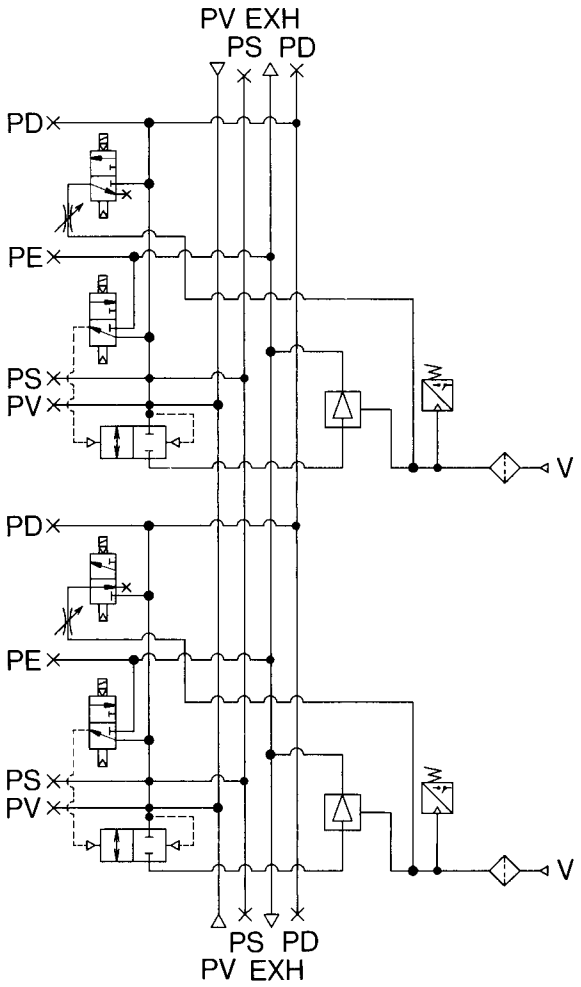


(mm)

Symbol / Stations	1	2	3	4	5	6	7	8
L_1	33	54	75	96	117	138	159	180
L_2	45	66	87	108	129	150	171	192
L_3	50	71	92	113	134	155	176	197


17.5
10
Supply valve
VJ324M
Manual override
Release valve
VJ314
Release flow
adjusting needle
SMC
SMC
SMC
SMC
PD
PE
PS
PV
PD
PE
PS
PV
51.3
28.5
20
22.5
=21
5

Circuit


PV EXH
PS PD
PD
PE
PS
PV
V
PD
PE
PS
PV
V
PS PD
PV EXH

Vacuum Module

Series ZX/External Vacuum Supply System

How to Order

Component		
Valve unit N.C. style	Vacuum switch unit	ZX100-K1□5LZ□EC□-Q
Valve unit N.O. style	Vacuum switch unit	ZX100-K3□5LZ□EC□-Q
Valve unit N.C. style	Filter unit	ZX100-K1□5LZ□F□-Q

Valve unit/Combination of supply valve and release valve
Refer to Table ① on p.3.1-39 .

Pilot valve

—	DC: 1W (With light: 1.05W)
Y*	DC: 0.45W (With light: 0.5W)

*24V DC and 12V DC are applicable to 0.45W.

Voltage

5	24V DC
6	12V DC
V	6V DC
S	5V DC
R	3V DC
—	Air operated (K6, K8, J3, J4, D3, D4)

- Refer to p.3.1-52 for ordering the manifold.
- Refer to p.3.1-62 and 3.1-63 for ordering a unit for replacement.

Electrical entry

L	Plug connector	Lead wire length: 0.3m
LN		Without lead wire
LO		Without connector
M		Lead wire length: 0.3m
MN		Without lead wire
MO		Without connector
G	Grommet	Lead wire length: 0.3m
H		Lead wire length: 0.6m
—	Air operated	

Note) In case of "K1" (combination of supply and release valves), M type plug connector can not be used.

- Refer to Table ② on p.3.1-39 for part number of lead wire with connector.

PV/V port size

—	M5
Y	M6 (Optional)

Vacuum switch electrical entry

—	Grommet	Lead wire length: 0.6m
L		Lead wire length: 3m
C	Connector	Lead wire length: 0.6m
CL		Lead wire length: 3m
CN		Without connector (without lead wire)

- Refer to Table ③ on p.3.1-39 for part number of lead wire with connector.

Vacuum switch unit/Filter unit

E	Vacuum pressure switch (General)	With suction filter
F	Suction filter only	

Vacuum digital pressure switch unit

D	mmHg	21	2 outputs/Without analog output
		22	2 outputs/With analog output
DP	kPa	23	1 output (With trouble detection)/Without analog
		24	1 output (With trouble detection)/With analog

Note) Analog output is available only for grommet style.

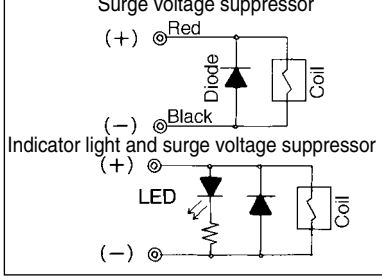
Manual override

—	Non-locking push style
B	Locking slotted style

Indicator light and surge voltage suppressor

—	None
Z	With indicator light and surge voltage suppressor
S*	With surge voltage suppressor

⚠ Caution



DC style:
Match the polarity of the connectors according to the ⊕ and ⊖ marks on the connectors. Do not interchange the polarities to prevent the diodes or the switching elements from becoming burned. If lead wires are pre-connected, the red wire is ⊕ and the black wire is ⊖.

Table 1. Valve unit/Combination of supply valve and release valve

Components		Symbol	Supply valve					Release valve				
			Solenoid		Air operated		None	Solenoid		Air operated	External release	None
Supply valve	Release valve		N.C. (VJ114)	N.O (VJ324)	N.C. (ZX1A)	N.O. (VJ324)		N.C. (VJ114)	N.C. (VJ314)	N.C. (VJA314)	ZX1A	
Solenoid (Normally closed)	Solenoid (Normally closed)	**K1**	●	–	–	–	–	●	–	–	–	–
Solenoid (Normally open)	Solenoid (Normally closed)	**K3**	–	●	–	–	–	–	●	–	–	–
Air operated (Normally closed)	External release	**K6**	–	–	●	–	–	–	–	–	●	–
Air operated (Normally open)	Air operated (Normally closed)	**K8**	–	–	–	●	–	–	–	●	–	–
—		–	Without valve unit									

Table 2. Valve unit/Lead wire with connector

Connector ass'y part No. (For DC)

VJ10 – 20 – 4A – 6

Lead wire length

—	0.3m (Standard)
6	0.6m
10	1m
15	1.5m
20	2m
25	2.5m
30	3m

How to order

If ordering vacuum module with 600m or the longer lead wire, specify both vacuum module and connector ass'y part numbers.
(Ordering example)
ZX100-K15LOZ-EC·····1 pc.
∗VJ10-20-4A-6·····2 pcs.

Table 3. Vacuum switch/Lead wire with connector

ZS – 10 – 5A – □

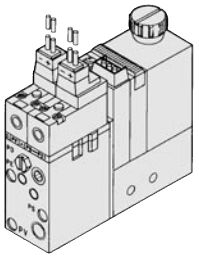
Lead wire length

—	0.6m
30	3m
50	5m

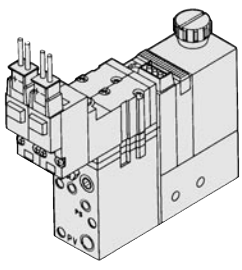
Note) If ordering switch with 5m lead wire, specify both switch and lead wire with connector part numbers.
(Ordering example)
ZX100-K150Z-ECN·····1 pc.
∗VJ10-20-4A-6····· 2 pcs.
∗ZS-10-5A-50·····1 pc.

External Vacuum Supply System/Recommended Model (The models below will have faster delivery.)

Model	Combination		Solenoid valve rated voltage	Electrical entry (lead wire)	Indicator light and surge voltage suppressor	Vacuum switch unit/Filter unit	Electrical entry (switch)
	Supply valve (Pilot valve)	Release valve (Direct operated)					
ZX100-K15LZ-F	N.C. (VJ114)	N.C. (VJ114)	24V DC	Plug connector type	With indicator light and surge voltage suppressor	Suction filter (ZX1-F)	Connector style
ZX100-K15LZ-EC	N.C. (VJ114)	N.C. (VJ114)				Vacuum switch (ZSE)	
ZX100-K35MZ-EC	N.O. (VJ324)	N.C. (VJ314)					



ZX100-K15LZ-E□



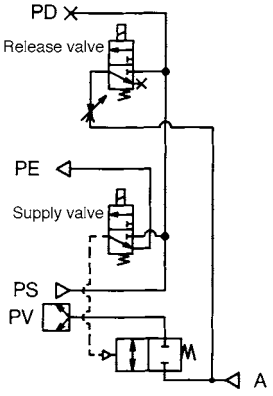
ZX100-K35MZ-E□

External Vacuum Supply System/Combination of supply valve and release valve

Combination symbol: K1

An N.C. solenoid valve is used for the supply valve. Also, an N.C. solenoid valve is used for the vacuum release valve.

Application: This combination is used for effecting control in accordance with electric signals.



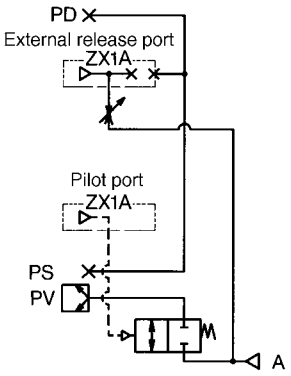
How to operate

Valve / Condition	Supply valve	Release valve
	Solenoid valve	Solenoid valve
1. Adsorption of work	ON	OFF
2. Vacuum release	OFF	ON
3. Operation stop	OFF	OFF

Combination symbol: K6

An external 3 port valve must be provided to serve as the supply valve. Also, an external 2 port valve (vacuum valve) must be provided to serve as the vacuum release valve.

Application: This combination is used for effecting control in accordance with electric signals.



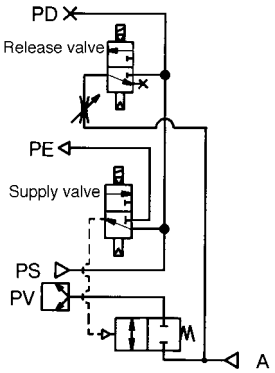
How to operate

Valve / Condition	Supply valve	Release valve
	Solenoid valve	Solenoid valve
1. Adsorption of work	ON	OFF
2. Vacuum release	OFF	ON
3. Operation stop	OFF	OFF

Combination symbol: K3

An N.O. solenoid valve is used for the supply valve. Also, an N.C. solenoid valve is used for the vacuum release valve.

Application: This combination is used for effecting control in accordance with electric signals. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This combination is used for preventing the workpieces from dropping during power outages.



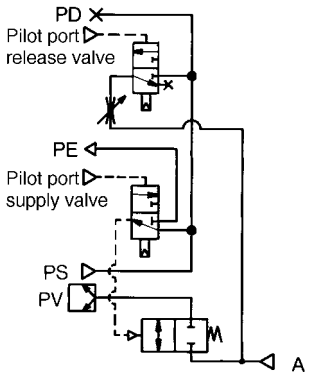
How to operate

Valve / Condition	Supply valve	Release valve
	Solenoid valve	Solenoid valve
1. Adsorption of work	OFF	OFF
2. Vacuum release	ON	ON
3. Operation stop	ON	OFF

Combination symbol: K8

An air operated N.O. valve is used as the supply valve. An air operated N.C. valve is used for the vacuum release valve.

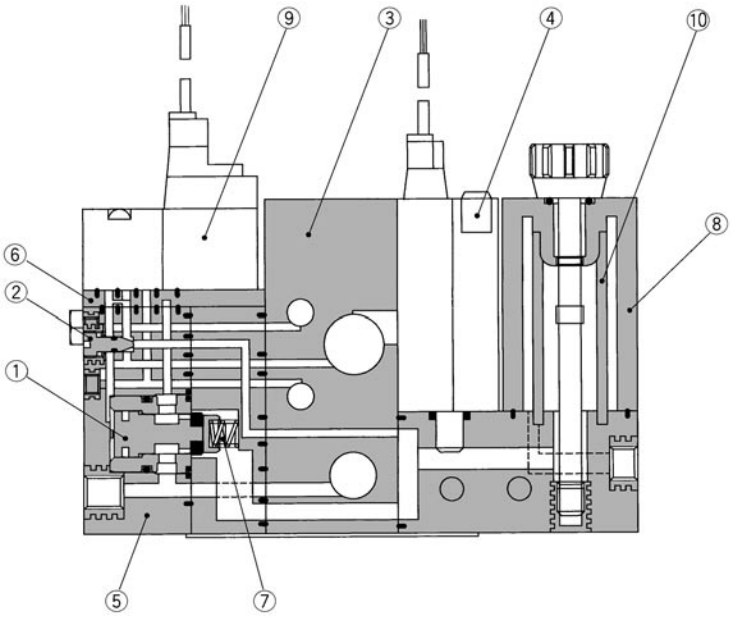
Application: This combination is used for effecting control in accordance with electric signals. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This type is used for preventing the workpieces from dropping during power outages.



How to operate

Valve / Condition	Supply valve	Release valve
	Air operated valve	Air operated valve
1. Adsorption of work	OFF	OFF
2. Vacuum release	ON	ON
3. Operation stop	ON	OFF

External Vacuum Supply System/Construction



Component Parts

No.	Description	Material	Note
①	Poppet valve assembly	—	ZX1-PV-O
②	Release flow adjusting needle	Stainless steel	
③	Manifold	Aluminum	
④	Vacuum switch	—	ZSE2, ZSP1
⑤	Valve unit	—	ZX1-VB□□□□□□-D-□
⑥	Interface plate	—	(PV)/(PS ↔ PD)
⑦	Return spring	Stainless steel	
⑧	Filter case (1)	Polycarbonate	

Replacement Parts

No.	Description	Material	Part No.
⑨	Pilot valve	—	Refer to Table 2 and 3.
⑩	Filter element	PVF	ZX1-FE

Note 1) • The case is made of polycarbonate. Therefore, do not use it with or expose it to the following chemicals: paint thinner, carbon tetrachloride, chloroform, acetic ester, aniline, cyclohexane, trichloroethylene, sulfuric acid, lactic acid, watersoluble cutting oil (alkalinic), etc.
• Do not expose it to direct sunlight.

Table1: How to order pilot valve

No.	Component		Model	Combination
	Supply valve	Release valve		
1	Solenoid valve N.C. (VJ114)	Solenoid valve N.C. (VJ114)	**ZX1-VJ114-□□□□**	K1, J1
2	Solenoid valve N.O. (VJ324)	Solenoid valve N.C. (VJ314)	**ZX1-VJ3$^{1}_{2}$4□-□□□□**	K3, J2
3	Air operated N.O. (VJA324)	Air operated N.C. (VJA314)	**ZX1-VJA3$^{1}_{2}$4**	K6
4	Solenoid valve	Air operated	No. 2 and 3 models only are applicable. Indicate the each part number.	
	Air operated	Solenoid valve		

Table 2: How to order solenoid valve

ZX1-VJ114 — □ – 5 L Z □ -Q

ZX1-VJ3 2 4 □ □ – 5 L Z □ -Q

Type of actuation

1	N.C. (Normally closed)
2	N.O. (Normally open)

Body option

—	Individual exhaust for pilot valve
M	Common exhaust for main and pilot valves

Note) In case of N.C. style, indicate no symbol. (Individual exhaust for Pilot valve)

Pilot valve

—	DC: 1W (With light: 1.05W)
Y*	DC: 0.45W (With light: 0.5W)

Voltage

5	24V DC
6	12V DC
V	6V DC
S	5V DC
R	3V DC

Electrical entry

L	Connector (0.3m)
LN	Connector (w/o lead wire)
LO	Without connector
M	Connector (0.3m)
MN	Connector (w/o lead wire)
MO	Without connector
G	Grommet (0.3m)
H	Grommet (0.6m)

Note) In case of "ZX1-VJ114", M, MN and MO cannot be used.

Manual override

—	Non-locking push style
B	Locking slotted style

Indicator light and surge voltage suppressor

—	None
S	With surge voltage suppressor
Z	W/ indicator light/surge suppressor

*24V DC and 12V DC are applicable to 0.45W.
Note) Screw length of VJ100 and VJ300 for series ZX is different from that of the standard model.

<Screw length> VJ100-M1.7 X 15
VJ300-M1.7 X 22

Table 3: How to order air operated valve

ZX1A–M3

Port size

M3	M3	Pilot port/External release port
M5	M5	

⚠Caution

Turning the vacuum release flow volume adjustment needle clockwise reduces the vacuum release flow volume; the needle valve is fully closed when the needle stops turning. Turning the needle 2 full turns counterclockwise from the fully closed position renders the needle valve fully open. The needle will fall out if it is turned more than 4 full turns.

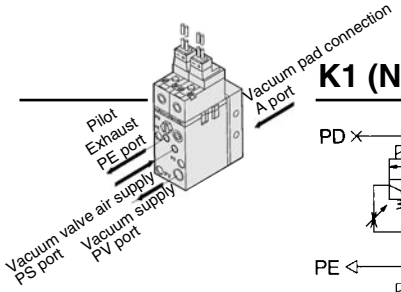
Valve Unit/ZX1-VB

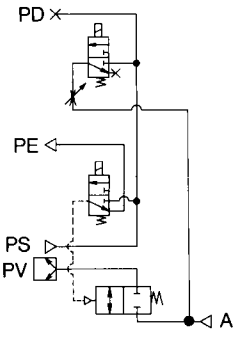
Refer to p.3.1-10 for details.

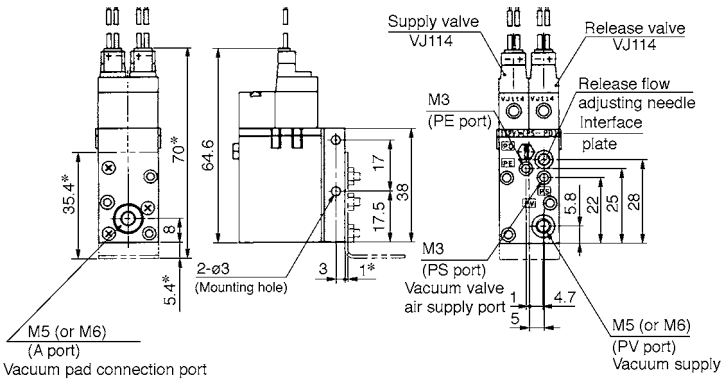
Specifications

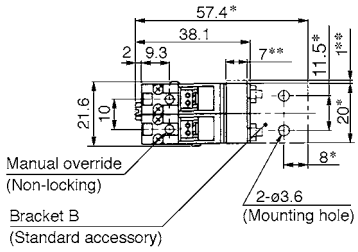
Unit No.	ZX1-VB□□□□□							
Components	Vacuum supply valve				Vacuum release valve			
Operation	Pilot operated				Direct operated			
	Solenoid vlave		Air operated		Solenoid valve		External release (ZX1A)	Air operated (VJA314)
	N.C. (VJ114)	N.O. (VJ234)	N.C. (ZX1A)	N.O. (VJA234)	N.C (VJ114)	N.C. (VJ314)		
Effective area mm² Flow Q (Nℓ/min)	3 (163.3) Main valve				0.07 (3.8)	0.45 (24.5)	—	
Operating pressure range	0.3 to 0.6MPa							
Max. operating frequency	5Hz							
Operating temperature range	5 to 50° C							
Interface plate symbol	(PV)/(PS↔PD)							
Standard accessory	Bracket B/Spacer 2							

K1 (Normally closed)

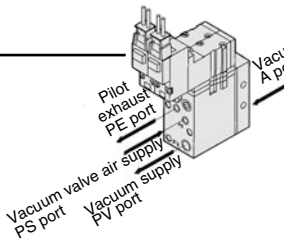


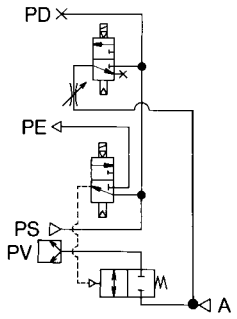


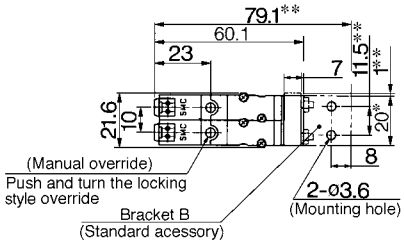


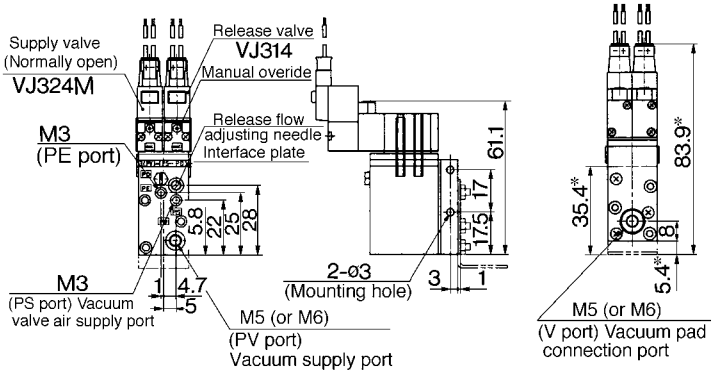


K3 (Normally open)









Note) Dimensions ∗: For mounting bracket B
∗∗: For mounting interface

Suction Filter Unit/ZX1-F

Refer to p.3.1-12 for details.

Specifications

Unit no.	ZX1-F
Operating pressure range	Vacuum to 0.5MPa
Operating temperature range	5 to 50°C
Filtration efficiency	30μm
Element	PVF
Weight	35g

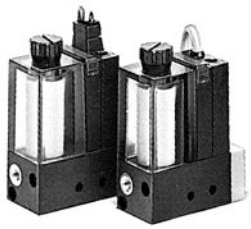
Note) If not operated within the specified range of pressure and temperature, trouble may result.

Vacuum Pressure Switch Unit/ZSE2, ZSE3

Refer to p.3.1-13 to 3.1-16 for details.

Vacuum Pressure Switch

High speed response/10ms
Uses a carrier diffusion semiconductor pressure sensor



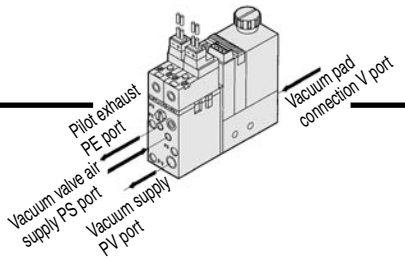
Vacuum Pressure Switch Specifications

Refer to p.3.0-0 on Best Pneumatics 4 for details.

Unit no.	ZSE2-0X	ZSE3-0X
Fluid	Air	
Setting pressure range	0 to –101kPa	
Hysteresis	3% Full span or less	
Accuracy	±3% Full span (5 to 40°C) ±5% Full span (0 to 60°C)	±1% Full span
Voltage	12 to 24VDC (Ripple ± 10% or less)	
Port size	M5	

Note) If not operated within the specified range of pressure and temperature, trouble may be caused.

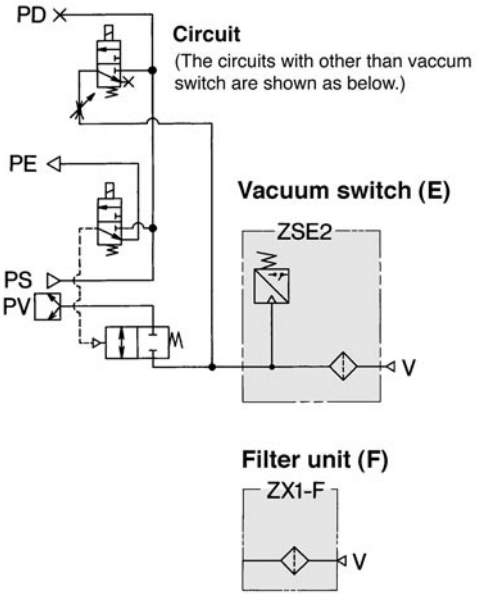
Valve Unit: K1



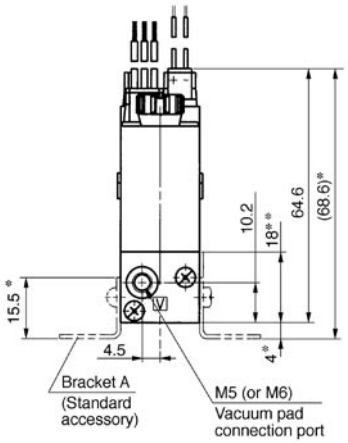
Configuration and Combination

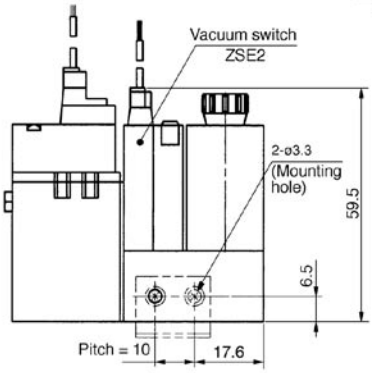
Valve unit (K1)	+	Vacuum switch (ZSE2)
		Vacuum switch (ZSE3)
		Filter unit (F)

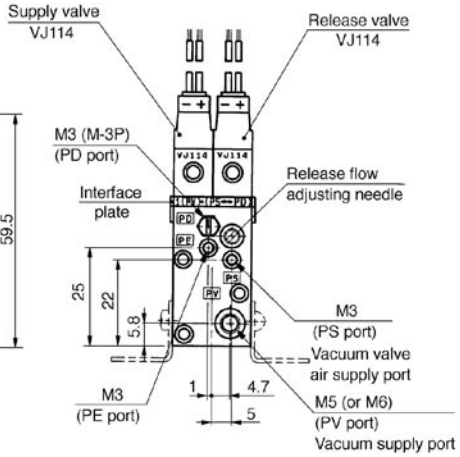
Model
ZX100 —— K1□□□□ —— **E□** **D□□** **F**

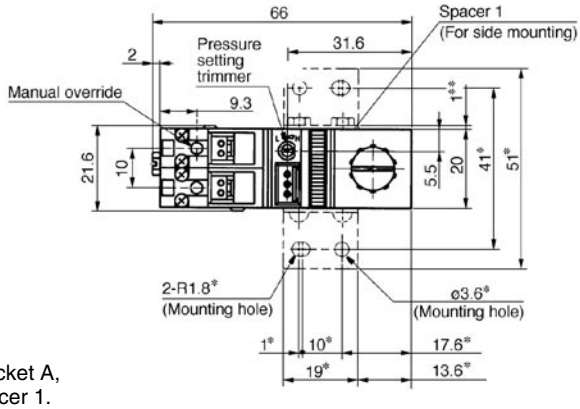


Vacuum Switch (ZSE2)
ZX100–K1□□□–E□



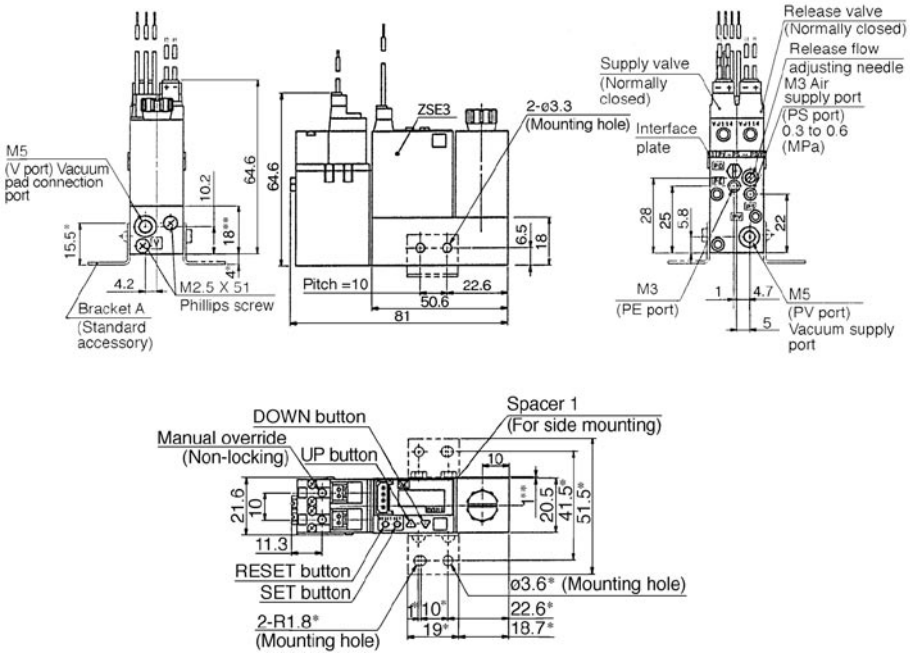




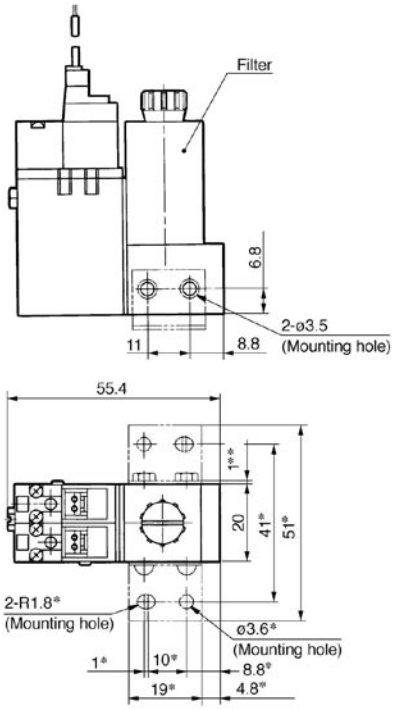


Note) Dimensions ∗: For mounting bracket A,
∗∗: For mounting spacer 1.

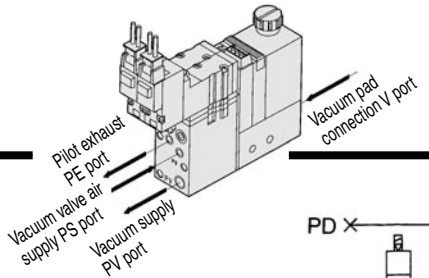
Vacuum Switch (ZSE3)
ZX100–K1□□□□–D□□



Filter Unit (F)
ZX100–K1□□□□–F



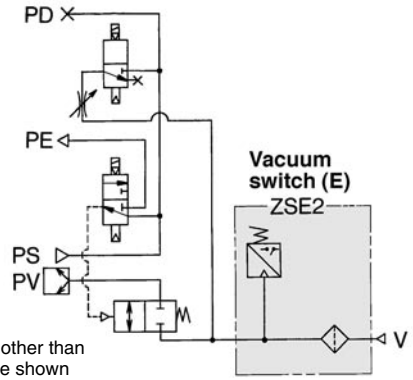
Valve Unit: K3



Configuration and Combination

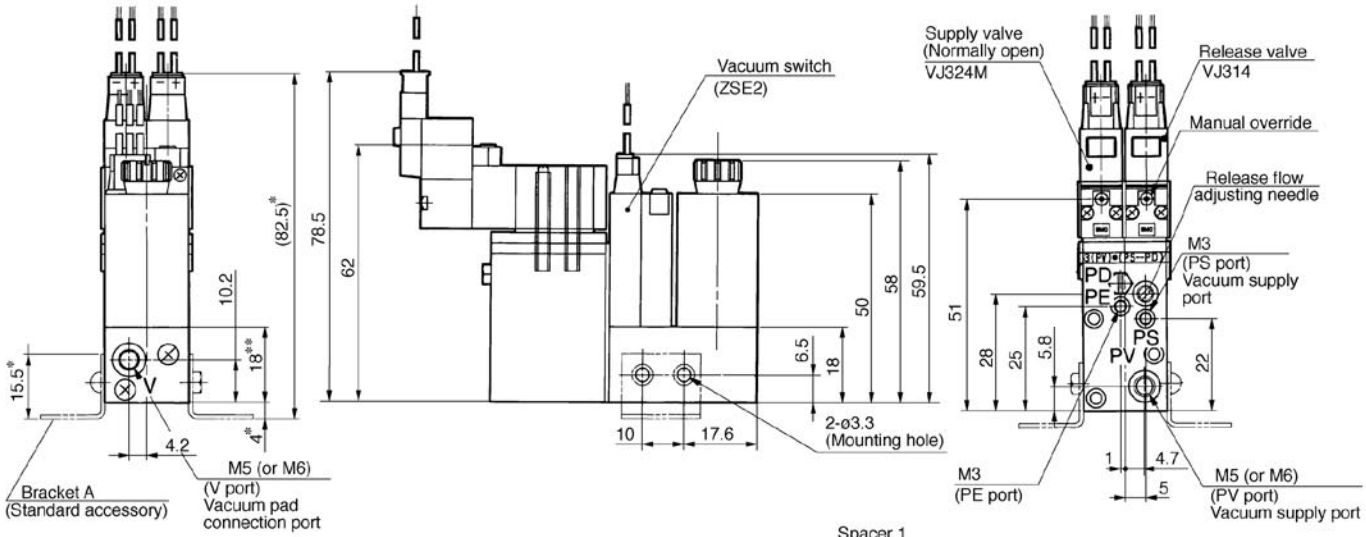
Vacuum switch (ZSE2)		
Valve unit (K3)	+	Filter unit (F)

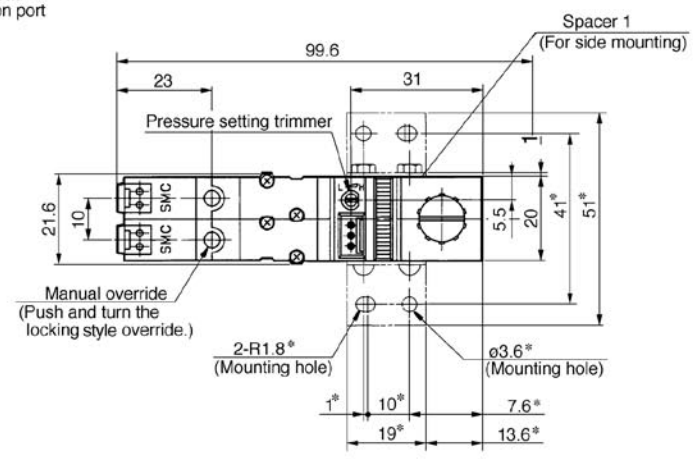
Model				
ZX100	—	K3□□□□	—	E□ F



Circuit
(The circuits with other than vacuum switch are shown as below.

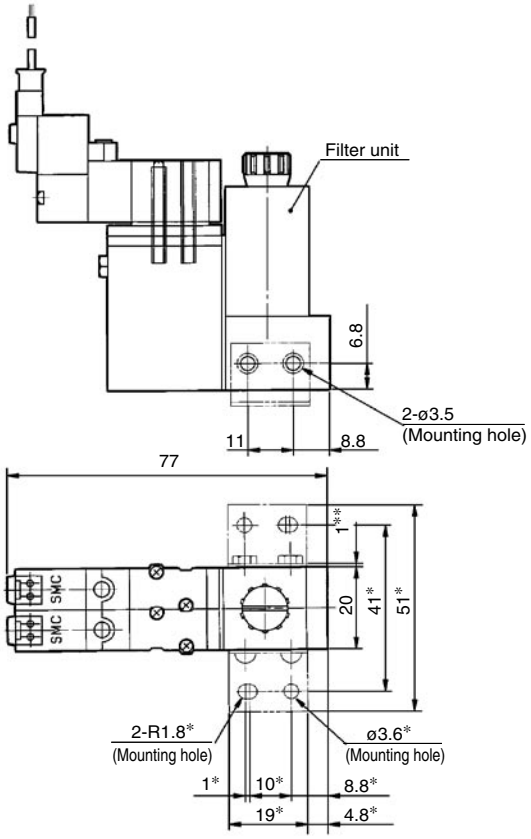
Vacuum Switch (ZSE2)
ZX100–K3□□□–E□





Note) Dimensions ∗: For mounting bracket A
∗∗: For mounting spacer 1

Filter Unit (F)
ZX100-K3□□□□–F

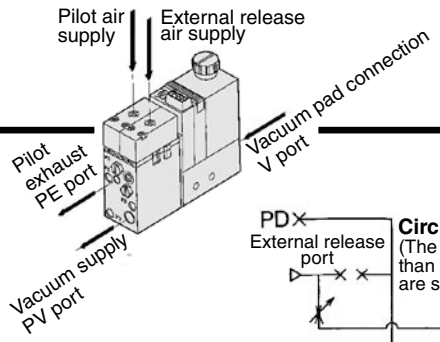


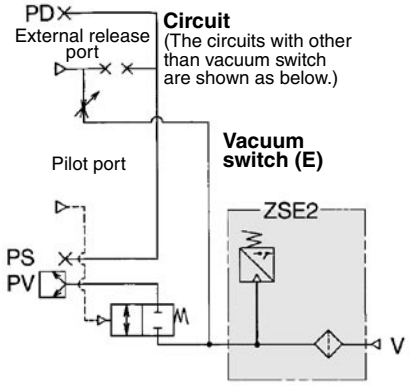
Valve Unit: K6

Configuration and Combination

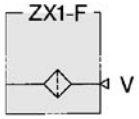
Vacuum switch (ZSE2)		
Valve unit (K6)	+	Filter unit (F)

Model				
ZX100	—	K6	—	E□ F

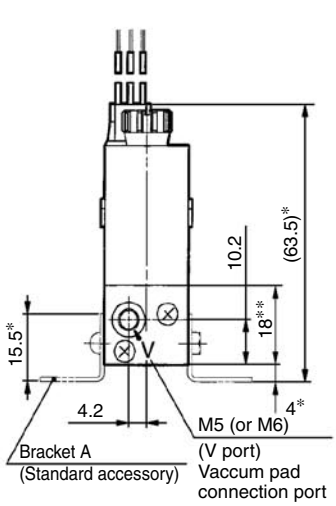


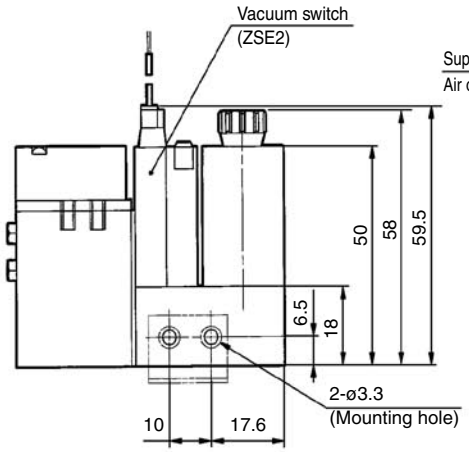


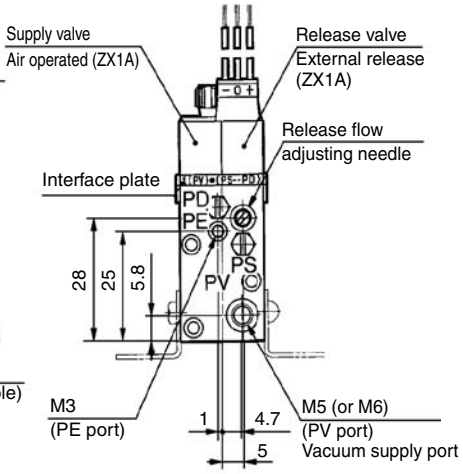
Filter unit (F)

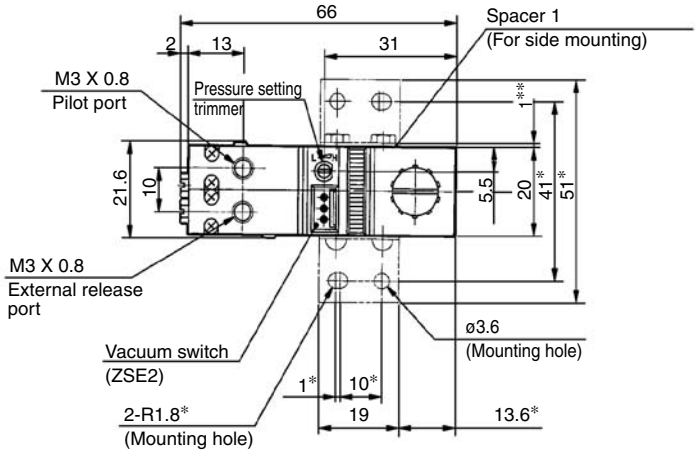


Vacuum Switch (ZSE2)
ZX100–K6–E□



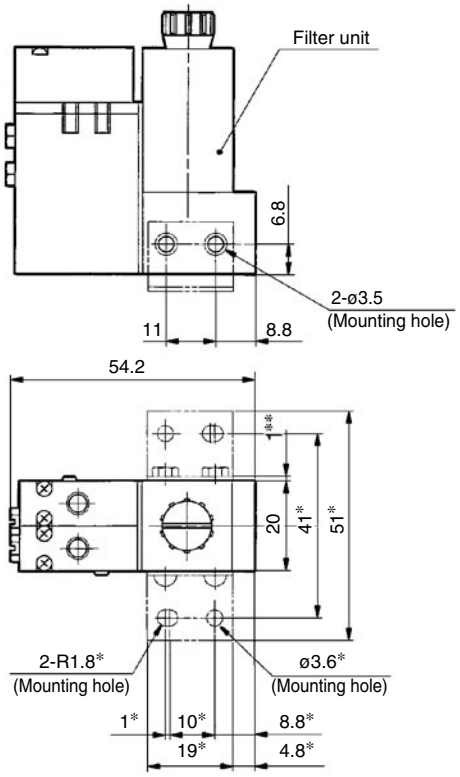




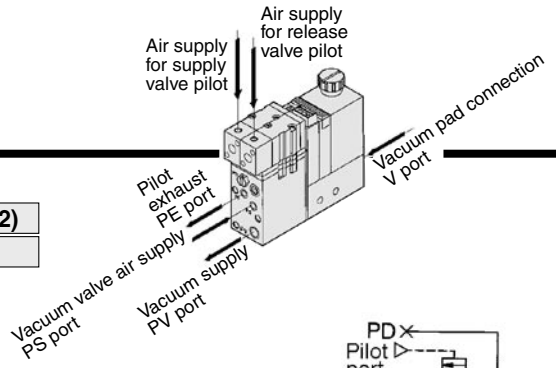


Note) Dimensions *: For mounting bracket B
**: For mounting spacer 1.

Filter Unit (F)
ZX100–K6–F



Valve Unit: K8



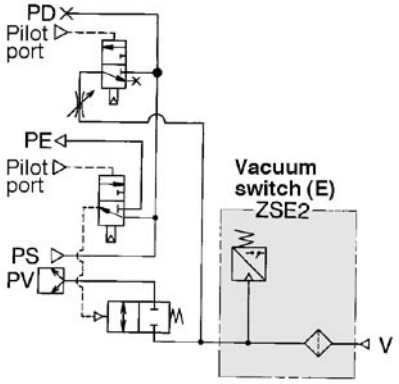
Configuration and Combination

Valve unit (K8)	+	Filter unit (F)
		Vacuum switch (ZSE2)

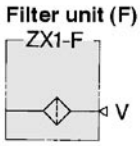
Model

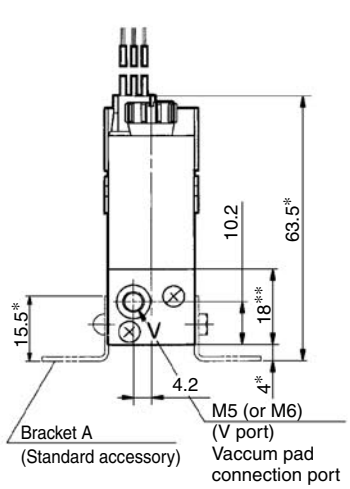
ZX100 — K8 — E□
F
None

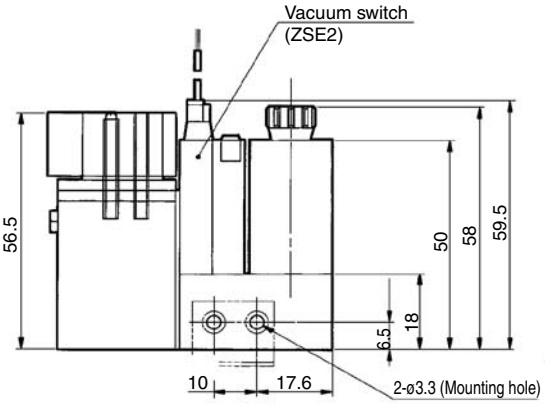
Circuit
(The circuits with other than vacuum switch are shown as below.)

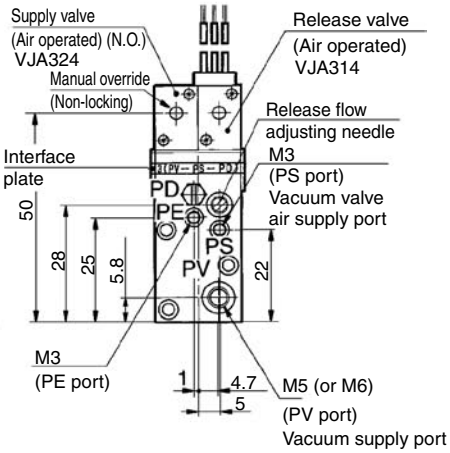


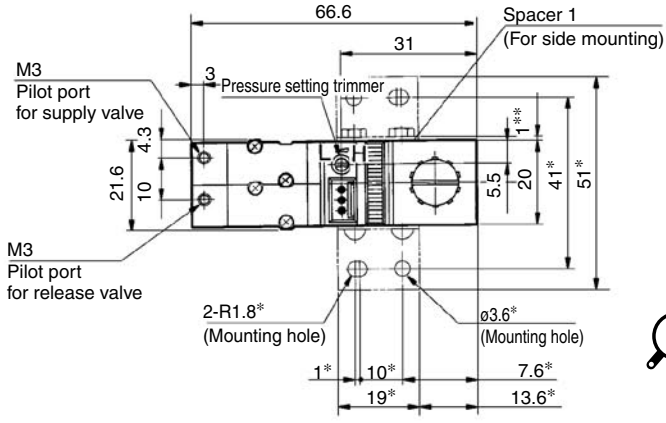
Vacuum Switch (ZSE2)
ZX100–K8–E□





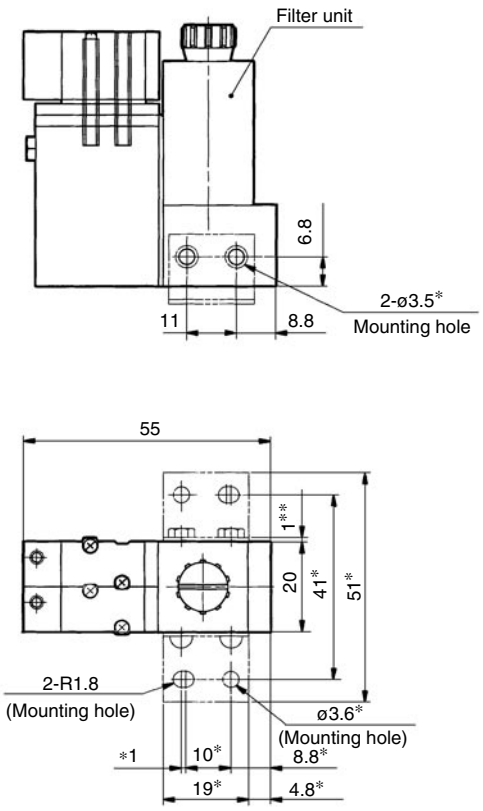




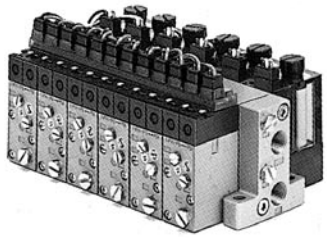


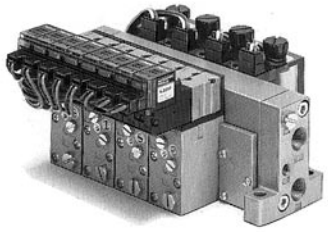
Note) Dimensions *: For mounting bracket A
**: For mounting spacer1.

Filter Unit (F)
ZX100–KB–F



External Vacuum Supply System/Manifold





Functions

Max. number of units	Max. 8 units
Function	Vacuum supply from PV port of the manifold is common supply. Air supply from PS port is common supply.

Individual spacer R1

Function	Separates air supply from manifold and makes units be used one by one.

Standard Specifications

Port	Port size	Function
PV port	1/8	External vacuum pump connection
PS port	M5	Air supply for vacuum valve
EXH port	1/8	Common exhaust
Weight	1 station: 73g (50g per additional station)	

Notes) PD port: Blank
Vacuum from both sides of PV port for 6 or more stations of ZX100 external vacuum pump manifold.

Air Supply

Supply port location \ Manifold Port	Left side		Right side	
	PV	**PS**	**PV**	**PS**
L	○	○	●	●
R	●	●	○	○
B	○	○	○	○

○: Vacuum supply from PV port ○: Air supply from PS port
●: Plugged (EXH port is released to atmospheric pressure.)

Note) All ports for each valve unit are provided with plugs.

When using individual spacer R1

It functions as a single unit. Vacuum is supplied from PV port of valve unit. PE port is released to atmospheric pressure. Other ports are plugged.

How to Order Manifold

Indicate the vacuum module, blank plate and individual spacer below the manifold base part number.

<Manifold base>

ZZX1 [06] — [ ] [R]

Number of stations

01	1 station
02	2 stations
⋮	⋮
08	8 stations

Port thread

—	Rc(PT)
F	G(PF)
T	NPTF

Supply port location

Symbol	Port location∗1	Supply	
		Vacuum supply	Air supply
R	Right side	PV port on the right side	PS port on the right side
L	Left side	PV port on the left side	PS port on the left side
B	Both sides	PV ports on both sides	PS ports on both sides

∗1 To the valve unit.
∗2 EXH port is released to atmospheric pressure. Plugs are attached to PD ports and all ports of the valve unit.

(Ordering example)
ZZX106-R····· 1 pc. (Manifold base)
∗ZX1101-K15LZ-EC····· 5 pcs. (Vacuum single unit)
∗ZX-BM1·····1 pc.(Blank plate)

<Individual spacer>

ZX1 — R1 — [1]

Location
(First station from the right end of the valve side is station 1.)

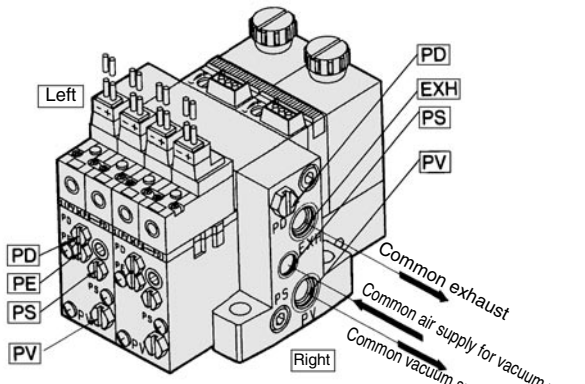
—	All stations
1	Station 1 only
⋮	⋮
8	Station 8 only

∗If more than one spacer is required, specify all spacers.

(Ordering example)
If mounted on station 1 and station 3:
ZZX106-R····· 1 pc.
∗ZX1101-K15LZ-EC····· 6 pcs.
∗ZX1-R1-1
∗ZX1-R1-3
∗ZX1-R16····· 4 pcs.

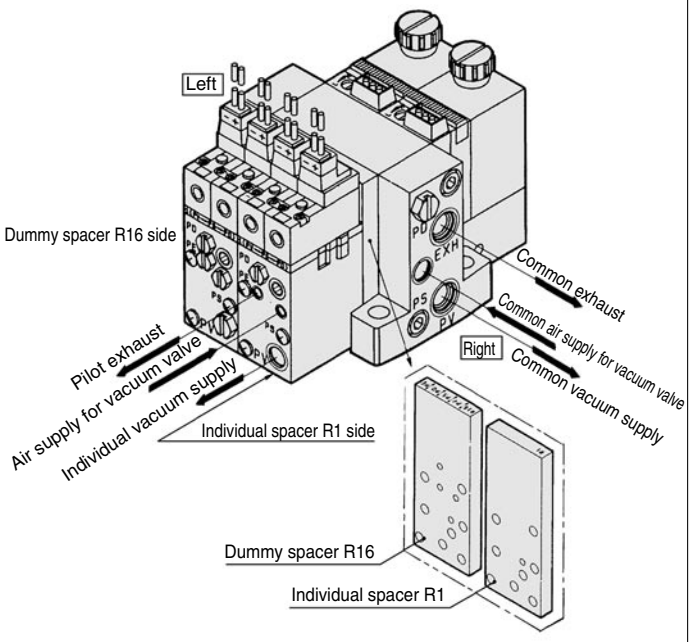
Manifold/System Circuit Example

When not using individual air pressure supply

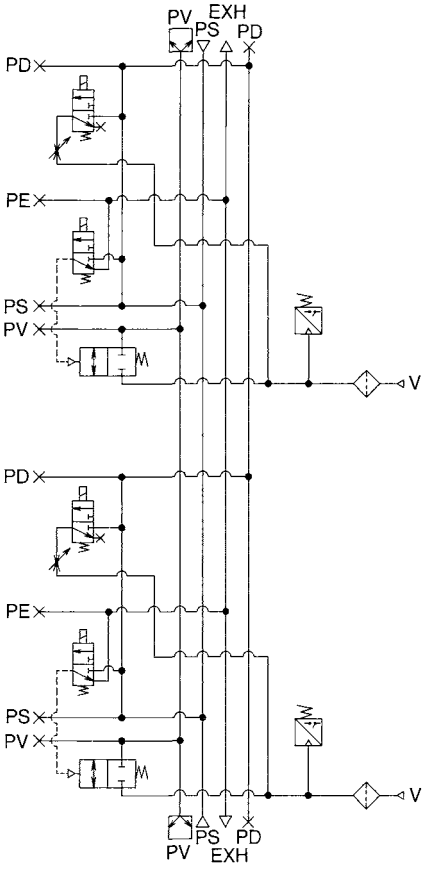


PV: Vacuum supply port
PS: Air supply port for vacuum valve
PD: Air supply port for release valve
PE: Pilot exhaust port
EXH: Common exhaust port

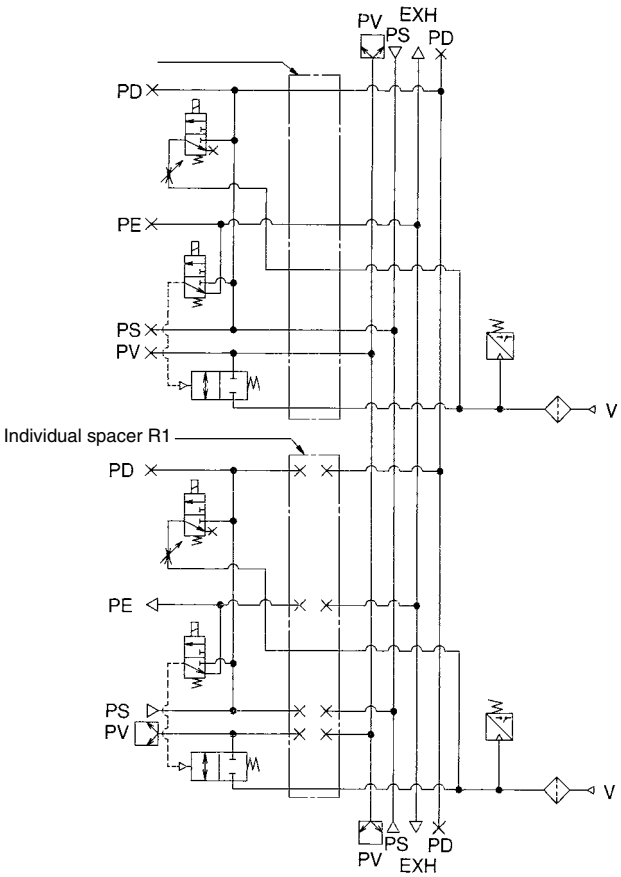
When using individual air pressure supply



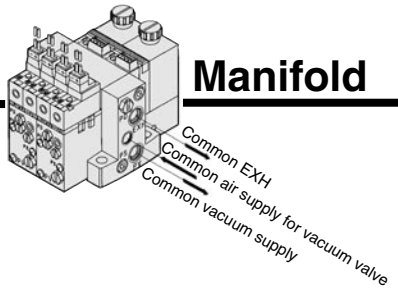
<System Circuit Example>



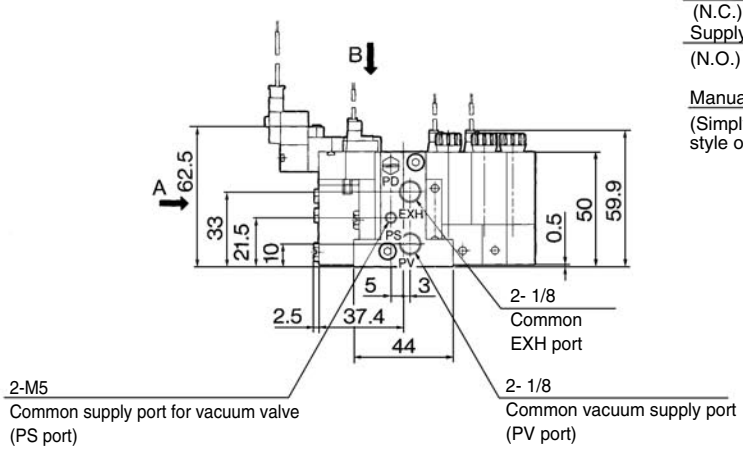
<System Circuit Example>

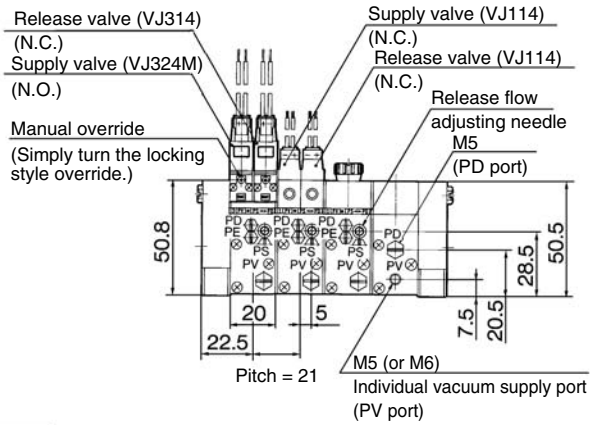


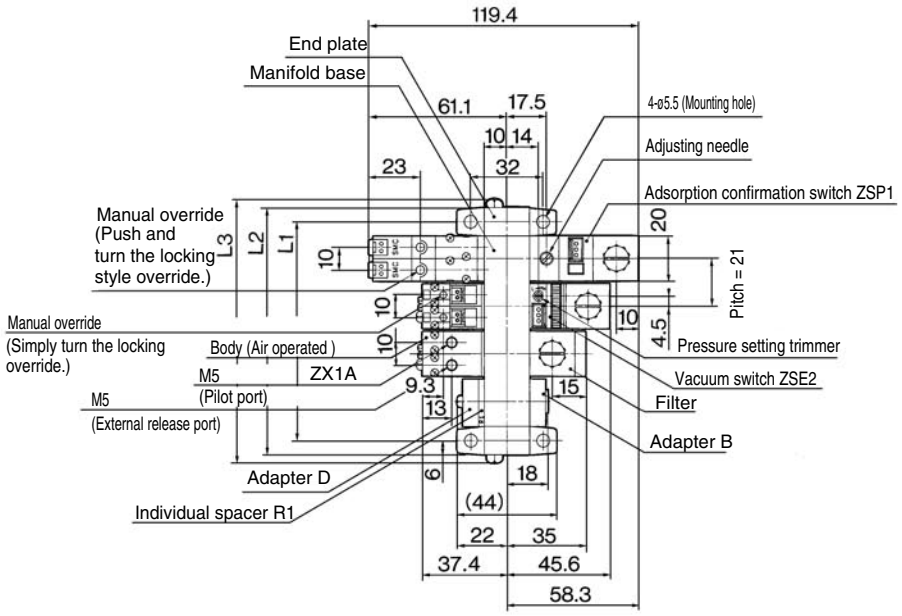
External Vacuum Supply System



Manifold





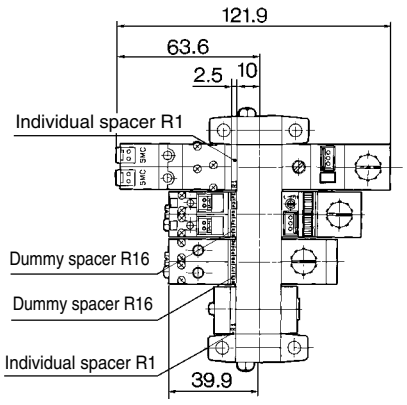


(mm)

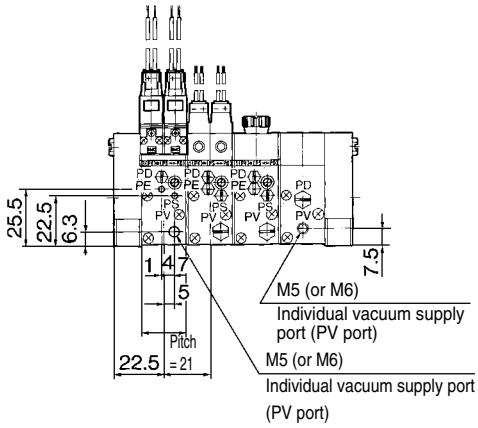
Symbol \ Stations	1	2	3	4	5	6	7	8
L1	33	54	75	96	117	138	159	180
L2	45	66	87	108	129	150	171	192
L3	50	71	92	113	134	155	176	197

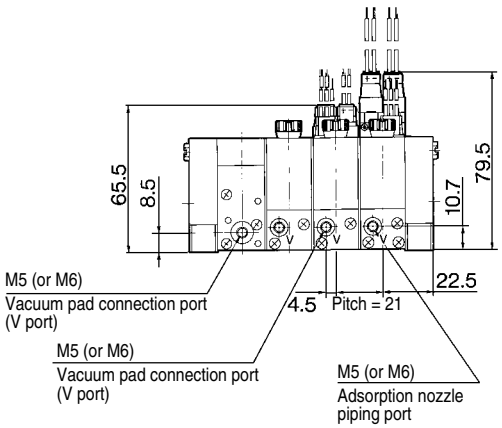
(In case of individual air pressure supply)

B cross section



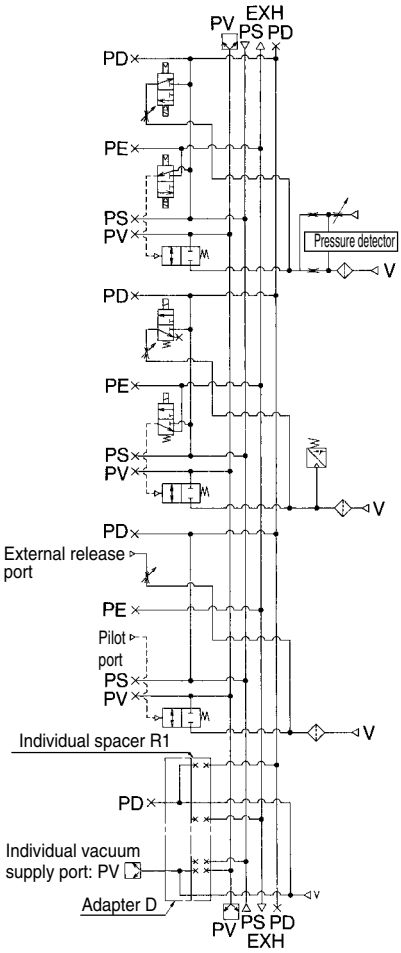
A cross section



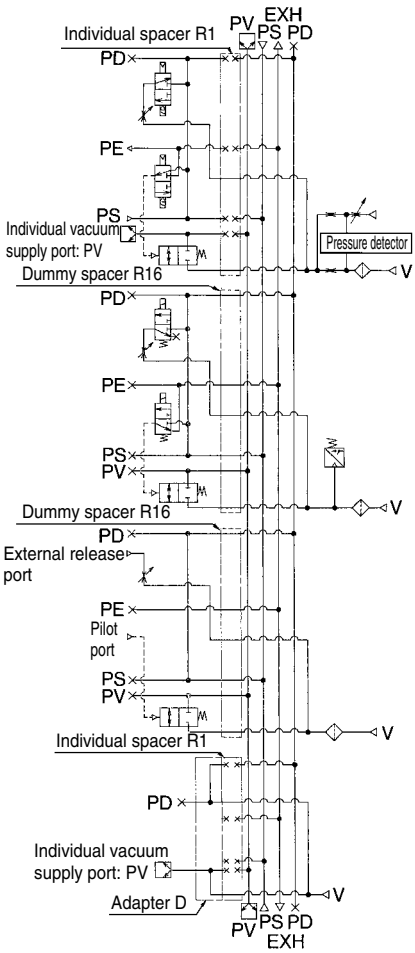


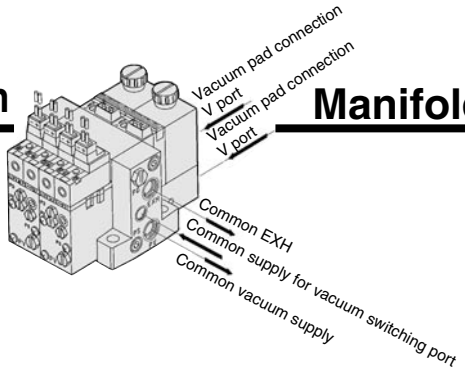
System Circuit Example

(Standard)



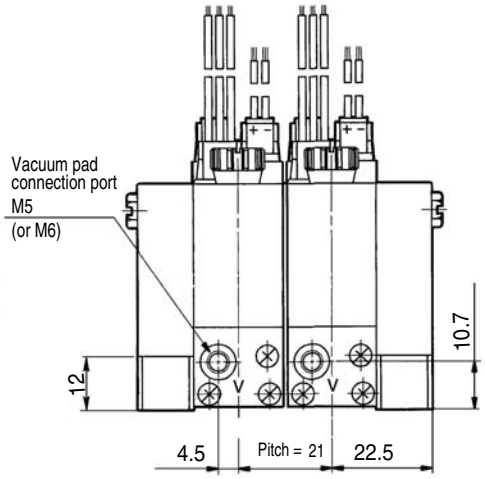
(Made to order)
(In case of individual vacuum pressure supply)

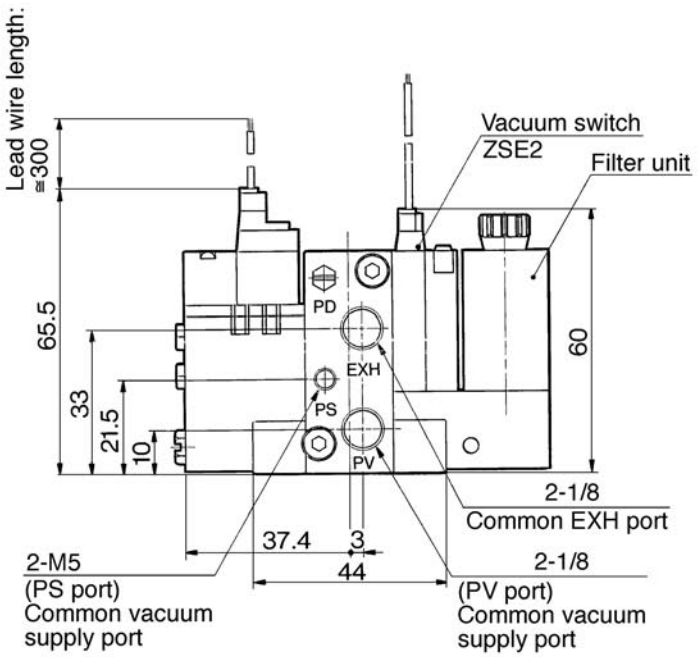


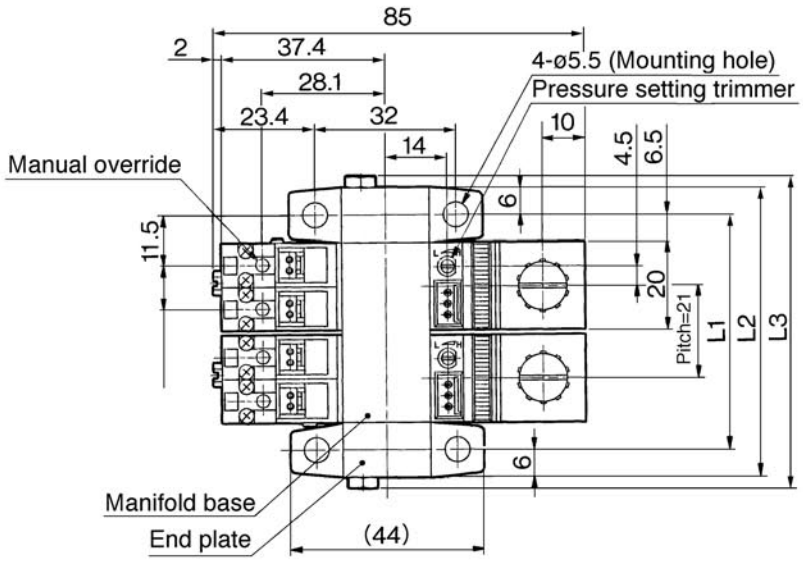


K1 type

ZZX1□□–□□
ZZX100-K1□L□–E□–□

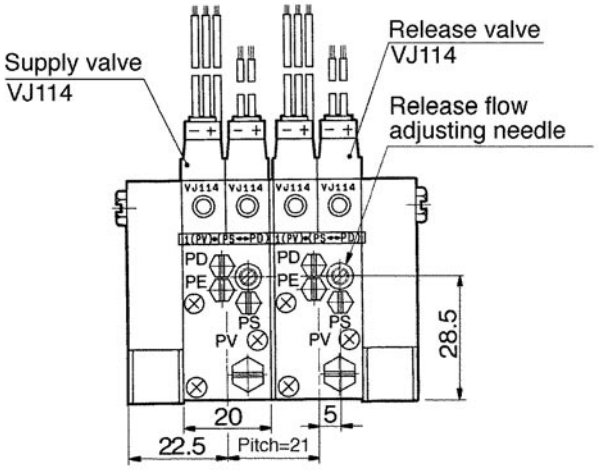




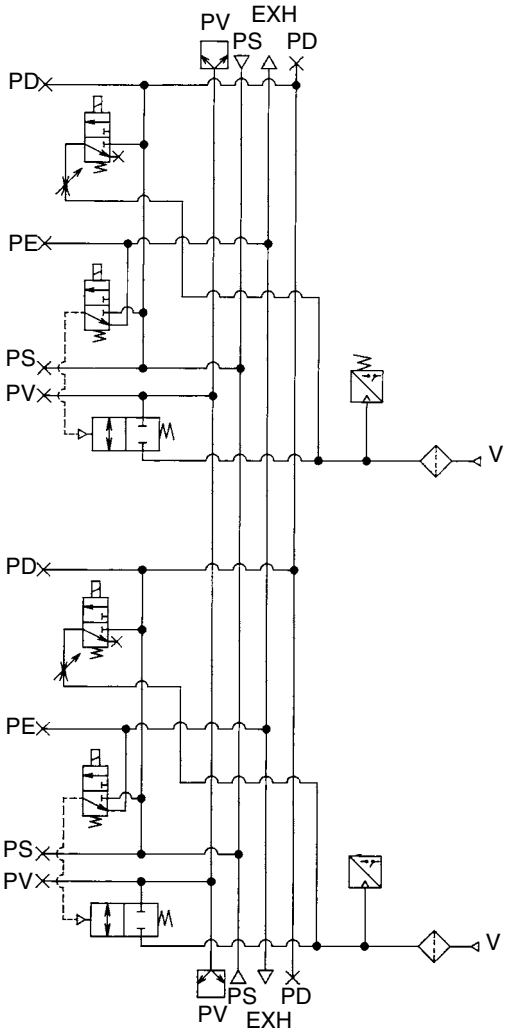


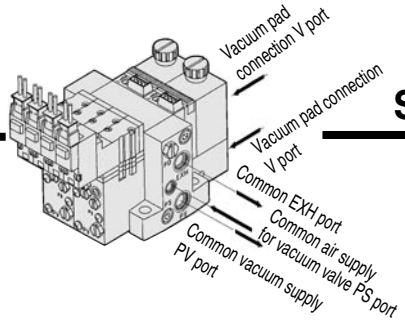
(mm)

Symbol \ Stations	1	2	3	4	5	6	7	8
L_1	33	54	75	96	117	138	159	180
L_2	45	66	87	108	129	150	171	192
L_3	50	71	92	113	134	155	176	197


Supply valve
VJ114
Release valve
VJ114
Release flow
adjusting needle
VJ114
PD
PE
PS
PV
28.5
20
5
22.5
Pitch=21

Circuit

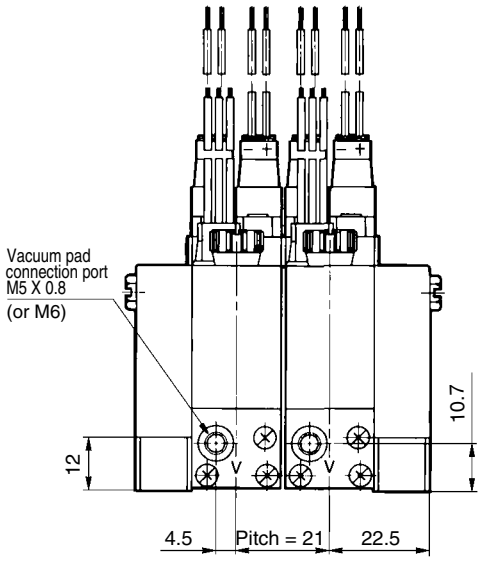

PV
EXH
PS
PD
PD
PE
PS
PV
V
PD
PE
PS
PV
V
PS
PD
PV
EXH

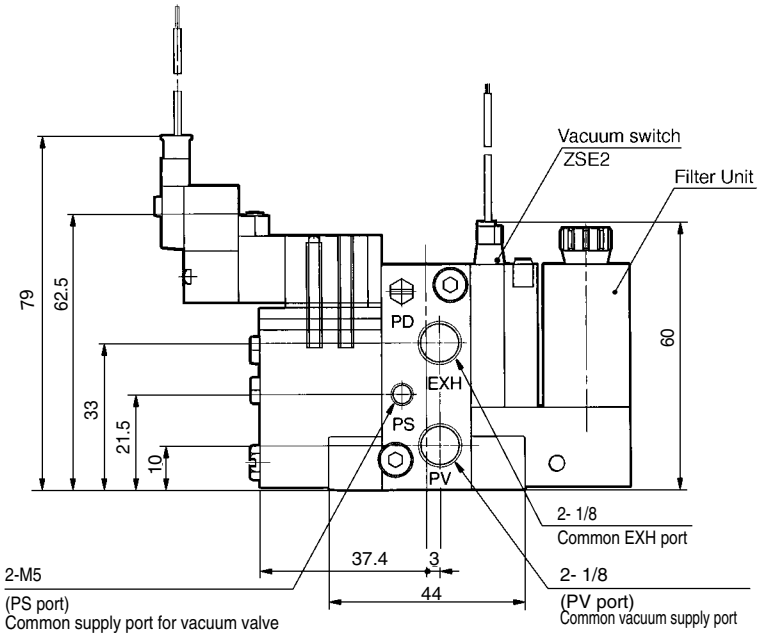


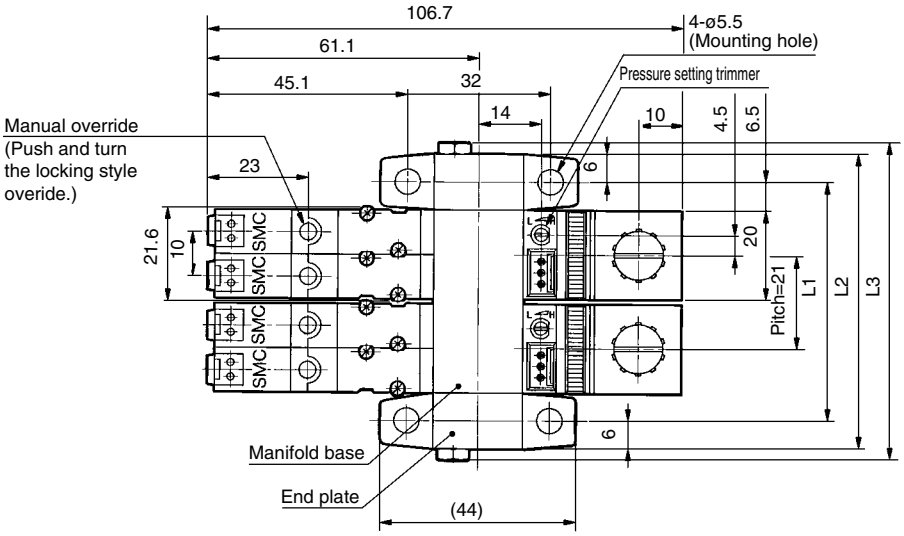
K3 type

ZZX1□□–□□

ZX100-K3□□□–E□–□

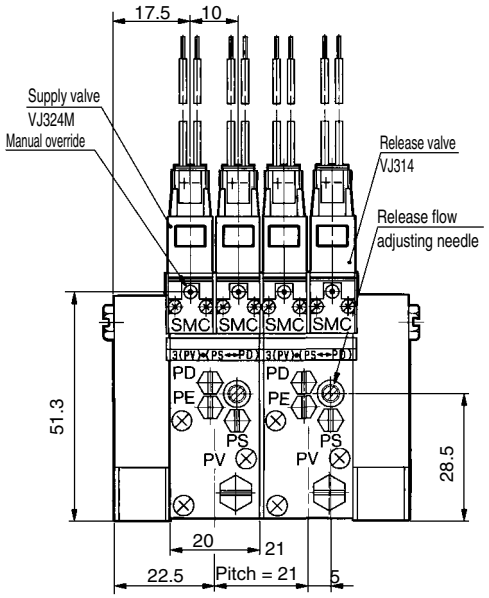




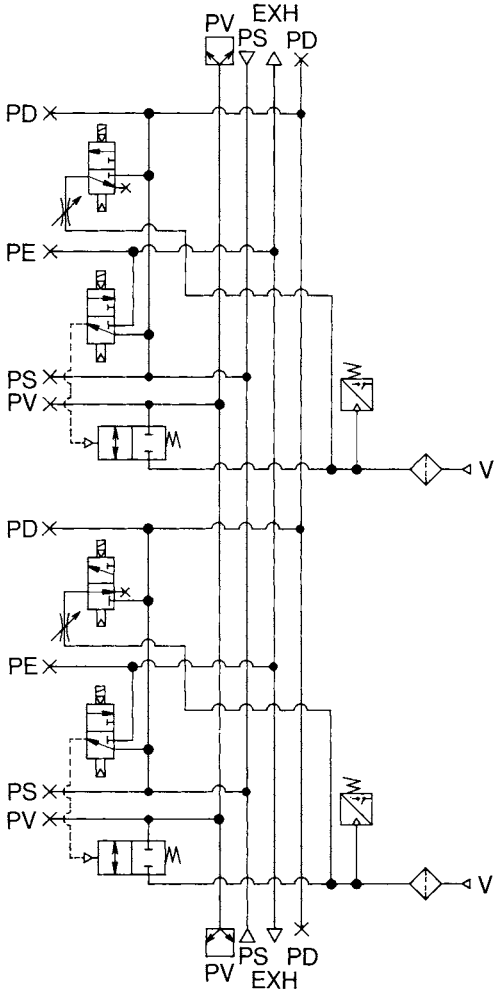


(mm)

Symbol \ Stations	1	2	3	4	5	6	7	8
L_1	33	54	75	96	117	138	159	180
L_2	45	66	87	108	129	150	171	192
L_3	50	71	92	113	134	155	176	197

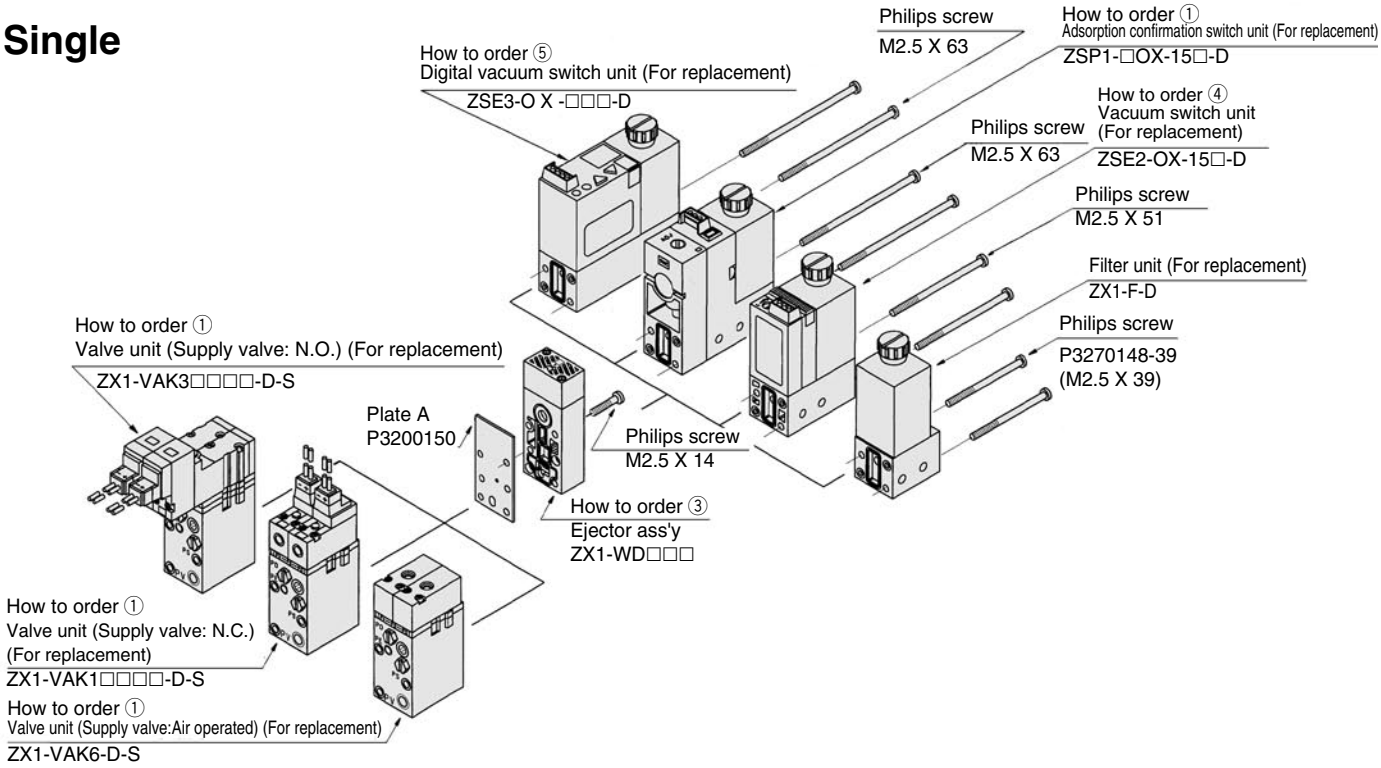

17.5
10
Supply valve
VJ324M
Manual override
Release valve
VJ314
Release flow
adjusting needle
SMC
SMC
SMC
SMC
PD
PE
PS
PV
PD
PE
PS
PV
51.3
28.5
20
21
22.5
Pitch = 21
5

Circuit


PV
EXH
PS
PD
PD
PE
PS
PV
V
PD
PE
PS
PV
V
PV
PS
PD
EXH

Ejector System/Unit Construction (Refer to below for unit replacement.)

Single



How to Order Unit for replacement

① **Valve unit**

ZX1−V A K1 □ 5 L Z B−D−S−Q

For ejector system

Combination of supply valve and release valve

Refer to p.3.1-6 for details

Pilot valve

—	DC: 1W (With light: 1.05W)
Y*	DC:0.45W (With light: 0.5W)

*24V DC and 12V DC are applicable to 0.45W.

Voltage

5	24V DC
6	12V DC
V	6V DC
S	5V DC
R	3V DC

Electrical entry

L	L plug connector

Indicator light and surge voltage suppressor

—	Unavailable
Z	Available

Manual override

—	Non-locking push style
B	Locking slotted style

Unit for replacement

Single
(PD and PS ports are equipped with plugs.)

③ **Ejector assembly**

ZX1−W D 05 1

Unit for replacement

Nozzle size

05	0.5mmø
07	0.7mmø
10	1.0mmø

Ejector EXH

1	Built-in silencer
2	Individual EXH Rc(PT)1/8

④ **Vacuum switch unit**

ZSE2−0X−15 C−D−Q

Electrical entry

—	Grommet (0.6m)
L	Grommet (3m)
C	Connector (0.6m)
CL	Connector (3m)
CN	Without connector

⑤ **Digital vacuum switch unit**

ZSE3−0X− □ 21 C−D−Q

C	Connector (0.6m)

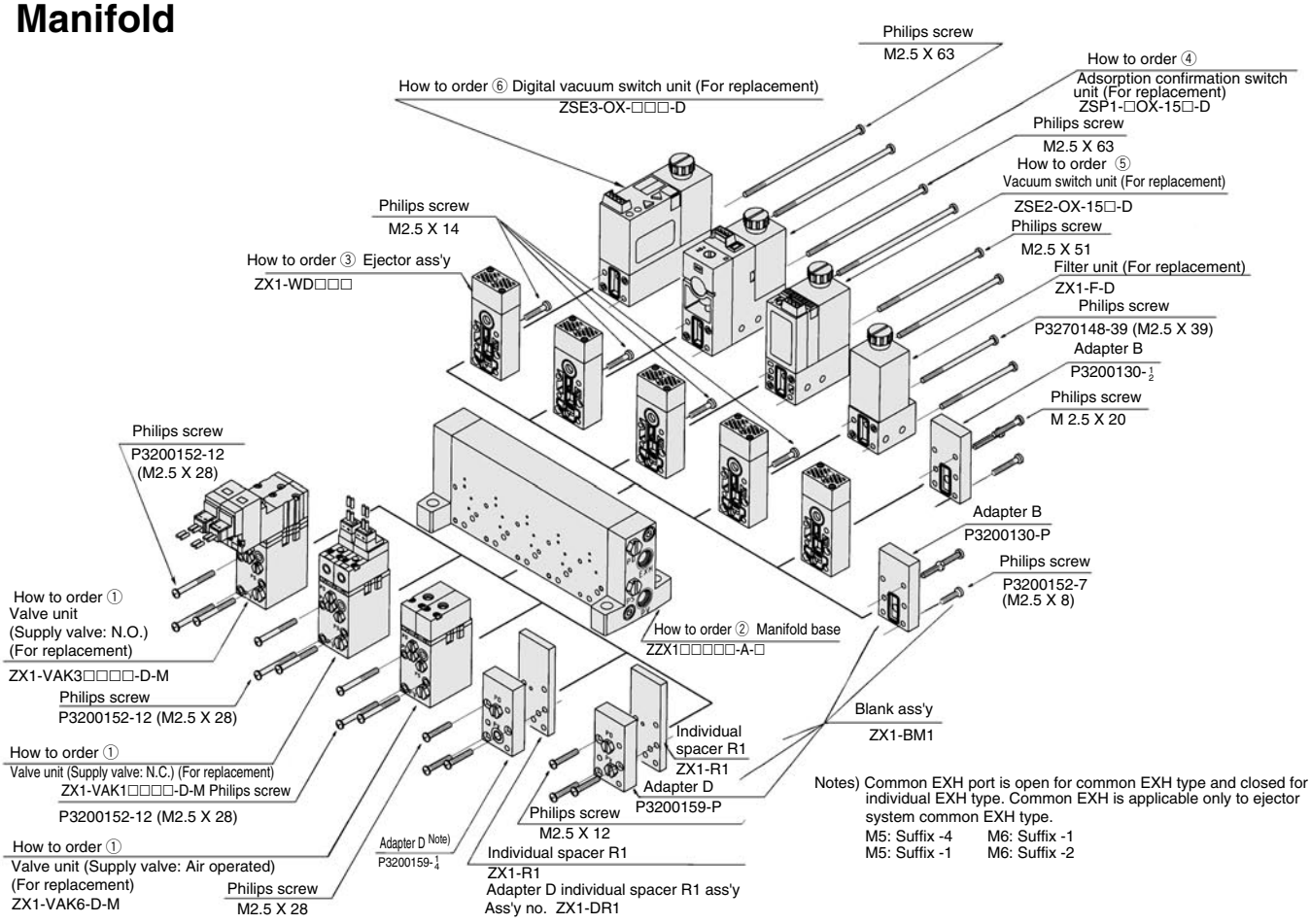
Pressure indication / **Output**

Pressure indication		Output	
—	mmHg	21	2 outputs/Without analogue output
		22	2 outputs/With analogue output
P	kPa	23	1 output (With trouble detection)/Without analogue
		24	1 output (With trouble detection)/With analogue

Note) analogue output is available only on grommet style.

D: Unit for replacement.
Ex.) If an adsorption confirmation switch is replaced for a vacuum switch on ZX1071-K15LZ-PBC, indicate as ZSE2-OX-15C-D.
In this case, mounting screws P3270148-49 (2 pcs.) are required.
If the unit is used on its own, not combined with others, "D" is not required. (Valve unit, ejector ass'y and switch unit)
Ex.) ZSE2-OX-15C, ZX1-VAK15LZ, ZX1-WO51

Manifold



How to Order Unit for replacement

① Valve unit

∗ Refer to p.3.1-10 for details.

ZX1–V A K1 □ 5 L Z B – D – M – Q

- A: For ejector system
- K1: Combination of supply valve and release valve
- □: Pilot valve
- 5: Rated voltage
- L: Electrical entry
- Z: Indicator light and surge voltage suppressor
- B: Manual override
- D: Unit for replacement
- M: Manifold (All ports are equipped with plugs.)
- Q

② Manifold base

ZZX1 05 – □ R – A – C

- 05: Number of stations

01	1
⋮	⋮
08	8

- □: Port thread

—	Rc (PT) 1/8
F	G(PF)
T	NPTF

- R: Supply port location

R	Right side
L	Left side
B	Both sides

- A: For ejector system (PD and PS ports are equipped with plugs.)
- C: Exhaust

—	Individual exhaust
C	Common exhaust

③ Ejector assembly

ZX1–W D 05 1

- D: Unit for replacement
- 05: Nozzle dia.

05	0.5mm
07	0.7mm
10	1.0mm

- 1: Ejector exhaust

1	Built-in silencer
2	Individual exhaust Rc(PT)1/8
3	Manifold common exhaust

⑤ Vacuum switch unit

ZSE2–0X–15 C – D – Q

- C: Electrical entry

—	Grommet (0.6m)	CL	Connector (3m)
L	Grommet (3m)	CN	Without connector
C	Connector (0.6m)		

- D: Unit for replacement
- Q

⑥ Digital vacuum switch unit

ZSE3–0X– □ 21 C – D – Q

- □: Pressure indication

—	mmHg
P	kPa

- 21: Output

21	2 outputs/Without analogue output
22	2 outputs/With analogue output
23	1 output (With trouble detection)/Without analogue
24	1 output (With trouble detection)/With analogue

- C: Electrical entry

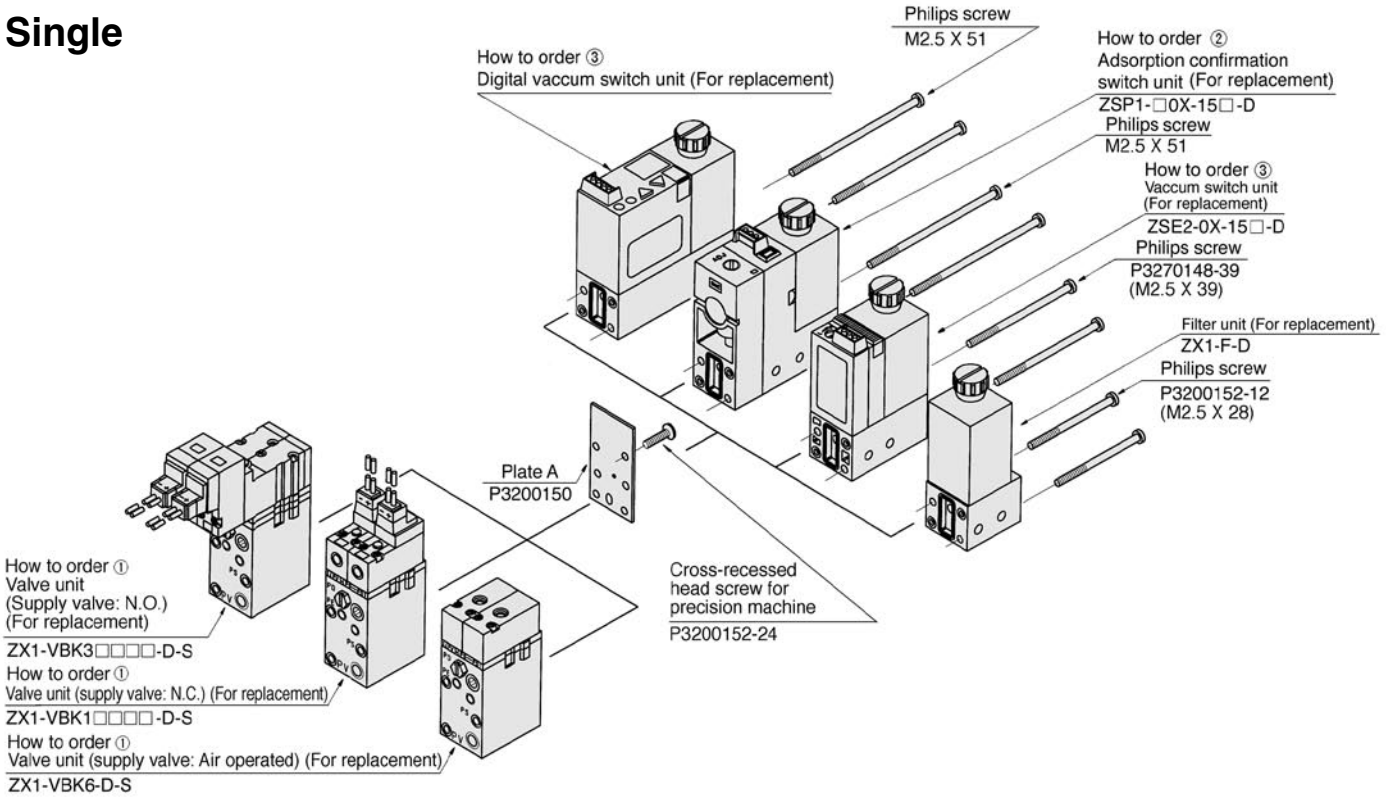
C	Connector (0.6m)

- D: Unit for replacement
- Q

Note) analogue output is available only on grommet style.

External Vaccum Supply System/Unit Construction (Refer to below for unit replacement.)

Single



How to Order Unit for replacement

① **Valve unit**

ZX1 – V B K1 □ 5 L Z B – D – S – Q

For external vaccum supply system

Combination of supply valve and release valve
(Refer to p.3.1-40 for details.)

Pilot valve

—	DC: 1W (With light: 1.05W)
Y*	DC: 0.45W (With light: 0.5W)

*24V DC and 12V DC are applicable to 0.45W.

Voltage

5	24V DC
6	12V DC
V	6V DC
S	5V DC
R	3V DC

Electrical entry

L	L plug connector

Indicator light and surge voltage suppressor

—	Unavailable
Z	Available

Manual override

—	Non-locking push type
B	Locking slotted type

Unit for replacement

Single
(PD port is equipped with plug.)

③ **Digital vaccum switch unit**

ZSE3 – 0X – □ 21 C – D – Q

Unit for replacement

Electrical entry

C	Connector (0.6m)

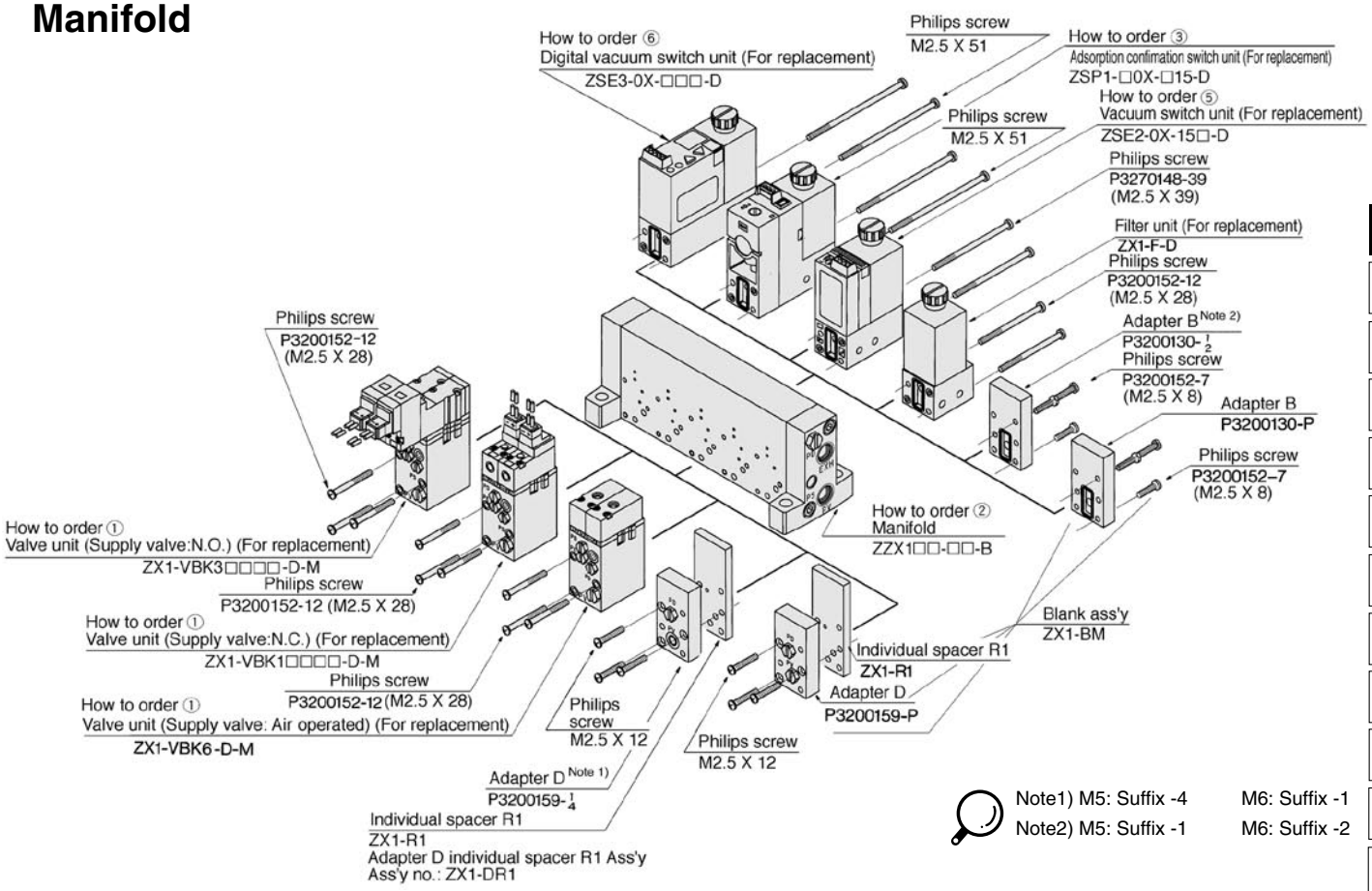
Plessure indication / **Output**

—	mmHg	21	2 outputs/ Without analogue output
		22	2 outputs/ With analogue output
P	kPa	23	1 output (With trouble detection)/ Without analogue
		24	1 output (With trouble detection)/ With analogue

Note) analogue output is available only on grommet style.

D: Unit for replacement
Ex.) If an adsorption confirmation switch is replaced for a vaccum switch on ZX1071-K15LZ-PBC, indicate as ZSE2-0X-15C-D. In this case, mounting screws P3270148-49 (2 pcs.) are required.
If the unit is used on its own, not combined with others, "D" is not required.
Ex.) ZSE2-0X-15C, ZX1-VAK15LZ

Manifold



Note1) M5: Suffix -4 M6: Suffix -1
Note2) M5: Suffix -1 M6: Suffix -2

How to Order Unit for replacement

① Valve unit

Refer to p.3.1-42 for details.

ZX1 – V [B] [K1] [ ] [5] [L] [Z] [B] – [D] – [M] – Q

- B: For external vacuum supply system
- K1: Combination of supply valve and release valve
- [ ]: Pilot valve
- 5: Voltage
- L: Electrical entry
- Z: Indicator light and surge voltage suppressor
- B: Manual override
- D: Unit for replacement
- M: Manifold (All ports are equipped with plugs.)
- Q

Refer to p.3.1-52 for details.

② Manifold base

ZZX1 [06] – [ ] [R] – B

Number of stations

01	1 station
⋮	⋮
08	8 stations

Port thread

—	Rc (PT)1/8
F	G (PF)
T	NPTF

Supply port location

R	Right side
L	Left side
B	Both sides

B: For external vacuum supply system (PD port is equipped with plug.)

④ Vacuum switch unit

ZSE2 – 0X – 15 [C] – [D] – Q

Electrical entry

—	Grommet (0.6m)
L	Grommet (3m)
C	Connector (0.6m)
CL	Connector (3m)
CN	Without connector

D: Unit for replacement

⑤ Digital vacuum switch unit

ZSE3 – 0X – [ ] [21] [C] – [D] – Q

D: Unit for replacement

Electrical entry

C	Connector (0.6m)

Pressure indication / Output

—	mmHg	21	2 outputs/Without analogue output
		22	2 outputs/With analogue output
P	kPa	23	1 output (With trouble detection)/Without analogue
		24	1 output (With trouble detection)/With analogue

Note) analogue output is available only on grommet style.

Series ZX (Consult SMC for detailed specifications, size and delivery.)

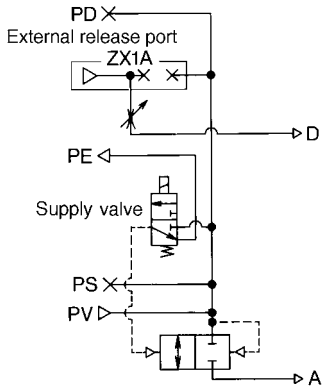
Made to Order Specifications

❶ Valve Unit/Other combinations of supply valve and release valve (Ejector unit)

Ejector Unit

If other than standard combination of supply valve and release valve (Refer to p.3.1-5.) are required, select from the following combinations. (Refer to p.3.1-4 for "How to Order".)

Combination symbol: K2



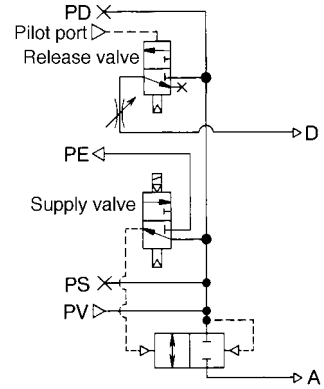
An N.C. solenoid valve is used for the supply valve. Also, an external 2 port valve (vacuum valve) must be provided to serve as the vacuum release valve.

Application: The supply pressure is controlled by electirc signals and a vacuum release is effected by introducing external air.

How to operate

Valve / Condition	Supply valve: Solenoid valve	Release valve: External 2 port valve
1. Work adsorption	ON	OFF
2. Vacuum release	OFF	ON
3. Operation stop	OFF	OFF

Combination symbol: K4



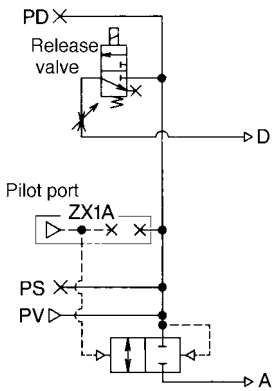
An N.O. solenoid valve is used as the supply vlave. An air operated N.C. valve is used for the vacuum release valve.

Application: The supply pressure is restricted by electric signals and a vacuum release is effected by air signals. Becuase the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This combination is used for preventing the workpieces from dropping during power outages.

How to operate

Valve / Condition	Supply valve: Solenoid valve	Release valve: Air operated valve
1. Work adsorption	OFF	OFF
2. Vacuum release	ON	ON
3. Operation stop	ON	OFF

Combination symbol: K5



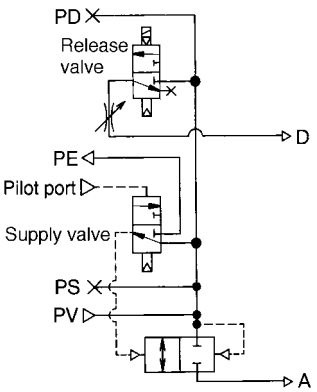
An external 3 port valve must be provided to serve as the supply valve. Also, an N.C. solenoid valve is used for the vacuum release valve.

Application: The supply pressure is controlled by external air signals and a vacuum release is effected by the solenoid valve.

How to operate

Valve / Condition	Supply valve: External 3 port valve	Release valve: Solenoid valve
1. Work adsorption	ON	OFF
2. Vacuum release	OFF	ON
3. Operation stop	OFF	OFF

Combination symbol: K7



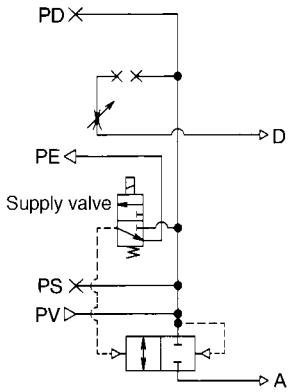
An air operated N.O. valve is used as the supply valve. An N.C. solenoid valve is used for the vacuum release valve.

Application: The supply pressure is controlled by external air signals and a vacuum release is effected by the solenoid valve. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This combination is used for preventing the workpieces from dropping during power outages.

How to operate

Valve / Condition	Supply valve: Air operated valve	Release valve: Solenoid valve
1. Work adsorption	OFF	OFF
2. Vacuum release	ON	ON
3. Operation stop	ON	OFF

Combination symbol: J1



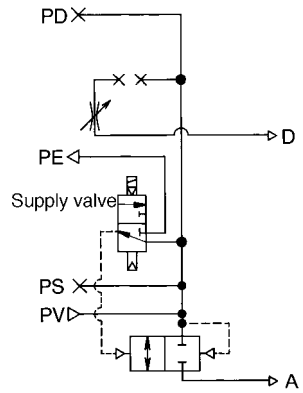
An N.C. solenoid valve is used for the supply valve. A vacuum release valve is not used.

Application: This combination is used for effecting control in accordance with electric signals. A vacuum release is effected by the intrusion of air between the silencer, pad, and the workpiece. This combination is used when there is no need to accelerate the vacuum release speed.

How to operate

Valve / Condition	Supply valve: Solenoid valve	Release valve: —
1. Work adsorption	ON	—
2. Vacuum release	OFF	—
3. Operation stop	OFF	—

Combination symbol: J2



An N.O. solenoid valve is used as the supply valve. A vacuum release valve is not used.

Application: It is used for controlling the supply pressure through electric signals. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This is used for preventing the workpieces from dropping during power outages. A vacuum release is effected by the intrusion of air between the silencer, pad, and the workpiece. This combination is used when there is no need to accelerate the vacuum release speed.

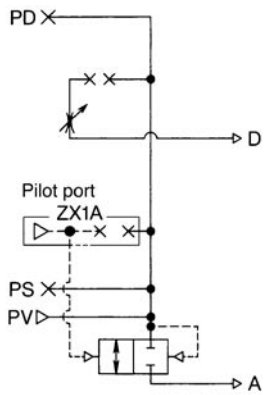
How to operate

Valve / Condition	Supply valve: Solenoid valve	Release valve: —
1. Work adsorption	OFF	—
2. Vacuum release	ON	—
3. Operation stop	ON	—

Series ZX (Consult SMC for detailed specifications, size and delivery.)

Made to Order Specifications

Combination symbol: J3



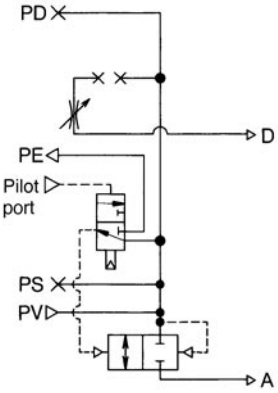
An N.C. solenoid valve is used as the supply valve. A vacuum release valve is not used.

Application: The supply pressure is controlled by external air signals. A vacuum release is effected by the intrusion of air between the silencer, pad, and the workpiece. This is used when there is no need to accelerate the vacuum release speed.

How to operate

Condition \ Valve	Supply valve	Release valve
	External 3 port valve	——
1. Work adsorption	ON	——
2. Vacuum release	OFF	——
3. Operation stop	OFF	——

Combination symbol: J4



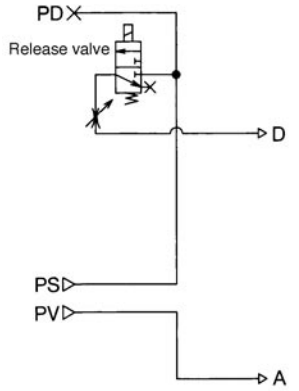
An air operated N.O. valve is used as the supply valve. A vacuum release valve is not used.

Application: The supply pressure is controlled by external air signals. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This is used for preventing the workpieces from dropping during power outages. A vacuum release is effected by the intrusion of air between the silencer, pad, and the workpiece. This type is used when there is no need to accelerate the vacuum release speed.

How to operate

Condition \ Valve	Supply valve	Release valve
	Air operated valve	——
1. Work adsorption	OFF	——
2. Vacuum release	ON	——
3. Operation stop	OFF	——

Combination symbol: D1



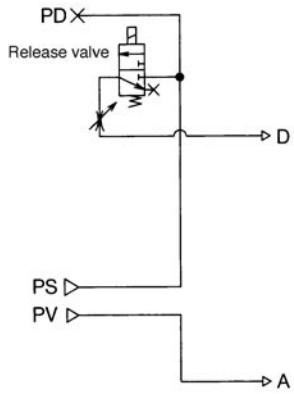
An N.C. solenoid valve is used for the vacuum release valve. An external supply valve must be provided.

Application: The supply pressure is controlled by the external valve and a vacuum release is effected by the solenoid valve.

How to operate

Condition \ Valve	Supply valve	Release valve
	External valve	Solenoid valve
1. Work adsorption	ON	OFF
2. Vacuum release	OFF	ON
3. Operation stop	OFF	OFF

Combination symbol: D2



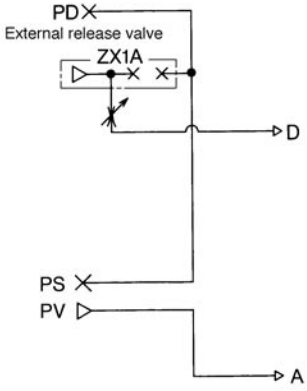
An N.C. solenoid valve is used for the vacuum release valve. An external supply valve must be provided.

Application: The supply pressure is controlled by the external valve and a vacuum release is effected by the solenoid valve.

How to operate

Condition \ Valve	Supply valve	Release valve
	External valve	Solenoid valve
1. Work adsorption	ON	OFF
2. Vacuum release	OFF	ON
3. Operation stop	OFF	OFF

Combination symbol: D3



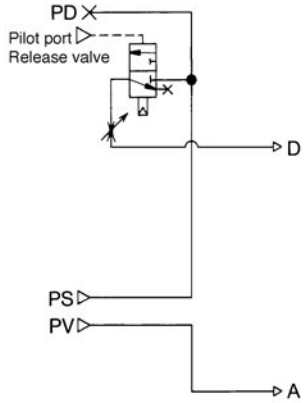
An external valve must be provided to serve as the supply valve. Also, an external 2 port valve (vacuum valve) must be provided to serve as the vacuum release valve.

Application: The supply pressure is controlled by the external valve and a vacuum release is effected by the external 2 port valve (vacuum valve).

How to operate

Condition \ Valve	Supply valve	Release valve
	External valve	Solenoid valve
1. Work adsorption	ON	OFF
2. Vacuum release	OFF	ON
3. Operation stop	OFF	OFF

Combination symbol: D4



An external valve must be provided to serve as the supply valve. An air operated N.C. valve is used for the vacuum release valve.

Application: The supply pressure is controlled by the external valve and a vacuum release is effected by external air signals.

How to operate

Condition \ Valve	Supply valve	Release valve
	External valve	Air operated valve
1. Work adsorption	ON	OFF
2. Vacuum release	OFF	ON
3. Operation stop	OFF	OFF

Series ZX (Consult SMC for detailed specifications, size and delivery.)

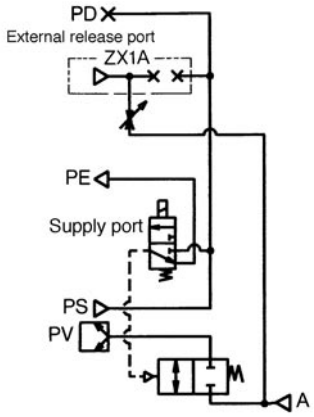
Made to Order Specifications

❶ Valve Unit/Other combinations of supply valve and release valve (External vacuum supply system)

External Vacuum Supply System

If other than standard combination of supply valve (Refer to p.3.1-39.) and release valve are required, select from the following combinations. (Refer to p.3.1-38 for "How to Order".)

Combination symbol: K2



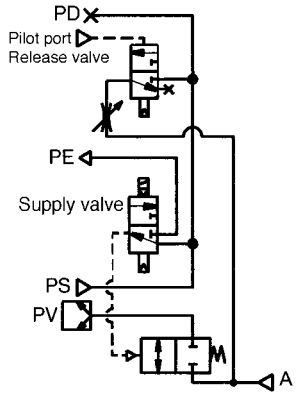
An N.C. solenoid valve is used as the supply valve. Also, an external 2 port valve (vacuum valve) must be provided to serve as the vacuum release valve.

Application: The supply pressure is controlled by electric signals and a vacuum release is effected by external air.

How to operate

Valve / Condition	Supply valve	Release valve
	Solenoid valve	Exterminal 2 port valve
1. Work adsorption	ON	OFF
2. Vacuum release	OFF	ON
3. Operation stop	OFF	OFF

Combination symbol: K4



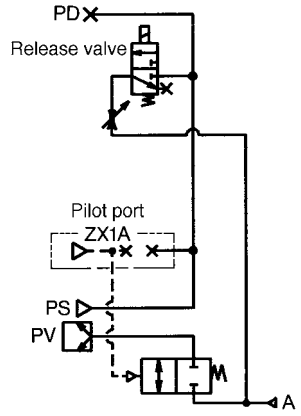
An N.O. solenoid valve is used as the supply valve. An air operated N.C. valve is used for the vacuum release valve.

Application: The supply pressure is controlled by electric signals and a vacuum release is effected by air signals. Because the supply valve is N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This combination is used for preventing the workpieces from dropping during power outages.

How to operate

Valve / Condition	Supply valve	Release valve
	Solenoid valve	Solenoid valve
1. Work adsorption	OFF	OFF
2. Vacuum release	ON	ON
3. Operation stop	ON	ON

Combination symbol: K5



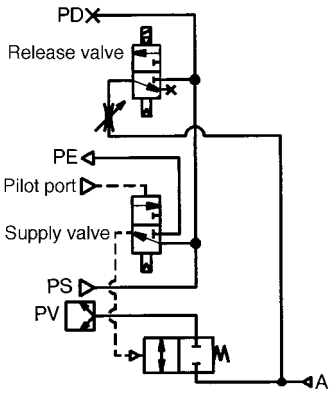
An external 3 port valve must be provided to serve as the supply valve. Also, an N.C. solenoid valve is used for the vacuum release valve.

Application: The supply pressure is controlled by external air signals and a vacuum release is effected by the solenoid valve.

How to operate

Valve / Condition	Supply valve	Release valve
	External 3 port valve	Solenoid valve
1. Work adsorption	ON	OFF
2. Vacuum release	OFF	ON
3. Operation stop	OFF	OFF

Combination symbol: K7



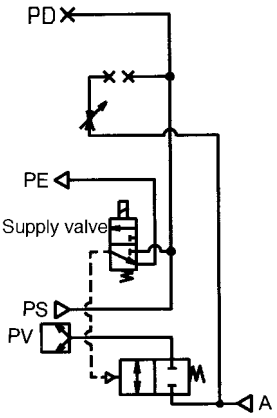
An air operated N.O. valve is used as the supply valve. An N.C. solenoid valve is used for the vacuum release valve.

Application: The supply pressure is controlled by external air signals and a vacuum release is effected by the solenoid valve. Because the supply valve is the N.O., the pressure that is supplied to the ejector is not interrupted during a power outage; as a result, the state of suction can be maintained. This combination is used for preventing the workpieces from dropping during power outages.

How to operate

Valve / Condition	Supply valve	Release valve
	Air operated valve	Solenoid valve
1. Work adsorption	OFF	OFF
2. Vacuum release	ON	ON
3. Operation stop	ON	OFF

Combination symbol: J1



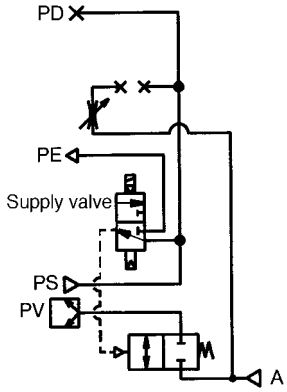
An N.C. solenoid valve is used as the supply valve. A vacuum release valve is not used.

Application: This combination is used for controlling the pressure by electric signals. Normally, the workpiece is released due to the air leakage that occurs between the pad and the workpiece. However, if there is no air leakage, the workpiece will not become detached because the vacuum state is maintained even when the supply valve is turned OFF. To effect releasing, an external 2 port valve (vacuum valve) must be provided.

How to operate

Valve / Condition	Supply valve	Release valve
	Solenoid valve	—
1. Work adsorption	ON	—
2. Vacuum release	OFF	—
3. Operation stop	OFF	—

Combination symbol: J2



An N.O. solenoid valve is used as the supply valve. A vacuum release valve is not used.

Application: Used for controlling with electric signals. Because the supply N.O., the pressure is not interrupted during a power outage. This prevents the workpieces from dropping. Normally, the workpiece is released due to leakage. However, if no air leakage, the workpiece will not detach because the vacuum state is maintained even when the supply valve is turned ON. To release, an external 2 port valve (vacuum valve) must be used.

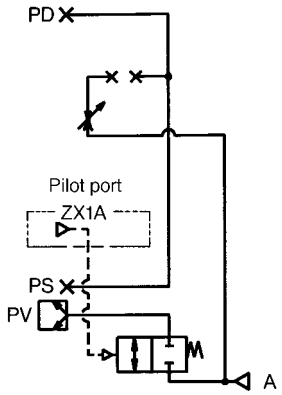
How to operate

Valve / Condition	Supply valve	Release valve
	Solenoid valve	—
1. Work adsorption	OFF	—
2. Vacuum release	ON	—
3. Operation stop	ON	—

Series ZX (Consult SMC for detailed specifications, size and delivery.)

Made to Order Specifications

Combination symbol: J3



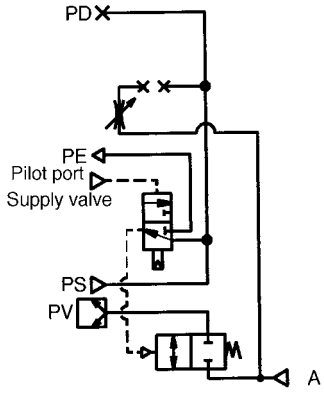
An N.C. solenoid valve is used as the supply valve. A vacuum release valve is not used.

Application: The supply pressure is controlled by external air signals. Normally, the workpiece is released due to the air leakage that occurs between the pad and the workpiece. However, if there is no air leakage, the workpiece will not become detached because the vacuum state is maintained even when the supply valve is turned OFF. To effect releasing, an external 2 port valve (vaccum valve) must be provided.

How to operate

Valve / Condition	Supply valve	Release valve
	External 3 port valve	——
1. Work adsorption	ON	——
2. Vacuum release	OFF	——
3. Operation stop	OFF	——

Combination symbol: J4



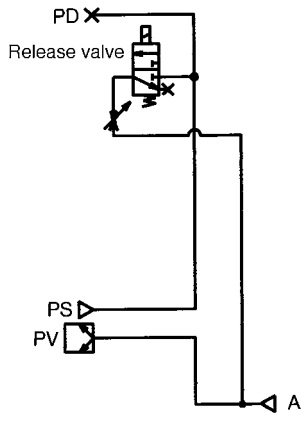
An air operated N.O. valve is used as the supply valve. A vaccum release valve is not used.

Application: Supply is controlled by external air signals. Because the valve is N.O., the pressure is not interrupted during a power outage. This prevents the workpieces from dropping. Normally, the workpiece is released due to leakage. However, if no leakage, the workpiece will not detach because the vacuum state is maintained even when the valve is turned ON. To release, an external 2 port valve (vaccum valve) must be provided.

How to operate

Valve / Condition	Supply valve	Release valve
	Air operated valve	——
1. Work adsorption	OFF	——
2. Vacuum release	ON	——
3. Operation stop	ON	——

Combination symbol: D1



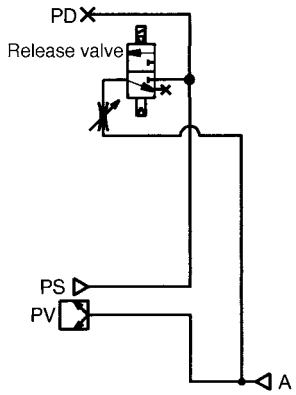
An N.C. solenoid valve is used as the vaccum release valve. A supply valve is not used.

Application: The supply pressure is controlled by an external 2 port valve (vaccum valve) and a vacuum release is effected by the solenoid.

How to operate

Valve / Condition	Supply valve	Release valve
	External 2 port valve	Solenoid valve
1. Work adsorption	ON	OFF
2. Vacuum release	OFF	ON
3. Operation stop	OFF	OFF

Combination symbol: D2



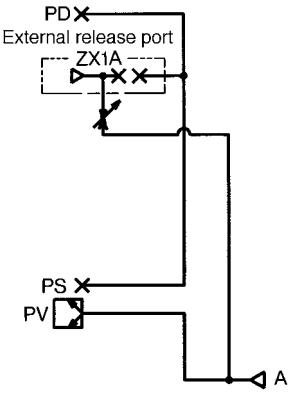
An N.C. solenoid valve is used as the vacuum release valve. A supply valve is not used.

Application: The supply pressure is controlled by external 2 port valve (vacuum valve) and a vaccum release is effected by the solenoid.

How to operate

Valve / Condition	Supply valve	Release valve
	External 2 port valve	Solenoid valve
1. Work adsorption	ON	OFF
2. Vacuum release	OFF	ON
3. Operation stop	OFF	OFF

Combination symbol: D3



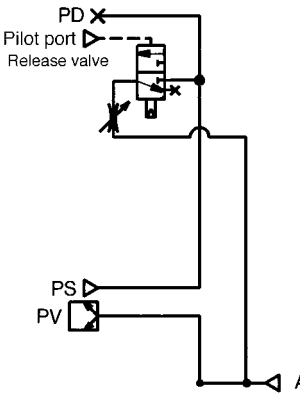
An external 2 port valve (vaccum valve) must be provided to serve as the supply valve and the vaccum release valve.

Application: The supply pressure is controlled by the external 2 port valve (vaccum valve) and releasing is also effected by the external 2 port valve.

How to operate

Valve / Condition	Supply valve	Release valve
	External 2 port valve	Solenoid valve
1. Work adsorption	ON	OFF
2. Vacuum release	OFF	ON
3. Operation stop	OFF	OFF

Combination symbol: D4



An external 2 port valve (vaccum valve) must be provided to serve as the supply valve. An air operated N.C. valve is used for the vaccum release valve.

Application: The supply pressure is controlled by the external 2 port valve (vaccum valve) and vaccum release is effected by external air signals.

How to operate

Valve / Condition	Supply valve	Release valve
	External 2 port valve	Solenoid valve
1. Work adsorption	ON	OFF
2. Vacuum release	OFF	ON
3. Operation stop	OFF	OFF

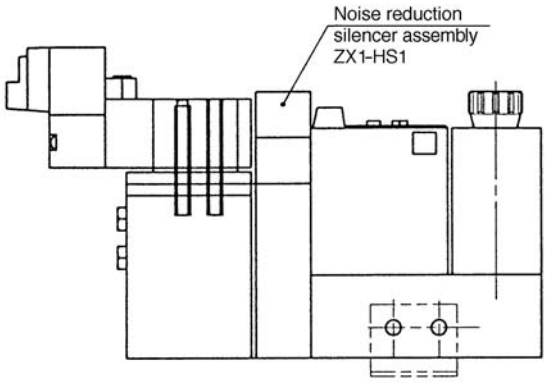
Series ZX (Consult SMC for detailed specifications, size and delivery.)
Made to Order Specifications Order Made

❶ Noise reduction silencer assembly/the ejector exhaust style is applicable to the silencer equipped specifications

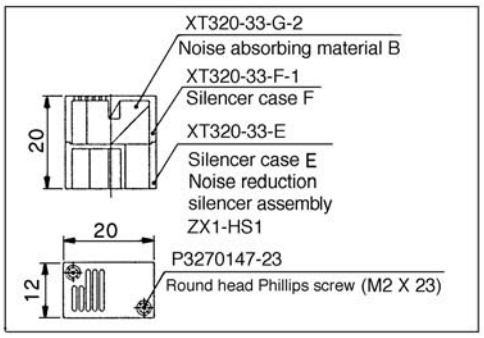
ZX1	Nozzle dia.	Exhaust style	–	Valve	Voltage	Electrical entry	–X121

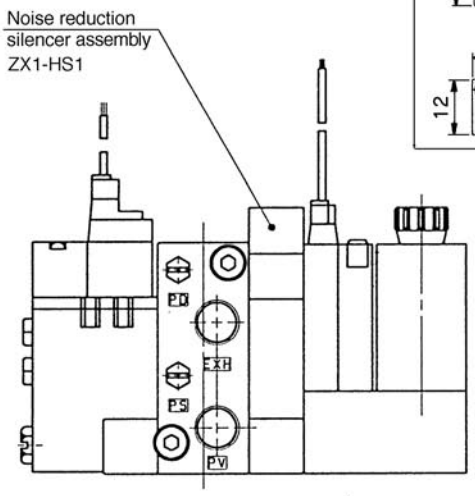
Noise reduction silencer assembly

Reduction in the exhaust noise from the ejector (silencing effect 8dB (A) Standard silencer assembly comparison)



Ordering example
ZX1101-K35LZ-D23C-X121





Ordering example ZZX102-R 1 pc.
*ZX1101-K15LZ-EC-X121 2 pcs.