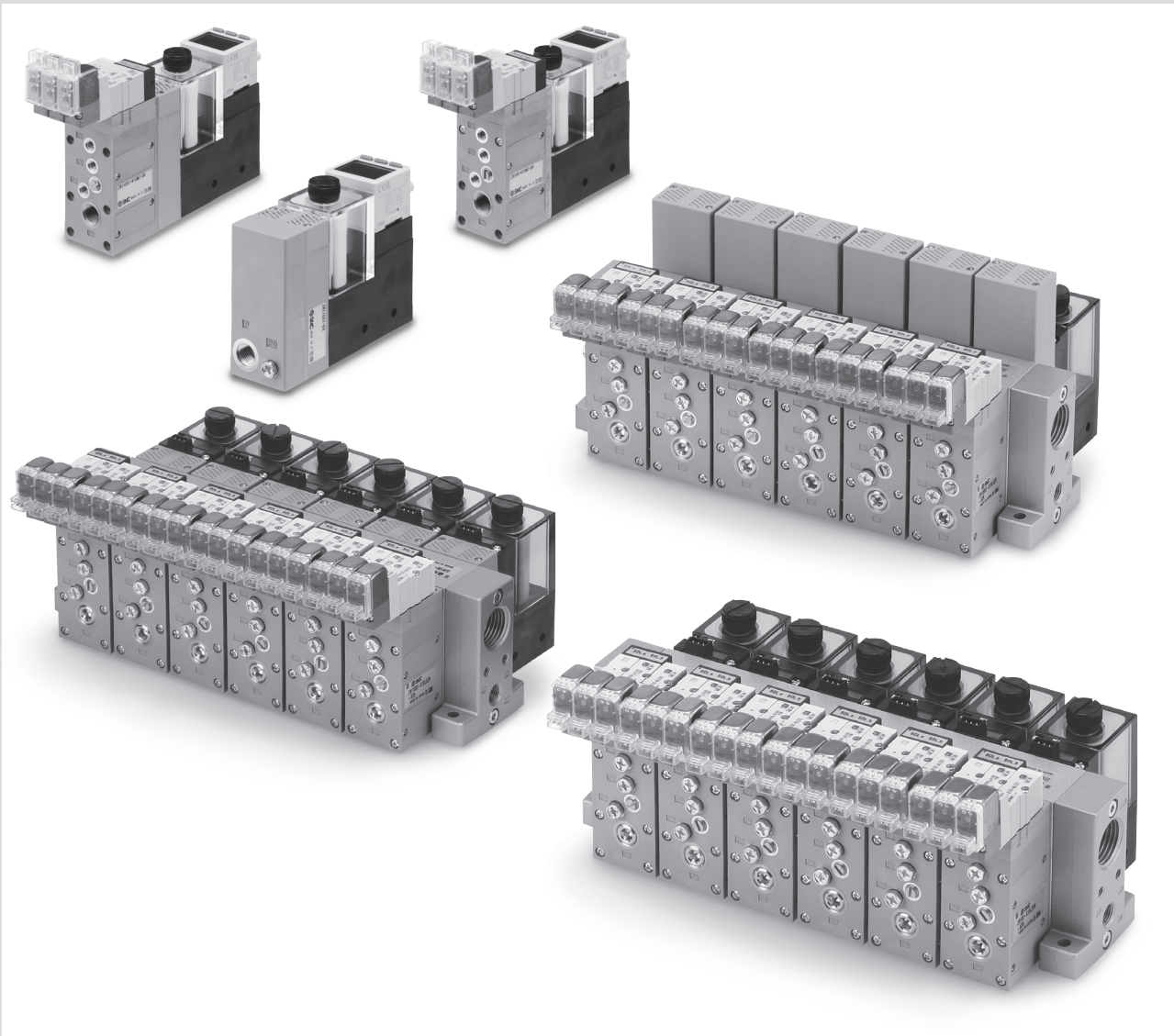


Large Size Vacuum Module: Ejector System/Vacuum Pump System



- Large suction flow rate, suitable when used with large size pads or multiple pads.
- Nozzle dia. Ø 1.0, Ø 1.3, Ø 1.5, Ø 1.8, Ø 2.0
- Vacuum module suitable for handling workpieces of 0.5 to 5 kg.



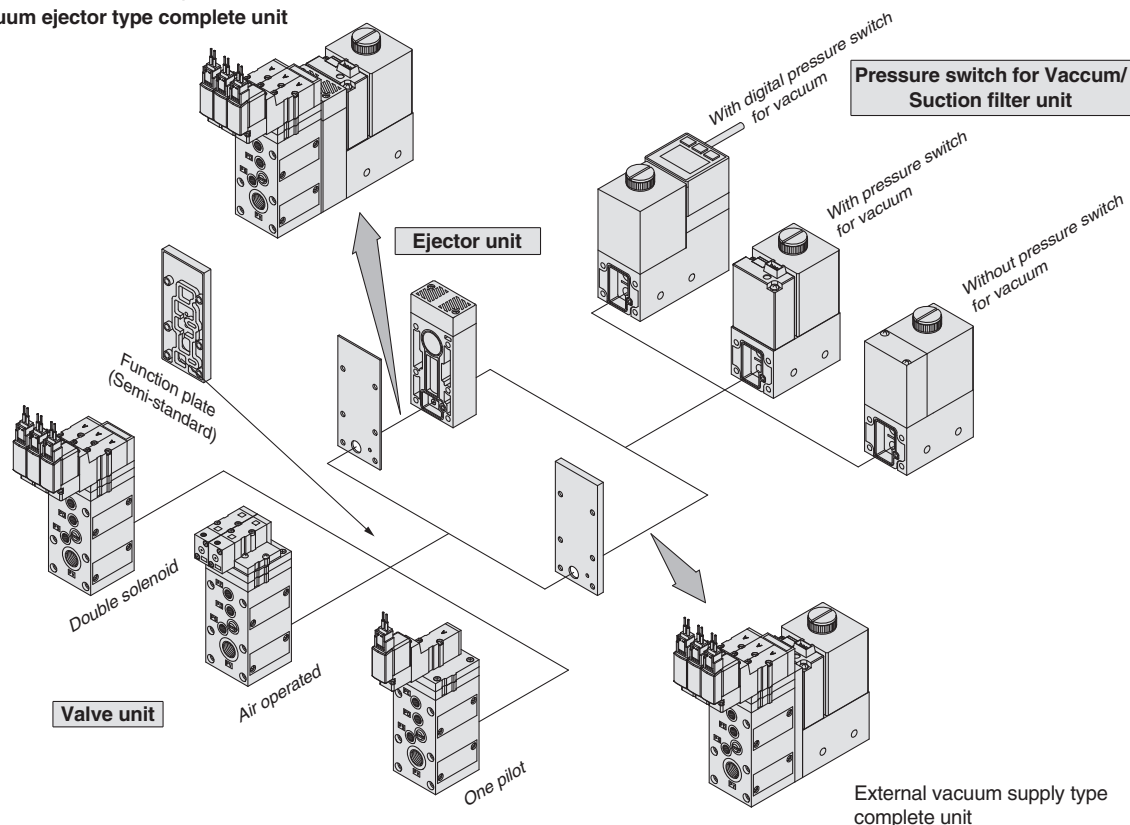
ZR Series

ZR Series

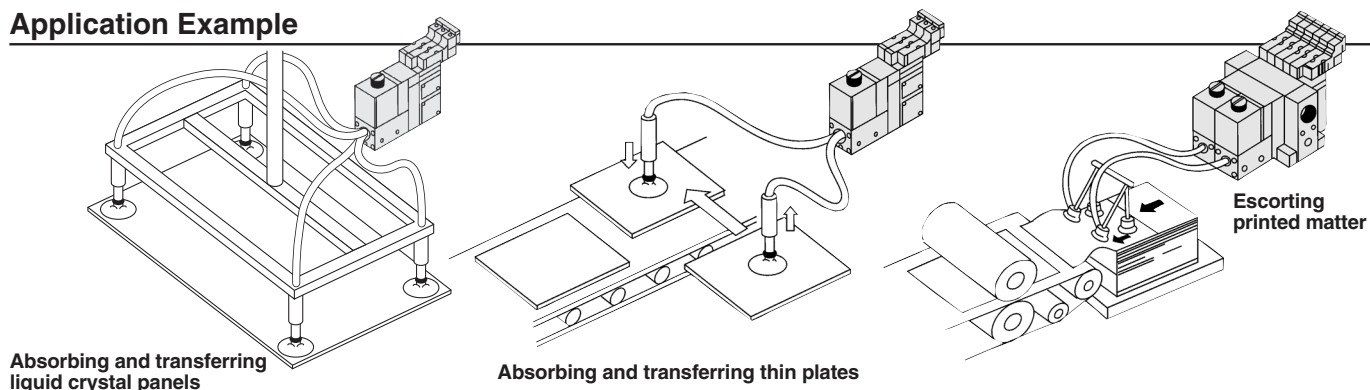
Vacuum module suitable for handling workpieces of 0.5 to 5 kg.

- **Modular design**/Customised application function through selection of modular 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 type complete unit

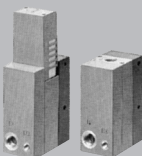







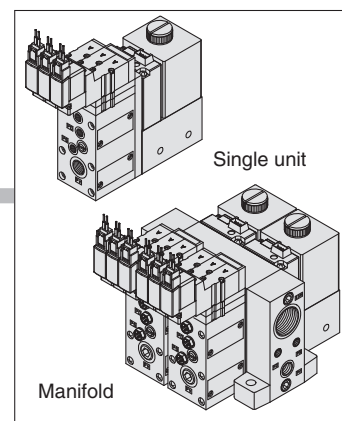
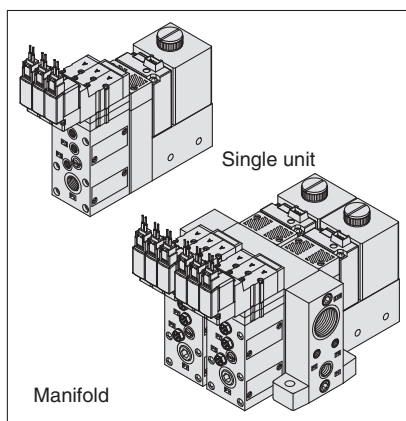
Application Example



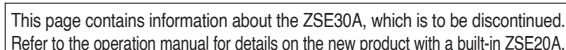
Absorbing and transferring copper plates, Automatic labeling machine, Absorbing and transferring veneers, Automatic screw fastening machine

Modular Components Introduction

System		Ejector System					Vacuum Pump System	
Component equipment		P. 3 to 32					P. 33 to 48	
<div>Ejector unit ZR1-W</div> <div></div>	Nozzle dia. (mm)		1.0	1.3	1.5	1.8	2.0	—
	Maximum suction flow rate (l/min. [ANR])	Type S	25	42	63	74	95	
		Type L	44	55	88	105	132	
	Air consumption (l/min [ANR])		53	86	102	155	194	
	Maximum vacuum pressure		S: -84 kPa L: -53 kPa					
Exhaust release (Ejector exhaust)		Built-in silencer, Manifold exhaust Individual exhaust port						
<div>Valve unit ZR1-V</div> <div></div>	Component equipment		Supply valve (Pilot type)/Release valve (Pilot type)					
	Function		N.C./N.O.					
	Operation		Solenoid valve (Double, Single)/Air operated valve					
	Power supply voltage		3, 5, 6, 12, 24 VDC					
<div>Pressure switch for vacuum ZSE2-0R-15/55 ZSE30A-00-□-□□□</div> <div></div>	Rated pressure range/Set pressure range		0 to -101 kPa					
	Hysteresis		3 % or less/variable					
	Operating voltage		12 to 24 VDC (Ripple ±10 % or less)					
<div>Suction filter unit ZR1-F</div> <div></div>	Operating pressure range		-0.1 to 0.5 MPa					
	Filtration degree		30 μm					
	Material		PVF					
<div>Function plate ZR1-RV</div>	Symbol	RV1	Air pressure supply (PV) port ↔ Pilot pressure supply (PS) port ↔ Release pressure supply (PD) port					
		RV2	Air pressure supply (PV) port ↔ Pilot pressure supply (PS) port / Release pressure supply (PD) port					
		RV3	Air pressure supply (PV) port / Pilot pressure supply (PS) port ↔ Release pressure supply (PD) port					
Common specifications	Unit	Air supply port	Rc 1/8					
		Vacuum pad connection port	Rc 1/8					
	Manifold	Air supply port	Rc 1/8					
		Pilot valve connection port	M5					
		Release valve connection port	M5					
		Common exhaust port	Rc 1/2					
		External vacuum supply port	—					
Refer to page 9 for further specifications of each unit.		<div></div> <div></div>						



Ejector + Without Valve



Components



Maximum vacuum pressure

- Option/Shipped separately

Note) Brackets are not shipped together with the manifold assembly.

Ejector exhaust

Note 1) When port exhaust is applied to the manifold, pilot exhaust is done by common exhaust. Thus, the exhaust port on the manifold base should be open while operating.

Note 2) When the product is used for the manifold specification and common exhaust, the exhaust air of the operating ejector releases may enter the vacuum (V) port of the non-operating ejector and be released if there are an operating and non-operating ejector. Select either the built-in silencer or port exhaust for the ejector exhaust method.

Combination of switch/filter

- **Lead wire specifications**

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

Refer to "Table (4)" on page 135 for part no. of lead wire with connector.

Pressure switch for vacuum (ZSE2) specifications (E)

Refer to "Table (3)" on page 135 for part no. of lead wire with connector.

Filter specifications (F)

- **Unit specifications**

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

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)

Output specifications

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

Pressure switch for vacuum
(ZSE2) specifications (E)

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

Filter specifications (F)

—	No setting
---	------------


This page contains information about the ZSE30A, which is to be discontinued.
Refer to the operation manual for details on the new product with a built-in ZSE20A.

Table (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. (SYJ3233-X126)	N.C (SYJ3133)	(SYJA3130)	N.C (SYJ3133)	(SYJA3130)
⊙	⊙	○	Double SOL. (SYJ3233-X126)	N.C. (SYJ3133)	K1	●	—	—	●	—
○	○	○	N.C. (SYJ3133)	N.C. (SYJ3133)	K2	—	●	—	●	—
○	○	○	Air operated (SYJA3130)	Air operated (SYJA3130)	K3	—	—	●	—	●
×	○	○	N.C. (SYJ3133)		C1	—	●	—	(Common with supply valve)	—
×	○	○	Air operated (SYJA3130)		C2	—	—	●	—	(Common with supply valve)
×	○	○	N.O. (SYJ3133)		C3	—	●	—	(Common with supply valve)	—
⊙: Possible ○: Possible with limitations (without self-holding function) X: Not possible					—	Without valve module				

○: Possible ○: Possible with limitations (without self-holding function) X: 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-Q 1 pc.
* SY100-30-4A-6 3 pcs.

Table (3) Pressure Switch for Vacuum (ZSE30A)/ 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-Q 1 pc.
* ZS-10-5A-50 1 pc.

Table (4) Digital Pressure Switch for Vacuum (ZSE30A)/ Lead Wire with Connector

ZS - 38 -  **L**

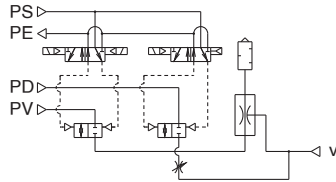
Lead wire core

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.

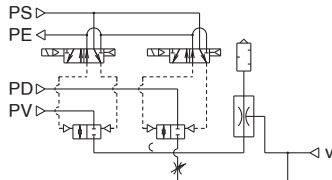


How to Operate

Operation	Pilot valve operation	Supply valve		Release valve	Note
		Pilot valve for supply	Pilot valve for supply stop	Pilot valve for release	
1. Adsorption		ON	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	
3. Operation stop		OFF	ON	OFF	

Combination Symbol: **K2**

Feature: Single solenoid valve is provided for supply valve.

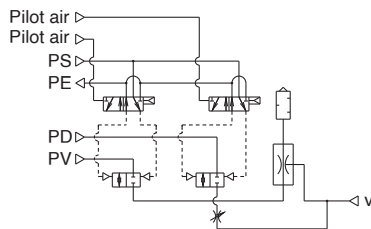


How to Operate

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

Combination Symbol: **K3**

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

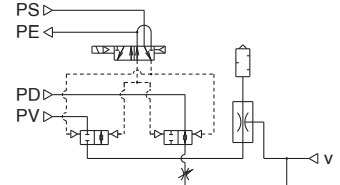


How to Operate

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

Combination Symbol: **C1**

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

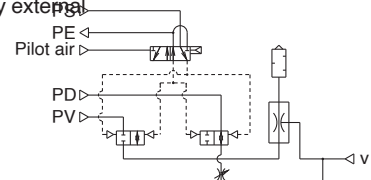


How to Operate

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.

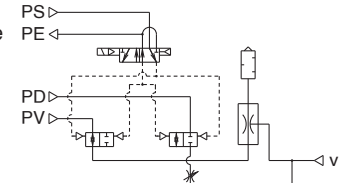


How to Operate

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-energised) and release of vacuum (when energised) 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	

⚠ Caution

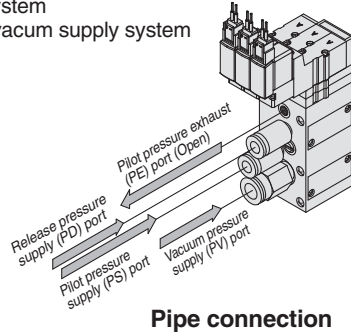
When pipe connection is made to one port connection (PV) port only, use a function plate (ZR1-RV1). Refer to page 6 for further information.

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.

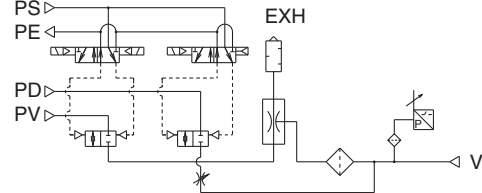
Without Function Plate (Standard)

Applicable system: Ejector system
External vacuum supply system



Pipe connection

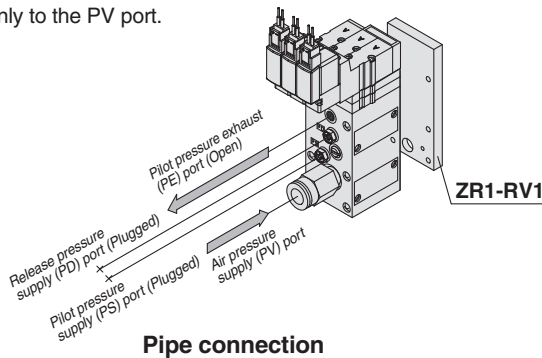
Circuit diagram



With Function Plate/Applicable to Ejector System Only

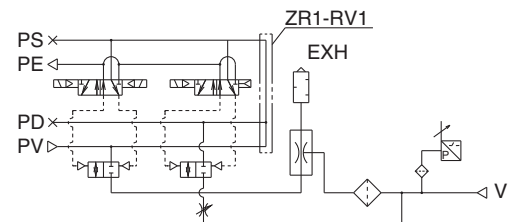
When ZR1/RV1 (PV PS PD) is Selected

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



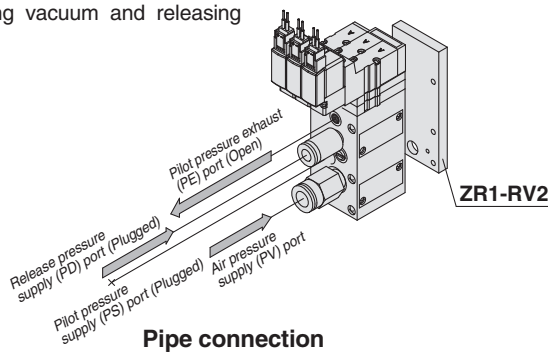
Pipe connection

Circuit diagram



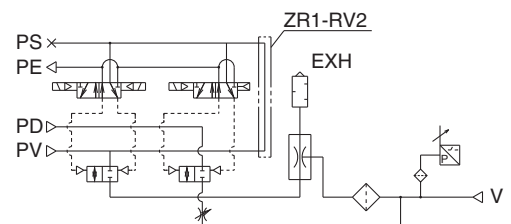
When ZR1/RV2 (PV PS/PD) is Selected

Supply air for generating vacuum and releasing vacuum respectively.



Pipe connection

Circuit diagram



How to Order Function Plate Unit (For Ejector System)

ZR1 – RV 1

Piping specifications

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

How to order

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

Example) ZR120S1-K15MZ-EC-Q..... 1 pc.

* ZR1-RV1 1 pc.

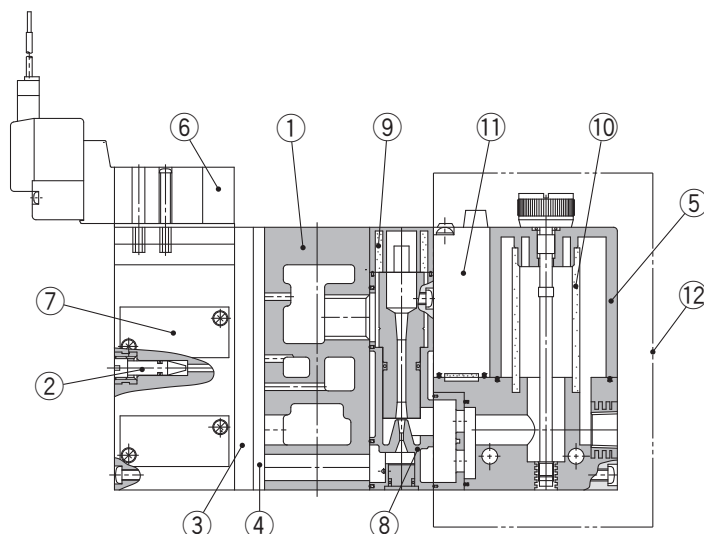
⚠ Caution

Length of assembling mounting threads varies when adding function plate. Order from the mounting thread parts list for unit combination on page 47.

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.

This page contains information about the ZSE30A, which is to be discontinued.
Refer to the operation manual for details on the new product with a built-in ZSE20A.

Construction



Component Parts

No.	Description	Material	Part Model
1	Manifold base	Aluminium alloy	
2	Release flow rate adjusting needle	Stainless steel	ZR1-NA ^{Note 2)}
3	Function plate	PBT	Refer to page 27.
4	Individual spacer	PBT	Refer to page 27.
5 ^{Note 1)}	Filter case	Polycarbonate	Refer to page 18.
6	Pilot valve assembly	—	Refer to "Table (5)" on page 8.
7	Valve body assembly	—	Refer to "Table (1)" on page 8.

No.	Description	Material	Part Model
8	Ejector assembly	—	Refer to "Table (2)" on page 8.
9	Silencer	PVA sponge	Refer to "Table (3)" on page 8.
10	Filter element	PVA sponge	ZR1-FZ(30 μm)
11	Pressure switch for vacuum	—	ZSE2-OR ¹⁵ ₅₅ -□ ZSE30A-00-□-□□□□-Equivalent
12	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 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 (ZR1-ND-L) lock nut is also available.

How to Order Solenoid Valves/Air Operated Valves

Air operated

SYJA3130

Solenoid valve

ZR1-SYJ3233 - □ □ □ □ - X126 - Q

SYJ3133 - □ □ □ □ - Q

rated voltage

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

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

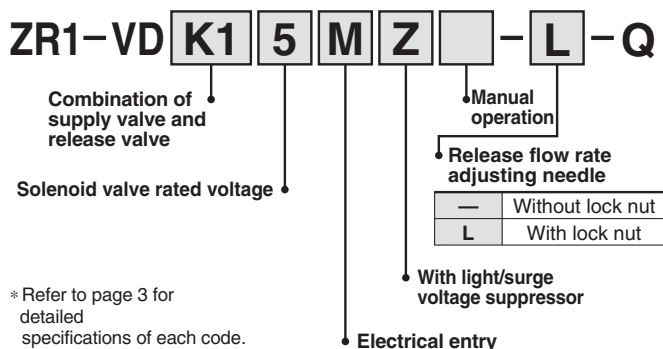
Electrical entry

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
H		Lead wire: 0.6 m

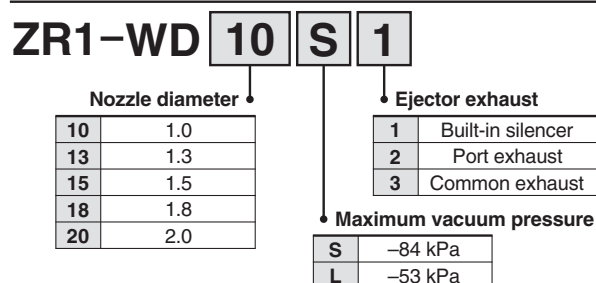
Note) Mounting screw and pilot valve gasket are included.

Construction

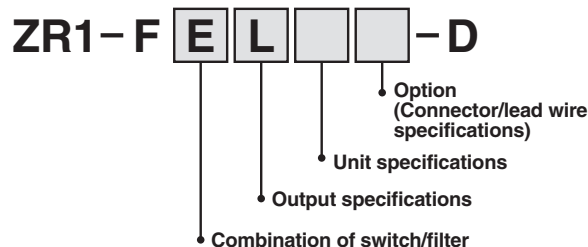
(1) How to Order Valve Body Assembly



(2) How to Order Ejector Assembly



(4) Pressure Switch for Vacuum + Suction Filter Unit



(5) How to Order Pilot Valves

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

(3) How to Order Silencer

Element

ZR1-SE **1**

Applicable ejector

1	For ZR110S1
	For ZR110L1
	For ZR113S1
	For ZR113L1
2	For ZR115S1
	For ZR115L1
3	For ZR118S1
	For ZR118L1
	For ZR120S1
	For ZR120L1

Silencer assembly (Case, Element, Mounting screw)

ZR1-SA **1** **-A**

Applicable ejector

1	For ZR110S1
	For ZR110L1
	For ZR113S1
	For ZR113L1
2	For ZR115S1
	For ZR115L1
3	For ZR118S1
	For ZR118L1
	For ZR120S1
	For ZR120L1

Silencer case assembly for port exhaust (Case, Mounting screw)

ZR1-SA **4** **-A**

Applicable ejector

4	For ZR110S2
	For ZR110L2
	For ZR113S2
	For ZR113L2
	For ZR115S2
	For ZR115L2
5	For ZR118S2
	For ZR118L2
	For ZR120S2
	For ZR120L2

Silencer case assembly for centralised exhaust (Case, Mounting screw)

ZR1-SA **6** **-A**

Applicable ejector

6	For ZR110S3
	For ZR110L3
	For ZR113S3
	For ZR113L3
	For ZR115S3
	For ZR115L3
7	For ZR118S3
	For ZR118L3
	For ZR120S3
	For ZR120L3

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 (PS port pressure or less)	
PD port supply pressure	0.05 to 0.6 MPa (PS port pressure or less)	
PS port supply pressure	0.25 to 0.6 MPa	
Supply pressure range of pilot pressure supply (PA, PB) ports for supply and release <small>Note)</small>	PS port pressure to 0.6 MPa	
Main valve effective area (mm²)	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 accessory	Bracket B (ZR1-OB B)	

Note) Combination of supply valve and release valve: K3, C2

The supply and release valves of this product have a structure which uses the pressure of the pilot pressure supply (PS) port to operate them. Be sure to supply a pressure that is the pressure of the pilot pressure supply (PS) port or more and 0.6 MPa or less to the pilot pressure supply (PA, PB) ports for supply and release.

Solenoid Valve/Specifications

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

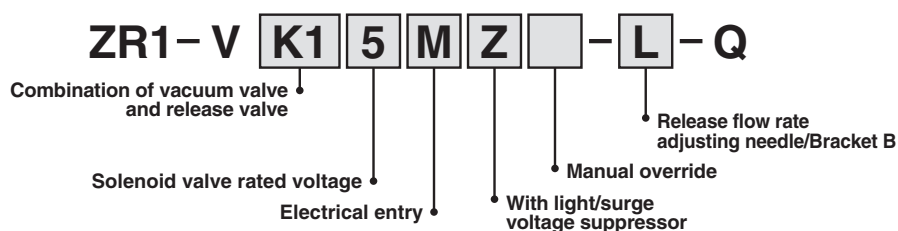
Combination of Supply Valve and Release Valve

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

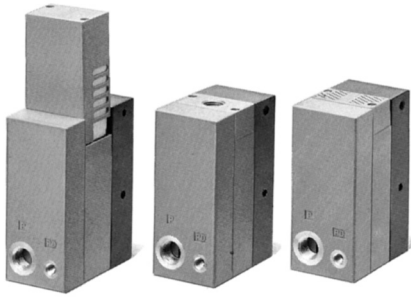
* Weight includes Bracket B. (Solenoid valve: 24 VDC, M plug connector type)

How to Order

Refer to page 3 for further part no. information.



Ejector Unit/ZR1 Series



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

Model	Nozzle dia. (mm)	Maximum suction flow rate (l/min (ANR))	Air consumption (l/min (ANR))	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

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

Model	Nozzle dia. (mm)	Maximum suction flow rate (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

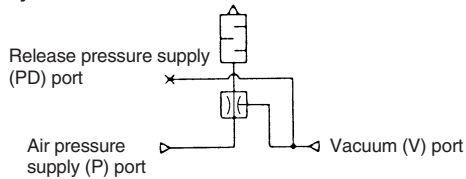
Common Specifications

Supply pressure range	0.2 to 0.55 MPa
Standard supply pressure	0.45 MPa
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)B

* How to Order: Code 1 and 2 are the suffixes in the ordering number to indicate the exhaust method.

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

Symbol



How to Order

ZR1-W 20 S 1 - □

Nozzle diameter

10	1.0
13	1.3
15	1.5
18	1.8
20	2.0

Maximum vacuum pressure

S	– 84 kPa
L	– 53 kPa

Bracket B

—	With Bracket B
N	Without Bracket B

Ejector exhaust

1	Built-in silencer
2	Individual exhaust*

* Port size:

Rc1/4 (Nozzle dia. 1.0 to 1.5)

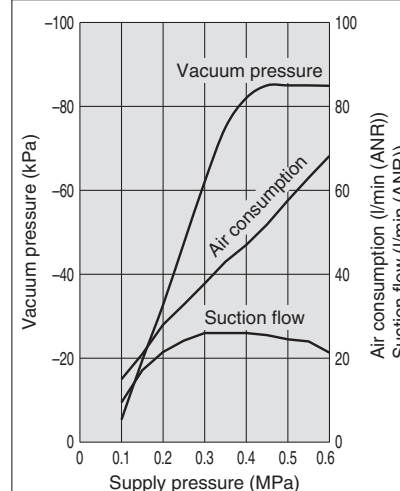
Rc3/8 (Nozzle dia. 1.8, 2.0)

Characteristics (Representative value)

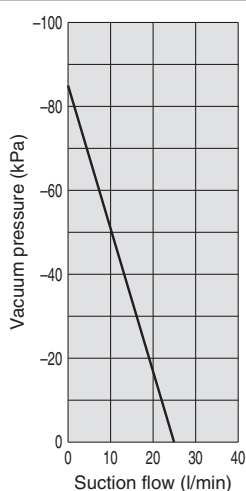
Ejector Unit/Standard Type (S): Max. Vacuum Pressure -84 kPa

At 0.45 MPa

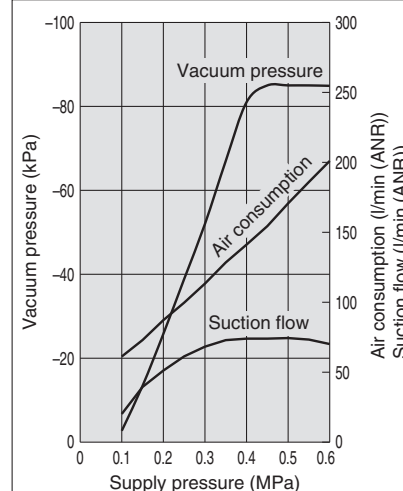
ZR1-W10S1 Exhaust characteristics



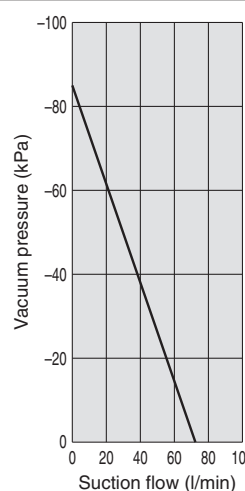
Flow rate characteristics



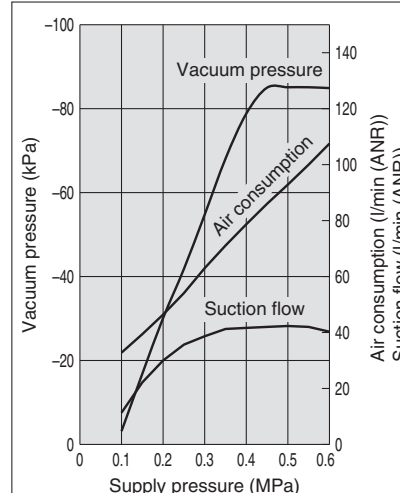
ZR1-W18S1 Exhaust characteristics



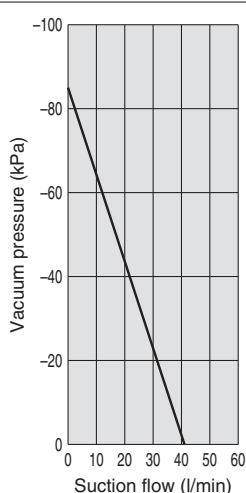
Flow rate characteristics



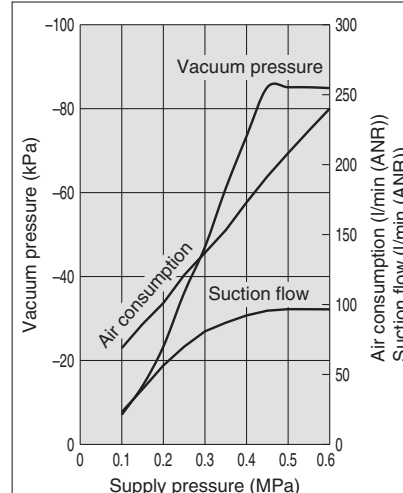
ZR1-W13S1 Exhaust characteristics



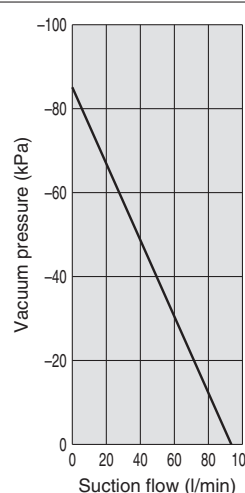
Flow rate characteristics



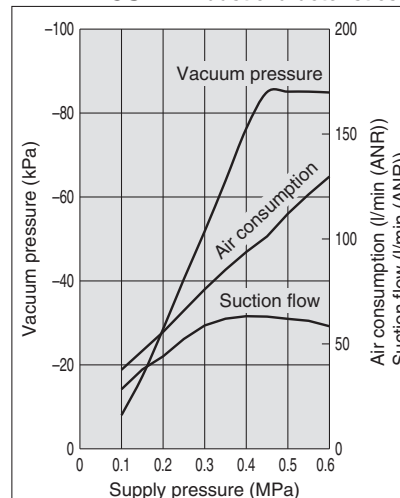
ZR1-W20S1 Exhaust characteristics



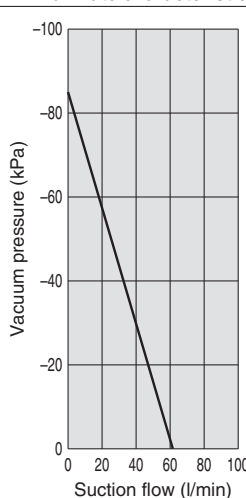
Flow rate characteristics



ZR1-W15S1 Exhaust characteristics



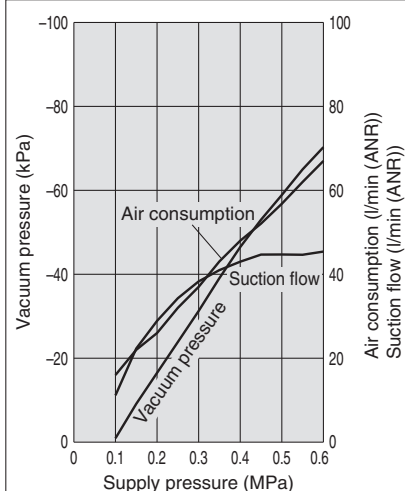
Flow rate characteristics



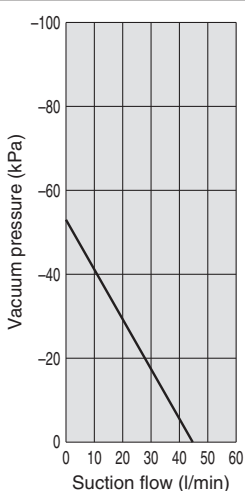
Ejector Unit/Large Flow Type (L): Max. Vacuum Pressure -53 kPa

At 0.45 MPa

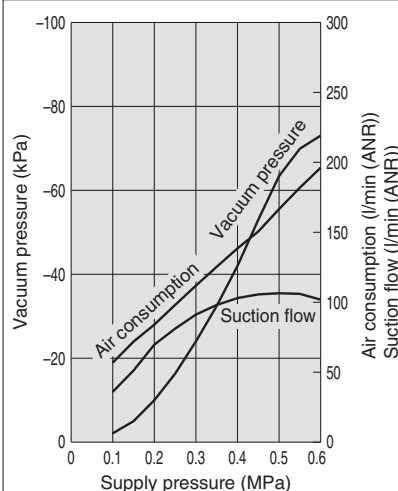
ZR1-W10L1 Exhaust characteristics



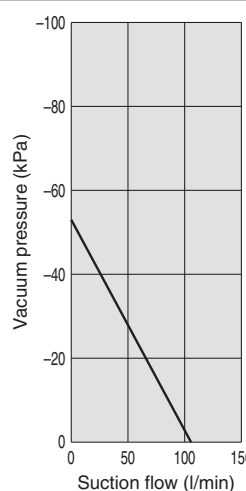
Flow rate characteristics



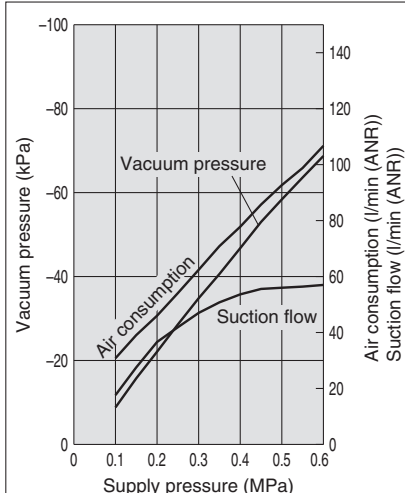
ZR1-W18L1 Exhaust characteristics



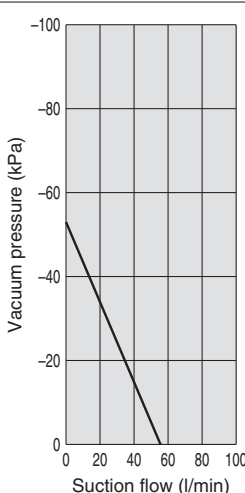
Flow rate characteristics



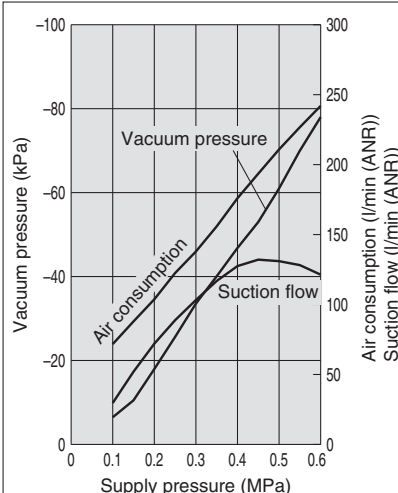
ZR1-W13L1 Exhaust characteristics



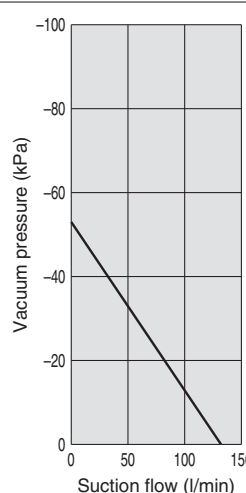
Flow rate characteristics



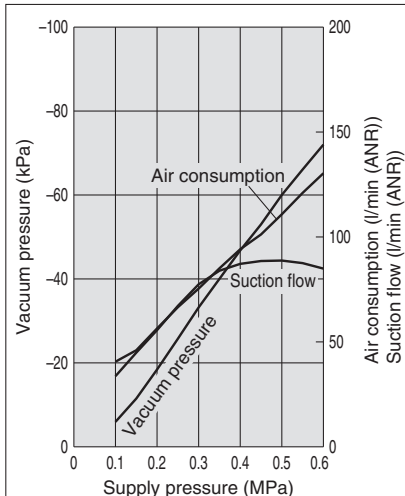
ZR1-W20L1 Exhaust characteristics



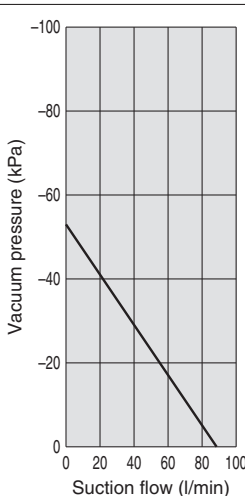
Flow rate characteristics



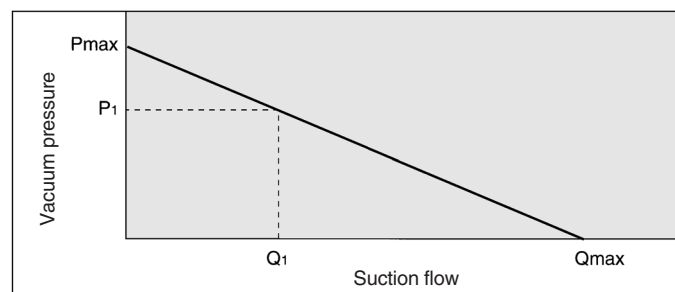
ZR1-W15L1 Exhaust characteristics



Flow rate characteristics



How to Read Flow Rate Characteristics Graph



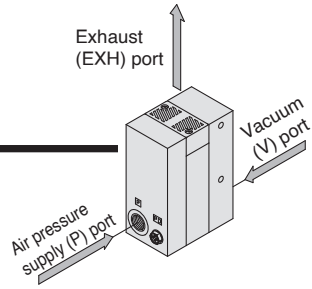
Flow rate characteristics are expressed in ejector vacuum pressure and suction flow. If suction flow rate changes, the vacuum pressure will also be changed. Normally this relationship is expressed in ejector standard use. In graph, Pmax is max. vacuum pressure and Qmax is maximum suction flow. The values are specified according to catalogue 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 (Pmax).
2. When suction port is opened gradually, air can flow through, (air leakage), suction flow increases, but vacuum pressure decreases. (condition P1 and Q1)
3. When suction port is opened further, suction flow moves to maximum value (Qmax), 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.

ZR Series

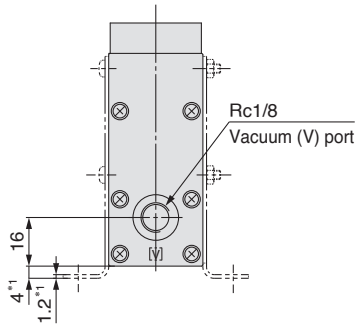
Ejector Unit



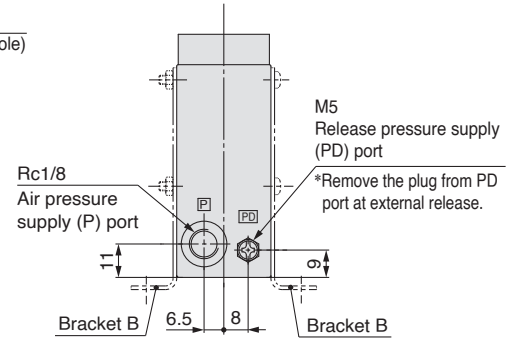
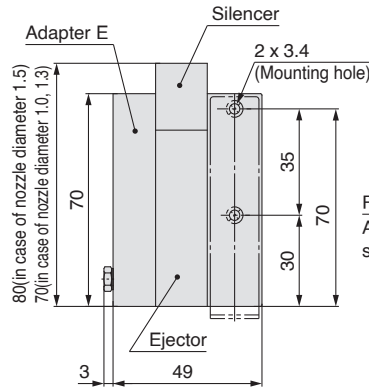
Nozzle Dia./ \varnothing 1.0, \varnothing 1.3, \varnothing 1.5, \varnothing 1.8, \varnothing 2.0

Nozzle dia./ \varnothing 1.0, \varnothing 1.3, \varnothing 1.5

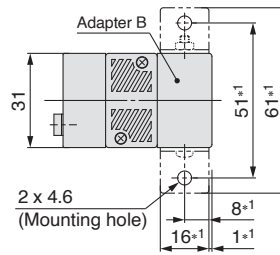
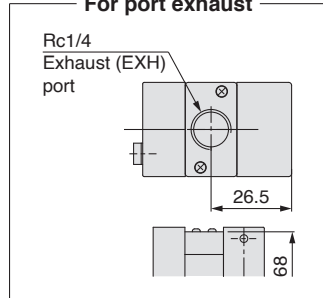
ZR1-W¹⁰
13 15



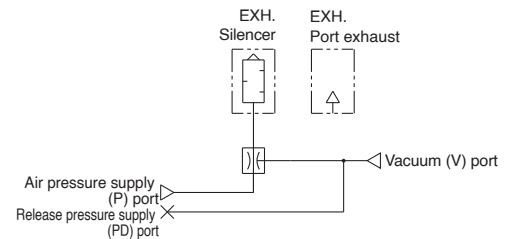
Note) Dimensions marked with “*1” are those after the bracket B is mounted.
Bracket B part no.: ZR1-OB (Standard accessory)



For port exhaust

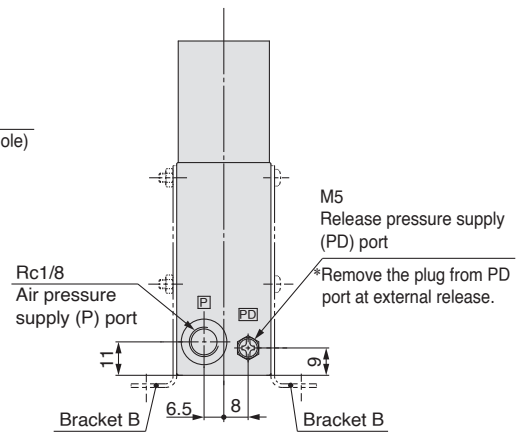
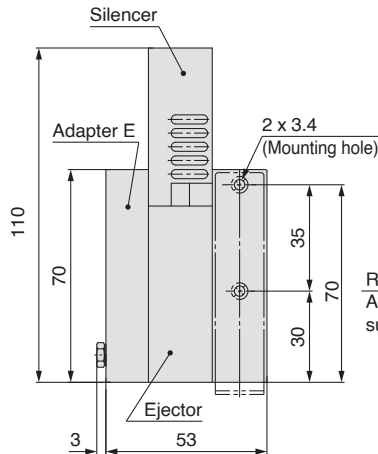
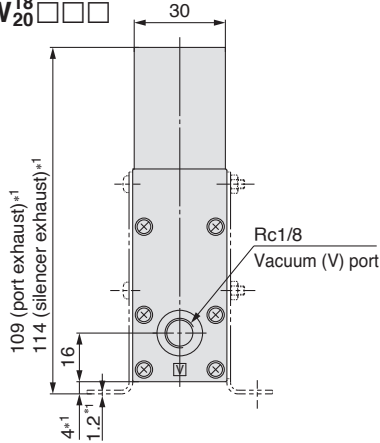


Circuit diagram

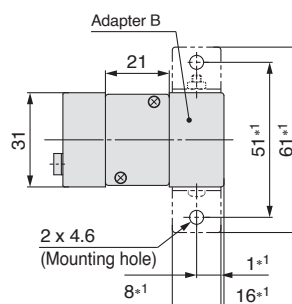
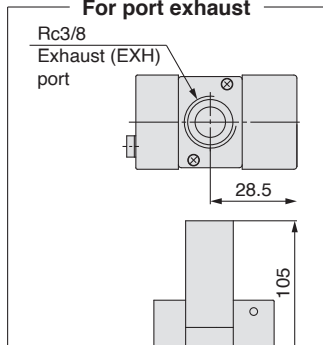


Nozzle dia./ \varnothing 1.8, \varnothing 2.0

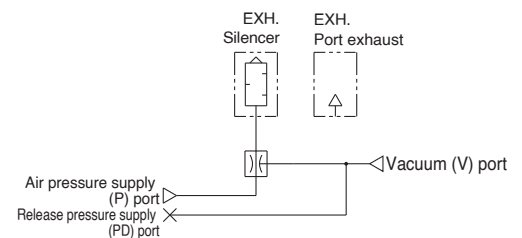
ZR1-W¹⁸
20



For port exhaust



Circuit diagram



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

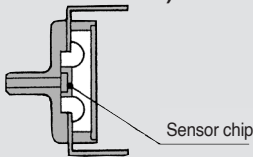
Quick response: 10 ms

Compact size: 39H x 20W x 15D
(except the connecting portion)

Improved wiring: Connector style

Uses a carrier diffusion
semiconductor pressure sensor

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



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 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.

How to Order

ZSE2 - 0R - 15 L

Output specifications

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

Piping specifications

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

With Connector/How to Order

- Without lead wire (housing and 3 sockets) ZS-10-A
- With lead wire ZS-10-5A-□

Lead wire length

—	0.6 m
30	3 m
50	5 m

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

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

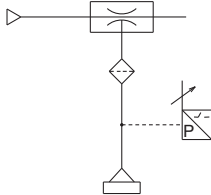
* Refer to catalogue on www.smc.eu for detailed specifications of pressure switches for vacuum.

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

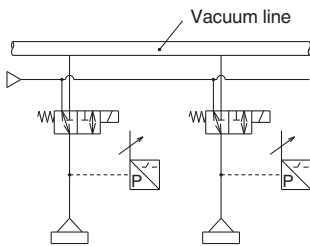
Guidelines for Use of Pressure Switch Unit for Vacuum

System circuit for work adsorption

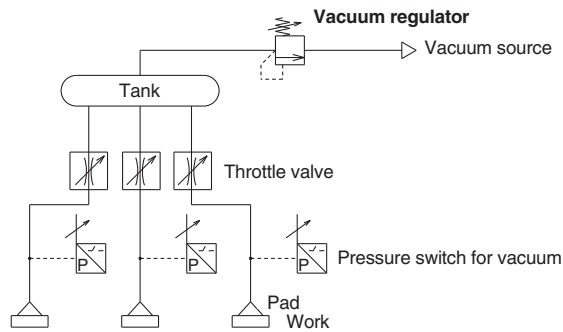
Ejector style



Vacuum pump style



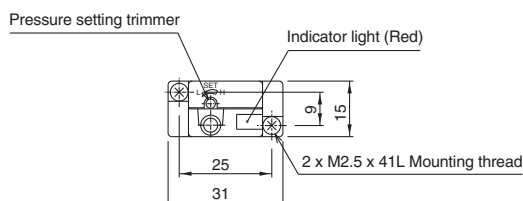
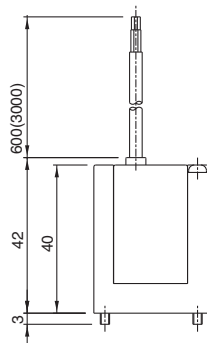
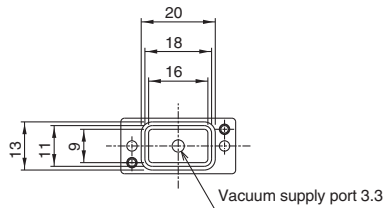
When pads and switches are common to one vacuum source, sometimes there is a possibility, depending on the number of adsorption and non-adsorption applications at each point in time, that the switches will not work within the range of set pressures due to pressure variations from the vacuum source. In 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.



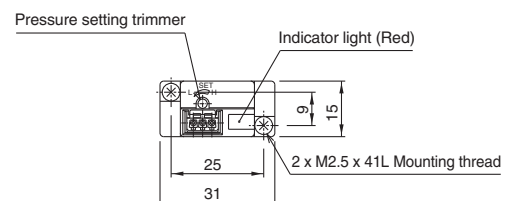
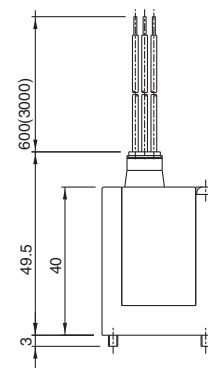
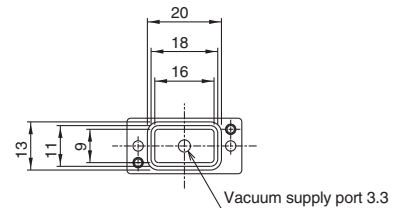
- Adjust the throttle valve to reduce the pressure fluctuation between absorption and non-absorption.
- Stabilise the source pressure by providing a tank and a vacuum regulator.
- If a vacuum switch valve is inserted into individual lines and false absorption occurs, each valve should be turned OFF to minimise the influences on other pads.

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

ZSE2-0R-□
ZSE2-0R-□L

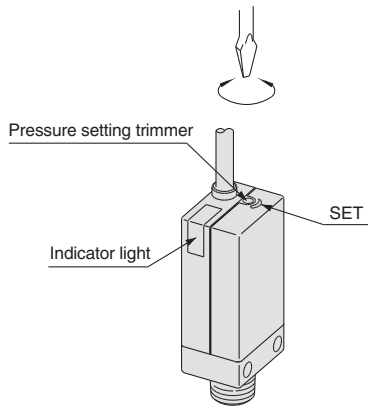


ZSE2-0R-□C
ZSE2-0R-□CL
ZSE2-0R-□CN

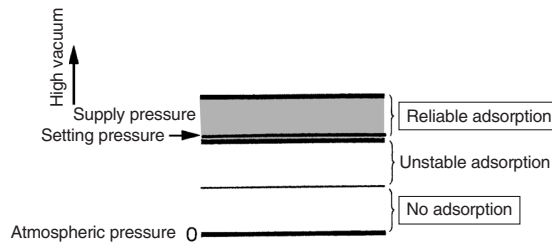


How to Set Vacuum Pressure

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

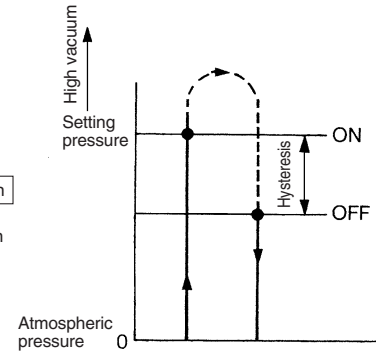


- When using the switch to confirm correct adsorption, the vacuum pressure is set to the minimum value to reliably absorb. If the value is set below the minimum, the switch will be turned ON even when adsorption has failed or is insufficient. If the pressure is set too high, the switch may not operate stably even though it may absorb correctly.



Hysteresis

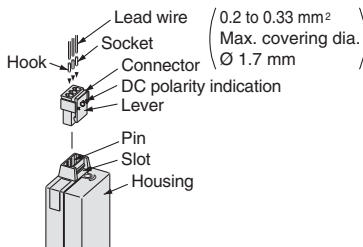
Hysteresis is the actual pressure variance from set pressure occurring when the output signal turns from ON to OFF. The set pressure is the pressure selected to switch from OFF to ON mode.



How to Use Connector

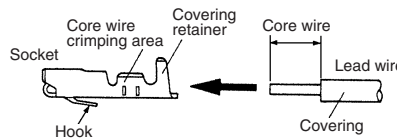
1. Attaching and detaching connectors

- 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. Crimping of lead wires and sockets

Strip 3.2 to 3.7 mm at the end of the lead wires, insert the ends of core wires evenly into the sockets, and then crimp with a crimping tool. When this is done, take care that the coverings of the lead wires do not enter the core wire crimping area. (Crimping tool: model no. DXT170-75-1)



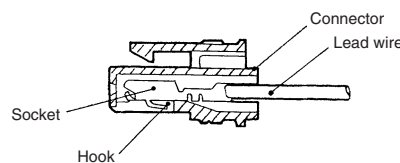
3. Attaching and detaching of socket to connector with lead wire

• Attaching

Insert the sockets into the square holes of the connector (with +, 1, 2, - indication), and continue to push the sockets all the way end. (When they are pushed in their hooks open and they are locked automatically.) Then confirm that they are locked by pulling lightly on the lead wires.

• Detaching

To detach a socket from a connector, pull out the lead wire while pressing the socket's hook with a stick having a thin tip (about 1 mm). If the socket will be used again, first spread the hook outward.



⚠ Precautions

- Be sure to read before handling.
- Refer to cack page for Safety Instructions.

Mounting

⚠ Warning

- Do not give an excessive impact load.
Do not drop, bump or apply excessive impact (1000 m/s²) when handling. Even if the switch body is not damaged, the switch may suffer internal damage that will lead to malfunction.
- Hold the product from the body side when handling.
When raising and moving the product, do not raise it by holding the lead wire only, but hold the body. It may cause malfunction due to broken contacts.

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

How to Order

ZR1-ZSE30A-00-**N**-**M**□



Output specifications

Symbol	Output		Analogue output	
	Type	Point	Voltage	Current
N	NPN	1	—	—
P	PNP	1	—	—
A	NPN	2	—	—
B	PNP	2	—	—
C	NPN	1	○	—
D	NPN	1	—	○
E	PNP	1	○	—
F	PNP	1	—	○

Option 1 (Connector/Lead wire specifications)

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

Display unit

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

Note 1) Fixed unit: kPa

Specifications

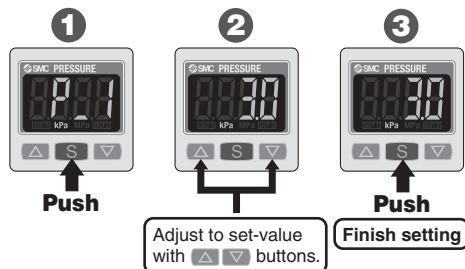
Rated pressure range		0.0 to −101.0 kPa	
Set pressure range		10.0 to −105.0 kPa	
Withstand pressure		500 kPa	
Minimum unit setting		0.1 kPa	
Applicable fluid		Air	
Power supply voltage		12 to 24 VDC ±10 % (with power supply polarity protection)	
Current consumption		40 mA (at no load)	
Switch output		NPN or PNP open collector 1 output NPN or PNP open collector 2 outputs (selectable)	
Hysteresis	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	±0.2 % F.S. ±1 digit	
Analogue output	Hysteresis mode	Variable (0 to variable)	
	Window comparator mode		
	Note 1) Voltage output	Output voltage (Rated pressure range)	1 to 5 V ±2.5 % F.S.
	Note 2) Current output	Linearity	±1% F.S. or less
		Output impedance	Approx. 1 kΩ
		Output current (Rated pressure range)	4 to 20 mA ±2.5 % F.S.
Linearity		±1 % F.S. or less	
	Load impedance	Maximum load impedance: Power supply voltage 12 V: 300 Ω, Power supply voltage 24 V: 600 Ω Minimum load impedance: 50 Ω	
Display		4-digit, 7-segment, 2-colour LCD (Red/Green) Sampling cycle: 5 times/sec	
Display accuracy		±2 % F.S. ±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: 0 to 50 °C, Stored: -10 to 60 °C (No freezing or condensation)	
	Operating humidity range	Operating/Stored: 35 to 85 % RH (No condensation)	
	Withstand voltage	1000 VAC for 1 minute between terminals and housing	
	Insulation resistance	50 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing	
Temperature characteristics		±2 % F.S. (Based on 25 °C)	
Lead wire		Oilproof heavy-duty vinyl cable, 3 cores Ø 3.5, 2 m 4 cores Conductor area: 0.15 mm ² (AWG26) Insulator O.D.: 1.0 mm	
Standards		CE Marking, UL/CSA, RoHS compliance	

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

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

Note 3) If the applied pressure fluctuates around the set value, the hysteresis must be set to a value more than the fluctuating width, otherwise, chattering will occur.

3-step setting



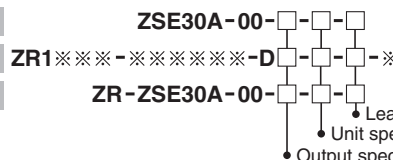
Power-saving function

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

*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 ZSE30A Series
Large size vacuum module ZR Series
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.smc.eu>).

Vacuum Pressure Switch Unit/Digital Pressure Switch for Vacuum:ZR1-ZSE20A-□-□-00-□

How to Order

Refer to the [Web Catalog](#) for details.

ZR1-ZSE20A-R-M-00-L

① ② ③



① Output specifications

X	NPN open collector 2 outputs + Copy function
Y	PNP open collector 2 outputs + Copy function
R	NPN open collector 2 outputs + Analog voltage output <small>Note 1)</small>
S	NPN open collector 2 outputs + Analog current output <small>Note 1)</small>
T	PNP open collector 2 outputs + Analog voltage output <small>Note 1)</small>
V	PNP open collector 2 outputs + Analog current output <small>Note 1)</small>

Note 1) Can be switched to auto-shift or copy function

② Display unit

-	With unit display switching function
M	Fixed SI unit
P	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

③ Option (Connector/Lead wire specifications)

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

Note) This product is not interchangeable with the existing product (lead wire with connector for the ZSE30A).

When using the lead wire with a connector for the ZSE30A to connect the ZSE20A, use the conversion cable. (Refer to page 680-1.)

Specifications

Model		ZSE20A (Vacuum pressure)
Applicable fluid		Air, Non-corrosive gas, Non-flammable gas
Pressure	Rated pressure range	0.0 to -101.0 kPa
	Display/Set pressure range	10.0 to -105.0 kPa
	Display/Smallest settable increment	0.1 kPa
	Withstand pressure	500 kPa
Power supply	Power supply voltage	12 to 24 VDC $\pm 10\%$, Ripple (p-p) 10% or less
	Current consumption	35 mA or less
	Protection	Polarity protection
Accuracy	Display accuracy	$\pm 2\%$ F.S. ± 1 digit (Ambient temperature of 25 $\pm 3^\circ\text{C}$)
	Repeatability	$\pm 0.2\%$ F.S. ± 1 digit
	Analog output accuracy	$\pm 2.5\%$ F.S. (Ambient temperature of 25 $\pm 3^\circ\text{C}$)
	Analog output linearity	$\pm 1\%$ F.S.
	Temperature characteristics	$\pm 2\%$ F.S. (25 $^\circ\text{C}$ standard)
Switch output	Output type	NPN or PNP open collector 2 outputs
	Output mode	Hysteresis mode, Window comparator mode, Error output, Output OFF
	Switch operation	Normal output, Reversed output
	Max. load current	80 mA
	Max. applied voltage (NPN only)	28 V
	Internal voltage drop (Residual voltage)	1 V or less (at load current of 80 mA)
	Delay time*1	1.5 ms or less (with anti-chattering function: 20, 100, 500, 1000, 2000, 5000 ms)
	Hysteresis	Hysteresis mode Window comparator mode
		Variable from 0*2
	Short circuit protection	Yes
Analog output	Voltage output	Output type Voltage output: 1 to 5 V
		Output impedance Approx. 1 k Ω
	Current output	Output type Current output: 4 to 20 mA
	Load impedance	Maximum load impedance at power supply voltage of 12 V: 300 Ω at power supply voltage of 24 V: 600 Ω Minimum load impedance: 50 Ω
Auto-shift input	Input type	Non-voltage input: 0.4 V or less
	Input mode	Select from Auto-shift or Auto-shift zero.
	Input time	5 ms or more
Display	Unit*3	MPa, kPa, kgf/cm 2 , bar, psi, inHg, mmHg
	Display type	LCD
	Number of screens	3-screen display (Main screen, Sub screen x 2)
	Display color	1) Main screen: Red/Green 2) Sub screen: Orange
	Number of display digits	1) Main screen: 4 digits (7 segments) 2) Sub screen: 4 digits (Upper 1 digit 11 segments, 7 segments for other)
	Indicator light	Lights up when switch output is turned ON. OUT1, OUT2: Orange
Digital filter*4		0, 10, 50, 100, 500, 1000, 5000 ms
	Enclosure	IP40
	Withstand voltage	1000 VAC for 1 minute between terminals and housing
	Insulation resistance	50 M Ω or more (500 VDC measured via megohmmeter) between terminals and housing
	Operating temperature range	Operating: -5 to 50 $^\circ\text{C}$, Stored: -10 to 60 $^\circ\text{C}$ (No condensation or freezing)
	Operating humidity range	Operating/Stored: 35 to 85% RH (No condensation)
Standards		CE/UKCA marking
Length of lead wire with connector		2 m

*1 Value without digital filter (at 0 ms)

*2 If the applied pressure fluctuates around the set value, the hysteresis must be set to a value greater than the amount of fluctuation, or chattering will occur.

*3 Setting is only possible for models with the units selection function. Only MPa or kPa is available for models without this function.

*4 The response time indicates when the set value is 90% in relation to the step input.

* Products with tiny scratches, marks, or display color or brightness variations which do not affect the performance of the product are verified as conforming products.

*The vacuum pressure switch mounted on this product is equivalent to our SMC product, the ZSE20A series compact digital pressure switch.

● Pressure switch correspondence table

Large size vacuum module ZR series

ZR1***-***-D

Vacuum pressure switch (For ZR)

ZR1-ZSE20A-□-□-00-□

Output specifications

Unit specifications

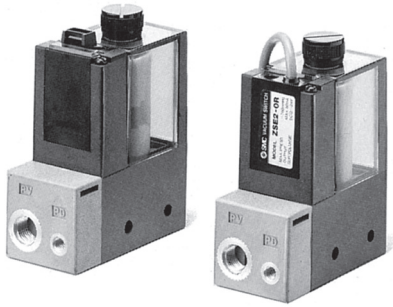
For details about vacuum pressure switch functions, refer to the ZSE20A series in the Web Catalog.

Lead wire specifications

This page contains information about the ZSE30A, which is to be discontinued.
Refer to the operation manual for details on the new product with a built-in ZSE20A.

Pressure Switch for Vacuum + 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.



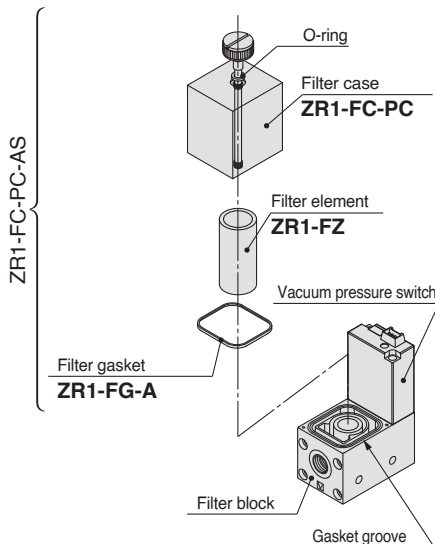
Filter case

⚠ Caution

- 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.
- 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.



Specification

Unit no.		ZR1-F□□□□-□
Suction filter	Rated pressure range/Set pressure range	-100 to 100 kPa
	Proof pressure	500 kPa
	Operating temperature range	5 to 50 °C
	Filtration degree	30 μm
Filtration material		PVF
Pressure switch for vacuum		Refer to pages 14 and 17 regarding pressure switch for vacuum.
Standard option		Bracket A (ZR1-OBA)

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

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

How to Order

ZR1 - 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) Fixed unit: kPa

Pressure switch for vacuum (ZSE2) specifications (E)

—	No setting
---	------------

Filter specifications (F)

—	No setting
---	------------

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 + Analogue voltage output
D	NPN open collector 1 output + Analogue current output
E	PNP open collector 1 output + Analogue voltage output
F	PNP open collector 1 output + Analogue 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

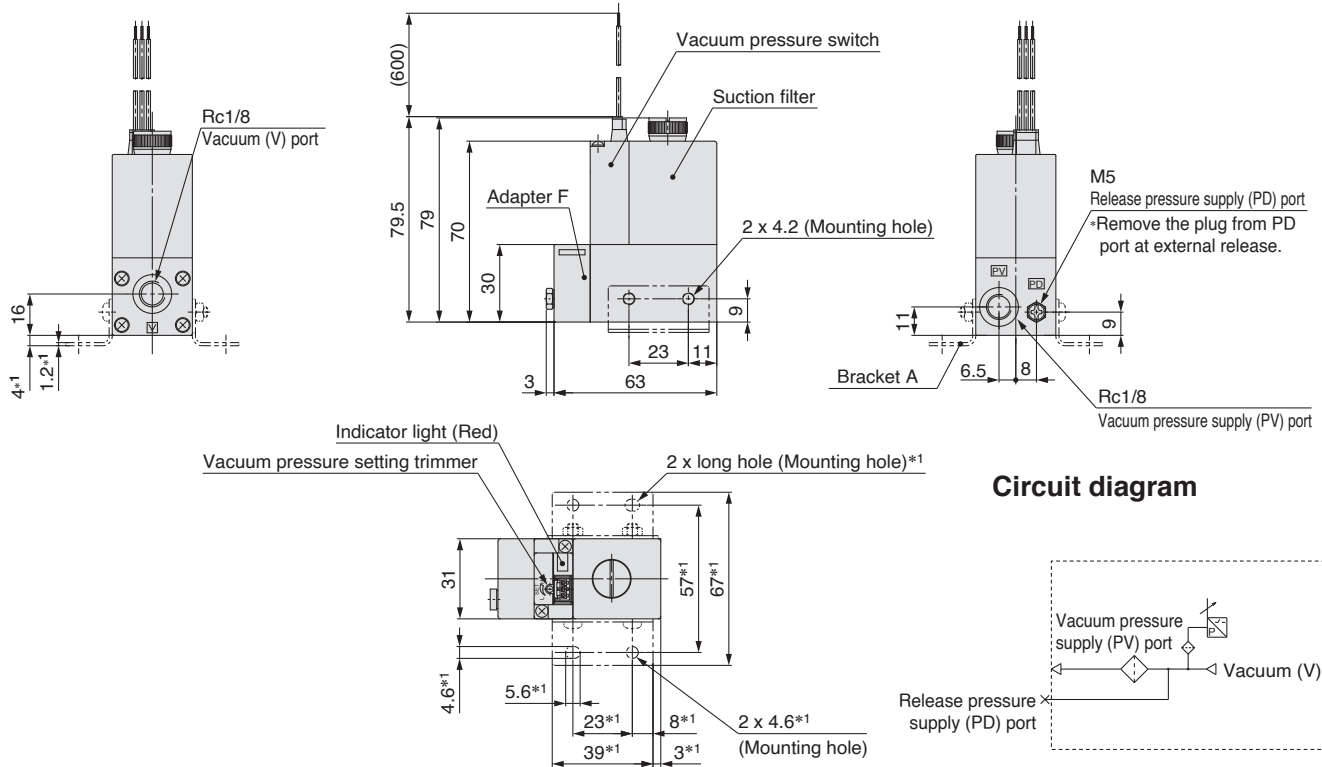
Lead wire core

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)

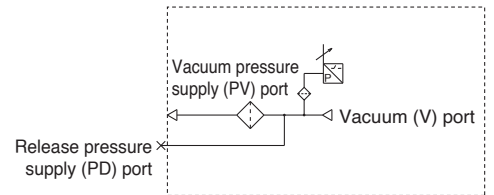
Pressure Switch for Vacuum + Suction Filter Unit: ZR1-F□□□□

Dimensions: ZR1-F□□□□

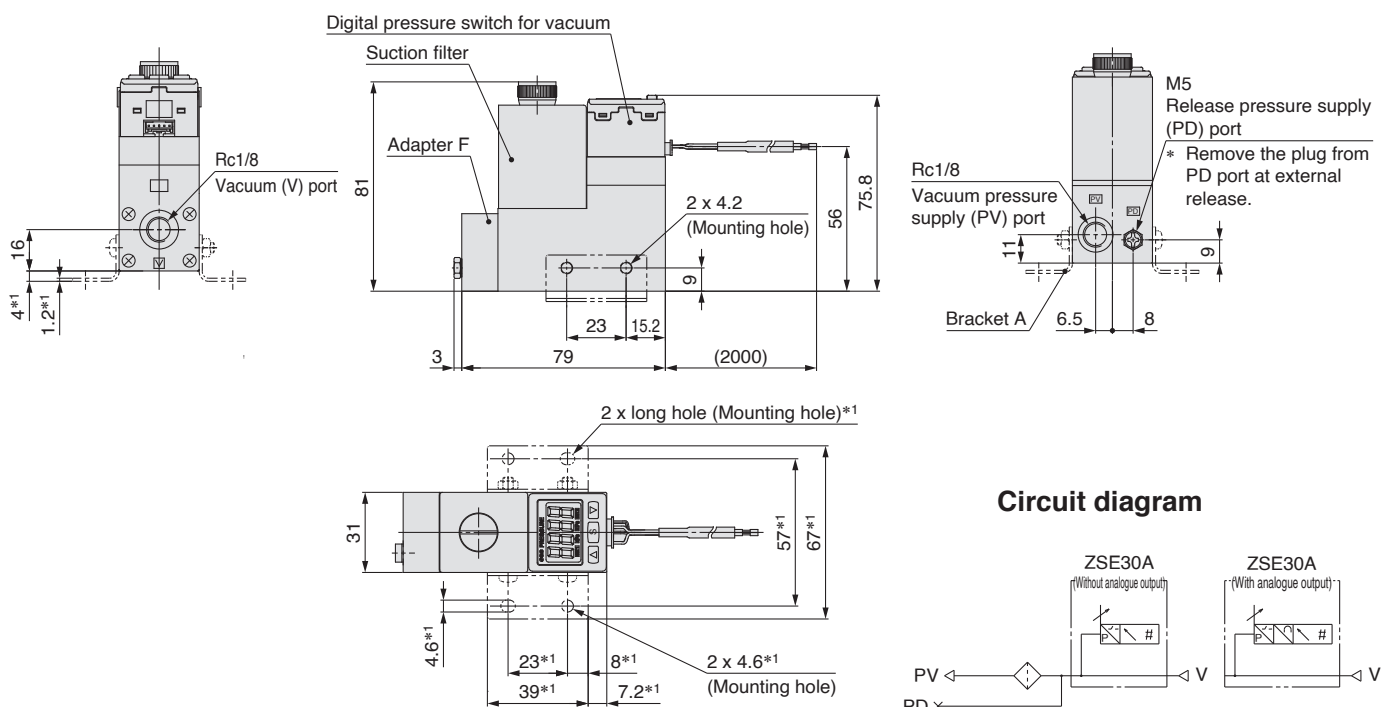
ZR1-FE□□□□



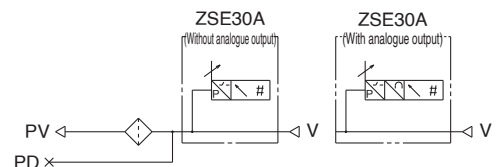
Circuit diagram



ZR1-FD□□□□



Circuit diagram



Note) Dimensions marked with "*1" are those after the bracket A is mounted.
Bracket A part no.: ZR1-OBA (Standard accessory)

Suction Filter: ZR1-FX-□

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



Specification

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

How to Order

ZR1-FX-□

• Bracket C

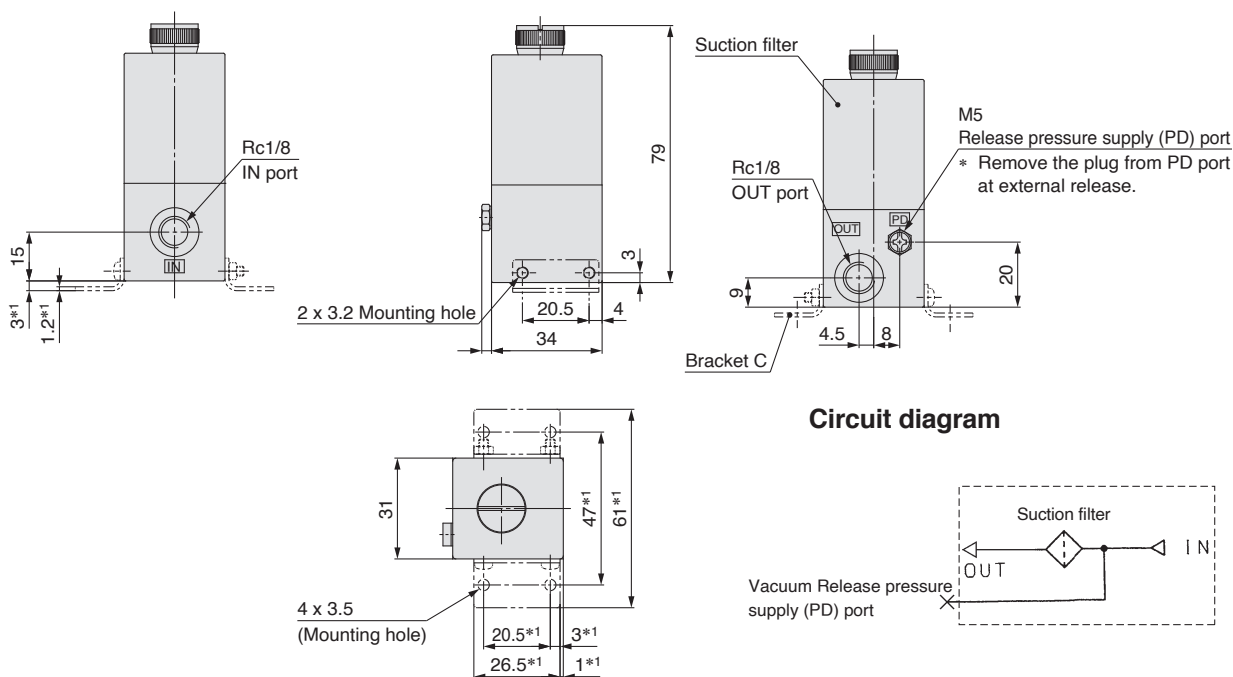
—	With bracket C
N	Without bracket C

Filter case

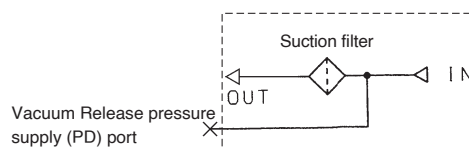
⚠ Caution

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, water soluble cutting oil (alkaline), etc.
2. Do not expose it to direct sunlight.

Dimensions: ZR1-FX-□



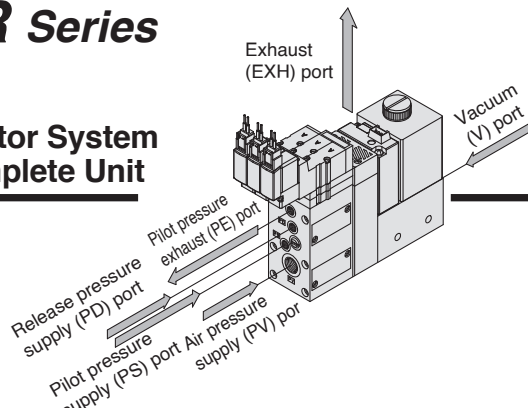
Circuit diagram



Note) Dimensions marked with “*1” are those after the bracket C is mounted.
Bracket C part no.: ZR1-OBC (Standard accessory)

ZR Series

Ejector System Complete Unit



This page contains information about the ZSE30A, which is to be discontinued. Refer to the operation manual for details on the new product with a built-in ZSE20A.

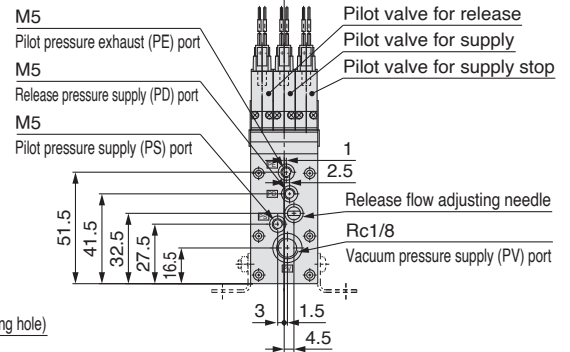
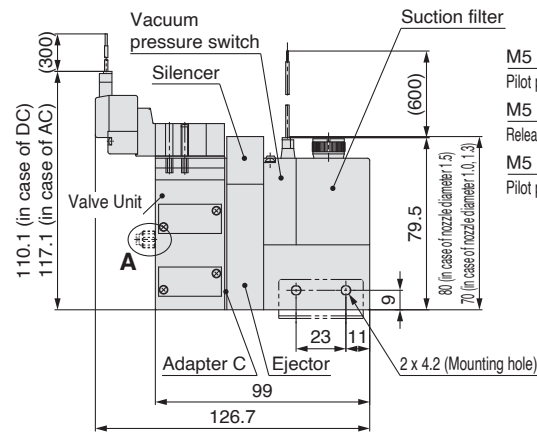
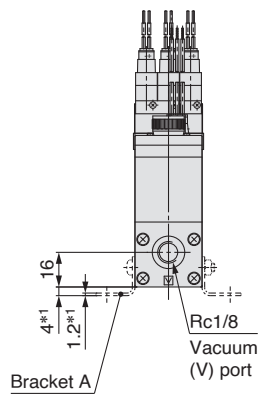
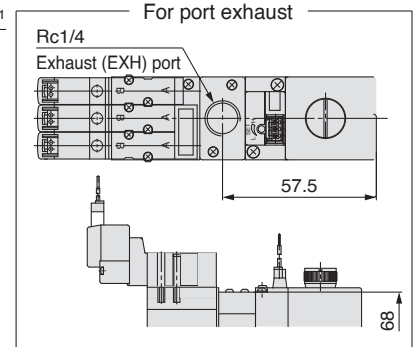
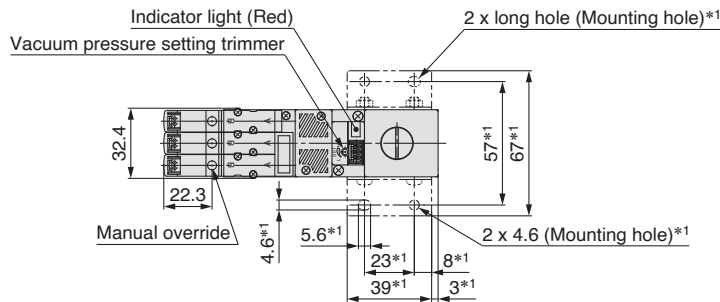
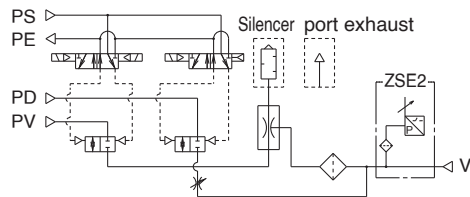
<Components> Ejector + Valve + Pressure Switch for Vacuum + Filter

Nozzle dia./ \varnothing 1.0, \varnothing 1.3, \varnothing 1.5

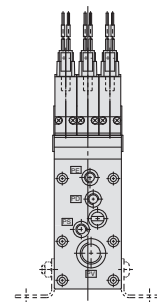
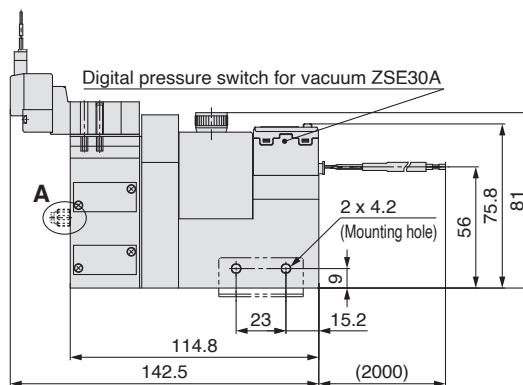
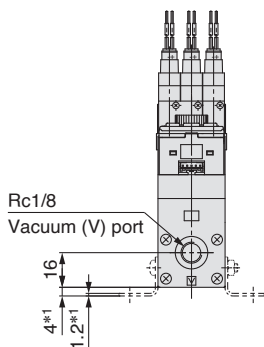
ZR1¹⁰₁₃¹⁵□1-K1□M□□-E□□-□

Circuit diagram

Pressure switch for vacuum (E)



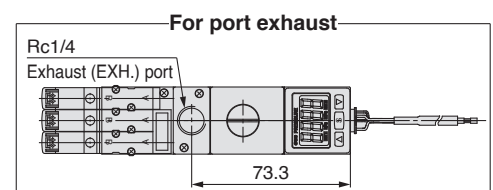
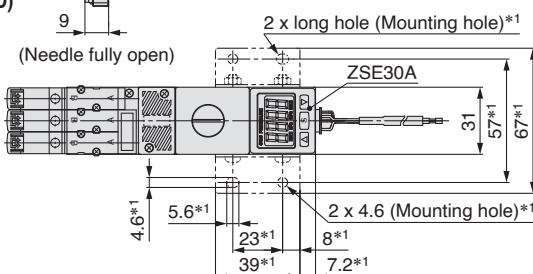
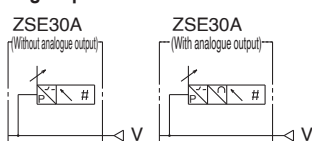
ZR1¹⁰₁₃¹⁵□-K1□M□□-D□□□-□



A: Release flow adjusting needle with lock nut

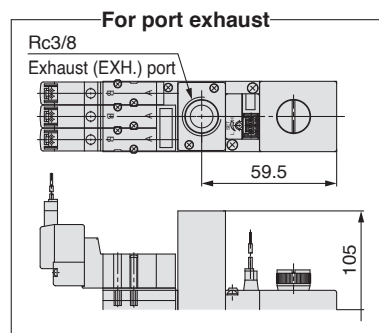
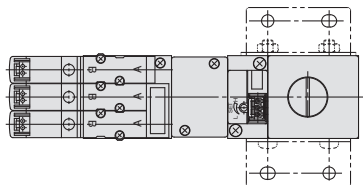
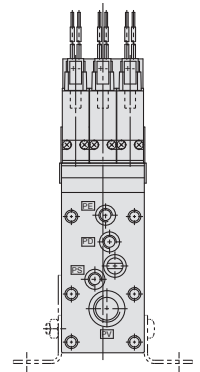
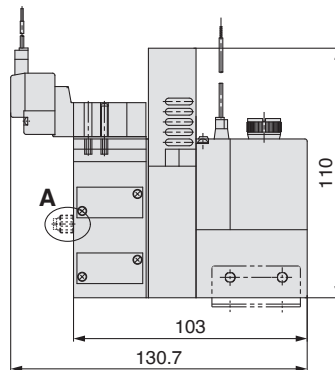
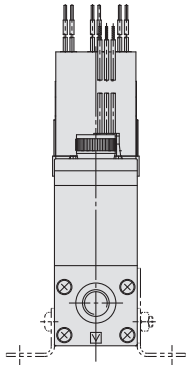
Circuit diagram

Digital pressure switch for vacuum (D)



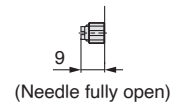
Nozzle dia./ \varnothing 1.8, \varnothing 2.0

ZR1¹⁸₂₀□1-K1□M□□-E□□-□



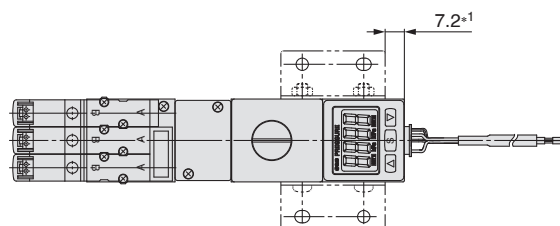
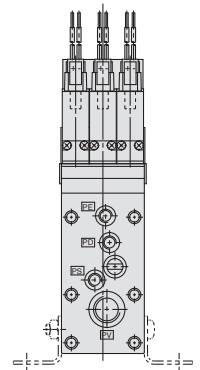
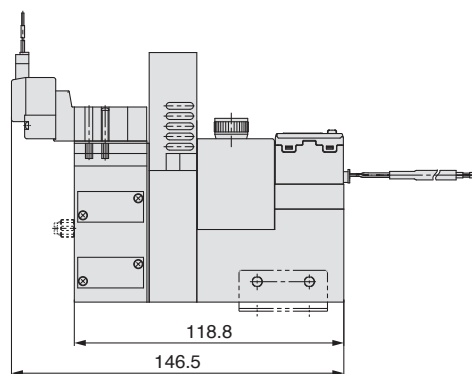
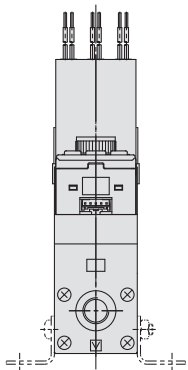
Note) Dimensions marked with “*1” are those after the bracket A is mounted.
Bracket A part no.: ZR1-0BA
(Standard accessory)

A: Release flow adjusting needle with lock nut

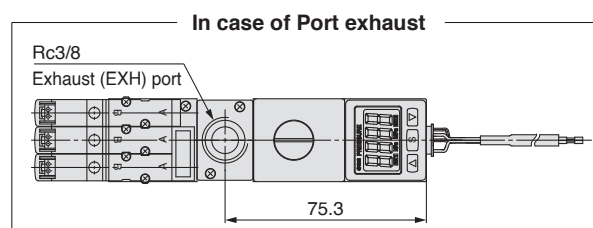
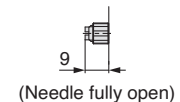


ZR1¹⁸₂₀□1-K1□M□□-D□□□-□

★ Dimensions not indicated are identical to the drawing on page 21.

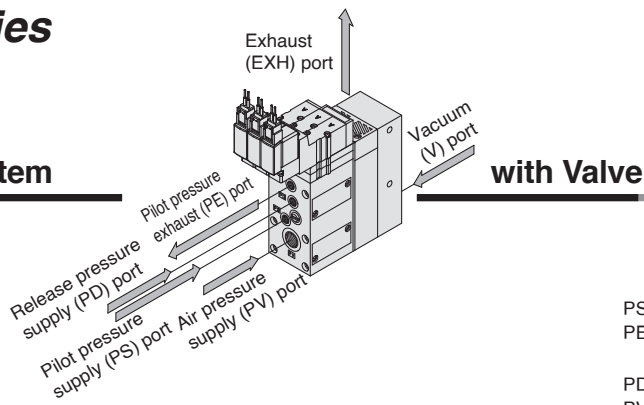


A: Release flow adjusting needle with lock nut



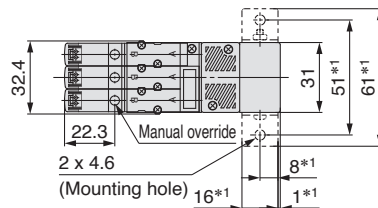
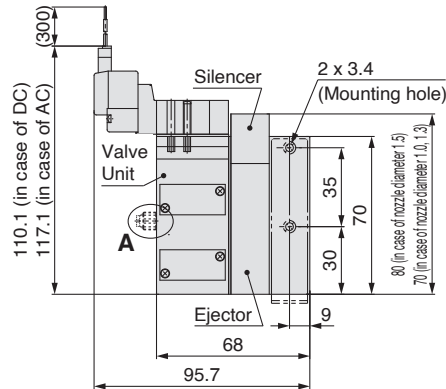
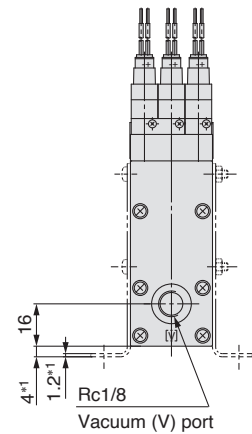
ZR Series

Ejector System



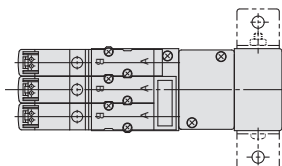
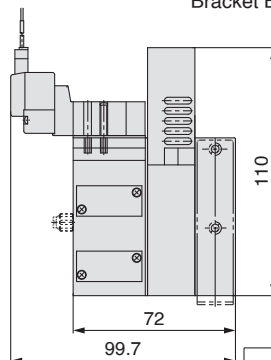
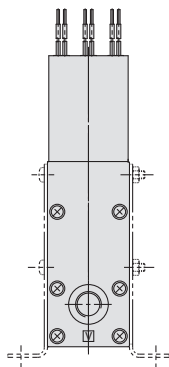
Nozzle dia./ \varnothing 1.0, \varnothing 1.3, \varnothing 1.5

ZR1¹⁰₁₃¹⁵ □1-K1 □M □□-□

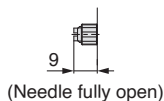


Nozzle dia./ \varnothing 1.8, \varnothing 2.0

ZR1¹⁸₂₀ □1-K1 □M □□-□

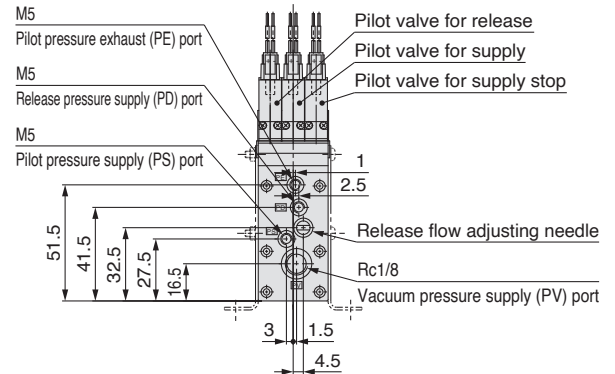
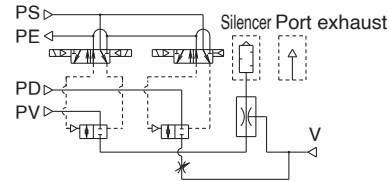


A: Release flow adjusting needle with lock nut

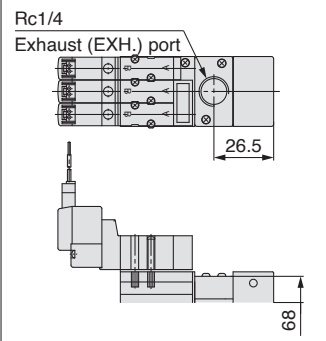


Note) Dimensions marked with “*1” are those after the bracket B is mounted.
Bracket B part no.: ZR1-OB B
(Standard accessory)

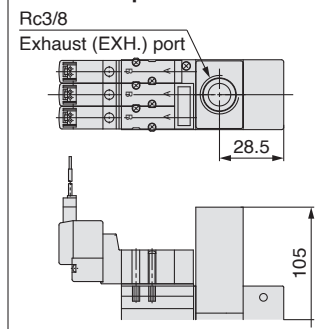
Circuit diagram



For port exhaust

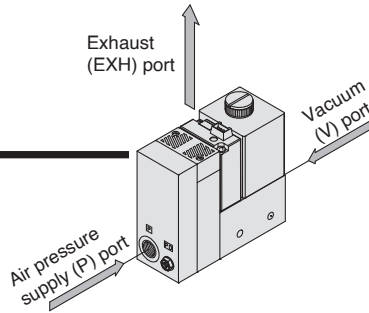


For port exhaust



★ Dimensions not indicated are identical to the top drawing.

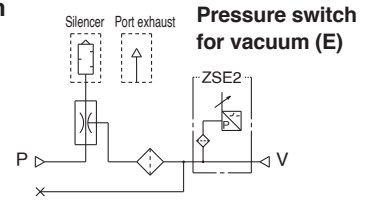
Ejector System



This page contains information about the ZSE30A, which is to be discontinued. Refer to the operation manual for details on the new product with a built-in ZSE20A.

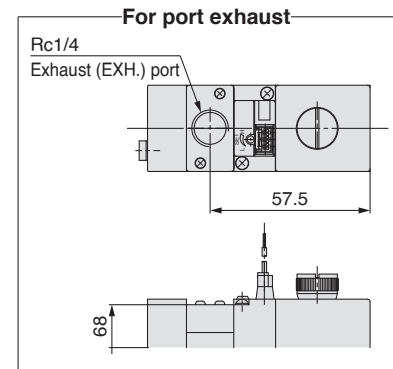
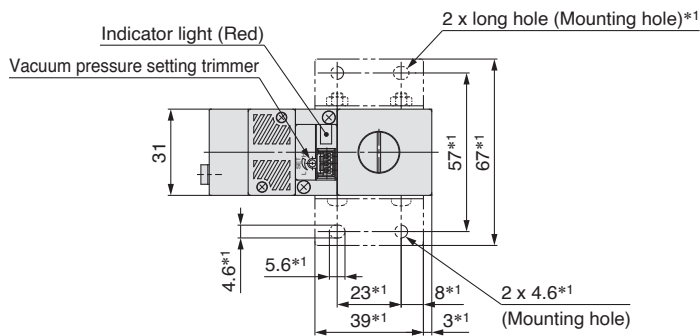
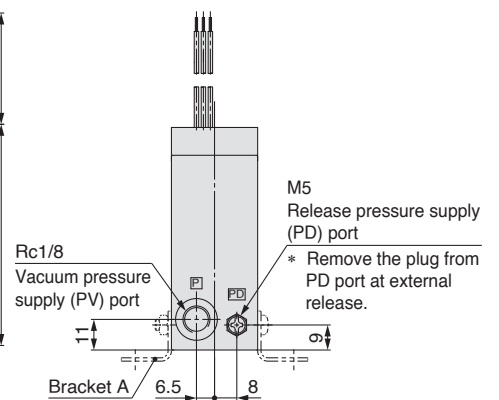
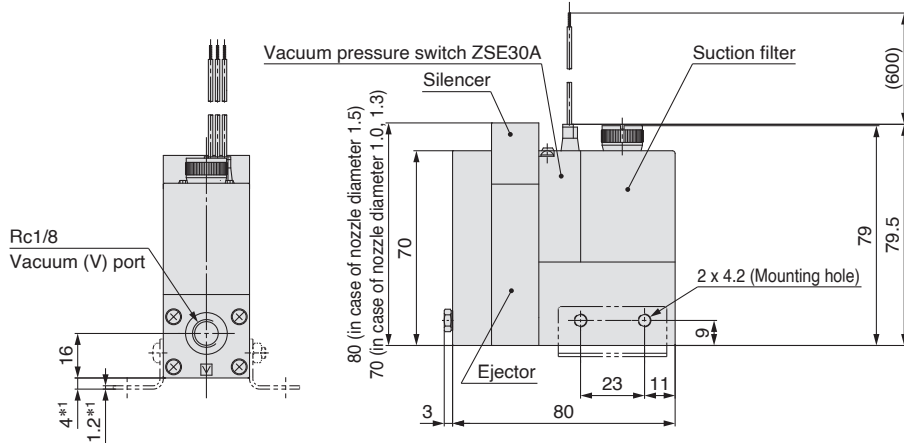
without Valve

Circuit diagram



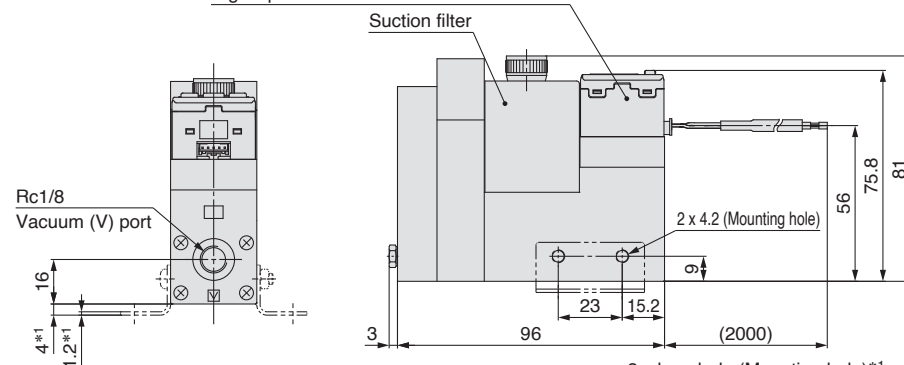
Nozzle dia./ \varnothing 1.0, \varnothing 1.3, \varnothing 1.5

ZR1¹⁰₁₃¹⁵ □1-E□□

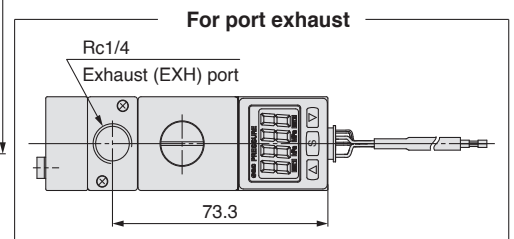
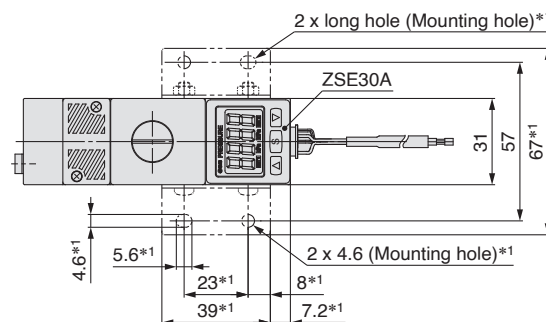
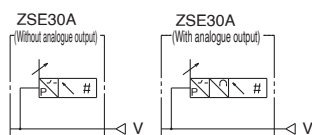


ZR1¹⁰₁₃¹⁵ □1-D□□□

Digital pressure switch for vacuum ZSE30A



Digital pressure switch for vacuum (D)



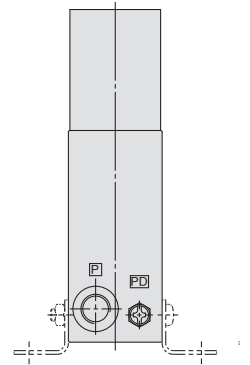
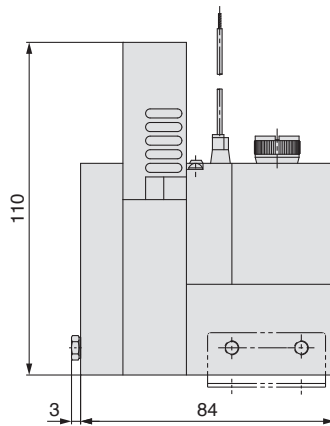
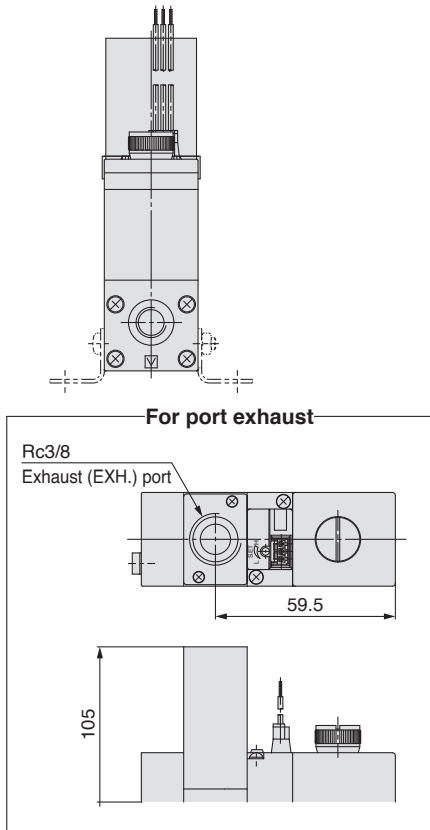
Large Size Vacuum Module: Ejector System **ZR Series**

This page contains information about the ZSE30A, which is to be discontinued.
Refer to the operation manual for details on the new product with a built-in ZSE20A.

Nozzle dia./ \varnothing 1.8, \varnothing 2.0

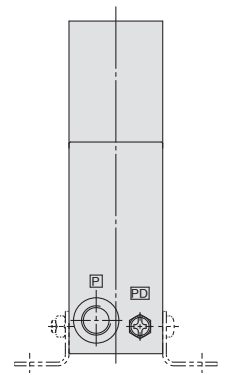
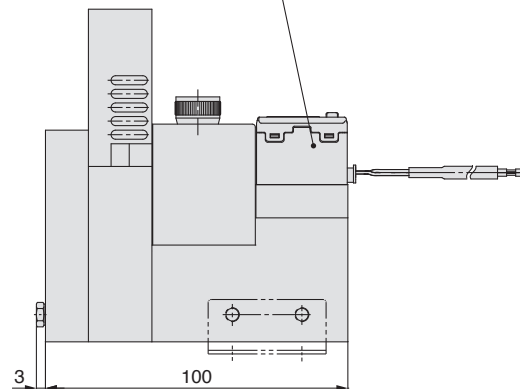
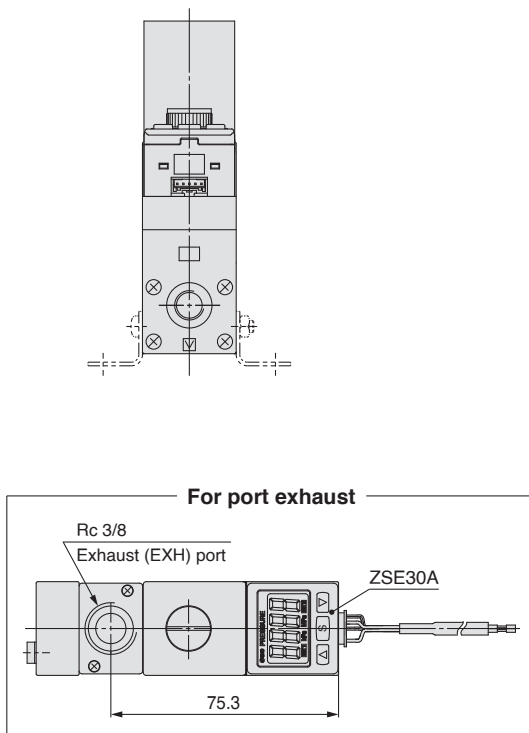
ZR1¹⁸₂₀□1-E□□

Note) Dimensions marked with “*1” are those
after the bracket A is mounted.
Bracket A part no.: ZR1-OBA
(Standard accessory)



ZR1¹⁸₂₀□1-D□□□

Digital pressure switch for vacuum ZSE30A



★ Dimensions not indicated are identical to the top drawing.

Ejector System/Manifold Specifications



Specifications

Max. number of units	Max. 6 stations
Port	Port size
Common air pressure supply (PV) port	1/8 (Rc, NPTF, G)
Common pilot pressure supply (PS) port	M5
Common release pressure supply (PD) port	M5
Common exhaust (EXH.) port	1/2 (Rc, NPTF, G)
Weight (Manifold bases only)	Basic mass for one station is 0.28 kg. Additional mass per one station is 0.12 kg.

- (1) When using 3 or more stations with ZR120□□ manifold, utilise PV port as supply port on both sides.
 (2) When using 3 or more stations with ZR120□ 3 manifold, utilise EXH port as exhaust port on both sides.

Manifold Air Supply

Manifold	Left			Right		
Supply port location	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 to R16	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 specifications of common and individual unit connecting ports for each unit is possible on manifolds 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

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)
 * 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

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.
 * When shipping only spacers, specify nothing.

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

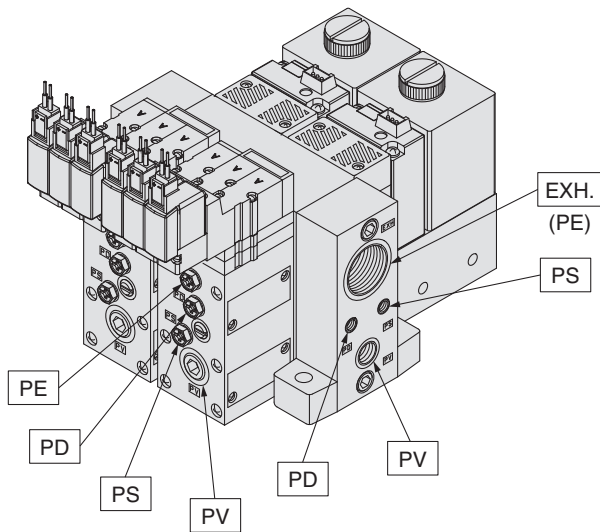
<Blanking plate>

ZR1 - BM1

Refer to Example 1).

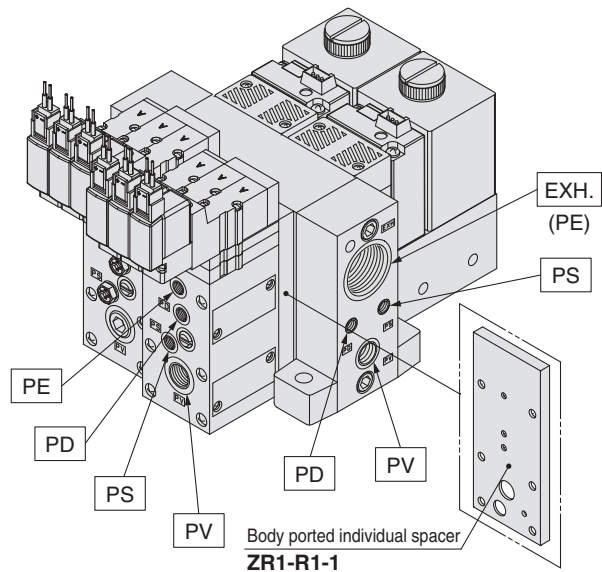
Manifold/System Circuit Example

When not using individual spacer



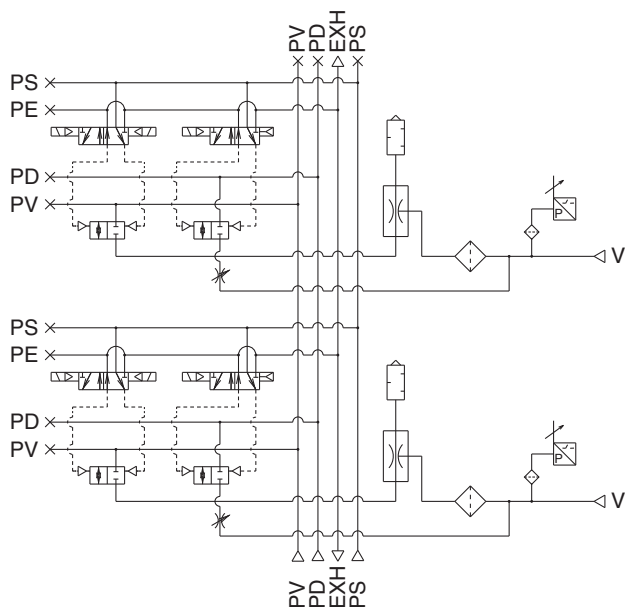
PV: Air pressure supply port
PS: Pilot pressure supply port
PD: Release pressure supply port
PE: Pilot pressure exhaust port
EXH.: Common exhaust port
V: Vacuum Port

When using individual spacer

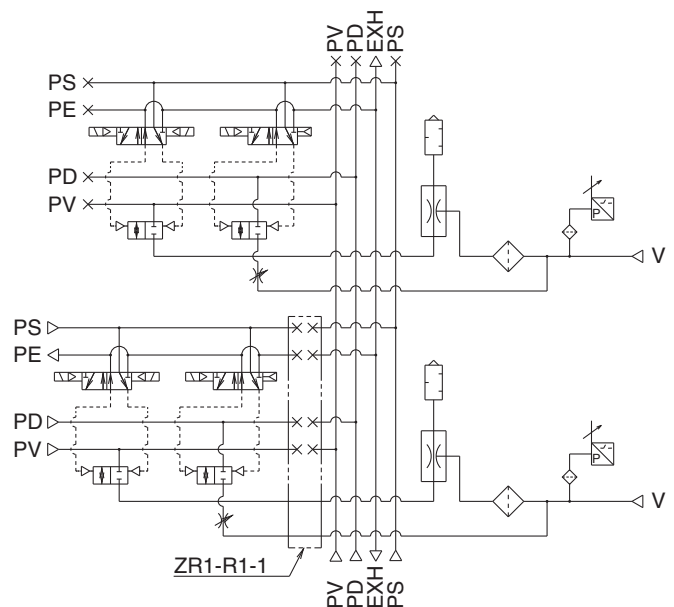


PV: Air pressure supply port
PS: Pilot pressure supply port
PD: Release pressure supply port
PE: Pilot pressure exhaust port
EXH.: Common exhaust port
V: Vacuum Port

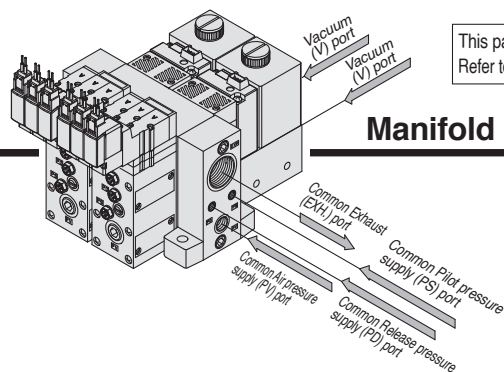
<System circuit example>



<System circuit example>

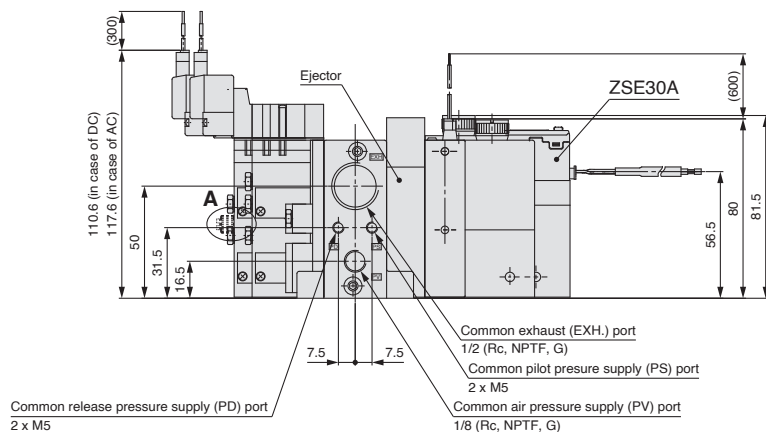
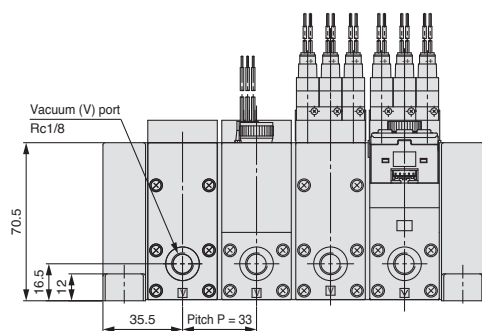


Ejector System

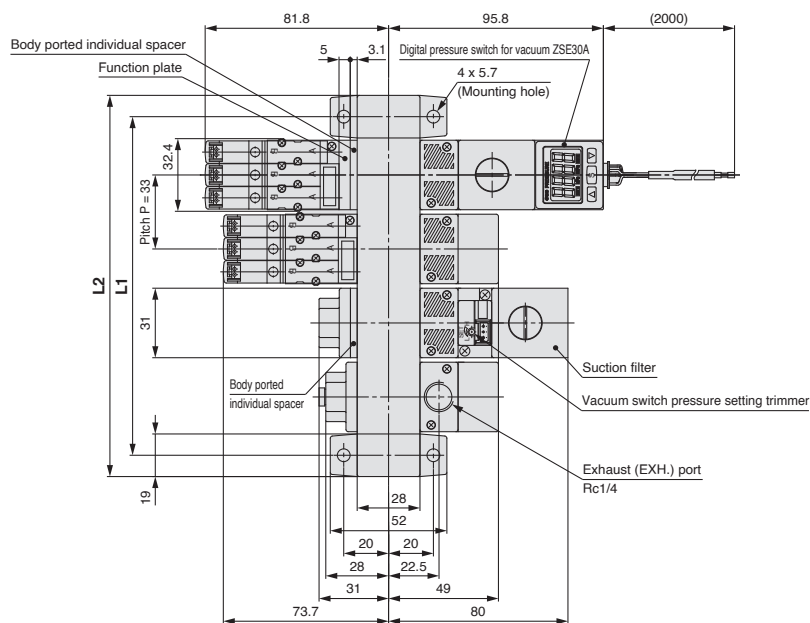
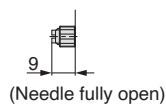


This page contains information about the ZSE30A, which is to be discontinued. Refer to the operation manual for details on the new product with a built-in ZSE20A.

Manifold Nozzle Dia./ Ø 1.0, Ø 1.3, Ø 1.5

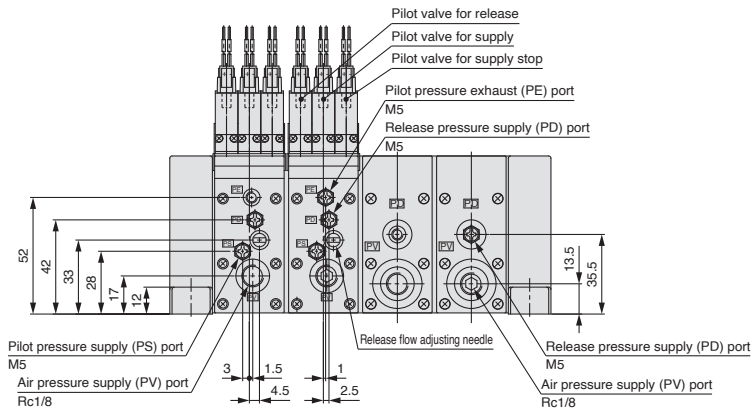


A: Release flow adjusting needle with lock nut

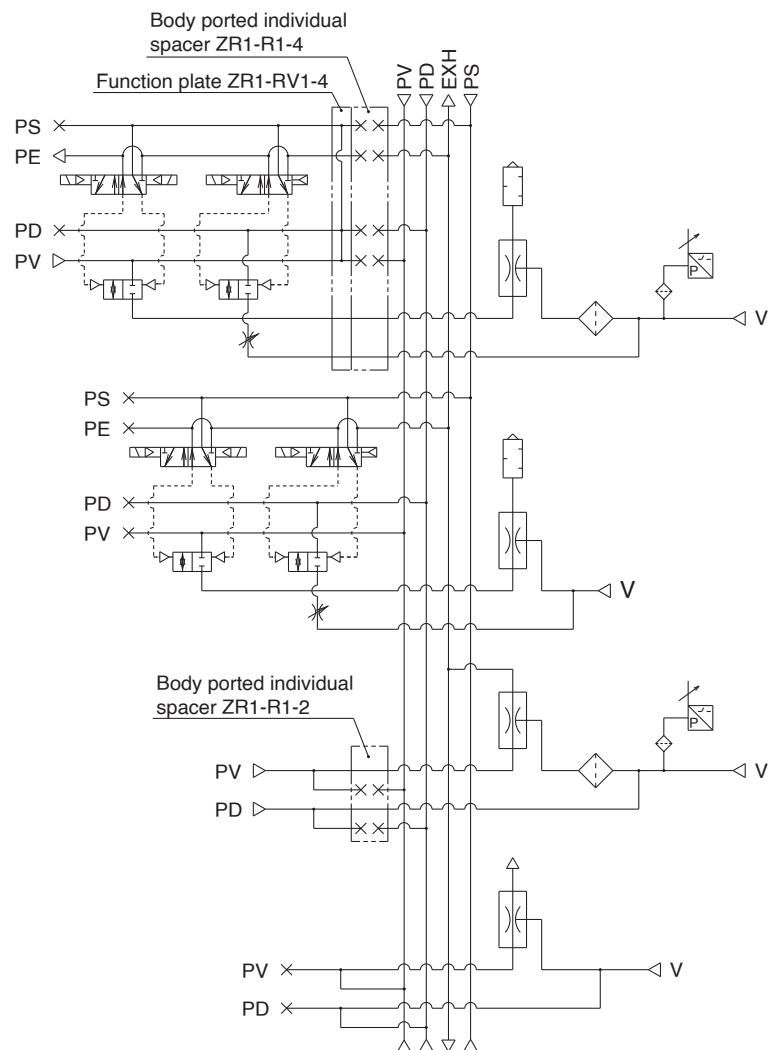


* The common exhaust (EXH.) port is also used as the pilot pressure exhaust (PE) port of the pilot valve. Use while the port is open to the atmosphere.

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

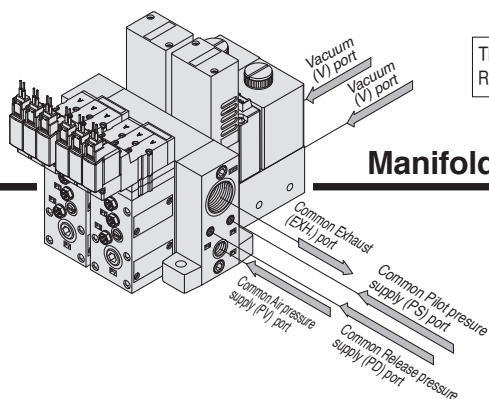


Circuit diagram



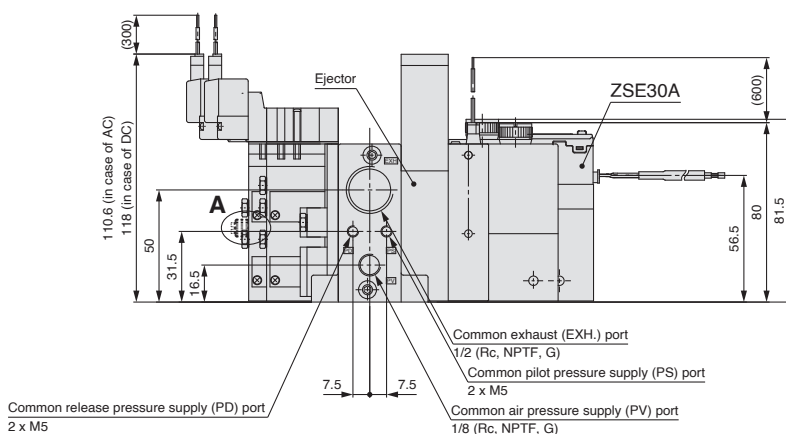
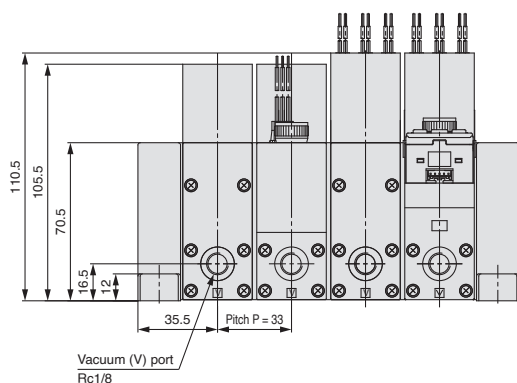
PV: Air pressure supply port
PS: Pilot pressure supply port
PD: Release pressure supply port
PE: Pilot pressure exhaust port
EXH.: Exhaust port
V: Vacuum Port

Ejector System

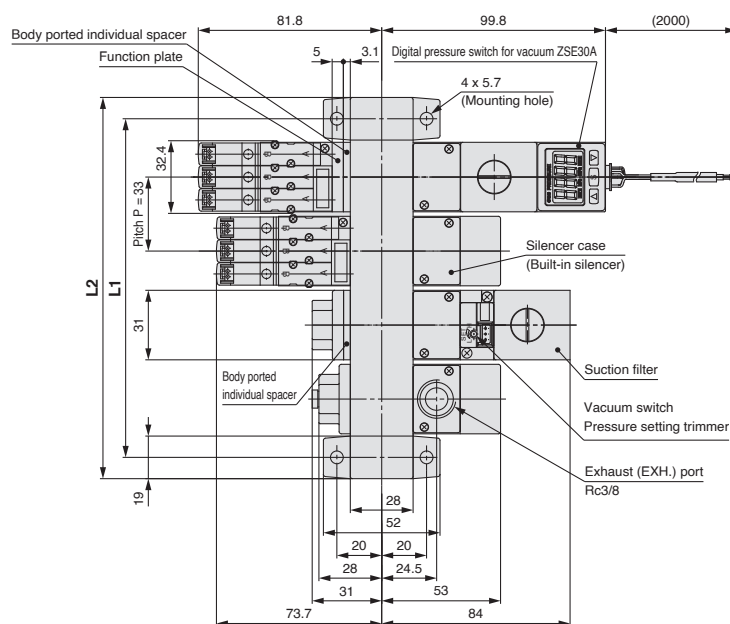
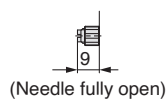


This page contains information about the ZSE30A, which is to be discontinued. Refer to the operation manual for details on the new product with a built-in ZSE20A.

Manifold Nozzle Dia./ Ø 1.8, Ø 2.0

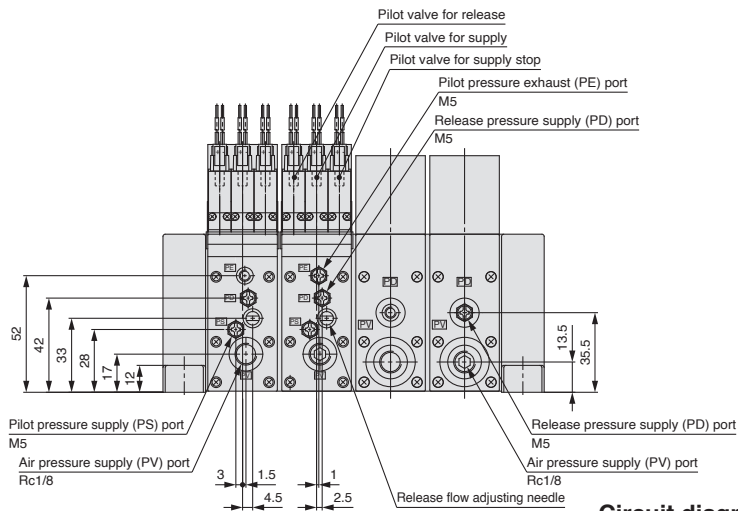


A: Release flow adjusting needle with lock nut

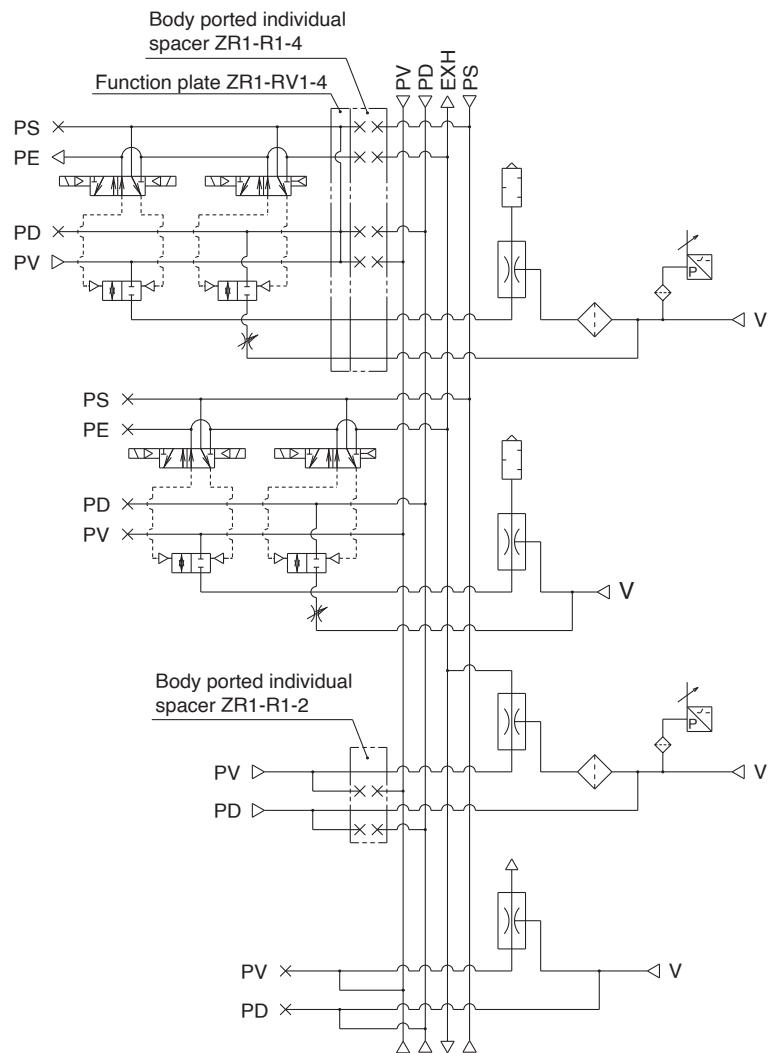


* 1 The common exhaust (EXH.) port is also used as the pilot pressure exhaust (PE) port of the pilot valve. Use while the port is open to the atmosphere.

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



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: Vacuum Pump System

ZR Series

Ejector + With Valve



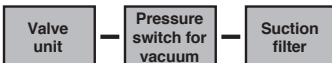
This page contains information about the ZSE30A, which is to be discontinued.
Refer to the operation manual for details on the new product with a built-in ZSE20A.

How to Order

Note for model selection

Take function plates into consideration.
(Refer to page 36.)

Components



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

Combination of vacuum valve and release valve

Refer to "Table (1)" in page 34 for details.

Solenoid valve rated voltage

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

Electrical entry

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

• Refer to "Table (2)" on page 34 for part no. of lead wire with connector.

Light/Surge voltage suppressor

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

* DC voltage: Be much careful about polarity, because it is incorrect at DC (surge voltage suppressor), diode or switching element may be damaged.

Manual override

—	Non-locking push type
B	Slotted locking type

Combination of switch/filter

D	Digital pressure switch for vacuum (ZSE30A) + Filter
E	Pressure switch for vacuum (ZSE2) + Filter
F	Filter

Option/Shipped separately

	Release flow adjusting needle with lock nut	Bracket (Included)
—	None	●
L	●	●
M	●	None
N	None	None

Shipped with the manifold assembly

	Release flow adjusting needle with lock nut
—	None
L	●

Note) Brackets are not shipped together with the manifold assembly.

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 34 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 34 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 + Analogue voltage output
D	NPN open collector 1 output + Analogue current output
E	PNP open collector 1 output + Analogue voltage output
F	PNP open collector 1 output + Analogue 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
---	------------

Table (1) Valve Unit/Combination of Vacuum Switch 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. (SYJ3233-X126)	N.C (SYJ3133)	(SYJA3130)	N.C (SYJ3133)	(SYJA3130)
⊙	⊙	○	Double SOL. (SYJ3233-X126)	N.C. (SYJ3133)	K1	●	—	—	●	—
○	○	○	N.C. (SYJ3133)	N.C. (SYJ3133)	K2	—	●	—	●	—
○	○	○	Air operated (SYJA3130)	Air operated (SYJA3130)	K3	—	—	●	—	●
×	○	○	N.C. (SYJ3133)		C1	—	●	—	(Common with supply valve)	—
×	○	○	Air operated (SYJA3130)		C2	—	—	●	—	(Common with supply valve)
×	○	○	N.O. (SYJ3133)		C3	—	●	—	(Common with supply valve)	—
○: Possible ○: Possible with limitations (without self-holding function) X: 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) ZR100-K15M□Z-EC-Q 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 with connector and the 5 m lead wire connector separately.

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

Table (4) Digital Pressure Switch for Vacuum ZSE30A/ Lead Wire with Connector

ZS - 38 -  **L**

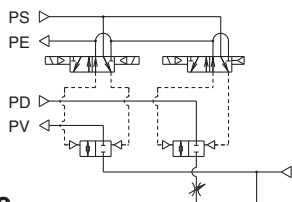
Lead wire core

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)

Vacuum Pump System/Combination of supply valve and release valve

Combination Symbol : **K1**

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

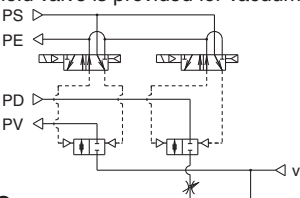


How to Operate

Operation	Pilot valve operation		Supply valve		Release valve	Note
			Pilot valve for supply	Pilot valve for supply stop	Pilot valve for release	
1. Adsorption			ON	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	
3. Operation stop			OFF	ON	OFF	

Combination Symbol : **K2**

Feature: Single solenoid valve is provided for vacuum valve.

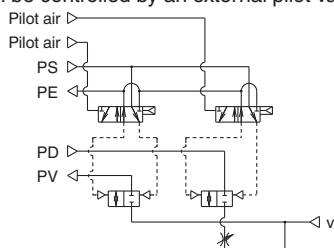


How to Operate

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

Combination Symbol : **K3**

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

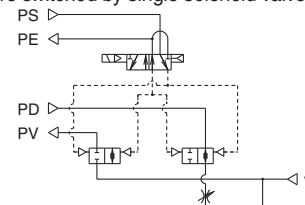


How to Operate

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

Combination Symbol : **C1**

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

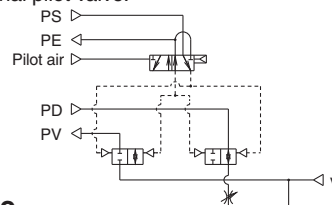


How to Operate

Operation	Pilot valve operation		Supply valve/Release valve	Note
			Pilot valve for supply/release	
1. Adsorption			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	

Combination Symbol : **C2**

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

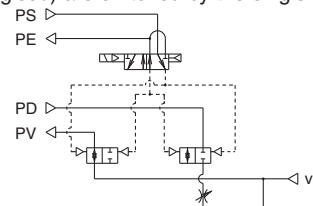


How to Operate

Operation	Pilot valve operation		Supply valve/Release valve	Note
			Air operated a	
1. Adsorption			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	

Combination Symbol : **C3**

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



How to Operate

Operation	Pilot valve operation		Supply valve/Release valve	Note
			Pilot valve for supply/release	
1. Adsorption			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	

⚠ Caution

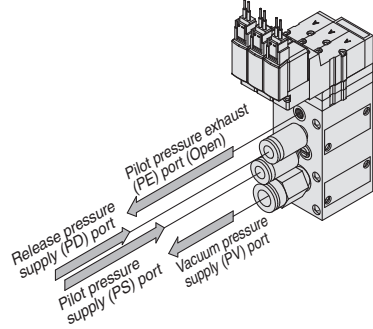
When pipe connection is made to two port connections (PV) port, (PD) port only, use a function plate (ZR1-RV3). Refer to page 36 for further information.

Function Plate : ZR1-RV3

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

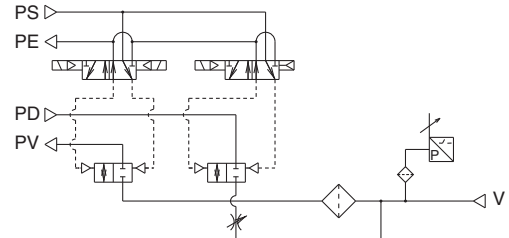
Without Function Plate (Standard)

Applicable system: Ejector system
External vacuum supply system



Pipe connection

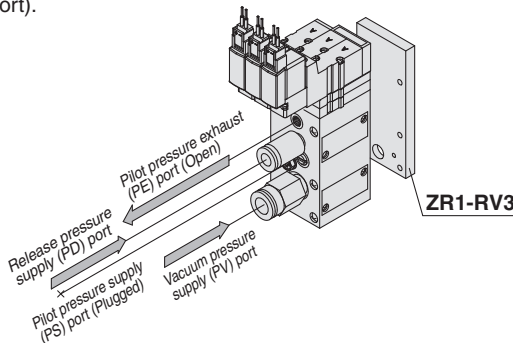
Example of circuit diagram



With Function Plate/Applicable to Vacuum Pump System Only

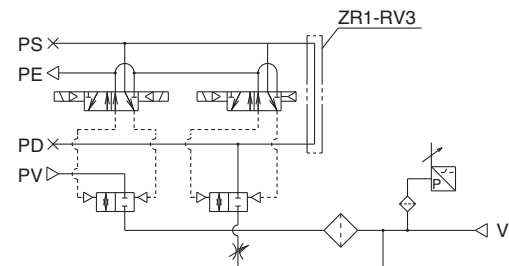
When ZR1-RV3 (PV/PS PD) is Selected

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



Pipe connection

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-Q 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 48.
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 (PS port pressure or less)	
PD port supply pressure	0.05 to 0.6 MPa (PS port pressure or less)	
PS port supply pressure	0.25 to 0.6 MPa	
Supply pressure range of pilot pressure supply (PA, PB) ports for supply and release ^{Note)}	PS port pressure to 0.6 MPa	
Main valve effective area (mm ²)	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-OB)B	

Note) Combination of supply valve and release valve: K3, C2

The supply and release valves of this product have a structure which uses the pressure of the pilot pressure supply (PS) port to operate them. Be sure to supply a pressure that is the pressure of the pilot pressure supply (PS) port or more and 0.6 MPa or less to the pilot pressure supply (PA, PB) ports for supply and release.

Solenoid Valve/Specifications

Solenoid	SYJ3133-□□□□, SYJ3233-□□□□-X126
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

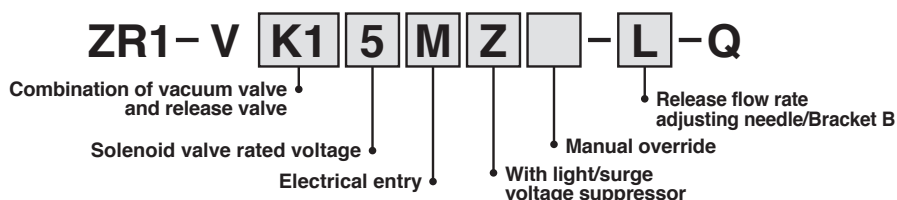
Combination of Supply Valve and Release Valve

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

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

How to Order

Refer to page 33 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
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-colour 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	±2 % F.S. (Based on 25 °C)

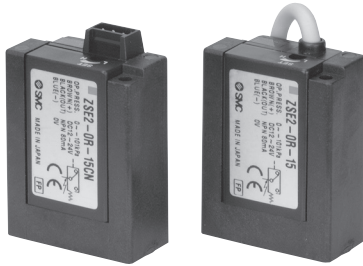
Note 1) When analogue voltage output is selected, analogue current output cannot be used together.

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

Note 3) If the applied pressure fluctuates around the set value, the hysteresis must be set to a value more than the fluctuating width, otherwise, chattering will occur.

Refer to page 17 for further specifications.

Vacuum Pressure Switch : ZSE2-0R-□□



Refer to page 14 for further specifications.

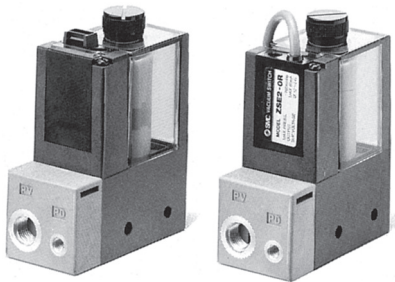
Specifications

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 18 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 14 and 17 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 (alkalinity), etc.
- ② Do not expose it to direct sunlight.

Suction Filter : ZR1-FX-□



Refer to page 20 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.

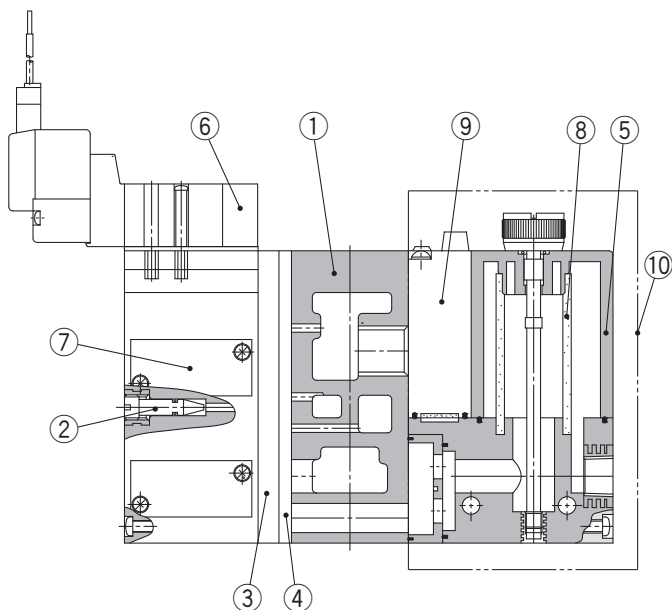
Filter case

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

Construction

This page contains information about the ZSE30A, which is to be discontinued.
Refer to the operation manual for details on the new product with a built-in ZSE20A.



Components Parts

No.	Description	Material	Part model
①	Manifold base	Aluminium alloy	
②	Release flow rate adjusting needle	Stainless steel	Refer to ZR1-NA ^{Note 2)}
③	Function plate	PBT	Refer to page 43.
④	Individual spacer	PBT	Refer to page 43.
⑤ ⁽¹⁾	Filter case	Polycarbonate	Refer to page 18.
⑥	Pilot valve assembly	—	Refer to Table (1)
⑦	Valve body assembly	—	Refer to Table (2)
⑧	Filter element	PVA sponge	ZR1-FZ (30 mm)
⑨	Pressure switch for vacuum	—	ZSE2-OR- ¹⁵ / ₅₅ -□
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, a—ine, 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	
K1	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-□□□□
K3	Air operated N.C (SYJA3130)	Air operated N.O (SYJA3130)	SYJA3130

Table (2) How to Order Valve Body Assembly

ZR1-VD	K1	5	M	Z	-	L	-	Q
--------	----	---	---	---	---	---	---	---

Combination of supply valve and release valve
 Pilot valve
 Solenoid valve rated voltage
 Electrical entry
 With light/surge voltage suppressor
 Manual override
 Release flow rate adjusting needle

—	Without lock nut
L	With lock nut

Refer to page 33 for further symbol specifications.

Table (3) Pressure Switch for Vacuum (ZSE30A) + Suction Filter Unit

ZR1-F				-	D
-------	--	--	--	---	---

Option (Connector/lead wire specifications)
 Unit specifications
 Output specifications
 Combination of switch/filter

Refer to page 18 for further symbol specifications.

How to Order Solenoid Valves/Air Operated Valves

Air operated

SYJA3130

Solenoid valve

ZR1-SYJ3233-□□□□-X126-Q

SYJ3133-□□□□-Q

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	

Electrical entry		Light/Surge voltage suppressor
L	L plug connector type	
LN	Lead wire: 0.3 m	— None
LO	Without lead wires	Z With light and surge voltage suppressor
M	Without connector	S With surge voltage suppressor
MN	M plug connector type	
MO	Lead wire: 0.3 m	
G	Without lead wires	
H	Without connector	
	Lead wire: 0.3 m	
	Lead wire: 0.6 m	

Note) Pilot valve gasket is included.

This page contains information about the ZSE30A, which is to be discontinued. Refer to the operation manual for details on the new product with a built-in ZSE20A.

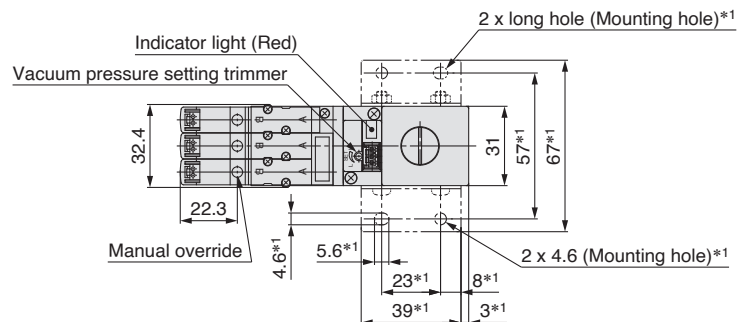
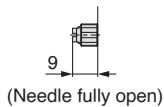
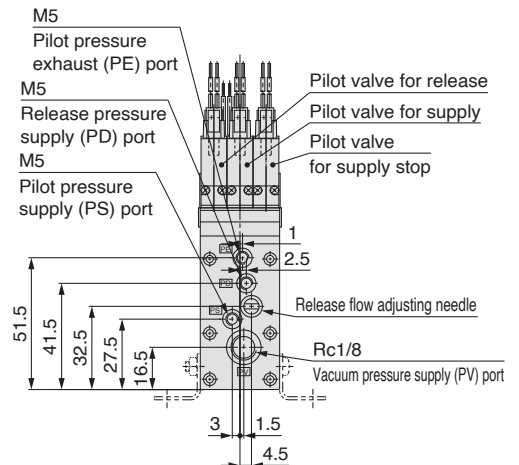
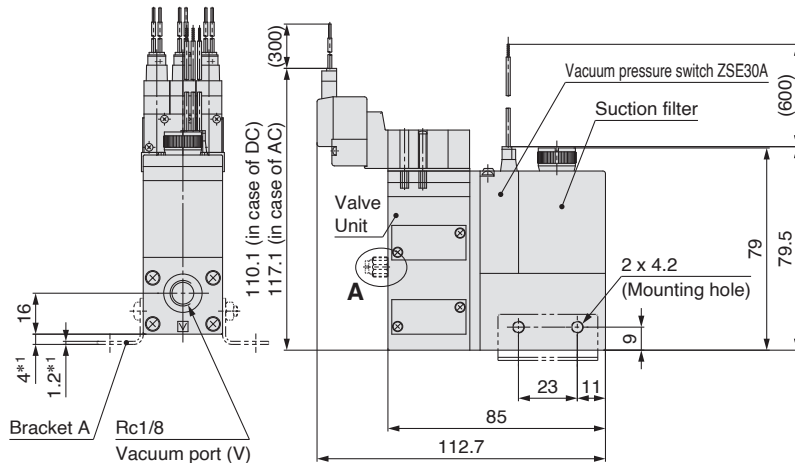
The diagram shows a 3-position solenoid valve with the following ports and connections:

- Pilot pressure exhaust (PE) port (Open):** Indicated by a downward arrow on the left side.
- Release pressure supply (PD) port:** Indicated by a downward arrow on the left side.
- Pilot pressure supply (PS) port:** Indicated by a downward arrow on the left side.
- Vacuum pressure supply (PV) port:** Indicated by a downward arrow on the left side.
- Vacuum (V) port:** Indicated by a downward arrow on the right side.


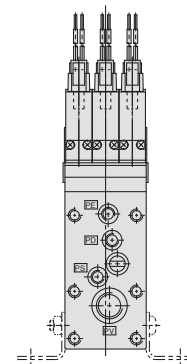
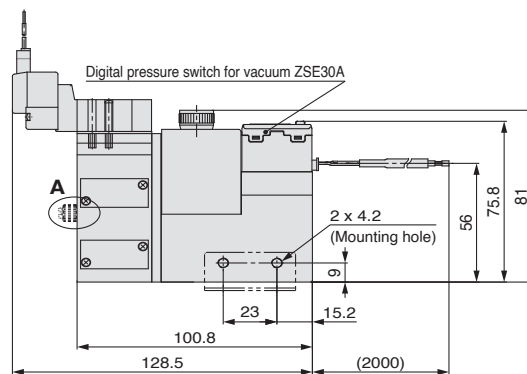
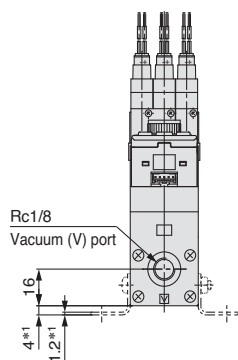
Valve + Pressure Switch for Vacuum + Filter Unit

The diagram shows a vacuum system with two pumps. The left pump is connected to a chamber with two inlets. The right pump is connected to a chamber with one inlet. Both pumps are connected to a common line that leads to a ZSE2 pressure sensor. The sensor is connected to a pressure measurement unit, which is also connected to a vacuum line. The ZSE2 sensor is labeled 'ZSE2' and 'Pressure for vacuum'.

ZR100-K1 **M** **-E** **-**

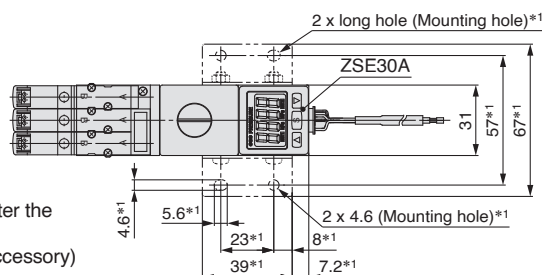


ZR100-K1 **M** **-D** **-**



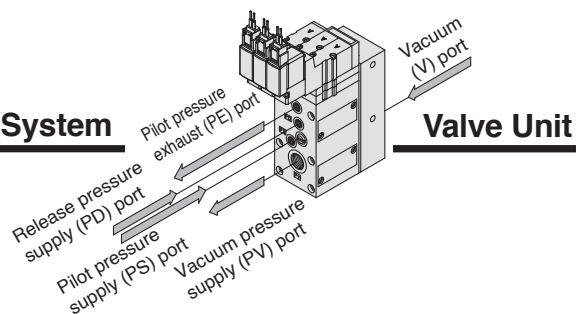
(Needle fully open)

Note) Dimensions marked with “*1” are those after the bracket A is mounted.
Bracket A part no.: ZR1-OBA (Standard accessory)



ZR Series

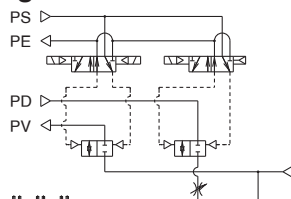
Vacuum Pump System



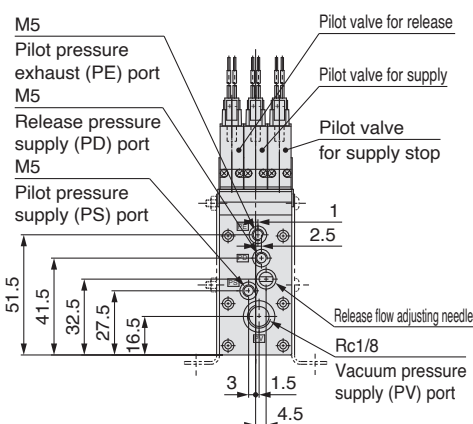
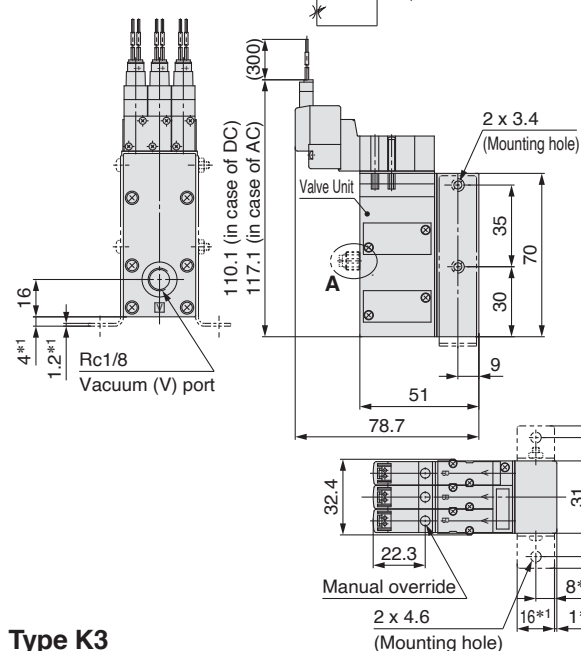
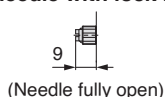
Type K1

ZR1-VK1□M□□-□

Circuit diagram



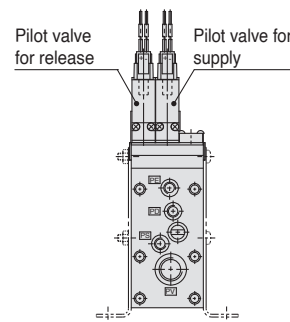
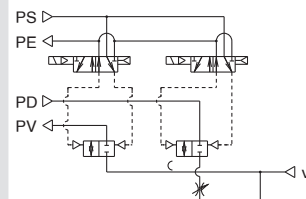
A: Release flow adjusting needle with lock nut



Type K2

ZR1-VK2□M□□-□

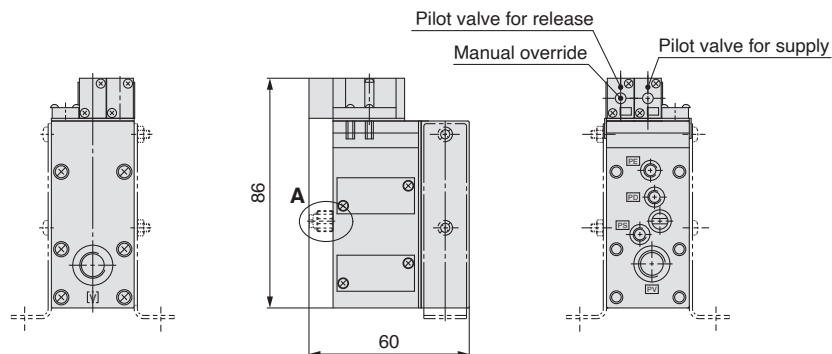
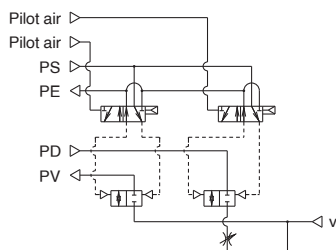
Circuit diagram



Type K3

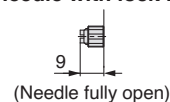
ZR1-VK3-□

Circuit diagram



M3
Pilot pressure supply port for release (PB)
M3
Pilot pressure supply port for supply (PA)

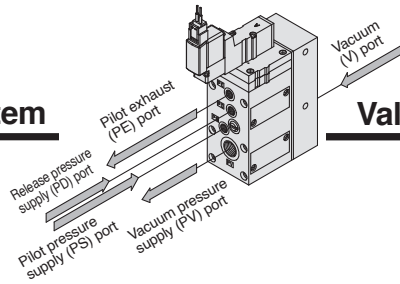
A: Release flow adjusting needle with lock nut



★ Dimensions not indicated are identical to type K2.

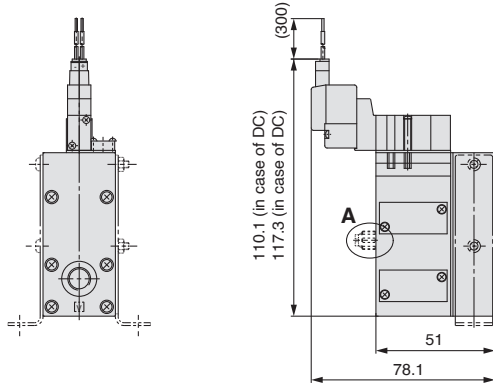
Vacuum Pump System

Valve Unit

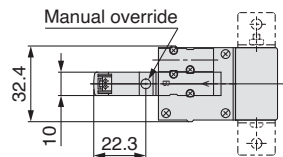
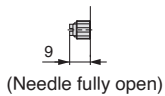


Type C1

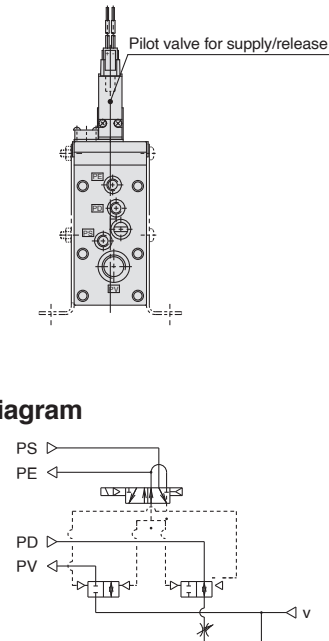
ZR1-VC1□M□□-□



A: Release flow adjusting needle with lock nut



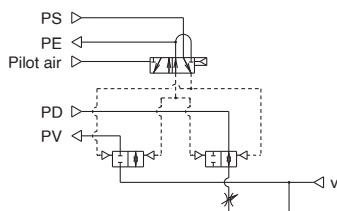
Circuit diagram



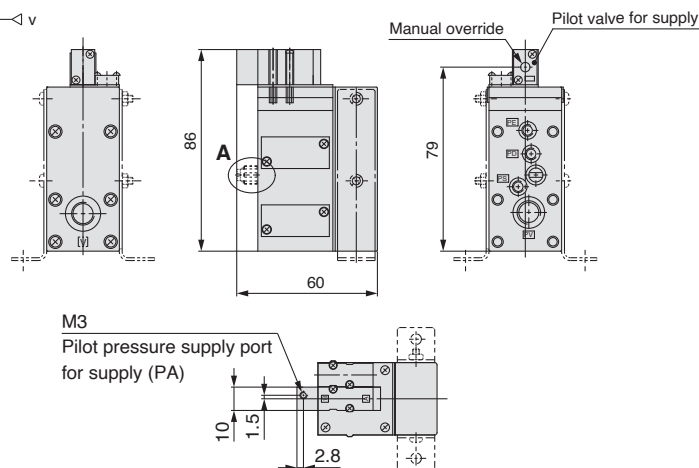
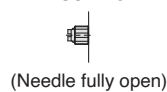
Type C2

ZR1-VC2-□

Circuit diagram



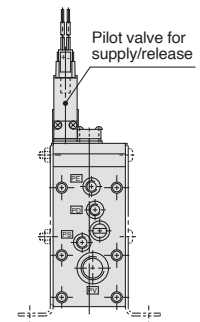
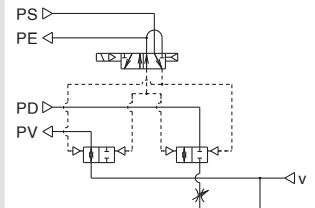
A: Release flow adjusting needle with lock nut



Type C3

ZR1-VC3□M□□-□

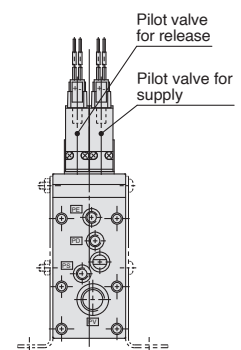
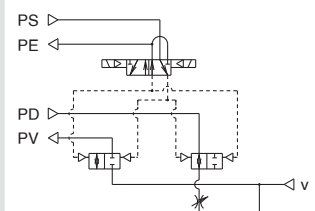
Circuit diagram



Type C4

ZR1-VC4□M□□-□

Circuit diagram



★ Dimensions not indicated are identical to drawings above.

Manifold Specifications/Vacuum Pump System



Specifications

Max. number of units	6 stations
Port	Port size
Common vacuum pressure supply (PV) port	1/8 (Rc, NPTF, G)
Common pilot pressure supply (PS) port	M5
Common release pressure supply (PD) port	M5
Common exhaust (EXH) port	1/2 (Rc, NPTF, G)
Weight (Manifold bases only)	Basic mass for one station is 0.28kg. Additional mass per one station is 0.12 kg.

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

Manifold Vacuum/Air Supply

Manifold		Left			Right		
Supply port location	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 to R16	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

<Manifold base>

ZZR1 06 - [] []

Stations	
01	1
⋮	⋮
06	6

Thread type	
—	Rc
F	G (Note)
T	NPTF

Port location	
R	Right side
L	Left side
B	Both sides

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

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

<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.

* When shipping only spacers, specify nothing.

<Blanking plate>

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

ZR1 - BM1

Refer to Example 1).

⚠ 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.

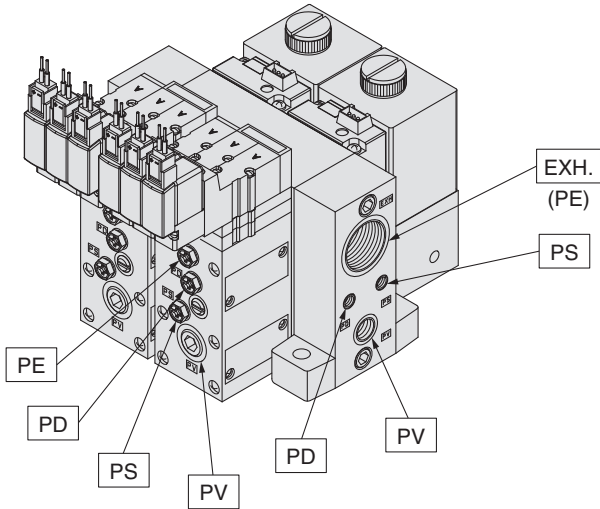
About individual spacers

- 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

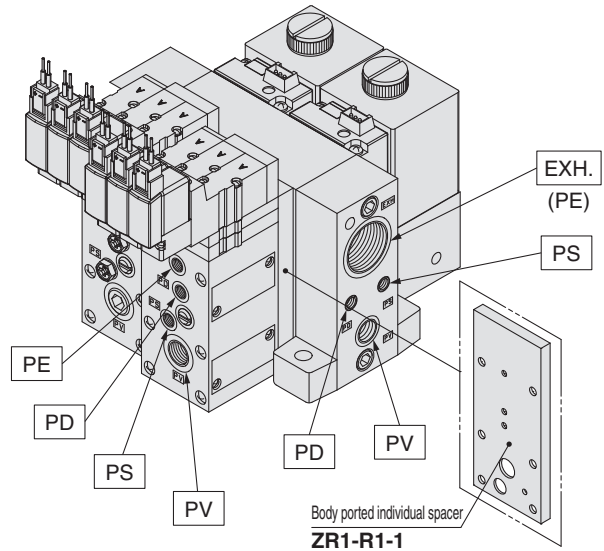
Manifold/System Circuit Example

When not using individual spacer



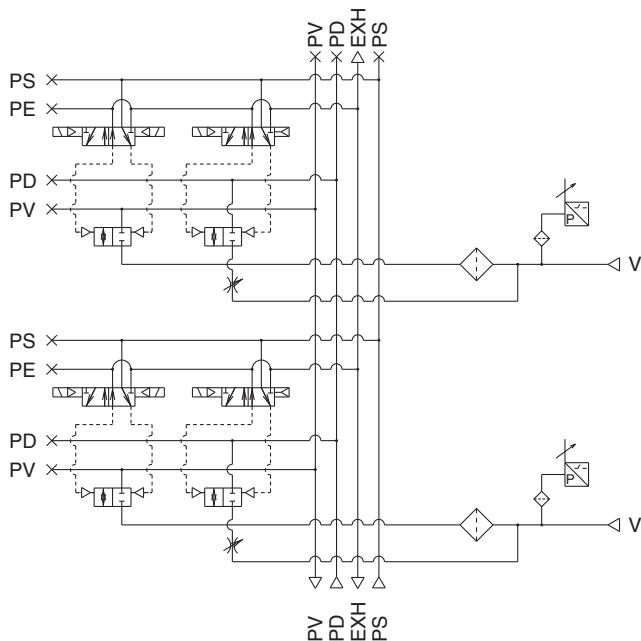
PV: Vacuum pressure supply port
PS: Pilot pressure supply port
PD: Release pressure supply port
PE: Pilot pressure exhaust port
EXH.: Common exhaust port
V: Vacuum Port

When using individual spacer

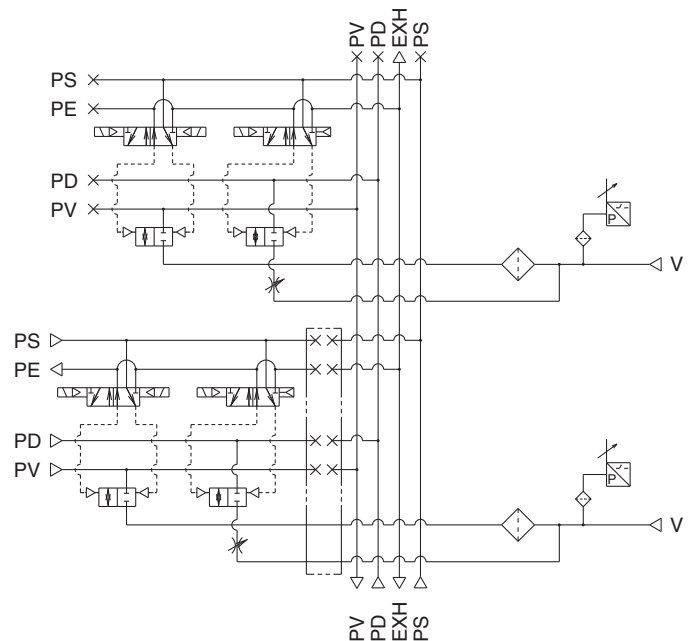


PV: Vacuum pressure supply port
PS: Pilot pressure supply port
PD: Release pressure supply port
PE: Pilot pressure exhaust port
EXH.: Common exhaust port
V: Vacuum Port

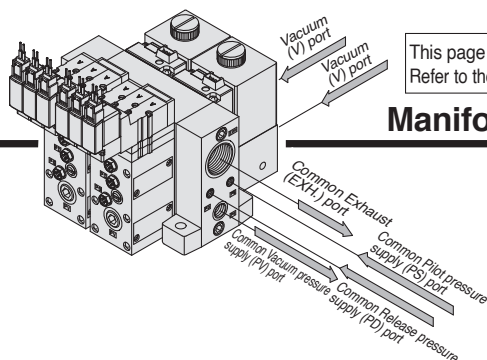
<System circuit example>



<System circuit example>

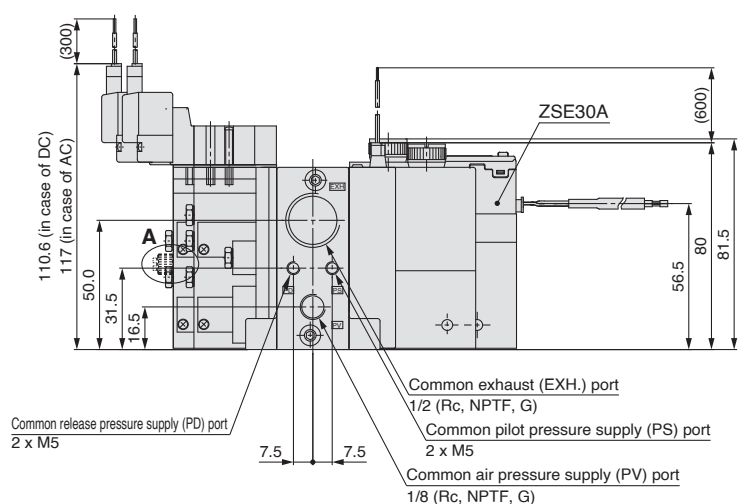
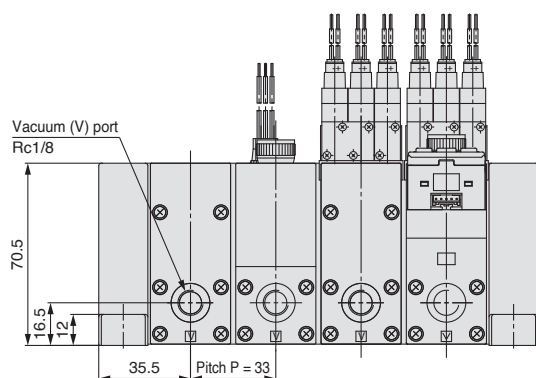


Vacuum Pump System

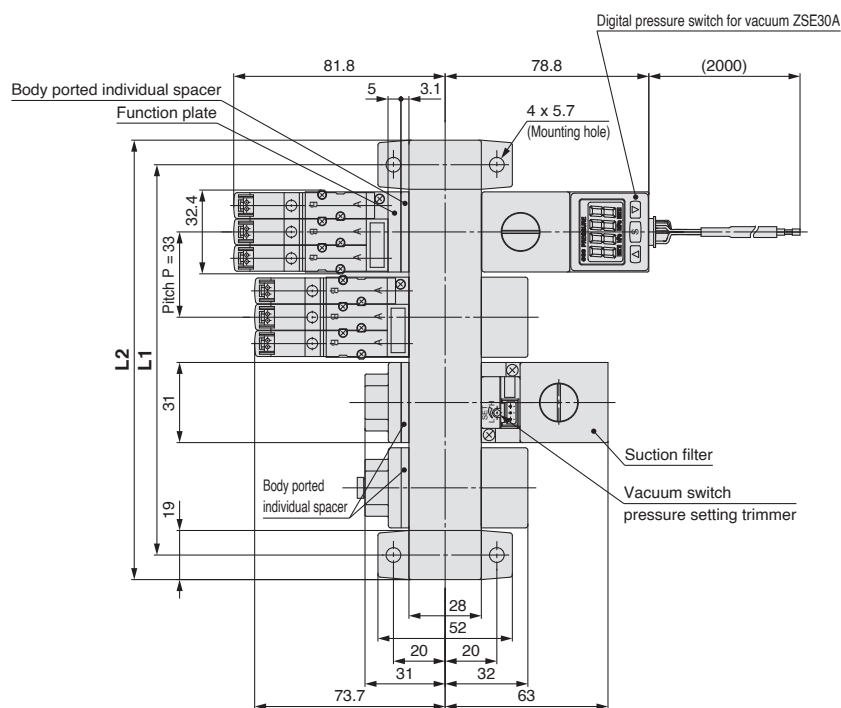
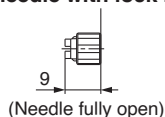


This page contains information about the ZSE30A, which is to be discontinued. Refer to the operation manual for details on the new product with a built-in ZSE20A.

Manifold

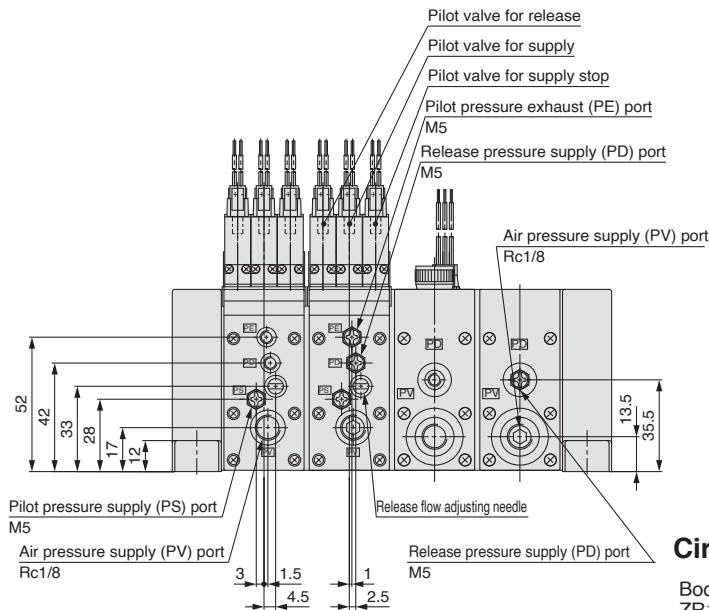


**A:Release flow adjusting
needle with lock nut**

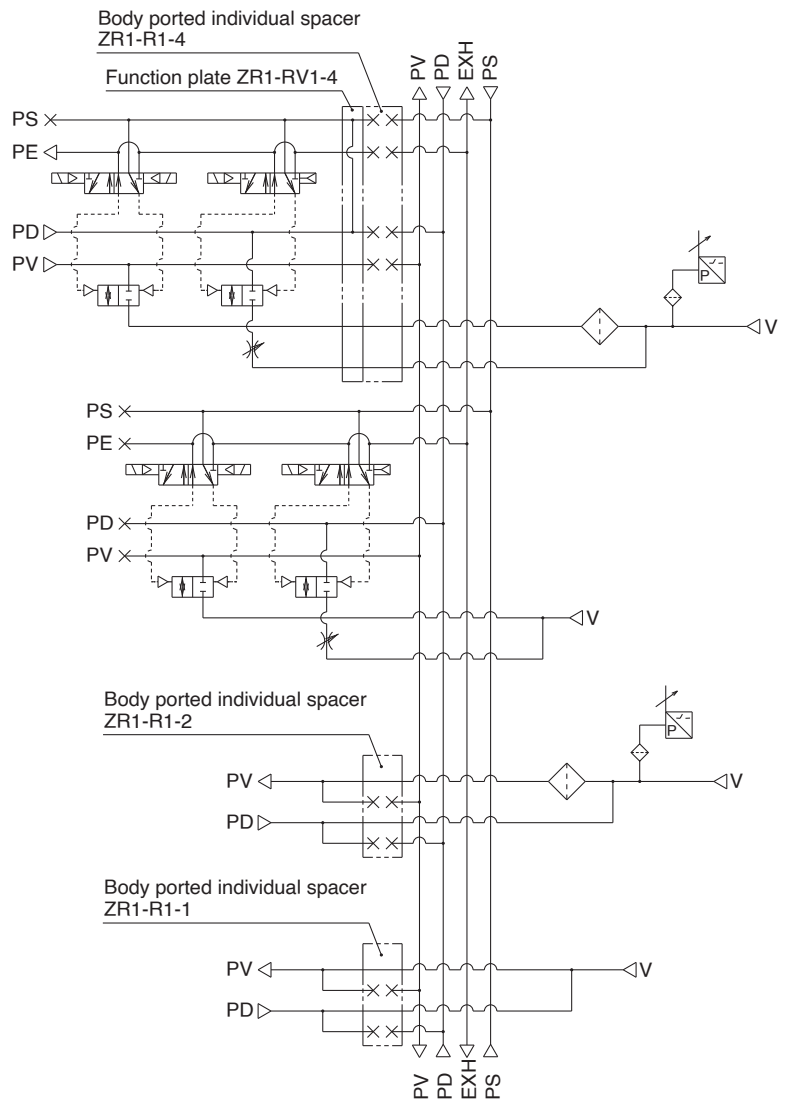


* 1 The common exhaust (EXH) port is also used as the pilot pressure exhaust (PE) port of the pilot valve. Use while the port is open to the atmosphere.

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



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

ZR Series

This page contains information about the ZSE30A, which is to be discontinued.
Refer to the operation manual for details on the new product with a built-in ZSE20A.

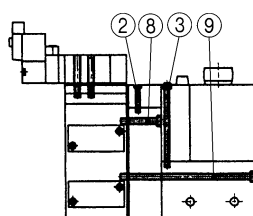
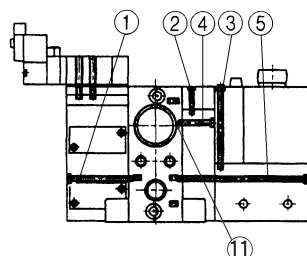
Ejector System

Mounting Thread Parts List for Unit Combination

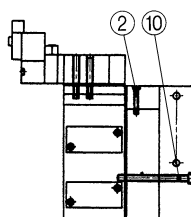
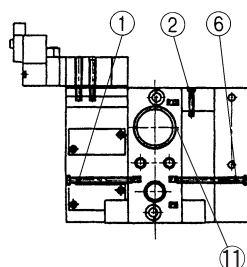
Manifold Specifications

Without Manifold

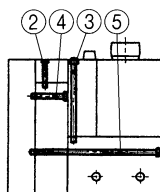
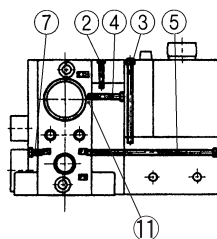
Components Valve unit + Ejector unit + Pressure switch for vacuum ZSE30A/Filter unit



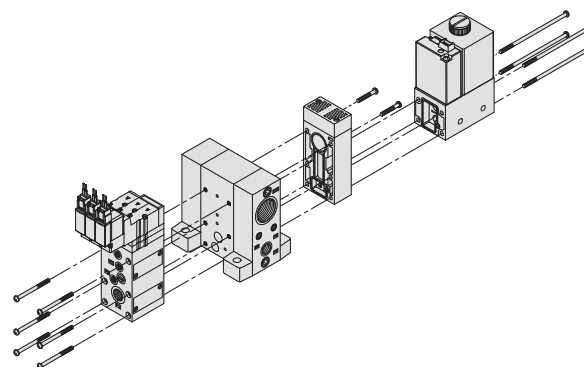
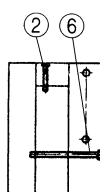
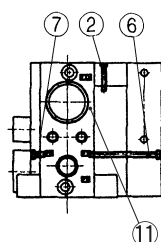
Components Valve unit + Ejector unit



Components Ejector unit + Pressure switch for vacuum ZSE30A/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	ZR1-SR1-13-A(a set of two threads)
	Common and port 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)
5	For nozzle size 18, 20	ZR1-SR2-21-A(a set of two threads)
	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)
6	For nozzle size 18, 20 [For ZSE30A spec.]	ZR1-SR2-86-A(a set of four threads)
	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)
	Standard (without options)	ZR1-SR2-5-A(a set of six threads)
7	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)
	For nozzle size 10, 13, 15 + with function plate	ZR1-SR3-24-1A(a set of two threads)
8	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)
	For nozzle size 10, 13, 15 + with function plate	ZR1-SR3-73-A(a set of four threads)
9	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)
	For nozzle size 10, 13, 15 + with function plate [For ZSE30A spec.]	ZR1-SR3-89-A(a set of four threads)
10	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)
	For nozzle size 10, 13, 15 + with function plate	ZR1-SR3-42-A(a set of six threads)
11	For nozzle size 18, 20 + with function plate	ZR1-SR3-46-A(a set of six threads)
	When the ejector is compatible with silencer exhaust or port exhaust	BA00601(M12 x 12)
Note 1)	When the ejector is compatible with common exhaust	Unnecessary

Note 1) • BA00601 (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 BA00601. 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 TB00148 for PV port are required.

⚠ Precautions

Be sure to read before handling.
Refer to back page for Safety Instructions.

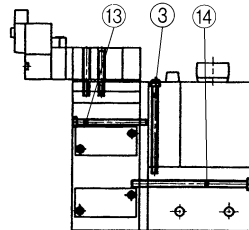
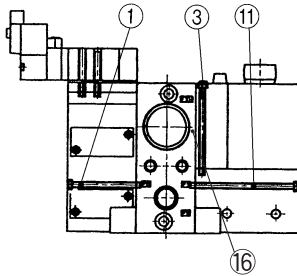
This page contains information about the ZSE30A, which is to be discontinued.
Refer to the operation manual for details on the new product with a built-in ZSE20A.

Vacuum Pump System

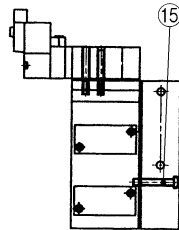
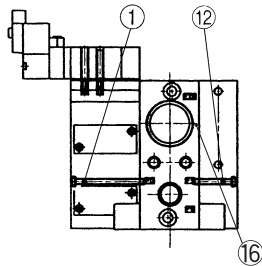
Mounting Thread Parts List for Unit Combination

Manifold Specifications Without Manifold

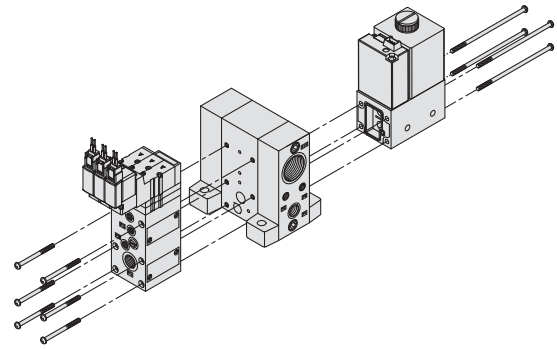
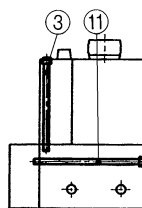
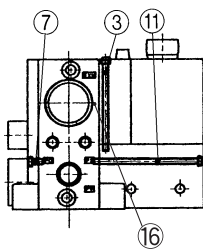
Components Valve unit + Pressure switch for vacuum ZSE30A / Filter unit



Components Valve unit



Components Pressure switch for vacuum ZSE30A/ 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)
	Standard (Without options)	ZR1-SR3-54-A(a set of four threads)
	With function plate	ZR1-SR3-59-A(a set of four threads)
14	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)
	Standard (Without options)	ZR1-SR3-19-A(a set of six threads)
15	Standard (Without options)	ZR1-SR3-24-A(a set of six threads)
	With function plate	ZR1-SR3-24-A(a set of six threads)
16 ^{Note 1)}	Standard	BA00601(M12 x 12)

Note 1) • BA00601 (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 BA00601. 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 TB00148 for PV port are required.



ZR Series

Specific Product Precautions 1

Be sure to read this before handling the products.

For safety instructions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smc.eu>

This page contains information about the ZSE30A, which is to be discontinued.
Refer to the operation manual for details on the new product with a built-in ZSE20A.

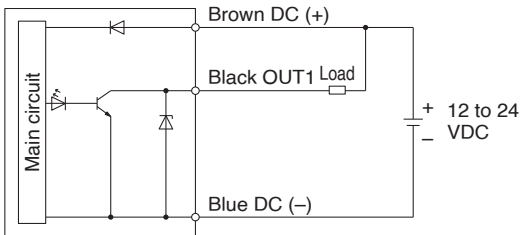
Vacuum Switch (ZSE30A)

Warning

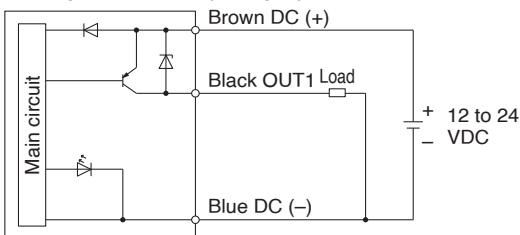
1. The following diagram shows the internal circuits of the vacuum switch as well as wiring examples. Incorrect wiring could cause malfunction or failure, leading to an electric shock or fire.

For Vacuum pressure switch (ZSE2)

NPN open collector (1 output)

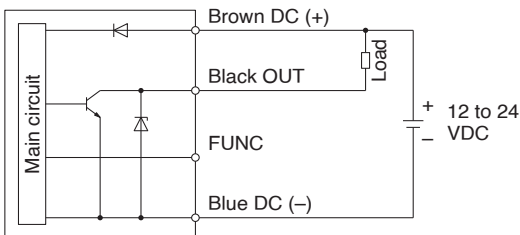


PNP open collector (1 output)

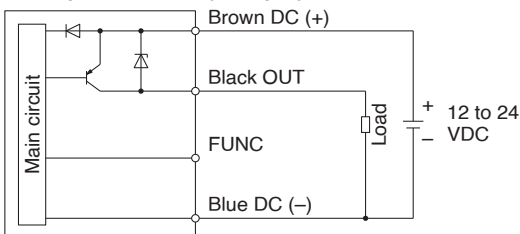


For Digital pressure switch for vacuum (ZSE30A)

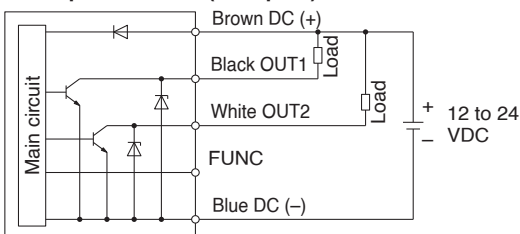
N NPN open collector (1 output)



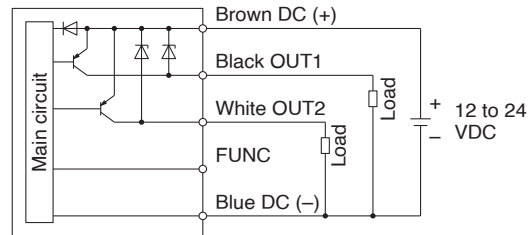
P PNP open collector (1 output)



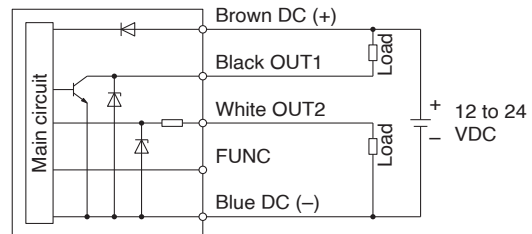
A NPN open collector (2 outputs)



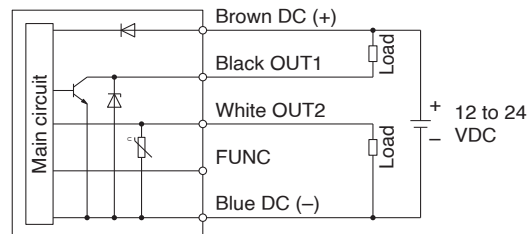
B PNP open collector (2 outputs)



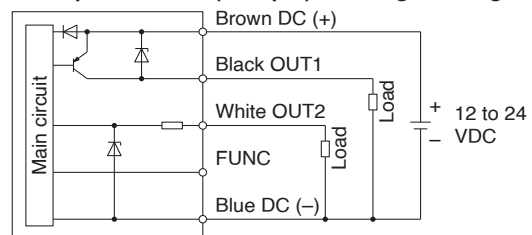
C NPN open collector (1 output) + Analogue voltage output



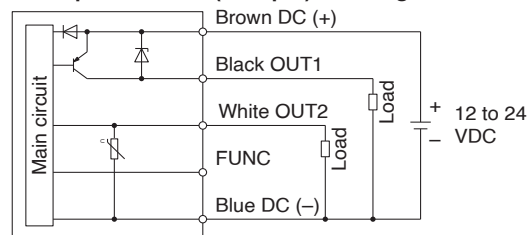
D NPN open collector (1 output) + Analogue current output



E PNP open collector (1 output) + Analogue voltage output



F PNP open collector (1 output) + Analogue current output



* The FUNC terminal is connected when using the copy function. (Refer to the operation manual of the ZSE30A series.)



ZR Series

Specific Product Precautions 2

Be sure to read this before handling the products.

For safety instructions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smc.eu>

This page contains information about the ZSE30A, which is to be discontinued.
Refer to the operation manual for details on the new product with a built-in ZSE20A.

Conversion Cable for the ZSE30A Lead Wire with Connector

⚠ Caution

The pressure switch (ZSE20A) lead wire with a connector is not interchangeable with the existing product (lead wire with connector for the ZSE30A).

Therefore, in order to connect the ZSE20A using the lead wire with a connector for the existing ZSE30A, the conversion cable shown below is required.

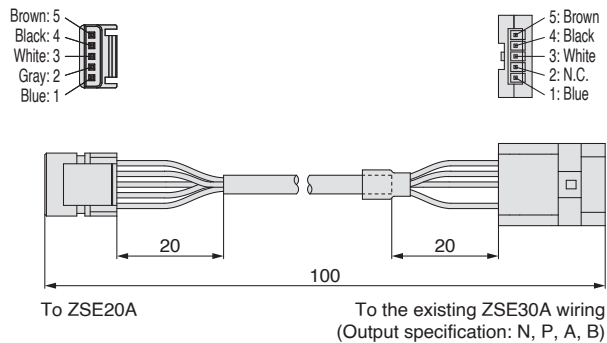
The conversion cable to be used varies depending on the existing pressure switch (ZSE30A) output specifications.

· Existing pressure switch (ZSE30A) output specification symbols

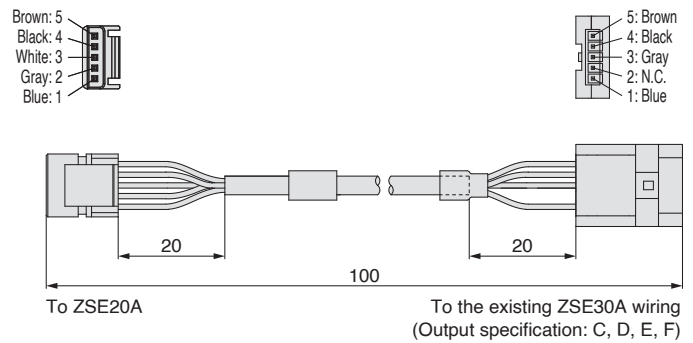
For N, P, A, B: ZS-46-5LA-X424

For C, D, E, F: ZS-46-5LB-X424

ZS-46-5LA-X424



ZS-46-5LB-X424



While this conversion cable allows for use of the existing wiring, output and functions other than that of the ZSE30A will be invalid (not wired).

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)¹⁾, and other safety regulations.

Danger:

Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Warning:

Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

Caution:

Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

- 1) ISO 4414: Pneumatic fluid power – General rules and safety requirements for systems and their components.
ISO 4413: Hydraulic fluid power – General rules and safety requirements for systems and their components.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.
etc.

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Our products cannot be used beyond their specifications. Our products are not developed, designed, and manufactured to be used under the following conditions or environments.

Use under such conditions or environments is not covered.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogues and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

Caution

We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.

Use in non-manufacturing industries is not covered.

Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.

The new Measurement Act prohibits use of any unit other than SI units in Japan.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”. Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.²⁾ Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.
- 2) Vacuum pads are excluded from this 1 year warranty.
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

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Bulgaria	+359 (0)2807670	www.smc.bg	sales.bg@smc.com
Croatia	+385 (0)13707288	www.smc.hr	sales.hr@smc.com
Czech Republic	+420 541424611	www.smc.cz	office.at@smc.com
Denmark	+45 70252900	www.smc.dk.com	smc.dk@smc.com
Estonia	+372 651 0370	www.smcee.ee	info.ee@smc.com
Finland	+358 207513513	www.smc.fi	smc.fi@smc.com
France	+33 (0)164761000	www.smc-france.fr	supportclient.fr@smc.com
Germany	+49 (0)61034020	www.smc.de	info.de@smc.com
Greece	+30 210 2717265	www.smchellas.gr	sales@smchellas.gr
Hungary	+36 23513000	www.smc.hu	office.hu@smc.com
Ireland	+353 (0)14039000	www.smcautomation.ie	technical.ie@smc.com
Italy	+39 03990691	www.smcitalia.it	mailbox.it@smc.com
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Netherlands	+31 (0)205318888	www.smc.nl	info@smc.nl
Norway	+47 67129020	www.smc-norge.no	post.no@smc.com
Poland	+48 22 344 40 00	www.smc.pl	office.pl@smc.com
Portugal	+351 214724500	www.smc.eu	apoiocliente.pt@smc.com
Romania	+40 213205111	www.smcromania.ro	office.ro@smc.com
Russia	+7 (812)3036600	www.smc.eu	sales@smcru.com
Slovakia	+421 (0)413213212	www.smc.sk	sales.sk@smc.com
Slovenia	+386 (0)73885412	www.smc.si	office.si@smc.com
Spain	+34 945184100	www.smc.eu	post.es@smc.com
Sweden	+46 (0)86031240	www.smc.nu	order.se@smc.com
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