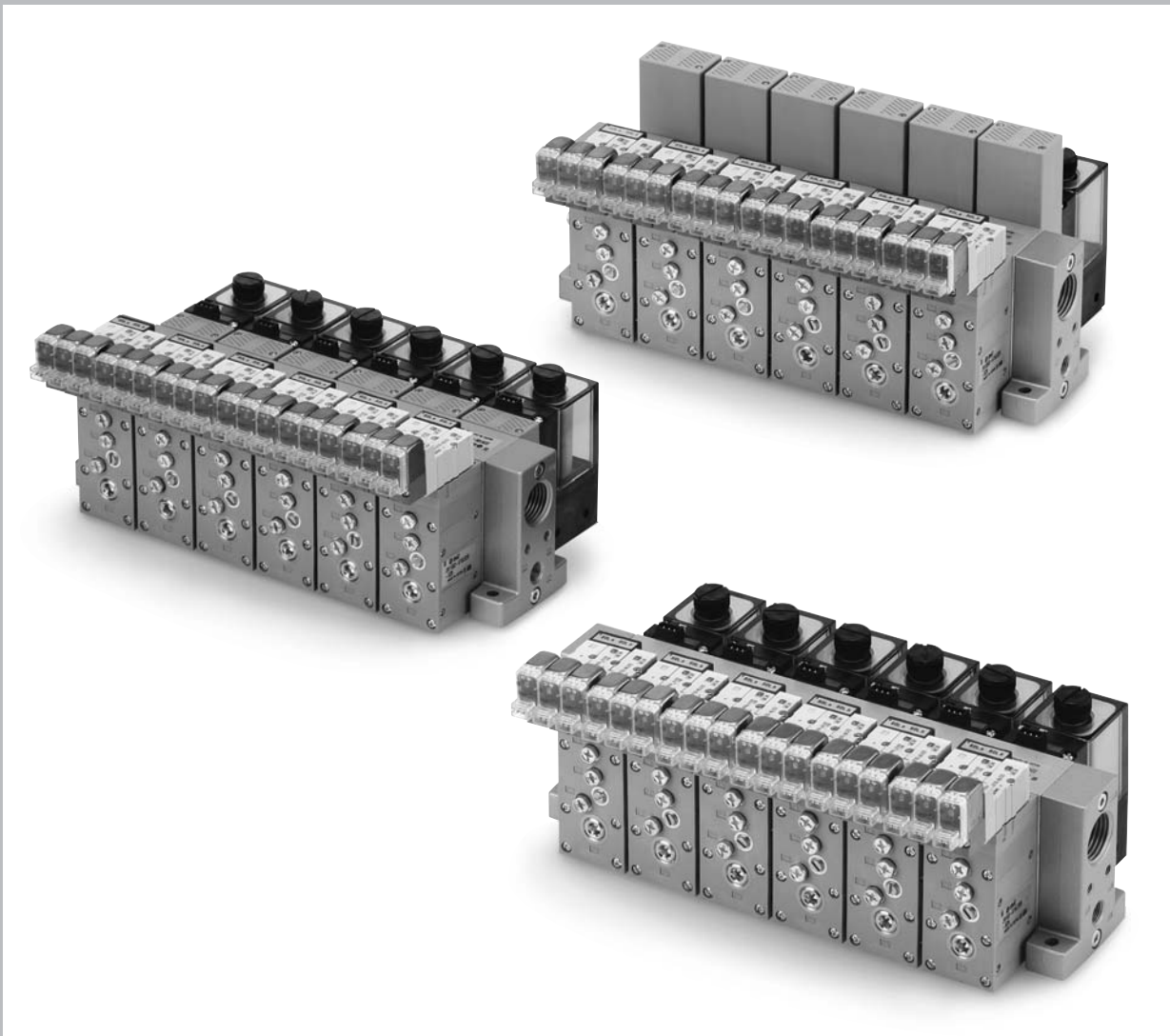


# Large Size Vacuum Module/series **ZR**

## Vacuum Ejector System/External Vacuum Supply System

- Nozzle size (mm):  $\varnothing 1.0$ ,  $\varnothing 1.3$ ,  $\varnothing 1.5$ ,  $\varnothing 1.8$ ,  $\varnothing 2.0$
- Suitable for handling workpieces of 0.5 to 5kg



ZX

**ZR**

ZM

ZY

ZH

ZU

ZL

ZF

ZP

ZCU

Vacuum  
related

# Large Size Vacuum Module

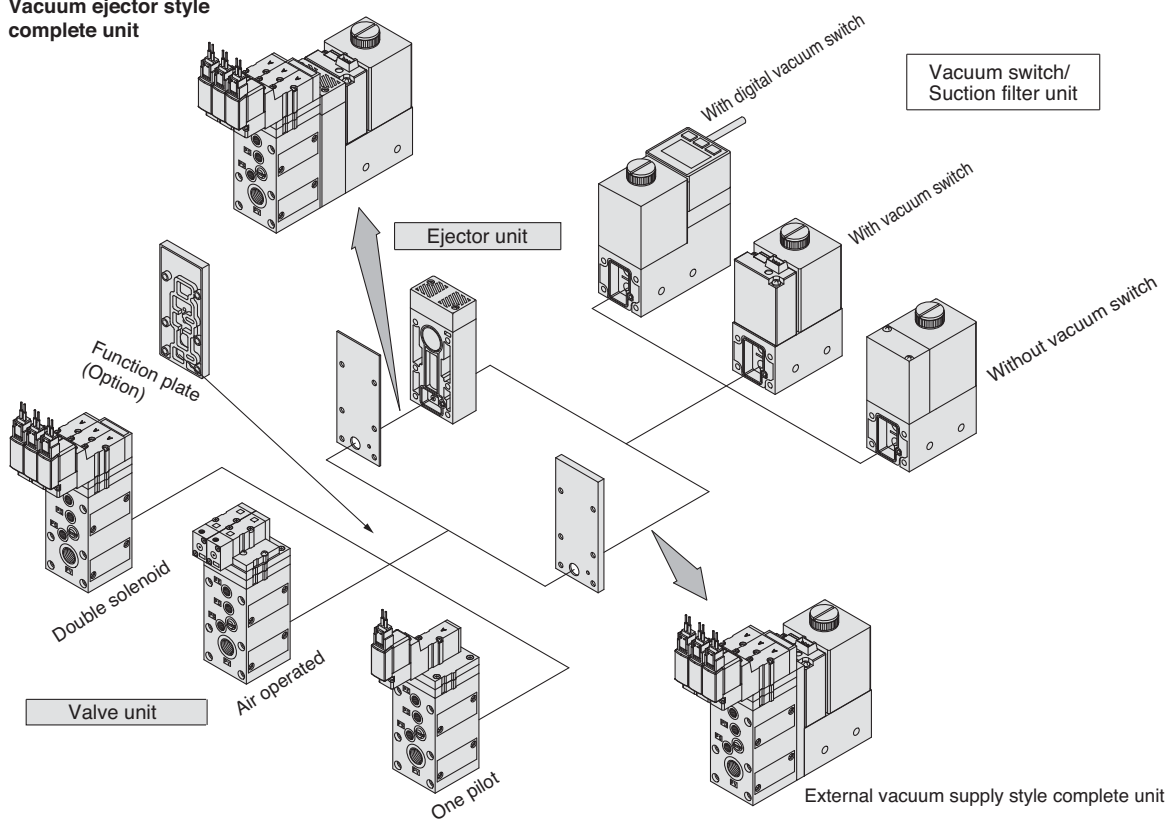
## Series ZR

Vacuum Ejector System/External Vacuum Supply System

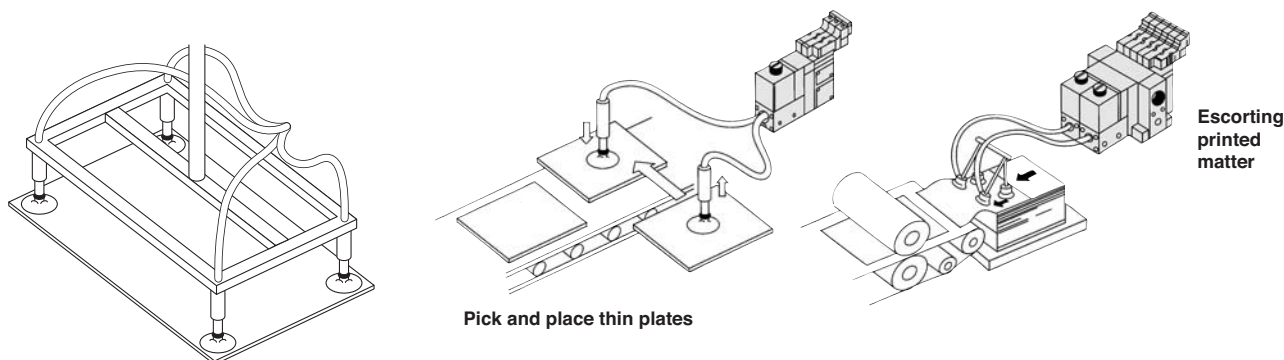
Vacuum module suitable for handling workpieces of 0.5 to 5kg.

- 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





Absorbing and transferring  
liquid crystal panels

Pick & place copper plates, Automatic labeling machine,  
Transporting veneers, Automatic screw fastening machine

## Modular Components Introduction

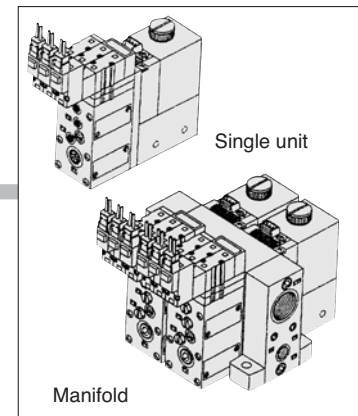
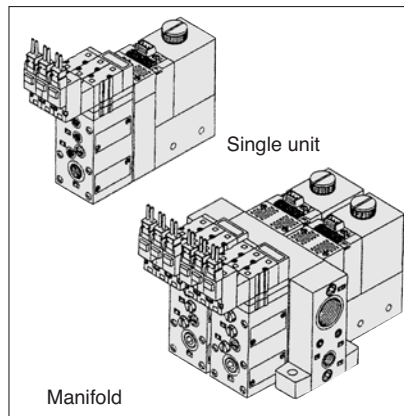
Basic Specifications			Vacuum Ejector Style					External Vacuum Supply Style					
Components		Characteristics		P.3.2-4 to 3.2-30					P.3.2-31 to 3.2-44				
<div>Ejector unit ZR1-W</div> 			Nozzle dia. φ(mm)		1.0	1.3	1.5	1.8	2.0	—			
			Max. suction flow (ℓ/min (ANR))		Type S		22	38	54			62	84
					Type 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										
<div>Valve unit ZR1-V</div> 			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								
<div>Pressure switch for vacuum ZSE2-0R-15/55 ZSE30A-00-□-□□□</div> 			Pressure setting range		0 to −101kPa								
			Hysteresis		3% or less								
			Operating voltage		12 to 24V DC (Ripple 10% or less)								
<div>Suction filter unit ZR1-F</div> 			Operating pressure range		Vacuum to 100kPa								
			Filtration		30μm								
			Material		PVF								
<div>Function plate ZR1-RV</div>			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 3.2-19 for further specifications of each unit.



ZX  
**ZR**  
 ZM  
 ZY  
 ZH  
 ZU  
 ZL  
 ZF  
 ZP  
 ZCU  
 Vacuum related

Refer to p.3.2-9 to 3.2-19 for further specifications of each unit.



# Large Size Vacuum Module

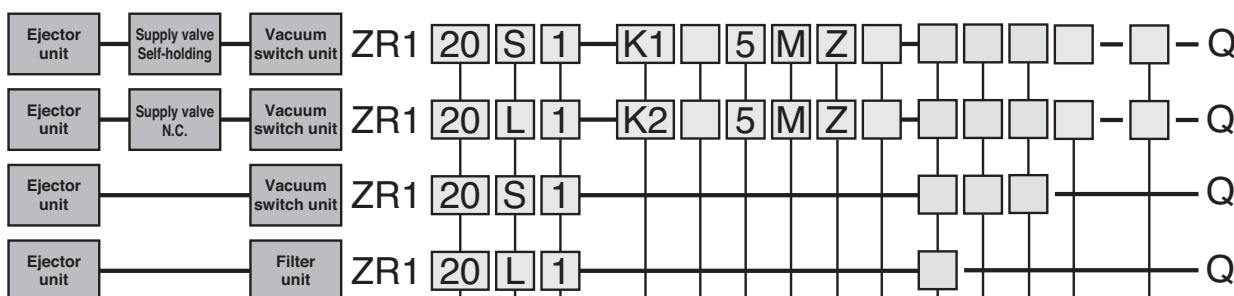
# Series ZR/Ejector System

## How to Order

### Note for model selection

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

### Components



### Ejector unit 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.

### 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.

### 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	Lead wire length 0.3m
LN	Without lead wire
LO	Without connector
M	Plug connector
MN	Lead wire length 0.3m
MO	Without lead wire
G	Grommet
H	Without connector
G	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.

### Manual override

—	Non-locking push style
B	Locking slotted style

### Combination of switch/filter

—	None
D	Digital pressure switch for vacuum (ZSE30A) + Filter
E	Pressure switch for vacuum (ZSE2) + Filter
F	Filter

### Release flow rate adjusting needle/Bracket A, B

	Lock nut	Bracket A or B
—	×	●
L	●	●
M	●	×
N	×	×

● : Attached (Bracket A or B is shipped together.)  
× : None

### Lead wire specifications

#### Digital pressure switch for vacuum (ZSE30A) specifications (D)

—	Without lead wire
L	Lead wire with connector (Length 2 m)

Refer to "Table (4)" on page 3.2-5 for part no. of lead wire with connector.

#### Pressure switch for vacuum (ZSE2) specifications (E)

—	Grommet/Lead wire (Length 0.6 m)
L	Grommet/Lead wire (Length 3 m)
C	Lead wire with connector (Length 0.6 m)
CL	Lead wire with connector (Length 3 m)
CN	Without lead wire with connector

Refer to "Table (3)" on page 3.2-5 for part no. of lead wire with connector.

#### Filter specifications (F)

—	No setting
---	------------

### Unit specifications

#### Digital pressure switch for vacuum (ZSE30A) specifications (D)

—	With unit switching function
M	SI unit only
P	With unit switching function (Initial value psi)

Note 1) Fixed unit: kPa

#### Pressure switch for vacuum (ZSE2) specifications (E)

—	No setting
---	------------

#### Filter specifications (F)

—	No setting
---	------------

### Output specifications

#### Digital pressure switch for vacuum (ZSE30A) specifications (D)

N	NPN open collector 1 output
P	PNP open collector 1 output
A	NPN open collector 2 outputs
B	PNP open collector 2 outputs
C	NPN open collector 1 output + Analog voltage output
D	NPN open collector 1 output + Analog current output
E	PNP open collector 1 output + Analog voltage output
F	PNP open collector 1 output + Analog current output

#### Pressure switch for vacuum (ZSE2) specifications (E)

—	NPN open collector 1 output
55	PNP open collector 1 output

#### Filter specifications (F)


—	No setting
---	------------

① Combination of Supply Valve and Release Valve

Valve unit function			Valve unit components		Symbol	Supply valve				Release valve			
Operation stop	Vacuum adsorption	Vacuum release	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)
⊙	⊙	○	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 supply valve)	—
×	○	○	Air operated (VJA3130)		C2	—	—	—	●	—	—	—	(Common with supply valve)
×	○	○	N.O. (VJA3130)		C3	—	—	●	—	—	—	(Common with supply valve)	—
×	⊙	⊙	Double solenoid (VJ3233-X18)		C4	—	●	—	—	—	(Common with supply valve)	—	—
			—		—	Without valve unit							

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

Table (2) How to Order Valve Plug Connector Assembly


DC      **SY100 – 30 – 4A –** 

Lead wire length

—	300 mm (Standard)
6	600 mm
10	1000 mm
15	1500 mm
20	2000 mm
25	2500 mm
30	3000 mm
50	5000 mm

**How to order**  
When requiring a vacuum unit equipped with valves with lead wires of 600 mm 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.  
              \*SY100-30-4A-6..... 3 pcs.

Table (3) Pressure Switch for Vacuum/Lead Wire with Connector


**ZS – 10 – 5A –** 

Lead wire length

—	0.6 m
30	3 m
50	5 m

**How to order**  
When requiring a vacuum switch with a lead wire of 5 m, indicate the part numbers of the vacuum unit switch without a lead wire connector and the 5 m lead wire connector separately.  
Example) ZR1□□□-□□□□□-□CN..... 1 pc.  
              \*ZS-10-5A-50 ..... 1 pc.

Table (4) Digital Pressure Switch for Vacuum/Lead Wire with Connector

**ZS – 38 –**  **3 L**

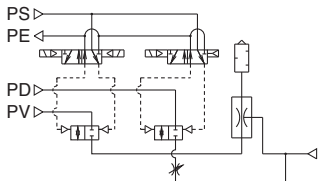
Lead wire core

3	3 cores, 1 output, 2 m (Output specifications: N, P)
4	4 cores, 2 outputs, 2 m (Output specifications: A, B, C, D, E, F)

Ejector System/Combination of Supply Valve and Release Valve

Combination Symbol: **K1**

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

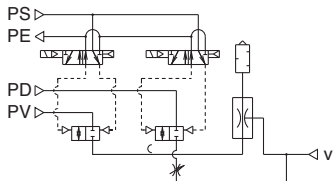


How to Operate

Operation	Pilot valve operation		Supply valve		Release valve		Note
			Pilot valve for supply	Pilot valve for supply stop	Pilot valve for release	Pilot valve for release	
1. Adsorption			ON	OFF	OFF	OFF	When power supply is cut off while the supply valve is ON, the operational state is held.
2. Vacuum release			OFF	ON	ON	ON	
3. Operation stop			OFF	ON	OFF	OFF	

Combination Symbol: **K2**

Feature: Single solenoid valve is provided for supply valve.

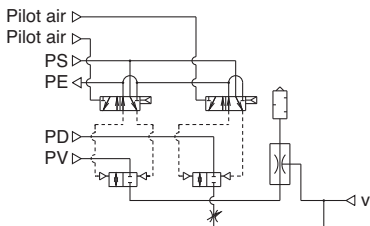


How to Operate

Operation	Pilot valve operation		Supply valve		Release valve		Note
			Pilot valve for supply	Pilot valve for supply	Pilot valve for release	Pilot valve for release	
1. Adsorption			ON	ON	OFF	OFF	When power supply is stopped, all operations will be stopped.
2. Vacuum release			OFF	OFF	ON	ON	
3. Operation stop			OFF	OFF	OFF	OFF	

Combination Symbol: **K3**

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



How to Operate

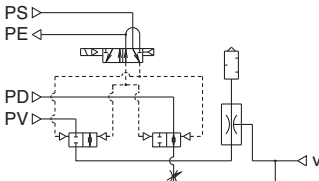
Operation	Pilot valve operation		Supply valve		Release valve		Note
			Air operated a	Air operated a	Air operated b	Air operated b	
1. Adsorption			ON	ON	OFF	OFF	The product is used under the environment in which solenoid valves cannot be used or when the centralized control is applied using external pilot air.
2. Vacuum release			OFF	OFF	ON	ON	
3. Operation stop			OFF	OFF	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 single solenoid valve.

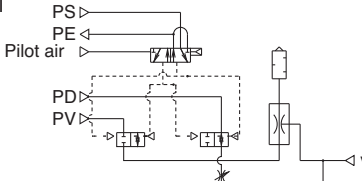


How to Operate

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

Combination Symbol: **C2**

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

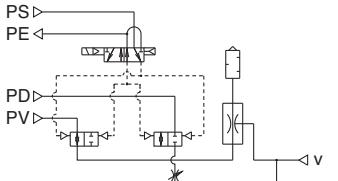


How to Operate

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

Combination Symbol: **C3**

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

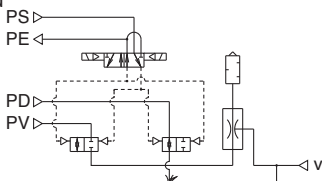


How to Operate

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

Combination Symbol: **C4**

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



How to Operate

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

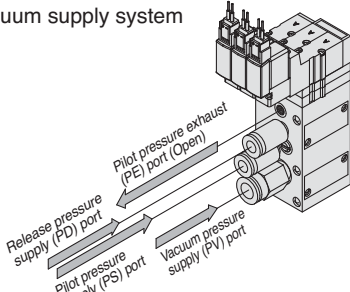


**Function Plate/ZR1-RV□**

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.

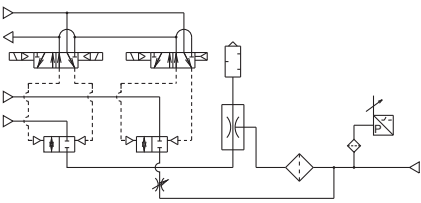
**Without Function Plate (Standard)**

Applicable system: Ejector system  
External vacuum supply system



Pipe connection

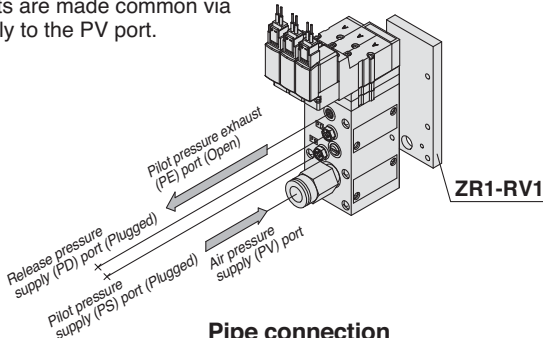
Circuit diagram



**With Function Plate/Applicable to Ejector System Only**

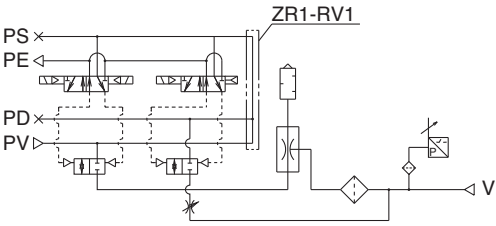
**When ZR1/RV1 (PV PS PD) is Selected**

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



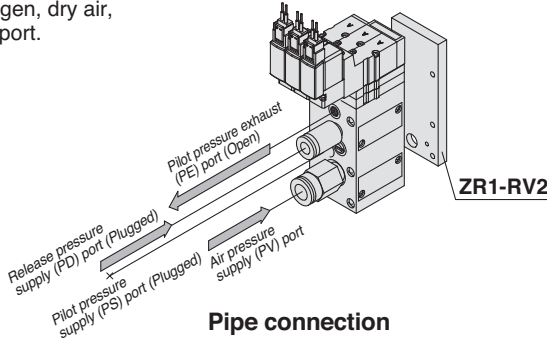
Pipe connection

Circuit diagram



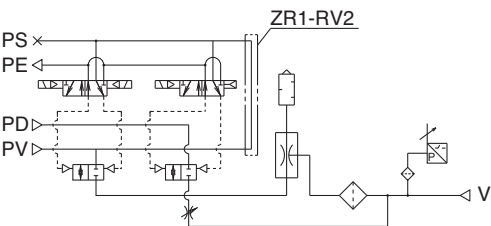
**When ZR1/RV2 (PV PS/PD) is Selected**

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

Circuit diagram



**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	

**Caution**

Length of assembling mounting threads varies when adding function plate. Order from the mounting thread parts list for unit combination on page 3.2-45. Order a plug (ZX1-MP1) separately in order to plug the PD and PS ports that are no longer used due to the addition of function plate.

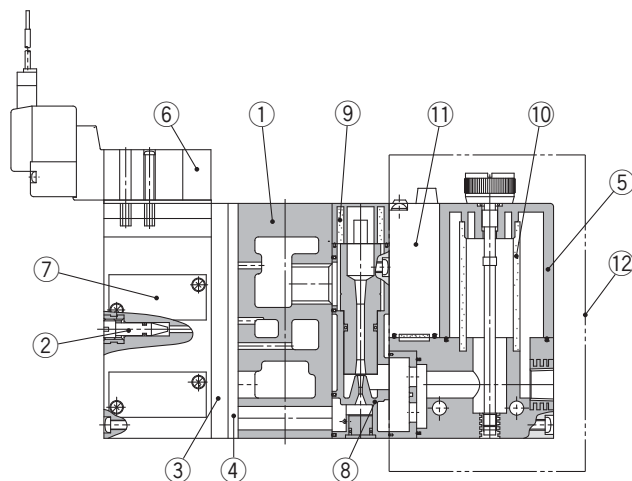
**How to order**

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

Example) ZR120S1-K15MZ-EC..... 1 pc.  
\* ZR1-RV1 ..... 1 pc.

ZX
ZR
ZM
ZY
ZH
ZU
ZL
ZF
ZP
ZCU
Vacuum related

Construction



Component Parts

No.	Description	Material	Part Model
1	Manifold base	Aluminum alloy	
2	Release flow rate adjusting needle	Stainless steel	ZR-NA <sup>Note 2)</sup>
3	Function plate	PBT	Refer to page 3.2-25
4	Individual spacer	PBT	Refer to page 3.2-25
5 <sup>Note 1)</sup>	Filter case	Polycarbonate	Refer to page 3.2-17
6	Pilot valve assembly	—	Refer to bellow table
7	Valve body assembly	—	Refer to bellow table

Note 1) Precautions on handling the filter case

- 1. The case is made of polycarbonate. Therefore, do not contact it 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.

Note 2) Turning the release flow rate adjusting needle 2 full turns from the fully closed position renders the needle valve fully open. Do not turn more than two times since turning excessively may cause the needle fall off.  
In order to prevent the needle from loosening and falling out, the release flow rate adjusting (ZR-ND-L) lock nut is also available.

No.	Description	Material	Part Model
8	Ejector assembly	—	Refer to bellow table
9	Silencer	PVF	Refer to bellow table
10	Filter element	PVF	ZR1-FZ(30 μm)
11	Pressure switch for vacuum	—	ZSE2-OR- <sup>15</sup> / <sub>55</sub> -□ ZSE30A-00-□-□□□-Equivalent
12	Filter switch unit for replacement	—	ZR1-F□□□□-D

How to Order Solenoid Valves/Air Operated Valves

Air operated

**SYJA3130**

Solenoid valve

**ZR1-SYJ3233** - □ □ □ □ - **X126**  
**X127** - **Q**

**SYJ3133** - □ □ □ □ - **Q**

rated voltage ●

5	DC24V
6	DC12V
V	DC6V
S	DC5V
R	DC3V

● Manual override

—	Non-locking push type
D	Slotted locking type

● Light/Surge voltage suppressor

—	None
Z	With light and surge voltage suppressor
S	With surge voltage suppressor (DC only)

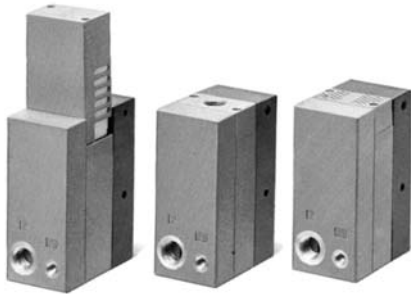
Electrical entry ●

L	L plug connector type	Lead wire: 0.3 m
LN		Without lead wires
LO		Without connector
M	M plug connector type	Lead wire: 0.3 m
MN		Without lead wires
MO		Without connector
G	Grommet type	Lead wire: 0.3 m (Applies only to DC)
H		Lead wire: 0.6 m (Applies only to DC)

Note) Mounting screw and pilot valve gasket (SYJ3000-14-6) are included.



## 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	25	53	0.132
ZR1-W13S□	1.3	42	86	0.134
ZR1-W15S□	1.5	63	102	0.136
ZR1-W18S□	1.8	74	155	0.154
ZR1-W20S□	2.0	95	194	0.156

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

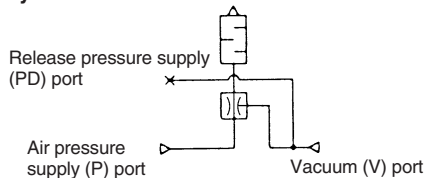
Model	Nozzle dia. ø(mm)	Max.suction flow (ℓ/min (ANR))	Air consumption (ℓ/min (ANR))	Weight(with bracket) (kg)
ZR1-W10L□	1.0	44	53	0.133
ZR1-W13L□	1.3	55	86	0.133
ZR1-W15L□	1.5	88	102	0.135
ZR1-W18L□	1.8	105	155	0.155
ZR1-W20L□	2.0	132	194	0.154

### 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 (ZR1-OB)

\* 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

#### Bracket B

-	With Bracket B
N	Without Bracket B

#### 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)

ZX

ZR

ZM

ZY

ZH

ZU

ZL

ZF

ZP

ZCU

Vacuum related

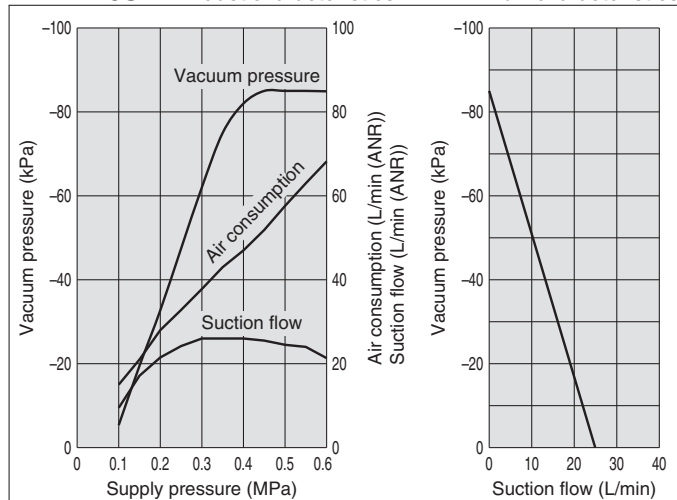
## Characteristics (Representative value)

### Ejector Unit/Standard Type (S): Max. Vacuum Pressure -84 kPa

At 0.45 MPa

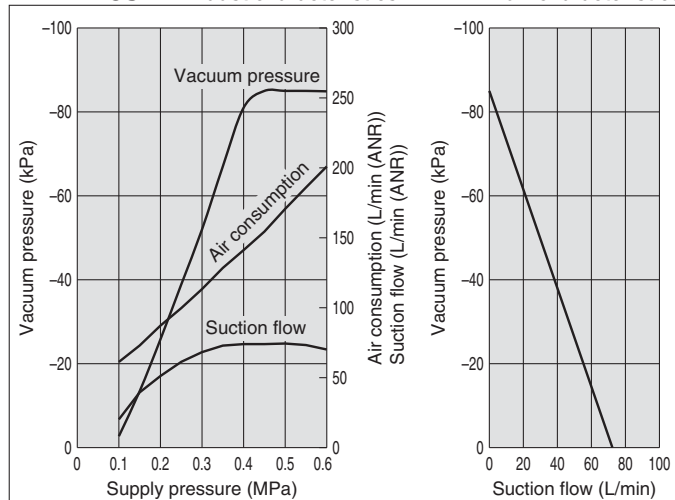
**ZR1-W10S1 Exhaust characteristics**

**Flow characteristics**



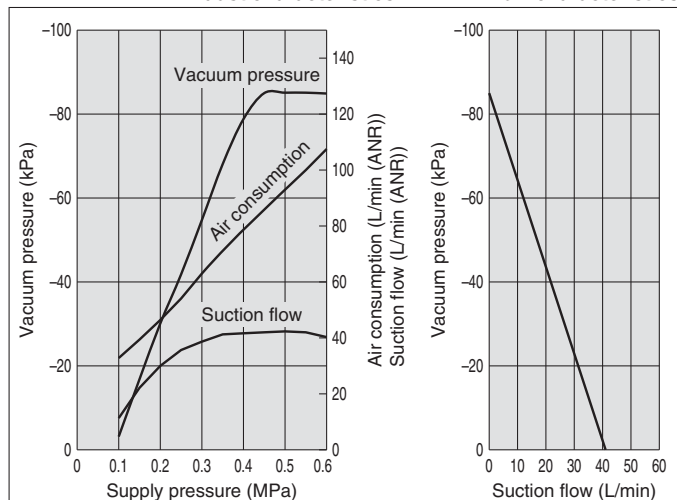
**ZR1-W18S1 Exhaust characteristics**

**Flow characteristics**



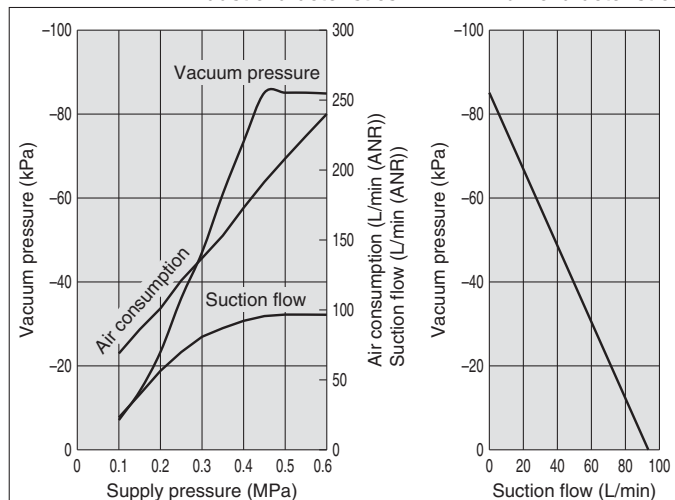
**ZR1-W13S1 Exhaust characteristics**

**Flow characteristics**



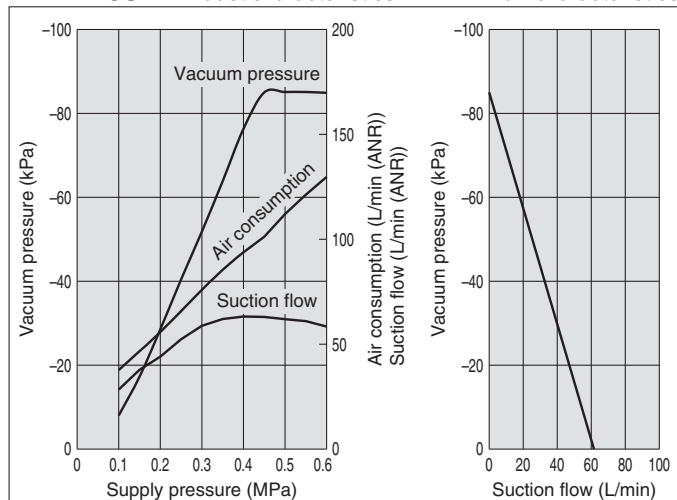
**ZR1-W20S1 Exhaust characteristics**

**Flow characteristics**



**ZR1-W15S1 Exhaust characteristics**

**Flow characteristics**

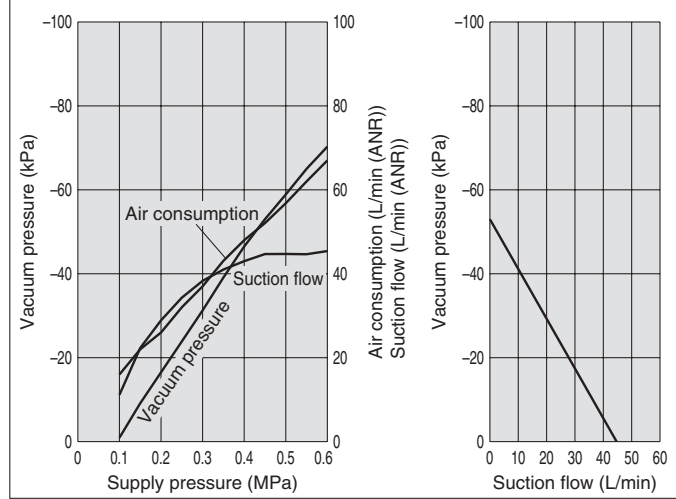


## Ejector Unit/Large Flow Type (L): Max. Vacuum Pressure -53 kPa

At 0.45 MPa

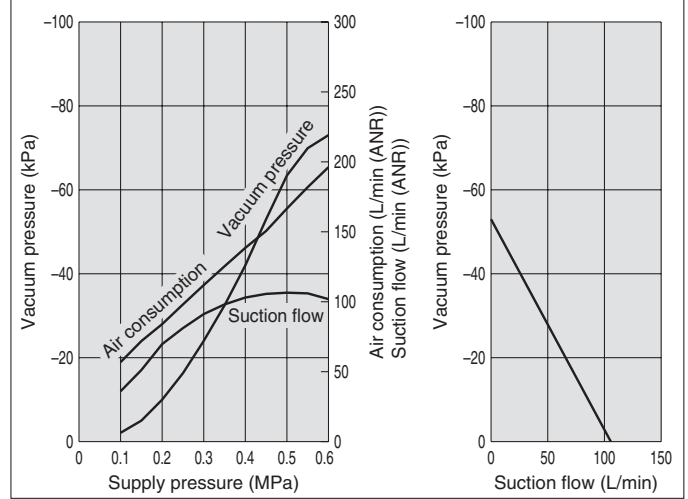
**ZR1-W10L1 Exhaust characteristics**

**Flow characteristics**



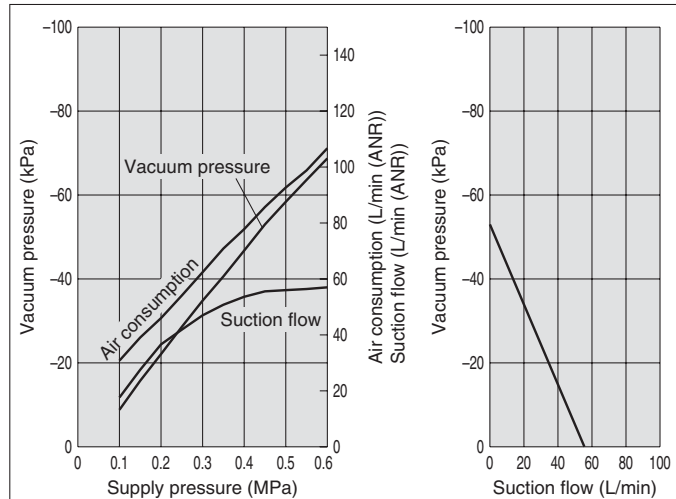
**ZR1-W18L1 Exhaust characteristics**

**Flow characteristics**



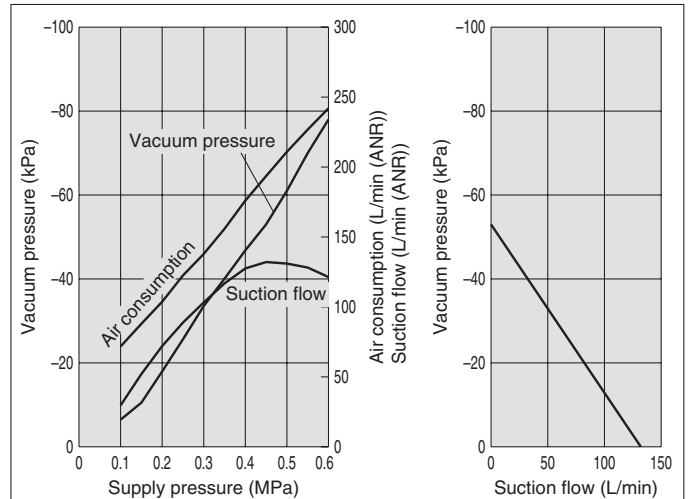
**ZR1-W13L1 Exhaust characteristics**

**Flow characteristics**



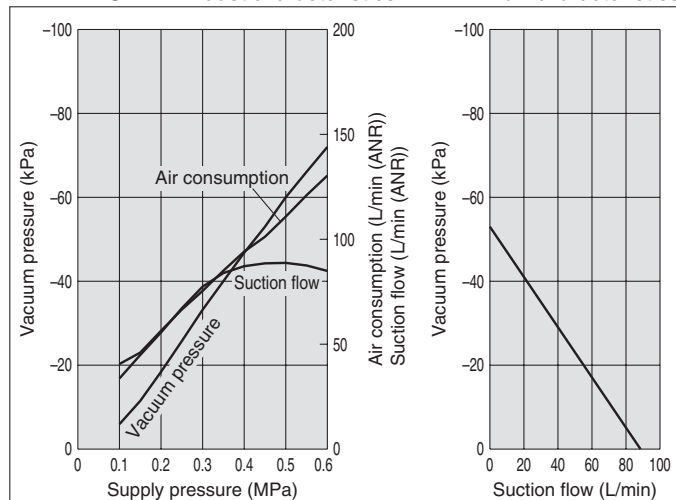
**ZR1-W20L1 Exhaust characteristics**

**Flow characteristics**

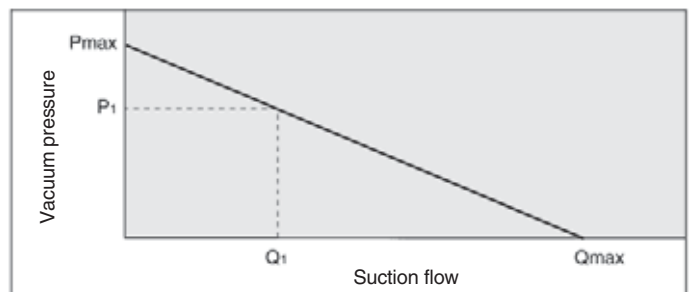


**ZR1-W15L1 Exhaust characteristics**

**Flow characteristics**



## How to Read Flow Characteristics Graph



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, P<sub>max</sub> is max. vacuum pressure and Q<sub>max</sub> is maximum suction flow. The values are specified according to catalog use. Changes in vacuum pressure are expressed in the below order.

1. When ejector suction port is covered and made airtight, suction flow becomes 0 and vacuum pressure is at maximum value (P<sub>max</sub>).
2. When suction port is opened gradually, air can flow through, (air leakage), suction flow increases, but vacuum pressure decreases. (condition P<sub>1</sub> and Q<sub>1</sub>)
3. When suction port is opened further, suction flow moves to maximum value (Q<sub>max</sub>), but vacuum pressure is near 0 (atmospheric pressure).

Based on the above, 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 rise.

ZX

ZR

ZM

ZY

ZH

ZU

ZL

ZF

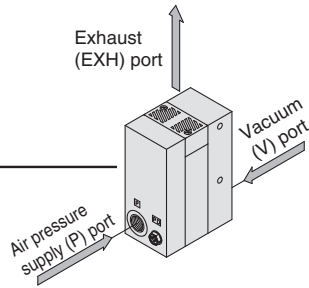
ZP

ZCU

Vacuum related

# Series ZR

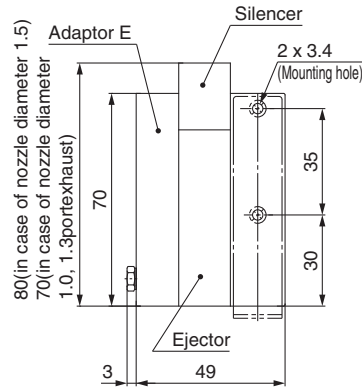
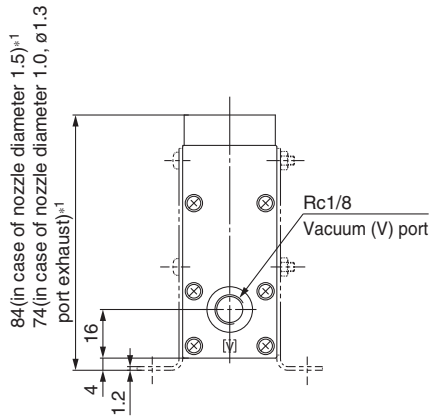
## Ejector Unit



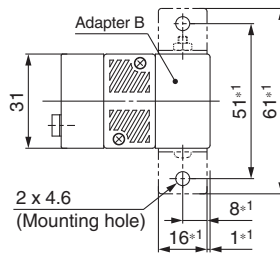
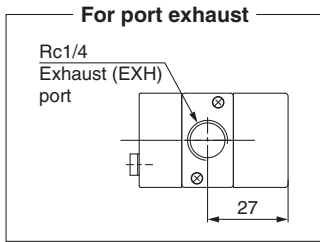
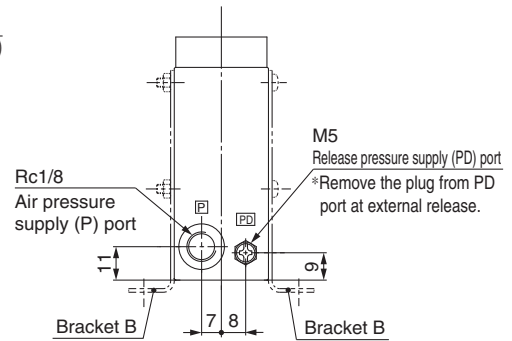
Nozzle Dia. / $\phi 1.0$ ,  $\phi 1.3$ ,  $\phi 1.5$ ,  $\phi 1.8$ ,  $\phi 2.0$ mm

Nozzle dia./ $\phi 1.0$ ,  $\phi 1.3$ ,  $\phi 1.5$  mm

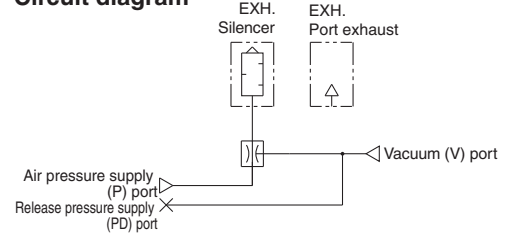
ZR1-W  $\begin{matrix} 10 \\ 13 \\ 15 \end{matrix} \square \square$



Note) \*1 Dimensions : For mounting bracket B  
Bracket B part number: ZR1-OB  
(Standard accessory)

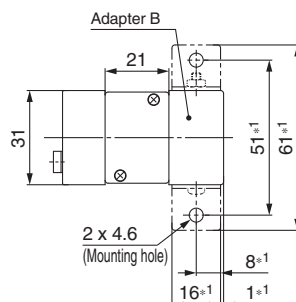
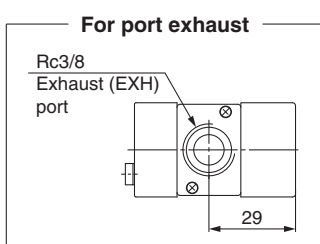
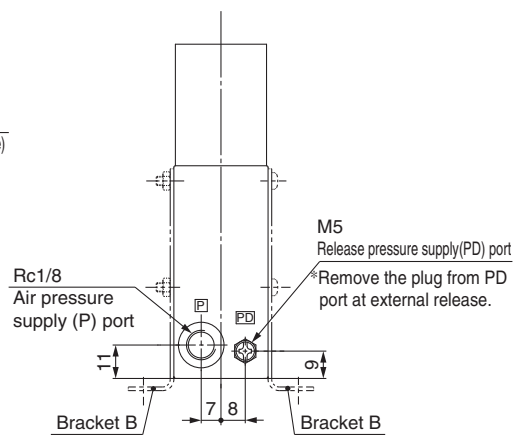
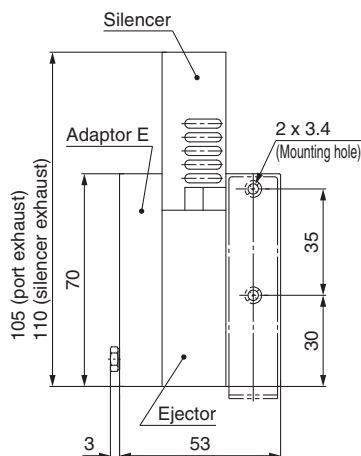
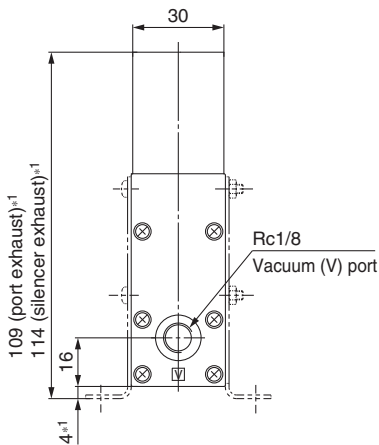


### Circuit diagram

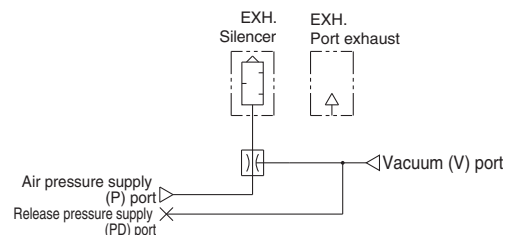


Nozzle dia./ $\phi 1.8$ ,  $\phi 2.0$  mm

ZR1-W  $\begin{matrix} 18 \\ 20 \end{matrix} \square \square$

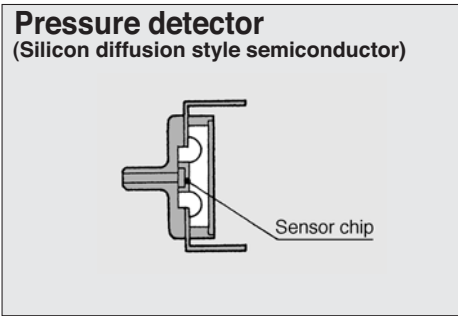


### Circuit diagram



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

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



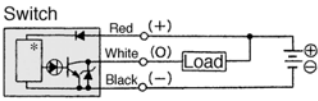
Specifications

Vacuum switch model No.	ZSE2-0R-15□	ZSE2-0R-55□
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	NPN Open collector 30 V, 80 mA	PNP Open collector 80 mA
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.

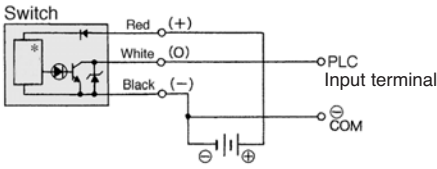
Wiring

**ZSE2 connection**



\* Switch Main circuit

**Connection with PLC At negative COM terminal**



How to Order

ZSE2 — 0R — 15 **L** - Q

Output specifications	
15	NPN Open collector 30V 80mA
55	PNP Open collector 80mA

Vacuum switch electrical entry		
—	Grommet style	Lead wire length 0.6m
L	Grommet style	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.

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

Lead wire length	
—	0.6m
30	3m
50	5m

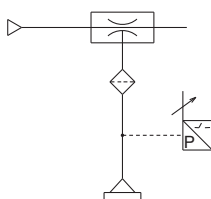
## Vacuum Pressure Switch Unit: ZSE2-0R-□□

### Guidelines for Use of Vacuum Switch Unit

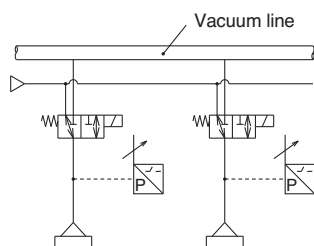
#### System circuit for work adsorption

#### System circuit for work adsorption

##### Ejector style

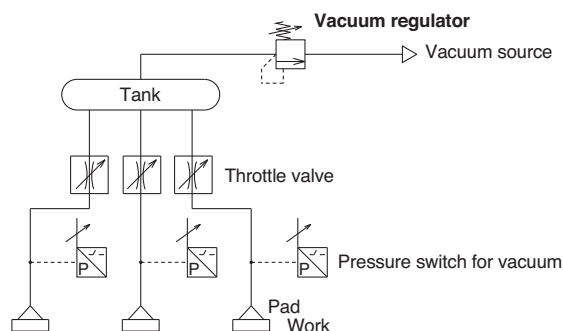


##### Vacuum pump style



#### 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.



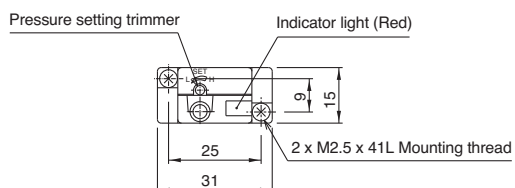
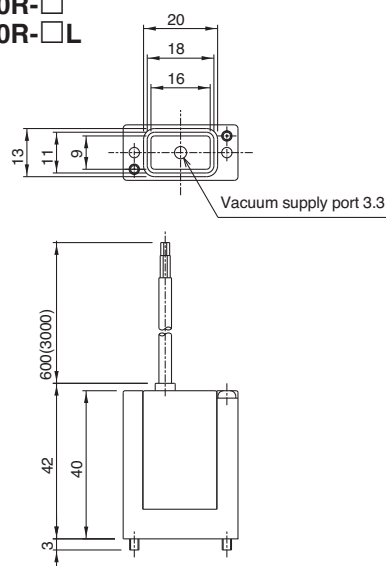
- Reduce pressure variation by means of needle valve, throttling it to some extent.
- Install tank, and vacuum pressure regulator (T203 Series) to stabilize vacuum source pressure.
- Sometimes it may be necessary to install individual vacuum switching valves to each nozzle supply line to isolate a line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

#### Setting pressure

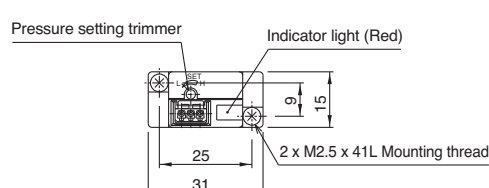
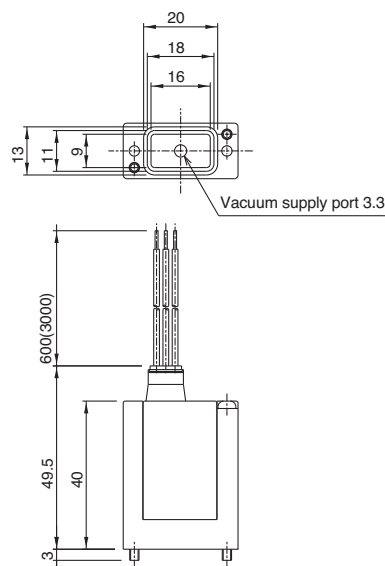
When it is used for work adsorption, set the pressure so that adsorption is complete and reliable. Sometimes the switch will turn ON even when adsorption is not complete.

### Vacuum Pressure Switch/ZSE2-0R-□□

ZSE2-0R-□  
ZSE2-0R-□L



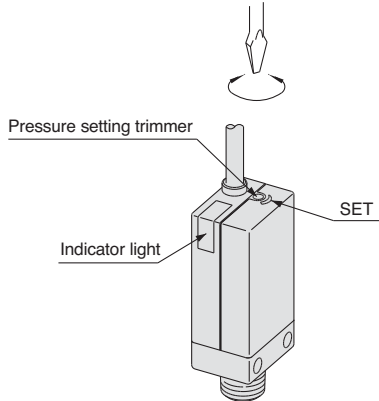
ZSE2-0R-□C  
ZSE2-0R-□CL  
ZSE2-0R-□CN



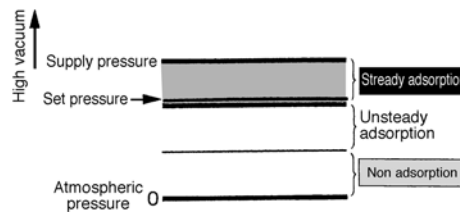


## How to Set Vacuum Pressure

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

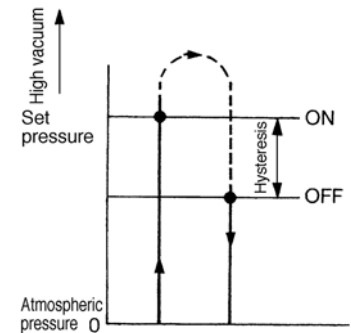


- When using the switch to confirm correct adsorption, the set pressure should be as low as possible, but not so low that a false confirmation signal is given when adsorption is incomplete.



## Hysteresis

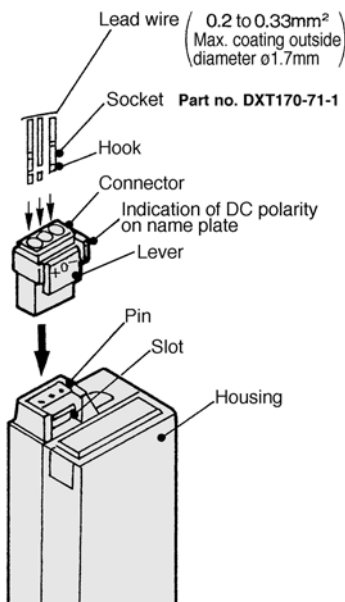
Hysteresis is the actual pressure variance from set pressure occurring when the output signal turns from ON to OFF. The set pressure is the pressure selected to switch from OFF to ON mode.



## How to Use Connector

### ① Connection

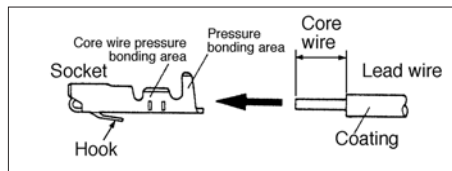
- When assembling the connector to the switch housing, push the connector straight onto the pins until the level locks into the housing slot.
- When removing the connector from the switch housing, push the lever down to unlock it from the slot and then withdraw the connector straight off of the pins.



### 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)



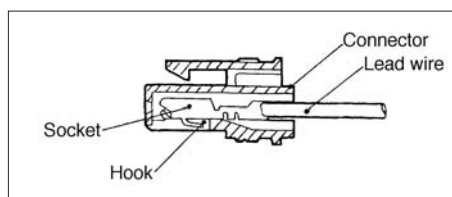
### ③ Assembly of socket to connector with lead wire

#### ● 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.

ZX

ZR

ZM

ZY

ZH

ZU

ZL

ZF

ZP

ZCU

Vacuum related

## How to Order



**ZR1 – ZSE30A – 00 – N – M**

Output specifications				
Symbol	Output		Analog output	
	Type	Point	Voltage	Current
<b>N</b>	NPN	1	—	—
<b>P</b>	PNP	1	—	—
<b>A</b>	NPN	2	—	—
<b>B</b>	PNP	2	—	—
<b>C</b>	NPN	1	○	—
<b>D</b>	NPN	1	—	○
<b>E</b>	PNP	1	○	—
<b>F</b>	PNP	1	—	○

- Option 1 (Connector/Lead wire specifications)

<b>Nil</b>	Without lead wire
<b>L</b>	Lead wire with connector (Length 2 m)

- **Display unit**

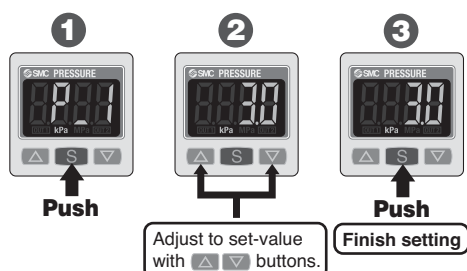
<b>Nil</b>	With unit display switching function
<b>M</b>	Fixed SI unit
<b>P</b>	With unit display switching function (Initial value psi)

Note 1) This is no longer sold for use in Japan due to the Weight and Measure Act (implemented October, 1999).

Note 2) Fixed unit: kPa

## Specifications

### ● 3-step setting



### ● Power-saving function

Power consumption is reduced by turning off the monitor. (Reduce power consumption by up to 20%.)

Rated pressure range		0.0 to –101.0 kPa
Set pressure range		10.0 to –105.0 kPa
Withstand pressure		500 kPa
Minimum unit setting		0.1 kPa
Applicable fluid		Air, Non-corrosive gas, Non-flammable gas
Power supply voltage		12 to 24 VDC $\pm 10\%$ (with power supply polarity protection)
Current consumption		40 mA (at no load)
Switch output	NPN or PNP open collector 1 output NPN or PNP open collector 2 outputs (selectable)	
	Maximum load current	80 mA
	Maximum applied voltage	28 V (at NPN output)
	Residual voltage	1 V or less (with load current of 80 mA)
	Response time	2.5 ms or less (with anti-chattering function: 20, 100, 500, 1000, 2000 ms)
	Short circuit protection	Yes
	Repeatability	$\pm 0.2\%$ F.S. $\pm 1$ digit
Hysteresis	Hysteresis mode	
	Window comparator mode	
	Variable (0 to variable)	
	Note 1) Voltage output	Output voltage (Rated pressure range) 1 to 5 V $\pm 2.5\%$ F.S.
	Linearity	
	$\pm 1\%$ F.S. or less	
	Approx. 1 k $\Omega$	
Analog output	Note 2) Current output	Output current (Rated pressure range) 4 to 20 mA $\pm 2.5\%$ F.S.
	Linearity	
	$\pm 1\%$ F.S. or less	
	Load impedance	
Display		Maximum load impedance: Power supply voltage 12 V: 300 $\Omega$ , Power supply voltage 24 V: 600 $\Omega$ Minimum load impedance: 50 $\Omega$
Display accuracy		4-digit, 7-segment, 2-color LCD (Red/Green) Sampling cycle: 5 times/sec. $\pm 2\%$ F.S. $\pm 1$ digit (Ambient temperature of 25°C)
Indicator light		Lights up when switch output is turned ON. (OUT1: Green, OUT2: Red)
Environment resistance	Enclosure	
	IP40	
	Operating temperature range	
	Operating/Stored: 0 to 50°C, Stored: –10 to 60°C (No freezing or condensation)	
	Operating humidity range	
Withstand voltage		Operating/Stored: 35 to 85% RH (No condensation) 1000 VAC for 1 minute between terminals and housing
Insulation resistance		50 M $\Omega$ or more (500 VDC measured via megohmmeter) between terminals and housing
Temperature characteristics		$\pm 2\%$ F.S. (Based on 25°C)
Lead wire		Oilproof heavy-duty vinyl cable, 3 cores $\phi 3.5$ , 2 m 4 cores Conductor area: 0.15 mm <sup>2</sup> (AWG26) Insulator O.D.: 1.0 mm
Standards		CE Marking, UL/CSA, RoHS compliance

Note 1) When analog voltage output is selected, analog current output cannot be used together.

Note 2) When analog current output is selected, analog voltage output cannot be used together.

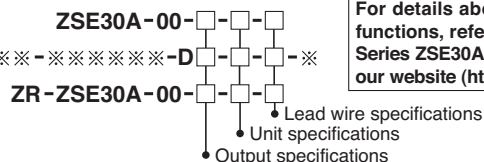
\*The vacuum pressure switch mounted on this product is equivalent to our SMC product, the ZSE30A series compact digital pressure switch.

●Pressure switch correspondence table

Digital pressure switch Series ZSE30A

Large size vacuum module Series ZR

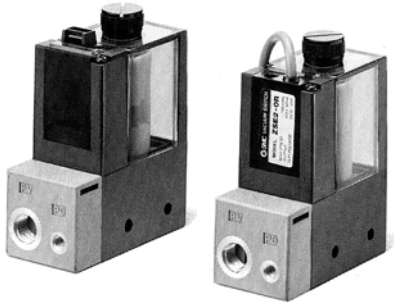
Vacuum pressure switch (For ZR)



For details about vacuum pressure switch functions, refer to the Operation Manual for Series ZSE30A that can be downloaded from our website (<http://www.smcworld.com>).

## 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.



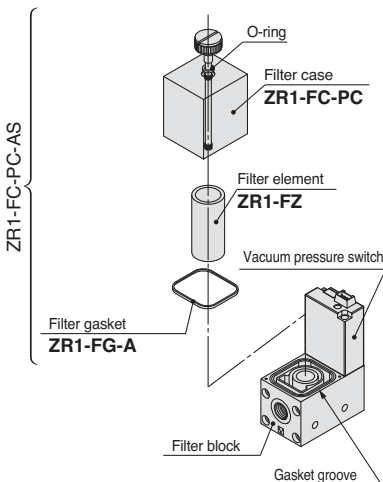
### Filter case

#### ⚠ Caution

1. The case is made of polycarbonate. Therefore, do not contact it 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 (alkalinalic), etc.
2. Do not expose it to direct sunlight.

### How to Replace Elements

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



### Specifications

Unit model No.		ZR1-F□□
Suction filter	Operating press range	Vacuum to 100kPa
	Operating temp range	5 to 50°C
	Filtration	30m
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 Pressure Switch for Vacuum and Suction Filter

Combination symbol	Suction filter	Pressure switch for vacuum	Weight (with bracket A) (kg)
E	●	ZSE2	0.15
D	●	ZSE30A	0.23
F	●	—	0.15

\* Adapter A is attached on vacuum switch mounting area.

### How to Order

ZR1 - F □ □ □ □ - □

Combination of pressure switch/filter	
D	Digital pressure switch for vacuum (ZSE30A) + Filter
E	Pressure switch for vacuum (ZSE2) + Filter
F	Filter

\*The filter mounted on the product is a simplified one. When used in an environment with a lot of dust, the built-in filter is likely to be clogged soon. The use with the ZFA, ZFB and ZFC series is recommended.

#### Output specifications

##### Digital pressure switch for vacuum (ZSE30A) specifications (D)

N	NPN open collector 1 output
P	PNP open collector 1 output
A	NPN open collector 2 outputs
B	PNP open collector 2 outputs
C	NPN open collector 1 output + Analog voltage output
D	NPN open collector 1 output + Analog current output
E	PNP open collector 1 output + Analog voltage output
F	PNP open collector 1 output + Analog current output

##### Pressure switch for vacuum (ZSE2) specifications (E)

—	NPN open collector 1 output
55	PNP open collector 1 output

##### Filter specifications (F)

—	No setting
---	------------

#### How to order

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

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

#### (1) Lead wire length for pressure switch for vacuum connector assembly

ZS - 10 - 5A - □

Lead wire length	
—	0.6 m
30	3 m
50	5 m

#### (2) Lead wire length for digital pressure switch for vacuum connector assembly

ZS - 38 - 3 L

Lead wire core	
3	3 cores, 1 output, 2 m (Output specifications: N, P)
4	4 cores, 2 outputs, 2 m (Output specifications: A, B, C, D, E, F)

Bracket A	
—	With Bracket A
N	Without Bracket A

#### Lead wire specifications

##### Digital pressure switch for vacuum (ZSE30A) specifications (D)

—	Without lead wire
L	Lead wire with connector (Length 2 m)

Refer to "Table (2)" for part numbers for lead wire with connector.

##### Pressure switch for vacuum (ZSE2) specifications (E)

—	Grommet/Lead wire (Length 0.6 m)
L	Grommet/Lead wire (Length 3 m)
C	Lead wire with connector (Length 0.6 m)
CL	Lead wire with connector (Length 3 m)
CN	Without lead wire with connector

Refer to "Table (1)" for part numbers for lead wire with connector.

##### Filter specifications (F)

—	No setting
---	------------

#### Unit specifications

##### Digital pressure switch for vacuum (ZSE30A) specifications (D)

—	With unit switching function
M	SI unit only
P	With unit switching function (Initial value psi)

Note 1) This is no longer sold for use in Japan due to the Weight and Measure Act (implemented October, 1999).

Note 2) Fixed unit: kPa

##### Pressure switch for vacuum (ZSE2) specifications (E)

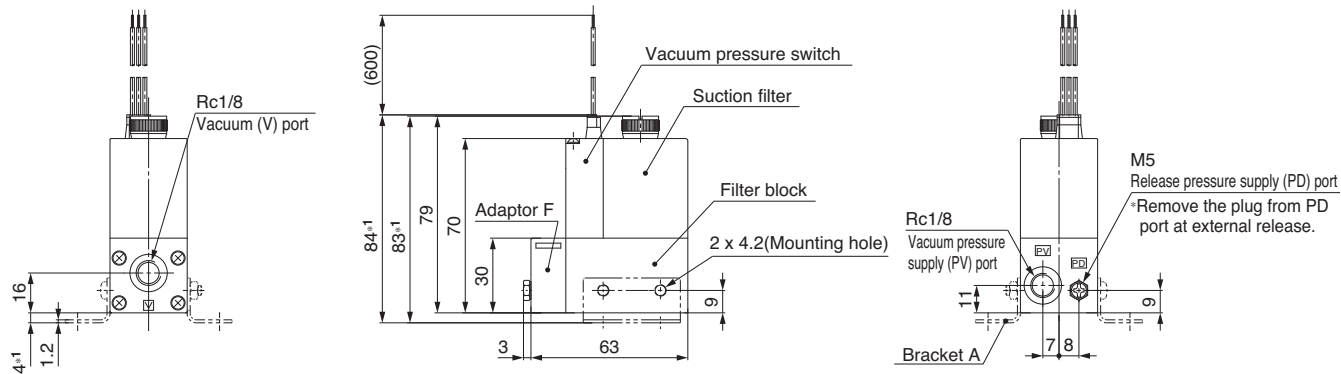
—	No setting
---	------------

##### Filter specifications (F)

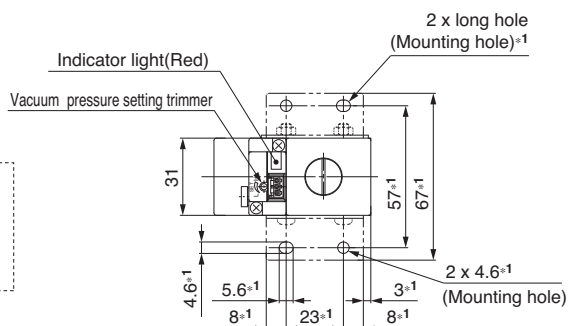
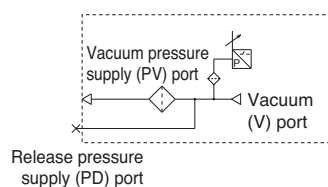
—	No setting
---	------------

## Dimensions/ZR1-F□□

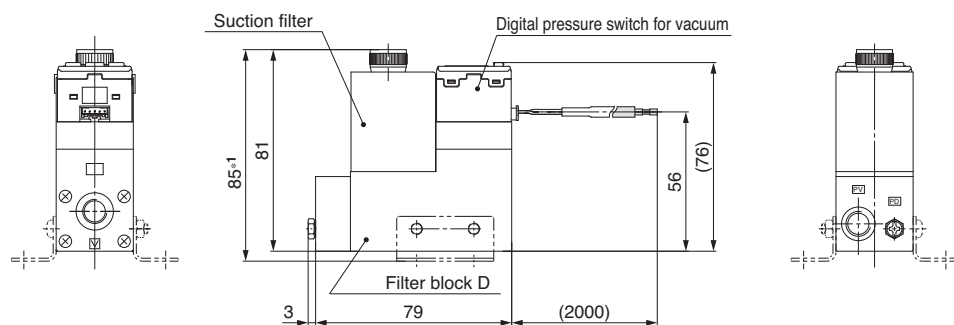
### ZR1-FE□□□



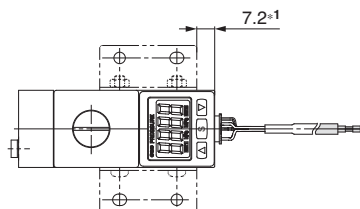
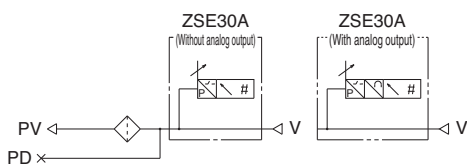
### Circuit diagram



### ZR1-FD□□□



### Circuit diagram



Note) \* 1 Dimensions : For mounting bracket A  
Bracket A part number: ZR1-OBA (standard)

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	30m
Filter material	PVF
Weight (With bracket)	0.1 kg
Standard	Bracket C (ZR1-OBC)

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

How to Order

ZR1-FX-□

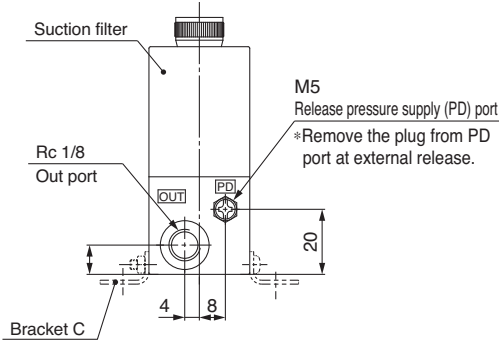
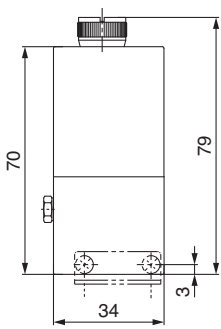
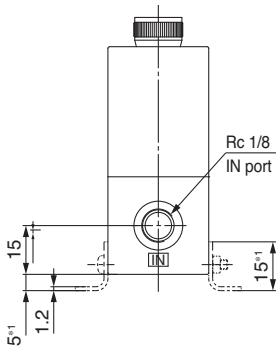
Bracket C	
-	With Bracket C
N	Without Bracket C

Precautions on handling the filter case

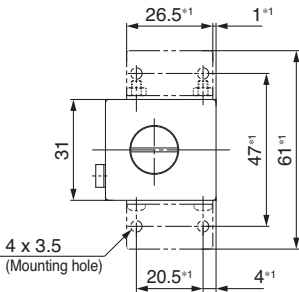
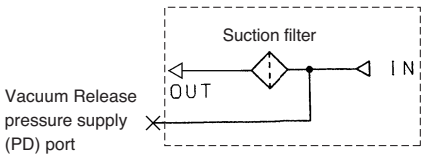
Caution

- 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-□



Circuit diagram



Note) \*1 Dimensions for mounting bracket C  
Bracket C part no. : ZR1-OBC (Standard accessory)

ZX

ZR

ZM

ZY

ZH

ZU

ZL

ZF

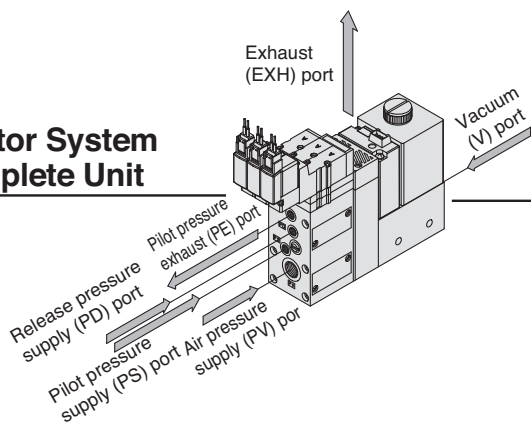
ZP

ZCU

Vacuum related

## Series ZR

## Ejector System Complete Unit

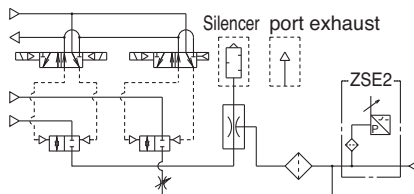


## <Components>

## Ejector + Valve + Pressure Switch for Vacuum + Filter

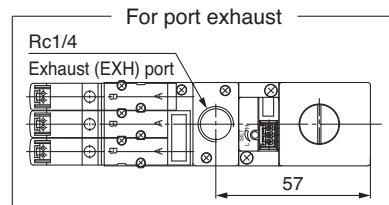
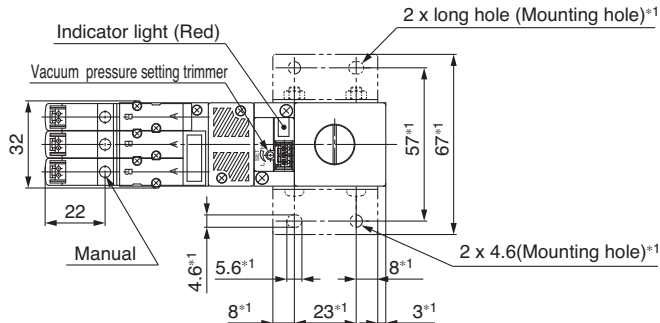
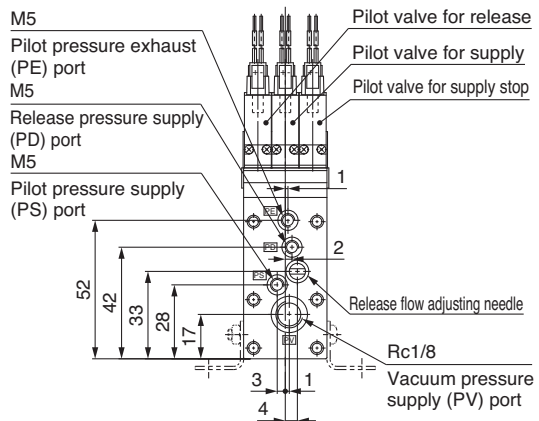
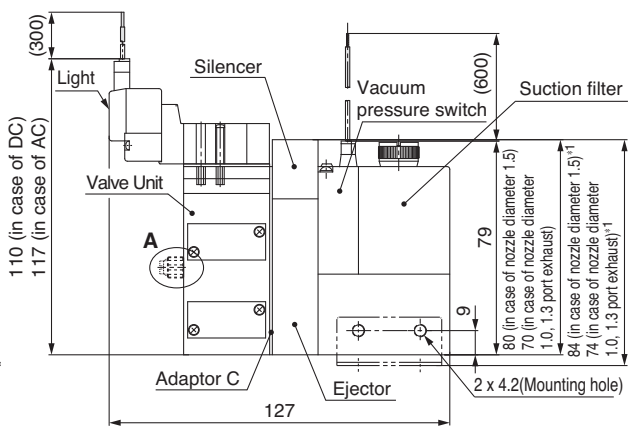
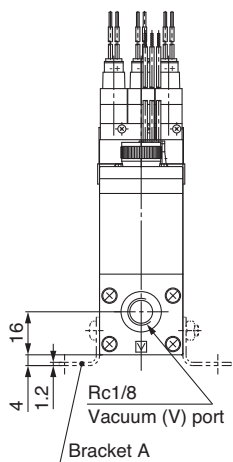
### Circuit diagram

**Pressure switch for vacuum (E)**



### Nozzle dia./ø1.0, ø1.3, ø1.5

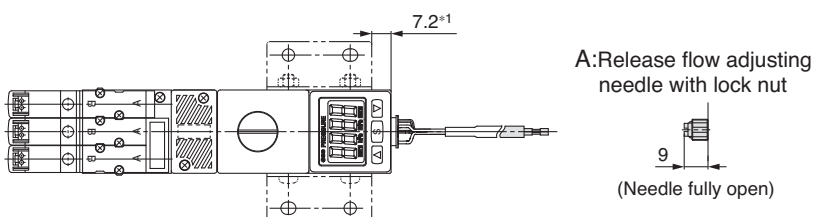
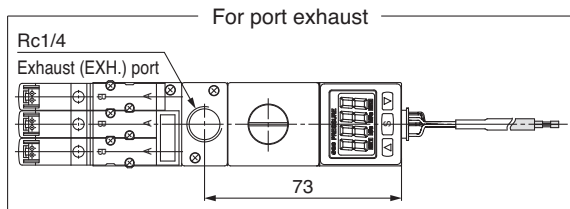
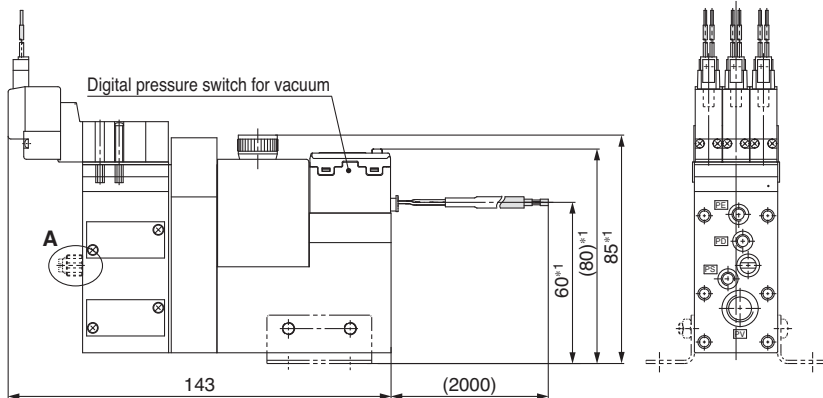
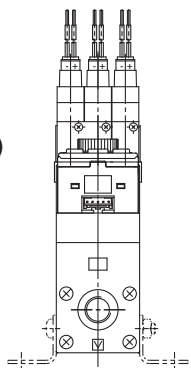
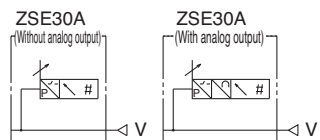
**ZR1<sup>10</sup><sub>13</sub><sub>15</sub>□1-K1□M□□-E□□-□**



**ZR1<sup>10</sup><sub>13</sub><sup>15</sup>□-K1□M□□-D□□□-□**

### Circuit diagram

**Digital pressure switch for vacuum (D)**

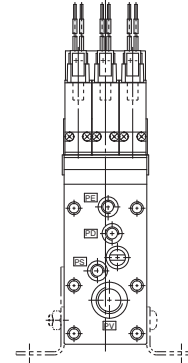
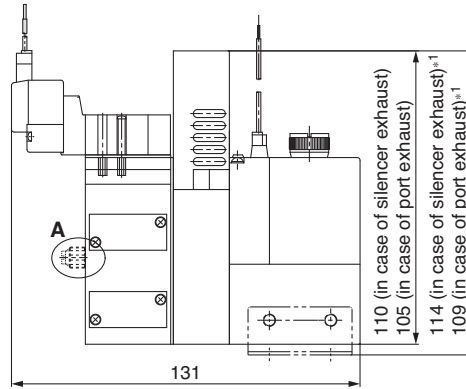
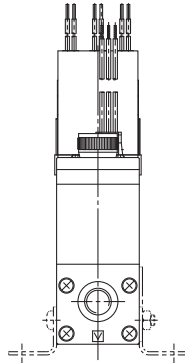




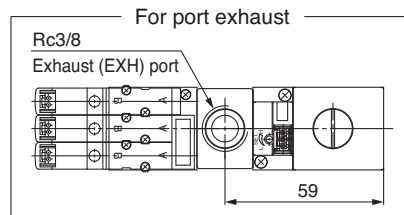
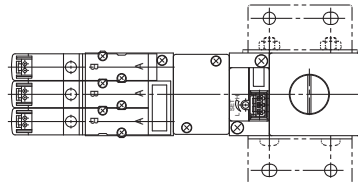
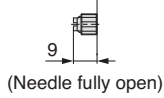
Nozzle dia./ $\phi 1.8$ ,  $\phi 2.0$

ZR1<sup>18</sup><sub>20</sub>□1-K1□M□□-E□□-□

Note) \*1 Dimensions for mounting bracket A  
\*2 Dimensions for mounting spacer A  
Bracket A part no. : ZR1-OBA  
(Standard accessory)

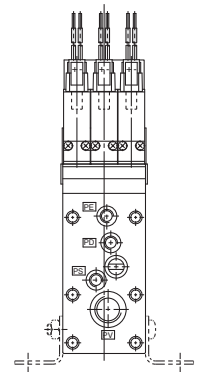
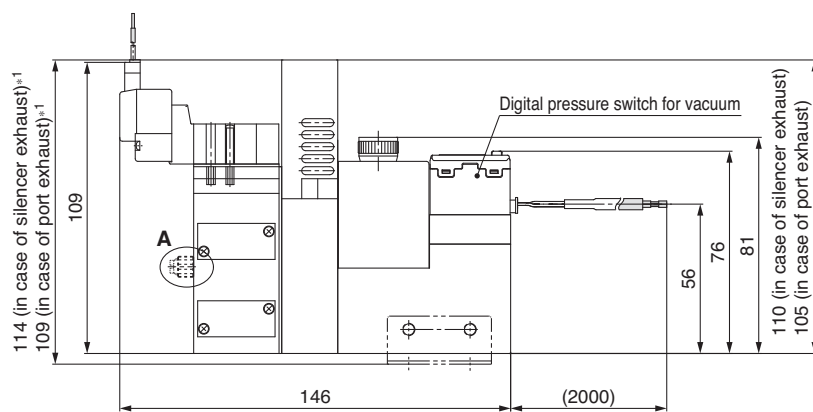
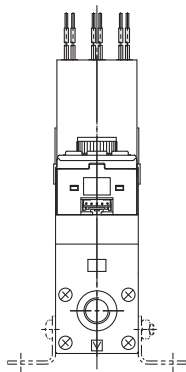


**A:** Release flow adjusting needle with lock nut

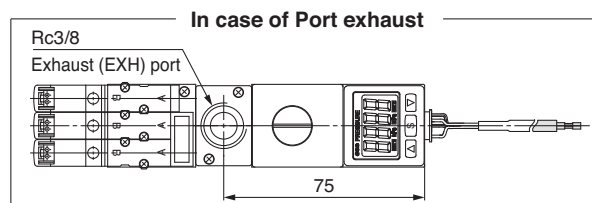
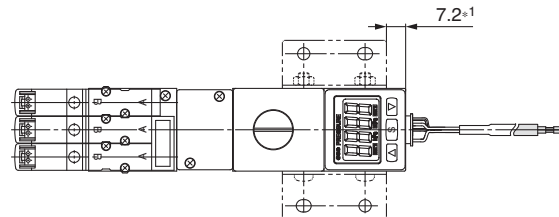
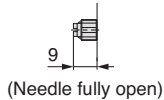


★ Dimensions not indicated are identical to the left drawing.

ZR1<sup>18</sup><sub>20</sub>□1-K1□M□□-D□□□-□



**A:** Release flow adjusting needle with lock nut



ZX

ZR

ZM

ZY

ZH

ZU

ZL

ZF

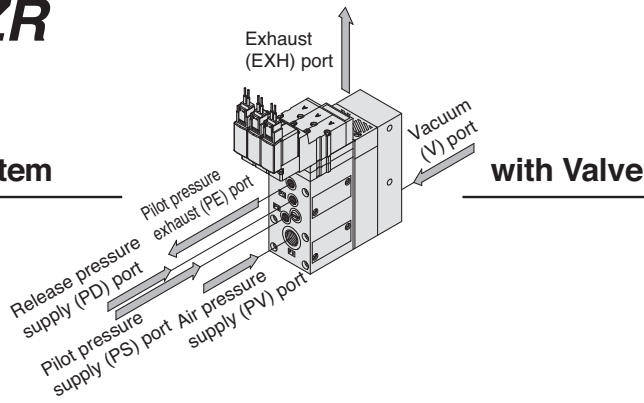
ZP

ZCU

Vacuum related

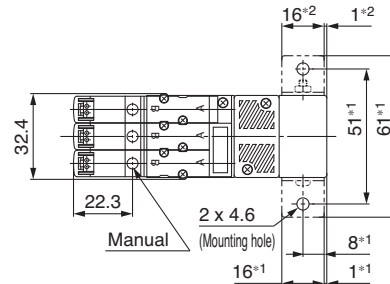
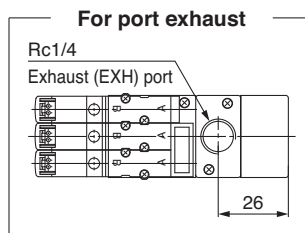
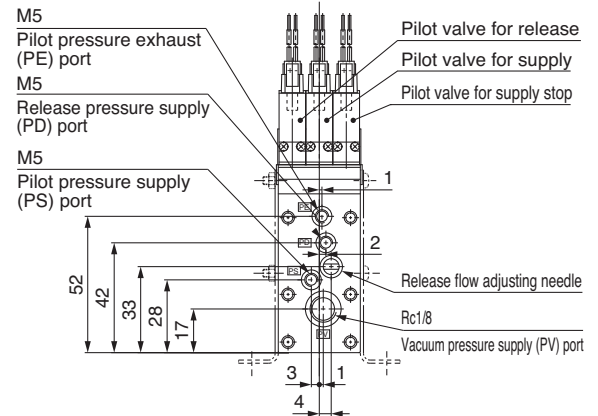
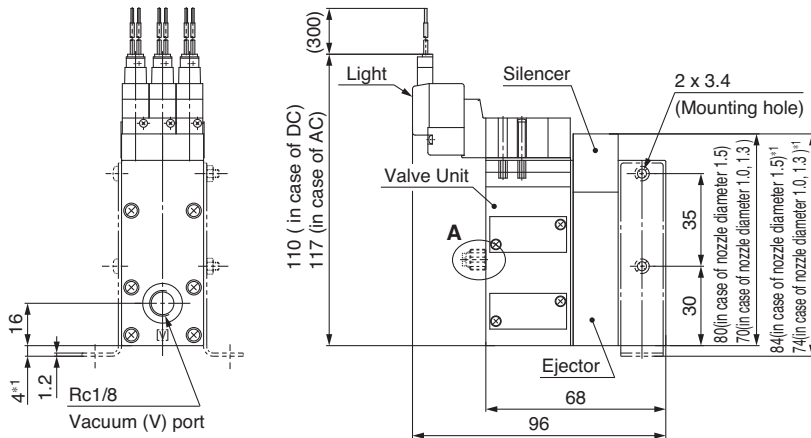
# Series ZR

## Ejector System

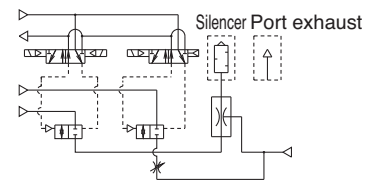


Nozzle dia./ $\phi 1.0$ ,  $\phi 1.3$ ,  $\phi 1.5$

ZR1<sup>10</sup><sub>13</sub><sup>15</sup> □1-K1 □M □□-□



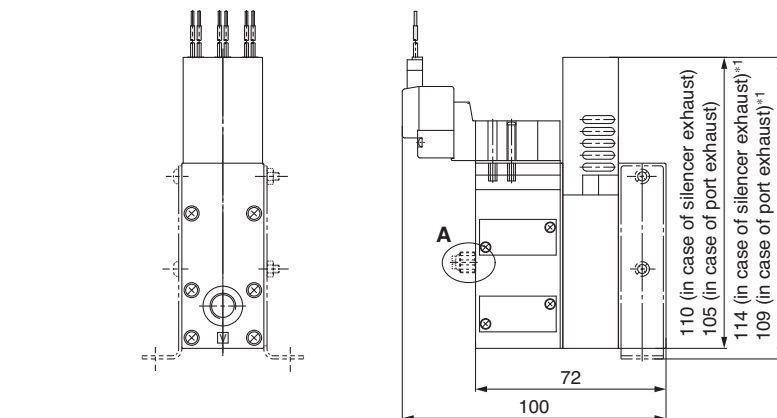
## Circuit diagram



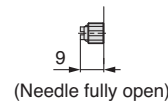
Nozzle dia./ $\phi 1.8$ ,  $\phi 2.0$

ZR1<sup>18</sup><sub>20</sub> □1-K1 □M □□-□

Note) \*1 Dimensions for mounting bracket B  
Bracket B part no. : ZR1-OB  
(Standard accessory)



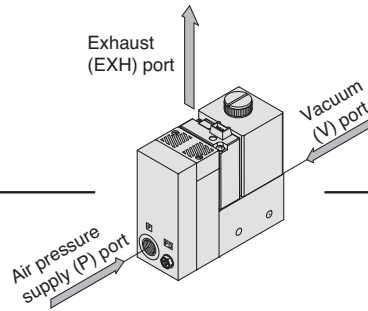
A: Release flow adjusting needle with lock nut



★ Dimensions not indicated are identical to the top drawing.

## Ejector System

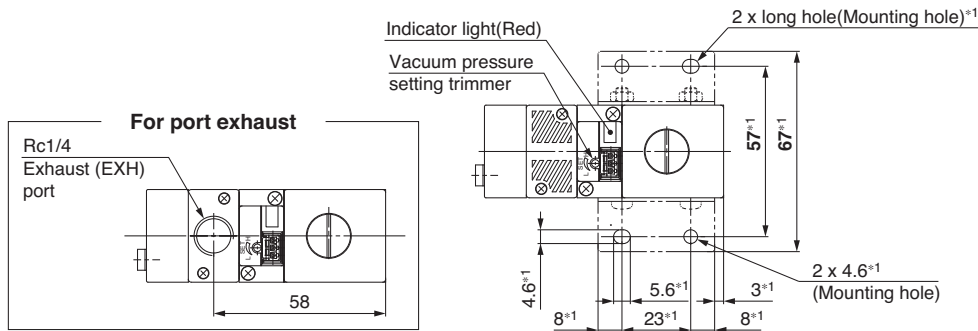
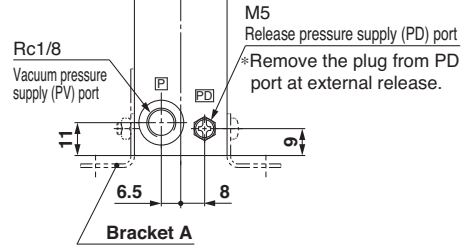
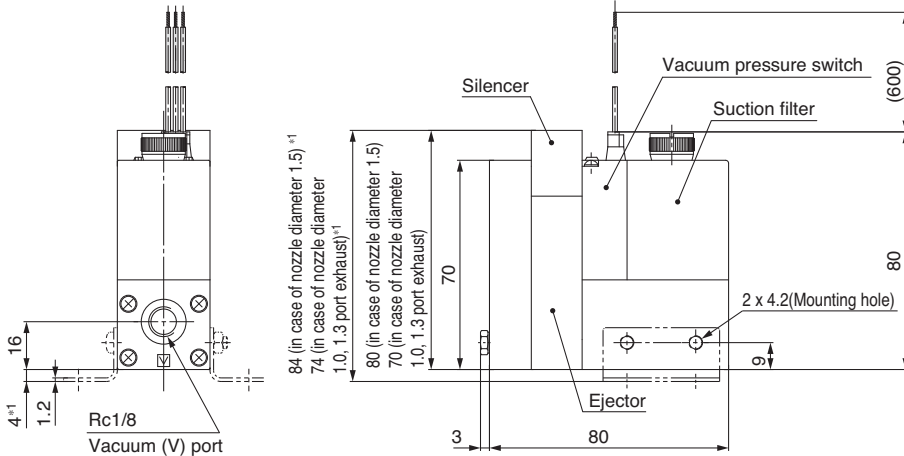
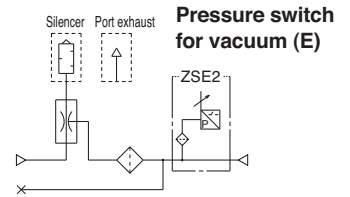
## without Valve



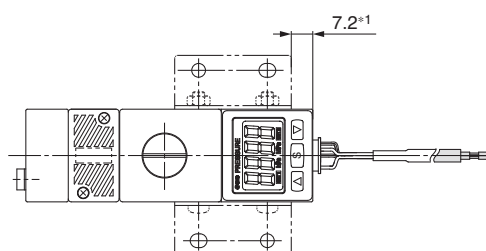
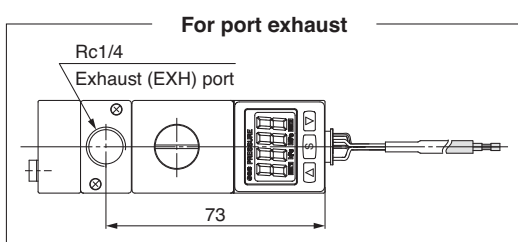
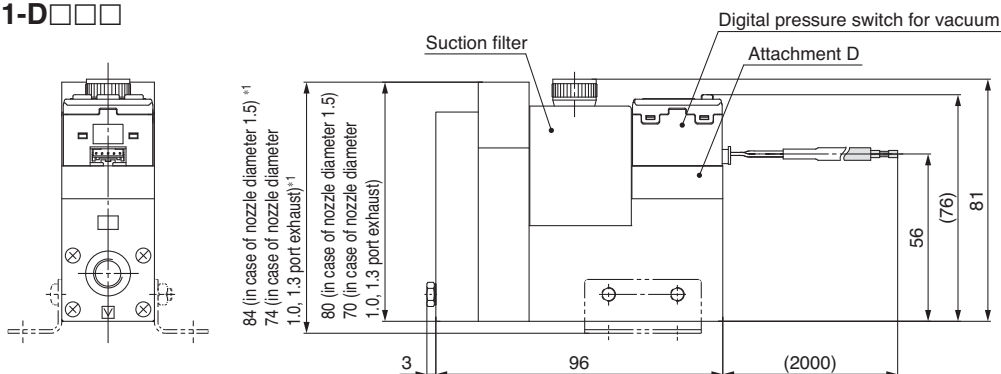
Nozzle dia./ $\phi 1.0, \phi 1.3, \phi 1.5$

ZR<sup>10</sup><sub>13</sub><sup>15</sup> □1-E□□

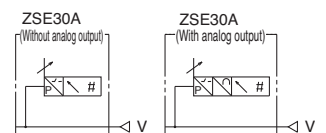
### Circuit diagram



ZR<sup>10</sup><sub>13</sub><sup>15</sup> □1-D□□□



### Digital pressure switch for vacuum (D)

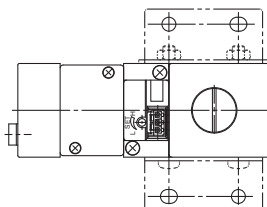
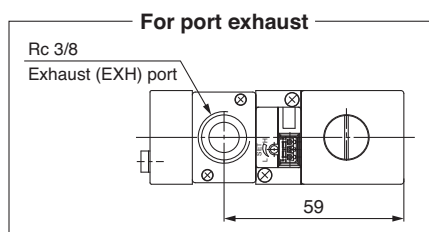
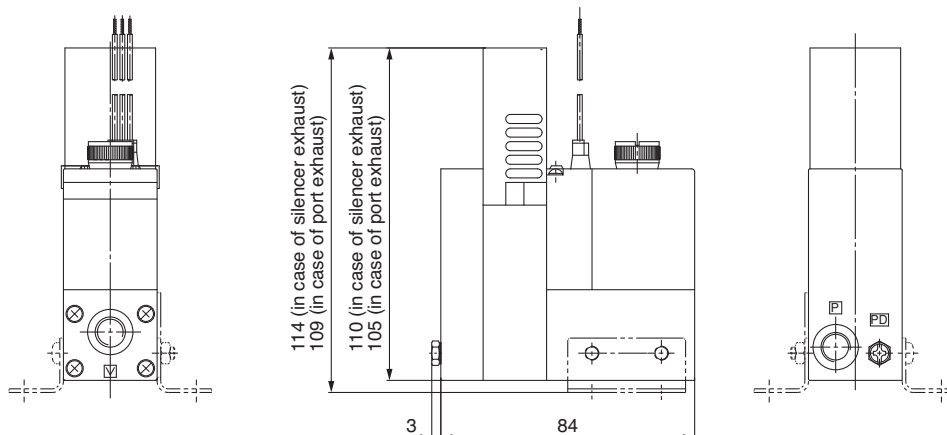


# Series ZR

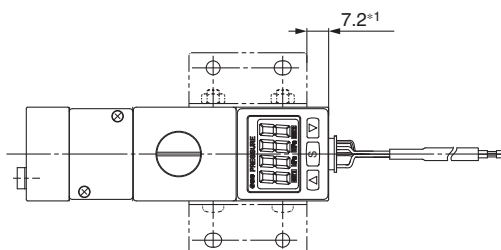
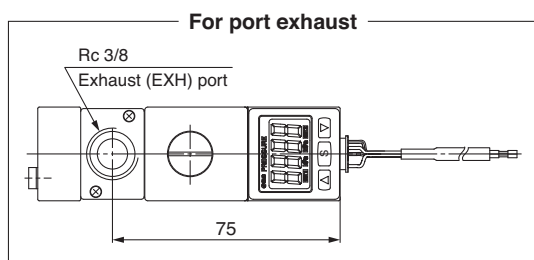
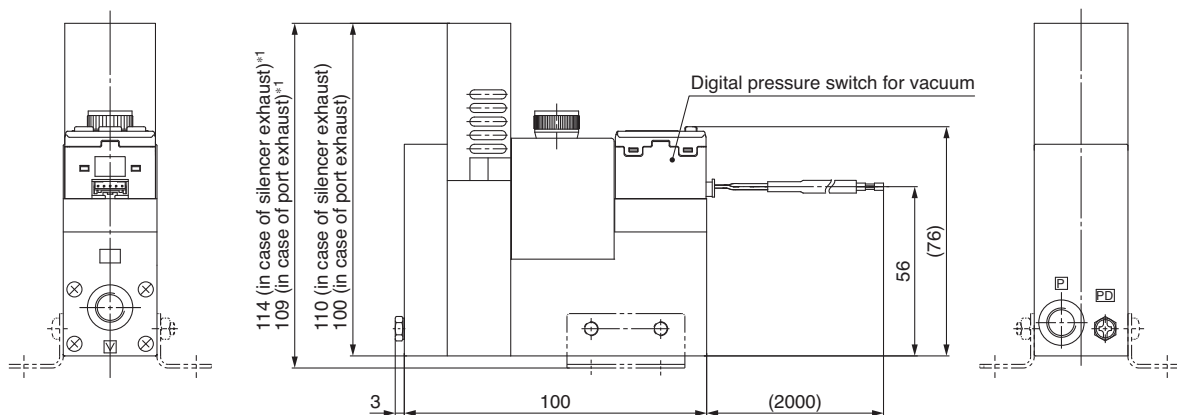
Nozzle dia./ø1.8, ø2.0

ZR1<sup>18</sup><sub>20</sub>□1-E□□

Note) \* 1 Dimensions for mounting bracket A  
Bracket A part no.: ZR1-OBA  
(Standard accessory)



ZR1<sup>18</sup><sub>20</sub>□1-D□□□



★ 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

Supply port	Manifold Port			Left			Right		
	PV	PS	PD	PV	PS	PD	PV	PS	PD
L (Left 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 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 specification of common and individual connecting ports for each unit is possible on manifold with this individual spacer.

### How to Order Manifold

#### <Manifold base>

ZZR1 06 - R

Stations		Port location	
01	1	R	Right side
⋮	⋮	L	Left side
06	6	B	Both sides

\* Viewed from the front side of valve unit, confirm the port location on the right and/or left side.

Thread type	
Nil	Rc
F	G (Note)
T	NPTF

Note) The thread ridge shape is compatible with the G thread standard (JIS B 0202), but other shapes are not conforming to ISO16030 and ISO1179.

Example 1)  
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

#### <Function plate>

ZR1 - RV 1 - 1

Piping specifications				
Symbol	Symbol	PV port	PS port	PD port
1	PV↔PS↔PD	Common		
2	PV↔PS·PD	Common	Individual	

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

1	1 station only
⋮	⋮
6	6 stations only
A	All stations

\* When the spacers are attached to the specified locations, specify all spacers.

Example 2) Attached to the first and third stations

\*ZR1-RV1-1  
\*ZR1-RV1-3

Example 3) Attached to all stations.

\*ZR1-RV1-A...3

Fill the number

#### <Individual spacer>

ZR1 - R1 - 1

R16

Refer to "About individual spacer."

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

1	1 station only
⋮	⋮
6	6 stations only
A	All stations

\* When the spacers are attached to the specified locations, specify all spacers.

Example 4) Attached to the first and third stations  
\*ZR1-R1-1  
\*ZR1-R1-3

### ⚠ Caution when ordering manifold

The asterisk denotes the symbol for assembly. Prefix it to the ejector part numbers to be mounted.  
When it is not added, the manifold base and ejector are shipped separately.

#### About individual spacers

• In the right table, ports with the symbol ↑ mean that they are manifold supply, while others are individual supply from the valve unit.  
• Symbols in the right table are printed on the surface of individual spacers.

Part no.	Symbol	Part no.	Symbol
ZR1-R1	R1	ZR1-R9	R9 ↑PV
-R2	R2 ↑PE	-R10	R10 ↑PV ↑PE
-R3	R3 ↑PD	-R11	R11 ↑PV ↑PD
-R4	R4 ↑PD ↑PE	-R12	R12 ↑PV ↑PD ↑PE
-R5	R5 ↑PS	-R13	R13 ↑PV ↑PS
-R6	R6 ↑PS ↑PE	-R14	R14 ↑PV ↑PS ↑PE
-R7	R7 ↑PS ↑PD	-R15	R15 ↑PV ↑PS ↑PD
-R8	R8 ↑PS ↑PD ↑PE	-R16	R16 ↑PV ↑PS ↑PD ↑PE

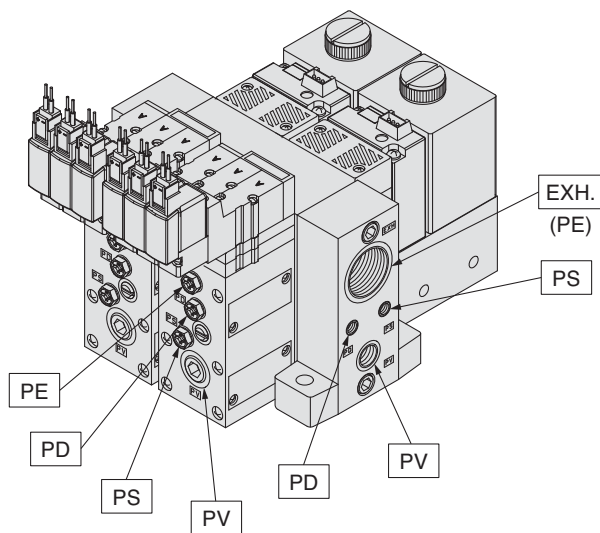
#### <Blanking plate>

ZR1 - BM1

Refer to Example 1).

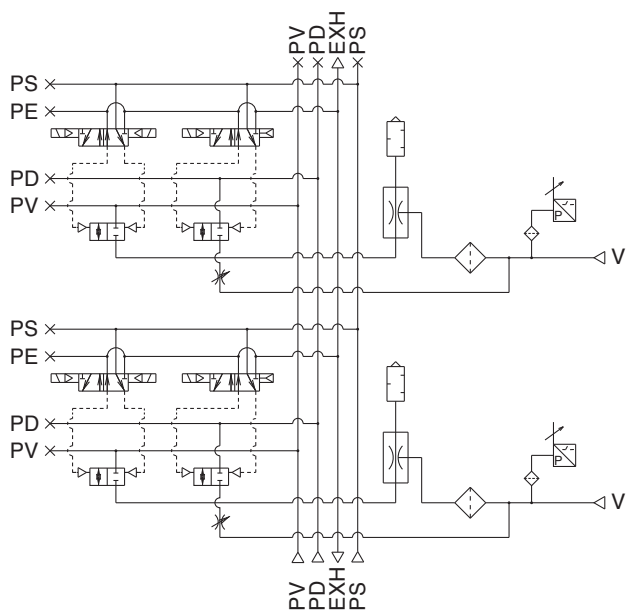
## Manifold/System Circuit Example

When not using individual spacer

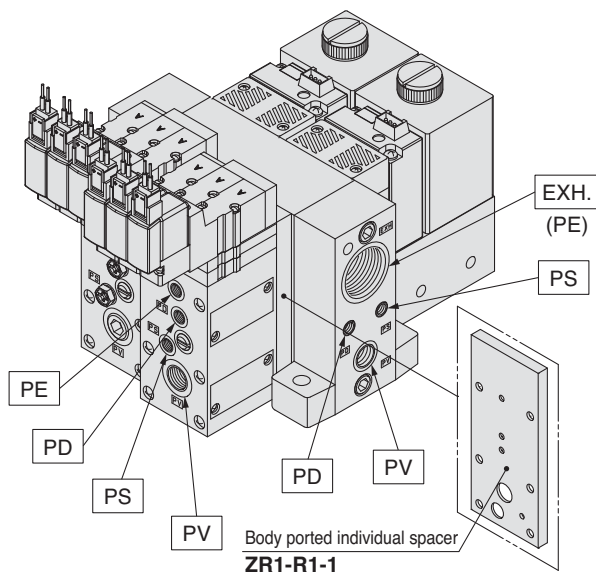


**PV:** Air pressure supply port  
**PS:** Pilot pressure supply port  
**PD:** Release pressure supply port  
**PE:** Pilot pressure exhaust port  
**EXH.:** Common exhaust port  
**V:** Vacuum Port

<System circuit example>

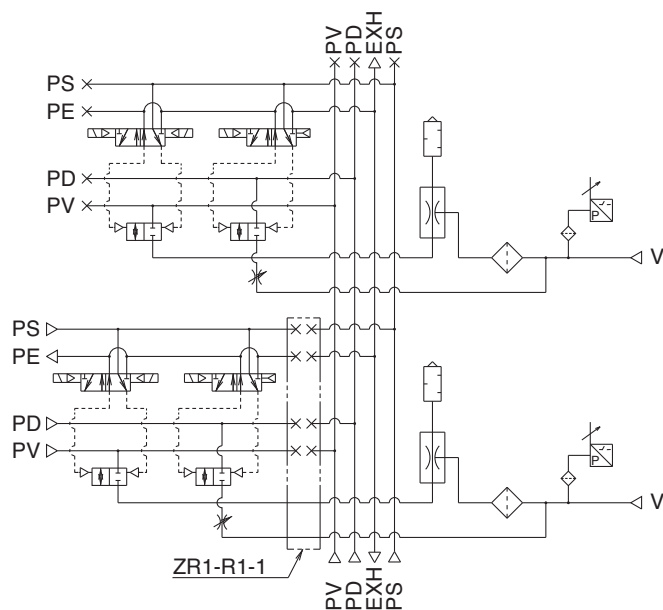


When using individual spacer



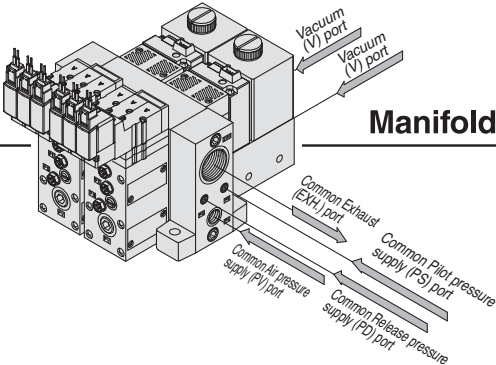
**PV:** Air pressure supply port  
**PS:** Pilot pressure supply port  
**PD:** Release pressure supply port  
**PE:** Pilot pressure exhaust port  
**EXH.:** Common exhaust port  
**V:** Vacuum Port

<System circuit example>

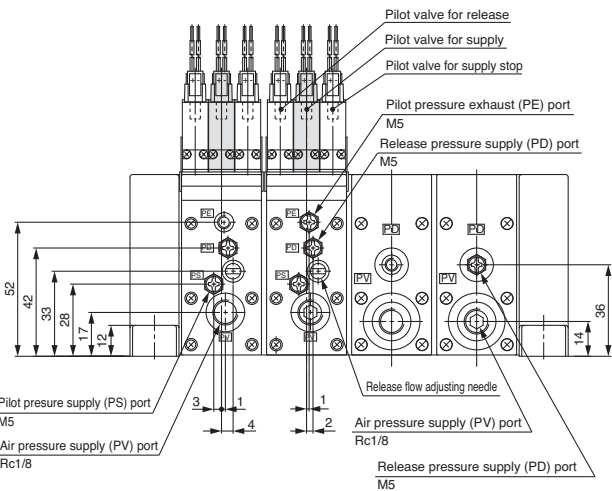
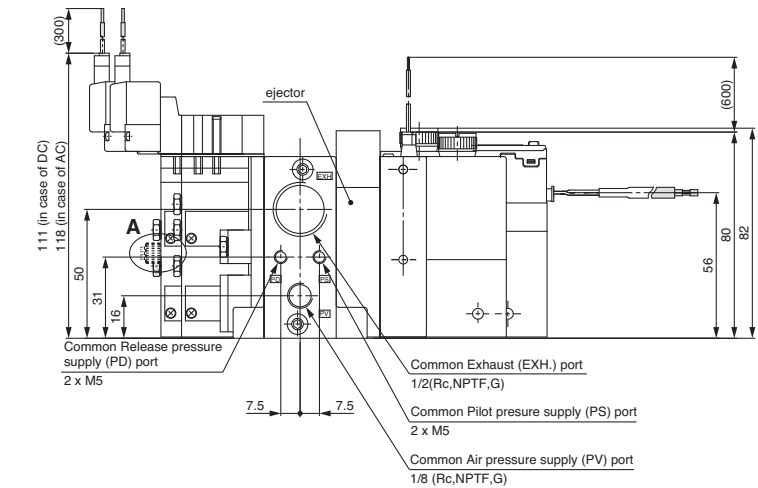




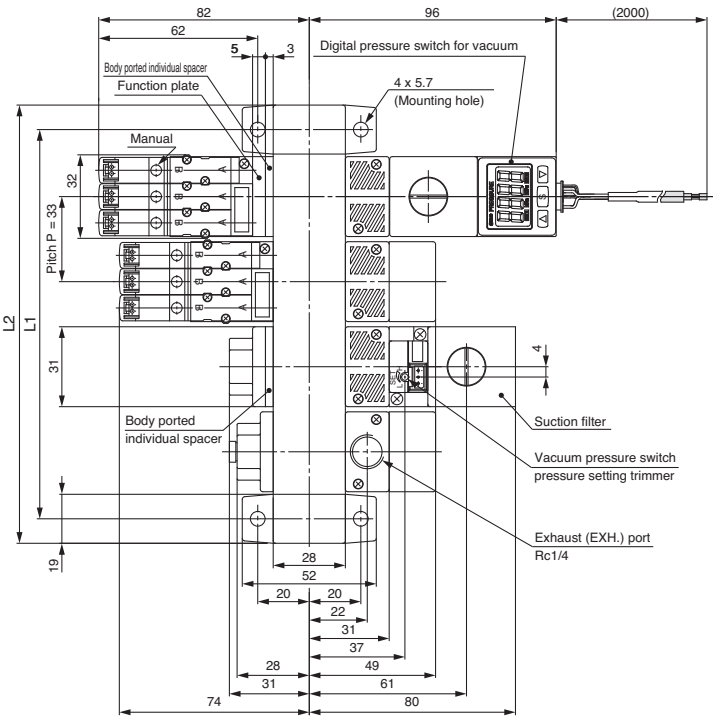
Ejector System



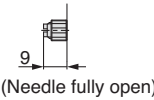
Manifold Nozzle Dia./ $\varnothing$ 1.0,  $\varnothing$ 1.3,  $\varnothing$ 1.5



\* 1 The common exhaust (EXH.) port is also used as the pilot pressure exhaust (PE) port of the pilot valve. Use while the port is open to the atmosphere.



A: Release flow adjusting needle with lock nut



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

ZX

ZR

ZM

ZY

ZH

ZU

ZL

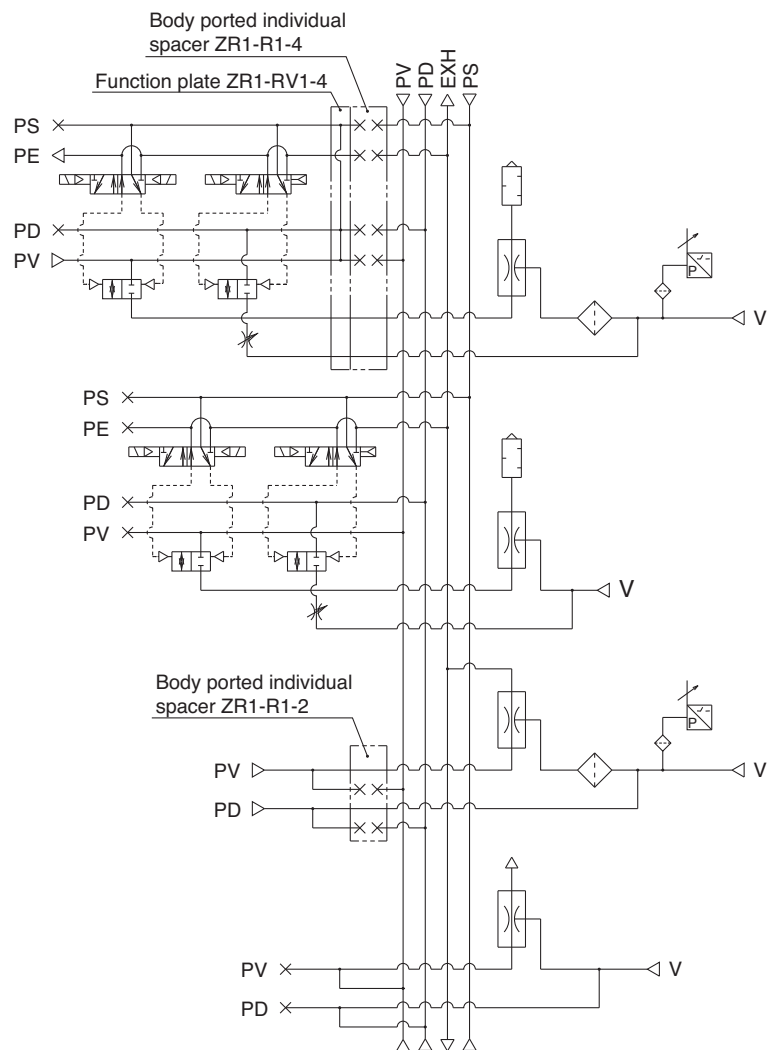
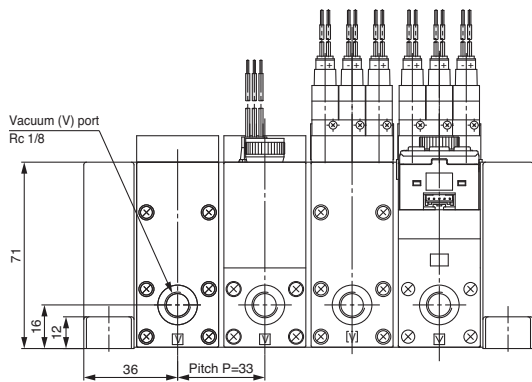
ZF

ZP

ZCU

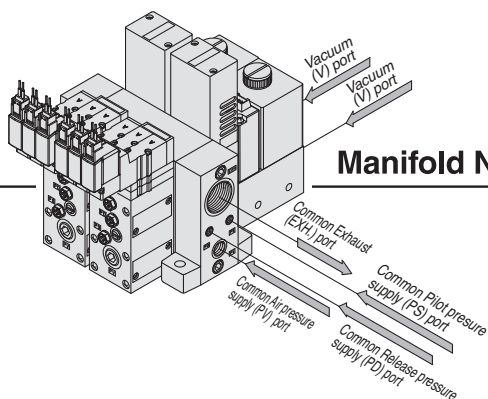
Vacuum related

## Circuit diagram

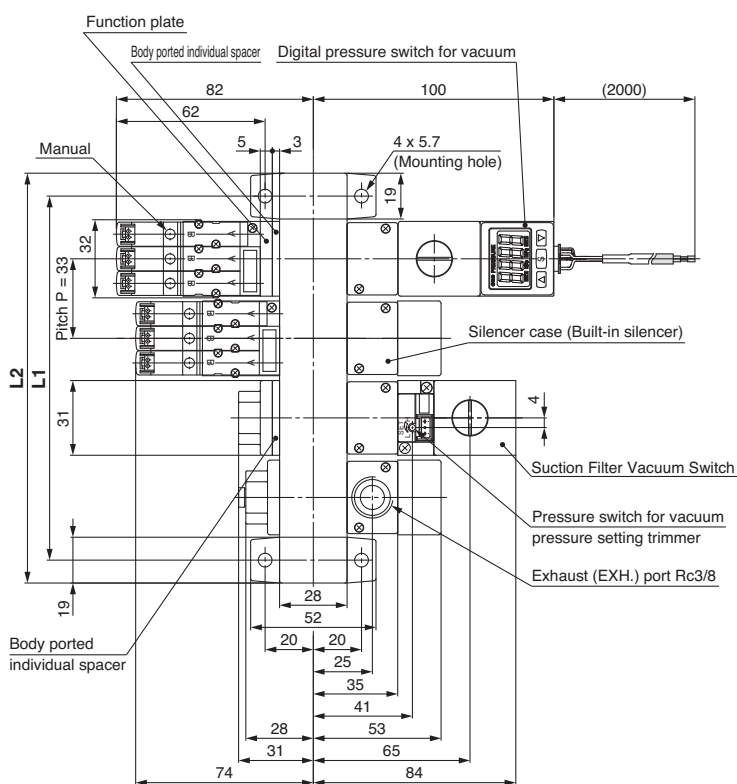
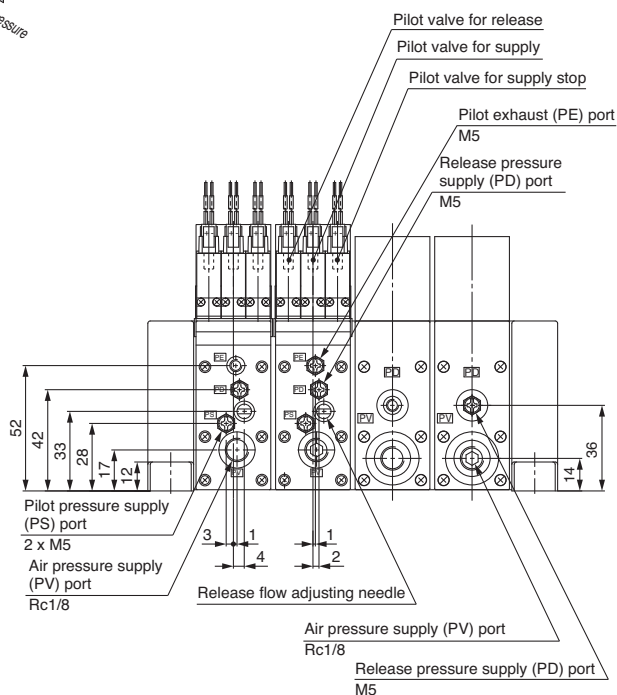
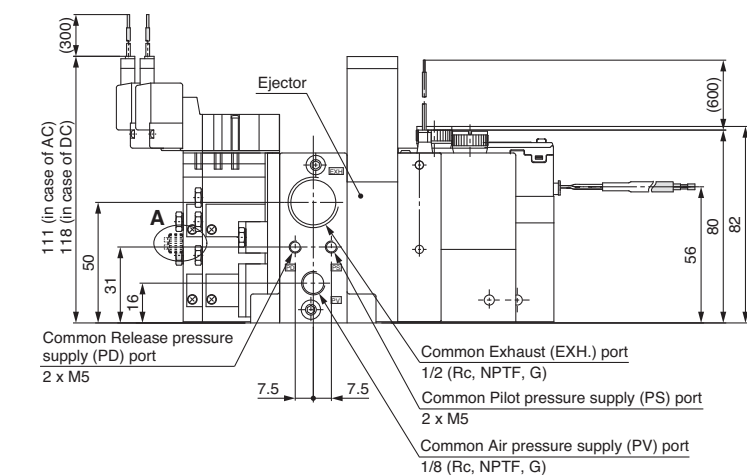


**PV**: Air pressure supply port  
**PS**: Pilot pressure supply port  
**PD**: Release pressure supply port  
**PE**: Pilot pressure exhaust port  
**EXH.**: Exhaust port  
**V**: Vacuum Port

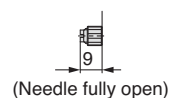
## Ejector System



### Manifold Nozzle Dia./ø1.8, ø2.0



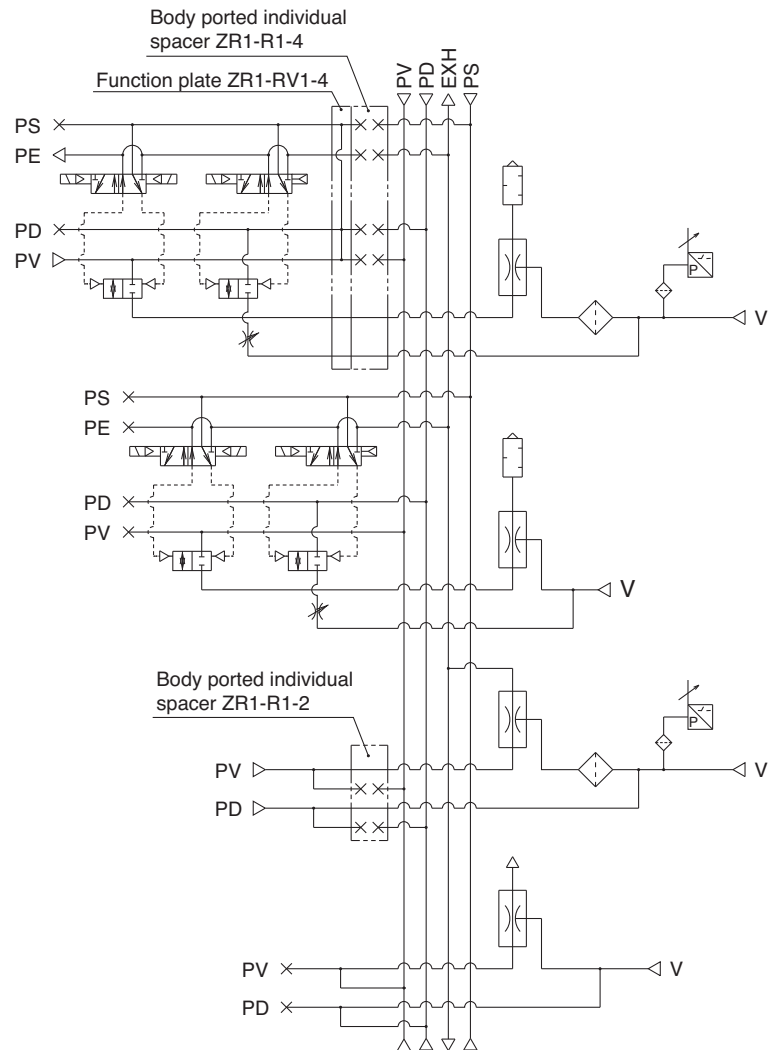
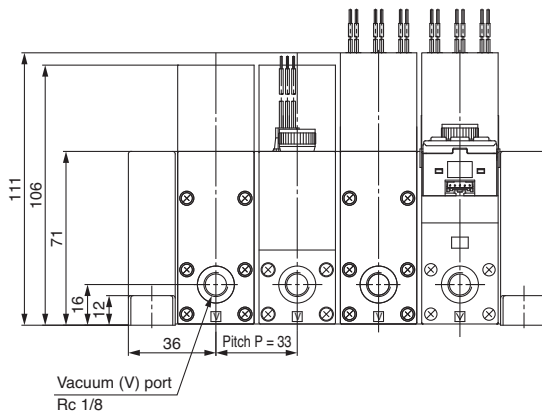
**A: Release flow adjusting needle with lock nut**



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

\* 1 The common exhaust (EXH.) port is also used as the pilot pressure exhaust (PE) port of the pilot valve. Use while the port is open to the atmosphere.

## Circuit diagram



**PV**: Air pressure supply port  
**PS**: Pilot pressure supply port  
**PD**: Release pressure supply port  
**PE**: Pilot pressure exhaust port  
**EXH.**: Common exhaust port  
**V**: Vacuum Port

# Large Size Vacuum Module

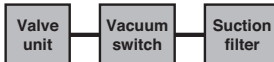
# Series ZR/External Vacuum Supply System

## How to Order

### Note for model selection

Take function plates into consideration.  
(Refer to p.3.2-34.)

### Components



ZR100 - K1 - 5 M Z - D - - - - - Q

Combination of vacuum valve and release valve  
Please refer to p.3.2-32 ①.

### 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.

### 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.3.2-32 ② for part no. of lead wire with connector.

### Indicator light and surge voltage suppressor

—	
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.

### Manual override

—	Non-locking push style
B	Locking slotted style

### Combination of switch/filter

—	None
D	Digital pressure switch for vacuum (ZSE30A) + Filter
E	Pressure switch for vacuum (ZSE2) + Filter
F	Filter

### Release flow rate adjusting needle/Bracket A, B

	Lock nut	Bracket A or B
—	×	●
L	●	●
M	●	×
N	×	×

● : Attached (Bracket A or B is shipped together.)  
× : None

### Lead wire specifications

#### Digital pressure switch for vacuum (ZSE30A) specifications (D)

—	Without lead wire
L	Lead wire with connector (Length 2 m)

Refer to "Table (4)" on page 3.2-32 for part no. of lead wire with connector.

#### Pressure switch for vacuum (ZSE2) specifications (E)

—	Grommet/Lead wire (Length 0.6 m)
L	Grommet/Lead wire (Length 3 m)
C	Lead wire with connector (Length 0.6 m)
CL	Lead wire with connector (Length 3 m)
CN	With connector/Without lead wire

Refer to "Table (3)" on page 3.2-32 for part no. of lead wire with connector.

#### Filter specifications (F)

—	No setting
---	------------

### Unit specifications

#### Digital pressure switch for vacuum (ZSE30A) specifications (D)

—	With unit switching function
M	SI unit only
P	With unit switching function (Initial value psi)

Note 1) This is no longer sold for use in Japan due to the Weight and Measure Act (implemented October, 1999).

Note 2) Fixed unit: kPa

#### Pressure switch for vacuum (ZSE2) specifications (E)

—	No setting
---	------------

#### Filter specifications (F)

—	No setting
---	------------

### Output specifications

#### Digital pressure switch for vacuum (ZSE30A) specifications (D)

N	NPN open collector 1 output
P	PNP open collector 1 output
A	NPN open collector 2 outputs
B	PNP open collector 2 outputs
C	NPN open collector 1 output + Analog voltage output
D	NPN open collector 1 output + Analog current output
E	PNP open collector 1 output + Analog voltage output
F	PNP open collector 1 output + Analog current output

#### Pressure switch for vacuum (ZSE2) specifications (E)

—	NPN open collector 1 output
55	PNP open collector 1 output

#### Filter specifications (F)

—	No setting
---	------------

ZX

ZR

ZM

ZY

ZH

ZU

ZL

ZF

ZP

ZCU

Vacuum related

**Table (1) Valve Unit/Combination of Vacuum Switch Valve and Release Valve**

Valve unit function			Valve unit components	
Operation stop	Vacuum adsorption	Vacuum release	Supply valve	Release valve
○	◎	○	Double SOL. (SYJ3233-X126)	N.C. (SYJ3133)
○	○	○	N.C. (SYJ3133)	N.C. (SYJ3133)
○	○	○	Air operated (SYJA3130)	Air operated (SYJA3130)
×	○	○	N.C. (SYJ3133)	
×	○	○	Air operated (SYJA3130)	
×	○	○	N.O. (SYJ3133)	
×	◎	◎	Double SOL. (SYJ3233-X127)	
○: Possible ○: Possible with limitations (without self-holding function) ×: Not possible				

Symbol	Supply valve				Release valve			
	Solenoid valve			Air operated	Solenoid valve			Air operated
	Double SOL. (SYJ3233-X126)	Double SOL. (SYJ3233-X127)	N.C (SYJ3133)	(SYJA3130)	Double SOL. (SYJ3233-X126)	Double SOL. (SYJ3233-X127)	N.C (SYJ3133)	(SYJA3130)
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 module							

**Table (2) How to Order Valve Plug Connector Assembly**

DC	<b>SY100- 30 - 4A -</b>	
Lead wire length		
—	300 mm (Standard)	
<b>6</b>	600 mm	
<b>10</b>	1000 mm	
<b>15</b>	1500 mm	
<b>20</b>	2000 mm	
<b>25</b>	2500 mm	
<b>30</b>	3000 mm	
<b>50</b>	5000 mm	

#### How to order

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

Example) ZR100-K15M□Z-EC.....1 pc.  
\* SY100-30-4A-6 ..... 3 pcs.

**Table (3) Pressure Switch for Vacuum/ Lead Wire with Connector**

<b>ZS - 10 - 5A -</b>	
Lead wire length	
—	0.6 m
<b>30</b>	3 m
<b>50</b>	5 m

#### How to order

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

Example) ZR100-□□□□□-□CN..... 1 pc.  
\* ZS-10-5A-50 ..... 1 pc.

**Table (4) Digital Pressure Switch for Vacuum/ Lead Wire with Connector**

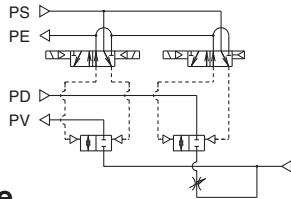
<b>ZS - 38 -</b>	<b>3</b>	<b>L</b>
Lead wire core		
<b>3</b>	3 cores, 1 output, 2 m (Output specifications: N, P)	
<b>4</b>	4 cores, 2 outputs, 2 m (Output specifications: A, B, C, D, E, F)	



## Vacuum Pump System/ Combination of supply valve and release valve

### Combination Symbol : **K1**

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

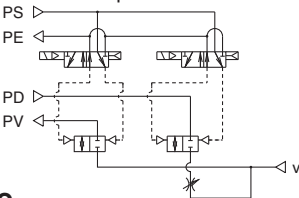


#### How to Operate

Operation	Pilot valve operation		Supply valve		Release valve		Note
	Pilot valve for supply	Pilot valve for supply stop	Pilot valve for supply	Pilot valve for supply stop	Pilot valve for release	Pilot valve for release	
1. Adsorption	ON	OFF	OFF	OFF	OFF	OFF	When power supply is cut off while the supply valve is ON, the operational state is held.
2. Vacuum release	OFF	ON	ON	ON	ON	ON	
3. Operation stop	OFF	ON	OFF	OFF	OFF	OFF	

### Combination Symbol : **K2**

Feature: Single solenoid valve is provided for vacuum valve.

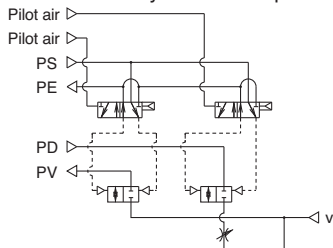


#### How to Operate

Operation	Pilot valve operation		Supply valve		Release valve		Note
	Pilot valve for supply	Pilot valve for release	Pilot valve for supply	Pilot valve for release	Pilot valve for supply	Pilot valve for release	
1. Adsorption	ON	OFF	OFF	OFF	OFF	OFF	When power supply is stopped, all operations will be stopped.
2. Vacuum release	OFF	ON	ON	ON	ON	ON	
3. Operation stop	OFF	OFF	OFF	OFF	OFF	OFF	

### Combination Symbol : **K3**

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



#### How to Operate

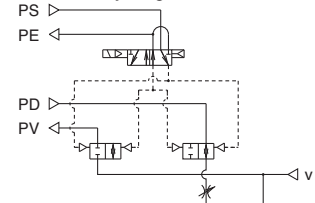
Operation	Pilot valve operation		Supply valve		Release valve		Note
	Air operated a	Air operated b	Air operated a	Air operated b	Air operated a	Air operated b	
1. Adsorption	ON	OFF	OFF	OFF	OFF	OFF	The product is used under the environment in which solenoid valves cannot be used or when the centralized control is applied using external pilot air.
2. Vacuum release	OFF	ON	ON	ON	ON	ON	
3. Operation stop	OFF	OFF	OFF	OFF	OFF	OFF	

### ⚠ Caution

When pipe connection is made to two port connections (PV) port, (PD) port only, use a function plate (ZR1-RV3). Refer to page 3.2-34 for further information.

### Combination Symbol : **C1**

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

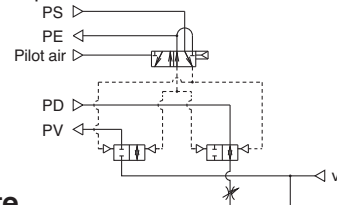


#### How to Operate

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

### Combination Symbol : **C2**

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

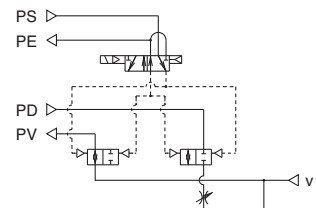


#### How to Operate

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

### Combination Symbol : **C3**

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

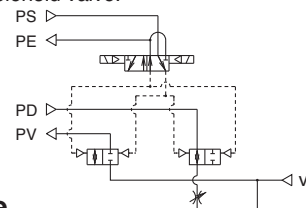


#### How to Operate

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

### Combination Symbol : **C4**

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



#### How to Operate

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

ZX

ZR

ZM

ZY

ZH

ZU

ZL

ZF

ZP

ZCU

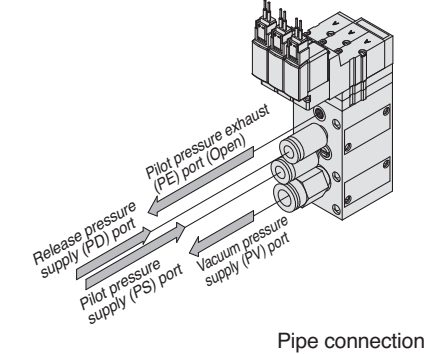
Vacuum related

**Function Plate : ZR1-RV3**

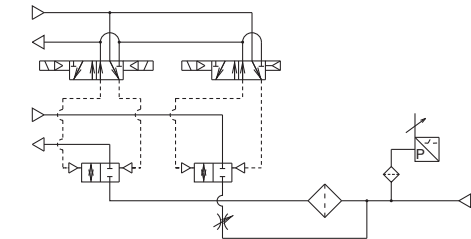
A function plate is used when each connecting port for the valve unit is common. If a function plate is not used (standard), make individual pipe connections to PV, PS, and PD ports respectively.

**Without Function Plate (Standard)**

Applicable system: Ejector system  
External vacuum supply system



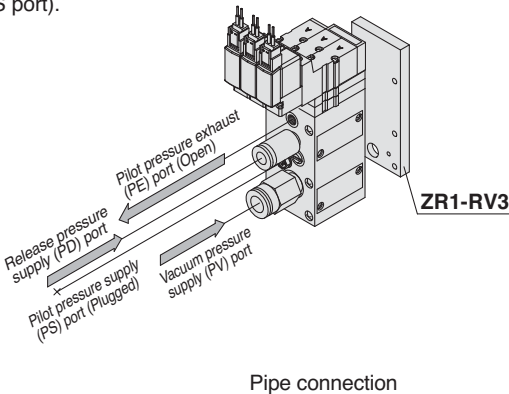
Example of circuit diagram



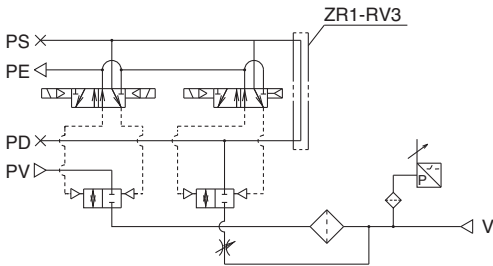
**With Function Plate/Applicable to Vacuum Pump System Only**

**When ZR1-RV3 (PV/PS PD) is Selected**

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



Example of circuit diagram



**How to Order Function Plate Unit (For Pump System)**

**ZR1 – RV 3**

**Piping specifications**

Symbol	Symbol	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.

Example) ZR100-K15MZ-E ..... 1  
\* ZR1-RV3 ..... 1

**Caution**

Length of assembling mounting threads varies when adding function plate.  
Order from the mounting thread parts list for unit combination on page 3.2-46.  
Order a plug (ZXI-MP1) separately in order to plug the PD and PS ports that are no longer used due to the addition of function plate.

## Valve Unit : ZR1-V□□□□□-□-□



### Specifications

Valve unit part no.	ZR1-V□□□□□-□-□	
Components	Supply valve	Release valve
Operating method	Pilot operated	Pilot operated
Combination of supply valve and release valve	Refer to the combination of supply valve and release valve below.	
PV port supply pressure	-0.1 to 0.6 MPa	
PD port supply pressure	0.05 to 0.6 MPa	
PS port supply pressure	0.25 to 0.6 MPa	
Main valve effective area (mm <sup>2</sup> )	8.2	0.96
Main valve effective area (Cv)	0.45	0.053
Maximum operating frequency	5 Hz	
Operating temperature range	5 to 50°C	
Standard	Bracket B(ZR1-0BB)	

### Solenoid Valve/Specifications

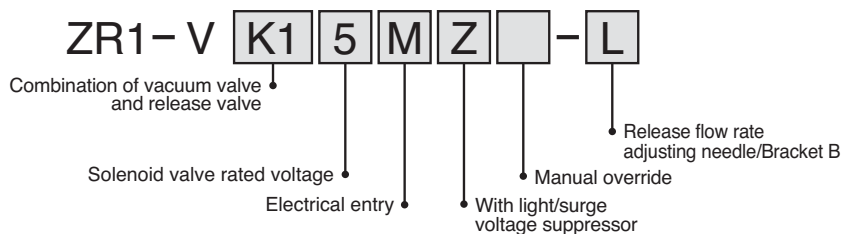
Solenoid	SYJ3133-□□□□, SYJ3233-□□□□-X126, SYJ3233-□□□□-X127
Rated voltage	24, 12, 6, 5, 3 VDC
Electrical entry	VDC-L/M plug connector, Grommet
Light/Surge voltage suppressor	Available, Not available (at grommet)
Manual operation	Non-locking push type, Locking slotted type

### Combination of Supply Valve and Release Valve

Combination symbol	Vacuum switch valve	Release valve	Weight (kg)
K1	Double SOL. (SYJ3233-X126)	N.C. (SYJ3133)	0.34
K2	N.C. (SYJ3133)	N.C. (SYJ3133)	0.27
K3	Air operated (SYJA3130)	Air operated (SYJA3130)	0.194
C1	N.C. (SYJ3133)		0.22
C2	Air operated SYJA3130		0.174
C3	N.C. (SYJ3133)		0.21
C4	Double SOL. (SYJ3233-X127)		0.27

\* Weight includes Bracket B. (Solenoid valve: 24 VDC, M plug connector type)

### How to Order / Refer to page 3.2-31 for further part no. information.



## Vacuum Pressure Switch Unit/Digital Pressure Switch for Vacuum : ZR1-ZSE30A-00-□-□□



### Specifications

Rated pressure range	0.0 to -101.0 kPa
Set pressure range	10.0 to -105.0 kPa
Withstand pressure	500 kPa
Applicable fluid	Air, Non-corrosive gas, Non-flammable gas
Power supply voltage	12 to 24 VDC ±10% (with power supply polarity protection)
Current consumption	40 mA (at no load)
Switch output	NPN or PNP open collector 1 output NPN or PNP open collector 2 outputs (selectable)
Hysteresis	Hysteresis mode Window comparator mode
Display	4-digit, 7-segment, 2-color LCD (Red/Green) Sampling cycle: 5 times/sec.
Display accuracy	±2% F.S. ±1 digit (Ambient temperature of 25°C)
Environment resistance	Enclosure Operating temperature range Operating humidity range Withstand voltage Temperature characteristics
	IP40 Operating: 0 to 50°C, Stored: -10 to 60°C (No freezing or condensation) Operating/Stored: 35 to 85% RH (No condensation) 1000 VAC for 1 minute between terminals and housing ±2% F.S. (Based on 25°C)

Note 1) When analog voltage output is selected, analog current output cannot be used together.  
Note 2) When analog current output is selected, analog voltage output cannot be used together.  
Refer to page 3.2-16 for further specifications.

ZX

ZR

ZM

ZY

ZH

ZU

ZL

ZF

ZP

ZCU

Vacuum related

## Vacuum Pressure Switch : ZSE2-0R-□□



Refer to page 3.2-13 for further specifications.

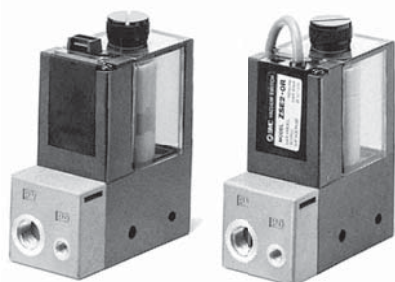
### Specifications

Pressure switch for vacuum part no.	ZSE2-0R-15□	ZSE2-0R-55□
Fluid	Air	
Rated pressure range/Set pressure range	0 to -101 kPa	
Proof pressure	500 kPa	
Hysteresis	3% F.S. or less (Fixed)	
Temperature characteristics (Based on 25°C)	± 3% F.S. or less	
Operating voltage	12 to 24 VDC (Ripple ±10% or less)	
Output	NPN Open collector 30 V, 80 mA	PNP Open collector 80 mA
Indicator light	Lights up when ON	
Current consumption	17 mA or less (when 24 VDC is ON)	
Proof pressure (Max. operating pressure)	0.5 MPa*	
Operating temperature range	5 to 50°C	

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

Note) Operation outside of the maximum operating pressure and operating temperature range may cause a serious accident or damage.

## Pressure Switch for Vacuum/Suction Filter Unit : ZR1-F□□□□-□



Refer to page 3.2-16 for further specifications.

### Specifications

Unit no.		ZR1-F□□□□-□
Suction filter	Rated pressure range/Set pressure range	-100 to 0.5 MPa
	Operating temperature range	5 to 50°C
	Filtration degree	30 μm
Filtration material		PVF
Pressure switch for vacuum		Refer to pages 985 and 988 regarding pressure switch for vacuum.
Standard option		Bracket A (ZR1-OBA)

Note) Operation outside of the operating pressure and operating temperature range may cause a serious accident or damage.

### Filter case

#### ⚠ Caution

- 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 (alkalinal), etc.
- ② Do not expose it to direct sunlight.

## Suction Filter : ZR1-FX-□



Refer to page 3.2-19 for further specifications.

### Specifications

Model	ZR1-FX-□
Operating pressure range	-0.1 to 0.5 MPa
Operating temperature range	5 to 50°C
Filtration efficiency	30 μm
Filter media	PVF
Weight (with bracket)	0.1 kg
Standard option	Bracket C (ZR1-OBC)

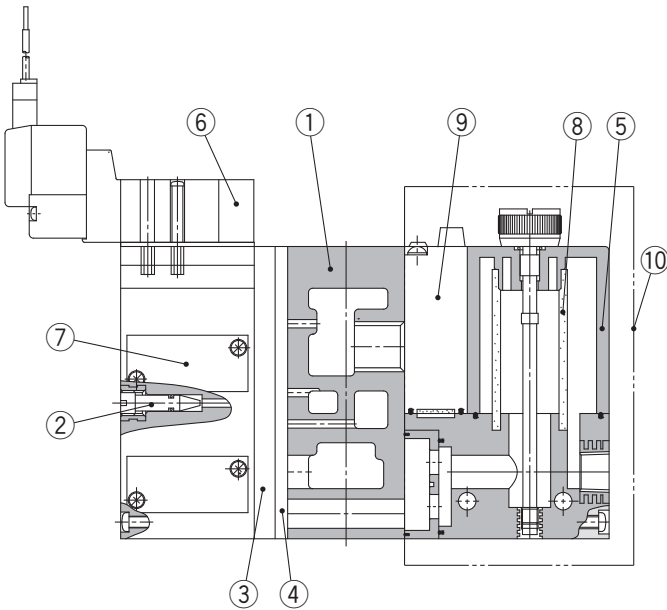
Note) Operation outside of the operating pressure and operating temperature range may cause a serious accident or damage.

### Filter case

#### ⚠ Caution

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

## Construction



## Components Parts

No.	Description	Material	Part model
①	Manifold base	Aluminum alloy	
②	Release flow rate adjusting needle	Stainless steel	Refer to ZR1-NA <sup>Note 2)</sup>
③	Function plate	PBT	Refer to page 3.2-41
④	Individual spacer	PBT	Refer to page 3.2-41
⑤ <sup>(1)</sup>	Filter case	Polycarbonate	Refer to page 3.2-17
⑥	Pilot valve assembly	—	Refer to Table (1)
⑦	Valve body assembly	—	Refer to Table (2)
⑧	Filter element	PVF	ZR1-FZ (30 μm)
⑨	Pressure switch for vacuum	—	ZSE2-OR- <sup>15</sup> / <sub>55</sub> -□
⑩	Filter switch unit for replacement	—	ZR1-F□□□□-D

Note 1) Precautions on handling the filter case

1. The case is made of polycarbonate. Therefore, do not contact it 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.

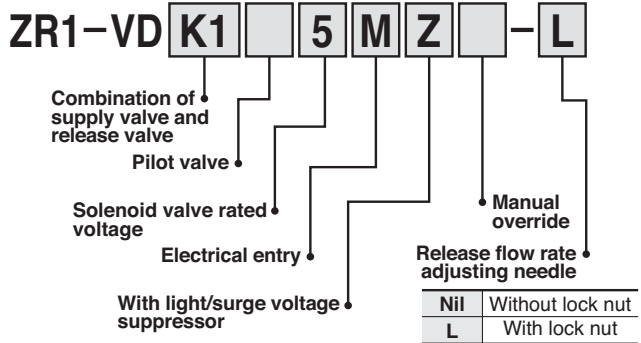
2. Do not expose it to direct sunlight.

Note 2) Turning the release flow rate adjusting needle 4 full turns from the fully closed position renders the needle valve fully open. Do not turn more than four times since turning excessively may cause the needle fall off. In order to prevent the needle from loosening and falling out, a release flow rate adjusting needle (ZR1-ND-L) with lock nut is available.

**Table (1) How to Order Pilot Valves**

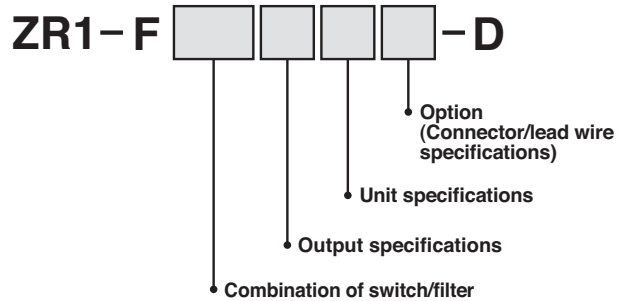
Symbol	Components		Model
	Supply valve	Release valve	
<b>K1</b>	Double solenoid valve N.C. (SYJ3233)	Single solenoid valve N.C. (SYJ3133)	Refer to "How to Order" below. Supply: ZR1-SYJ3233-□□□□-X126 Release: ZR1-SYJ3133-□□□□
<b>C4</b>	Double solenoid valve N.O. (SYJ3233)	Double solenoid valve N.O. (SYJ3233)	Refer to "How to Order" below. Supply: ZR1-SYJ3233-□□□□-X127 Release: ZR1-SYJ3233-□□□□-X127
<b>K3</b>	Air operated N.C (SYJA3130)	Air operated N.O (SYJA3130)	SYJA3130

**Table (2) How to Order Valve Body Assembly**



Refer to page 3.2-31 for further symbol specifications.

**Table (3) Pressure Switch for Vacuum + Suction Filter Unit**



Refer to page 3.2-17 for further symbol specifications.

## How to Order Solenoid Valves/Air Operated Valves

### Air operated

### SYJA3130

### Solenoid valve

**ZR1-SYJ3233-□□□□-X126**  
**SYJ3133-□□□□-X127**

rated voltage		Manual override
5	24 VDC	
6	12 VDC	— Non-locking push type
V	6 VDC	D Slotted locking type
S	5 VDC	
R	3 VDC	
1	100 VAC (50/60Hz)	
3	110 VAC (50/60Hz)	

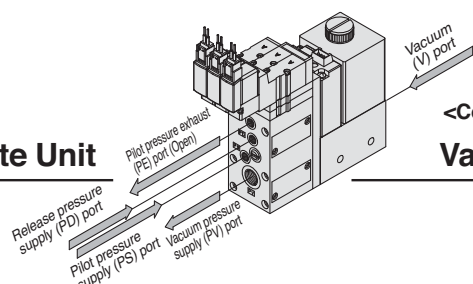
Electrical entry		Light/Surge voltage suppressor
L	L plug connector type	
LN		— None
LO		Z With light and surge voltage suppressor
M	M plug connector type	S With surge voltage suppressor (DC only)
MN		
MO		
G	Grommet type	
H		

Note) Pilot valve gasket (SYJ3000-14-6) is included.

ZX
ZR
ZM
ZY
ZH
ZU
ZL
ZF
ZP
ZCU
Vacuum related

# Series ZR

## Complete Unit



<Components>

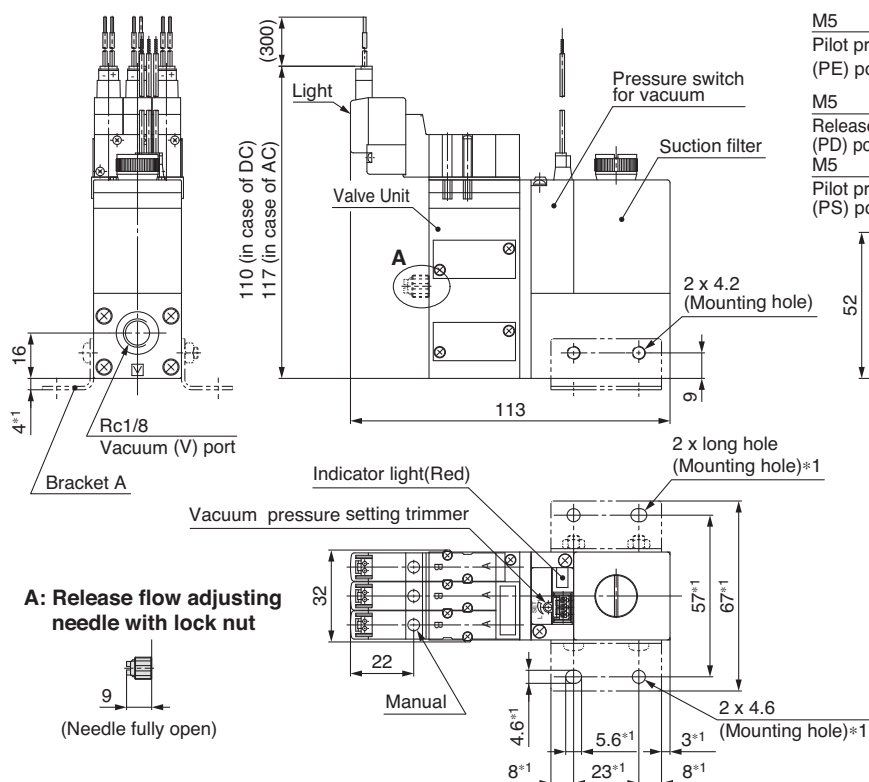
## Valve + Pressure Switch for Vacuum + Filter Unit

### Type K1

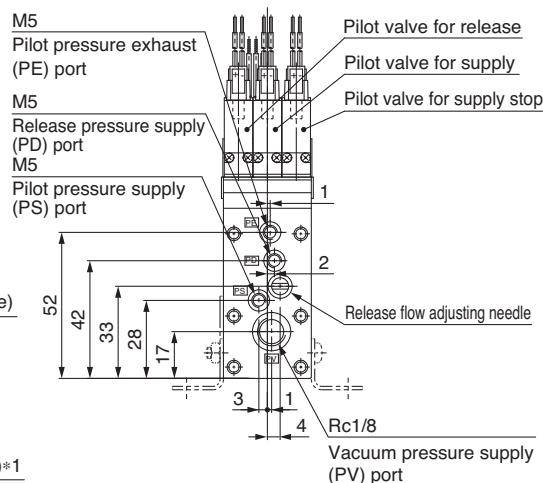
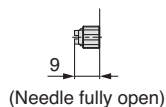
Vacuum valve: Double SOL.

Release valve: Single SOL. (N.C.)

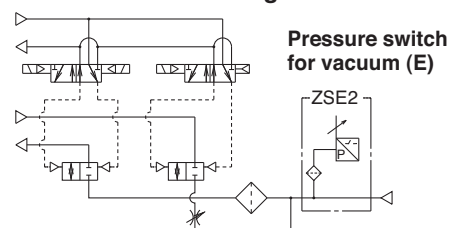
ZR100-K1□M□□-E□□-□



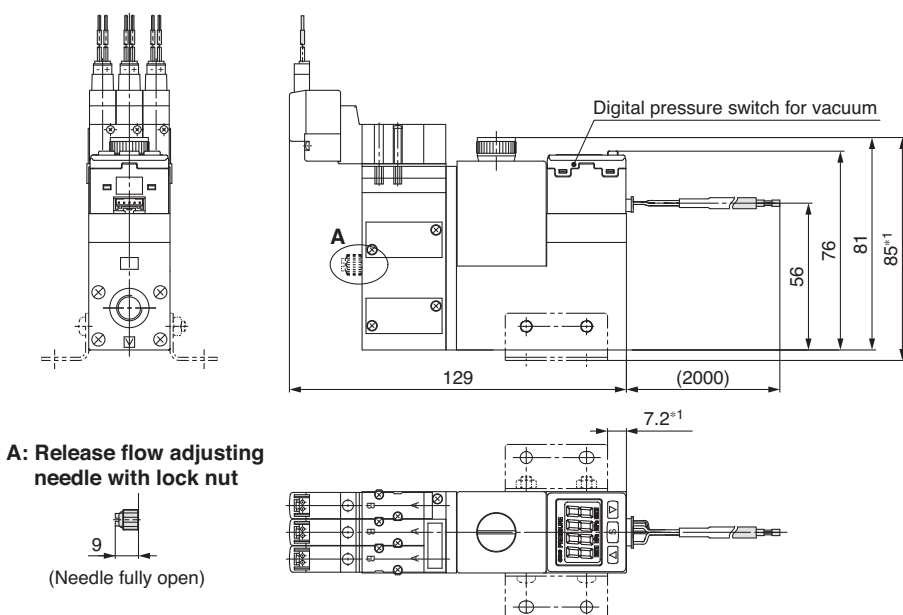
A: Release flow adjusting needle with lock nut



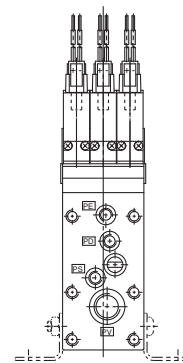
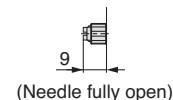
### Circuit diagram



ZR100-K1□M□□-D□□□-□

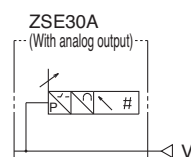
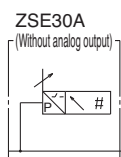


A: Release flow adjusting needle with lock nut



Note \* 1 Dimensions for mounting bracket A  
Bracket A part no.: ZR1-OBA  
(Standard accessory)

### Digital pressure switch for vacuum (D)



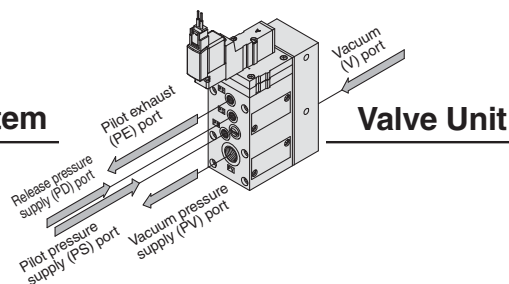






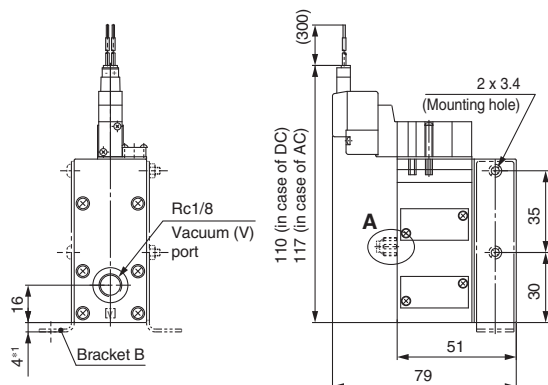
# Series ZR

## Vacuum Pump System

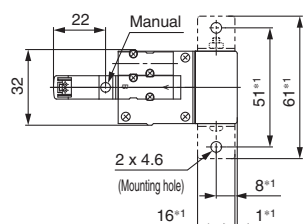
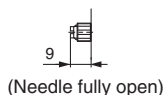


### Type C1

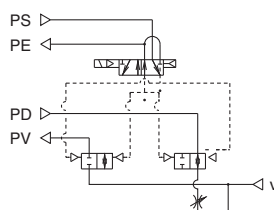
ZR1-VC1□M□□-□



#### A: Release flow adjusting needle with lock nut

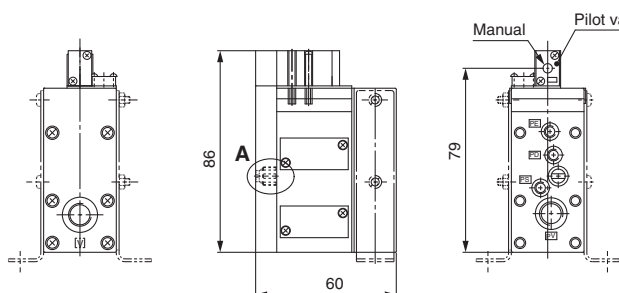


#### Circuit diagram



### Type C2

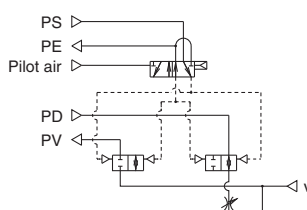
ZR1-VC2-□



#### A: Release flow adjusting needle with lock nut



#### Circuit diagram

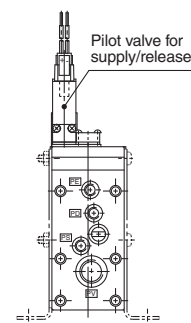
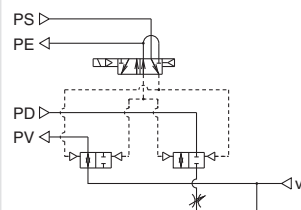


Note) Dimensions \*: For mounting bracket B  
Bracket B part number: ZR1-OB  
(Standard accessory)

### Type C3

ZR1-VC3□M□□-□

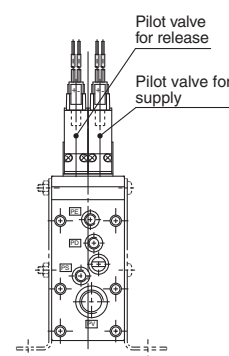
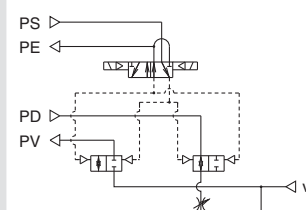
#### Circuit diagram



### Type C4

ZR1-VC4□M□□-□

#### Circuit diagram



★ Dimensions not indicated are identical to drawings above.

## 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	Left			Right		
Supply port	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	Port location
01 1	R Right side
⋮ ⋮	L Left side
06 6	B Both sides

Thread type	
— Rc	
F G (Note)	
T NPTF	

Note) The thread ridge shape is compatible with the G thread standard (JIS B 0202), but other shapes are not conforming to ISO16030 and ISO1179.

Example 1)

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

#### ⚠ Caution when ordering manifold

The asterisk denotes the symbol for assembly. Prefix it to the ejector part numbers to be mounted.  
 When it is not added, the manifold base and ejector are shipped separately.

#### <Function plate>

**ZR1 - RV3** - [1]

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

1	1 station only
⋮	⋮
6	6 stations only
A	All stations

\* When the spacers are attached to the specified locations, specify all spacers.

Example 2) Attached to the first and third stations

\*ZR1-RV3-1  
 \*ZR1-RV3-3

Example 3) Attached to all stations.

\*ZR1-RV3-A...2

Fill the number

#### <Individual spacer>

**ZR1 - R1** - [1]

R16

Refer to  
 (About individual spacer.)

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

1	1 station only
⋮	⋮
6	6 stations only
A	All stations

\* When the spacers are attached to the specified locations, specify all spacers.

Example 4) Attached to the first and third stations

\*ZR1-R1-1  
 \*ZR1-R1-3

#### <Blanking plate>

**ZR1 - BM1**

Refer to Example 1).

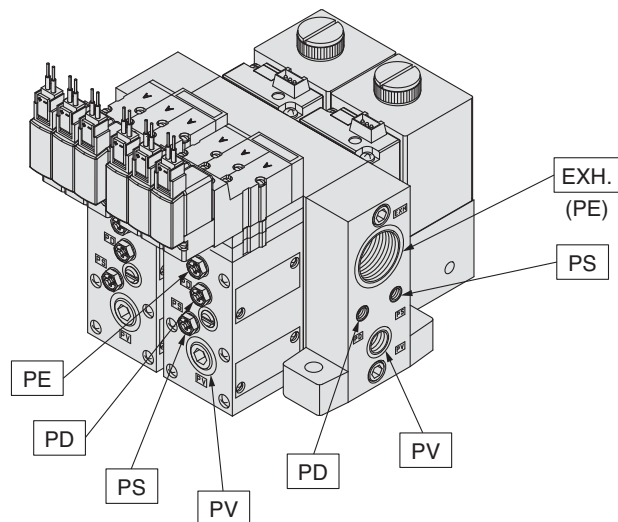
#### About individual spacers

- Manifold supply or valve unit supply can be selectable for each port. In the right table, ports with the symbol ↑ mean that they are manifold supply, while others are individual supply from the valve unit.
- Symbols in the right table are printed on the surface of individual spacers.

Part no.	Symbol	Part no.	Symbol
ZR1-R1	R1	ZR1-R9	R9 ↑PV
-R2	R2 ↑PE	-R10	R10 ↑PV ↑PE
-R3	R3 ↑PD	-R11	R11 ↑PV ↑PD
-R4	R4 ↑PD ↑PE	-R12	R12 ↑PV ↑PD ↑PE
-R5	R5 ↑PS	-R13	R13 ↑PV ↑PS
-R6	R6 ↑PS ↑PE	-R14	R14 ↑PV ↑PS ↑PE
-R7	R7 ↑PS ↑PD	-R15	R15 ↑PV ↑PS ↑PD
-R8	R8 ↑PS ↑PD ↑PE	-R16	R16 ↑PV ↑PS ↑PD ↑PE

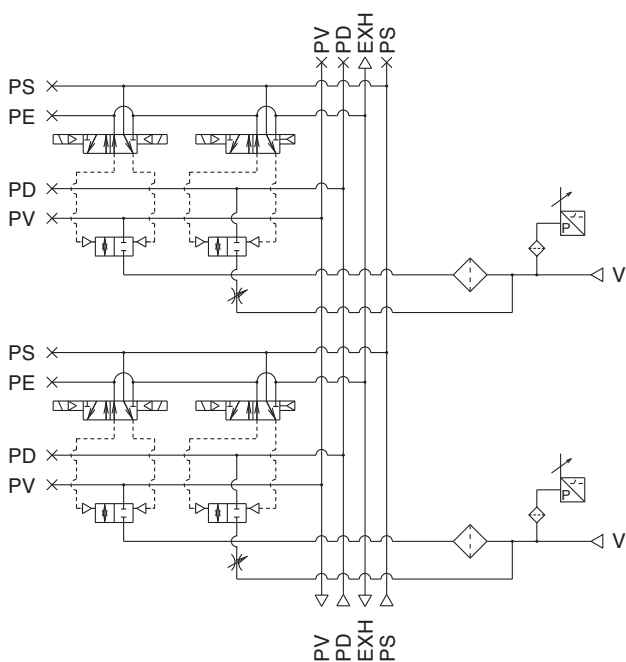
## Manifold/System Circuit Example

### When not using individual spacer

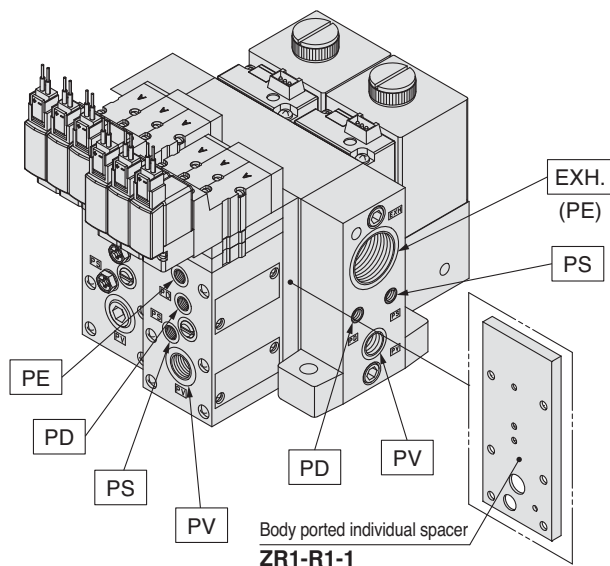


**PV:** Vacuum pressure supply port  
**PS:** Pilot pressure supply port  
**PD:** Release pressure supply port  
**PE:** Pilot pressure exhaust port  
**EXH.:** Common exhaust port  
**V:** Vacuum Port

### <System circuit example>

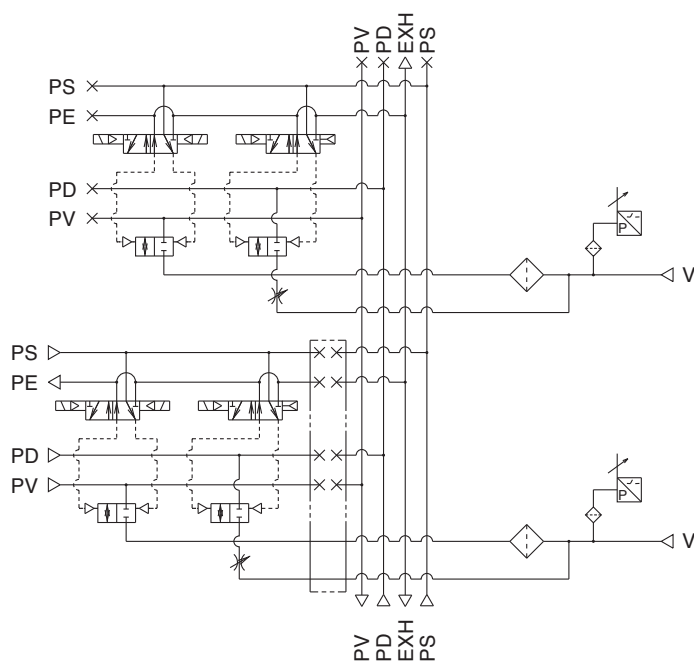


### When using individual spacer

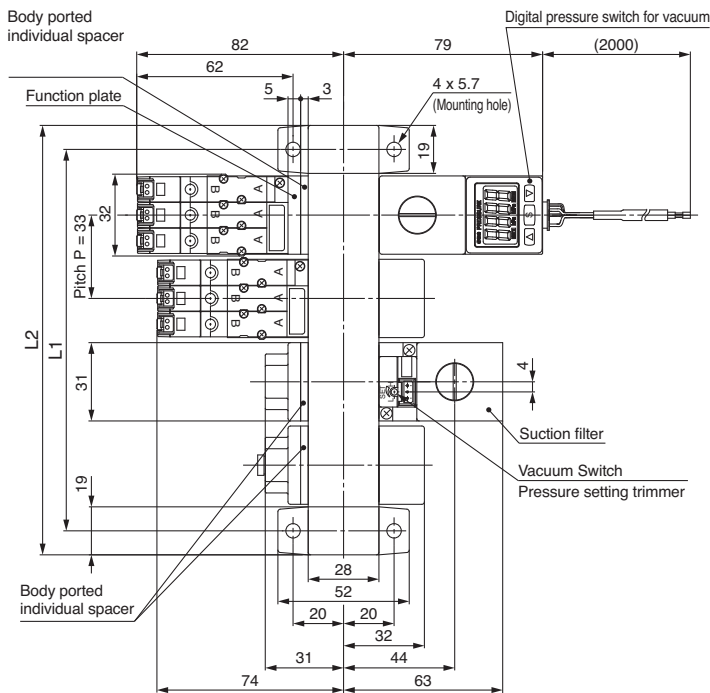
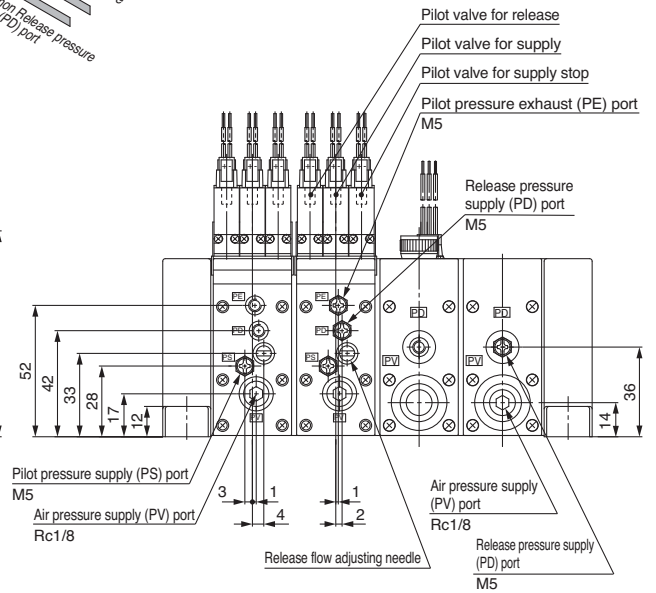
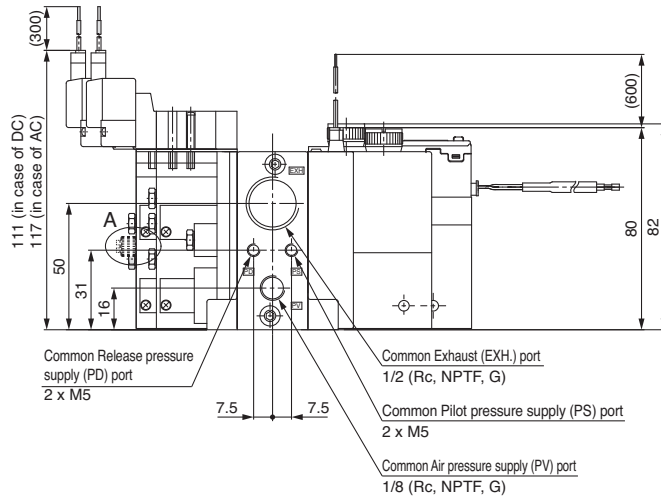
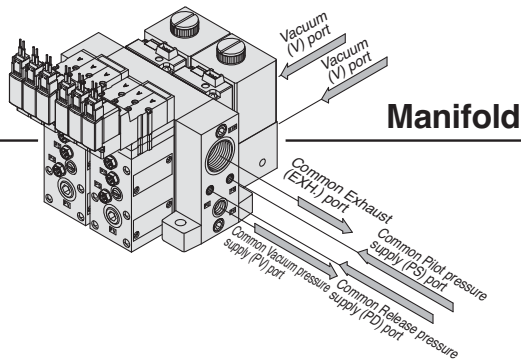


**PV:** Vacuum pressure supply port  
**PS:** Pilot pressure supply port  
**PD:** Release pressure supply port  
**PE:** Pilot pressure exhaust port  
**EXH.:** Common exhaust port  
**V:** Vacuum Port

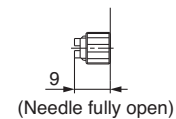
### <System circuit example>



## Vacuum Pump System



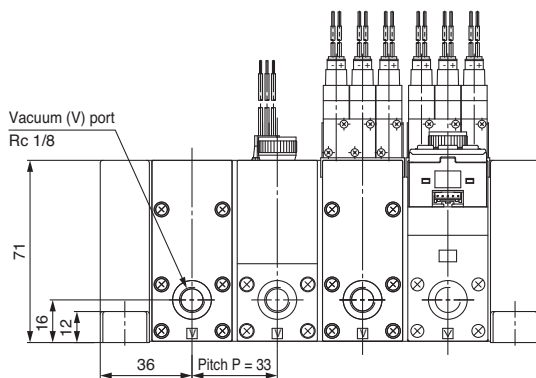
### A: Release flow adjusting needle with lock nut



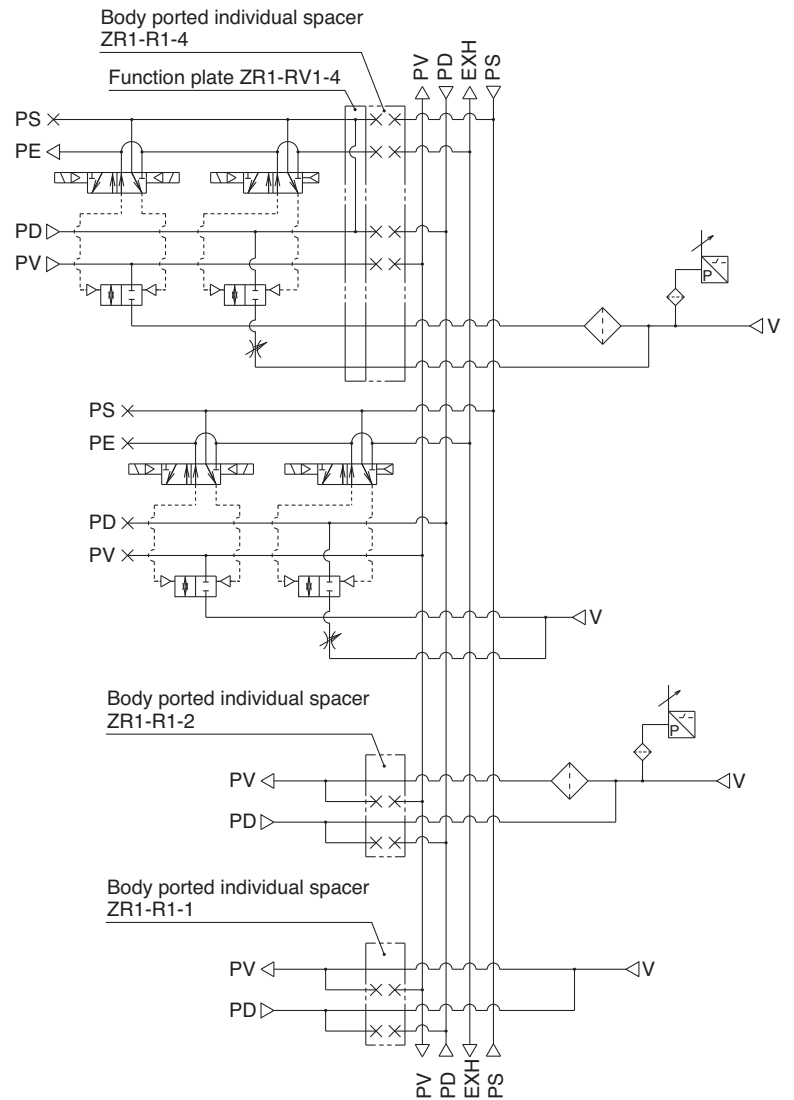
\* 1 The common exhaust (EXH) port is also used as the pilot pressure exhaust (PE) port of the pilot valve. Use while the port is open to the atmosphere.

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

(mm)



## Circuit diagram

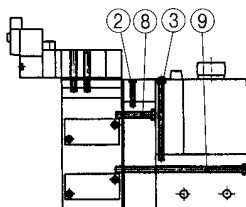
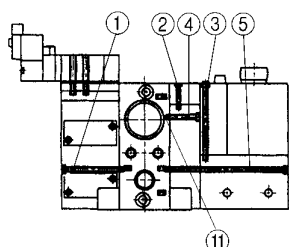


- PV** : Vacuum pressure supply port
- PS** : Common pilot pressure supply port
- PD** : Common release pressure supply port
- PE** : Pilot valve exhaust port
- EXH** : Common exhaust port
- V** : Vacuum Port

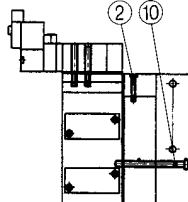
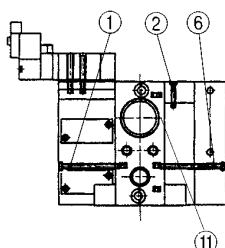
## Ejector System

### Mounting Thread Parts List for Unit Combination

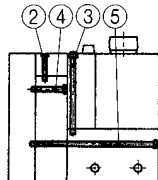
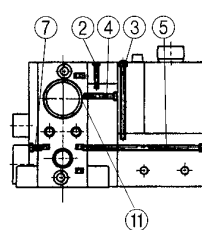
Manifold Specifications	Without Manifold
Components	Valve unit + Ejector unit + Vacuum switch/Filter unit



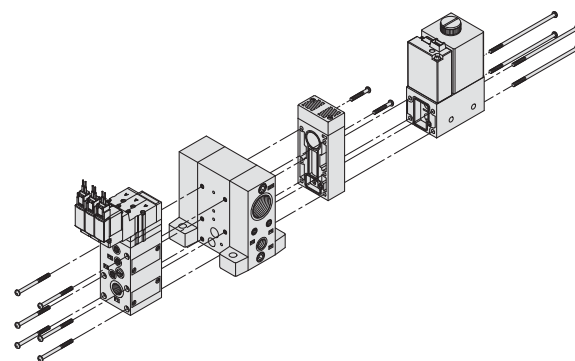
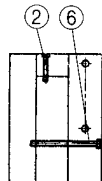
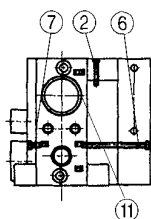
Components	Valve unit + Ejector unit
------------	---------------------------



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



Components	Ejector unit
------------	--------------



### Mounting Thread Parts List for Unit Combination

No.	Combination specifications	Assembly part number
1	Standard (without options)	ZR1-SR2-33-A(a set of six threads)
	With individual spacer	ZR1-SR2-37-A(a set of six threads)
	With function plate	ZR1-SR2-39-A(a set of six threads)
	With individual spacer + with function plate	ZR1-SR2-41-A(a set of six threads)
2	Individual, common and port exhaust style for nozzle size 10, 13 Common and port exhaust style for nozzle size 15	ZR1-SR1-13-A(a set of two threads)
	Individual exhaust style for nozzle size 15	ZR1-SR1-23-A(a set of two threads)
	Common and port exhaust style for nozzle size 18, 20	ZR1-SR1-48-A(a set of two threads)
	Individual exhaust style for nozzle size 18, 20	ZR1-SR1-53-A(a set of two threads)
3	For vacuum switch and adapter A	ZR1-SR2-41-1A(a set of two threads)
4	For nozzle size 10, 13, 15	ZR1-SR2-17-A(a set of two threads)
	For nozzle size 18, 20	ZR1-SR2-21-A(a set of two threads)
5	For nozzle size 10, 13, 15	ZR1-SR2-66-A(a set of four threads)
	For nozzle size 18, 20	ZR1-SR2-70-A(a set of four threads)
	For nozzle size 10, 13, 15 [For ZSE30A spec.]	ZR1-SR2-82-A(a set of four threads)
	For nozzle size 18, 20 [For ZSE30A spec.]	ZR1-SR2-86-A(a set of four threads)
6	For nozzle size 10, 13, 15	ZR1-SR2-35-A(a set of six threads)
	For nozzle size 18, 20	ZR1-SR2-39-A(a set of six threads)
7	Standard (without options)	ZR1-SR2-5-A(a set of six threads)
	With individual spacer	ZR1-SR2-8-A(a set of six threads)
	For nozzle size 10, 13, 15	ZR1-SR3-19-1A(a set of two threads)
	For nozzle size 18, 20	ZR1-SR3-23-A(a set of two threads)
8	For nozzle size 10, 13, 15 + with function plate	ZR1-SR3-24-1A(a set of two threads)
	For nozzle size 18, 20 + with function plate	ZR1-SR3-28-A(a set of two threads)
	For nozzle size 10, 13, 15	ZR1-SR3-68-A(a set of four threads)
	For nozzle size 18, 20	ZR1-SR3-72-A(a set of four threads)
9	For nozzle size 10, 13, 15 + with function plate	ZR1-SR3-73-A(a set of four threads)
	For nozzle size 18, 20 + with function plate	ZR1-SR3-77-A(a set of four threads)
	For nozzle size 10, 13, 15 [For ZSE30A spec.]	ZR1-SR3-84-A(a set of four threads)
	For nozzle size 18, 20 [For ZSE30A spec.]	ZR1-SR3-88-A(a set of four threads)
10	For nozzle size 10, 13, 15 + with function plate [For ZSE30A spec.]	ZR1-SR3-89-A(a set of four threads)
	For nozzle size 18, 20 + with function plate [For ZSE30A spec.]	ZR1-SR3-93-A(a set of four threads)
	For nozzle size 10, 13, 15	ZR1-SR3-37-A(a set of six threads)
	For nozzle size 18, 20	ZR1-SR3-41-A(a set of six threads)
11	For nozzle size 10, 13, 15 + with function plate	ZR1-SR3-42-A(a set of six threads)
	For nozzle size 18, 20 + with function plate	ZR1-SR3-46-A(a set of six threads)
Note 1)	When the ejector is compatible with silencer exhaust or port exhaust	M12 x 12
	When the ejector is compatible with common exhaust	Unnecessary

Note 1) • Screw M12 x 12 screws (Hexagon socket head set screws) in until the head aligns with the manifold base surface.

• The manifold base not assembled with the unit does not include M12 x 12 screws (Hexagon socket head set screws). Please order them separately.

Note 2) When the valve unit is assembled from a single unit function to a manifold function, 3 pcs. of ZX1-MP1 for PS, PD, PE ports and 1 pc. of R1/8 for PV port are required.

### ⚠ 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.

ZX

ZR

ZM

ZY

ZH

ZU

ZL

ZF

ZP

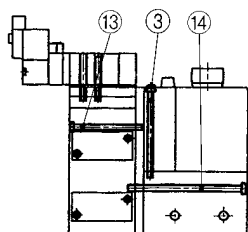
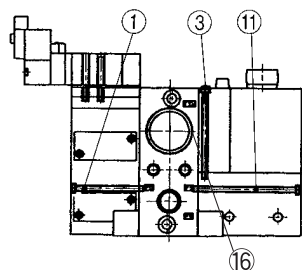
ZCU

Vacuum related

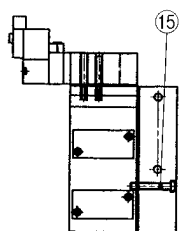
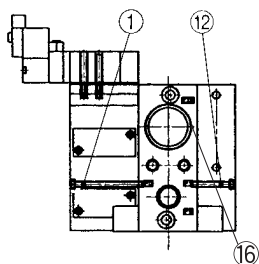
## External Vacuum Supply System Mounting Thread Parts List for Unit Combination

### Manifold Specifications Without Manifold

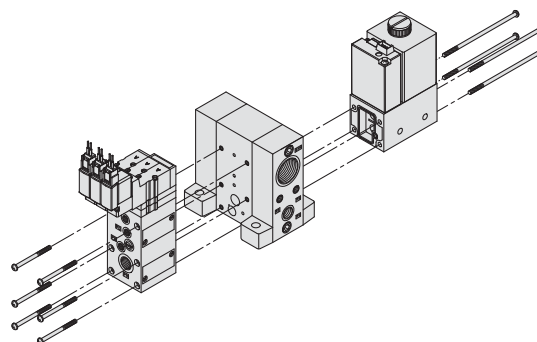
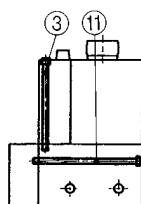
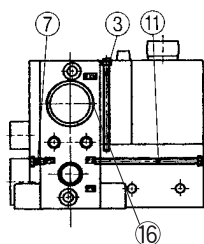
Components Valve unit + Vacuum switch/Filter unit



Components Valve unit



Components Vacuum switch/Filter unit



### Mounting Thread Parts List for Unit Combination

No.	Combination specifications	Assembly part number
1	Standard (Without options)	ZR1-SR2-33-A(a set of six threads)
	With individual spacer	ZR1-SR2-37-A(a set of six threads)
	With function plate	ZR1-SR2-39-A(a set of six threads)
	With individual spacer + with function plate	ZR1-SR2-41-A(a set of six threads)
3	For vacuum switch and adapter A	ZR1-SR2-41-1A(a set of two threads)
7	Standard (Without options)	ZR1-SR2-5-A(a set of six threads)
	With individual spacer	ZR1-SR2-8-A(a set of six threads)
11	Standard (Without options)	ZR1-SR2-49-A(a set of four threads)
	Standard (Without options) [For ZSE30A spec.]	ZR1-SR2-66-A(a set of four threads)
12	Standard (Without options)	ZR1-SR2-18-A(a set of six threads)
13	Standard (Without options)	ZR1-SR2-33-1A(a set of two threads)
	With function plate	ZR1-SR2-39-1A(a set of two threads)
14	Standard (Without options)	ZR1-SR3-54-A(a set of four threads)
	With function plate	ZR1-SR3-59-A(a set of four threads)
	Standard (Without options) [For ZSE30A spec.]	ZR1-SR3-70-A(a set of four threads)
	With function plate [For ZSE30A spec.]	ZR1-SR3-75-A(a set of four threads)
15	Standard (Without options)	ZR1-SR3-19-A(a set of six threads)
	With function plate	ZR1-SR3-24-A(a set of six threads)
16 <sup>Note 1)</sup>	Standard	M12 x 12

Note 1) • Screw M12 x 12 screws (Hexagon socket head set screws) in until the head aligns with the manifold base surface.  
• The manifold base not assembled with the unit does not include M12 x 12 screws (Hexagon socket head set screws). Please order them separately.

Note 2) When the valve unit is assembled from a single unit function to a manifold function, 3 pcs. of ZX1-MP1 for PS, PD, PE ports and 1 pc. of R1/8 for PV port are required.