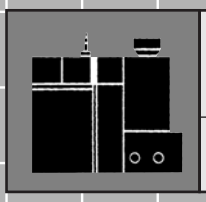


Large Size Vacuum Module/*Series ZR*

Vacuum Ejector System/External Vacuum Supply System

- **Nozzle size (mm): ø1.0, ø1.3, ø1.5, ø1.8, ø2.0**
- **Suitable for handling workpieces of 0.5 to 5kg**

Large Size Vacuum Module

Series ZR

Vacuum Ejector System/External Vacuum Supply System

Vacuum module suitable for handling workpieces of 0.5 to 5kg.

Modular design/Customized application function through selection of module components.

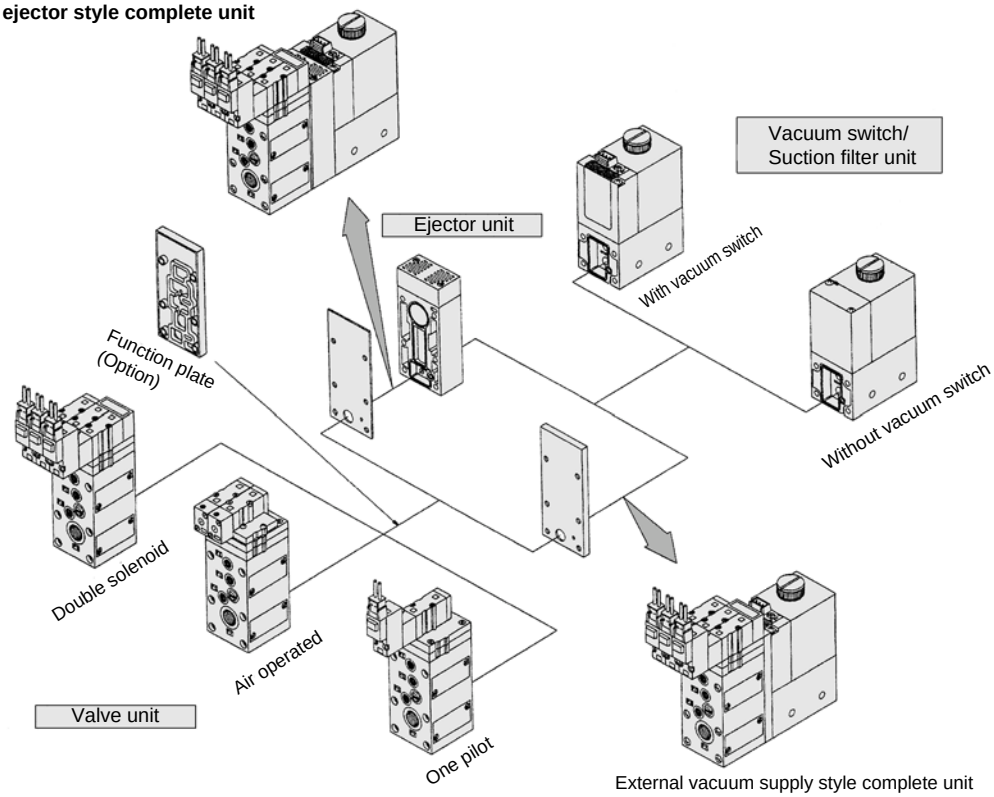
Modules for use with external vacuum supply (from pump or mainline) or as an air driven ejector system.

Safe — Vacuum self-holding function by means of double solenoid valves.

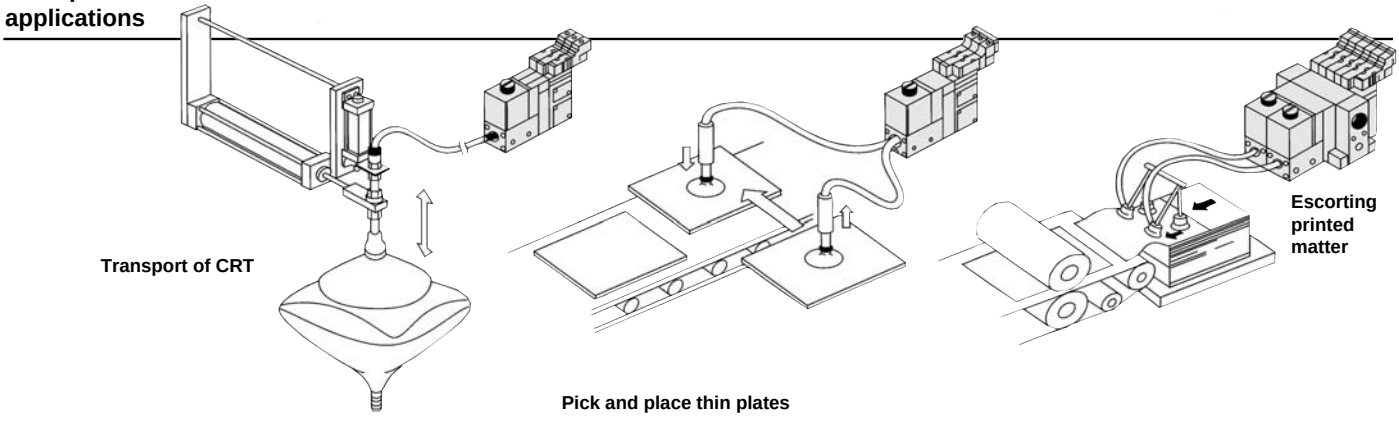
Compact, lightweight

Manifolding possible

Vacuum ejector style complete unit



Example applications

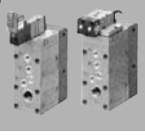


Pick and place thin plates

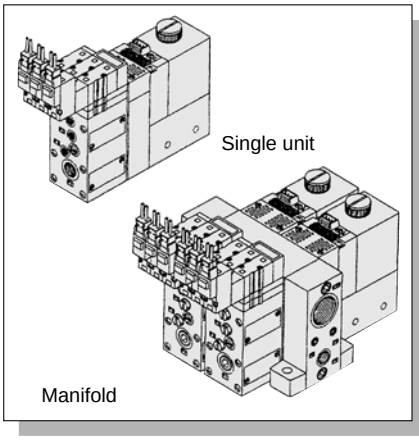
Also: Pick & place copper plates, Automatic labeling machine, Transporting veneers, Automatic screw fasting machine

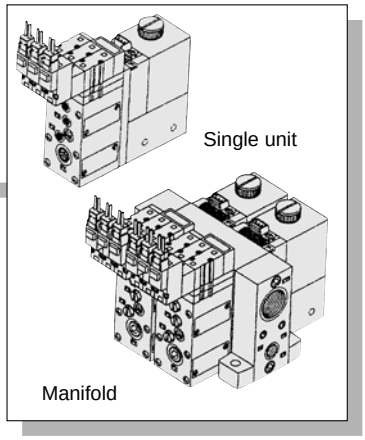
SMC

Modular Components Introduction

Basic Specifications			Vacuum Ejector Style					External Vacuum Supply Style
Components	Characteristics		P.3.2-4 to 3.2-27					P.3.2-28 to 3.2-41
Ejector unit ZR1-W 	Nozzle dia. ø(mm)		1.0	1.3	1.5	1.8	2.0	—
	Max. suction flow (ℓ/min (ANR))	Type S	22	38	54	62	84	
		Type L	42	52	74	88	105	
	Air consumption (ℓ/min)		46	78	95	150	185	
	Max. vacuum pressure		S: −84kPa L: −53kPa					
	Exhaust release (Ejector exhaust)		Built-in silencer, Manifold common or individual exhaust					
Valve unit ZR1-V 	Components		Supply valve (pilot style)/Release valve (pilot style)					
	Functions		N.C./N.O.					
	Operation		Solenoid valve (double, single)/Air operated valve					
	Supply voltage		3, 5, 6, 12, 24V DC					
Vacuum switch ZSE2-0R-15 	Pressure setting range		0 to –101kPa					
	Hysteresis		3% or less					
	Operating voltage		12 to 24V DC (Ripple ± 10% or less)					
Suction filter unit ZR1-F 	Operating pressure range		Vaccum to 100kPa					
	Filtration		30μm					
	Material		PVF					
Function plate ZR1-RV	Code	RV1	PV↔PS↔PD					
		RV2	PV↔PS/PD					
		RV3	PV/PS↔PD					
		RV4	PV/PS/PD					
Common specifications	Unit	Air supply port	Rc (PT) 1/8					
		Vacuum pad connection port	Rc (PT) 1/8					
	Manifold	Air supply port	Rc (PT) 1/8					
		Pilot valve connection port	M5					
		Release valve connection port	M5					
		Common exhaust port	Rc (PT) 1/2					
		External vacuum supply port	—					Rc (PT) 1/8

Refer to p.3.2-9 to 3.2-18 for further specifications of each unit.





Large Size Vacuum Module

Series ZR/Ejector System

How to Order

Note for model selection

Take function plates into consideration.
(Refer to p.3.2-7.)

Components

Ejector unit	Supply valve Self-holding	Vacuum switch unit	ZR1 20 S 1 K1 □ 5 M Z □ E C - Q
Ejector unit	Supply valve N.C.	Vacuum switch unit	ZR1 20 L 1 K2 □ 5 M Z □ E C - Q
Ejector unit		Vacuum switch unit	ZR1 20 S 1 E C - Q
Ejector unit		Filter unit	ZR1 20 L 1 F

Ejector unit nozzle dia.

10	1.0mm
13	1.3mm
15	1.5mm
18	1.8mm
20	2.0mm

Max. vacuum pressure

S	–84kPa
L	–53kPa

Ejector exhaust method

Symbol	Style	Unit	Manifold
1	Individual (built-in silencer)	●	●
2	Individual exhaust Rc(PT)1/8	●	●
3	Common exhaust	—	●

Combination of vacuum supply and release valve

Please refer to p.3.2-5.

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		W/o lead wire with connector

•Refer to p.3.2-5 for part no. of lead wire with connector.

Combination of vacuum switch/Suction filter

—	None
E	Vacuum switch + Suction filter
F	Suction filter

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.

Manual override

—	Non-locking push style
B	Locking slotted style

Rated voltage

—	Air operated
5	24V DC
6	12V DC
V	6V DC
S	5V DC
R	3V DC

Electrical entry

—	Air operated	
For 24, 12, 6, 5, 3V DC		
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

•Refer to p.3.2-5 for part no. of lead wire with connector.

Indicator light and surge voltage suppressor

—	None
Z	Indicator light and surge voltage suppressor (Connector style valve only)
S	With surge voltage suppressor

*S and Z are not available for grommet style (DC).
If the polarity is incorrect at DC (surge voltage suppressor), diode or switching element may be damaged.

① Combination of Supply Valve and Release Valve

Valve unit function			Valve unit components	
Operation stop	Vacuum adsorption	Vacuum release	Supply valve	Release valve
◎	◎	○	Double SOL. (VJ3233-X17)	N.C. (VJ3133)
○	○	○	N.C. (VJ3133)	N.C. (VJ3133)
○	○	○	Air operated (VJA3130)	Air operated (VJA3130)
×	○	○	N.C. (VJ3133)	
×	○	○	Air operated (VJA3130)	
×	○	○	N.O. (VJA3130)	
×	◎	◎	Double solenoid (VJ3233-X18)	
			—	

Symbol	Supply valve				Release valve			
	Solenoid valve			Air operated	Solenoid valve			Air operated
	Double SOL. (VJ3233-X17)	Double SOL. (VJ3233-X18)	N.C. (VL3130)	(VJA3130)	Double SOL. (VJ3233-X17)	Double SOL. (VJ3233-X18)	N.C. (VL3130)	(VJA3130)
K1	●	—	—	—	—	—	●	—
K2	—	—	●	—	—	—	●	—
K3	—	—	—	●	—	—	—	●
C1	—	—	●	—	—	—	(Common with supply valve)	—
C2	—	—	—	●	—	—	—	(Common with supply valve)
C3	—	—	●	—	—	—	(Common with supply valve)	—
C4	—	●	—	—	—	(Common with supply valve)	—	—
—	Without valve unit							

◎: Possible ○: Possible with limitations (W/o self holding function) ×: Not Possible

②How to Order Valve Plug Connector Ass'y

DC

VJ10 — 20 — 4A — □

Lead wire length

—	300mm (standard)
6	600mm
10	1000mm
15	1500mm
20	2000mm
25	2500mm
30	3000mm

How to Order

When requiring a vacuum unit equipped with valves with lead wires of 600mm or more, specify the vacuum module valves without the standard connectors and order the required connector ass'ys separately.

Example) ZR120S1-K15M□Z-EC ····· 1 pc.

∗VJ10-20-4A-6 ····· 2 pcs.

③Vacuum Switch Plug Connector Ass'y

ZS — 10 — 5A — □

Lead wire length

—	0.6mm
30	3mm
50	5mm

How to Order

When requiring a vacuum switch with a lead wire of 5m, indicate the part numbers of the vacuum unit switch without a lead wire connector and the 5m lead wire connector separately.

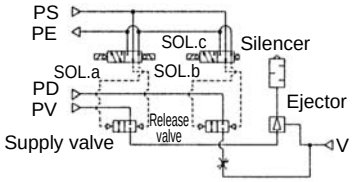
Example) ZR1□□□-□□□□□-□CN ····· 1 pc.

∗ZS-10-5A-50 ····· 1 pc.

Ejector System/Combination of supply valve and release valve

Combination symbol: K1

Feature: Double solenoid supply valve allows for self-holding.

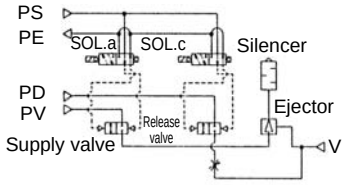


How to operate

Pilot valve operation / Operation	Supply valve		Release valve	Note
	SOL.a	SOL.b	SOL.c	
1. Adsorption	ON	OFF	OFF	The supply valve will hold the operation even during stoppage of power supply.
2. Vacuum release	OFF	ON	ON	
3. Stop operation	OFF	ON	OFF	

Combination symbol: K2

Feature: Single solenoid valve is provided for supply valve.

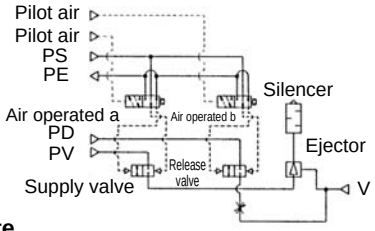


How to operate

Pilot valve operation / Operation	Supply valve	Release valve	Note
	SOL.a	SOL.c	
1. Adsorption	ON	OFF	When power supply is stopped, all operations will be stopped.
2. Vacuum release	OFF	ON	
3. Stop operation	OFF	OFF	

Combination symbol: K3

Feature: Operation can be controlled by an external pilot valve.



How to operate

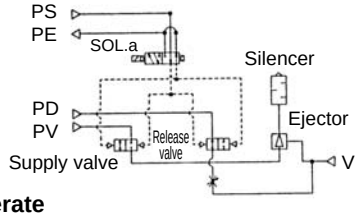
Pilot valve operation / Operation	Supply valve	Release valve	Note
	Air operated a	Air operated b	
1. Adsorption	ON	OFF	Suitable when solenoid valves cannot be used or for centralized control using external pilot air.
2. Vacuum release	OFF	ON	
3. Stop operation	OFF	OFF	

Caution

When pipe connection is made to one port connection (PV port) only, use a function plate (ZR1-RV1). Refer to p.3.2-7 for further information.

Combination symbol: C1

Feature: Adsorption of workpieces (when energized) and release of vacuum (when de-energized) are switched by the single solenoid valve.

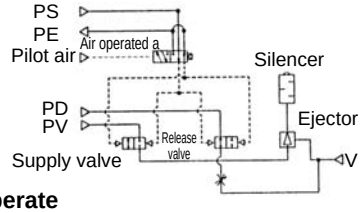


How to operate

Pilot valve operation / Operation	Supply valve/Release valve	Note
	SOL.a	
1. Adsorption	ON	Be careful for blow off of workpieces or displacement of adsorption position in case of small and/or lightweight workpieces.
2. Vacuum release	OFF	

Combination symbol: C2

Feature: Adsorption of workpieces and release of vacuum are switched by external pilot valve.

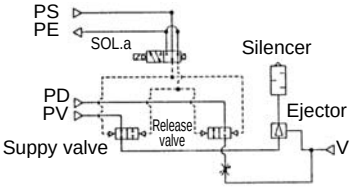


How to operate

Pilot valve operation / Operation	Supply valve/Release valve	Note
	Air operated a	
1. Adsorption	ON	Be careful for blow off of workpieces or displacement of adsorption position in case of small and/or lightweight workpieces.
2. Vacuum release	OFF	

Combination symbol: C3

Feature: Adsorption of workpieces (when de-energized) and release of vacuum (when energized) are switched by single solenoid valve.

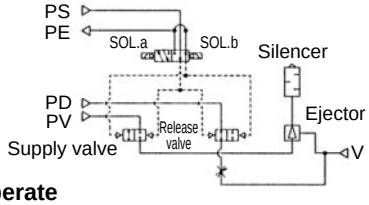


How to operate

Pilot valve operation / Operation	Supply valve/Release valve	Note
	SOL.a	
1. Adsorption	OFF	Be careful for blow off of workpieces or displacement of adsorption position in case of small and/or lightweight workpieces.
2. Vacuum release	ON	

Combination symbol: C4

Feature: Adsorption of workpieces and release of vacuum are switched by double solenoid valve.



How to operate

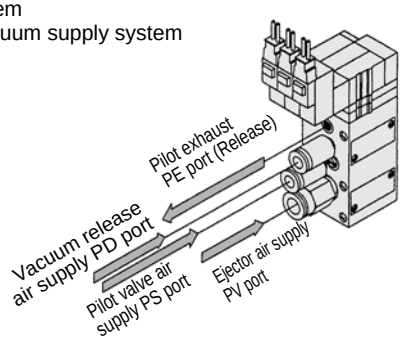
Pilot valve operation / Operation	Supply valve/Release valve		Note
	SOL.a	SOL.b	
1. Adsorption	ON	OFF	When power supply is stopped supply valve/vacuum release valve will hold the operation.
2. Vacuum release	OFF	ON	

Function Plate/ZR1-RV□

A function plate is used when each connecting port for the valve unit is common. If a function plate is not used (standard), make individual pipe connections to PV, PS, and PD ports respectively.

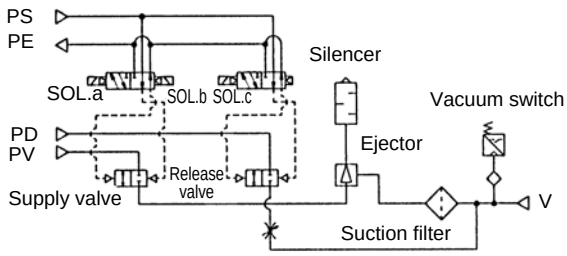
Without Function Plate (Standard)

Applicable system: Ejector system
External vacuum supply system



Pipe connection

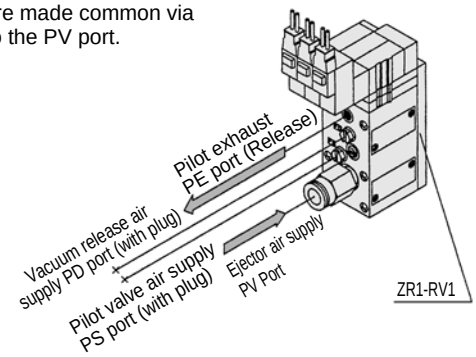
Internal circuit



With Function Plate/Applicable to Ejector System Only

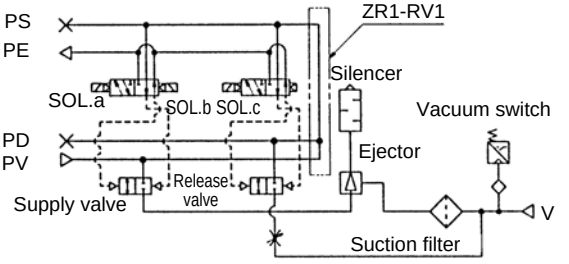
When ZR1/RV1 (PV ⇔ PS ⇔ PD) is Selected

Since PV, PS and PD ports are made common via the function plate, pipe only to the PV port.



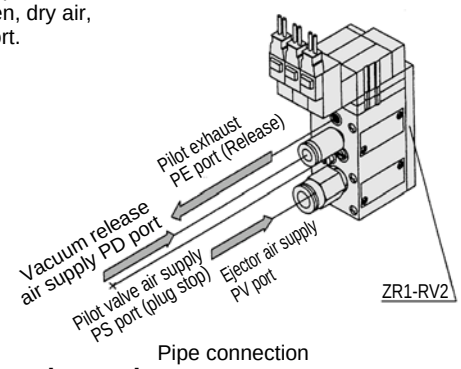
Pipe connection

Internal circuit



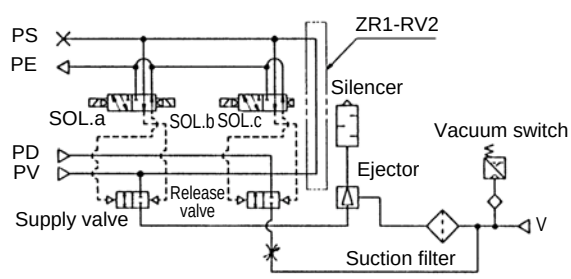
When ZR1/RV2 (PV ⇔ PS/PD) is Selected

When the work should be kept clean or contaminant-free, it is possible to use a nitrogen, dry air, etc. connection to the PD port.



Pipe connection

Internal circuit



How to Order Function plate unit

ZR1—RV 1

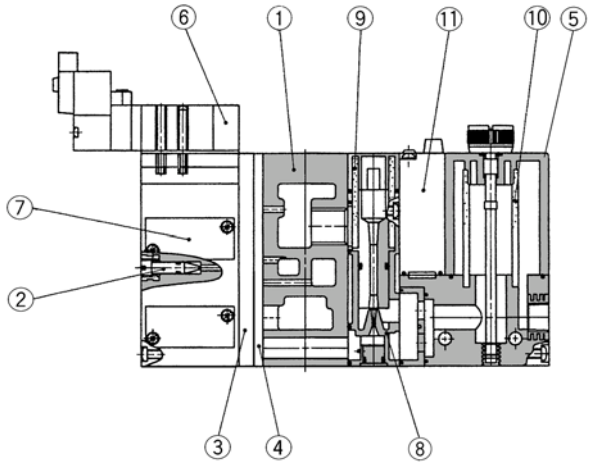
Pipe specifications

Symbol	Indication	PV port	PS port	PD port
1	PV↔PS↔PD	Common		
2	PV↔PS/PD	Common		Individual

How to Order

Indicate the model numbers of the vacuum module and the function plate.

Construction



Component Parts

No.	Description	Material	Note
①	Manifold base	Aluminum	
②	Release flow adjusting needle	Stainless steel	
③	Function plate	PBT	→ Refer to p.3.2-7
④	Individual spacer	PBT	→ Refer to p.3.2-22
⑤*	Filter case	Polycarbonate	

* Precautions on handling the filter case
1)The case is made of polycarbonate. Therefore, do not use 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.
2)Do not expose it to direct sunlight.

Replacement Parts

No.	Description	Material	Parts No.
⑥	Pilot valve ass'y	—	→Refer to below table①.
⑦	Valve body ass'y	—	→Refer to below table②.
⑧	Ejector ass'y	—	→Refer to below table③.
⑨	Silencer element	PVF	→Refer to below table④.
⑩	Filter element	PVF	ZR1-FZ (30μm)
⑪	Vacuum switch	—	ZSE2-OR-15-□

①How to Order Pilot Valve

Combination symbol	Components: Supply valve	Components: Release valve	Model
K1	Solenoid valve Double solenoid N.C. (VJ3233)	Solenoid valve Single solenoid N.C. (VJ3133)	→Refer to "How to Order" below ZR1-VJ3233-□□□□-X17
C4	Solenoid valve Double solenoid N.O. (VJ3233)	Solenoid valve Double solenoid N.O. (VJ3233)	→Refer to "How to Order" below ZR1-VJ3233-□□□□-X18
K3	Air operated valve N.C. (VJA3130)	Air operated valve N.O. (VJA3130)	ZR1-VJA3130

How to Order Solenoid Valve/Air Operated Valve

Air operated valve

ZR1−VJA3130

Solenoid valve

ZR1−VJ3233 □ − 5 M Z □ − X17 X18 - Q

- Pilot valve
- Rated voltage
- Electrical entry
- Indicator light and surge voltage suppressor
- Manual override

∗Refer to p.3.2-4 for detailed specifications of each code.

②How to Order Valve Body Assembly

ZR1−VD K1 □ 5 M Z □ - Q

- Combination of supply valve and release valve
- Pilot valve
- Rated voltage
- Electrical entry
- Indicator light and surge voltage suppressor
- Manual override

∗Refer to p.3.2-4 for detailed specifications of each code.

③How to Order Ejector Assembly

ZR1−WD 10 S 1

Ejector nozzle dia.

10	1.0mm
13	1.3mm
15	1.5mm
18	1.8mm
20	2.0mm

Max. vacuum pressure

S	–84kPa
L	–53kPa

Ejector exhaust method

1	Built-in silencer
2	Individual exhaust
3	Common exhaust

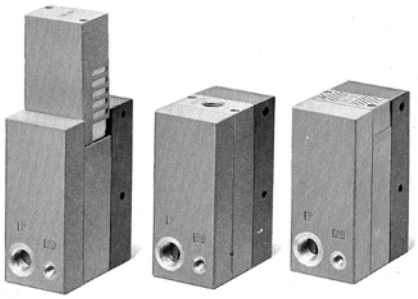
④How to Order Silencer Element

ZR1− SZ 10

Ejector nozzle dia.

10	1.0mm
13	1.3mm
15	1.5mm
18	1.8mm
20	2.0mm

Ejector Unit/Series ZR1



Max. Vacuum Pressure – 84kPa (S: Standard)/Model

Model	Nozzle dia. ø(mm)	Max.suction flow (ℓ/min)	Air consumption (ℓ/min)	Weight(with bracket) (kg)
ZR1-W10S□	1.0	22	46	0.132
ZR1-W13S□	1.3	38	78	0.134
ZR1-W15S□	1.5	54	95	0.136
ZR1-W18S□	1.8	62	150	0.154
ZR1-W20S□	2.0	84	185	0.156

Max. Vacuum Pressure – 53kPa (L: Large flow)/Model

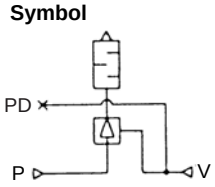
Model	Nozzle dia. ø(mm)	Max.suction flow (ℓ/min (ANR))	Air consumption (ℓ/min (ANR))	Weight(with bracket) (kg)
ZR1-W10L□	1.0	42	46	0.133
ZR1-W13L□	1.3	52	78	0.133
ZR1-W15L□	1.5	74	95	0.135
ZR1-W18L□	1.8	88	150	0.155
ZR1-W20L□	2.0	105	185	0.154

Common Specifications

Max. operating pressure	0.7MPa
Supply pressure range	0.2 to 0.55MPa
Standard supply pressure	0.45MPa
Operating temperature range	5 to 50°C
Model* (Ejector exhaust method)	Code 1: Built-in silencer - for unit and manifold
	Code 2: Individual exhaust - for unit and manifold
Standard accessory	Bracket

* How to Order: Code 1 and 2 are the suffixes in the ordering number to indicate the exhaust method.
Note) If not operating within the specified range of pressure and temperature, trouble may result.

Symbol



How to Order

ZR1−W 20 S 1

Ejector nozzle dia.

10	1.0mm
13	1.3mm
15	1.5mm
18	1.8mm
20	2.0mm

Max. vacuum pressure

S	–84kPa
L	–54kPa

Ejector exhaust method

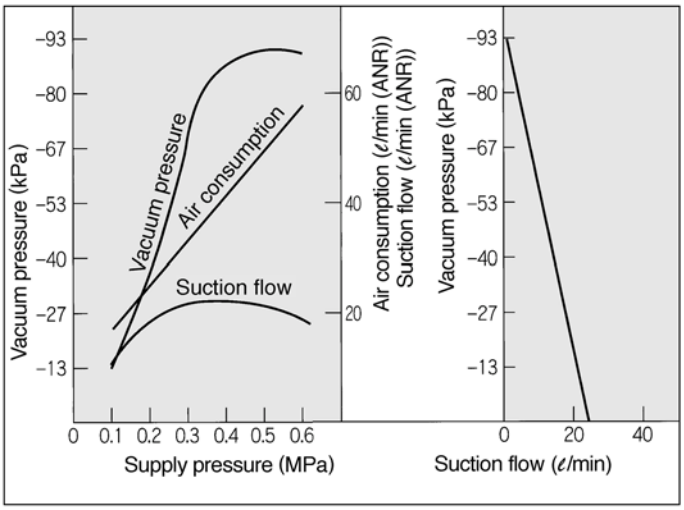
1	Built-in silencer
2	Individual exhaust*

*Port size: RC(PT)1/8 (Nozzle dia. 1.0 to 1.5mm)
RC(PT)1/4 (Nozzle dia. 1.8 to 2.0mm)

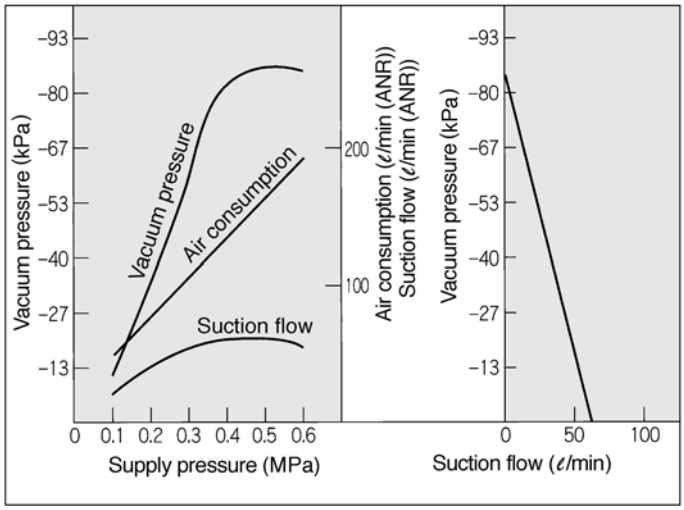
Ejector Unit/Standard (S): Max. Vacuum Pressure – 84kPa

At 0.45MPa

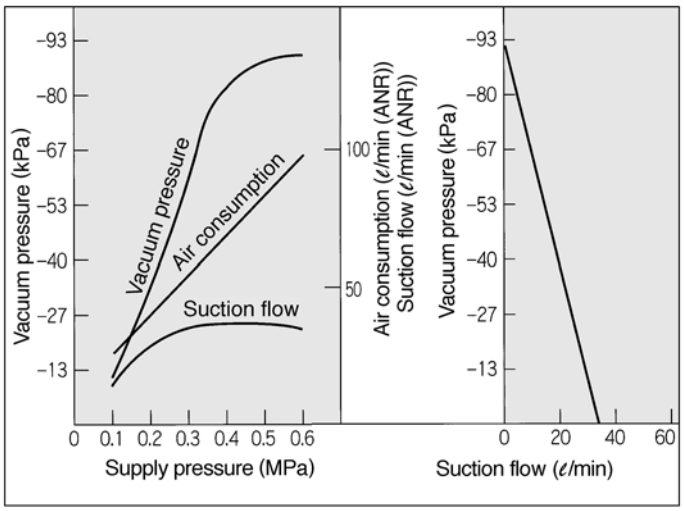
ZR1-W10S1



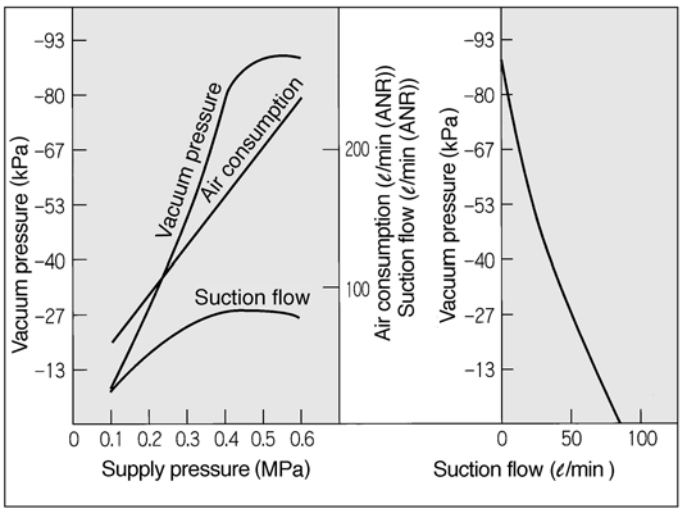
ZR1-W18S1



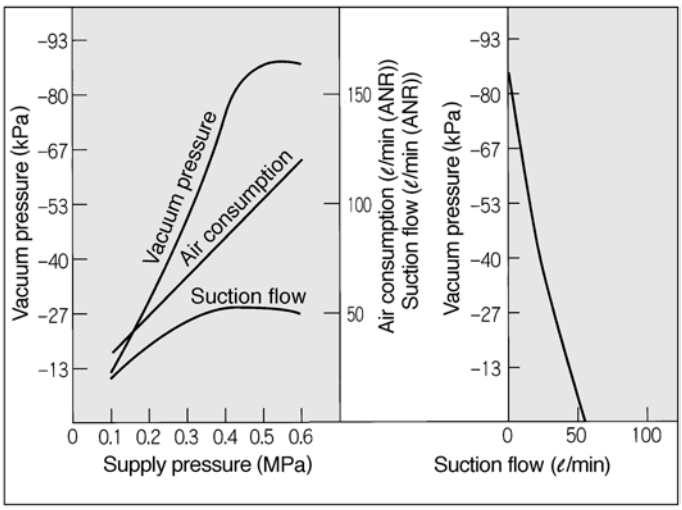
ZR1-W13S1



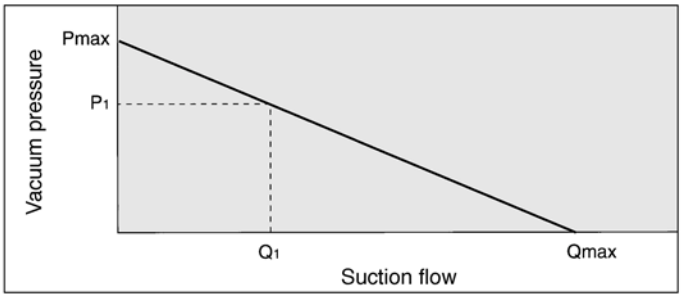
ZR1-W20S1



ZR1-W15S1



How to Read Graphs



Flow characteristics are expressed in ejector vacuum pressure and suction flow. If suction flow rate changes, the vacuum pressure will also change. Normally this relationship is expressed in ejector standard use. In graph, Pmax is max. vacuum pressure and Qmax is max. suction flow. The values are specified according to catalog 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)

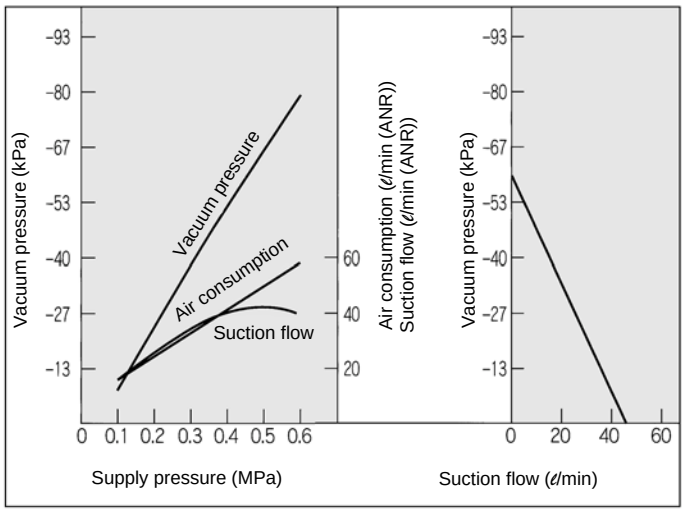
③When suction port is opened further, suction flow moves to maximum value (Qmax), but vacuum pressure is near 0 (atmospheric pressure).

When vacuum port (vacuum piping) has no leakage, vacuum pressure becomes maximum, and vacuum pressure decreaes 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.

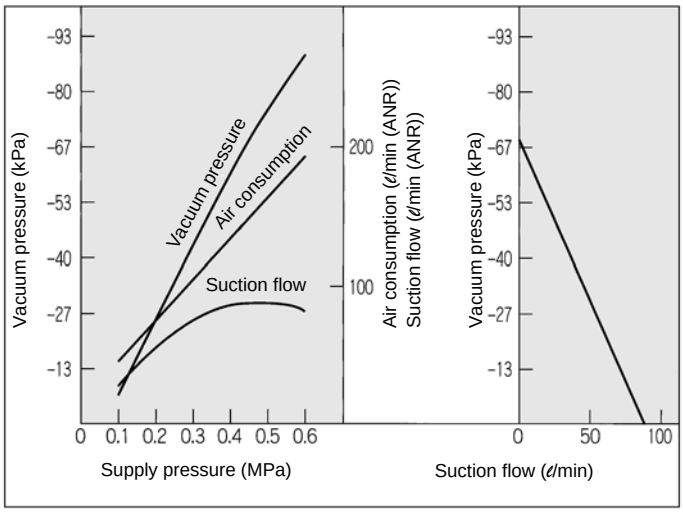
Ejector Unit/Large Flow Style (L): Max. Vacuum Pressure – 53kPa

At 0.45MPa

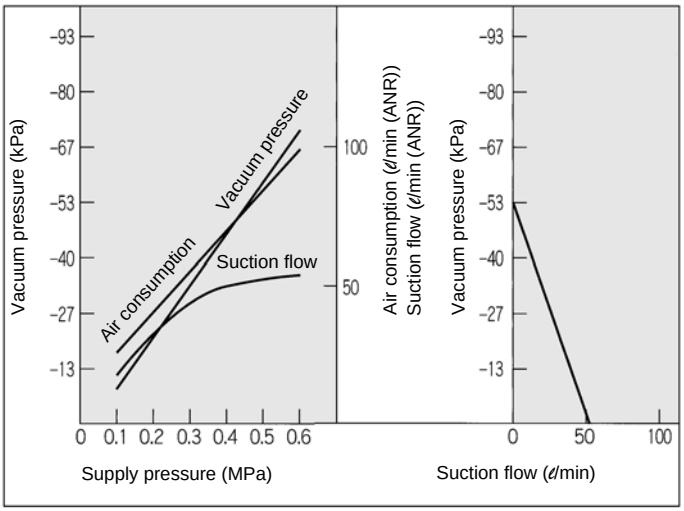
ZR1-W10L1



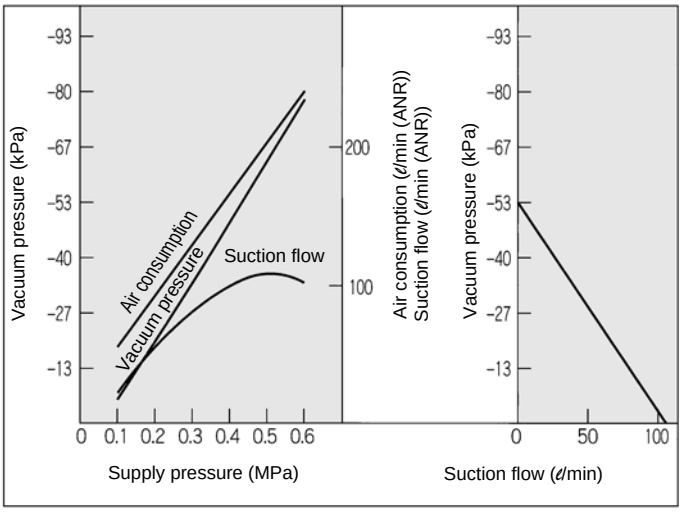
ZR1-W18L1



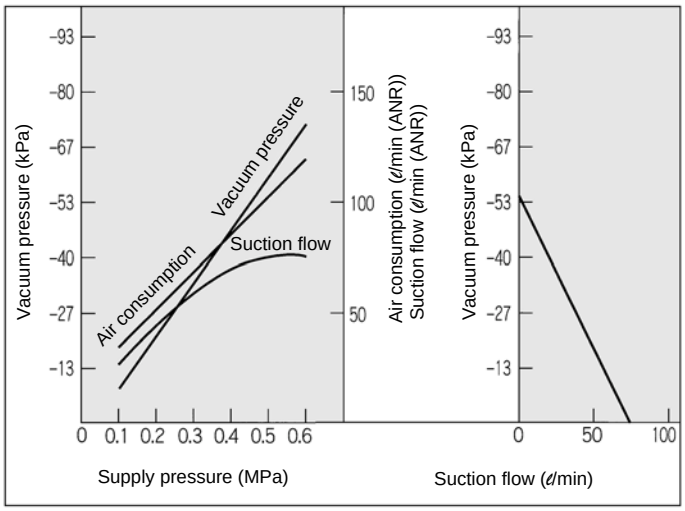
ZR1-W13L1



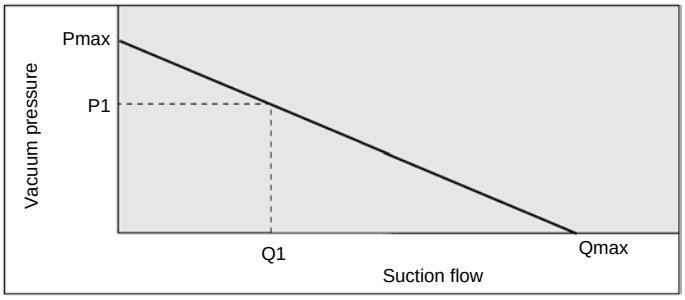
ZR1-W20L1



ZR1-W15L1



How to Read Graphs



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

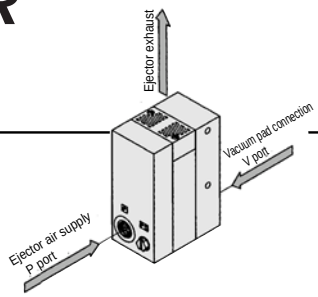
①When ejector suction port is covered and made airtight, suction flow becomes 0 and vacuum pressure is at maximum value (Pmax).

②When suction port is opened gradually, air can flow through, (air leakage), suction flow increases, but vacuum pressure decreaes. (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).

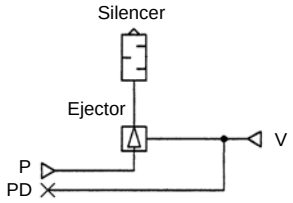
When vacuum port (vacuum piping) has no leakage, vacuum pressure becomes maximum, and vacuum pressure decreases as leakage increases. When leakage value is the same as max. suction flow, vacuum pressure is near 0. In the case when ventirative or leaky work should be adsorbed, please note that vacuum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

Ejector Unit



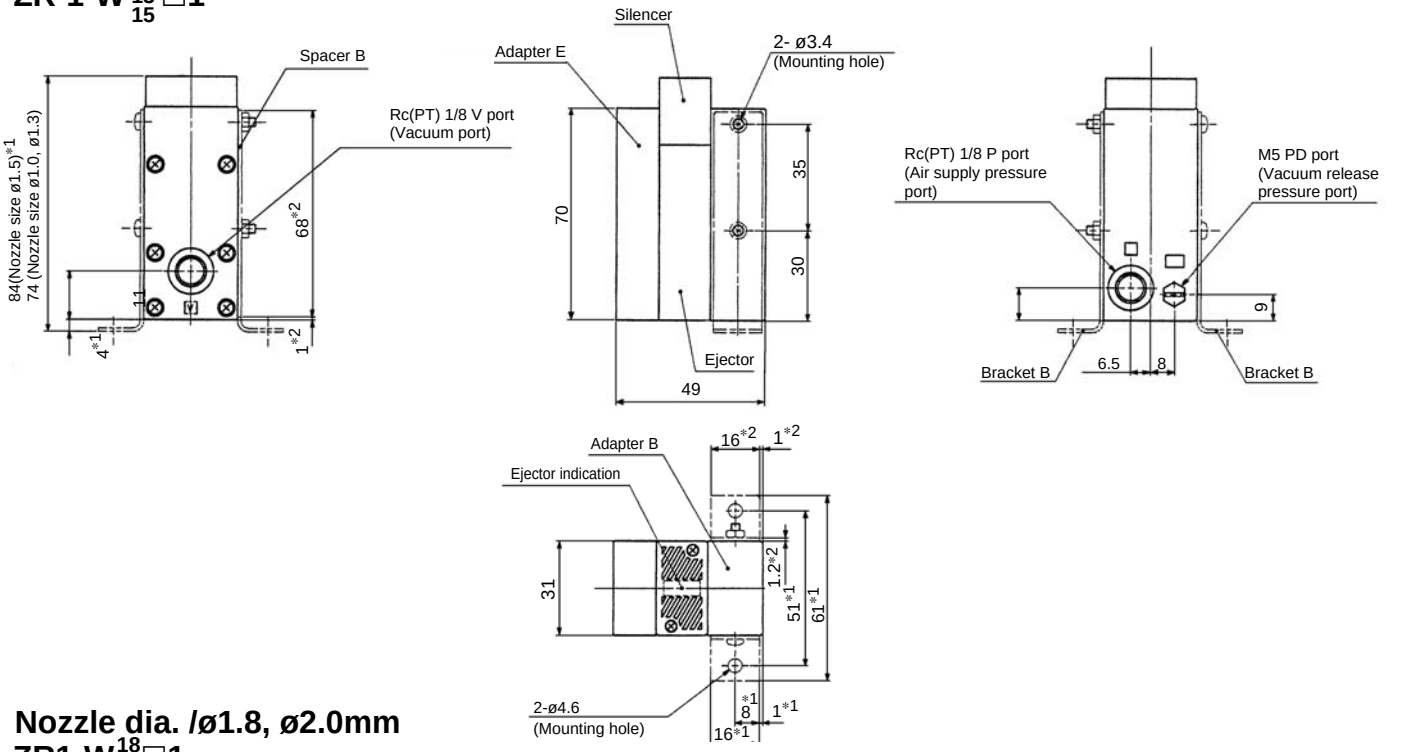
Nozzle Dia. /ø1.0, ø1.3, ø1.5, ø1.8, ø2.0mm

Internal circuit



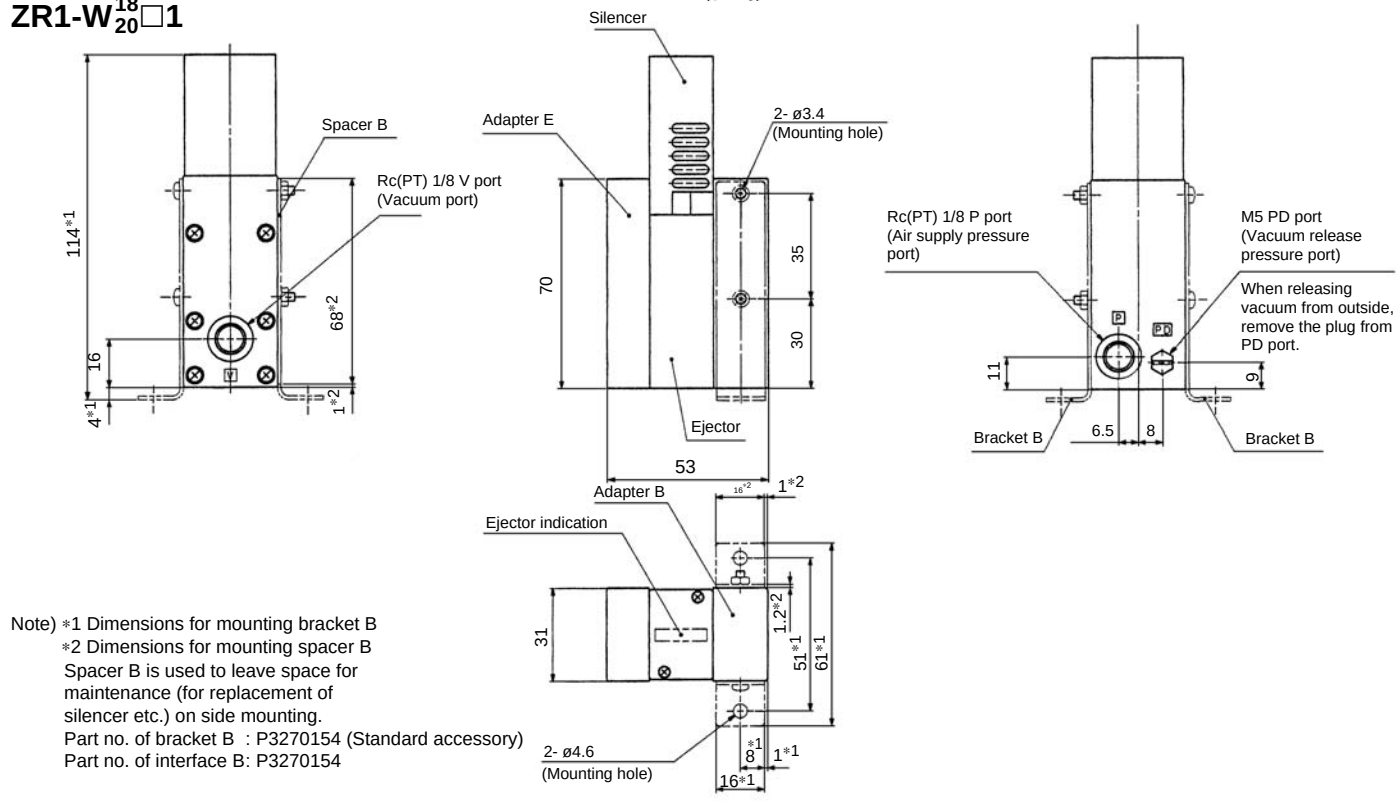
Nozzle dia. /ø1.0, ø1.3, ø1.5mm

ZR-1-W$^{10}_{13}_{15}$□1



Nozzle dia. /ø1.8, ø2.0mm

ZR1-W$^{18}_{20}$□1

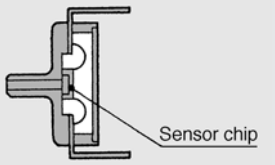


Note) ∗1 Dimensions for mounting bracket B
∗2 Dimensions for mounting spacer B
Spacer B is used to leave space for maintenance (for replacement of silencer etc.) on side mounting.
Part no. of bracket B : P3270154 (Standard accessory)
Part no. of interface B: P3270154

Vacuum Pressure Switch Unit: ZSE2-0R-15□

Quick response/10mS
Compact size/39H X 20W X 15D
Improved wiring/connector style
Diffusion style semiconductor based pressure sensor

Pressure detector
(Silicon diffusion style semiconductor)



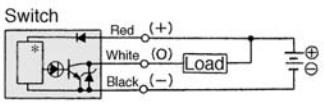
Specifications

Vacuum switch model No.	**ZSE2-0R-15□**
Fluid	Air
Setting pressure range	0 to 101kPa
Hysteresis	3% or less
Temperature characteristics	±3% Full span (5 to 40°C) ±5% Full span (0 to 60°C)
Operating voltage	12 to 24V DC (Ripple ±10% or less)
Output	Open collector 30V, 80mA
Operating indicator	Light when output is ON
Current consumption	17mA or less (24V DC at ON)
Max. operating pressure	0.2MPa*
Operating temperature range	5 to 50°C

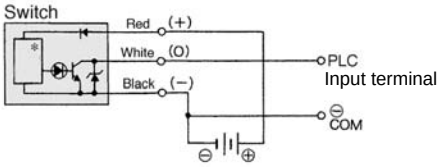
*When using ejector system, instantaneous pressure up to 0.5MPa will not damage the switch.
Note) If not operating within the specified range of pressure and temperature, trouble may result.

Wiring

ZSE2 connection



Connection with PLC At negative COM terminal



* Switch Main circuit

How to Order

ZSE2 — 0R — 15 L - Q

Switch specification/ Voltage
Solid state/12 to 24V DC

Vacuum switch electrical entry

—	Grommet style	Lead wire length 0.6m
L		Lead wire length 3m
C	Connector style	Lead wire length 0.6m
CL		Lead wire length 3m
CN		Without lead wire

How to Order Connector Assembly

● **Without lead wire (housing and 3 sockets)**····· ZS-10-A
● **With lead wire**····· ZS-10-5A-

Note) When requiring a switch with lead wire of 5m, indicate separately the model numbers of the connector type switch without lead wire and the connector assembly with 5m lead wire.

Lead wire length

—	0.6m
30	3m
50	5m

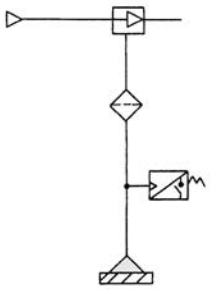
Example) ZSE2-0R-15CN ····· 1 pc.
ZS-10-5A-50····· 1 pc.

Vacuum Pressure Switch Unit: ZSE2-0R-15□

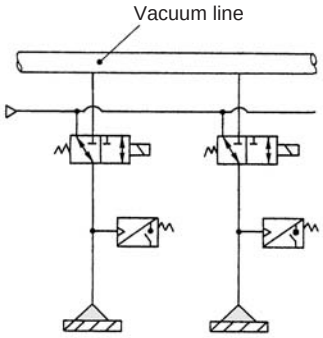
Guidelines for Use of Vacuum Switch Unit

System circuit for work adsorption

Ejector style

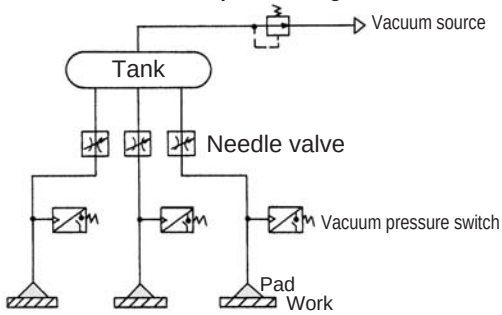


External vacuum supply style



One vacuum source with multiple outlets
When pads and switches are common to one vacuum source, sometimes there is a possibility, depending on the number of adsorption and non-adsorption applications at each point in time, that the switches will not work within the range of set pressures due to pressure variations from the vacuum source. In particular, when small diameter nozzles are used for adsorption, the switches are greatly influenced by pressure variations. In order to remedy this situation, the following circuit is recommended.

Vacuum pressure regulator

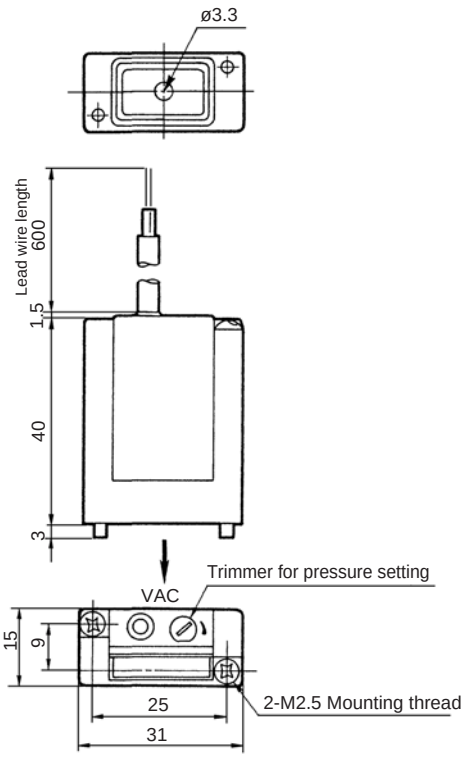


- Reduce pressure variation by means of needle valve, throttling it to some extent.
- Install tank, and vacuum pressure regulator (T203 Series) to stabilize vacuum source pressure.
- Sometimes it may be necessary to install individual vacuum switching valves to each nozzle supply line to isolate a line if an error occurs (e.g., incomplete adsorption) thus preventing other apparatus from being influenced by the reduction of vacuum pressure.

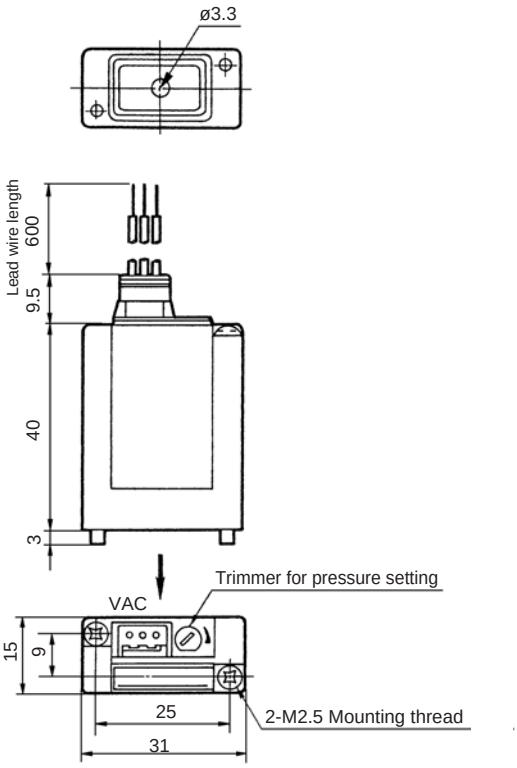
Setting pressure
When it is used for work adsorption, set the pressure so that adsorption in complete and reliable. Sometimes the switch will turn ON even when adsorption is not complete.

Vacuum Pressure Switch/ZSE2-0R-15□

ZSE2-0R-15
ZSE2-0R-15L

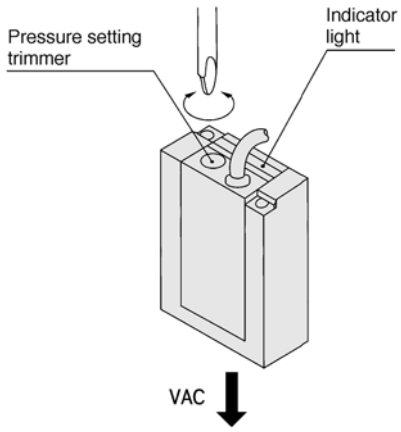


ZSE2-0R-15C
ZSE2-0R-15CL
ZSE2-0R-15CN

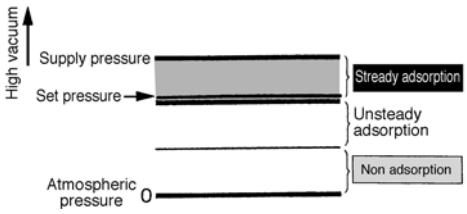


How to Set Vacuum Pressure

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

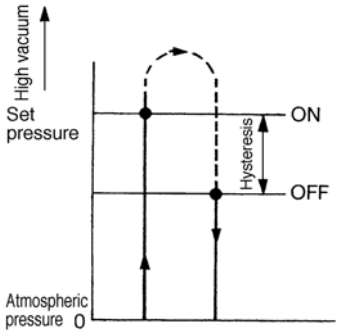


● When using the switch to confirm correct adsorption, the set pressure should be as low as possible, but not so low that a false confirmation signal is given when adsorption is incomplete.



Hysteresis

Hysteresis is the actual pressure variance from set pressure occuring when the output signal turns from ON to OFF. The set pressure is the pressure selected to switch from OFF to ON mode.

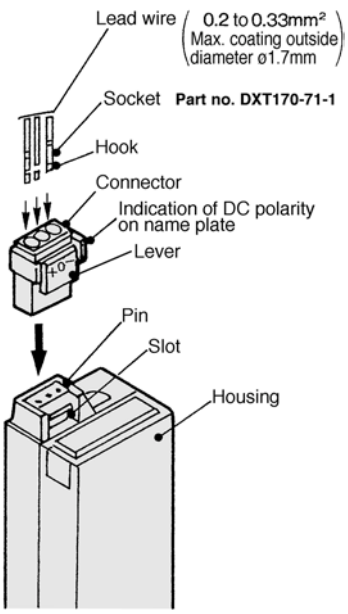


How to Use Connector

① Connection

● When assembling the connector to the switch housing, push the connector straight onto the pins until the level locks into the housing slot.

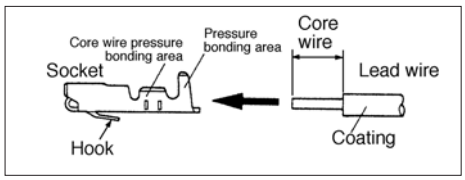
● When removing the connector from the switch housing, push the lever down to unlock it from the slot and then withdraw the connector straight off of the pins.



② Press bonding socket to lead wire

Strip the end of the lead wire 3.2 to 3.7mm long, put wire into socket taking care to prevent the lead wire insulation from entering the core wire pressure bonding area, press bond using press bonding tool.

(Press-bonding tool: Part No. DXT170-75-1)



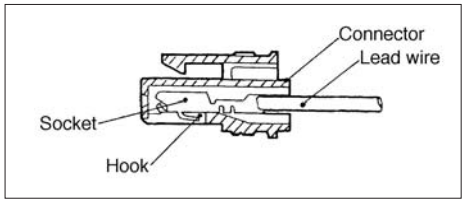
③ Assembly of socket to connector with lead wire

● Assembling

Push socket into hole in connector until the hook of the socket locks into the connector. (The socket hook will spring open inside the connector.) Gently pull lead wire back to confirm that socket is locked in position.

● Disassembling

When disassembling socket from connector, push the hook of the socket down with a small diameter instrument (about 1mm). Pull socket out by means of the lead wire. If the socket is to be re-used, bend the hook of the socket out to its original position before re-assembling.



⚠ Precautions

Be sure to read before handling. Refer to p.0-20 and 0-21 for Safety Instruction and common precautions and refer to p.3.0-2 for precautions on every series.

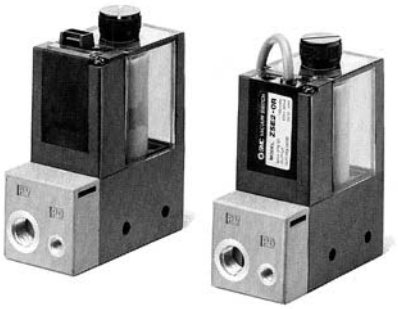
Mounting

⚠ Warning

Refer to technical data on Best Pneumatics 3 for precautions on the vacuum circuit.

Vacuum Switch + Suction Filter Unit/ZR1-F□□

Combination unit of vacuum pressure switch for vacuum pressure detection and suction filter to protect the unit from dust and contamination.



Specifications

Unit model No.		ZR1-F□□
Suction filter	Operating press range	Vacuum to 100kPa
	Operating temp range	5 to 50°C
	Filtration	30μm
Filtration material		PVF
Vacuum pressure range		Refer to vacuum switch on p.3.2-13
Standard accessory		Bracket A

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

Combination of Vacuum Switch + Suction Filter

Combination symbol	Suction filter	Vacuum switch	Weight (with bracket A) kg
E	●	●	0.15
F	●	None*	0.15

* Adapter A is attached on vacuum switch mounting area.

How to Order

ZR1 — F [E] [L]

Combination of vacuum switch + suction filter

Symbol	Components
E	Vacuum switch + Suction filter
F	Suction filter

Vacuum switch electrical entry

—	Grommet style	Lead wire length 0.6m
L		Lead wire length 3m
C	Connector style	Lead wire length 0.6m
CL		Lead wire length 3m
CN*		W/o lead wire

* Refer to below ① for model No. of lead wire with connector.

How to Order
When requiring a switch with lead wire of 5m, indicate separately the model numbers of the vacuum switch unit without a lead wire connector and the 5m lead wire connector.

Ex.) ZR1□□□-□□□□□-□CN ····· 1 pc.
ZS-10-5A-50 ····· 2 pcs.

①Lead wire length for vacuum switch connector ass'y

ZS — 10 — 5A — □

Lead wire length

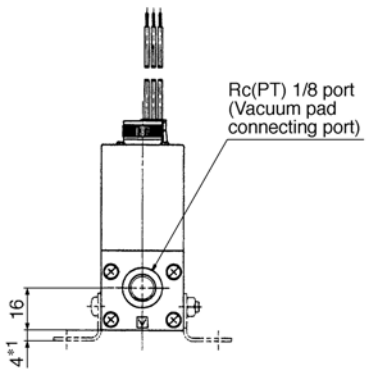
—	0.6m
30	3m
50	5m

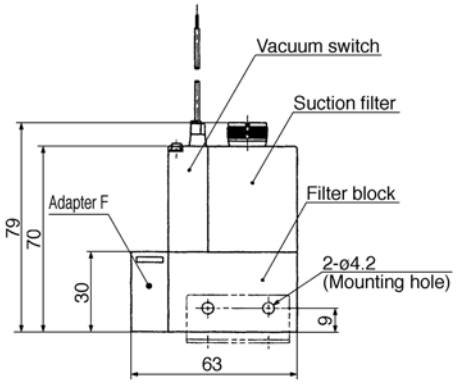
Precautions on handling the filter case

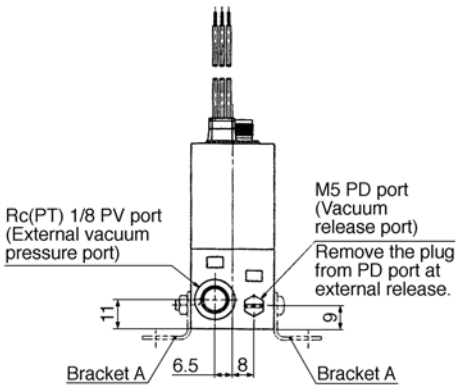
⚠ Caution

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.

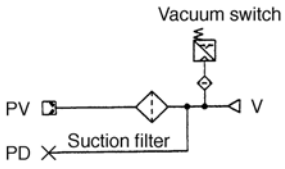
Dimensions/ZR1-F□□

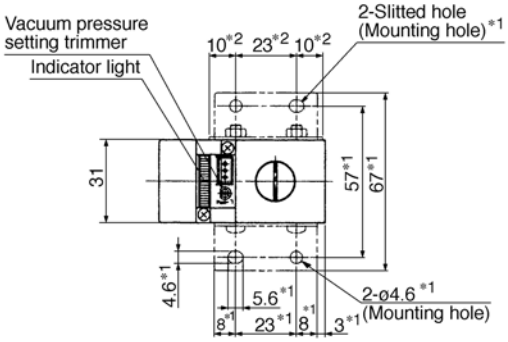




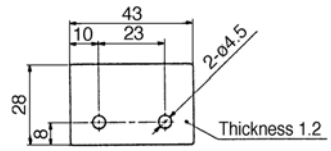


System circuit





Spacer A

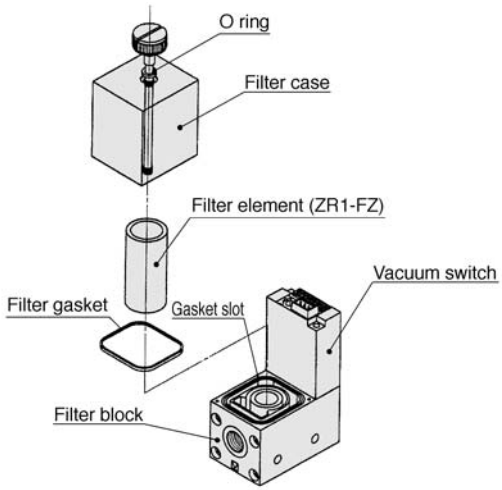


Spacer A is used to leave space for maintenance (for replacement of filter element etc.) on side mounting.

Note) ∗1 Dimensions for mounting bracket A
∗2 Dimensions for mounting spacer A
Bracket A part no. : P3270153 (Standard accessory)
Spacer A part no. : P3270156

Replacement of Element

Replacement of element (filter)
When the element becomes clogged, adsorption performance and response times are degraded. Stop operation and replace element. (Element part no. ZR1-FZ). Please ensure that gasket is in slot before re-installation.



Suction Filter/ZR1-FX

ZR1-FX is to be used alone and cannot be combined with other units.

Specifications

Model	ZR1-FX
Operating pressure range	Vacuum to 0.5MPa
Operating temperature range	5 to 50°C
Filtration	30μm
Filter material	PVF
Weight (with bracket)	0.1kg

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

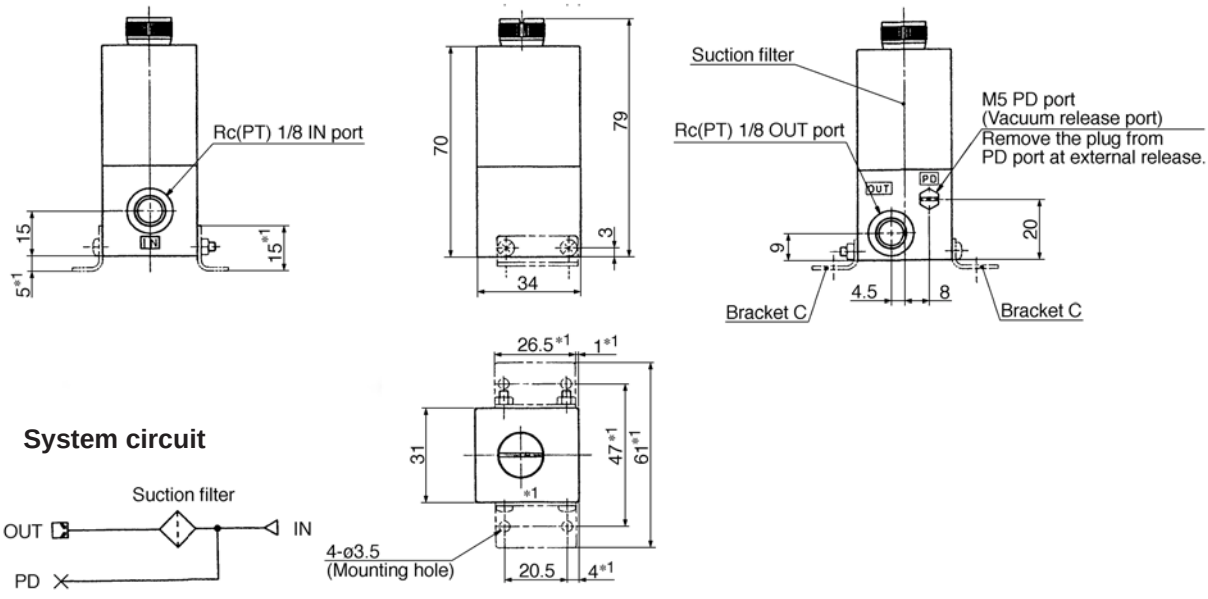
Precautions on handling the filter case

⚠ 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.

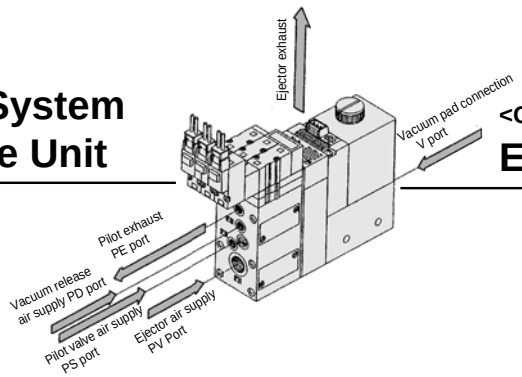
Dimensions/ZR1-FX



System circuit

Note) ∗1 Dimensions for mounting bracket C
Bracket C part no. : P3270155

Ejector System Complete Unit

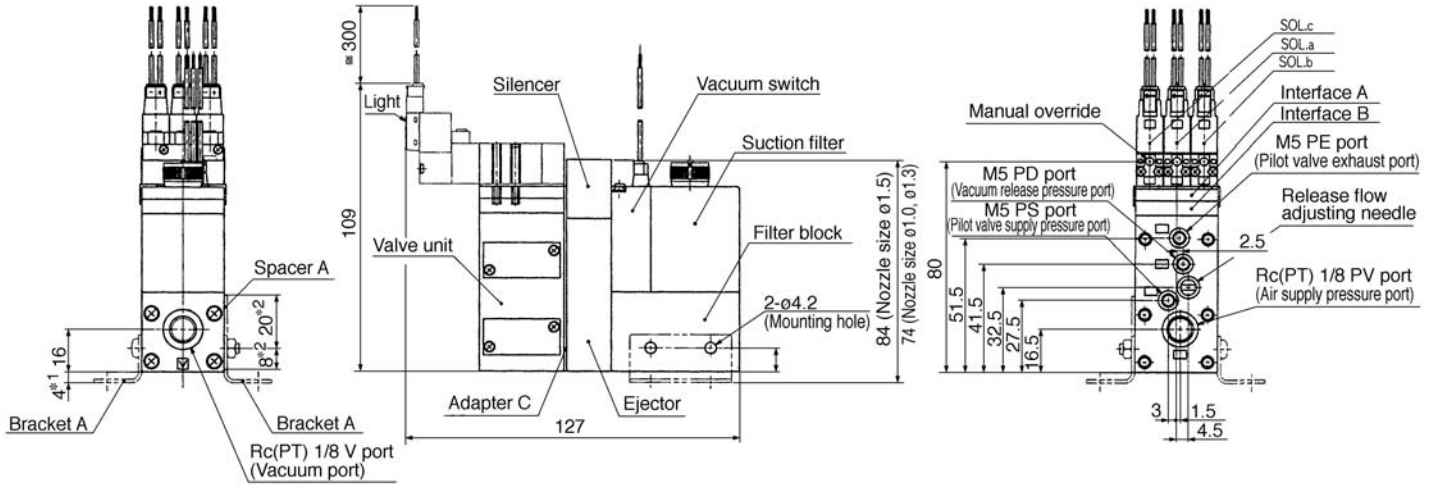


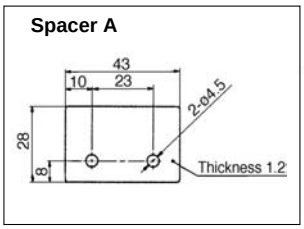
<Components>

Ejector + Valve + Vacuum Switch + Filter

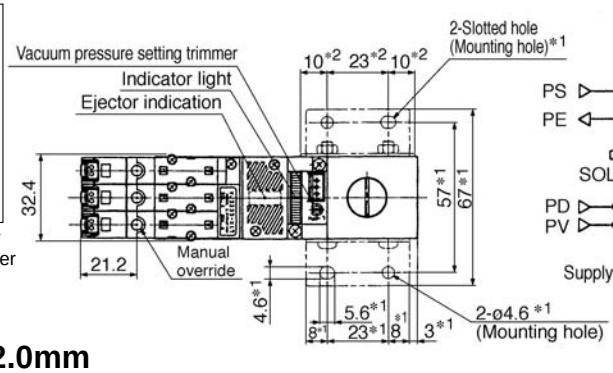
Nozzle dia. /ø1.0, ø1.3, ø1.5mm

ZR1$^{10}_{13}_{15}$□1-K1□M□□-□□

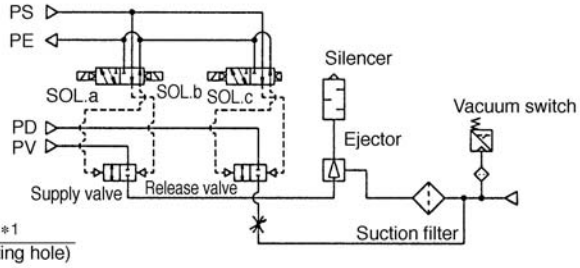




Spacer A is used to leave space for maintenance (for replacement of filter element etc.) on side mounting.

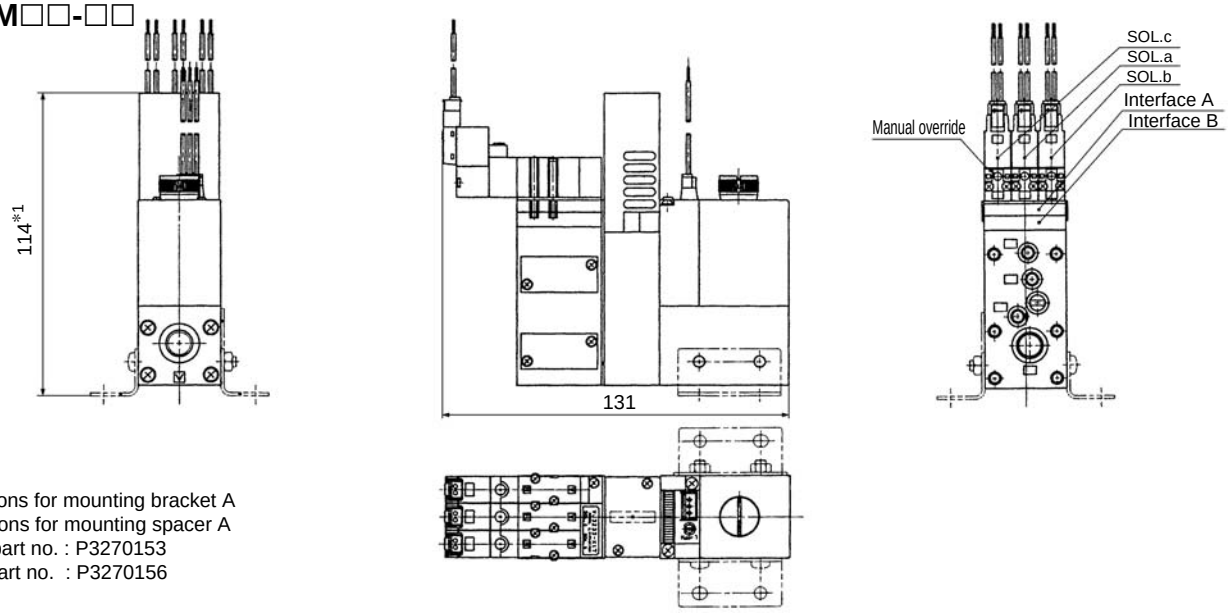


System circuit



Nozzle dia. /ø1.8, ø2.0mm

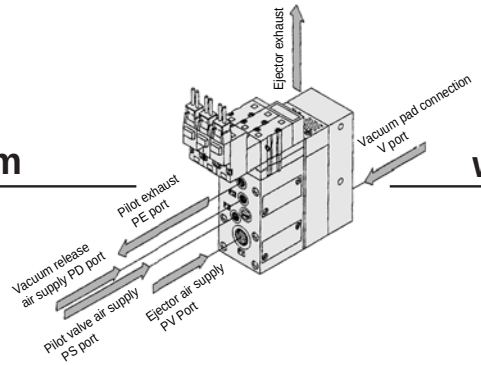
ZR1$^{18}_{20}$□1-K1□M□□-□□



Note) ∗1 Dimensions for mounting bracket A
∗2 Dimensions for mounting spacer A
Bracket A part no. : P3270153
Spacer A part no. : P3270156

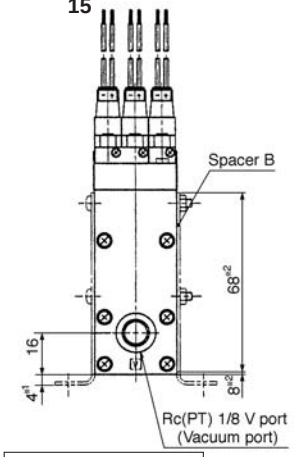
★Dimensions not indicated are identical to the top drawing.

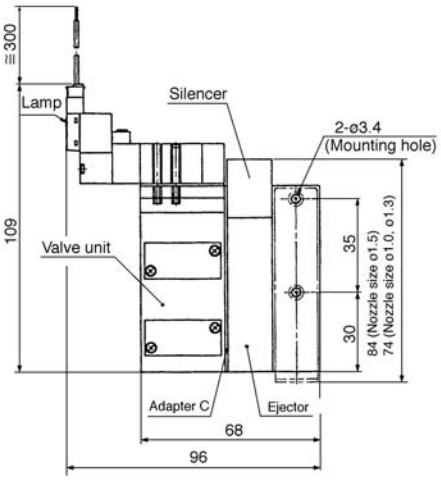
Ejector System with Valve

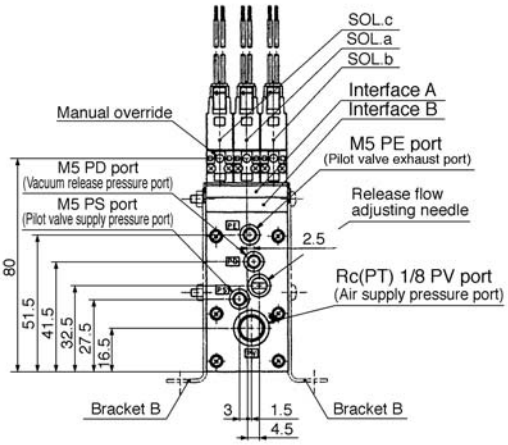


Nozzle dia. /ø1.0, ø1.3, ø1.5mm

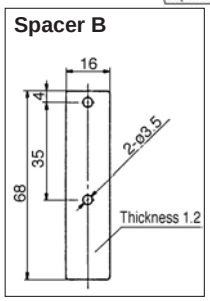
ZR1$^{10}_{13}_{15}$□1-K1□M□□□



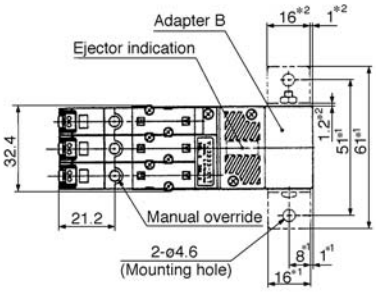




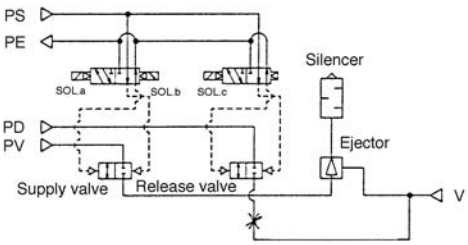
Spacer B



Spacer B is used to leave space for maintenance (for replacement of filter element etc.) on side mounting.



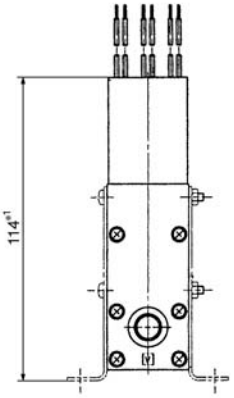
System circuit

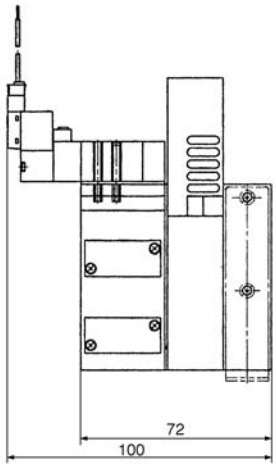


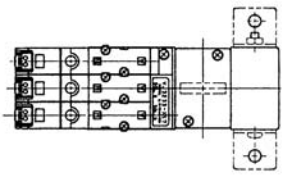
Note) ∗1 Dimensions for mounting bracket B
∗2 Dimensions for mounting spacer B
Bracket B part no. : P3270154 (Standard accessory)
Spacer B part no. : P3270157

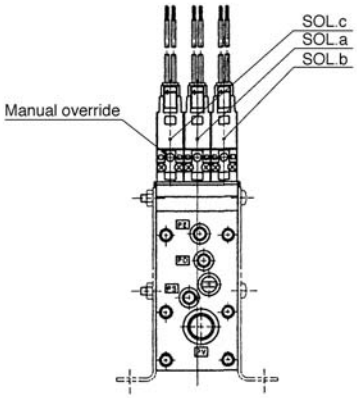
Nozzle dia. /ø1.8, ø2.0mm

ZR1$^{18}_{20}$□1-K1□M□□-□



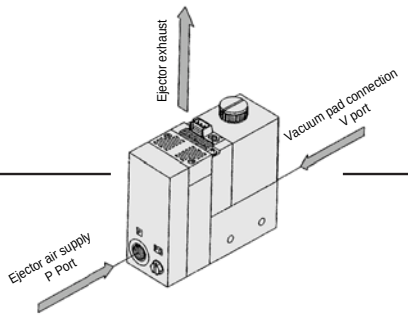




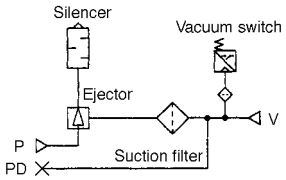


★Dimensions not indicated are identical to the top drawing.

Ejector System without Valve

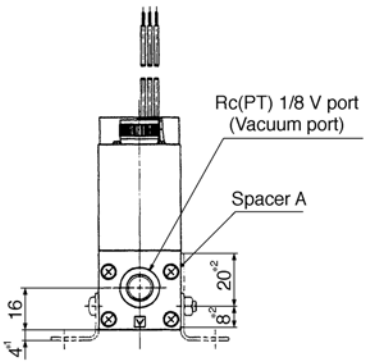


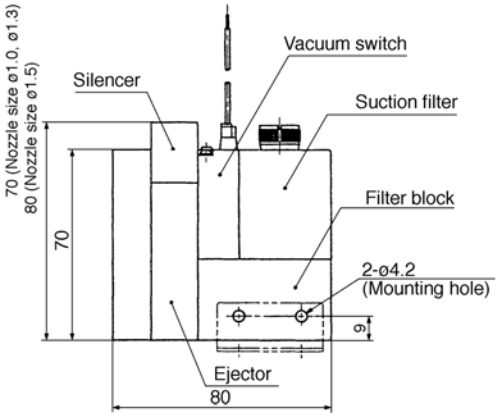
System circuit

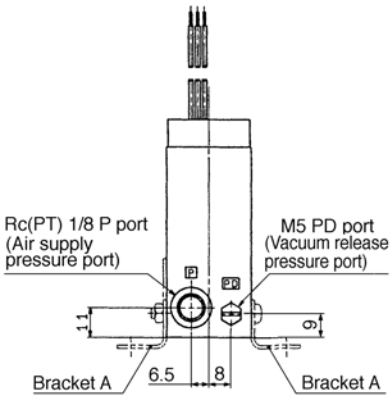


Nozzle dia. /ø1.0, ø1.3, ø1.5mm

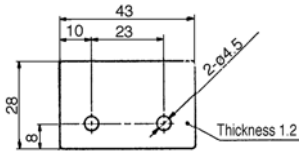
ZR1$^{10}_{13}_{15}$□1-□□



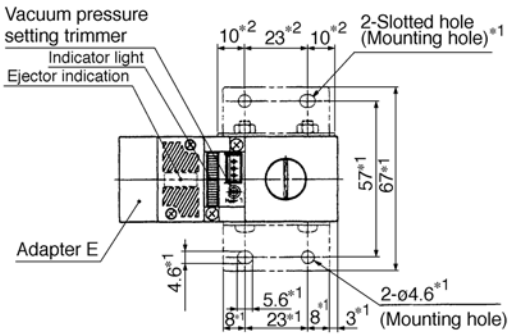




Spacer A



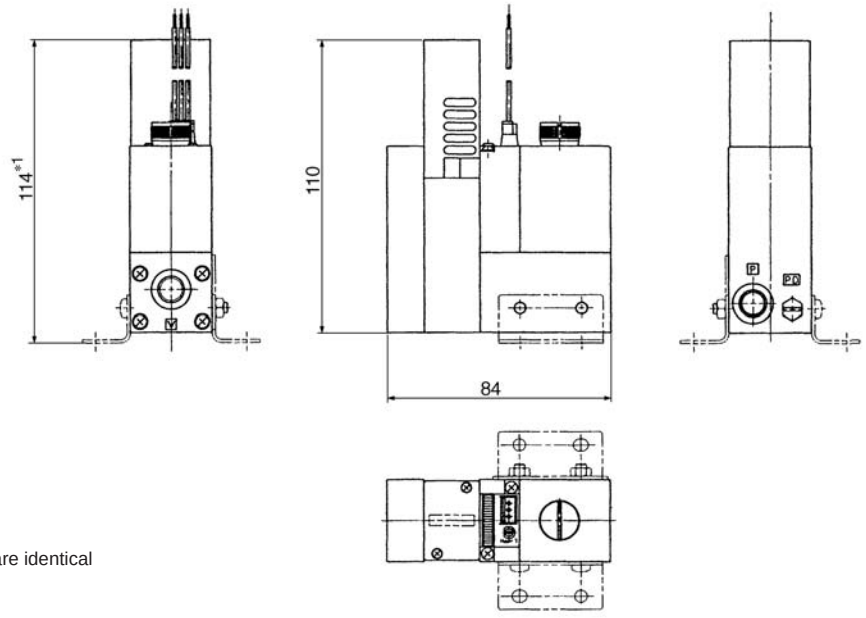
Spacer A is used to leave space for maintenance (for replacement of filter element etc.) on side mounting.



Note) ∗1 Dimensions for mounting bracket A
∗2 Dimensions for mounting spacer A
Bracket A part no. : P3270153 (Standard accessory)
Spacer A part no. : P3270156

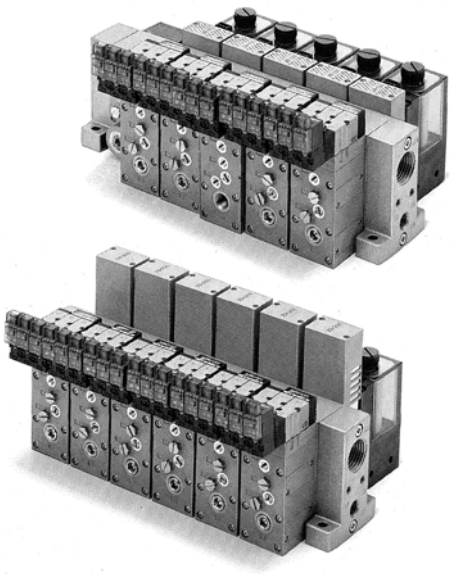
Nozzle dia. /ø1.8, ø2.0mm

ZR1$^{18}_{20}$□1-□□



★Dimensions not indicated are identical to the top drawing.

For Ejector System/Manifold Specifications



Specifications

Number of max. unit stations	Max. 6 stations	
Port	Port size	Function
PV Port	Rc (PT) 1/8	Air supply for ejector
PS Port	M5	Air supply for pilot valve
PD port	M5	Air supply for release
EXH port	Rc(PT) 1/2	Common exhaust
Weight	Basic one station: 0.275kg Additional station: 0.12kg	

Notes) When using 3 or more stations with ZR120□□ manifold, utilize PV port as supply port on both sides.
When using 3 or more stations with ZR120□ 3 manifold, utilize EXH port as exhaust port on both sides.

Manifold Air Supply

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

Air supply to ○ port
Blank plug attached to ● port
Note) Blank plug is attached on all ports of valve unit.

Individual Spacer

Part No.	Port	Function
ZR1-R1	PV	Possible to set the air supply pressure individually
	PS	Possible to set the pilot valve air supply presure individually
	PD	Possible to set the release valve supply pressure individually
	PE	Possible to set the pilot valve exhaust individually

Individual spacer is used when the connecting port of each unit is not common for the manifold connecting port. Mixed specification of common and individual connecting ports for each unit is possible on manifold with this individual spacer.

How to Order Manifold

Indicate separately the model number of the manifold and the vacuum units, individual spacers and blank plates to be included.

<Manifold Base>

ZZR1 [06] [ ] [R]

Stations

01	1 Station
⋮	⋮
06	6 Stations

Port position

R	Right side
L	Left side
B	Both sides

Port thread

—	Rc (PT)
F	G(PF)
T	NPTF

<Function plate>

ZR1 − RV [1] [1]

Piping

Symbol	Indication	PV port	PS port	PD port
1	PV↔PS↔PD	Common		
2	PV↔PS/PD	Common		Individual

Arrangement
(With reference from valve side, valve position 1 starts from right side.)

—	Installed all stations
1	1st station only
⋮	⋮
6	6th station only
A	All stations

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

Example) Attached to the first and third stations
∗ZR1-R1-1
∗ZR1-R1-3

<Individual spacer>

ZR1 − R1 − [1]

Arrangement
(With reference from valve side, valve position 1 starts from right side.)

—	Installed all stations
1	1st station only
⋮	⋮
6	6th station only
A	All stations

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

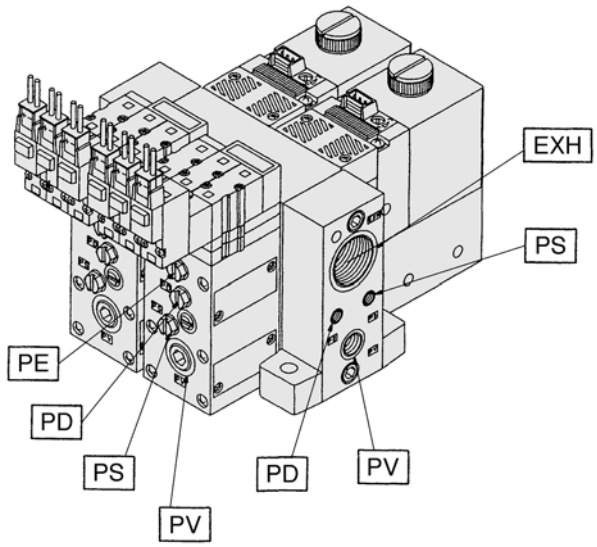
Example) Attached to the first and third stations
∗ZR1-R1-1
∗ZR1-R1-3

Example) **ZZR106-R**·····1 pc. (Manifold base only)
∗ZR120S1-K15MZ-EC·····5 pcs. (Unit)
∗ZR1-BM1·····1 pc. (Blank plate)
∗ZR1-R1-3·····1 pc. (Individual spacer)

With reference from valve side, the third station from right side

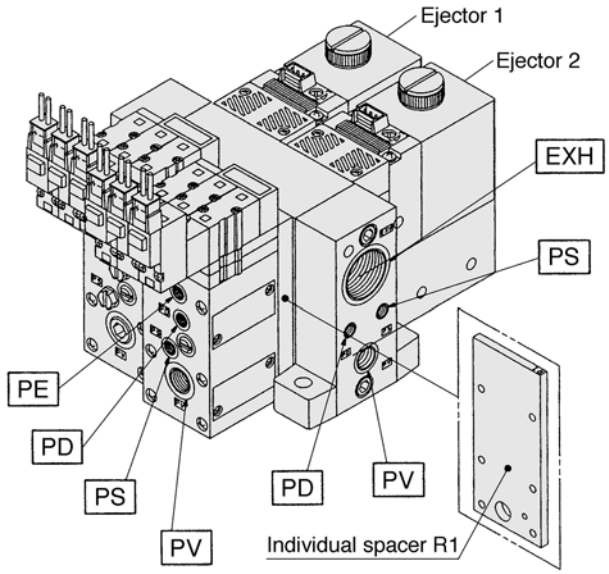
Manifold Construction/System Circuit Example

Manifold common supply
When individual air pressure supply is not done.



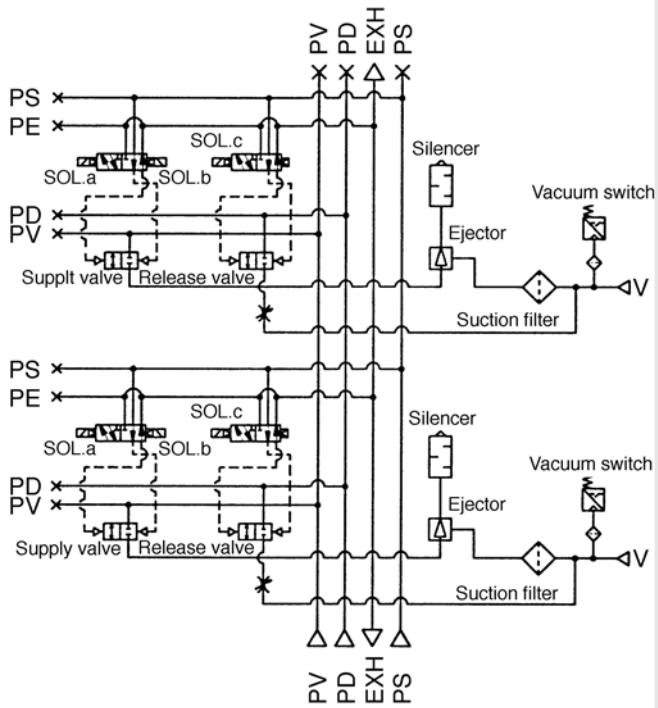
PV: External supply port
PS: Supply valve supply pressure port
PD: Release valve supply pressure port
PE: Pilot exhaust port
EXH: Common exhaust port

Individual unit supply
When individual air pressure supply is done.

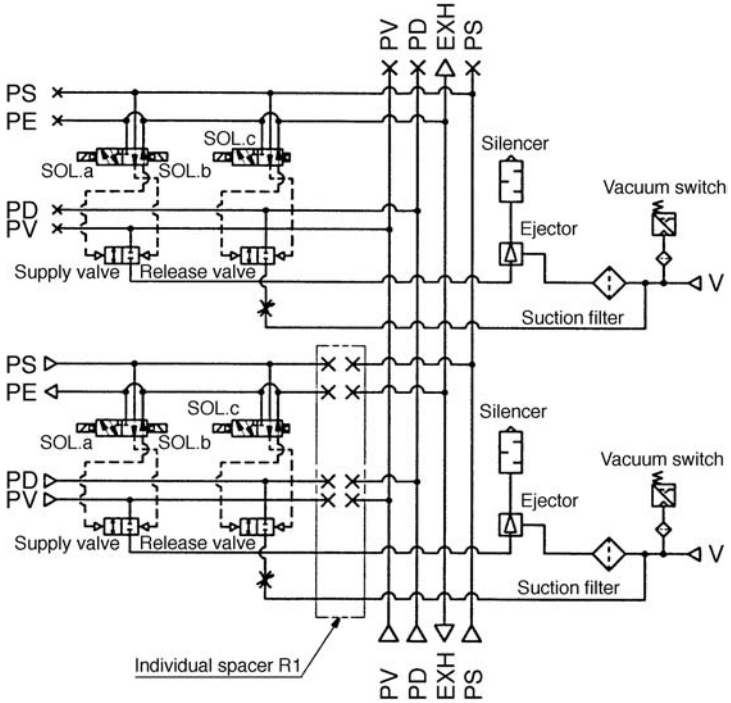


PV: External supply port
PS: Supply valve supply pressure port
PD: Release valve supply pressure port
PE: Pilot exhaust port
EXH: Common exhaust port

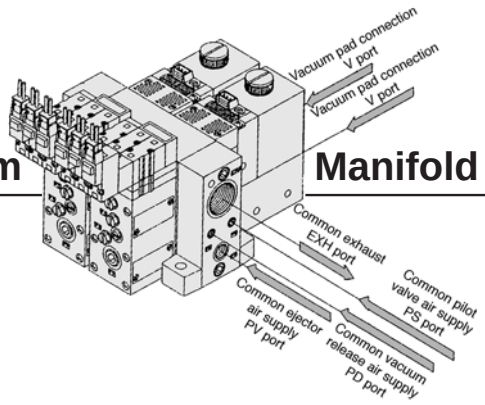
<System circuit example>

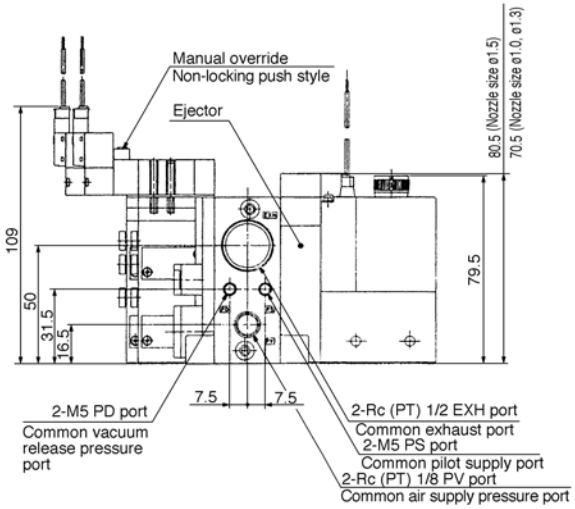


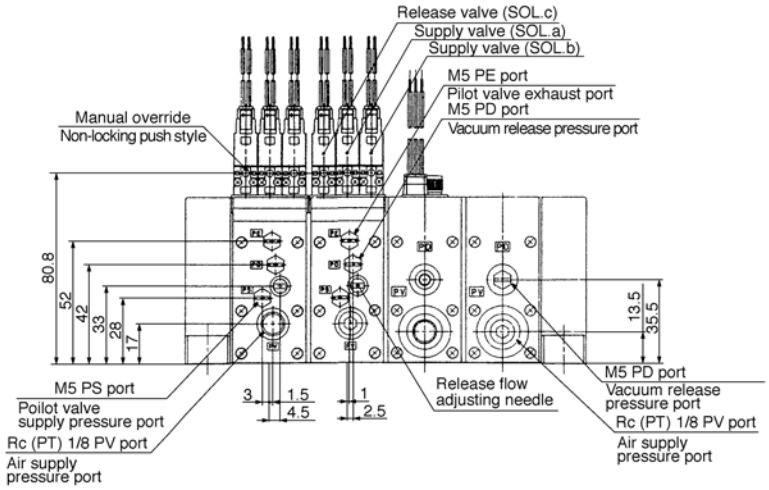
<System circuit example>

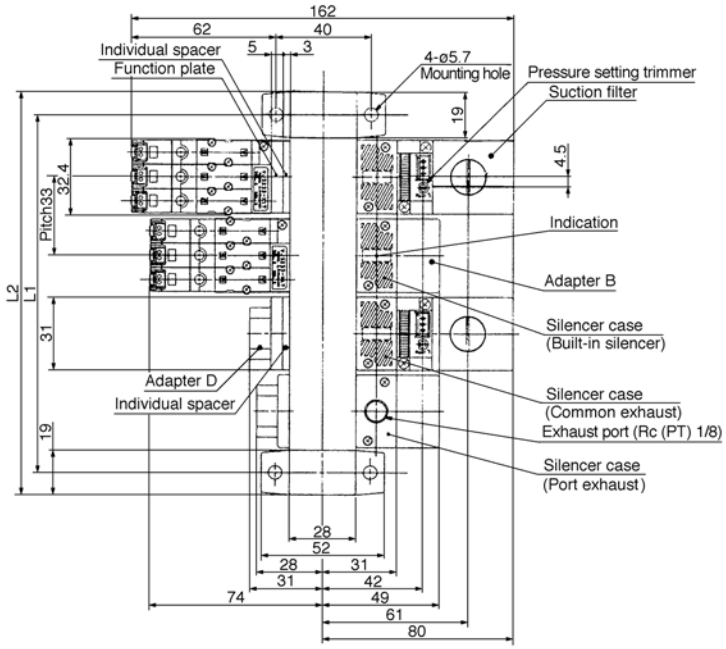


Ejector System Manifold Nozzle dia. /ø1.0, ø1.3, ø1.5mm



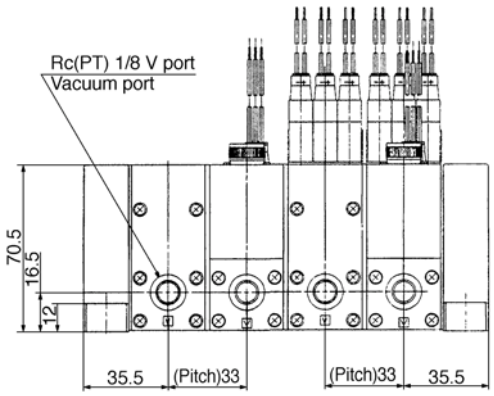




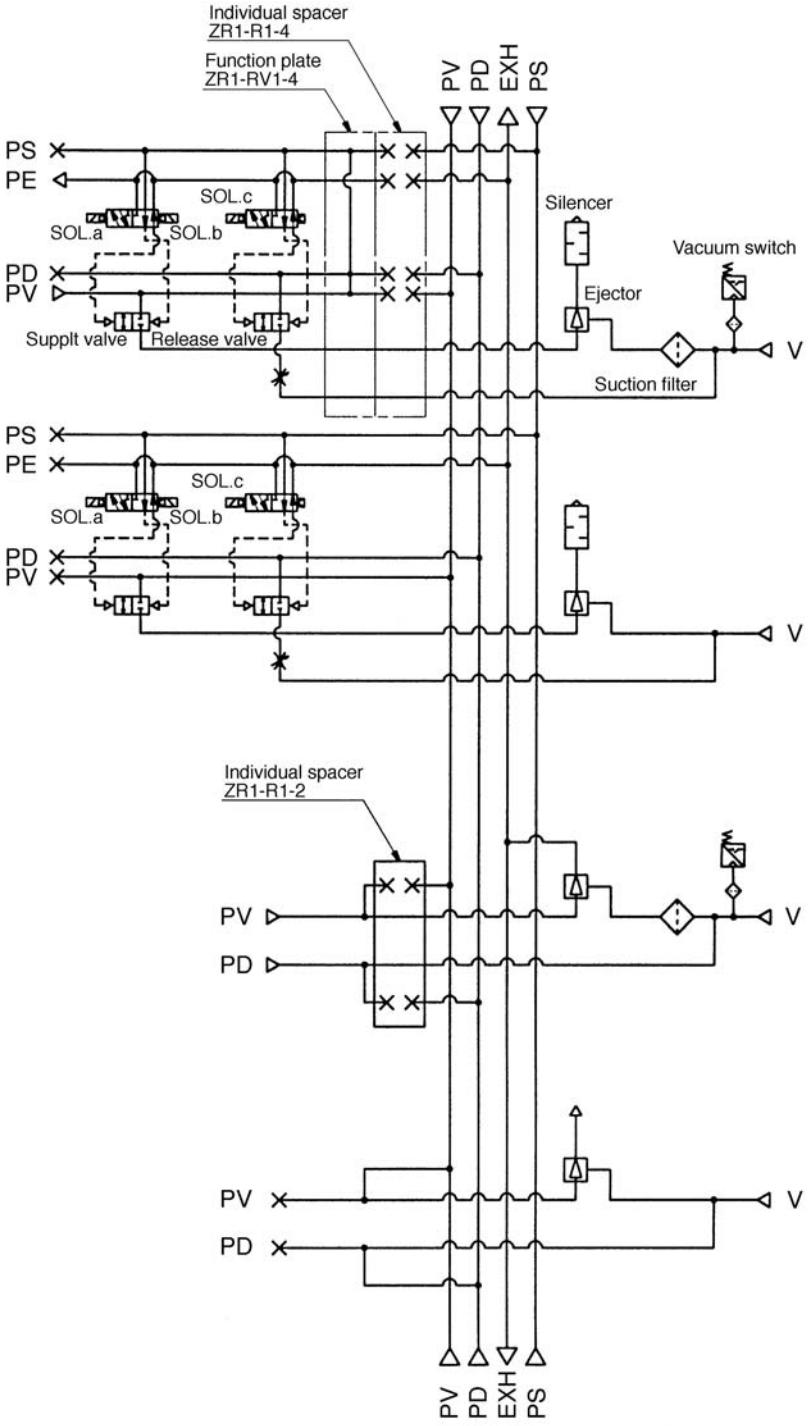


(mm)

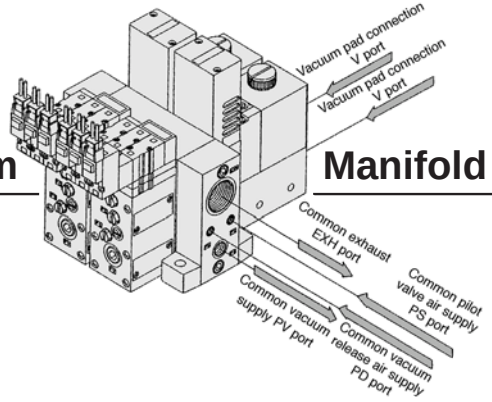
Symbol \ Stations	1	2	3	4	5	6
L1	52	85	118	151	184	217
L2	71	104	137	170	203	236

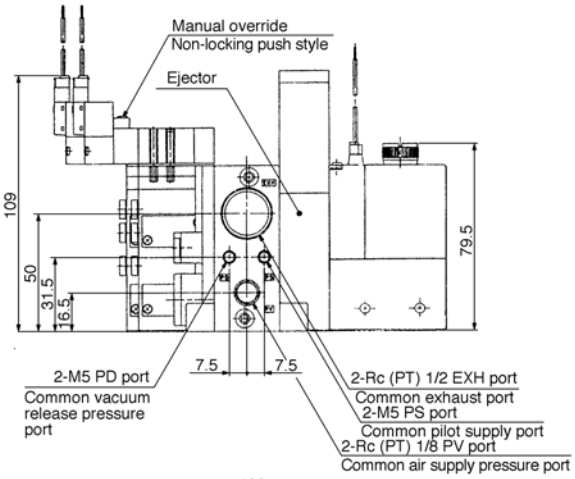


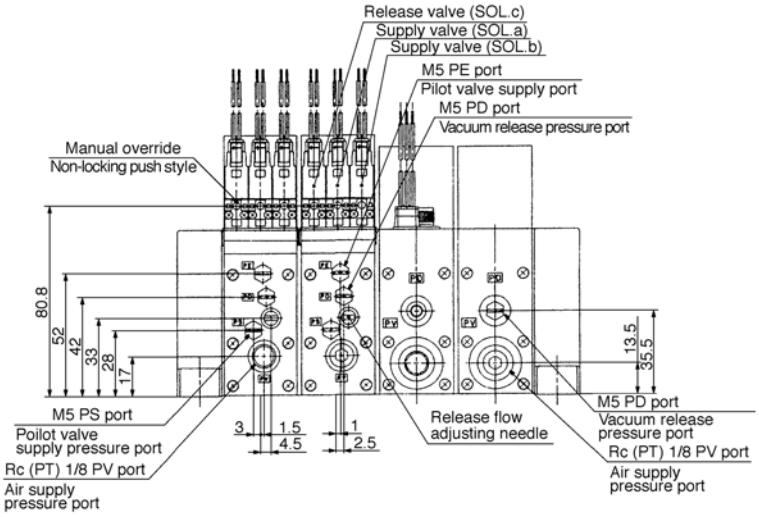
System circuit

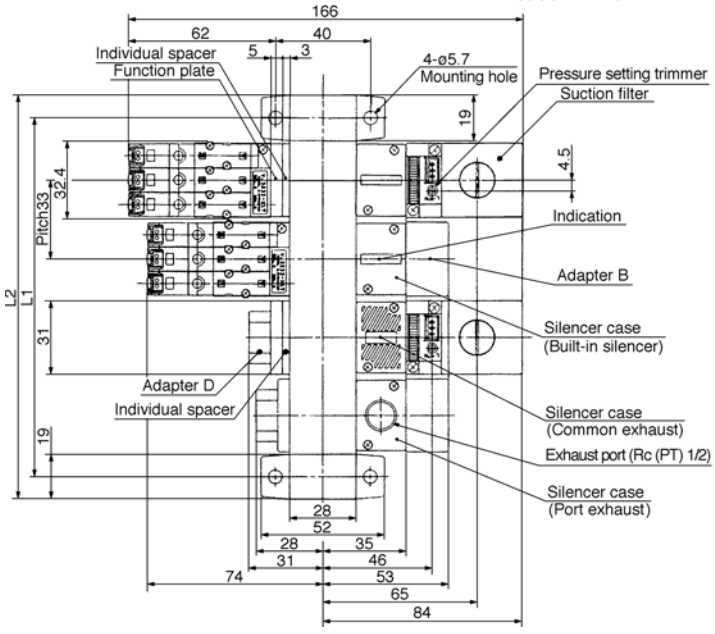


Ejector System Manifold Nozzle dia. /ø1.8, ø2.0mm



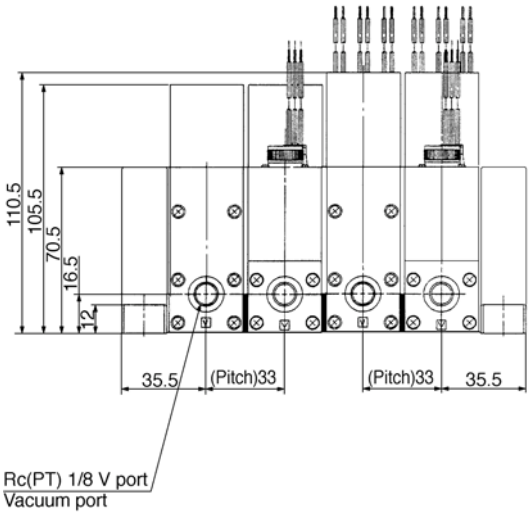




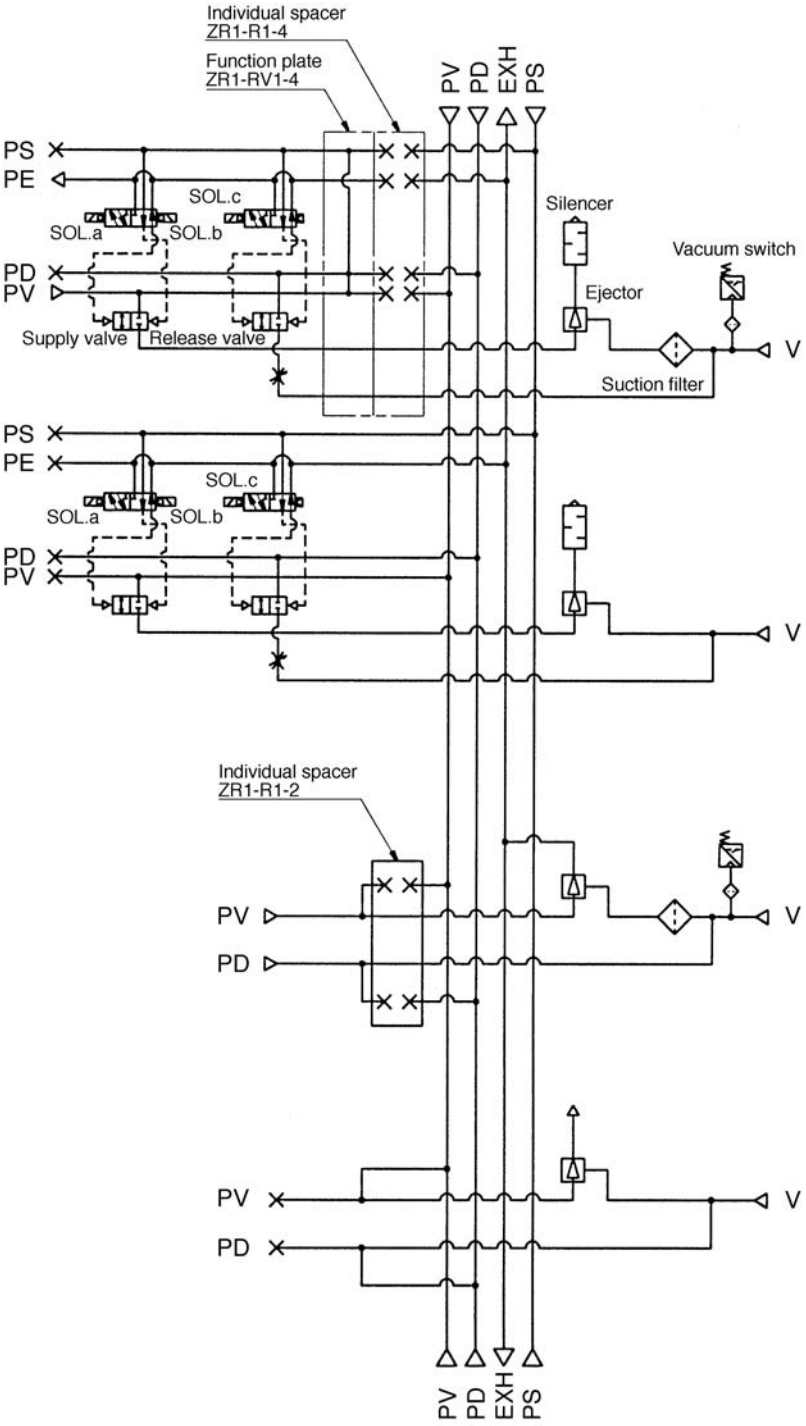


(mm)

Symbol \ Stations	1	2	3	4	5	6
L1	52	85	118	151	184	217
L2	71	104	137	170	203	236



System circuit



Large Size Vacuum Module

Series ZR/External Vacuum Supply System

How to Order

Note for model selection

Take function plates into consideration.
(Refer to p.3.2-31.)

Components

Valve unit — Vacuum switch — Suction filter

ZR100 — K1 ☐ 5 M Z ☐ — E ☐ - Q

Combination of vacuum valve and release valve

Please refer to p.3.2-29 ①.

Rated voltage

—	Air operated
5	24V DC
6	12V DC
V	6V DC
S	5V DC
R	3V DC

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 lead wire

- Refer to p.3.2-29 ③ regarding lead wire with connector part no.

Combination of vacuum switch/Suction filter

—	None
E	Vacuum switch + Suction filter
F	Suction filter

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.

Electrical entry

—	Air operated	
For 24, 12, 6, 5, 3V DC		
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

- Refer to p.3.2-29 ② for part no. of lead wire with connector.

Manual override

—	Non-locking push style
B	Locking slotted style

Indicator light and surge voltage suppressor

—	None
Z	Indicator light and surge voltage suppressor (Connector style valve only)
S	With surge voltage suppressor

*S and Z are not available for grommet style (DC).
If the polarity is incorrect at DC (surge voltage suppressor), diode or switching element may be damaged.

① Valve Unit/Combination of Vacuum Valve and Release Valve

Valve unit function			Valve unit components		Symbol	Vacuum valve				Release valve			
						Solenoid valve			Air operated	Solenoid valve			Air operated
Operation stop	Vacuum adsorption	Vacuum release	Vacuum valve	Release valve		Double SOL. (VJ3233-X17)	Double SOL. (VJ3233-X18)	N.C. (VJ3133)	(VJA3130)	Double SOL. (VJ3233-X17)	Double SOL. (VJ3233-X18)	N.C. (VJ3133)	(VJA3130)
◎	◎	○	Double SOL. (VJ3233-X17)	N.C. (VJ3133)	**K1**	●	—	—	—	—	—	●	—
○	○	○	N.C. (VJ3133)	N.C. (VJ3133)	**K2**	—	—	●	—	—	—	●	—
○	○	○	Air operated (VJA3130)	Air operated (VJA3130)	**K3**	—	—	—	●	—	—	—	●
×	○	○	N.C. (VJ3133)		**C1**	—	—	●	—	—	—	(Common with vacuum valve)	—
×	○	○	Air operated (VJA3130)		**C2**	—	—	—	●	—	—	—	(Common with vacuum valve)
×	○	○	N.O. (VJ3133)		**C3**	—	—	●	—	—	—	(Common with vacuum valve)	—
×	◎	◎	Double solenoid (VJ3233-X18)		**C4**	—	●	—	—	—	(Common with vacuum valve)	—	—
			—		**—**	Without valve unit							

◎: Possible ○: Possible with limitations (W/o self holding function) ×: Not possible

② How to Order Valve Plug Connector Ass'y

DC **VJ10 — 20 — 4A —** □

Lead wire length

—	300mm (standard)
6	600mm
10	1000mm
15	1500mm
20	2000mm
25	2500mm
30	3000mm

How to Order

When requiring a vacuum unit equipped with valves with lead wires of 600mm or more, specify the vacuum module valves without the standard connectors and order the required connector ass'ys separately.

Example) ZR100-K15M□Z-EC ····· 1 pc.
∗VJ10-20-4A-6 ····· 2 pcs.

③ Vacuum Switch Plug Connector Ass'y

ZS — 10 — 5A — □

Lead wire length

—	0.6m
30	3m
50	5m

How to Order

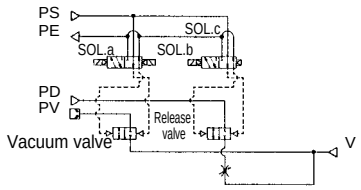
When requiring a vacuum switch with a lead wire of 5m, indicate the part numbers of the vacuum unit switch without a lead wire connector and the 5m with lead wire connector separately.

Example) ZR100-□□□□□-□CM ····· 1 pc.
∗ZS-10-5A-50 ····· 1 pc.

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

Combination symbol: K1

Feature: Double solenoid vacuum valve allows for self-holding.

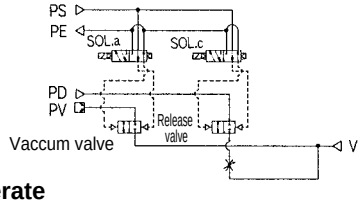


How to Operate

Pilot valve operation / Operation	Vacuum valve		Release valve	Note
	SOL.a	SOL.b	SOL.c	
1.Adsorption	ON	OFF	OFF	The vacuum valve will hold the operation even during stoppage of power supply.
2.Vacuum release	OFF	ON	ON	
3.Stop operation	OFF	ON	OFF	

Combination symbol: K2

Feature: Single solenoid valve is provided for vacuum valve.

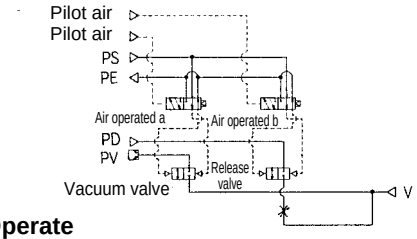


How to Operate

Pilot valve operation / Operation	Vacuum valve	Release valve	Note
	SOL.a	SOL.c	
1.Adsorption	ON	OFF	When power supply is stopped, all operations will be stopped.
2.Vacuum release	OFF	ON	
3.Stop operation	OFF	OFF	

Combination symbol: K3

Feature: Operation can be controlled by an external pilot valve.

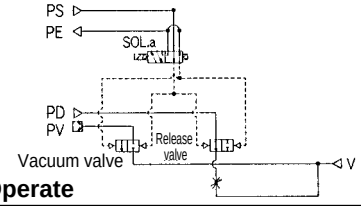


How to Operate

Pilot valve operation / Operation	Vacuum valve	Release valve	Note
	Air operated a	Air operated b	
1.Adsorption	ON	OFF	Suitable when solenoid valves can be used or for centralized control using external pilot air.
2.Vacuum release	OFF	ON	
3.Stop operation	OFF	OFF	

Combination symbol: C1

Feature: Adsorption of workpieces (when energized) and release of vacuum (when de-energized) are switched by the single solenoid valve.

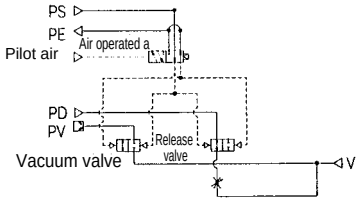


How to Operate

Pilot valve operation / Operation	Vacuum valve/Release valve	Note
	SOL.a	
1. Adsorption	ON	Be careful for blow off of workpieces or displacement of adsorption position in case of small and/or lightweight workpieces.
2.Vacuum release	OFF	

Combination symbol: C2

Feature: Adsorption of workpieces and release of vacuum are switched by external pilot valve.

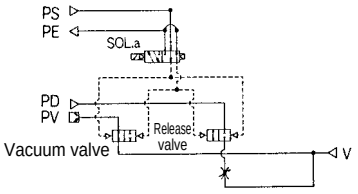


How to Operate

Pilot valve operation / Operation	Vacuum valve/Release valve	Note
	Air operated a	
1.Adsorption	ON	Be careful for blow off of workpieces or displacement of adsorption position in case of small and/or lightweight workpieces.
2.Vacuum release	OFF	

Combination symbol: C3

Feature: Adsorption of workpieces (when de-energized) and release of vacuum (when energized) are switched by single solenoid valve.

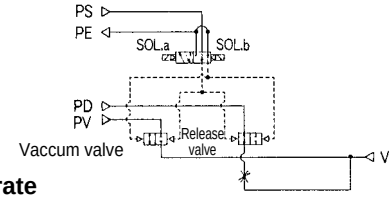


How to Operate

Pilot valve operation / Operation	Vacuum valve/Release valve	Note
	SOL.a	
1.Adsorption	OFF	Be careful for blow off of workpieces or displacement of adsorption position in case of small and/or lightweight workpieces.
2.Vacuum release	ON	

Combination symbol: C4

Feature: Adsorption of workpieces and release of vacuum are switched by double solenoid valve.



How to Operate

Pilot valve operation / Operation	Vacuum valve/Release valve		Note
	SOL.a	SOL.b	
1.Adsorption	ON	OFF	When power supply is stopped vacuum valve / vacuum release valve will hold the operation.
2.Vacuum release	OFF	ON	

⚠ Caution

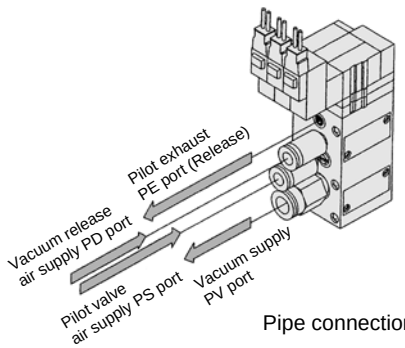
When pipe connection is made to one port connection (PV port, PD port) only, use a function plate (ZR1-RV3). Refer to p.3.2-31 for further information.

Function Plate/ZR1-RV3

A function plate is used when each connecting port for the valve unit is common. If a function plate is not used (standard), make individual pipe connections to PV, PS, and PD ports respectively.

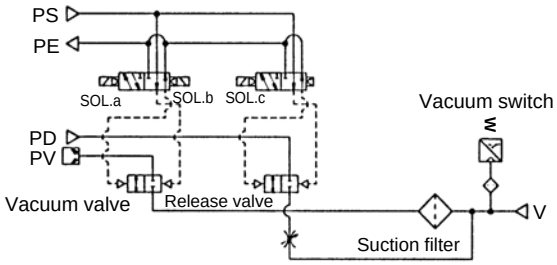
Without Function Plate (Standard)

Applicable system: Ejector system
External vacuum supply system



Pipe connection

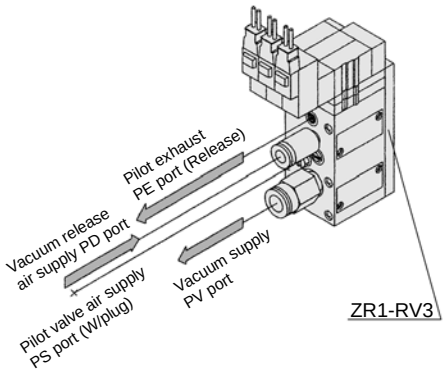
Internal circuit



With Function Plate/Applicable to External Vacuum Supply Only

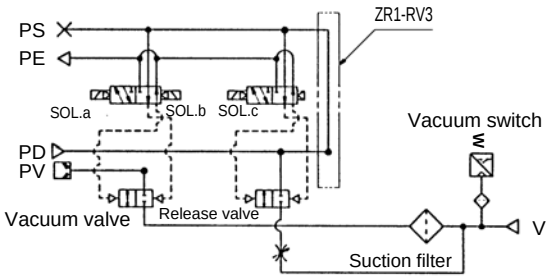
When ZR1-RV3 (PV/PS ⇔ PD) is selected

Since compressed air is necessary to operate pilot valve in external vacuum supply system, supply air to PD port (or PS port).



Pipe connection

Internal circuit



How to Order Function Plate Unit

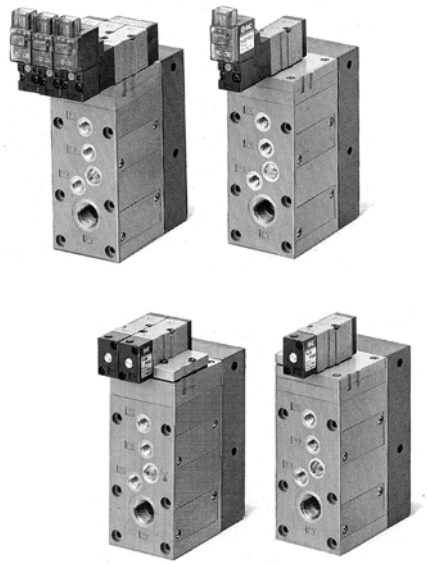
ZR1 — RV 3

Pipe specifications

Symbol	Indication	PV port	PS·PD port
3	PV/PS↔PD	Individual	Common

How to Order
Indicate the model numbers of the vacuum module and the function plate.

Valve Unit/ZR1-V



Specifications

Valve unit part No.		ZR1-V□□□□□				
Components		Vacuum valve			Release valve	
Operating method		Pilot valve			Pilot valve	
	Vacuum valve, release valve individual	Double solenoid valve VJ3233-X17	Valve VJ3133	Air operated VJA3130	Valve VJ3133	Air operated VJA3130
	Vacuum valve, release valve common	Double solenoid valve VJ3233-X18	Valve VJ3133	Air operated VJA3130		
Operating pressure		0.25 to 0.6MPa				
Main valve effective area (mm^2)		8.2			0.96	
Main valve Flow Qn (Nℓ/mim)		446.4			52.3	
Max. operating frequency		5Hz				
Operating temperature range		5 to 50°C				

Standard accessory - Bracket B

Solenoid Valve Specifications

Solenoid valve	VJ3133-□□□□ , VJ3233-□□□□-X17, VJ3233-□□□□-X18
Rated voltage	24, 12, 6, 5, 3V DC
Electrical entry	3, 5, 6, 12, 24V DC-L/M plug connector, Grommet
Indicator light and surge voltage suppressor	Available, not available (at grommet)
Manual override	Non-locking push style, Locking slotted style

∗ Applicable to plug connector. Connector assembly with rectifier is attached.

Combination of Vacuum Valve and Release Valve

Combination symbol	Vacuum valve	Release valve	Weight (kg)
K1	Double SOL. (VJ3233-X17)	N.C. (VJ3133)	0.245
K2	N.C. (VJ3133)	N.C. (VJ3133)	0.213
K3	Air operated (VJA3130)	Air operated (VJA3130)	0.194
C1	N.C. (VJ3133)		0.187
C2	Air operated (VJA3130)		0.174
C3	N.C. (VJ3133)		0.184
C4	Double SOL. (VJ3233-X18)		0.214

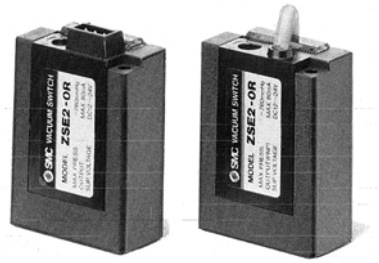
∗ Weight includes bracket B. (Solenoid valve: 24V DC, M plug connector style)

How to Order/ ∗Refer to p.3.2-28 for further part No. information.

ZR1− V [K1] [ ] [5] [M] [Z] [ ] - Q

- **Combination of vacuum valve and release valve**
- **Pilot valve**
- **Solenoid valve rated voltage**
- **Electrical entry**
- **Indicator light and surge voltage suppressor**
- **Manual override**

Vacuum Pressure Switch/ZSE2-0R-15



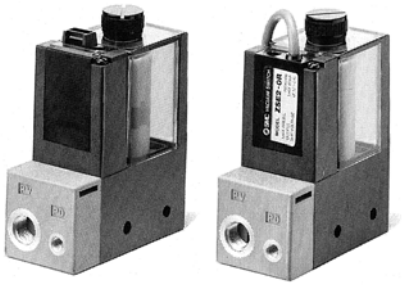
Refer to p.3.2-13 for further specifications.

Specifications

Vacuum pressure switch part No.	**ZSE2-0R-15□**
Fluid	Air
Setting pressure range	0 to –101kPa
Hysteresis	3% or less
Temperature	±3% Full Span (5 to 40°C) ±5% Full Span (0 to 60°C)
Operating voltage	12 to 24V DC (Ripple ± 10% or less)
Output	Open collector 30V, 80mA
Indicator light	Light at ON
Current consumption	17mA or less (24V DC at ON)
Max. operating pressure	0.2MPa*
Operating temeprature range	5 to 50°C

*When using ejector system, instantaneous pressure up to 0.5MPa will not damage the switch.

Vacuum Switch/Suction Filter Unit ZR1-F



Refer to p.3.2-16 for further specifications.

Specifications

Unit part No.		**ZR1-F□□**
Suction filter	Operating pressure range	Negative pressure to 0.5MPa
	Operating temp range	5 to 50°C
	Filtration	30μm
Filter material		PVF
Vacuum switch		Refer to p.3.2-16 regarding vacuum switch.
Standard option		Bracket A

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

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.

Suction Filter/ZR1-FX

Refer to p.3.2-18 for further specifications.

Specifications

Model	**ZR1-FX**
Operating pressure range	Negative pressure to 0.5MPa
Operating temperature range	5 to 50°C
Filtration	30μm
Filter material	PVF
Weight (with bracket)	0.1kg

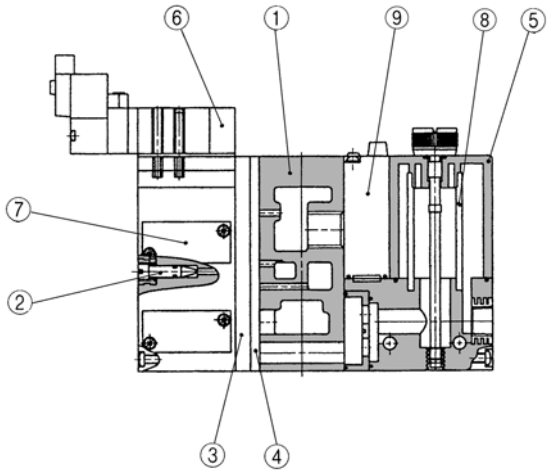
Note) If not operated within the specified range of pressure and temeprature, trouble may result.

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.

Construction



Component Parts

No.	Description	Material	Note
①	Manifold base	Aluminum	
②	Release flow adjusting needle	Stainless steel	
③	Function plate	PBT	→Refer to p.3.2-31
④	Individual spacer	PBT	→Refer to p.3.2-38
⑤*	Filter case	Polycarbonate	

* Precautions on handling the filter case
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, water soluble cutting oil (alkalinic), etc.
2) Do not expose it to direct sunlight.

Replacement Parts

No.	Description	Material	Parts No.
⑥	Pilot valve ass'y	—	→Refer to below ①
⑦	Valve body ass'y	—	→Refer to below ②
⑧	Filter element	PVF	ZR1-FZ (30μm)
⑨	Vacuum switch	—	ZSE2-OR-15-□

① How to Order Pilot Valve

Combination Symbol	Components		Model
	Vacuum valve	Release valve	
K1	Double solenoid valve N.C. (VJ3233)	Single solenoid valve N.C. (VJ3133)	→ Refer to "How to Order" below ZR1-VJ3233-□□□□-X17
C4	Double solenoid valve N.O. (VJ3233)	Double solenoid valve N.O. (VJA3233)	→ Refer to "How to Order" below ZR1-VJ3233-□□□□-X18
K3	Air operated valve N.C. (VJA3130)	Air operated valve N.O. (VJA3130)	ZR1-VJA3130

How to Order Solenoid Valve/Air Operated Valve

Air operated valve

ZR1−VJA3130

Solenoid valve

ZR1−VJ3233 □ 5 M Z □ X17 X18 - Q

- Pilot valve
- Solenoid valve rated voltage
- Electrical entry
- Indicator light and surge voltage suppressor
- Manual override

*Refer to p.3.2-28 for further symbol specifications.

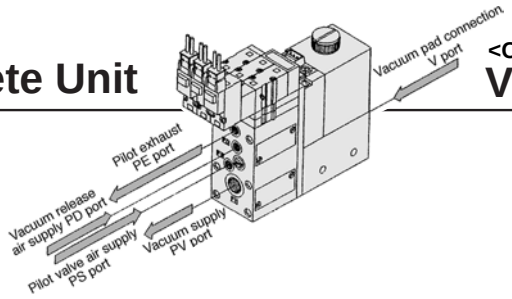
② How to Order Valve Body Assembly

ZR1−VD K1 □ 5 M Z □ - Q

- Combination of vacuum valve and release valve
- Pilot valve
- Solenoid valve rated voltage
- Electrical entry
- Indicator light and surge voltage suppressor
- Manual override

*Refer to p.3.2-28 for further symbol specifications.

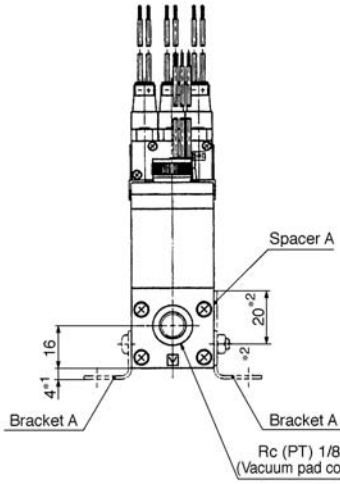
Complete Unit

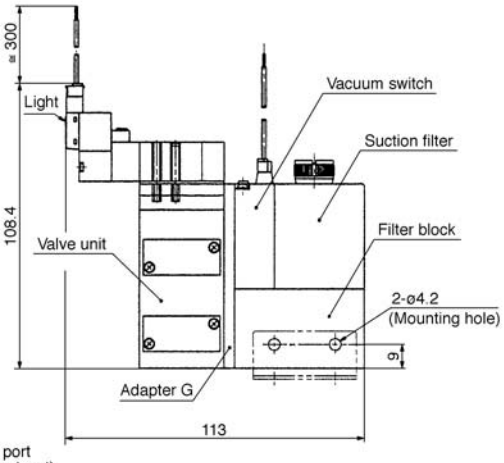


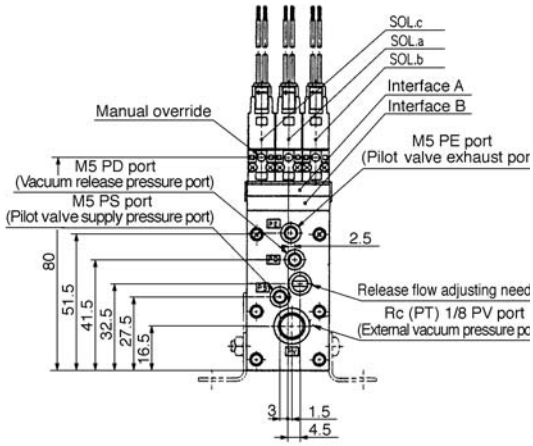
<Components>

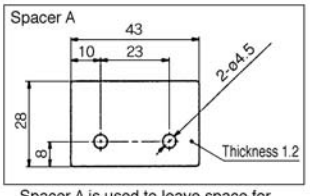
Valve + Vacuum Switch + Filter Unit

K1 type
Vacuum valve: Double SOL.
Release valve: Single SOL. (N.C.)
ZR100-K1□M□□-□□

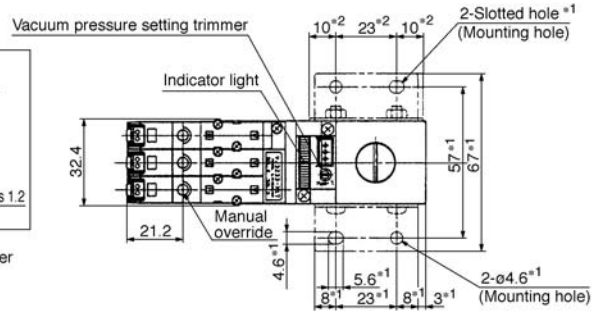




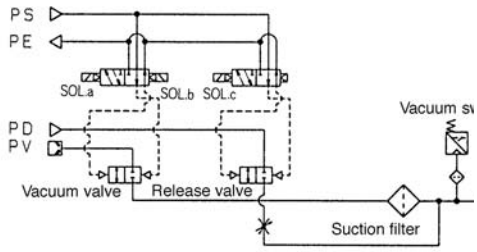




Spacer A is used to leave space for maintenance (for replacement of filter element etc.) on side mounting.

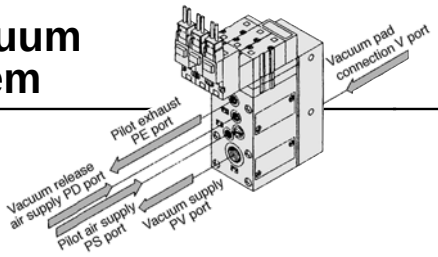


System circuit



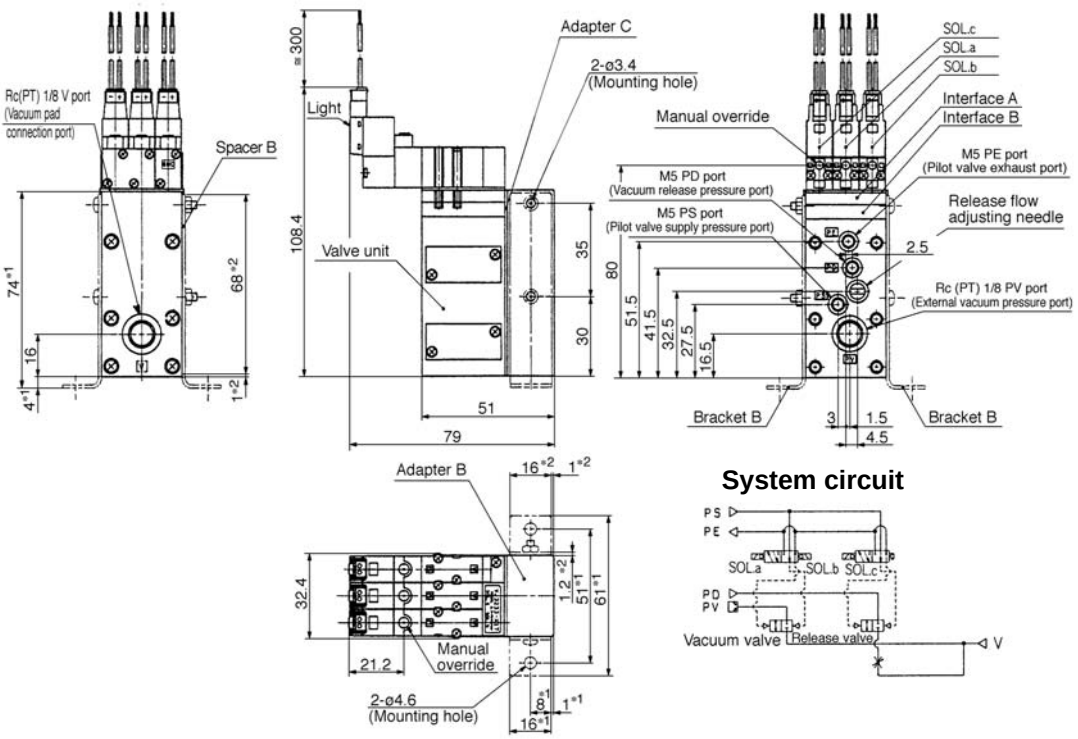
Note) *1 Dimensions for mounting bracket A
*2 Dimensions for mounting spacer A
Bracket A part no.: P 3270153 (Standard accessory)
Spacer A part no. : P3270156

External Vacuum Supply System



Valve Unit

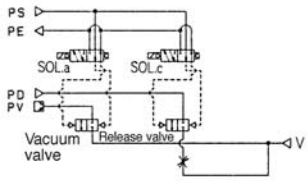
K1 type
ZR1-VK1□M□□□

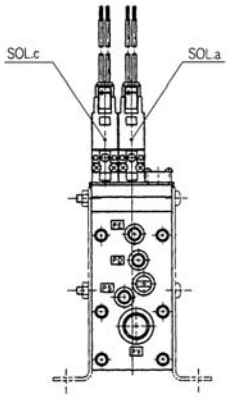


System circuit

K2 type
ZR1-VK2□M□□□

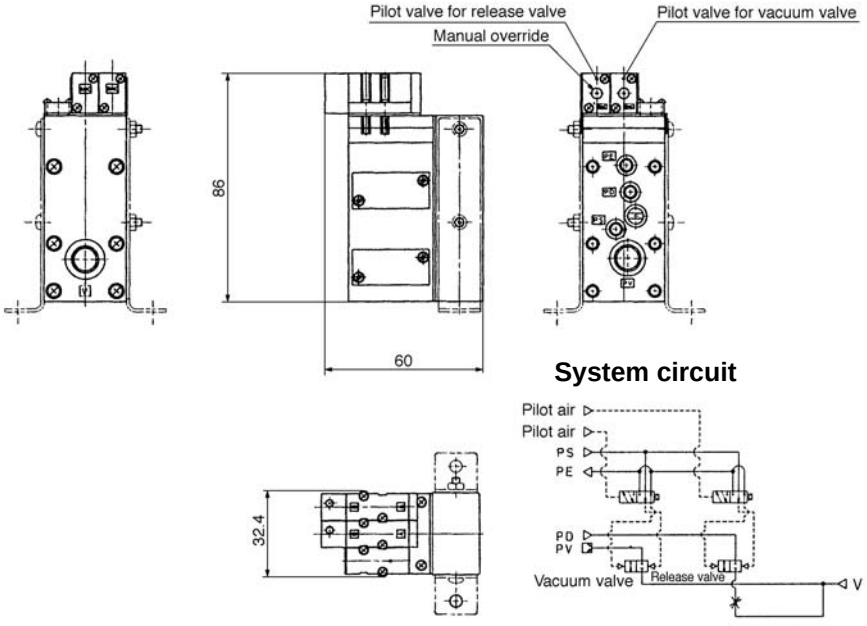
System circuit





Note) ∗1 Dimensions for mounting bracket B
∗2 Dimensions for mounting spacer B
Spacer B is used to leave space for maintenance (for replacement of solenoid valve etc.) on side mounting or used on surface mounting.
Bracket B part no. : P3270154 (Standard accessory)
Spacer B part no. : P3270157

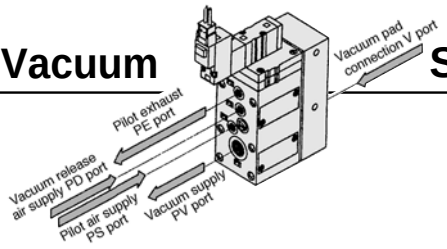
K3 type
ZR1-VK3□M□□□□



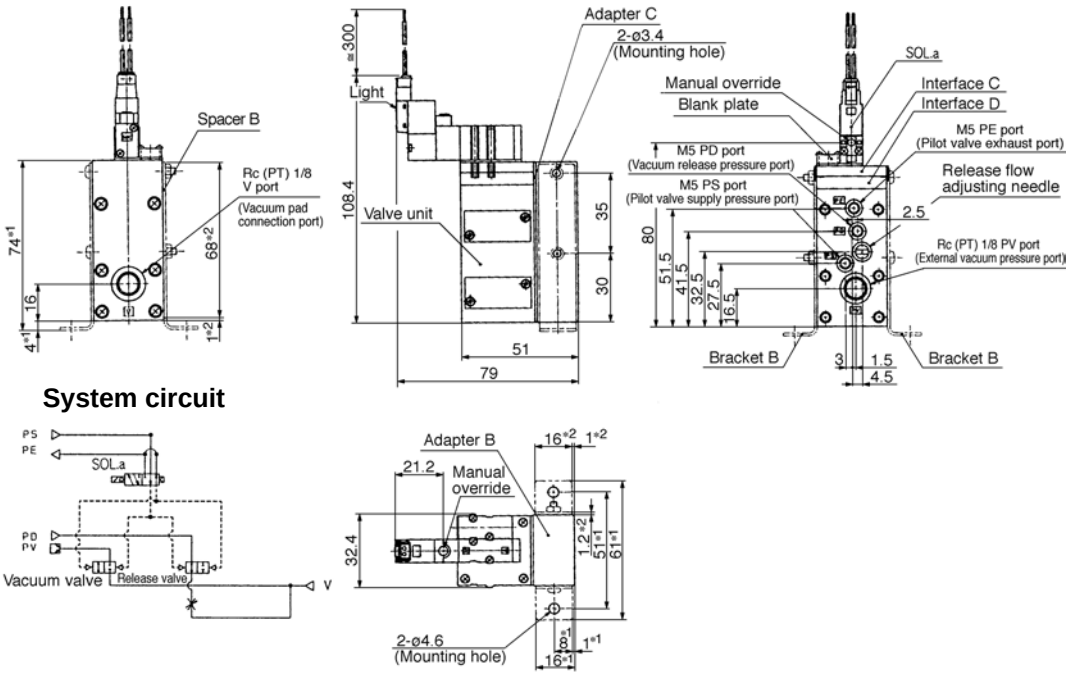
System circuit

★Dimensions not indicated are identical to K2 type.

External Vacuum Supply System Valve Unit



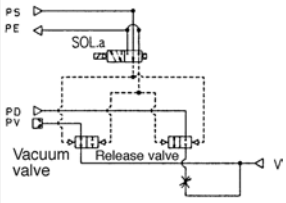
C1 type
ZR1-VC1□□□□

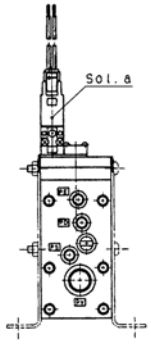


System circuit

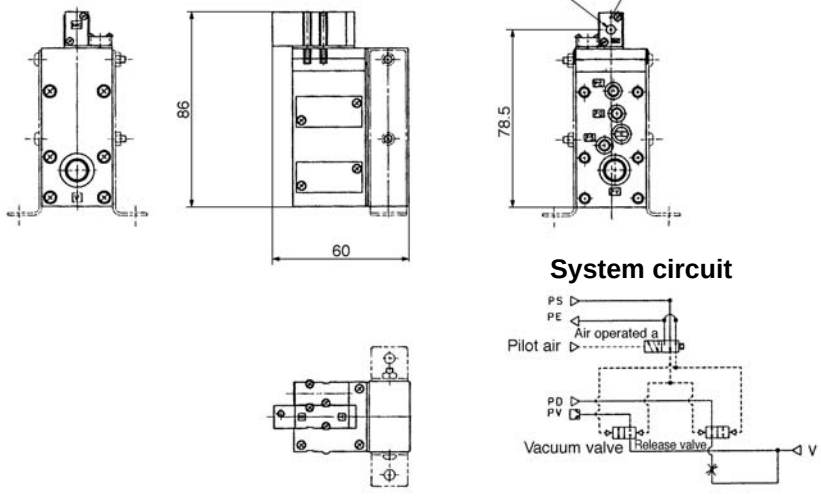
C3 type
ZR1-VC3□□□□

System circuit





C2 type
ZR1-VC2□□□□

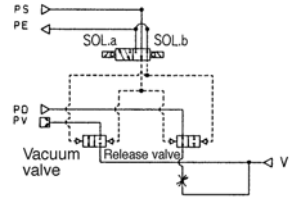


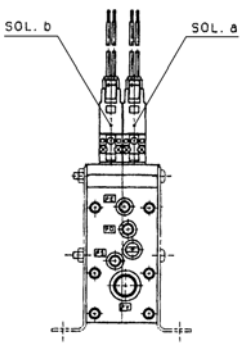
System circuit

Note) *1 Dimensions for mounting bracket B
*2 Dimensions for mounting spacer B
① Spacer B is used to leave space for maintenance (for replacement of solenoid valve etc.) on side mounting of used on surface mounting.
Bracket B part no. : P3270154 (Standard accessory)
Spacer B part no. : P3270157

C4 type
ZR1-VC4□□□□

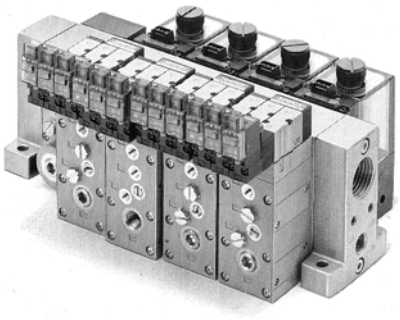
System circuit





★Dimensions not indicated are identical to C1 type.

Manifold Specifications/External Vacuum Supply System



Specifications

Number of max. unit stations	Max. 6 stations	
Port	Port size	Function
PV port	Rc (PT) 1/8	External vacuum supply connection
PS port	M5	Air supply for pilot valve
PD port	M5	Air supply for release
EXH port	Rc (PT) 1/2	Common exhaust
Weight	Basic one station: 0.275kg Additional station: 0.12kg.	

Note) When using 3 or more stations with ZR100 manifold, utilize PV port as suction on both sides.

Manifold Vacuum/Air Supply

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

Vacuum supply to ◎ PV port.
Air supply to ○ port.
Blank plug attached to ● port
Note) Blank plug is attached on all ports of valve unit.

Individual Spacer

Part No.	Port	Function
ZR1-R1	PV	Possible to set the external vacuum pressure individually
	PS	Possible to set the pilot valve air supply pressure individually
	PD	Possible to set the release valve supply pressure individually
	PE	Possible to set the pilot valve exhaust individually

Individual spacer is used when the connecting port of each unit is not common for the manifold connecting port. Mixed specifications of common and individual unit connecting ports for each unit is possible on manifolds with this individual spacer.

How to Order Manifold

Indicate separately the model number of the manifold and the vacuum units, individual spacers and blank plates to be included.

<Manifold base>

ZZR1 [06] – [ ] [ ]

Stations

01	1 station
⋮	⋮
06	6 stations

Port position

R	Right side
L	Left side
B	Both sides

Port thread

—	Rc(PT)
F	G(PF)
T	NPTF

Example) **ZZR106-R** ····· 1 pc. (Manifold base only)
∗ZR100-K15MZ-EC ····· 5 pcs. (Unit)
∗ZR1-BM1 ····· 1 pc. (Blank plate)
∗ZR1-R1-3 ····· 1 pc. (Individual spacer)

With reference from valve side, the third station from right side

<Function plate>

ZR1–RV3– [1]

Arrangement
(Right valve station which is looked from valve side is first station.)

—	Installed all stations
1	1st station only
⋮	⋮
6	6th station only
A	All stations

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

Example) Attached to the first and third stations
∗ ZR1-R1-1
∗ ZR1-R1-3

<Individual spacer>

ZR1–R1– [1]

Arrangement
(Right valve station which is looked from valve side is first station.)

—	Installed all stations
1	1st station only
⋮	⋮
6	6th station only
A	All stations

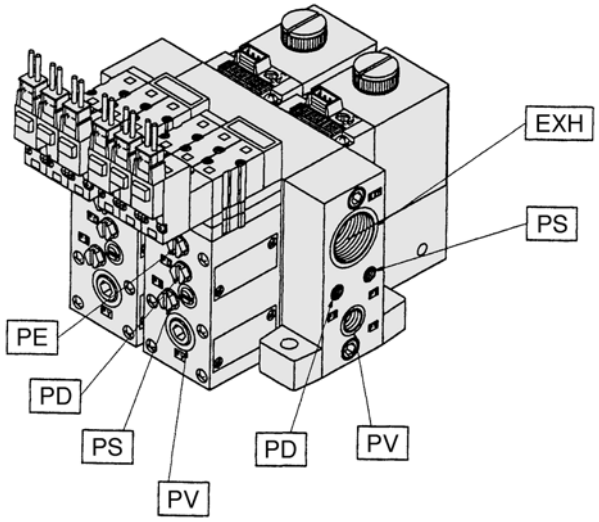
∗ When more than one spacer is required, specify all spacers individually.

Example) Attached to the first and third stations
∗ ZR1-R1-1
∗ ZR1-R1-3

Manifold Construction/System Circuit Example

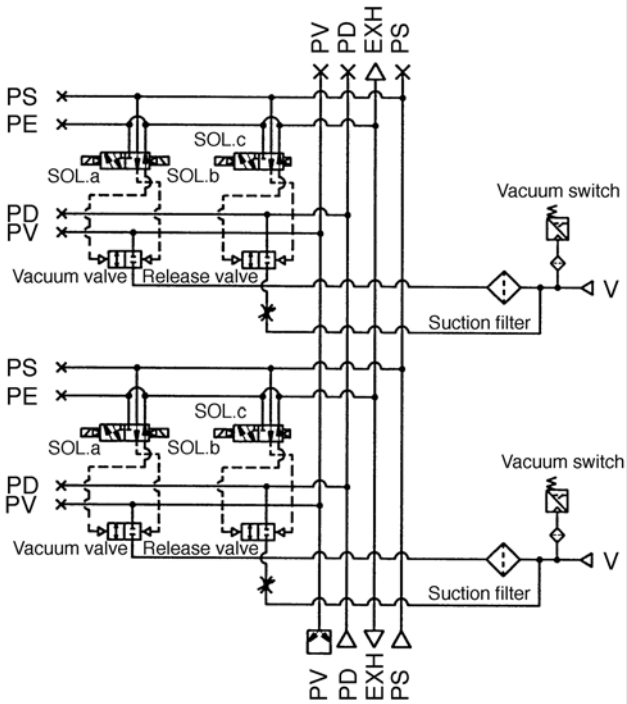
Manifold common supply

When individual air pressure supply is not done.



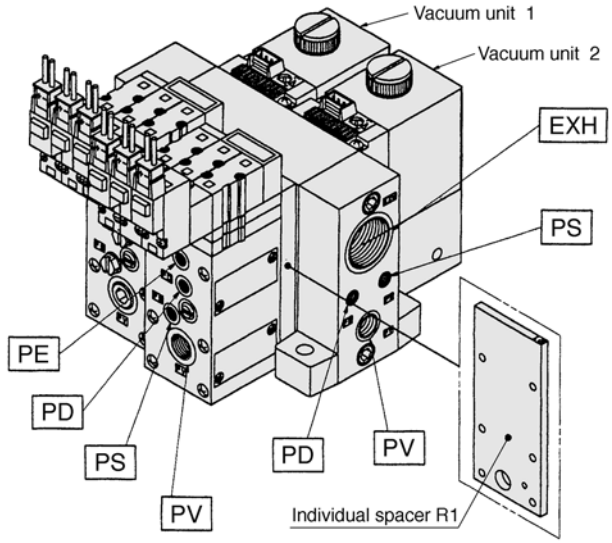
PV : External vacuum pressure port
PS : Pilot valve air supply port
PD : Release valve / Supply valve port
PE : Pilot valve exhaust port
EXH: Common exhaust port

<System circuit example>



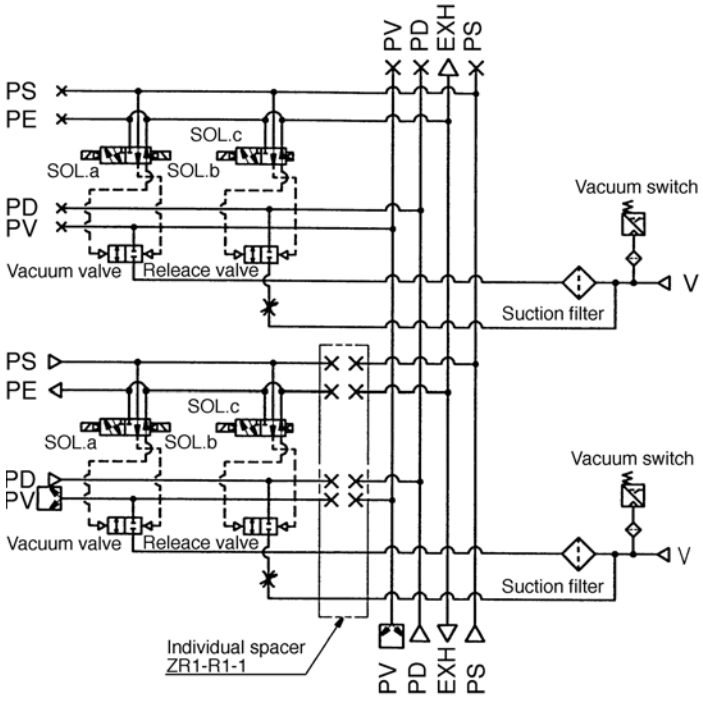
Individual unit supply

When individual air pressure supply is not done.

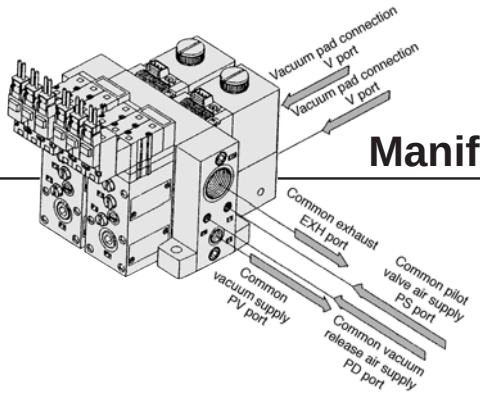


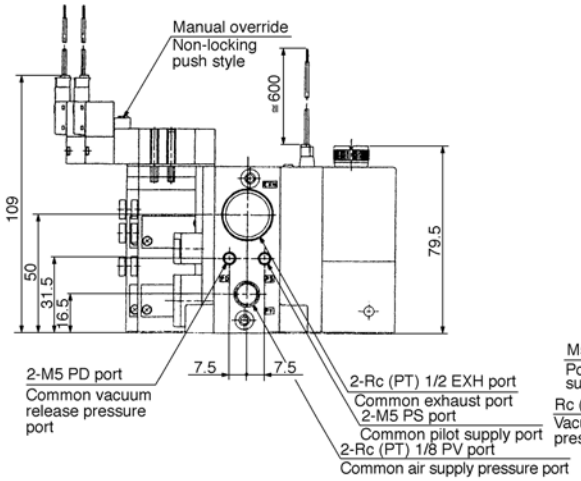
PV : External vacuum pressure port
PS : Pilot valve air supply port
PD : Release valve/Supply valve port
PE : Pilot valve exhaust port
EXH: Common exhaust port

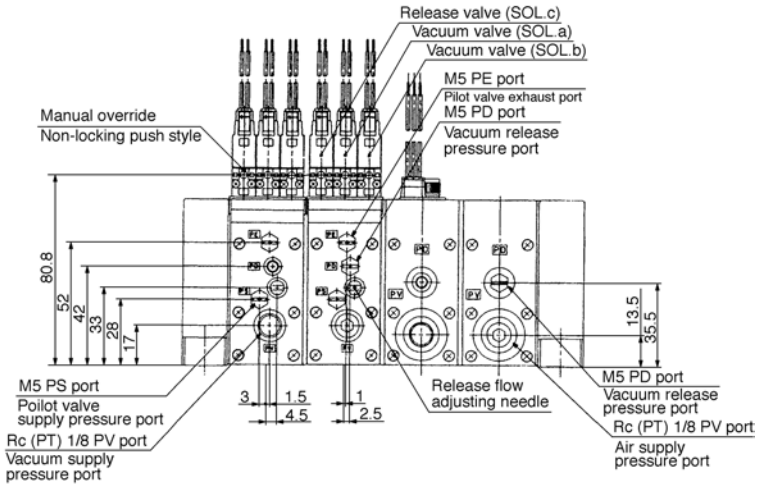
<System circuit example>

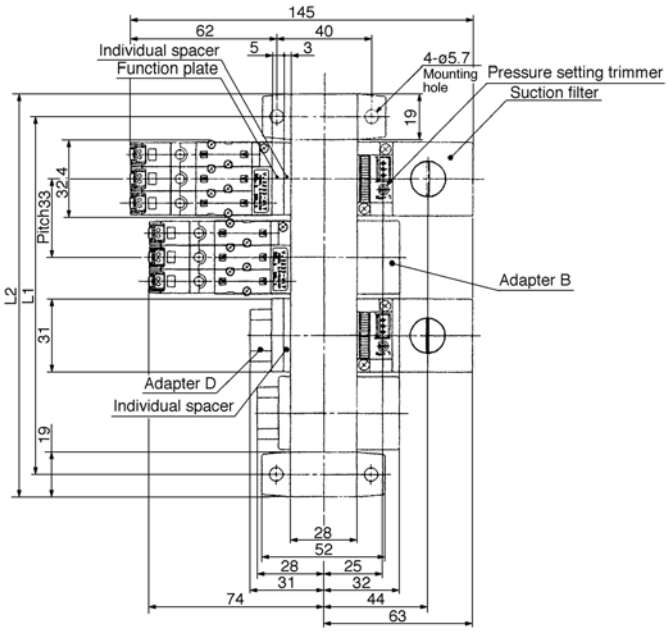


Manifold



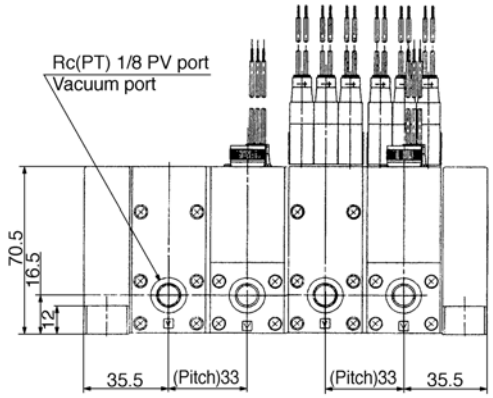




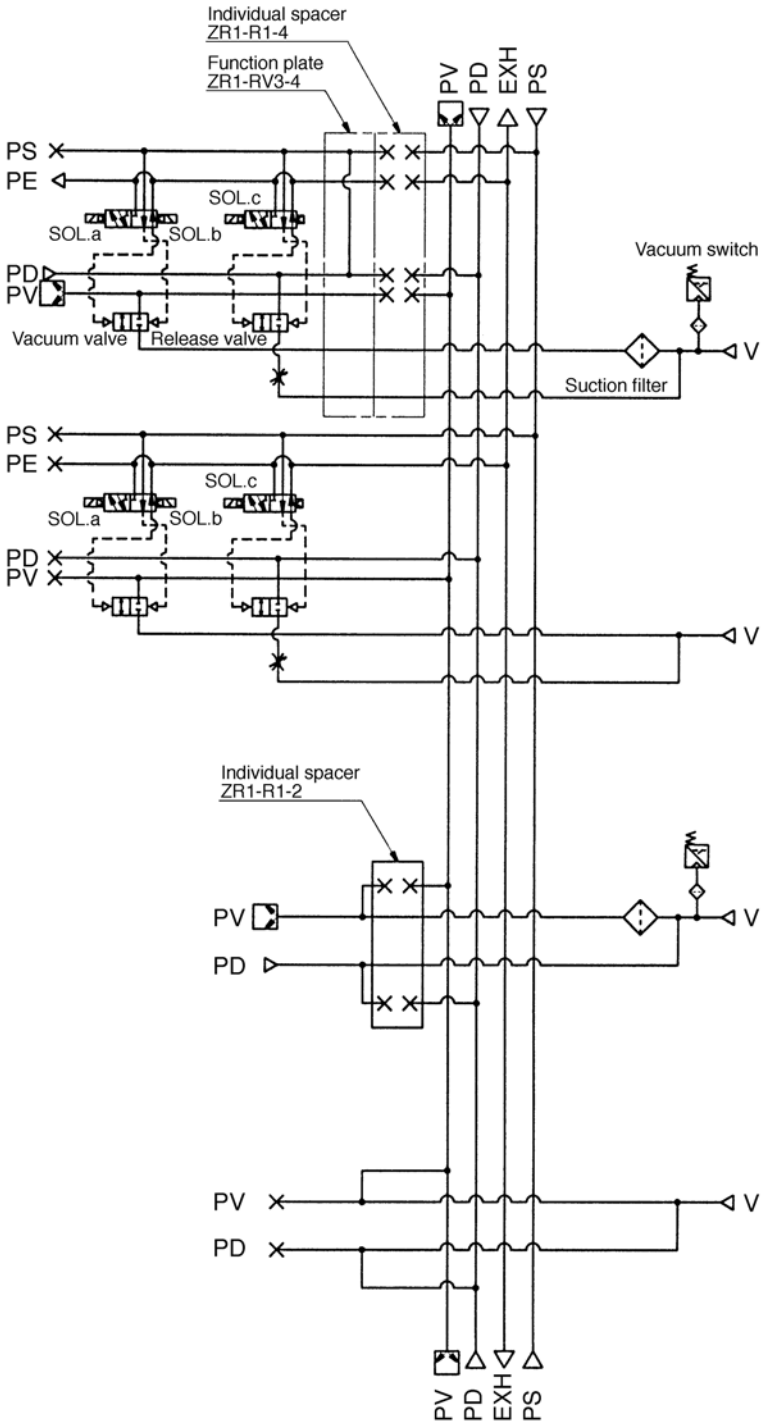


(mm)

Symbol \ Stations	1	2	3	4	5	6
L1	52	85	118	151	184	217
L2	71	104	137	170	203	236



System circuit

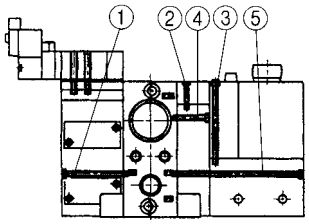


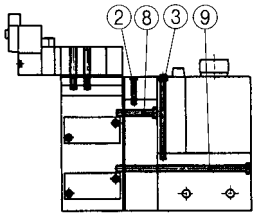
Ejector System

Mounting Thread Parts List for Unit Combination

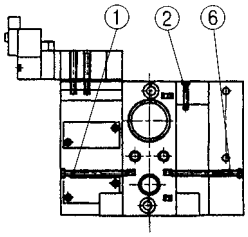
Manifold Specifications | **Without Manifold**

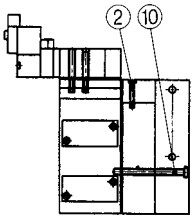
Components	Valve unit + Ejector unit + Vacuum switch/Filter unit



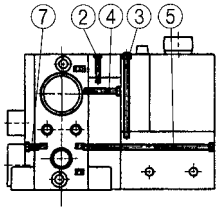


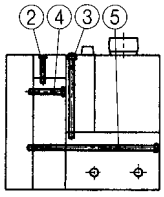
Components	Valve unit + Ejector unit



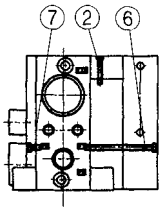


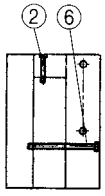
Components	Ejector unit + Vacuum switch/Filter unit

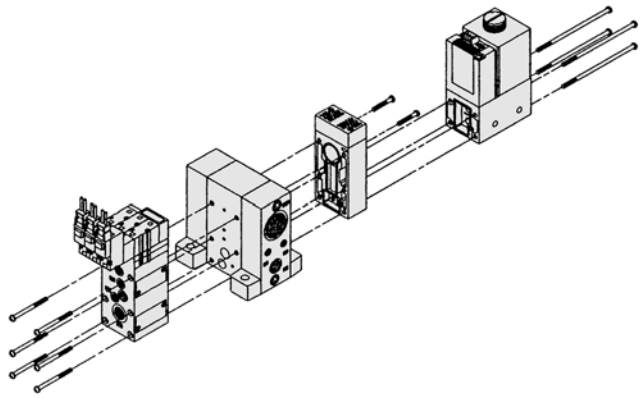




Components	Ejector unit







Mounting thread parts list for unit combination

No.	Combination specifications	Mounting thread	Quantity
①	Standard (without options)	M2.5 X 32	6
	With individual spacer	M2.5 X 35	6
	With function plate	M2.5 X 37	6
	With individual spacer + function plate	M2.5 X 40	6
②	Individual, common and port exhaust style for nozzle size 1.0, 1.3	M2 X 13	2
	Common and port exhaust style for nozzle size 1.5		
	Individual exhaust style for nozzle size 1.5	M2 X 23	2
	Common and port exhaust style for nozzle size 1.8, 2.0	M2 X 48	2
	Individual exhaust style for nozzle size 1.8, 2.0	M2 X 53	2
③	For vacuum switch and adapter A	M2.5 X 41	2
④	For nozzle size 1.0,1.3,1.5	M2.5 X 17	2
	For nozzle size 1.8, 2.0	M2.5 X 21	2
⑤	For nozzle size 1.0,1.3,1.5	M2.5 X 66	4
	For nozzle size 1.8, 2.0	M2.5 X 70	4
⑥	For nozzle size 1.0,1.3,1.5	M2.5 X 35	6
	For nozzle size 1.8, 2.0	M2.5 X 39	6
⑦	Standard (without option)	M2.5 X 5	6
	With body ported individual spacer	M2.5 X 8	6
⑧	For nozzle size 1.0,1.3,1.5	M3 X 0.35 X 19	2
	For nozzle size 1.8, 2.0	M3 X 0.35 X 23	2
	For nozzle size 1.0, 1.3, 1.5 + with function plate	M3 X 0.35 X 24	2
	For nozzle size 1.8, 2.0 + with function plate	M3 X 0.35 X 28	2
⑨	For nozzle size 1.0,1.3,1.5	M3 X 0.35 X 68	4
	For nozzle size 1.8, 2.0	M3 X 0.35 X 72	4
	For nozzle size 1.0,1.3,1.5 + with function plate	M3 X 0.35 X 73	4
	For nozzle size 1.8, 2.0 + with function plate	M3 X 0.35 X 77	4
⑩	For nozzle size 1.0,1.3,1.5	M3 X 0.35 X 37	6
	For nozzle size 1.8, 2.0	M3 X 0.35 X 41	6
	For nozzle size 1.0,1.3,1.5 + with function plate	M3 X 0.35 X 42	6
	For nozzle size 1.8, 2.0 + with function plate	M3 X 0.35 X 46	6

⚠ Precautions

Be sure to read before handling. Refer to p.0-20 and 0-21 for Safety Instructions and common precautions and refer to p.3.0-2 for precautions on every series.

⚠ Caution

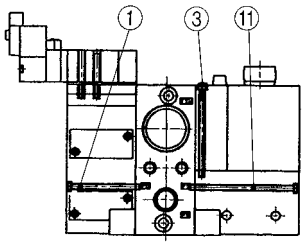
Refer to technical data on Best Pneumatics 3 for precautions on the vacuum circuit.

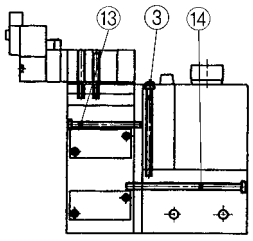
External Vacuum Supply System

Mounting Thread Parts List for Unit Combination

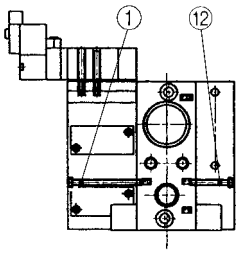
Manifold Specifications | **Without Manifold**

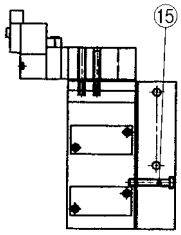
Components	Valve unit + Vacuum switch/Filter unit



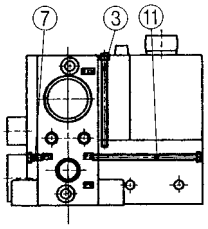


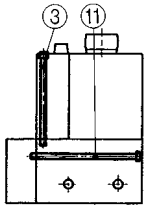
Components	Valve unit

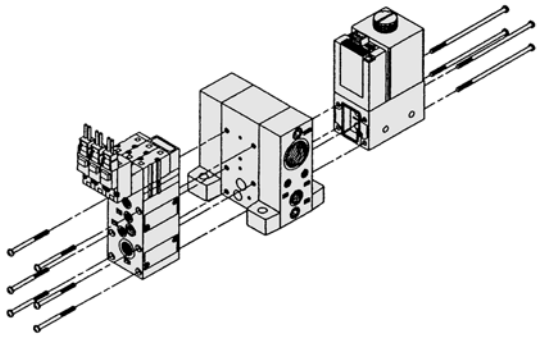




Components	Vacuum switch/Filter unit







Mounting thread parts list for unit combination

No.	Combination specifications	Mounting thread	Quantity
①	Standard (without options)	M2.5 X 32	6
	With individual spacer	M2.5 X 35	6
	With function plate	M2.5 X 37	6
	With individual spacer + with function plate	M2.5 X 40	6
③	For vacuum switch and adapter A	M2.5 X 41	2
⑦	Standard (without options)	M2.5 X 5	6
	With individual spacer	M2.5 X 8	6
⑪	Standard (without options)	M2.5 X 49	4
⑫	Standard (without options)	M2.5 X 18	6
⑬	Standard (without options)	M2.5 X 33	2
	With function plate	M2.5 X 38	2
⑭	Standard (without options)	M3 X 0.35 X 54	4
	With function plate	M3 X 0.35 X 59	4
⑮	Standard (without options)	M3 X 0.35 X 19	6
	With function plate	M3 X 0.35 X 24	6