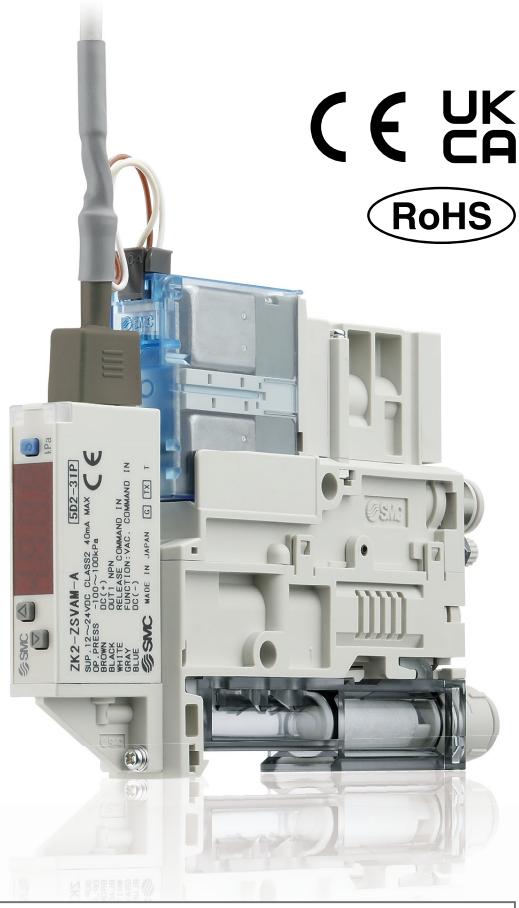
Vacuum Unit

Ejector System | **Vacuum Pump System**



CE UK CA

RoHS

New

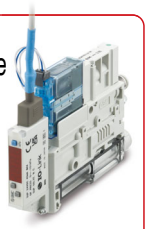
Supply valve: An N.O. specification has been added.

- Can hold vacuum*1 even when the power goes out or is turned off
- Prevents the sudden dropping of workpieces*1

*1 Supposing the supply pressure is being maintained

An IO-Link compatible pressure switch has been added.

- Allows for ejector control with a single communication line
- Reading of the device information and parameter batch settings are possible.



Air supply is cut-off when vacuum is reached.

Energy saving ejector

Air consumption

93 % reduction

Reduced by the pressure switch for vacuum with energy saving function and efficient ejectors

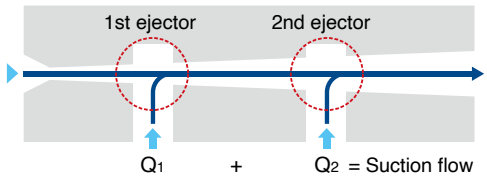
(Under SMC's measurement conditions)

More efficient ejector

Suction flow (Compared to other SMC 1-stage ejectors)

50 % increase

2-stage ejector



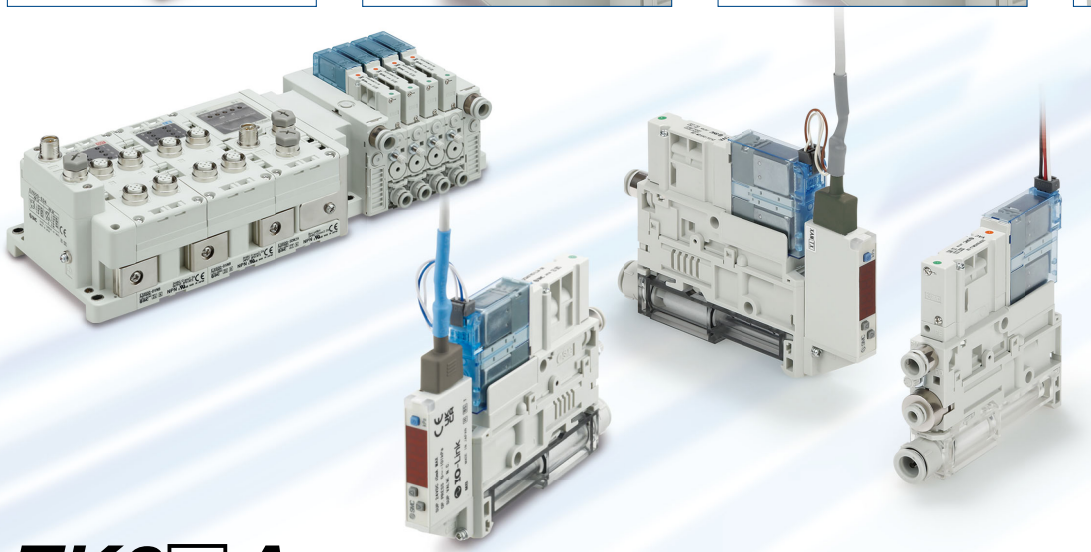
Wiring variations

New Fieldbus system

D-sub connector

Flat ribbon cable connector

Individual wiring



Air-operated specification

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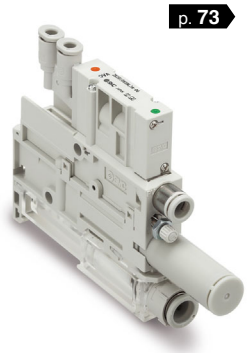
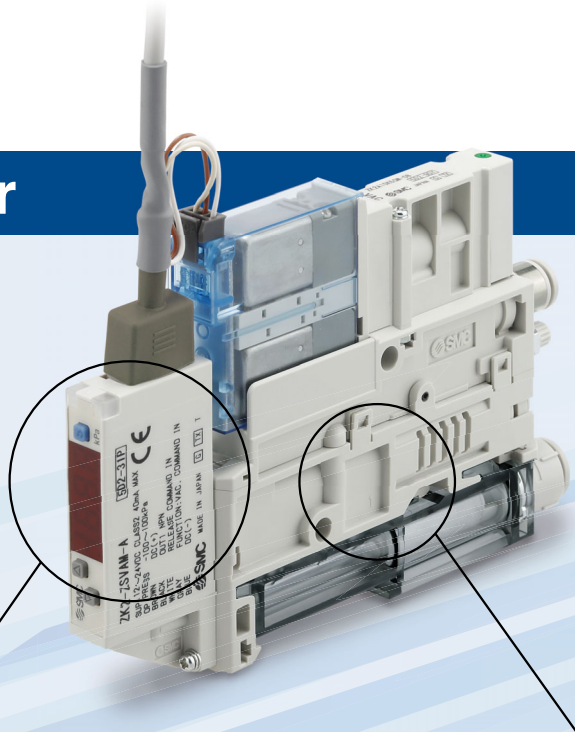


ZK2□A Series

SMC

CAT.EUS100-129C-UK

Energy Saving Ejector



Energy saving is possible due to the pressure switch for vacuum with energy saving function.

Air consumption **90 % reduction**[*1]

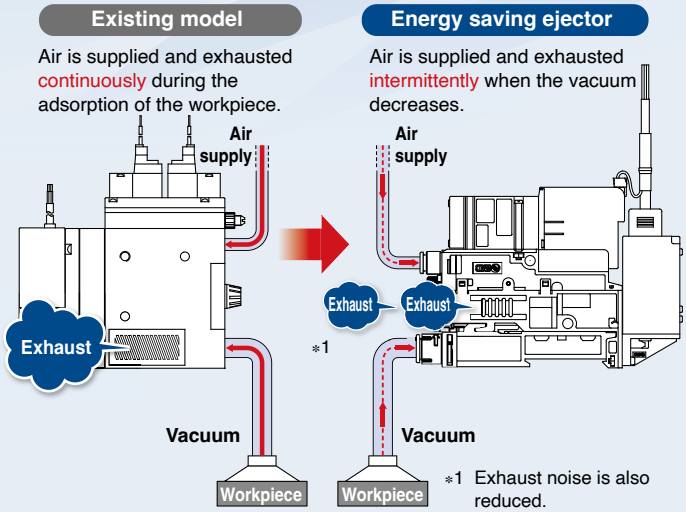
*1 Based on SMC's measurement conditions

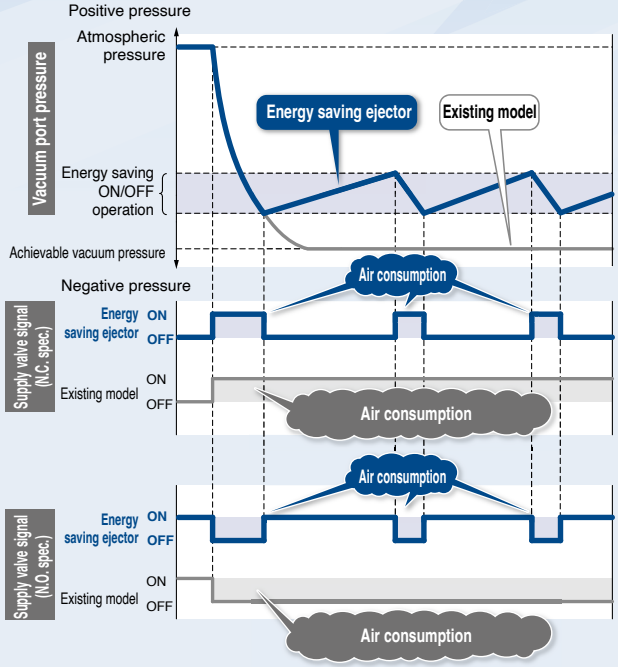
While the suction signal is ON, the ON/OFF operation of the supply valve is also performed automatically within the set value.

More efficient ejector

Air consumption **30 % reduction**

(Compared to other SMC 1-stage ejectors)





Energy saving efficiency: 93 % reduction

Power consumption cost per year reduced by 109 €/year[*1]

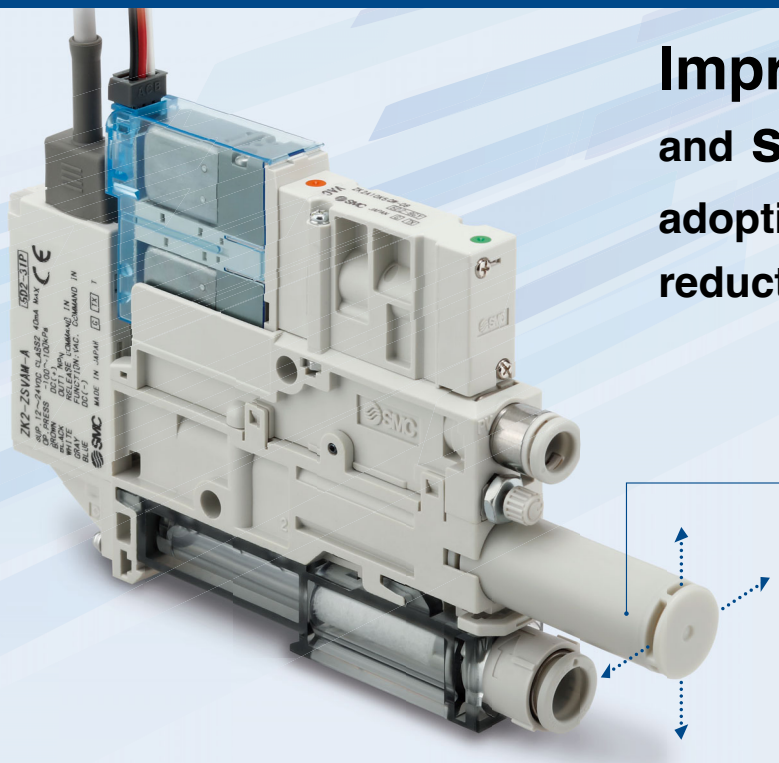
With energy saving function

More efficient ejector

	Power consumption cost per year	Annual air consumption	Exhaust time	Air consumption
ZK2/With energy saving function (Part no.: ZK2A12K5KWA-08)	**8 €/year**	**652.5 m³/year**	**0.6 s**	**58 l/min(ANR)**
Existing model (Part no.: ZM131AM-K5LZ-E15)	117 €/year	9,562.5 m³/year	6 s	**85 l/min(ANR)**

*1 **Cost conditions** · Air unit 0.012 €/m³ (ANR), Annual operating cycles: 1125000
(Operating hours: 10 hours/day, Operating days: 250 days/year, 450 cycles/h, when 1 unit is used)

High-noise Reduction Silencer



Improved low noise and suction flow by adoption of a high-noise reduction silencer

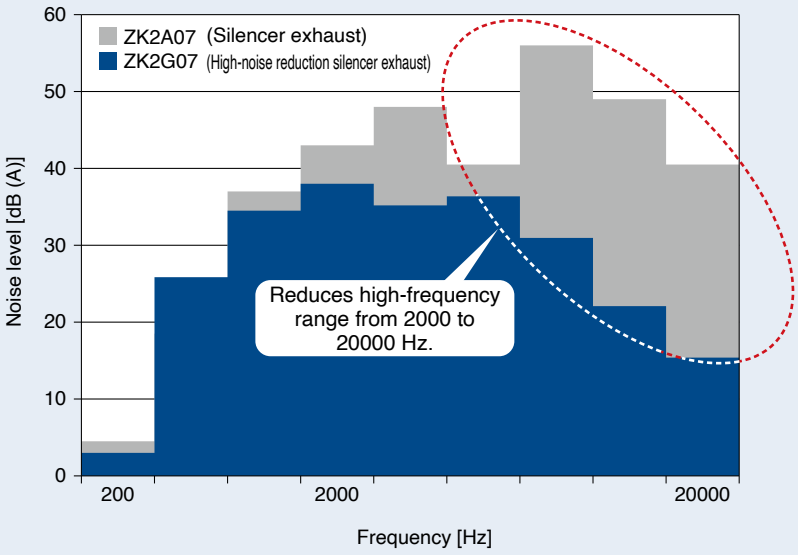
High-noise reduction silencer

Unpleasant frequencies are removed while maximizing vacuum performance by using a dedicated silencer with better silencing effect.

Low noise

46 dB (A)[*1]

*1 Nozzle size: Ø 0.7 (Under SMC's measurement conditions)



Suction flow

Improved by up to approx. 20 %

Nozzle size	Exhaust type	Max. suction flow [l/min (ANR)]
Ø 1.5	High-noise reduction silencer exhaust	83
	Silencer exhaust	67

All in One Piping Wiring Installation time reduced!!

Dual 2-port valve (Supply valve/Release valve)

■ Supply valve: Self-holding*1

Even if there is a power cut, the vacuum is maintained as long as there is supply air.

❶ The vacuum is maintained during power failure as long as air is supplied.
This can prevent the workpiece from being dropped.

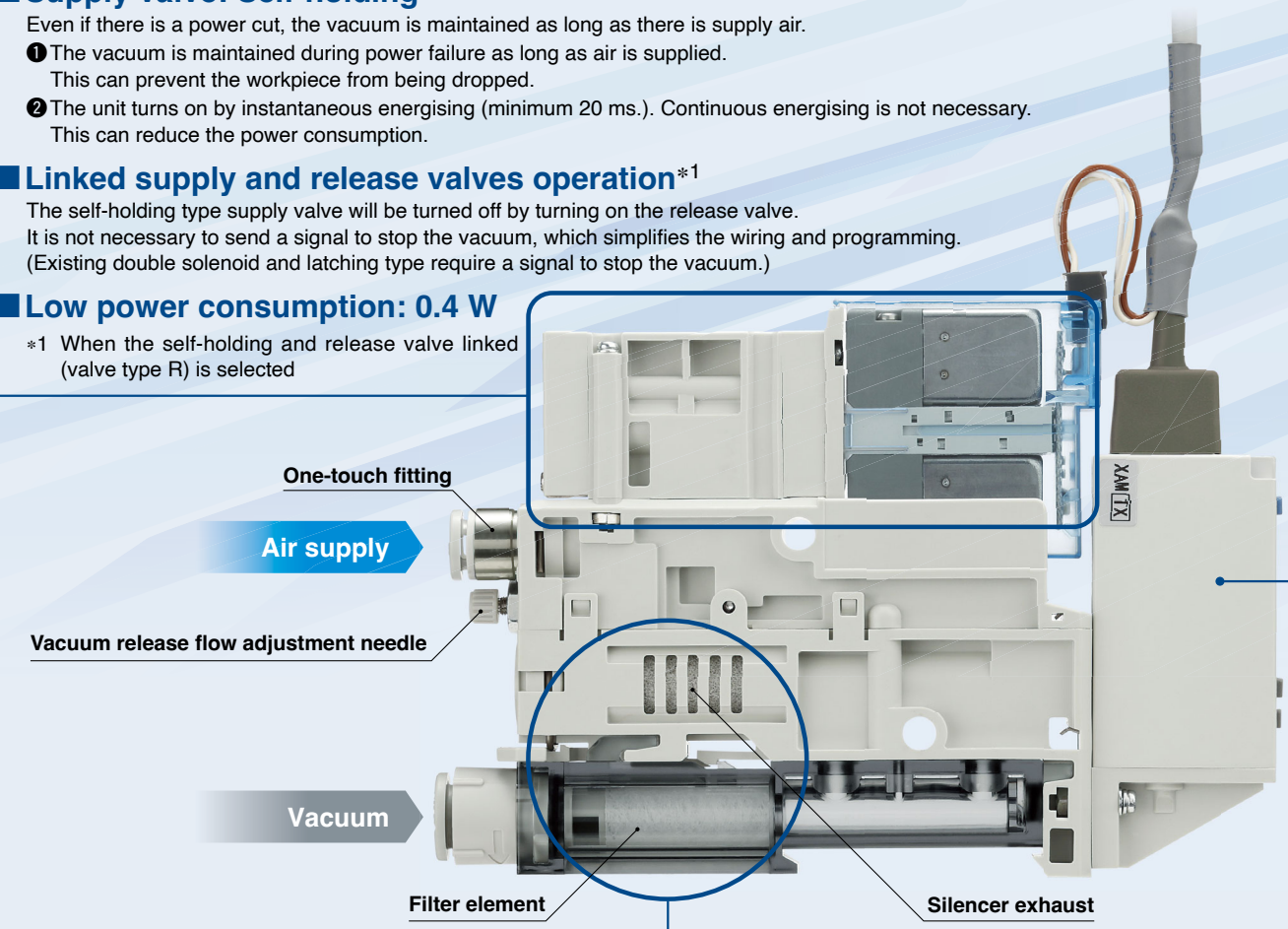
❷ The unit turns on by instantaneous energising (minimum 20 ms.). Continuous energising is not necessary.
This can reduce the power consumption.

■ Linked supply and release valves operation*1

The self-holding type supply valve will be turned off by turning on the release valve.
It is not necessary to send a signal to stop the vacuum, which simplifies the wiring and programming.
(Existing double solenoid and latching type require a signal to stop the vacuum.)

■ Low power consumption: 0.4 W

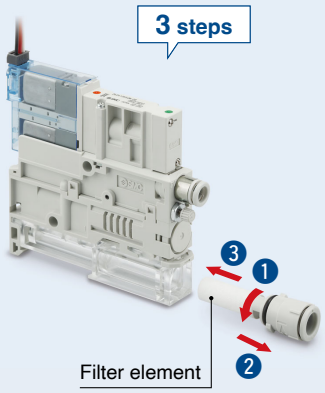
*1 When the self-holding and release valve linked (valve type R) is selected



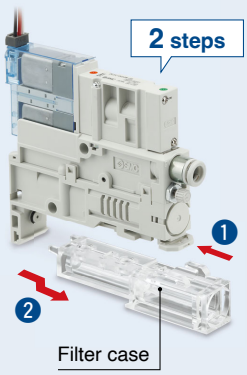
Transparent filter case allows visual check of the contamination.
If there is dirt inside the case, it is possible to remove the case and clean it.

Easier maintenance No tools are required for replacement.

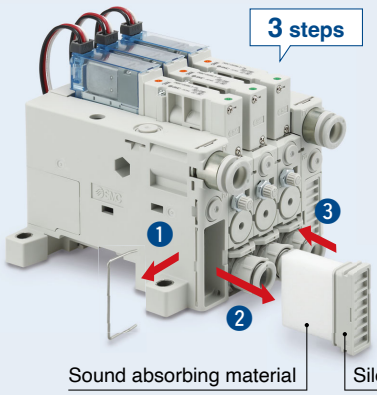
■ Replacement of filter element



■ Replacement of filter case

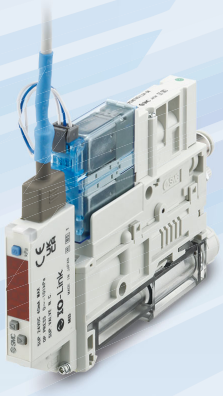


■ Replacement of sound absorbing material

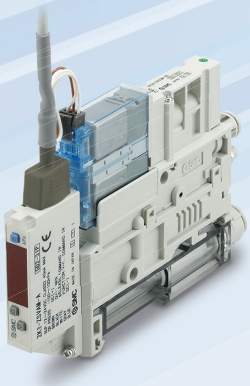


The sound absorbing material can be installed/removed without using screws.

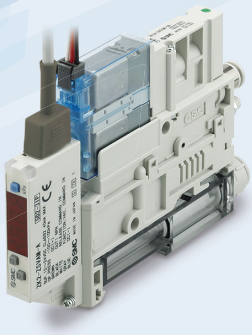
Pressure Sensor/Switch Variations



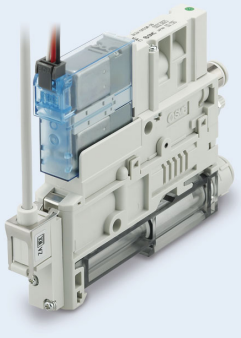
■ **IO-Link compatible vacuum pressure switch**
The energy saving function can be turned ON or OFF via the parameter settings.



■ **Pressure switch for vacuum with energy saving function**



■ **Pressure switch for vacuum**

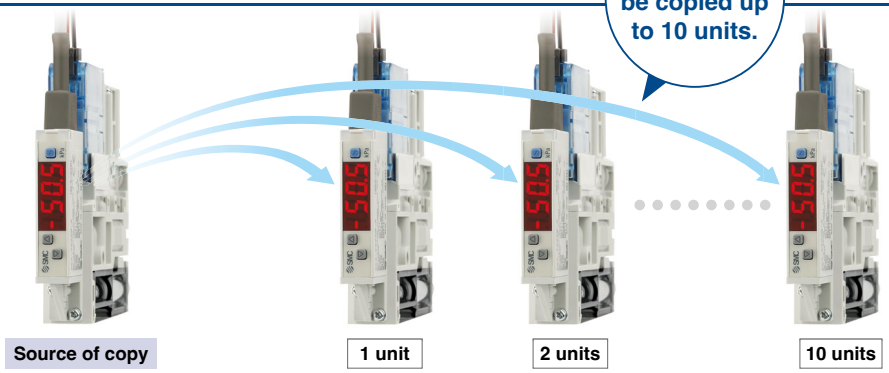


■ **Pressure sensor**

Pressure switch for vacuum Set value copy function*1

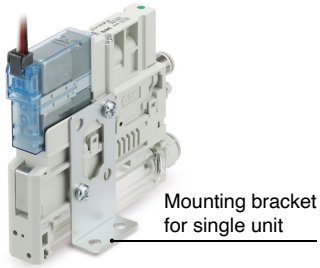
Reduction in setting work/Prevention of mistakes in setting

*1 Copy function is not available for switches with the pressure switch for vacuum with energy saving function.

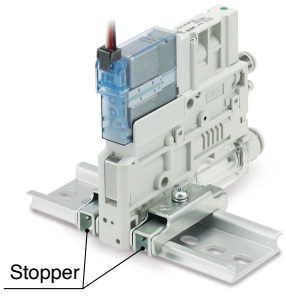


Mounting

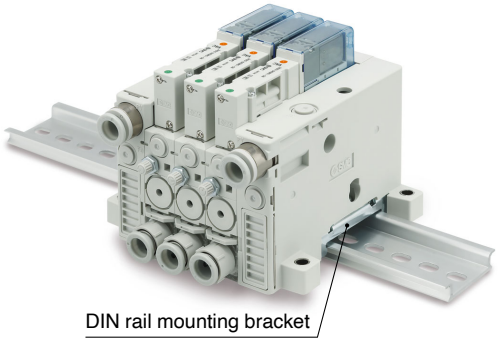
■ **Single unit bracket mounting**



■ **Single unit DIN rail mounting**



■ **Manifold DIN rail mounting**



Vacuum Unit Variations

Single Unit

Ejector System

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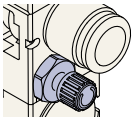
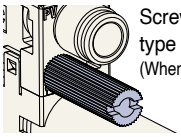
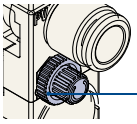
Nozzle size

Ø 0.7, Ø 1.0, Ø 1.2, Ø 1.5

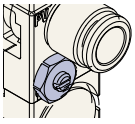
Vacuum release flow adjustment needle

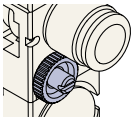

Standard specification

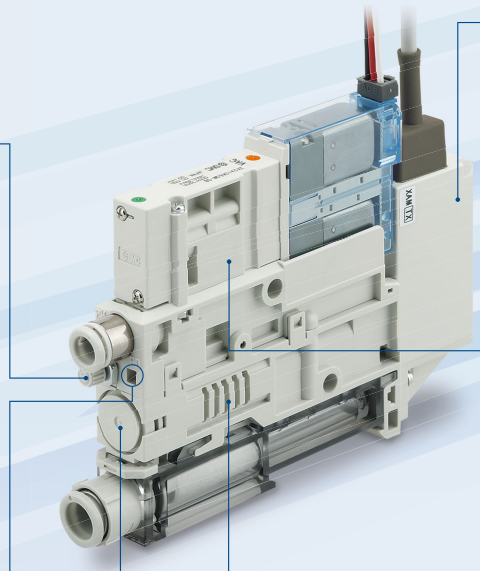

Screwdriver operation type long lock nut
(When option E is selected)


Round lock nut
(When option J is selected)

Lock nut


Screwdriver operation type
(When option K is selected)


Combination of the screwdriver operation type and round lock nut
(When options J and K are selected)



Vacuum switch

- Pressure sensor
- Pressure switch for vacuum
- Pressure switch for vacuum with energy saving function
- IO-Link compatible vacuum pressure switch

Without vacuum switch

Combination of supply valve and release valve

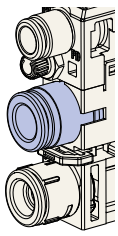
Supply valve	Release valve
N.C.	N.C.
N.C.	None
Self-holding release valve linked	N.C.
N.O.	N.C.
None	None

Exhaust type

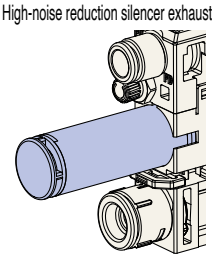
Silencer exhaust

Exhaust (EXH) port

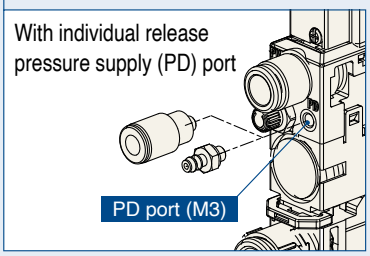
Port exhaust



High-noise reduction silencer exhaust



With individual release pressure supply (PD) port



PD port (M3)

Vacuum Pump System

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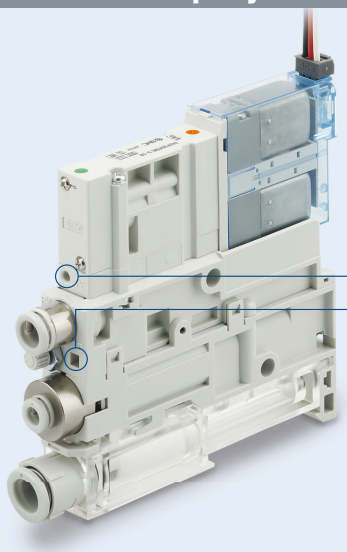
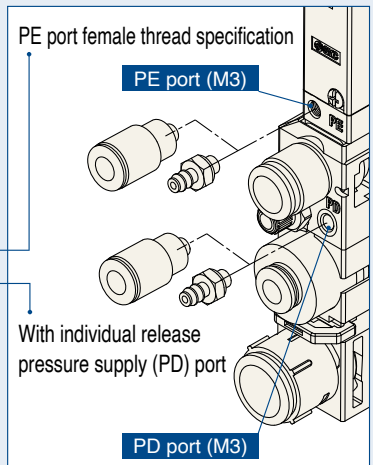


PE port female thread specification

PE port (M3)



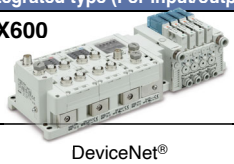
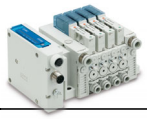
With individual release pressure supply (PD) port

PD port (M3)

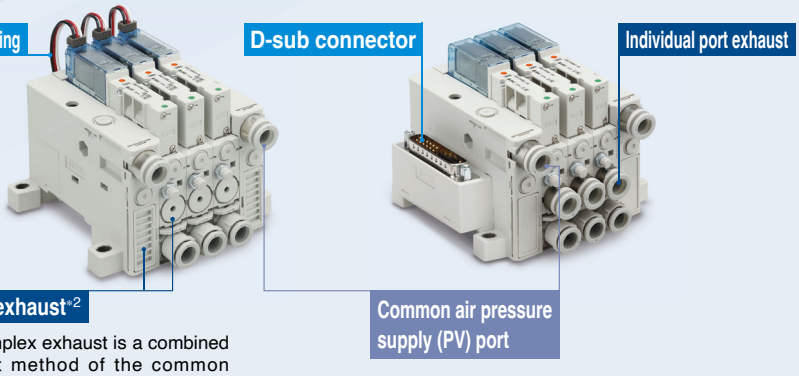
Manifold

Ejector System p. 19

Fieldbus System *1 / Compatible Protocols

Integrated type (For output)	Integrated type (For input/output)	Gateway decentralised system
EX260 	**EX600** 	**EX500** 
DeviceNet® PROFIBUS DP CC-Link EtherNet/IP™ EtherCAT PROFINET Ethernet POWERLINK IO-Link	DeviceNet® PROFIBUS DP CC-Link EtherNet/IP™ EtherCAT PROFINET EtherNet/IP™ compatible wireless base PROFINET compatible wireless base	EtherNet/IP™ PROFINET

*1 This is only available for supply valve and release valve control in Fieldbus systems.



*2 The complex exhaust is a combined exhaust method of the common exhaust from the end plate and the direct exhaust from each station.

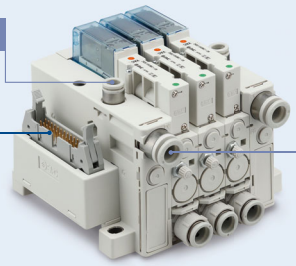
*3 Option

Wiring type
- D-sub connector
- Flat ribbon cable connector
- Individual wiring
- Fieldbus system

Exhaust type
- Complex exhaust*2
- Port exhaust
- High-noise reduction silencer exhaust

Air pressure supply (PV) port
- Common supply
- Individual supply

Vacuum Pump System p. 27

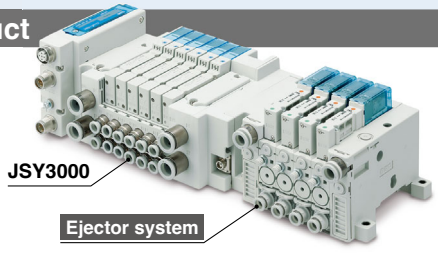


Wiring type
- D-sub connector
- Flat ribbon cable connector
- Individual wiring

Related Product

JSY3000 Combination Manifold

A ZK2 (ejector manifold) with a JSY3000 (valve manifold) connected to the same manifold



IO-Link Compatible p. 14, 17, 24, 26

Energy saving is possible due to the vacuum pressure switch with energy saving function and efficient ejectors.

Air consumption 93 % reduction[*1]

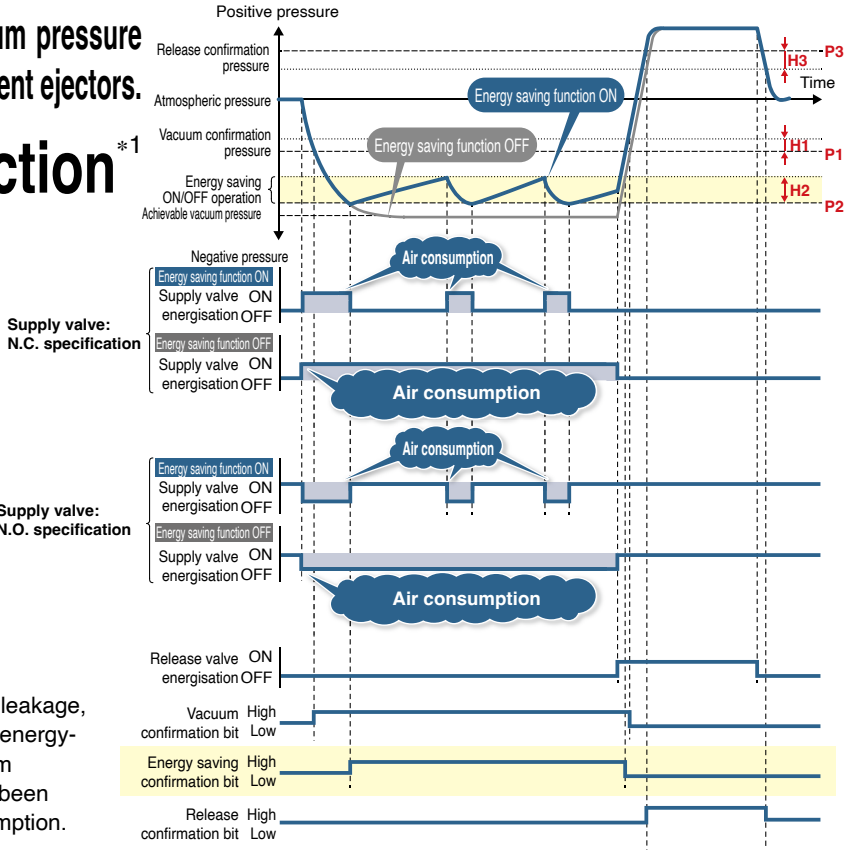
*1 Based on SMC's measurement conditions

Energy saving function ON

Air is supplied **intermittently** when the vacuum decreases.

Energy saving function OFF

Air is supplied **continuously** during the adsorption of the workpiece.

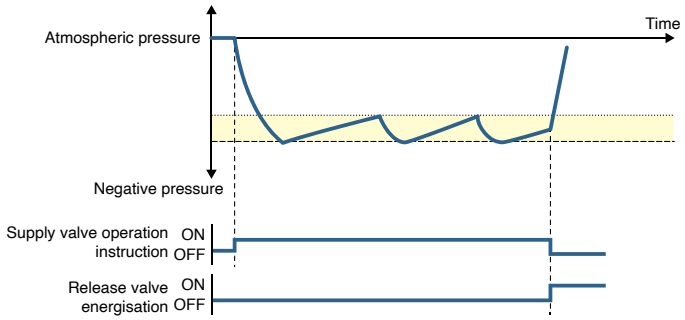


Energy-saving pressure confirmation signal

When adsorbing a workpiece with a large amount of leakage, this signal allows for the confirmation of whether the energy-saving operation is being performed once the vacuum pressure that initiates the energy-saving control has been reached. This contributes to a reduction in air consumption.

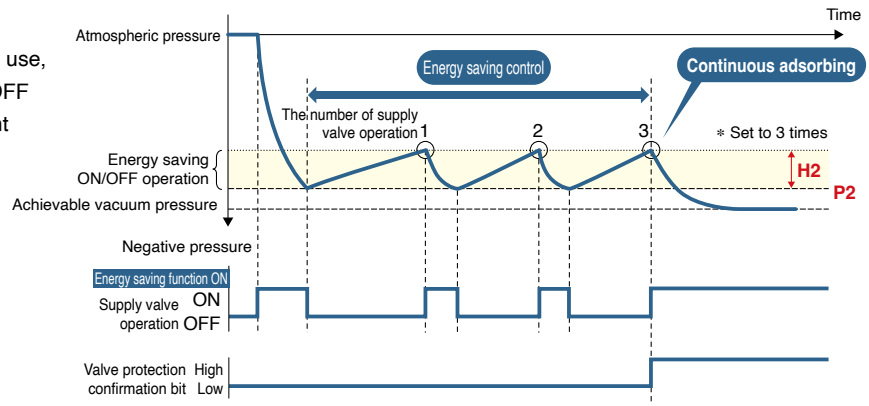
Automatic Release Function

When the supply valve operation instruction is turned OFF, the release valve ON operation is started automatically, reducing the amount of time required for the customer to construct an operating program.



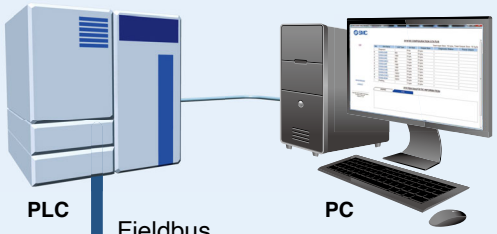
Valve Protection Function

If the supply valve reaches the set number of operations while the energy-saving function is in use, the energy-saving function automatically turns OFF and switches to continuous adsorption to prevent excessive valve operation.



IO-Link Compatible ZK2□A p. 14, 17, 24, 26

Visualisation of operation/equipment status/Remote monitoring and control by communication



Configuration File (IODD File*1)
·Manufacturer ·Product part no. ·Set value

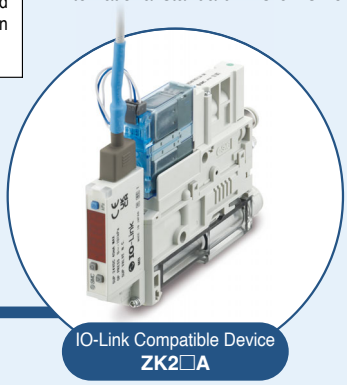
*1 IODD File:
IODD is an abbreviation of IO Device Description. This file is necessary for setting the device and connecting it to a master. Save the IODD file on the PC to be used to set the device prior to use.

IO-Link

IO-Link is an open communication interface technology between the sensor/actuator and the I/O terminal that is an international standard: IEC 61131-9.

Device settings can be set by the master.
- Threshold value
- Operation mode, etc.

Read the device data.
- ON/OFF signal and analogue value
- Device information: Manufacturer, Product part number, Serial number, etc.
- Normal or abnormal device status
- Cable breakage



IO-Link Compatible Device
ZK2□A

IO-Link Master

Implement diagnostic bits in the process data.

The diagnostic bit in the cyclic process data makes it easy to find problems with the equipment. It is possible to find problems with the equipment in real time using the cyclic (periodic) data and to monitor such problems in detail with the noncyclic (aperiodic) data.

Process Data

Input process data	Output process data
4 bytes	2 bytes

Error	Warning	Pressure value diagnosis
• OUT1/2 over current • Outside of zero-clear range • Temperature sensor failure • Master version mismatch	• Valve protection warning • Energy saving operation warning	• Above the upper limit/below the lower limit of the display range

Input Process Data

Byte	1								0							
Bit offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Item	System error	Error	Valve warning	PD_IN forced output	Reservation			Pressure value diagnosis	Release valve output	Supply valve output	Reservation	Pressure confirmation	Pressure confirmation	Release confirmation	Energy saving confirmation	Suction confirmation

Byte	3								2							
Bit offset	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
Item	Measured pressure value															

Output Process Data

Byte	1								0							
Bit offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Item	Reservation								Reservation			Automatic release forced OFF	Valve protection forced OFF	Energy saving control forced OFF	Release instruction	Vacuum instruction

Display function Displays the output communication status and indicates the presence of communication data

Operation and Display

Communication with master	Status			Screen display	Description
Yes	IO-Link mode	Normal	Operate	oPE ↔ 0.0 *1	Normal communication status (readout of measured value, command) ∗ Output process data valid
				idLE ↔ 0.0 *1	Normal communication status (readout of measured value) ∗ Output process data invalid
			Start up	Str ↔ 0.0 *1	At the start of communication
			Preoperate	PrE ↔ 0.0 *1	
		Abnormal	Version does not match	E15	The IO-Link version does not match that of the master.*2
No			Communication disconnection	idLE ↔ 0.0 *1 Str ↔ 0.0 *1 PrE ↔ 0.0 *1	Normal communication was not received for 1 s or longer.
	SIO mode*3			SIO ↔ 0.0 *1	General switch output

∗1 Displays the measured value ∗2 When the product is connected to the master with version "V1.0," error E15 is generated. ∗3 Cannot be used in SIO mode

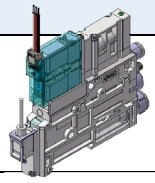
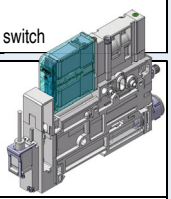
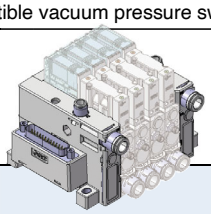
ZK2□A Series Vacuum Unit Guide by Type

Ejector System

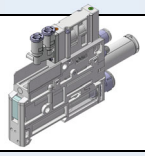
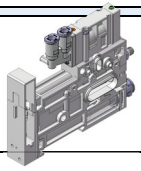
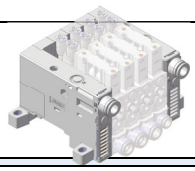
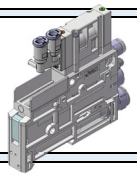
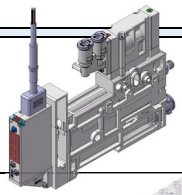
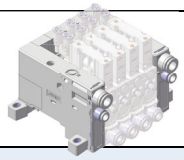
			Valve			Switch and Sensor			How to order Page
			Supply valve	Release valve	Without	Without energy saving function: Pressure sensor/ Pressure switch for vacuum	With energy saving function: Pressure switch for vacuum	IO-Link compatible vacuum pressure switch (The energy saving function can be turned ON or OFF via the parameter settings.)	
Ejector System	Single Unit	With valve Without energy saving function	●	●	–	●	–	–	12
			●	–	–	●	–	–	
			●	●	–	–	–	–	
			●	–	–	–	–	–	
		With valve With energy saving function	●	●	–	–	●	–	13
		With valve IO-Link compatible vacuum pressure switch	●	●	–	–	–	●	14
		Without valve	–	–	●	●	–	–	18
			–	–	●	–	–	–	
	For Manifold	Individual wiring, D-sub/Flat ribbon cable connector With valve Without energy saving function	●	●	–	●	–	–	15
			●	–	–	●	–	–	
			●	●	–	–	–	–	
			●	–	–	–	–	–	
		With valve With energy saving function	●	●	–	–	●	–	16
		With valve IO-Link compatible vacuum pressure switch	●	●	–	–	–	●	17
		Without valve	–	–	●	●	–	–	18
			–	–	●	–	–	–	
	Manifold		–						19
	For Manifold	Fieldbus System With valve	●	●	–	●	–	–	20
			●	–	–	●	–	–	
			●	●	–	–	–	–	
			●	–	–	–	–	–	
	Manifold		–						21

ZK2□A Series Vacuum Unit Guide by Type

Vacuum Pump System

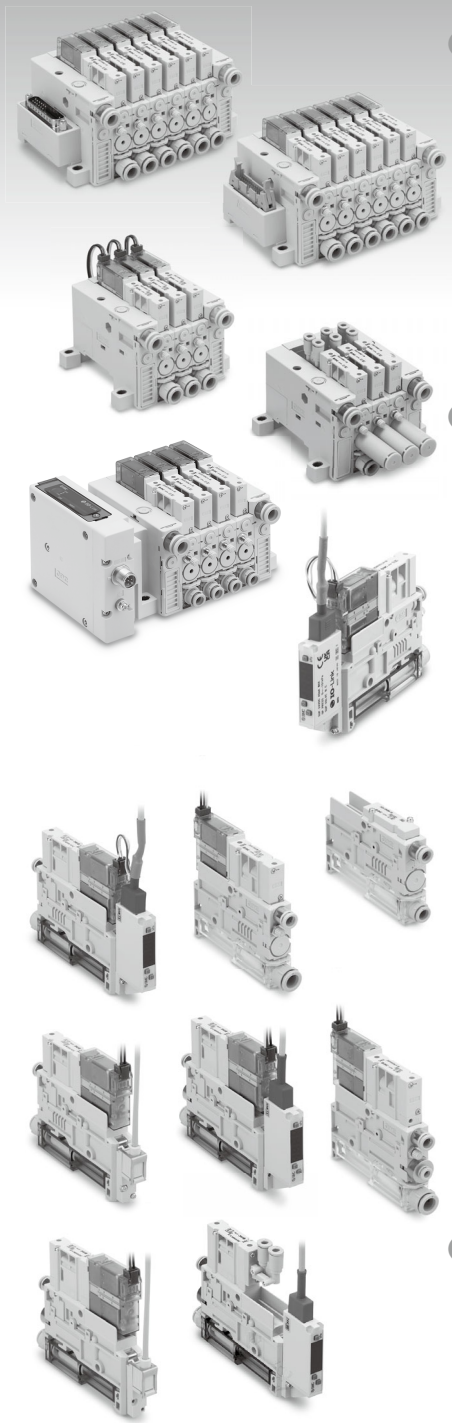
			Valve			Switch and Sensor		How to order Page
			Supply valve	Release valve	Without	Pressure sensor/ Pressure switch for vacuum	IO-Link compatible vacuum pressure switch	
Vacuum Pump System	Single Unit	With valve 	●	●	–	●	–	23
			●	–	–	●	–	
			●	●	–	–	–	
			●	–	–	–	–	
		With valve IO-Link compatible vacuum pressure switch 	●	●	–	–	●	24
	For Manifold	With valve	●	●	–	●	–	25
			●	–	–	●	–	
			●	●	–	–	–	
			●	–	–	–	–	
		With valve IO-Link compatible vacuum pressure switch	●	●	–	–	●	26
	Manifold		–					27

Air Operated Specification

			Valve		Switch and Sensor (Without energy saving function)	How to order Page
			Supply valve	Release valve		
Ejector System	Single Unit		●	●	●	73
			●	●	–	
	For Manifold		●	●	●	74
			●	●	–	
	Manifold		–			
Vacuum Pump System	Single Unit		●	●	●	75
			●	●	–	
	For Manifold		●	●	●	76
			●	●	–	
	Manifold		–			

CONTENTS

Vacuum Unit *ZK2□A Series*



Ejector System **Vacuum Unit**

ZK2□A Series

CE UK CA RoHS

Single Unit Ejector + With Valve + Without Energy Saving Function

Refer to pages 36, 37, 39, and 40 for the port layouts (including circuit examples) and pages 57 to 59 for the dimensions.

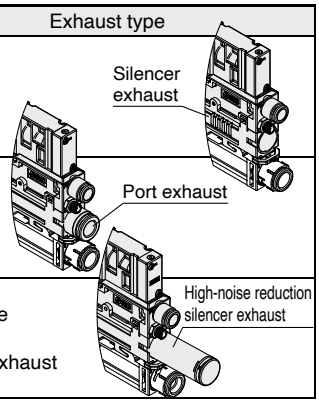
How to Order

ZK2 A 12 K 5 A L A- 08 -□

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽

❶ Body/Exhaust type

Symbol	Body	Exhaust type
A	Single unit	Silencer exhaust*1
B		Port exhaust
G		High-noise reduction silencer exhaust



*1 With exhaust port when ❷ is 12 or 15

❹ Rated voltage (Supply valve/Release valve)

Symbol	Voltage
5	24 VDC
6	12 VDC

❺ Pressure switch for vacuum/Pressure sensor

Symbol	Type	Pressure range [kPa]	Specifications		
			NPN	PNP	With unit selection function*4
			2 outputs		
A	Pressure switch for vacuum	0 to -101	●	–	●
B			●	–	None (SI unit only)
C			–	●	●
D			–	●	None (SI unit only)
E		-100 to 100	●	–	●
F			●	–	None (SI unit only)
H			–	●	●
J			–	●	None (SI unit only)
P	Pressure sensor	0 to -101	Analogue output 1 to 5 V		
T		-100 to 100			
N	Without pressure switch for vacuum/pressure sensor				

*4 The unit for the type without the unit selection function is fixed as kPa.

❼ Vacuum (V) port

Symbol	Vacuum (V) port
06	Ø 6
08	Ø 8
07	Ø 1/4"
09	Ø 5/16"

❷ Nominal nozzle size*2

Symbol	Nominal nozzle size
07	Ø 0.7
10	Ø 1.0
12	Ø 1.2
15	Ø 1.5

*2 Refer to page 29 for the standard supply pressure per nozzle diameter.

❸ Combination of supply valve and release valve

Symbol	Supply valve			Release valve
	N.C.	N.O.	Self-holding	N.C.
K	●	–	–	●
J	●	–	–	–
R	–	–	●*3	●
E	–	●	–	●

*3 Supply valve maintains vacuum by energisation (20 ms or more). Stopping the vacuum turns on the release valve. Refer to the precautions on page 90.

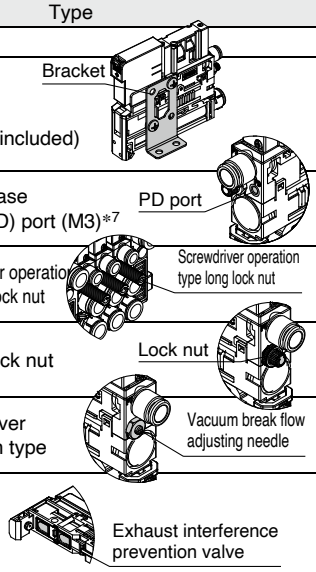
❻ Connector (Supply valve/Release valve/Pressure switch for vacuum)

Symbol	For supply valve/ release valve: 300 mm (Connector assembly)*5	For pressure switch for vacuum: 2 m (Lead wire with connector)	Pressure sensor assembly: 3 m (With lead wire)	Note
L	●	●		Cannot be selected when ❺ is N
L1	None	●		
L2	●	None		Cannot be selected when ❺ is P or T
L3	None	None		

*5 For the connector length other than 300 mm, order the connector assembly on page 44 separately.

❽ Option*6 (For details on the Function/Application, refer to page 69.)

Symbol	Type	Note
—	Without option	—
B	Mounting bracket for single unit (nuts and bolts are included)	—
D	With individual release pressure supply (PD) port (M3)*7	Cannot be selected when ❸ is J
E	Vacuum release flow adjustment needle*8: Screwdriver operation type long lock nut	Cannot be selected when ❸ is J Can be selected only for the combination of J and K
J	Vacuum release flow adjustment needle*8: Round lock nut	
K	Vacuum release flow adjustment needle*8: Screwdriver operation type	
W	With exhaust interference prevention valve	When J is selected for ❸, install the atmospheric release valve or vacuum release valve in the middle of the vacuum piping.



*6 When more than one option is selected, list the option symbols in alphabetical order. (Example -BJ)

*7 Use a One-touch fitting or barb fitting (M-3AU-4) for piping. (O.D.: Within Ø 6.2)

*8 When "K," "R," or "E" is selected for ❸, a vacuum release flow adjustment needle is installed as standard. However, select it when improved operability is required.

Ejector System **Vacuum Unit**

ZK2□A Series

Single Unit **Ejector + With Valve + With Energy Saving Function**

Refer to page 37 for the port layout (including a circuit example) and page 60 for the dimensions.

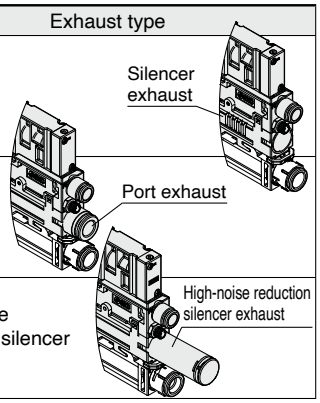
How to Order

ZK2 [A] [12] [K] [5] [K] [W] A− [08] − [ ]

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽

❶ Body/Exhaust type

Symbol	Body	Exhaust type
A	Single unit	Silencer exhaust*1
B		Port exhaust
G		High-noise reduction silencer exhaust



*1 With exhaust port when ❷ is 12 or 15

❷ Nominal nozzle size*2

Symbol	Nominal nozzle size
07	Ø 0.7
10	Ø 1.0
12	Ø 1.2
15	Ø 1.5

*2 Refer to page 29 for the standard supply pressure per nozzle diameter.

❸ Combination of supply valve and release valve

Symbol	Supply valve		Release valve
	N.C.	N.O.	N.C.
K	●	—	●
E	—	●	●

❹ Rated voltage (Supply valve/Release valve)

Symbol	Voltage
5	24 VDC
6	12 VDC

❺ Pressure switch for vacuum with energy saving function

Symbol	Pressure range [kPa]	Specifications		
		NPN	PNP	With unit selection function*3
		1 output		
K	-100 to 100	●	—	●
Q		●	—	None (SI unit only)
R		—	●	●
S		—	●	None (SI unit only)

*3 The unit for the type without the unit selection function is fixed as kPa.

❻ Connector

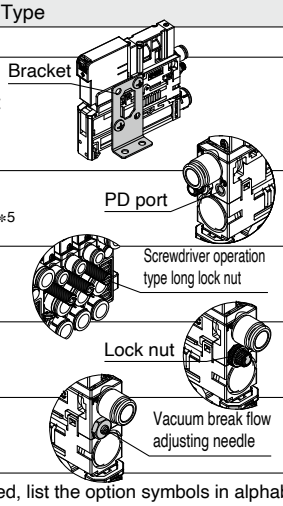
Symbol	For pressure switch for vacuum with energy saving function: 2 m (Lead wire with connector)
W	●
L3	None

❼ Vacuum (V) port

Symbol	Vacuum (V) port
06	Ø 6
08	Ø 8
07	Ø 1/4"
09	Ø 5/16"

❽ Option*4 (For details on the Function/Application, refer to page 69.)

Symbol	Type		Note
—	Without option		—
B	Mounting bracket for single unit (nuts and bolts are included)		—
D	With individual release pressure supply (PD) port (M3)*5		—
E	Vacuum release flow adjustment needle*6	Screwdriver operation type long lock nut	Can be selected only for the combination of J and K
J		Round lock nut	
K		Screwdriver operation type	



*4 When more than one option is selected, list the option symbols in alphabetical order. (Example -BJ)
*5 Use a One-touch fitting or barb fitting (M-3AU-4) for piping. (O.D.: Within Ø 6.2)
*6 A vacuum release flow adjustment needle is installed as standard. However, select it when improved operability is required.

Ejector System **Vacuum Unit**

ZK2□A Series

Single Unit **Ejector +** With **Valve + IO-Link Compatible**

Refer to pages 37 and 40 for the port layouts (including circuit examples) and page 60 for the dimensions.

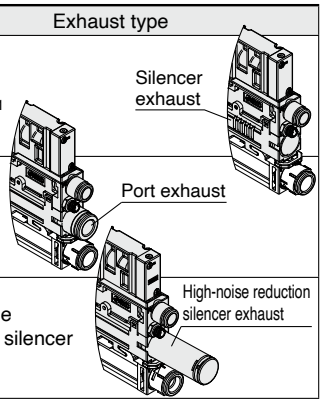
How to Order

ZK2 **A** **12** **K** **5** **1** **H** A− **08** −□

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽

❶ Body/Exhaust type

Symbol	Body	Exhaust type
A	Single unit	Silencer exhaust*1
B		Port exhaust
G		High-noise reduction silencer exhaust



*1 With exhaust port when ❷ is 12 or 15

❷ Nominal nozzle size*2

Symbol	Nominal nozzle size
07	Ø 0.7
10	Ø 1.0
12	Ø 1.2
15	Ø 1.5

*2 Refer to page 29 for the standard supply pressure per nozzle diameter.

❸ Combination of supply valve and release valve

Symbol	Supply valve		Release valve
	N.C.	N.O.	N.C.
K	●	–	●
E	–	●	●

❹ Rated voltage (Supply valve/Release valve)

Symbol	Voltage
5	24 VDC

❺ IO-Link compatible vacuum pressure switch

Symbol	Pressure range [kPa]	Specifications	
		Energy saving function*3	With unit selection function*4
1	0 to -101	–	●
2		–	None (SI unit only)
3	-100 to 100	–	●
4		–	None (SI unit only)
5		●	●
6		●	None (SI unit only)

*3 In order to use the energy-saving function, 2 check valves are required. Symbols "1," "2," "3," and "4" for ❺ are for a single check valve, so the energy-saving function cannot be used. Symbols "5" and "6" for ❺ are equipped with 2 check valves, so the energy-saving function can be used. However, when the vacuum is stopped, workpiece release by atmospheric release cannot be used.

*4 The unit for the type without the unit selection function is fixed as kPa.

❻ Connector

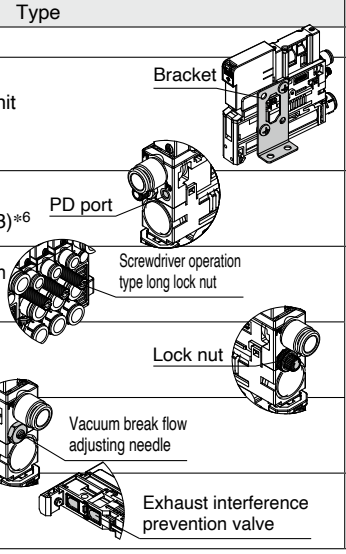
Symbol	Lead wire with connector for IO-Link (With M12 connector): 300 mm
H	●
L3	None

❼ Vacuum (V) port

Symbol	Vacuum (V) port
06	Ø 6
08	Ø 8
07	Ø 1/4"
09	Ø 5/16"

❽ Option*5 (For details on the Function/Application, refer to page 69.)

Symbol	Type		Note
–	Without option		–
B	Mounting bracket for single unit (nuts and bolts are included)		–
D	With individual release pressure supply (PD) port (M3)*6		–
E	Vacuum release flow adjustment needle*7	Screwdriver operation type long lock nut	Can be selected only for the combination of J and K
J		Round lock nut	
K		Screwdriver operation type	
W	With exhaust interference prevention valve		Cannot be selected when ❺ is 5 or 6



*5 When more than one option is selected, list the option symbols in alphabetical order. (Example -BJ)

*6 Use a One-touch fitting or barb fitting (M-3AU-4) for piping. (O.D.: Within Ø 6.2)

*7 A vacuum release flow adjustment needle is installed as standard. However, select it when improved operability is required.

Ejector System Vacuum Unit

ZK2□A Series

CE UK CA RoHS

For Manifold Ejector + With Valve + Without Energy Saving Function

Refer to page 19 for How to Order Manifold, pages 37, 38, 40, and 41 for the port layouts (including circuit examples), and pages 62 to 64 for the dimensions.

How to Order

ZK2 C 12 K 5 A L A− 08 −□

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽

❶ Body/Exhaust type

Symbol	Body	Exhaust type
C	For Manifold	Complex exhaust*1 (Direct exhaust, End plate exhaust)
F		Individual port exhaust (Individual port exhaust)
H		High-noise reduction silencer exhaust (High-noise reduction silencer exhaust)

*1 Combination of direct exhaust and end plate exhaust from each station

❹ Rated voltage (Supply valve/Release valve)

Symbol	Voltage
5	24 VDC
6	12 VDC

❺ Pressure switch for vacuum/Pressure sensor

Symbol	Type	Pressure range [kPa]	Specifications		
			NPN	PNP	With unit selection function*4
			2 outputs		
A	Pressure switch for vacuum	0 to -101	●	—	●
B			●	—	None (SI unit only)
C			—	●	●
D			—	●	None (SI unit only)
E		-100 to 100	●	—	●
F			●	—	None (SI unit only)
H			—	●	●
J			—	●	None (SI unit only)
P	Pressure sensor	0 to -101	Analogue output 1 to 5 V		
T		-100 to 100			
N	Without pressure switch for vacuum/pressure sensor				

*4 The unit for the type without the unit selection function is fixed as kPa.

❼ Vacuum (V) port

Symbol	Vacuum (V) port
06	Ø 6
08	Ø 8
07	Ø 1/4"
09	Ø 5/16"

❷ Nominal nozzle size*2

Symbol	Nominal nozzle size
07	Ø 0.7
10	Ø 1.0
12	Ø 1.2
15	Ø 1.5

*2 Refer to page 29 for the standard supply pressure per nozzle diameter.

❸ Combination of supply valve and release valve

Symbol	Supply valve			Release valve
	N.C.	N.O.	Self-holding	N.C.
K	●	—	—	●
J	●	—	—	—
R	—	—	●*3	●
E	—	●	—	●

*3 Supply valve maintains vacuum by energisation (20 ms or more). Stopping the vacuum turns on the release valve. Refer to the precautions on page 90.

❻ Connector (Supply valve/Release valve/Pressure switch for vacuum)

Symbol	For supply valve/release valve		For pressure switch for vacuum: 2 m (Lead wire with connector)	Pressure sensor assembly: 3 m (With lead wire)	Note
	Common wiring specification (Plug-in)	Individual wiring specification: 300 mm (Connector assembly)*5			
C	●	None	●		Cannot be selected when ❺ is N
C1	●	None	None		Cannot be selected when ❺ is P or T
L	None	●	●		Cannot be selected when ❺ is N
L1	None	None	●		
L2	None	●	None		Cannot be selected when ❺ is P or T
L3	None	None	None		

*5 For the connector length other than 300 mm, order the connector assembly on page 44 separately.

❽ Option*6 (For details on the Function/Application, refer to page 69.)

Symbol	Type	Note
—	Without option	—
E	Vacuum release flow adjustment needle*7: Screwdriver operation type long lock nut	Cannot be selected when ❸ is J. Can be selected only for the combination of J and K
J	Round lock nut	
K	Screwdriver operation type	
L	Manifold individual supply specification*8	—
P	With manifold common release pressure supply (PD) port	Cannot be selected when ❸ is J
W	With exhaust interference prevention valve	When J is selected for ❸, install the atmospheric release valve or vacuum release valve in the middle of the vacuum piping.

*6 When more than one option is selected, list the option symbols in alphabetical order. (Example -EL)

*7 When "K," "R," or "E" is selected for ❸, a vacuum release flow adjustment needle is installed as standard. However, select it when improved operability is required.

*8 When F or H is selected for ❶ and L is selected for the option, the space for adjusting the needle is reduced. Products which can be operated more easily can be specified by option E.

Ejector System **Vacuum Unit**

ZK2□A Series

CE UK CA RoHS

For Manifold **Ejector + With Valve + With Energy Saving Function**

Refer to page 19 for How to Order Manifold, pages 38 and 42 for the port layouts (including circuit examples).

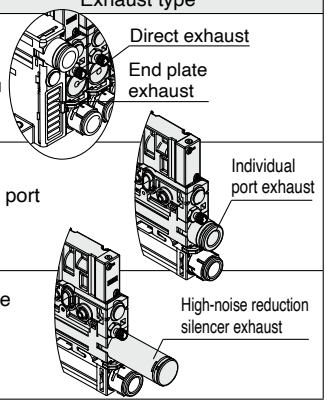
How to Order

ZK2 **C** **12** **K** **5** **K** **W** **A** – **08** – **□**

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽

❶ Body/Exhaust type

Symbol	Body	Exhaust type
C	For Manifold	Complex exhaust*1 (Direct exhaust, End plate exhaust)
F		Individual port exhaust (Individual port exhaust)
H		High-noise reduction silencer exhaust (High-noise reduction silencer exhaust)



*1 Combination of direct exhaust and end plate exhaust from each station

❷ Nominal nozzle size*2

Symbol	Nominal nozzle size
07	Ø 0.7
10	Ø 1.0
12	Ø 1.2
15	Ø 1.5

*2 Refer to page 29 for the standard supply pressure per nozzle diameter.

❸ Combination of supply valve and release valve

Symbol	Supply valve		Release valve
	N.C.	N.O.	N.C.
K	●	–	●
E	–	●	●

❹ Rated voltage (Supply valve/Release valve)

Symbol	Voltage
5	24 VDC
6	12 VDC

❺ Pressure switch for vacuum with energy saving function

Symbol	Pressure range [kPa]	Specifications		
		NPN	PNP	With unit selection function*3
		1 output		
K	-100 to 100	●	–	●
Q		●	–	None (SI unit only)
R		–	●	●
S		–	●	None (SI unit only)

*3 The unit for the type without the unit selection function is fixed as kPa.

❻ Connector

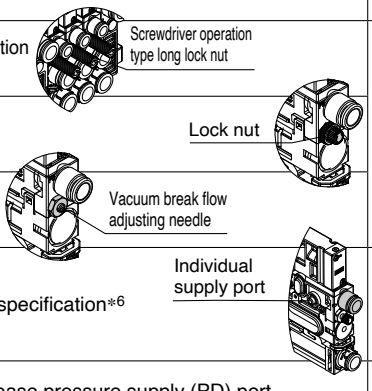
Symbol	For pressure switch for vacuum with energy saving function: 2 m (Lead wire with connector)
W	●
L3	None

❼ Vacuum (V) port

Symbol	Vacuum (V) port
06	Ø 6
08	Ø 8
07	Ø 1/4"
09	Ø 5/16"

❽ Option*4 (For details on the Function/Application, refer to page 69.)

Symbol	Type	Note
–	Without option	–
E	Vacuum release flow adjustment needle*5: Screwdriver operation type long lock nut	Can be selected only for the combination of J and K
J	Vacuum release flow adjustment needle*5: Round lock nut	
K	Vacuum release flow adjustment needle*5: Screwdriver operation type	
L	Manifold individual supply specification*6	–
P	With manifold common release pressure supply (PD) port	–



*4 When more than one option is selected, list the option symbols in alphabetical order. (Example -EL)
*5 A vacuum release flow adjustment needle is installed as standard. However, select it when improved operability is required.
*6 When F or H is selected for ❶ and L is selected for the option, the space for adjusting the needle is reduced. Products which can be operated more easily can be specified by option E.

Ejector System **Vacuum Unit**

ZK2□A Series

CE UK CA RoHS

For Manifold **Ejector +** With **Valve + IO-Link Compatible**

Refer to page 19 for How to Order Manifold, pages 38 and 42 for the port layouts (including circuit examples).

How to Order

ZK2 C 12 K 5 1 H A− 08 − □

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽

❶ Body/Exhaust type

Symbol	Body	Exhaust type
C	For Manifold	Complex exhaust*1 (Direct exhaust, End plate exhaust)
F		Individual port exhaust (Individual port exhaust)
H		High-noise reduction silencer exhaust (High-noise reduction silencer exhaust)

*1 Combination of direct exhaust and end plate exhaust from each station

❷ Nominal nozzle size*2

Symbol	Nominal nozzle size
07	Ø 0.7
10	Ø 1.0
12	Ø 1.2
15	Ø 1.5

*2 Refer to page 29 for the standard supply pressure per nozzle diameter.

❸ Combination of supply valve and release valve

Symbol	Supply valve		Release valve
	N.C.	N.O.	N.C.
K	●	–	●
E	–	●	●

❹ Rated voltage (Supply valve/Release valve)

Symbol	Voltage
5	24 VDC

❺ IO-Link compatible vacuum pressure switch

Symbol	Pressure range [kPa]	Specifications	
		Energy saving function*3	With unit selection function*4
1	0 to -101	–	●
2		–	None (SI unit only)
3	-100 to 100	–	●
4		–	None (SI unit only)
5		●	●
6		●	None (SI unit only)

*3 In order to use the energy-saving function, 2 check valves are required. Symbols "1," "2," "3," and "4" for ❺ are for a single check valve, so the energy-saving function cannot be used.
Symbols "5" and "6" for ❺ are equipped with 2 check valves, so the energy-saving function can be used. However, when the vacuum is stopped, workpiece release by atmospheric release cannot be used.

*4 The unit for the type without the unit selection function is fixed as kPa.

❻ Connector

Symbol	Lead wire with connector for IO-Link (With M12 connector): 300 mm
H	●
L3	None

❼ Vacuum (V) port

Symbol	Vacuum (V) port
06	Ø 6
08	Ø 8
07	Ø 1/4"
09	Ø 5/16"

❽ Option*5 (For details on the Function/Application, refer to page 69.)

Symbol	Type		Note
—	Without option		–
E	Vacuum release flow adjustment needle*6	Screwdriver operation type long lock nut (Screwdriver operation type long lock nut)	Can be selected only for the combination of J and K
J		Round lock nut (Lock nut)	
K		Screwdriver operation type (Vacuum break flow adjusting needle)	
L	Manifold individual supply specification*7 (Individual supply port)		–
P	With manifold common release pressure supply (PD) port		–
W	With exhaust interference prevention valve (Exhaust interference prevention valve)		Cannot be selected when ❺ is 5 or 6

*5 When more than one option is selected, list the option symbols in alphabetical order. (Example -EL)

*6 A vacuum release flow adjustment needle is installed as standard. However, select it when improved operability is required.

*7 When F or H is selected for ❶ and L is selected for the option, the space for adjusting the needle is reduced. Products which can be operated more easily can be specified by option E.

Ejector System **Vacuum Unit**

ZK2□A Series

CE UKCA RoHS

Single Unit **For Manifold** **Ejector +** Without **Valve +** Without **Energy Saving Function**

Refer to page 19 for How to Order Manifold.

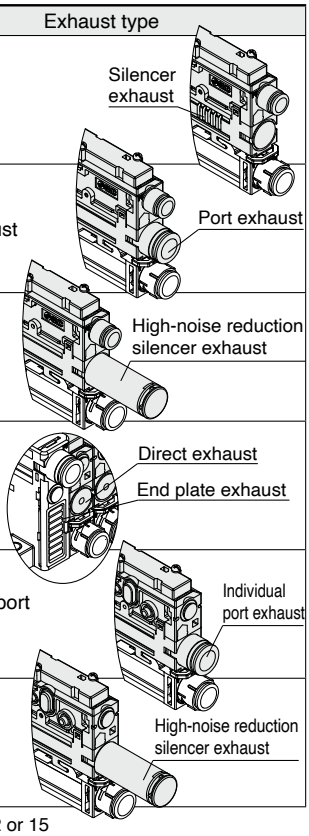
How to Order

ZK2 **A** **12** N0 **N** **N** A− **08** −□

❶ ❷ ❸ ❹ ❺ ❻

❶ Body/Exhaust type

Symbol	Body	Exhaust type
A	Single unit	Silencer exhaust*1
B		Port exhaust
G		High-noise reduction silencer exhaust
C	For Manifold	Complex exhaust*2
F		Individual port exhaust
H		High-noise reduction silencer exhaust



*1 With exhaust port when ❷ is 12 or 15

*2 Combination of direct exhaust and end plate exhaust from each station

❷ Nominal nozzle size*3

Symbol	Nominal nozzle size
07	Ø 0.7
10	Ø 1.0
12	Ø 1.2
15	Ø 1.5

*3 Refer to page 29 for the standard supply pressure per nozzle diameter.

❹ Connector

Symbol	For pressure switch for vacuum: 2 m (Lead wire with connector)	Pressure sensor assembly: 3 m (With lead wire)	Note
Y	●		Cannot be selected when ❸ is N
Y1	None		Cannot be selected when ❸ is P, T, or N
N	None		When "N" is selected for ❸

❸ Pressure switch for vacuum/Pressure sensor

Symbol	Type	Pressure range [kPa]	Specifications: NPN (2 outputs)	Specifications: PNP (2 outputs)	Specifications: With unit selection function*4
A	Pressure switch for vacuum	0 to -101	●	–	●
B			●	–	None (SI unit only)
C			–	●	●
D			–	●	None (SI unit only)
E		-100 to 100	●	–	●
F			●	–	None (SI unit only)
H			–	●	●
J			–	●	None (SI unit only)
P	Pressure sensor	0 to -101	Analogue output 1 to 5 V		
T		-100 to 100			
N	Without pressure switch for vacuum/pressure sensor				

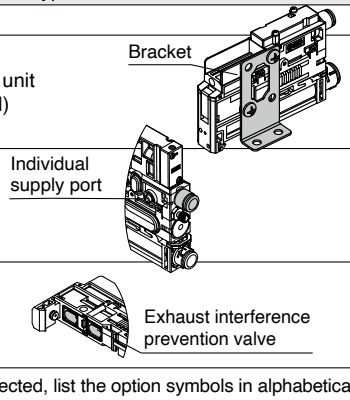
*4 The unit for the type without the unit selection function is fixed as kPa.

❺ Vacuum (V) port

Symbol	Vacuum (V) port
06	Ø 6
08	Ø 8
07	Ø 1/4"
09	Ø 5/16"

❻ Option*5 (For details on the Function/Application, refer to page 69.)

Symbol	Type	Note
–	Without option	–
B	Mounting bracket for single unit (nuts and bolts are included)	Cannot be selected when ❶ is C, F, or H
L	Manifold individual supply specification	Cannot be selected when ❶ is A, B, or G
W	With exhaust interference prevention valve	Install the atmospheric release valve or vacuum release valve in the middle of the vacuum piping.



*5 When more than one option is selected, list the option symbols in alphabetical order. (Example -BW)

Ejector System Vacuum Unit

Individual Wiring/D-sub Connector/Flat Ribbon Cable Connector

ZK2□A Series

Manifold

Refer to pages 15 to 18 for the ejector installed to the manifold, pages 37, 38, 40 to 42 for the port layouts (including circuit examples), and pages 62 to 64 for the dimensions.

How to Order Manifold

ZZK2 ❶04 A− ❷A ❸1 ❹L − ❺

If the manifold parts (set of end plates for both ends and tension bolts) are shipped unassembled, please refer to page 48.

❶ Stations*1

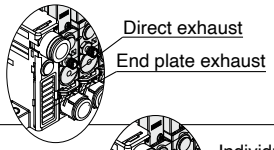
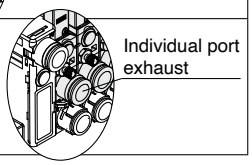
Symbol	Stations
01	1 station
02	2 stations
⋮	⋮
10	10 stations

*1 For adequate performance, the number of stations that can be operated simultaneously depends on the nozzle diameter. Refer to the Max. Number of Manifold Stations that can be Operated Simultaneously on page 29.

❷ System/Port

Symbol	System	Port
A	Ejector system	Ø 8 (Common PV)
AN		Ø 5/16" (Common PV)

❸ Exhaust

Symbol	Exhaust	Selectable single unit number
1	Complex exhaust*2	ZK2C 
2	Individual exhaust	ZK2F, ZK2H 

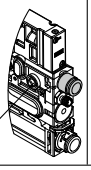
*2 Combination of direct exhaust and end plate exhaust from each station

❹ Supply valve and release valve wiring*2

Symbol	Wiring	Selectable wiring for manifold (Refer to ❻ on pages 15 to 17 and ❹ on page 18.)										
		C	C1	L	L1	L2	L3	W	H	Y	Y1	N
L	Individual wiring	–	–	●	●	●	●	●	●	–	–	–
F	D-sub connector	●	●	–	–	–	–	–	–	–	–	–
P	Flat ribbon cable connector	●	●	–	–	–	–	–	–	–	–	–
N	No wiring (No valve)	–	–	–	–	–	–	–	–	●	●	●

*3 Common wiring F/P is available only for solenoid valve wiring. Individual wiring is specified for vacuum switches and sensors.

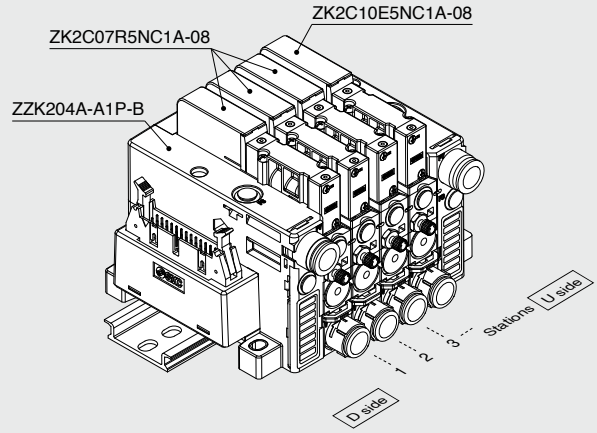
❺ Option*4 (For details on the Function/Application, refer to page 69.)

Symbol	Type	Selectable option for manifold (Refer to ❽ on pages 15 to 17 and ❻ on page 18.)						Note
		E	J	K	L	P	W	
–	Without option	●	●	●	–	–	●	–
B	With DIN rail mounting bracket*5	●	●	●	●	●	●	–
D	With common release pressure supply (PD) port	●	●	●	–	◎*6	●	Cannot be selected when ❹ is N
L	Manifold individual supply specification / Individual supply port 	●	●	●	◎*6	–	●	–

*4 When more than one option is selected, list the option symbols in alphabetical order. (Example -BD)
*5 The DIN rail should be ordered separately. (Refer to page 48.)
*6 When the option D is selected, select P for single unit for manifold. When the option L is selected, select L for single unit for manifold. (◎ must be selected.)

How to Order Valve Manifold Assembly

Example



ZZK204A-A1P-B ····· 1 set (Manifold part number)
*** ZK2C07R5NC1A-08 ····· 3 sets**
*** ZK2C10E5NC1A-08 ····· 1 set**
*** The asterisk denotes the symbol for the assembly.**
*** Prefix to the single unit part number.**

- When the manifold is viewed from V port, the first station starts from the left (D side).
- After the manifold part number, specify the installed single unit from the first station.
- Complex exhaust and individual port exhaust cannot be mixed in the ejector system manifold.
- The DIN rail should be ordered separately. (Refer to page 48.)

Ejector System **Vacuum Unit**

Fieldbus System

ZK2□A Series

CE UK CA RoHS

For Manifold **Ejector +** With **Valve +** Without **Energy Saving Function**

Refer to page 21 for How to Order Manifold.

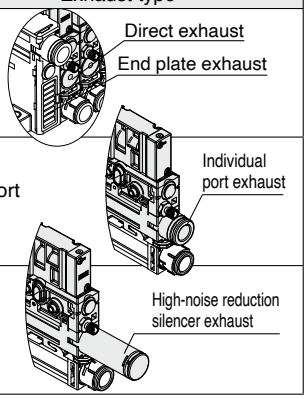
How to Order Ejectors

ZK2 C 12 K 5 A C A− 08 − □

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽

❶ Body/Exhaust type

Symbol	Body	Exhaust type
C	For Manifold	Complex exhaust∗1 (Direct exhaust, End plate exhaust)
F		Individual port exhaust (Individual port exhaust)
H		High-noise reduction silencer exhaust (High-noise reduction silencer exhaust)



∗1 Combination of direct exhaust and end plate exhaust from each station

❷ Nominal nozzle size∗2

Symbol	Nominal nozzle size
07	Ø 0.7
10	Ø 1.0
12	Ø 1.2
15	Ø 1.5

∗2 Refer to page 29 for the standard supply pressure per nozzle diameter.

❸ Combination of supply valve and release valve

Symbol	Supply valve			Release valve
	N.C.	N.O.	Self-holding	N.C.
K	●	–	–	●
J	●	–	–	–
R	–	–	●∗3	●
E	–	●	–	●

∗3 Supply valve maintains vacuum by energisation (20 ms or more). Stopping the vacuum turns on the release valve. Refer to the precautions on page 90.

❹ Rated voltage (Supply valve/Release valve)

Symbol	Voltage
5	24 VDC

❺ Pressure switch for vacuum/Pressure sensor

Symbol	Type	Pressure range [kPa]	Specifications		
			NPN	PNP	With unit selection function∗4
			2 outputs		
A	Pressure switch for vacuum	0 to -101	●	–	●
B			●	–	None (SI unit only)
C			–	●	●
D			–	●	None (SI unit only)
E		-100 to 100	●	–	●
F			●	–	None (SI unit only)
H			–	●	●
J			–	●	None (SI unit only)
P	Pressure sensor	0 to -101	Analogue output 1 to 5 V		
T		-100 to 100			
N	Without pressure switch for vacuum/pressure sensor				

∗4 The unit for the type without the unit selection function is fixed as kPa.

❻ Connector (Supply valve/Release valve/Pressure switch for vacuum)

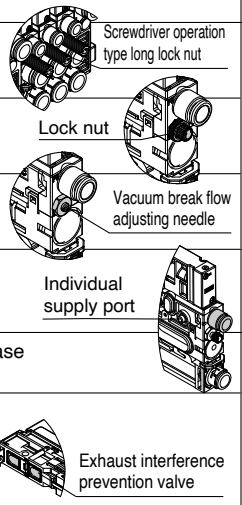
Symbol	For supply valve/ release valve	For pressure switch for vacuum: 2 m (Lead wire with connector)	Pressure sensor assembly: 3 m (With lead wire)	Note
	Common wiring specification (Plug-in)			
C	●	●		Cannot be selected when ❺ is N
C1	●	None		Cannot be selected when ❺ is P or T

❼ Vacuum (V) port

Symbol	Vacuum (V) port
06	Ø 6
08	Ø 8
07	Ø 1/4"
09	Ø 5/16"

❽ Option∗5 (For details on the Function/Application, refer to page 69.)

Symbol	Type		Note
—	Without option		–
E	Vacuum release flow adjustment needle∗6	Screwdriver operation type long lock nut	Cannot be selected when ❸ is J Can be selected only for the combination of J and K
J		Round lock nut	
K		Screwdriver operation type	
L	Manifold individual supply specification∗7		–
P	With manifold common release pressure supply (PD) port		Cannot be selected when ❸ is J
W	With exhaust interference prevention valve		When J is selected for ❸, install the atmospheric release valve or vacuum release valve in the middle of the vacuum piping.



∗5 When more than one option is selected, list the option symbols in alphabetical order. (Example -EL)

∗6 When "K," "R," or "E" is selected for ❸, a vacuum release flow adjustment needle is installed as standard. However, select it when improved operability is required.

∗7 When F or H is selected for ❶ and L is selected for the option, the space for adjusting the needle is reduced. Products which can be operated more easily can be specified by option E.

Ejector System **Vacuum Unit**

Fieldbus System

ZK2□A Series

Manifold

Refer to page 2 0 for the ejector installed to the manifold and pages 65 to 68 for the dimensions.

Fieldbus Compatible Vacuum Unit How to Order Manifolds

ZZK2 [04] A− [A] [1] [S6] [Q] [2] [1] − [ ]

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽

❶ Stations*1

Symbol	Stations	Note
01	1 station	2 outputs per station (Supply valve/ Release valve) Max. 16 outputs
02	2 stations	
⋮	⋮	
08	8 stations	

*1 For adequate performance, the number of stations that can be operated simultaneously depends on the nozzle diameter. Refer to the Max. Number of Manifold Stations that can be Operated Simultaneously on page 29.

❷ System/Port

Symbol	System	Port
A	Ejector system	Ø 8 (Common PV)
AN		Ø 5/16" (Common PV)

❸ Exhaust

Symbol	Exhaust	Selectable single unit number
1	Complex exhaust*2	ZK2C
2	Individual exhaust	ZK2F, ZK2H

*2 Combination of direct exhaust and end plate exhaust from each station

❹ SI unit

Symbol	SI unit
S0	Without SI unit
S	EX260/EX500
S6	EX600

❺ SI unit

EX260

Symbol		Protocol	Number of outputs	Communication connector specifications
Positive common (NPN)	Negative common (PNP)			
QA	**QAN**	DeviceNet®	32	M12
NA	**NAN**	PROFIBUS DP		M12
NC	**NCN**			D-sub
VA	**VAN**	CC-Link		M12
DA	**DAN**	EtherCAT		M12
FA	**FAN**	PROFINET		M12
EA	**EAN**	EtherNet/IP™		M12
—*3	**GAN**	Ethernet POWERLINK		M12
—*3	**KAN**	IO-Link		M12

*3 Positive common (NPN) type is not available.

EX500

Symbol	SI unit	Number of outputs	Connector specifications
A3N	Gateway decentralised system 2	32*4, *5	M12

*4 16 outputs can be set by switching the built-in setting switch.
*5 When using the SI unit with 32 outputs, use the GW unit compatible with the EX500 Gateway Decentralised System 2 (128 points).

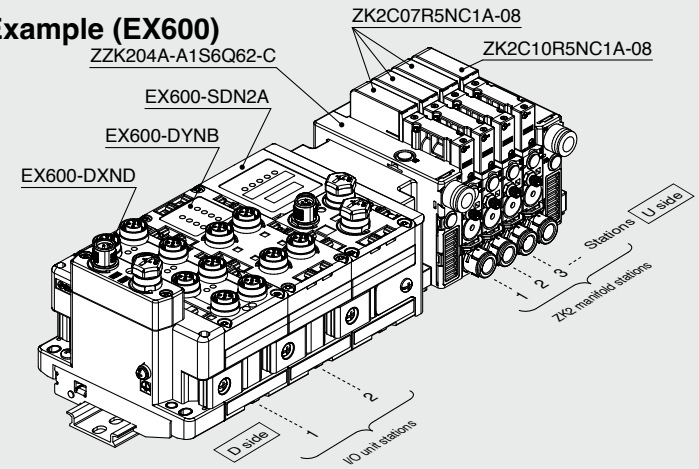
EX600*6

Symbol	Protocol	Number of outputs
Q	DeviceNet®	32
N	PROFIBUS DP	
V	CC-Link	
EB	EtherNet/IP™ (IO-Link unit)	
DA	EtherCAT (IO-Link unit)	
FA	PROFINET (IO-Link unit)	
WE	EtherNet/IP™ compatible wireless base*7	
WF	PROFINET compatible wireless base*7	
WS	Wireless remote*7	

*6 I/O unit cannot be mounted without SI unit.
*7 The wireless system is suitable for use only in a country where it is in accordance with the Radio Act and regulations of that country.

How to Order Valve Manifold Assembly

Example (EX600)



ZZK204A-A1S6Q62-C ····· 1 set (Manifold part number)
*** ZK2C07R5NC1A-08 ····· 3 sets**
*** ZK2C10R5NC1A-08 ····· 1 set**
*** EX600-DXND ····· 1 set I/O unit part number (Station 1)**
*** EX600-DYNB ····· 1 set I/O unit part number (Station 2)**
*** The asterisk denotes the symbol for the assembly.**
*** Prefix to the single unit part number.**

- When the manifold is viewed from V port, the first station starts from the left (D side).
- After the manifold part number, state the ejectors to be mounted in order starting with the first station, and then state the I/O units in order starting with the first station as shown in the figure.
- Refer to page 54 for the I/O unit part numbers.
- Complex exhaust and individual port exhaust cannot be mixed in the ejector system manifold.
- The DIN rail should be ordered separately. (Refer to page 48.)

❻ SI output polarity, End plate type

Only available for EX600

SI unit output polarity	M12 power supply connector B-coded (EX600-ED2)	7/8 inch power supply connector (EX600-ED3)	M12 power supply connector IN/OUT, A-coded	
			Pin arrangement 1 (EX600-ED4)	Pin arrangement 2 (EX600-ED5)
Without SI unit	—			
SI unit positive common	2	3	6	8
SI unit negative common	4	5	7	9

∗ Ensure a match with the common specification of the valve to be used.
∗ When not selecting an SI unit, the symbol will be "—."

❼ I/O unit stations

Only available for EX600

—	None
1	1 station
⋮	⋮
9	9 stations

∗ When not selecting an SI unit, the symbol will be "—."
∗ SI unit is not included in I/O unit stations.
∗ When I/O unit is selected, it is shipped separately, and assembled by users. Refer to the attached operation manual for mounting.

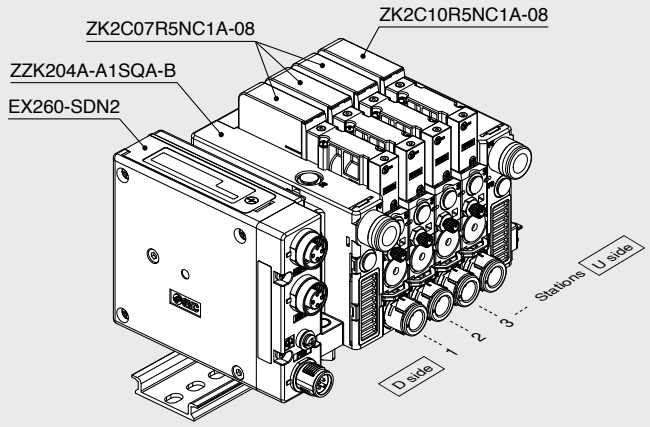
❽ Option

Symbol	Type	Selectable options for manifold (Refer to "How to Order Ejectors" on page 20.)					
		E	**J**	**K**	**L**	**P**	**W**
—	Without option	●	●	●	—	—	●
B	With DIN rail mounting bracket for the EX260/EX500∗8	●	●	●	●	●	●
C	With DIN rail mounting bracket for the EX600∗8	●	●	●	●	●	●
D	With common release pressure supply (PD) port	●	●	●	—	◎∗9	●
L	Manifold individual supply specification	●	●	●	◎∗9	—	●

∗8 The DIN rail should be ordered separately. (Refer to page 46.)
∗9 When option "D" is selected, select option "P" for the single unit for manifold. When option "L" is selected, select option "L" for the single unit for manifold. (◎ must be selected.)
∗ When more than one option is selected, list the option symbols in alphabetical order. (Example -BD)

How to Order Valve Manifold Assembly

Example (EX260)



ZZK204A-A1SQA-B ····· 1 set (Manifold part number)
∗ ZK2C07R5NC1A-08 ····· 3 sets
∗ ZK2C10R5NC1A-08 ····· 1 set
∗ The asterisk denotes the symbol for the assembly.
∗ Prefix to the single unit part number.

· When the manifold is viewed from V port, the first station starts from the left (D side).
· After the manifold part number, specify the installed single unit from the first station.
· Complex exhaust and individual port exhaust cannot be mixed in the ejector system manifold.
· The DIN rail should be ordered separately. (Refer to page 48.)

Vacuum Pump System **Vacuum Unit**

ZK2□A Series

Single Unit **Vacuum Pump System +** With **Valve +** Without **Energy Saving Function**

Refer to pages 36 and 38 for the port layouts (including circuit examples) and page 57 for the dimensions.

How to Order

ZK2P00 K 5 A L A– 08 – □

❶ ❷ ❸ ❹ ❺ ❻

❶ Combination of supply valve and release valve

Symbol	Supply valve		Release valve
	N.C.	Self-holding	N.C.
K	●	—	●
J	●∗1	—	—
R	—	●∗2	●

∗1 Install the atmospheric release valve or vacuum release valve in the middle of the vacuum piping.
∗2 Supply valve maintains vacuum by energisation (20 ms or more). Stopping the vacuum turns on the release valve.
Refer to the precaution on page 90.

❷ Rated voltage (Supply valve/Release valve)

Symbol	Voltage
5	24 VDC
6	12 VDC

❸ Pressure switch for vacuum/Pressure sensor

Symbol	Type	Pressure range [kPa]	Specifications		
			NPN	PNP	With unit selection function∗3
			2 outputs		
A	Pressure switch for vacuum	0 to -101	●	—	●
B			●	—	None (SI unit only)
C			—	●	●
D			—	●	None (SI unit only)
E		-100 to 100	●	—	●
F			●	—	None (SI unit only)
H			—	●	●
J			—	●	None (SI unit only)
P	Pressure sensor	0 to -101	Analogue output 1 to 5 V		
T		-100 to 100			
N	Without pressure switch for vacuum/pressure sensor				

∗3 The unit for the type without the unit selection function is fixed as kPa.

❹ Connector (Supply valve/Release valve/Pressure switch for vacuum)

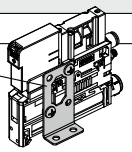
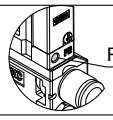
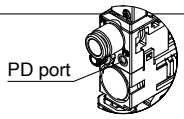
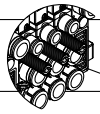
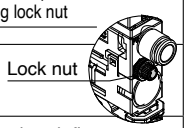
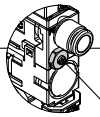
Symbol	For supply valve/release valve: 300 mm (Connector assembly)∗4	For pressure switch for vacuum: 2 m (Lead wire with connector)	Pressure sensor assembly: 3 m (With lead wire)	Note
L	●	●		Cannot be selected when ❸ is N
L1	None	●		
L2	●	None		Cannot be selected when ❸ is P or T
L3	None	None		

∗4 For the connector length other than 3 0 0 mm, order the connector assembly on page 44 separately.

❺ Vacuum (V) port

Symbol	Vacuum (V) port
06	Ø 6
08	Ø 8
07	Ø 1/4"
09	Ø 5/16"

❻ Option∗5 (For details on the Function/Application, refer to page 69.)

Symbol	Type	Note
—	Without option	—
B	Mounting bracket for single unit (nuts and bolts are included) 	—
C	Vacuum pump system PE port female thread specification (M3) 	When R is selected for ❶, D needs to be selected.
D	With individual release pressure supply (PD) port (M3)∗6 	Cannot be selected when ❶ is J
E	Vacuum release flow adjustment needle∗7 — Screwdriver operation type long lock nut 	Cannot be selected when ❶ is J Can be selected only for the combination of J and K
J	Round lock nut 	
K	Screwdriver operation type 	

∗5 When more than one option is selected, list the option symbols in alphabetical order. (Example -BJ)
∗6 Use a One-touch fitting or barb fitting (M-3AU-4) for piping. (O.D.: Within Ø 6.2)
∗7 When "K" or "R" is selected for ❶, a vacuum release flow adjustment needle is installed as standard. However, select it when improved operability is required.

Vacuum Pump System **Vacuum Unit**

ZK2□A Series

CE UKCA RoHS

Single Unit **Vacuum Pump System + With Valve + IO-Link Compatible**

Refer to page 38 for the port layout (including a circuit example).

How to Order

ZK2P00 K 5 1 H A− 08 −□

❶ ❷ ❸ ❹ ❺ ❻

❶ Combination of supply valve and release valve

Symbol	Supply valve	Release valve
	N.C.	N.C.
K	●	●

❷ Rated voltage (Supply valve/Release valve)

Symbol	Voltage
5	24 VDC

❸ IO-Link compatible vacuum pressure switch

Symbol	Pressure range [kPa]	Specifications
		With unit selection function*1
1	0 to -101	●
2		None (SI unit only)
3	-100 to 100	●
4		None (SI unit only)

*1 The unit for the type without the unit selection function is fixed as kPa.

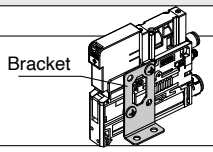
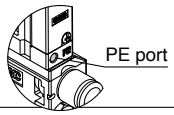
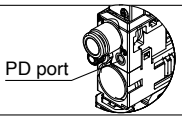
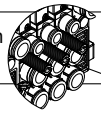
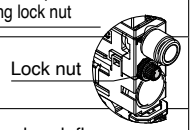
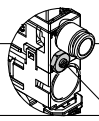
❹ Connector

Symbol	Lead wire with connector for IO-Link (With M12 connector): 300 mm
H	●
L3	None

❺ Vacuum (V) port

Symbol	Vacuum (V) port
06	Ø 6
08	Ø 8
07	Ø 1/4"
09	Ø 5/16"

❻ Option*2 (For details on the Function/Application, refer to page 69.)

Symbol	Type	Note
—	Without option	—
B	Mounting bracket for single unit (nuts and bolts are included) 	—
C	Vacuum pump system PE port female thread specification (M3) 	—
D	With individual release pressure supply (PD) port (M3)*3 	—
E	Vacuum release flow adjustment needle*4 — Screwdriver operation type long lock nut 	Can be selected only for the combination of J and K
J	Round lock nut 	
K	Screwdriver operation type 	

*2 When more than one option is selected, list the option symbols in alphabetical order. (Example -BJ)
*3 Use a One-touch fitting or barb fitting (M-3AU-4) for piping. (O.D.: Within Ø 6.2)
*4 A vacuum release flow adjustment needle is installed as standard. However, select it when improved operability is required.

Vacuum Pump System **Vacuum Unit**

ZK2□A Series

CE UK CA RoHS

For Manifold Vacuum Pump System + With Valve + Without Energy Saving Function

Refer to page 27 for How to Order Manifold, pages 36 and 39 for the port layouts (including circuit examples), and pages 62 to 64 for the dimensions.

How to Order

ZK2Q00 K 5 A L A – 08 – □

❶ ❷ ❸ ❹ ❺ ❻

❶ Combination of supply valve and release valve

Symbol	Supply valve		Release valve
	N.C.	Self-holding	N.C.
K	●	—	●
J	●∗1	—	—
R	—	●∗2	●

∗1 Install the atmospheric release valve or vacuum release valve in the middle of the vacuum piping.
∗2 Supply valve maintains vacuum by energisation (20 ms or more). Stopping the vacuum turns on the release valve.
Refer to the precaution on page 90.

❷ Rated voltage (Supply valve/Release valve)

Symbol	Voltage
5	24 VDC
6	12 VDC

❸ Pressure switch for vacuum/Pressure sensor

Symbol	Type	Pressure range [kPa]	Specifications		
			NPN	PNP	With unit selection function∗3
			2 outputs		
A	Pressure switch for vacuum	0 to -101	●	—	●
B			●	—	None (SI unit only)
C			—	●	●
D			—	●	None (SI unit only)
E		-100 to 100	●	—	●
F			●	—	None (SI unit only)
H			—	●	●
J			—	●	None (SI unit only)
P	Pressure sensor	0 to -101	Analogue output 1 to 5 V		
T		-100 to 100			
N	Without pressure switch for vacuum/pressure sensor				

∗3 The unit for the type without the unit selection function is fixed as kPa.

❹ Connector (Supply valve/Release valve/Pressure switch for vacuum)

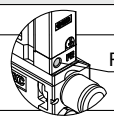
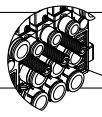
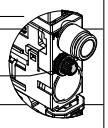
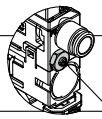
Symbol	For supply valve/release valve		For pressure switch for vacuum: 2 m (Lead wire with connector)	Pressure sensor assembly: 3 m (With lead wire)	Note
	Centralised wiring specification (Plug-in)	Individual wiring specification: 300 mm (Connector assembly)∗4			
C	●	None	●		Cannot be selected when ❸ is N
C1	●	None	None		Cannot be selected when ❸ is P or T
L	None	●	●		Cannot be selected when ❸ is N
L1	None	None	●		
L2	None	●	None		Cannot be selected when ❸ is P or T
L3	None	None	None		

∗4 For the connector length other than 300 mm, order the connector assembly on page 44 separately.

❺ Vacuum (V) port

Symbol	Vacuum (V) port
06	Ø 6
08	Ø 8
07	Ø 1/4"
09	Ø 5/16"

❻ Option∗5 (For details on the Function/Application, refer to page 69.)

Symbol	Type		Note
—	Without option		—
C	Vacuum pump system PE port female thread specification (M3)	 PE port	When R is selected for ❶, P needs to be selected.
E	Vacuum release flow adjustment needle∗6	Screwdriver operation type long lock nut  Screwdriver operation type long lock nut	Cannot be selected when ❶ is J Can be selected only for the combination of J and K
J		Round lock nut  Lock nut	
K		Screwdriver operation type  Vacuum break flow adjusting needle	
P	With manifold common release pressure supply (PD) port		Cannot be selected when ❶ is J

∗5 When more than one option is selected, list the option symbols in alphabetical order. (Example -EP)
∗6 When "K" or "R" is selected for ❶, a vacuum release flow adjustment needle is installed as standard. However, select it when improved operability is required.

Vacuum Pump System **Vacuum Unit**

ZK2□A Series

CE UK CA RoHS

For Manifold **Vacuum Pump System +** With **Valve + IO-Link Compatible**

Refer to page 27 for How to Order Manifold and page 36 for the port layout (including a circuit example).

How to Order

ZK2Q00 K 5 1 H A− 08 − □

❶ ❷ ❸ ❹ ❺ ❻

❶ Combination of supply valve and release valve

Symbol	Supply valve	Release valve
	N.C.	N.C.
K	●	●

❷ Rated voltage (Supply valve/Release valve)

Symbol	Voltage
5	24 VDC

❸ IO-Link compatible vacuum pressure switch

Symbol	Pressure range [kPa]	Specifications
		With unit selection function*1
1	0 to -101	●
2		None (SI unit only)
3	-100 to 100	●
4		None (SI unit only)

*1 The unit for the type without the unit selection function is fixed as kPa.

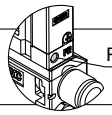
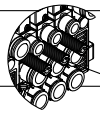
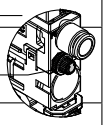
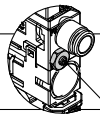
❹ Connector

Symbol	Lead wire with connector for IO-Link (With M12 connector): 300 mm
H	●
L3	None

❺ Vacuum (V) port

Symbol	Vacuum (V) port
06	Ø 6
08	Ø 8
07	Ø 1/4"
09	Ø 5/16"

❻ Option*2 (For details on the Function/Application, refer to page 69.)

Symbol	Type		Note
—	Without option		—
C	Vacuum pump system PE port female thread specification (M3)	 PE port	—
E	Vacuum release flow adjustment needle*3	Screwdriver operation type long lock nut  Screwdriver operation type long lock nut	Can be selected only for the combination of J and K
J		Round lock nut  Lock nut	
K		Screwdriver operation type  Vacuum break flow adjusting needle	
P	With manifold common release pressure supply (PD) port		—

*2 When more than one option is selected, list the option symbols in alphabetical order. (Example -EP)

*3 A vacuum release flow adjustment needle is installed as standard. However, select it when improved operability is required.

Vacuum Pump System

Vacuum Unit

ZK2□A Series

Manifold

Refer to pages 25 and 26 for the vacuum pump system installed to the manifold, pages 36 and 39 for the port layouts (including circuit examples), and pages 62 to 64 for the dimensions.

How to Order Manifold

ZZK2 04 A− P 2 L −

❶ ❷ ❸ ❹

If the manifold parts (set of end plates for both ends and tension bolts) are shipped unassembled, please refer to page 48.

❶ Stations

Symbol	Stations
01	1 station
02	2 stations
⋮	⋮
10	10 stations

❷ System/Port

Symbol	System	Port
P	Vacuum pump system	Ø 8 (Common PV) Ø 6 (Common PS)
PN		Ø 5/16"(Common PV) Ø 1/4" (Common PS)

❸ Supply valve and release valve wiring*1

Symbol	Wiring	Selectable wiring for manifold ❹ (Refer to pages 25 and 26.)						
		C	C1	L	L1	L2	L3	H
L	Individual wiring	—	—	●	●	●	●	●
F	D-sub connector	●	●	—	—	—	—	—
P	Flat ribbon cable connector	●	●	—	—	—	—	—

*1 Common wiring F/P is available only for solenoid valve wiring. Individual wiring is specified for vacuum switches and sensors.

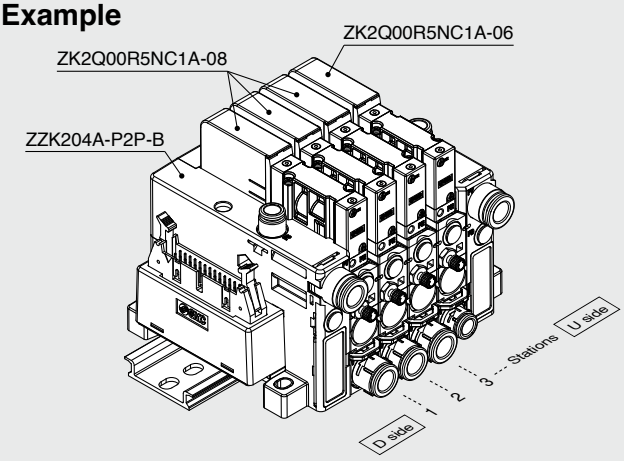
❹ Option*2 (For details on the Function/Application, refer to page 69.)

Symbol	Type	Selectable option for manifold ❻ (Refer to pages 25 and 26.)				
		C	E	J	K	P
—	Without option	●	●	●	●	—
B	With DIN rail mounting bracket*3	●	●	●	●	●
D	With common release pressure supply (PD) port	●	●	●	●	◎*4

*2 When more than one option is selected, list the option symbols in alphabetical order. (Example -BD)
*3 The DIN rail should be ordered separately. (Refer to page 48.)
*4 When D is selected for manifold option, select P for single unit option. (◎ must be selected.)

How to Order Valve Manifold Assembly

Example



ZZK204A-P2P-B ····· 1 set (Manifold part number)
*** ZK2Q00R5NC1A-08 ····· 3 sets**
*** ZK2Q00R5NC1A-06 ····· 1 set**
*** The asterisk denotes the symbol for the assembly.**
*** Prefix to the single unit part number.**

· When the manifold is viewed from V port, the first station starts from the left (D side).
· After the manifold part number, specify the installed single unit from the first station.
· The DIN rail should be ordered separately. (Refer to page 48.)

Specifications

General Specifications

Operating temperature range (No condensation)	**-5 to 50 °C**	Without pressure sensor/switch, With pressure switch, With pressure switch with energy saving function, With IO-Link compatible pressure switch
	0 to 50 °C	With pressure sensor
Fluid		Air
Vibration resistance∗1	**30 m/s²**	Without pressure sensor/switch With pressure sensor
	20 m/s²	With pressure switch
Impact∗2, ∗3 **resistance**	**150 m/s²**	Without pressure sensor/switch With pressure sensor
	100 m/s²	With pressure switch
Standards		CE/UKCA marking (EMC directive, RoHS directive)

∗1 The characteristics are satisfied when tested for 2 hours in each of the X, Y and Z directions at 10 to 500 Hz without energisation. (Initial value)
∗2 The characteristics are satisfied when tested one time in each of the X, Y and Z directions without energisation. (Initial value)
∗3 For valve type R (Self-holding release valve linked), impact resistance is 50 m/s².

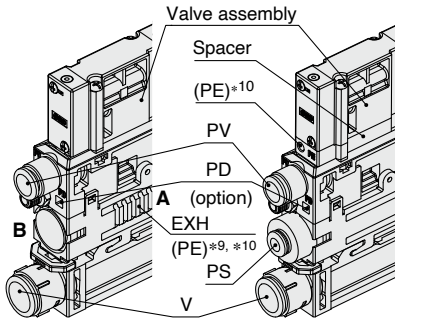
Valve Common Specifications

Model∗4	ZK2-VA□K	ZK2-VA□R	ZK2-VAAE	ZK2-VA□J
Type of actuation∗5	Supply valve: N.C. Release valve: N.C.	Self-holding release valve linked Release valve: N.C.	Supply valve: N.O. Release valve: N.C.	Supply valve: N.C. Release valve: None
Valve configuration∗6	Pilot operated dual 2-port			Pilot operated 2-port
Operating pressure range	0.3 to 0.6 MPa			
Valve construction	Poppet seal			
Manual override	Push type			
Rated voltage	24 VDC, 12 VDC			
Power consumption	0.4 W			
Lead wire (ZK2-LV∗∗-A)	Cross section: 0.2 mm² (AWG24) Insulator O.D.: 1.4 mm			

∗4 Refer to the Valve assembly on page 44 for the valve model number.
∗5 ZK2-VA□R: After instantaneous energisation of the supply valve (20 ms or more), ON state is maintained without energisation. Supply valve turns off simultaneously when the release valve turns on.
∗6 The V100 series is used as the pilot valve. For details on the V100 series, refer to the **V100 series** in the **Web Catalogue** and the **3/4/5-port solenoid valve precautions**.

Application and Operating Pressure Range of Each Port

Port	Description	Ejector system	Vacuum pump system∗11
PV	Air pressure supply port	Compressed air supply for operating ejector	—
	(Operating pressure range)	0.3 to 0.6 MPa∗7, ∗8	—
	Vacuum pressure supply port	—	Vacuum source (Vacuum pump)
	(Operating pressure range)	—	0 to –100 kPa∗10
PS	Pilot pressure supply port	For option L	Compressed air supply for pilot valve
	(Operating pressure range)	0.3 to 0.6 MPa	
PD	Individual release pressure supply port	Release pressure Compressed air supply for individual setting (Option)	
	(Operating pressure range)	0 to 0.6 MPa (PD ≤ PV, PD ≤ PS for option L)	0 to 0.6 MPa (PD ≤ PS)
V	Vacuum port	For connecting adsorption equipment including pad	
EXH	Exhaust port	Exhaust when ejector operates∗9	—
PE	Pilot pressure exhaust port	Exhaust when valve operates∗10	

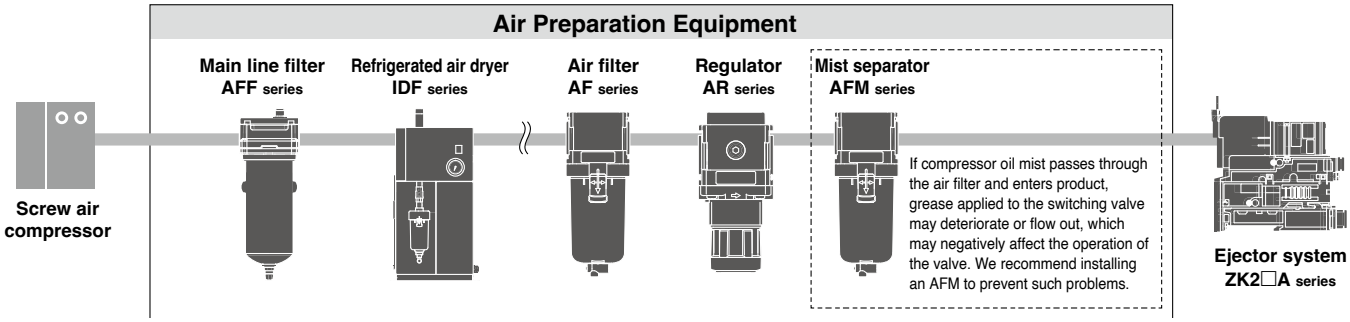


Ejector System Vacuum Pump System

∗7 For models without valve, pressure can be 0.3 MPa or less. (Ejector system)
∗8 Manifold can be used at 0.3 MPa or less when the manifold is for individual SUP. For 0.2 MPa or less, select K or J for the valve type. Set pressure as PV ≤ PS.
∗9 For ejectors with silencer, air exhausts from A (slit on both sides). For port exhaust type, air exhausts from B.
∗10 Pilot pressure for ejectors is exhausted from the ejector and the common exhaust. Vacuum pump system exhausts air from PE port on the spacer. Female thread type (M3) is available by option [C] for PE port of the vacuum pump system.
When option [C] is selected for valve type R, operating conditions below apply.
· Select the type with release pressure supply port (PD) as an option.
Single unit/Manifold: Option [D]
For Manifold: Option [P]
· Vacuum pressure for PV port: –60 to -100 kPa
· The energisation time of the release valve: 200 ms or longer when the PD port is released to the atmosphere
500 ms or longer when the 0.1 MPa is supplied to the PD port
If the product is used out of this operating condition, please contact your local sales office.
∗11 For vacuum pump systems, if vacuum is released when the piping on the V port side is restricted, the V port internal pressure will rise, which may result in the filter case gasket coming off. Therefore, when the internal pressure rises during vacuum release, try to keep the pressure at 0.1 MPa or less. Depending on the V port piping conditions and the shape of the adsorption part, if there are concerns regarding the internal pressure rise, select the option with a release pressure supply (PD) port, and adjust the PD port supply pressure to 0.1 MPa or less.

Quality of Supply Air

Supply air containing foreign matter, water, oil, condensate, etc., can cause malfunction of the supply valve and release valve. So, install air preparation equipment on the upstream side of the product (refer to the piping example below) and perform maintenance periodically to control the supply air properly.



Specifications

Ejector Specifications

Item / Model			ZK2□07	ZK2□10	ZK2□12	ZK2□15
Nozzle diameter		[mm]	0.7	1.0	1.2	1.5
Max. suction flow*1	Silencer exhaust/ Complex exhaust	[l/min(ANR)]	29	44	61	67
	Port exhaust	[l/min(ANR)]	34	56	74	89
	High-noise reduction silencer exhaust	[l/min(ANR)]	34	56	72	83
Air consumption*1		[l/min(ANR)]	24	40	58	90
Max. vacuum pressure*1		[kPa]	–91			
Supply pressure range*2		[MPa]	0.3 to 0.6 (0.1 to 0.6)			
Standard supply pressure*3		[MPa]	0.35			0.4 (0.37)

*1 Values at the standard supply pressure. Values are based on standard of SMC measurements. They depend on atmospheric pressure (weather, altitude, etc.) and measurement method.
*2 The value in ( ) is for without valve.
*3 The value in ( ) is for without valve. For nozzle size 07 to 12, the value is common to the ejectors with valve and without valve.

Suction Filter

Nominal filtration rating	30 μm
Filtration area	510 mm²

Max. Number of Manifold Stations that Can Operate Simultaneously*4

Item / Model (Nozzle size)			ZK2□07	ZK2□10	ZK2□12	ZK2□15
Air pressure supply (PV) port Ø 8, Ø 5/16"	Complex exhaust	Supply from one side	8	5	4	3
		Supply from both sides	10	7	5	5
	Individual port exhaust, High-noise reduction silencer exhaust	Supply from one side	8	6	6	3
		Supply from both sides	10	9	9	6

*4 If the number of vacuum units simultaneously generating vacuum is less than the listed number, the max. number of manifold stations will be 10 stations.

Noise Level (Reference values)

Item / Model		ZK2□07	ZK2□10	ZK2□12	ZK2□15
Noise level [dB (A)]	ZK2G (High-noise reduction silencer exhaust)	46	55	63	69
	ZK2A (Silencer exhaust)	59	66	75	76

Actual values under SMC's measurement conditions (Not guaranteed values)

Weight

Single Unit

Single unit model	Weight [g]
ZK2P00K□N□A (Vacuum pump system, Single unit, Without pressure sensor/switch)	110
ZK2A□K□N□A (Ejector system, Single unit, Without pressure sensor/switch)	95
ZK2A□N0NN (Ejector system, Single unit, Without valve)	54
ZK2 (One station for manifold, Without pressure sensor/switch)	99

Pressure Sensor/Pressure Switch for Vacuum

Pressure sensor/Pressure switch for vacuum model	Weight [g]
ZK2-PS□-A (Except cable portion)	5
ZK2-ZS□-A (Except lead wire with connector)	14

Manifold Base

	1 station	2 stations	3 stations	4 stations	5 stations	6 stations	7 stations	8 stations	9 stations	10 stations
Weight [g]	129	132	135	138	141	144	147	149	152	155

●Calculation of Weight for the Manifold Type

(Single unit weight x Number of stations) + (Pressure sensor/Pressure switch for vacuum weight x Number of stations) + Manifold base

Example) 5-station manifold with pressure sensors

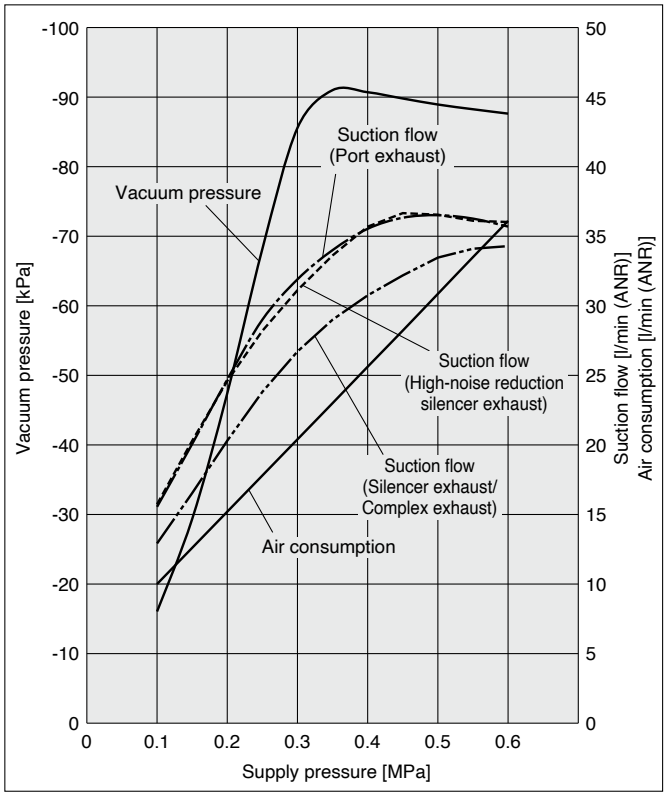
99 g x 5 pcs. + 5 g x 5 pcs. + 141 g = 661 g

Ejector Exhaust Characteristics/Flow Rate Characteristics (Representative value)

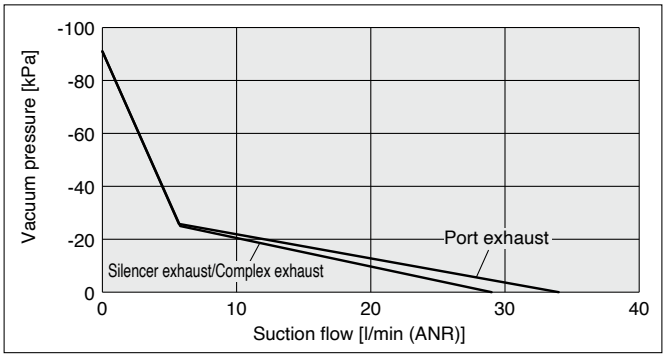
* The flow rate characteristics correspond to the standard supply pressure.

ZK2□07

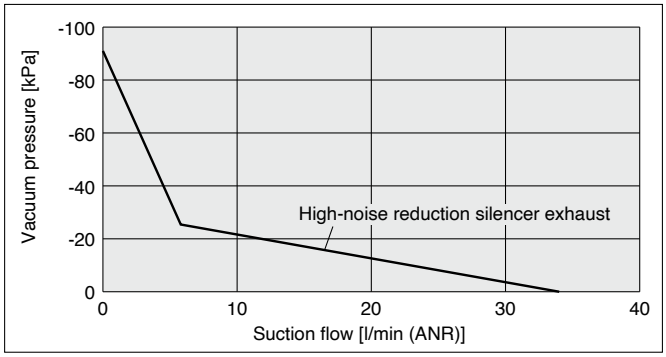
Exhaust Characteristics



Flow Rate Characteristics

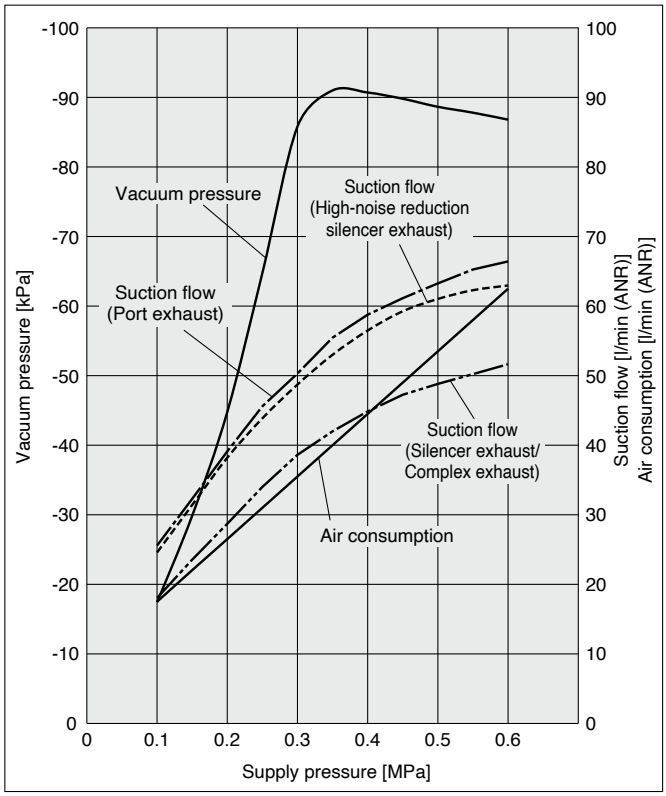


Flow Rate Characteristics

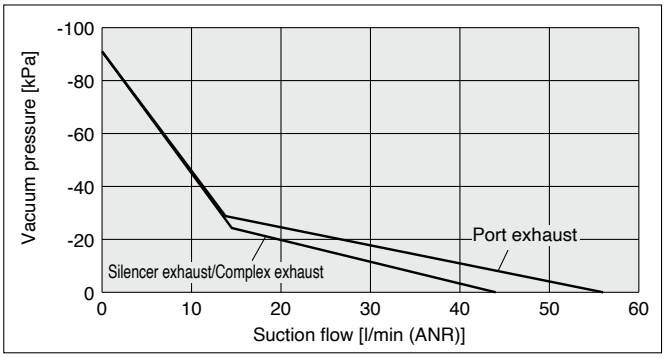


ZK2□10

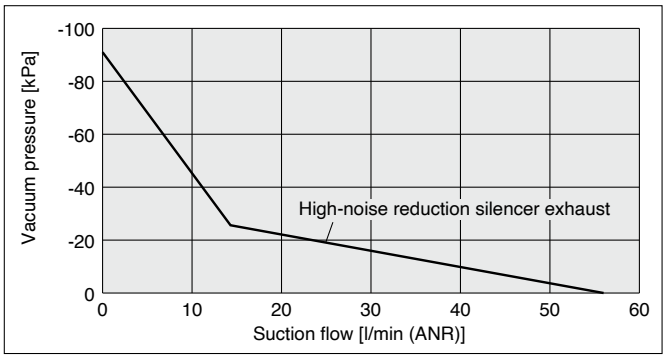
Exhaust Characteristics



Flow Rate Characteristics



Flow Rate Characteristics

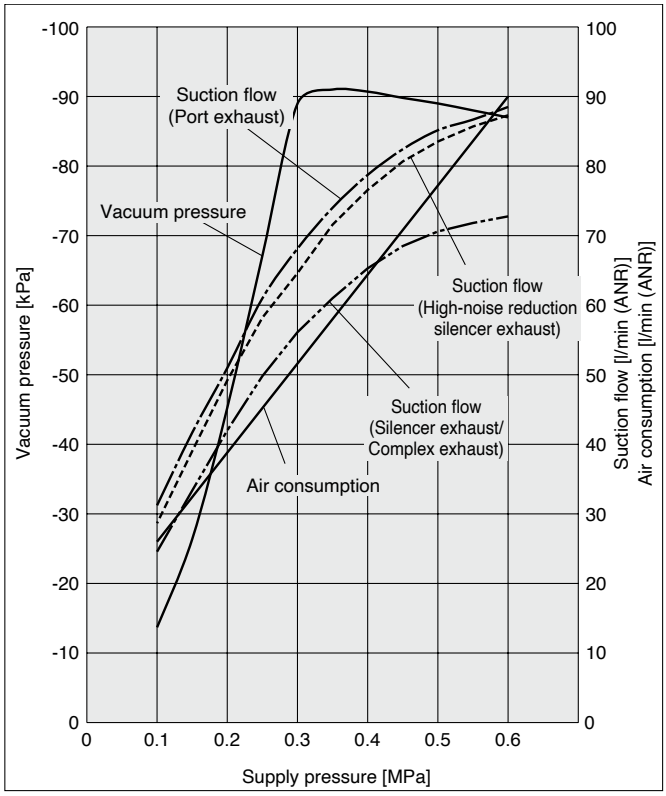


Ejector Exhaust Characteristics/Flow Rate Characteristics (Representative value)

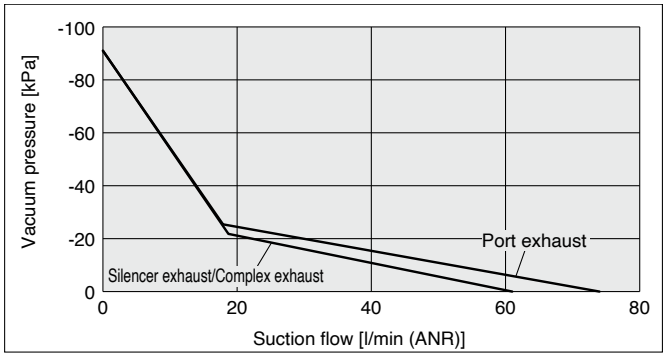
* The flow rate characteristics correspond to the standard supply pressure.

ZK2□12

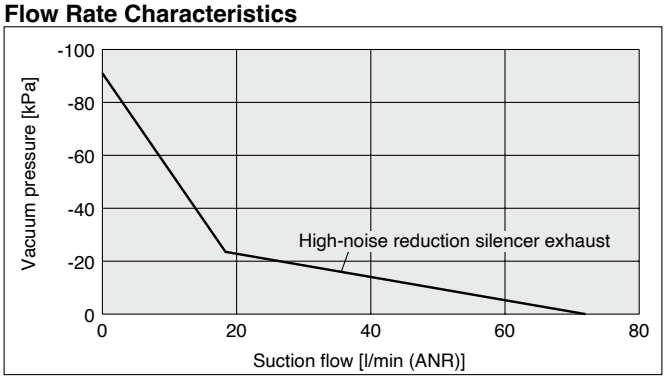
Exhaust Characteristics



Flow Rate Characteristics

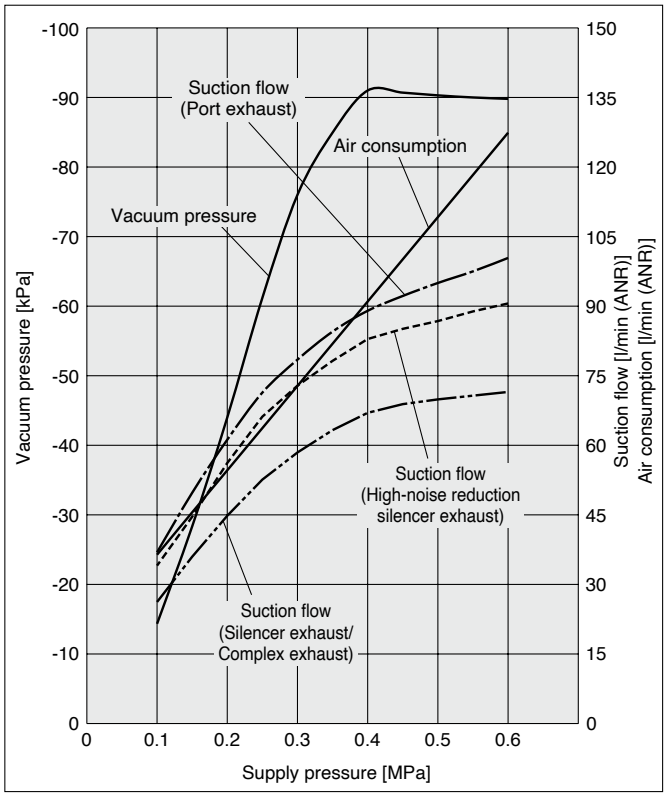


Flow Rate Characteristics

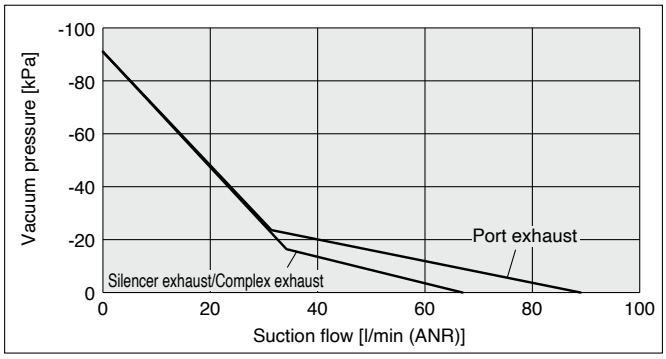


ZK2□15 * The following graphs show the characteristics of the ejector with valve. (Please contact SMC for models without valve.)

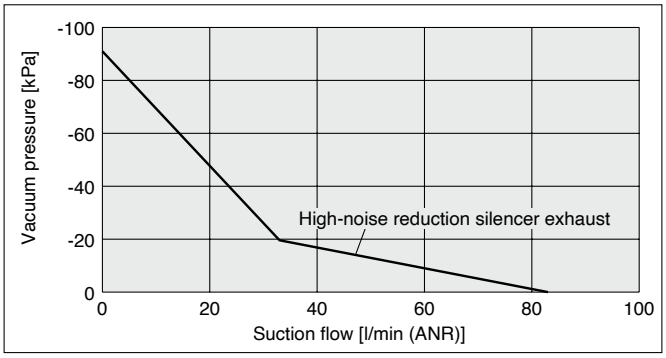
Exhaust Characteristics



Flow Rate Characteristics

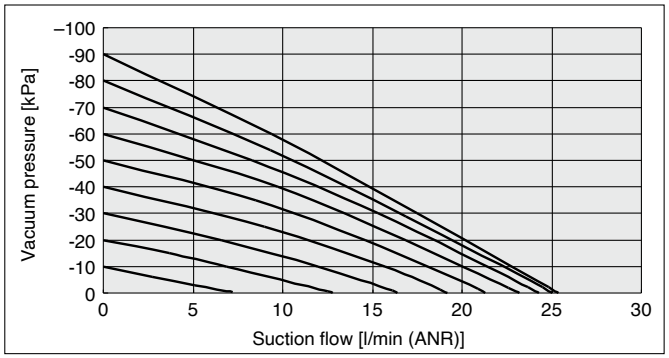


Flow Rate Characteristics



Vacuum Pump System Flow Rate Characteristics/ZK2P00

The graph shows the suction flow rate characteristics of the vacuum pump system at different vacuum pressures.

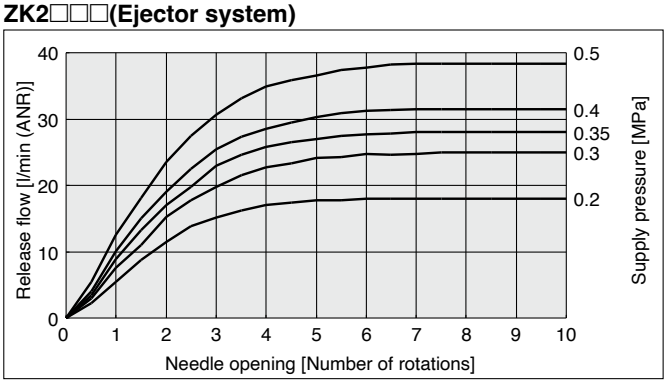


The actual suction flow at the point of suction varies depending on the piping conditions to the vacuum port. (The above graph shows the value when V port is Ø 8.)

Vacuum Release Flow Rate Characteristics

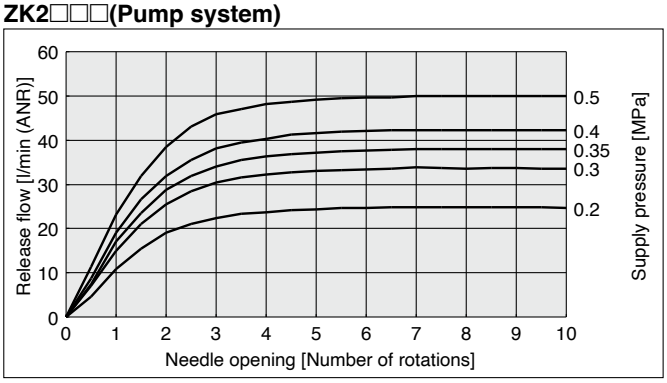
The graph shows the flow rate characteristics at different supply pressures when the vacuum release flow adjustment needle is open from the fully closed state.

ZK2□□□(Ejector system)



The actual suction flow at the point of suction varies depending on the piping conditions to the vacuum port. (The above graph shows the value of the ZK2B07.)

ZK2□□□(Pump system)



The actual suction flow at the point of suction varies depending on the piping conditions to the vacuum port.

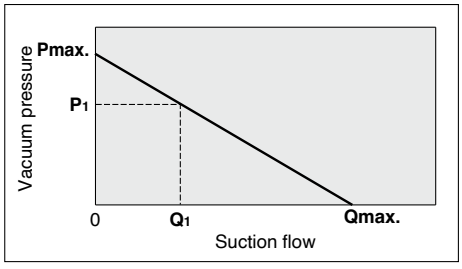
Vacuum Pump System Flow Rate Characteristics of Flow Path and Vacuum Release

Port size		Flow rate characteristics of V → PV (Vacuum side)				Flow rate characteristics of PS → V (Vacuum release side)*1			
PV port	V port	C[dm³/(s·bar)]	b	Cv	Q [l/min (ANR)]*2	C[dm³/(s·bar)]	b	Cv	Q [l/min (ANR)]*2
Ø 6	Ø 8	0.39	0.14	0.09	90	0.20	0.06	0.04	45

*1 When needle is fully open

*2 These values have been calculated according to ISO 6358 and indicate the flow rate under standard conditions with an inlet pressure of 0.6 MPa (relative pressure) and a pressure drop of 0.1 MPa.

How to Read the Flow Rate Characteristics Graph

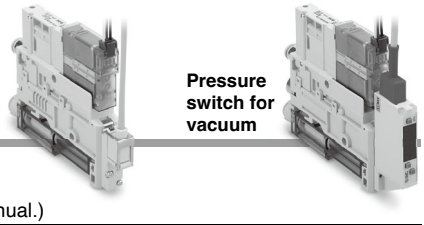


The flow rate characteristics indicate the relationship between the vacuum pressure and the suction flow of the ejector. They also show that when the suction flow changes, the vacuum pressure also changes. In general, this indicates the relationship at the ejector's standard operating pressure.
In the graph, **Pmax** indicates the max. vacuum pressure, and **Qmax** indicates the max. suction flow. These are the values that are published as specifications in catalogs, etc. Changes in vacuum pressure are explained in the order below.

1. If the ejector's suction port is closed and sealed tight, the suction flow becomes "0," and the vacuum pressure increases to the max. (**Pmax**).
2. If the suction port is opened gradually and air is allowed to flow (the air leaks), the suction flow increases, and the vacuum pressure decreases. (The condition of **P1** and **Q1**)
3. If the suction port is opened completely, the suction flow increases to the max. (**Qmax**), while the vacuum pressure then drops almost to "0" (atmospheric pressure).

As described above, the vacuum pressure changes when the suction flow changes. In other words, when there is no leakage from the vacuum (V) port, the vacuum pressure can reach its maximum, but as the amount of leakage increases, the vacuum pressure decreases. When the amount of leakage and the maximum suction flow become equal, the vacuum pressure becomes almost zero.
When adsorbing workpieces which are permeable, subject to leakage, etc., caution is required as the vacuum pressure will not be very high.

Pressure Sensor/Pressure Switch for Vacuum Specifications



Pressure Sensor (For details, refer to the PSE series in the **Web Catalogue**, and the Operation Manual.)

Model (Sensor unit: Standard model number)		ZK2-PS1-A (PSE541)	ZK2-PS3-A (PSE543)
Rated pressure range		0 to -101 kPa	-100 to 100 kPa
Proof pressure		500 kPa	
Output voltage		1 to 5 VDC	
Output impedance		Approx. 1 kΩ	
Power supply voltage		12 to 24 VDC ±10 %, Ripple (p-p) 10 % or less	
Current consumption		15 mA or less	
Accuracy		±2 % F.S. (Ambient temperature at 25 °C)	
Linearity		±0.4 % F.S.	
Repeatability		±0.2 % F.S.	
Effect of power supply voltage		±0.8 % F.S.	
Environmental resistance	Temperature range	Stored: -20 to 70 °C (No condensation or freezing)	
	Humidity range	Operating/Stored: 35 to 85 % RH (No condensation)	
Temperature characteristics		±2 % F.S. or less (Ambient temperature: 25 °C reference)	
Material	Case	Resin case: PBT	
	Pressure sensing section	Sensor pressure receiving area: Silicon, O-ring: HNBR	
Lead wire		Oil-resistant vinyl cabtire cable (elliptic) 3 cores, 2.7 x 3.2 mm, 3 m Cross section: 0.15 mm^2 Insulator O.D.: 0.9 mm	

Pressure Switch for Vacuum (For details, refer to the ZSE/ISE10 series in the **Web Catalogue**, and the Operation Manual.)

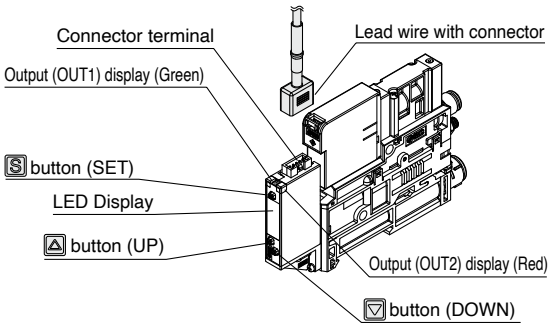
Model (Switch unit: Standard model number)		ZK2-ZSE□□□-A (ZSE10)	ZK2-ZSF□□□-A (ZSE10F)
Rated pressure range		0 to -101 kPa	-100 to 100 kPa
Set pressure range/Pressure display range		10 to -105 kPa	-105 to 105 kPa
Proof pressure		500 kPa	
Smallest settable increment		0.1 kPa	
Power supply voltage		12 to 24 VDC ±10 %, Ripple (p-p) 10 % or less (Protected against reverse connection)	
Current consumption		40 mA or less	
Switch output	Output type	NPN or PNP open collector 2 outputs (selectable)	
	Max. load current	80 mA	
	Max. applied voltage	28 V (with NPN output)	
	Residual voltage	2 V or less (at 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	
Hysteresis	Hysteresis mode	Variable from 0*1	
	Window comparator mode		
Display type		3 1/2 digit, 7-segment LED, 1-colour display (Red)	
Display accuracy		±2 % F.S. ±1 digit (Ambient temperature at 25 ±3 °C)	
Indicator light		Lights up when output is turned ON. OUT1: Green, OUT2: Red	
Environmental resistance	Enclosure	IP40	
	Temperature range	Stored: -10 to 60 °C (No condensation or freezing)	
	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. (Ambient temperature: based on 25 °C)	
Lead wire		Oilproof heavy-duty vinyl cable 5 cores Ø 3.5, 2 m Cross section: 0.15 mm^2 (AWG26) Insulator O.D.: 1.0 mm	

*1 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.

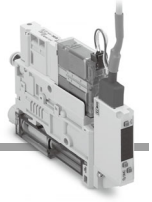
Description (Pressure Switch for Vacuum)

Output (OUT1) display (Green)	Lights up when OUT1 is turned ON.
Output (OUT2) display (Red)	Lights up when OUT2 is turned ON. Pressure switch for vacuum with energy saving function: LED (Red) is ON when the pilot valve for supply valve is energised.
LED display	Displays the current pressure, set mode and error code.
△ button (UP)	Selects the mode or increases the ON/OFF set value.
	Use for switching to the peak display mode.
▽ button (DOWN)	Selects the mode or decreases the ON/OFF set value.
	Use for switching to the bottom display mode.
S button (SET)	Use for changing the mode or setting the set value.

* Refer to the Operation Manual for details on each setting and operation methods.



Pressure Switch for Vacuum with Energy Saving Function Specifications



Pressure switch for vacuum with energy saving function

Pressure Switch for Vacuum with Energy Saving Function

(For details, refer to the Operation Manual for the ZK2-ZSV□□□□-A/ZK2-ZSW□□□□-A on the SMC website.)

Model		ZK2-ZS$^{V}_{W}$□□□□-A
Rated pressure range		-100 to 100 kPa
Set pressure range		-105 to 105 kPa
Proof pressure		500 kPa
Smallest settable increment		0.1 kPa
Power supply voltage		12 to 24 VDC ±10 %, Ripple (p-p) 10 % or less (Protected against reverse connection)
Current consumption		40 mA or less
Switch output	**Output type**	NPN or PNP open collector OUT1: General purpose, OUT2: Valve control
	Max. load current	80 mA
	Max. applied voltage	26.4 VDC
	Residual voltage	2 V or less (at 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
Hysteresis	**Hysteresis mode**	Variable from 0∗1
Display type		3 1/2 digit, 7-segment LED, Colour display (Red)
Display accuracy		±2 % F.S. ±1 digit (Ambient temperature at 25 ±3 °C)
Indicator light		Lights up when output is turned ON. OUT1: Green, OUT2: Red
Environmental resistance	**Enclosure**	IP40
	Operating temperature range	-5 to 50 °C
	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. (Ambient temperature: 25 °C reference)
Lead wire		Cable: 5 cores Ø 3.5, 2 m Cross section: 0.15 mm^2 (AWG26) Insulator O.D.: 1.0 mm

∗1 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.

IO-Link Compatible Vacuum Pressure Switch Specifications

IO-Link compatible vacuum pressure switch

IO-Link Compatible Vacuum Pressure Switch

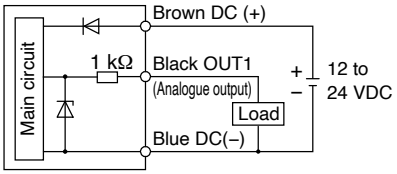
(For details, refer to the ZK2-ZS□L□□□□-A operation manual on the SMC website.)

Model		ZK2-ZSEL$^{1}_{2}$□□□-A	ZK2-ZSFL$^{1}_{2}$□□□-A
Rated pressure range		0 to -101 kPa	-100 to 100 kPa
Set pressure range		10 to -105 kPa	-105 to 105 kPa
Proof pressure		500 kPa	
Smallest settable increment		0.1 kPa	
Power supply voltage		24 VDC ±10 %, Ripple (p-p) 10 % or less (Protected against reverse connection)	
Current consumption		40 mA or less	
Switch output	**Output type**	PNP open collector OUT1, OUT2: Valve control	
	Residual voltage	2 V or less (at load current of 80 mA)	
	Short circuit protection	Yes	
Repeatability		±0.2 % F.S. ±1 digit (Ambient temperature at 25 ±3 °C)	
Hysteresis		Variable from 0.1	
Display type		3 1/2 digit, 7-segment LED, Colour display (Red)	
Display accuracy		±2 % F.S. ±1 digit (Ambient temperature at 25 ±3 °C)	
Indicator light		Lights up when solenoid valve output is turned ON. Release valve output (OUT1): Green, Supply valve output (OUT2): Red	
Digital filter		Variable from 0 to 10 s (0.01 s increments)	
Environmental resistance	**Enclosure**	IP40	
	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	
	Operating temperature range	Operating: -5 to 50 °C, Stored: -10 to 60 °C (No condensation or freezing)	
	Operating humidity range	Operating/Stored: 35 to 85 % RH (No condensation)	
Temperature characteristics		±2 % F.S. (25 °C reference)	
Lead wire		Cable 3 cores, Ø 3.4, 300 mm Valve connector lead wire Insulator O.D.: 1.0 mm, 45 mm	

Internal Circuits and Wiring Examples

Pressure Sensor

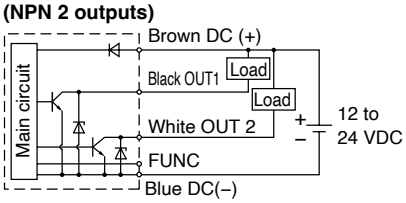
ZK2-PS□-A



Voltage output type: 1 to 5 V
Output impedance: Approx. 1 kΩ

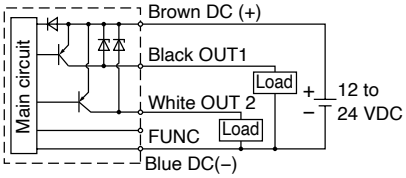
Pressure Switch for Vacuum

ZK2-ZS□A□□-A
(NPN 2 outputs)



Max. 28 V, 80 mA
Residual voltage: 2 V or less

ZK2-ZS□B□□-A
(PNP 2 outputs)

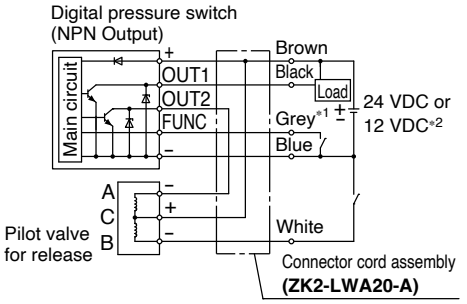


Max. 80 mA
Residual voltage: 2 V or less

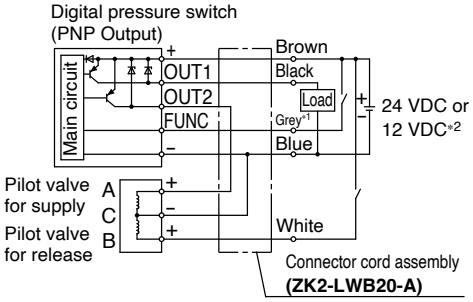
∗ The FUNC terminal is connected when using the copy function. (For details, refer to the Operation Manual for the ZSE10/ISE10 on the SMC website.)

Pressure Switch for Vacuum with Energy Saving Function

ZK2-ZSVA□□-A
(NPN 1 output)



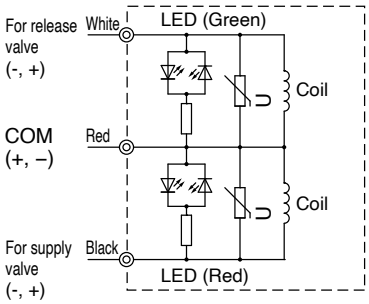
ZK2-ZSVB□□-A
(PNP 1 output)



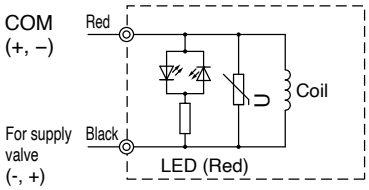
∗1 The grey wire (FUNC) is connected when operating the supply valve by energy saving control (for workpiece adsorption). (For details, refer to the Operation Manual for the ZK2-ZSV□□□-A on the SMC website.)
∗2 When the valve's rated voltage is 12 VDC, be sure to apply 12 VDC.

Supply Valve/Release Valve

Valve type K/R
(With supply valve/release valve)

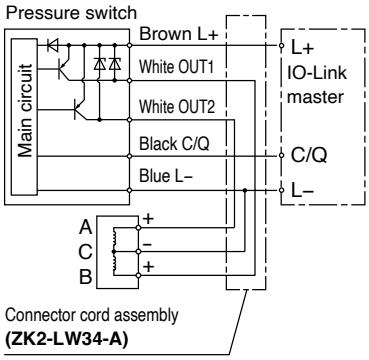


Valve type J
(With supply valve/Without release valve)



IO-Link Compatible Vacuum Pressure Switch

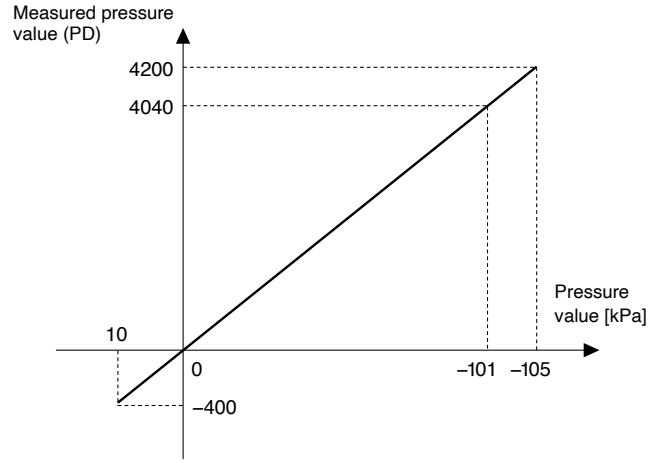
ZK2-ZS$^{E}_{F}$L$_{2}^{1}$□□□-A



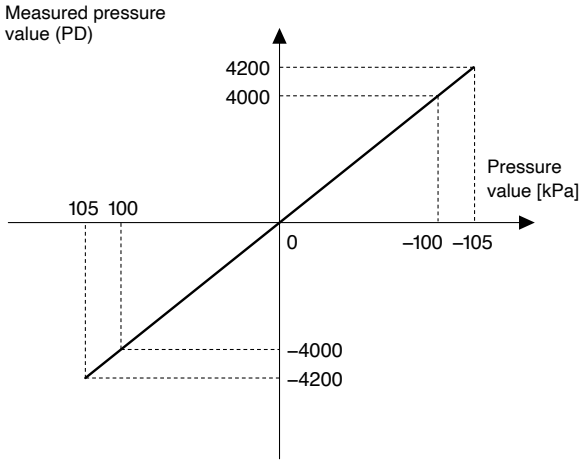
IO-Link: Process Data

Relationship between the process data and pressure value

ZK2-ZSEL$_{2}^{1}$□□□-A (For 0 to -101 kPa)



ZK2-ZSFL$_{2}^{1}$□□□-A (For -100 to 100 kPa)



● PV: Air pressure supply port/Port for vacuum source (Vacuum pump) ● PS: Pilot pressure supply port
● PD: Release pressure supply port ● V: Vacuum port ● EXH: Exhaust port
● PE: Pilot pressure exhaust port For details ⇒ Page 28

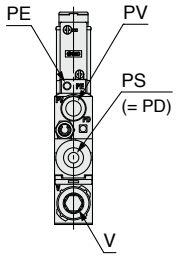
Port Layout

∗ System depends on vacuum source (vacuum pump/ejector).

Standard Products

Port layout No. 1

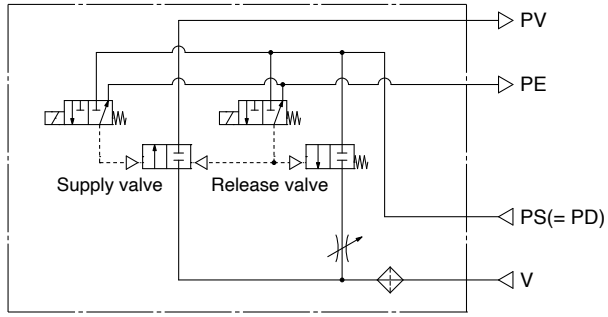
Single unit: ZK2P00R□N□A-□



System		Vacuum pump
Body type		Single unit
Exhaust type		Without silencer
Application and purpose	Vacuum pressure	—
	Exhaust	—
	Release pressure	Same pressure as PS

Port combination: PV ≠ PS = PD

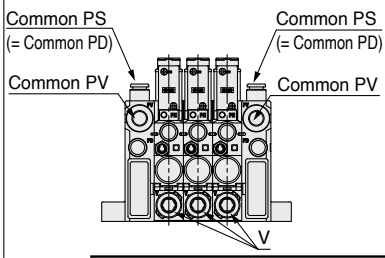
Circuit example



Supply valve: Self-holding type Release valve: N.C. (R type)

Port layout No. 2

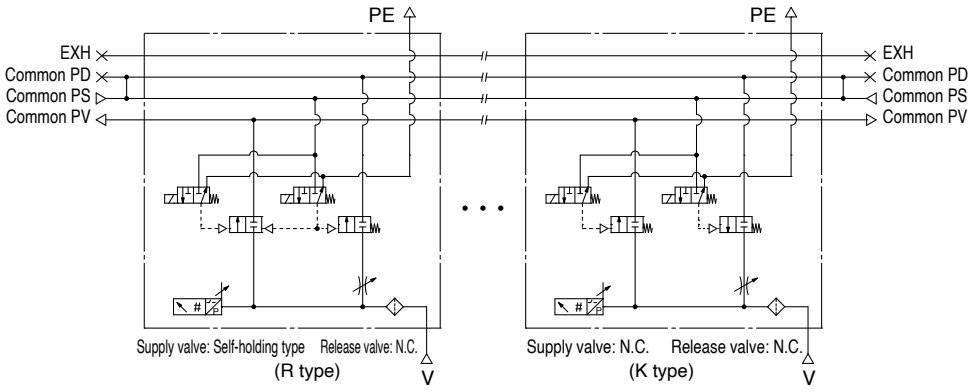
Single unit: ZK2Q00K□□□A-□ ┌A to J, 1 to 4
Manifold: ZZK2□A-P2□



System		Vacuum pump
Body type		Manifold
Exhaust type		Without silencer
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	—
	Release pressure	Same pressure as common PS

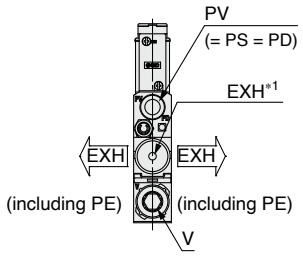
Port combination: Common PV ≠ Common PS = Common PD

Circuit example



Port layout No. 3

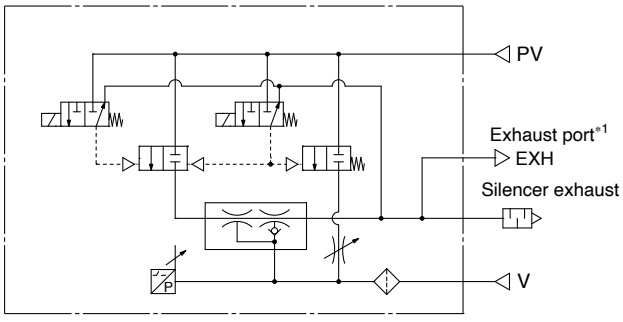
Single unit: ZK2A□R□$^{P}_{T}$□A-□



System		Ejector
Body type		Single unit
Exhaust type		Silencer exhaust
Application and purpose	Vacuum pressure	—
	Exhaust	Released in operating environment
	Release pressure	Same pressure as PV

Port combination: PV = PS = PD

Circuit example



Supply valve: Self-holding type Release valve: N.C. (R type)

∗1 Nozzle size: 12, 15

Refer to page 28 for the purpose of port and the operating pressure range.

● PV: Air pressure supply port/Port for vacuum source (Vacuum pump) ● PS: Pilot pressure supply port
● PD: Release pressure supply port ● V: Vacuum port ● EXH: Exhaust port
● PE: Pilot pressure exhaust port For details ⇒ Page 28

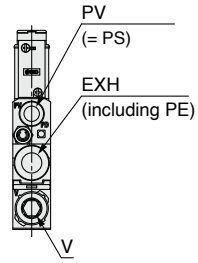
Port Layout

∗ System depends on vacuum source (vacuum pump/ejector).

Standard Products

Port layout No. 4

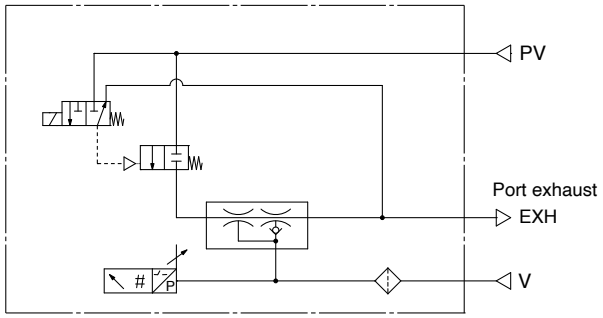
Single unit: ZK2B□J□ A to J □A-□



System		Ejector
Body type		Single unit
Exhaust type		Port exhaust
Application and purpose	Vacuum pressure	—
	Exhaust	After piping, individual exhaust is necessary.
	Release pressure	—

Port combination: PV = PS

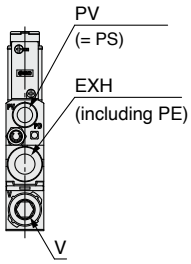
Circuit example



Supply valve: N.C. Release valve: Without release valve (J type)

Port layout No. 5

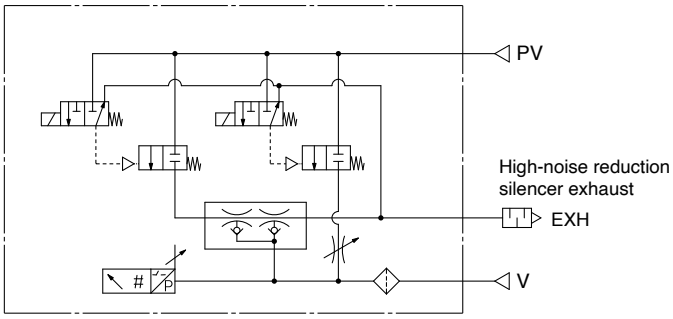
Single unit: ZK2G□K□□□A-□ K to S, 5, 6



System		Ejector
Body type		Single unit
Exhaust type		High-noise reduction silencer exhaust
Application and purpose	Vacuum pressure	—
	Exhaust	Released in operating environment
	Release pressure	Same pressure as PV

Port combination: PV = PS = PD

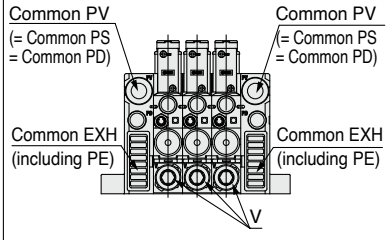
Circuit example



Supply valve: N.C. Release valve: N.C.
(K type)

Port layout No. 6

Single unit: ZK2C□ R K □ P T □A-□
Manifold: ZZK2□A-A1□

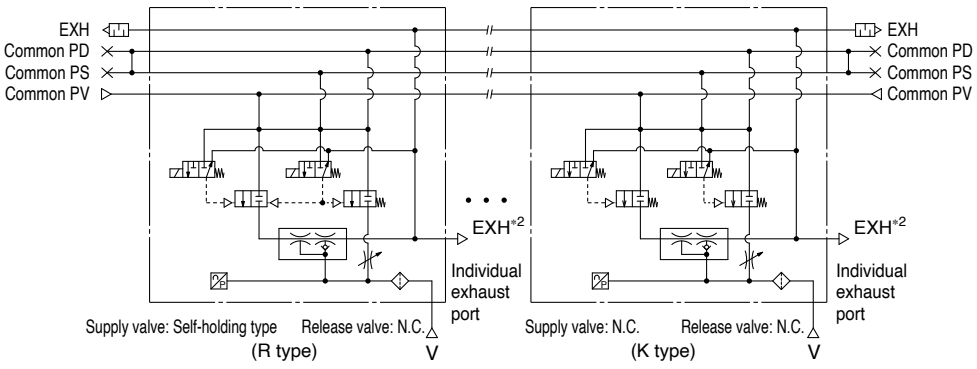


∗1 The complex exhaust is a combined exhaust method of the common exhaust from the end plate and the direct exhaust from each station.

System		Ejector
Body type		Manifold
Exhaust type		Complex exhaust∗1
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	Released in operating environment
	Release pressure	Same pressure as common PV

Port combination: Common PV = Common PS = Common PD

Circuit example



∗2 For complex exhaust type, individual exhaust port is provided to each station.

Refer to page 28 for the purpose of port and the operating pressure range.

● PV: Air pressure supply port/Port for vacuum source (Vacuum pump) ● PS: Pilot pressure supply port
● PD: Release pressure supply port ● V: Vacuum port ● EXH: Exhaust port
● PE: Pilot pressure exhaust port For details ⇒ Page 28

Port Layout

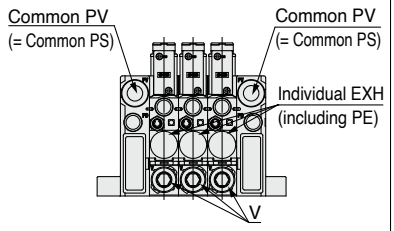
∗ System depends on vacuum source (vacuum pump/ejector).

Standard Products

Port layout No. 7

Single unit: ZK2F□J□$^{A\ to\ J}$□A-□

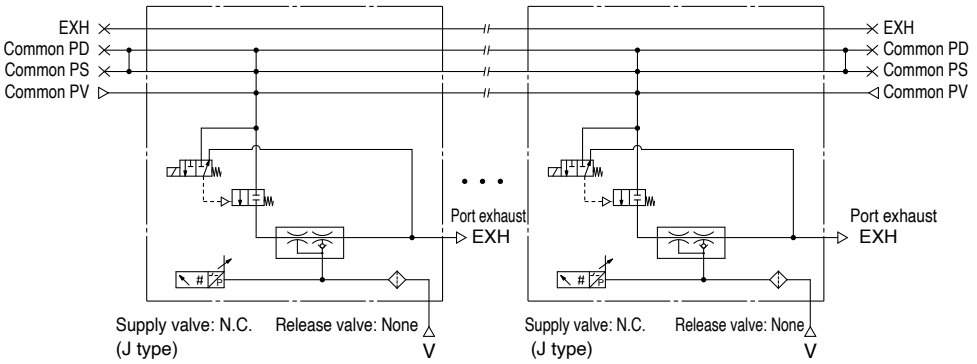
Manifold: ZZK2□A-A2□



System		Ejector
Body type		Manifold
Exhaust type		Individual port exhaust
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	After piping, individual exhaust is necessary.
	Release pressure	—

Port combination: Common PV = Common PS

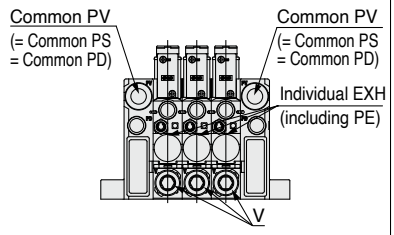
Circuit example



Port layout No. 8

Single unit: ZK2H□$^{E}_{K}$□□□A-□ ┌K to S, 5, 6

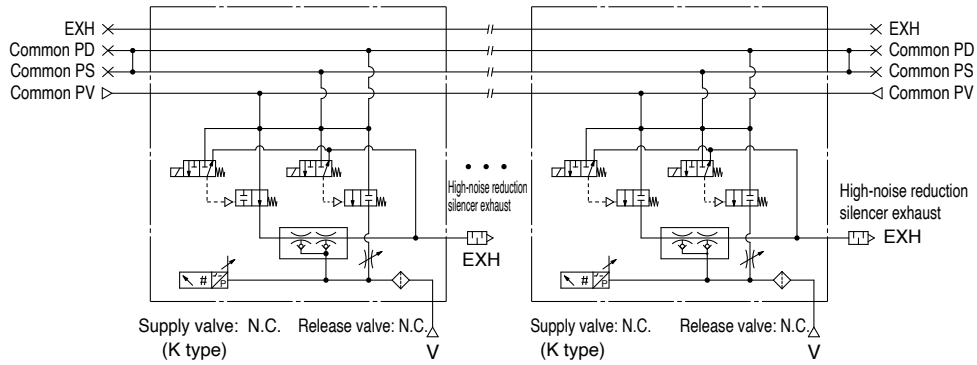
Manifold: ZZK2□A-A2□



System		Ejector
Body type		Manifold
Exhaust type		High-noise reduction silencer exhaust
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	Released in operating environment
	Release pressure	Same pressure as common PV

Port combination: Common PV = Common PS = Common PD

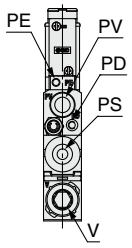
Circuit example



Option -D

Port layout No. 9

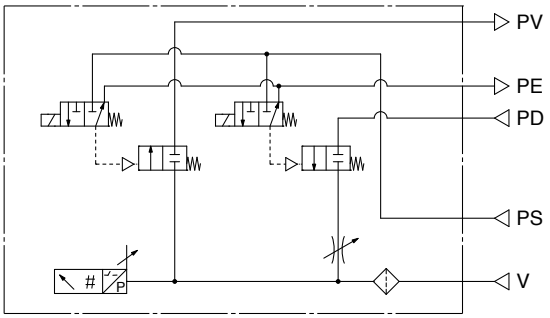
Single unit: ZK2P00K□□□A-□-D ┌A to J, 1 to 4



System		Vacuum pump
Body type		Single unit
Exhaust type		Without silencer
Application and purpose	Vacuum pressure	—
	Exhaust	—
	Release pressure	PD pressure has to be supplied with PS pressure.

Port combination: PV ≠ PS ≠ PD

Circuit example



Refer to page 28 for the purpose of port and the operating pressure range.

● PV: Air pressure supply port/Port for vacuum source (Vacuum pump) ● PS: Pilot pressure supply port
● PD: Release pressure supply port ● V: Vacuum port ● EXH: Exhaust port
● PE: Pilot pressure exhaust port For details ⇒ Page 28

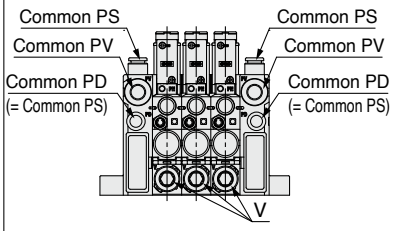
Port Layout

∗ System depends on vacuum source (vacuum pump/ejector).

Option -D

Port layout No. 10

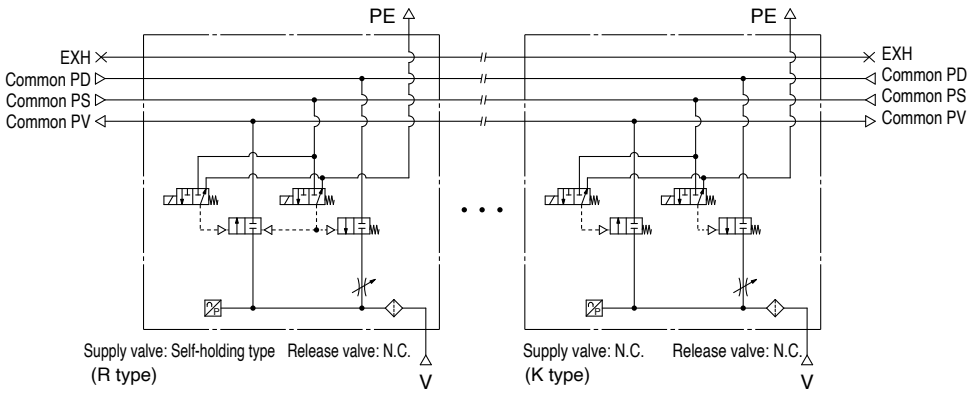
Single unit: ZK2Q00$^{B}_{K}$□$^{P}_{T}$□A-□-P
Manifold: ZZK2□A-P2□-D



System		Vacuum pump
Body type		Manifold
Exhaust type		Without silencer
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	—
	Release pressure	Common PD pressure has to be supplied with common PS.

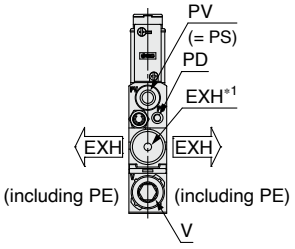
Port combination: Common PV ≠ Common PS ≠ Common PD

Circuit example



Port layout No. 11

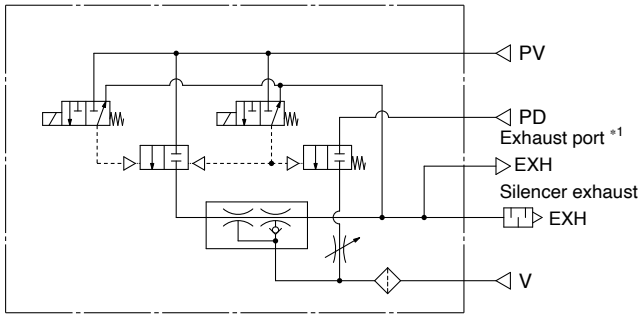
Single unit: ZK2A□R□N□A-□-D



System		Ejector
Body type		Single unit
Exhaust type		Silencer exhaust
Application and purpose	Vacuum pressure	—
	Exhaust	Released in operating environment
	Release pressure	PD pressure has to be supplied with PV pressure.

Port combination: PV = PS ≠ PD

Circuit example

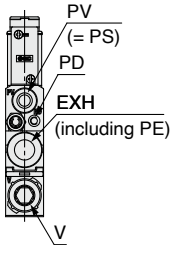


Supply valve: Self-holding type Release valve: N.C. (R type)

∗1 Nozzle size: 12, 15

Port layout No. 12

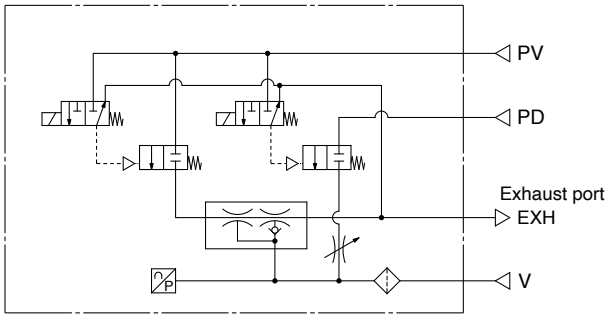
Single unit: ZK2B□K□$^{P}_{T}$□A-□-D



System		Ejector
Body type		Single unit
Exhaust type		Port exhaust
Application and purpose	Vacuum pressure	—
	Exhaust	After piping, individual exhaust is necessary.
	Release pressure	PD pressure has to be supplied with PV pressure.

Port combination: PV = PS ≠ PD

Circuit example



Supply valve: N.C. Release valve: N.C. (K type)

Refer to page 28 for the purpose of port and the operating pressure range.

● PV: Air pressure supply port/Port for vacuum source (Vacuum pump) ● PS: Pilot pressure supply port
● PD: Release pressure supply port ● V: Vacuum port ● EXH: Exhaust port
● PE: Pilot pressure exhaust port For details ⇒ Page 28

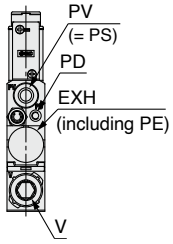
Port Layout

∗ System depends on vacuum source (vacuum pump/ejector).

Option -D

Port layout No. 13

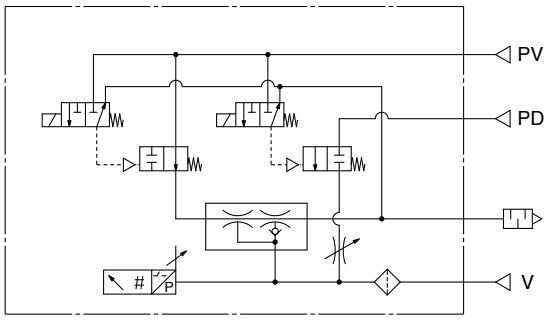
Single unit: ZK2G□E□□□A-□-D (A to J, 1 to 4)



System		Ejector
Body type		Single unit
Exhaust type		High-noise reduction silencer exhaust
Application and purpose	Vacuum pressure	—
	Exhaust	Released in operating environment
	Release pressure	PD pressure has to be supplied with PV pressure.

Port combination: PV = PS ≠ PD

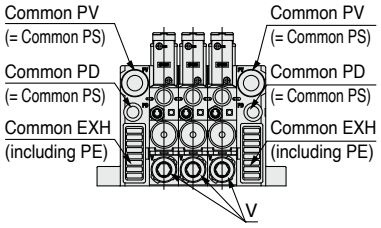
Circuit example



Supply valve: Self-holding type Release valve: N.C.
(R type)

Port layout No. 14

Single unit: ZK2C□$^{R}_{K}$□N□A-□-P
Manifold: ZZK2□A-A1□-D

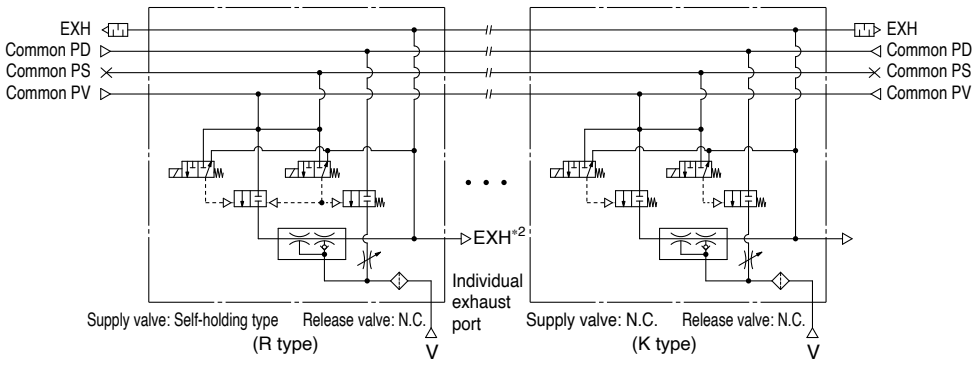


∗1 The complex exhaust is a combined exhaust method of the common exhaust from the end plate and the direct exhaust from each station.

System		Ejector
Body type		Manifold
Exhaust type		Complex exhaust∗1
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	Released in operating environment
	Release pressure	Common PD pressure has to be supplied with common PV.

Port combination: Common PV = Common PS ≠ Common PD

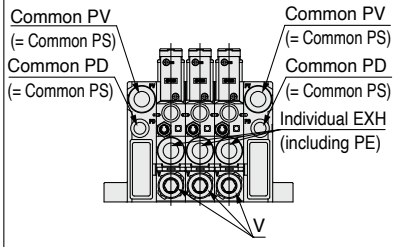
Circuit example



∗2 For complex exhaust type, individual exhaust port is provided to each station.

Port layout No. 15

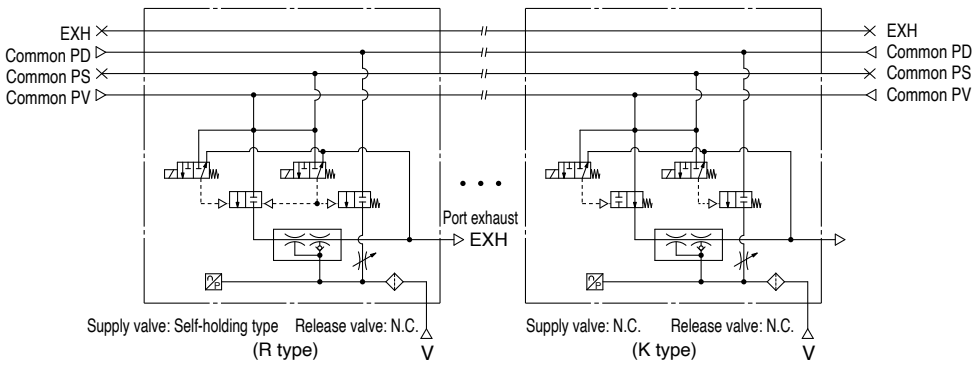
Single unit: ZK2F□$^{R}_{E}$□$^{P}_{T}$□A-□-P
Manifold: ZZK2□A-A2□-D



System		Ejector
Body type		Manifold
Exhaust type		Individual port exhaust
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	After piping, individual exhaust is necessary.
	Release pressure	Common PD pressure has to be supplied with common PV.

Port combination: Common PV = Common PS ≠ Common PD

Circuit example



Refer to page 28 for the purpose of port and the operating pressure range.

● PV: Air pressure supply port/Port for vacuum source (Vacuum pump) ● PS: Pilot pressure supply port
● PD: Release pressure supply port ● V: Vacuum port ● EXH: Exhaust port
● PE: Pilot pressure exhaust port For details ⇒ Page 28

Port Layout

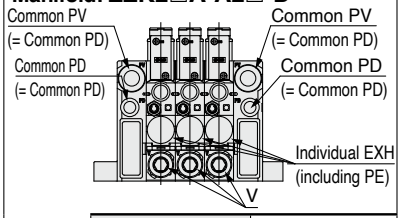
∗ System depends on vacuum source (vacuum pump/ejector).

Option -D

Port layout No. 16

Single unit: ZK2H□(E/K)□□□A-□-P (A to J, 1 to 4)

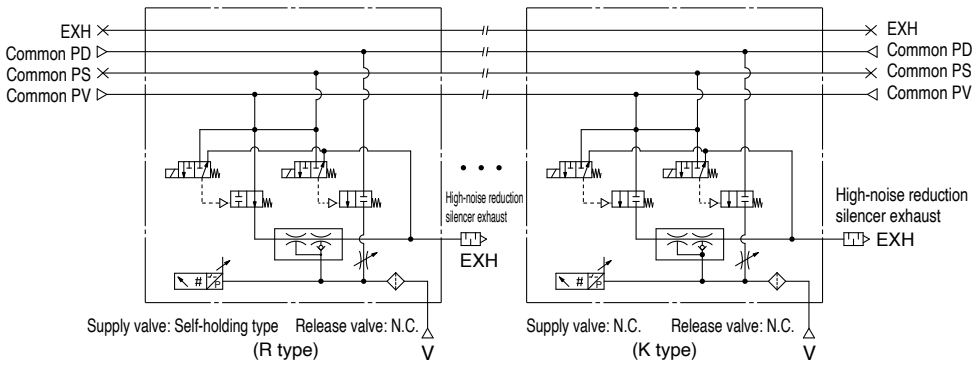
Manifold: ZZK2□A-A2□-D



System		Ejector
Body type		Manifold
Exhaust type		High-noise reduction silencer exhaust
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	Released in operating environment
	Release pressure	PD pressure has to be supplied with PV pressure.

Port combination: Common PV = Common PS ≠ Common PD

Circuit example

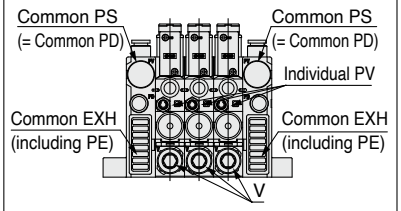


Option -L

Port layout No. 17

Single unit: ZK2C□(R/K)□(P/T)□A-□-L

Manifold: ZZK2□A-A1□-L

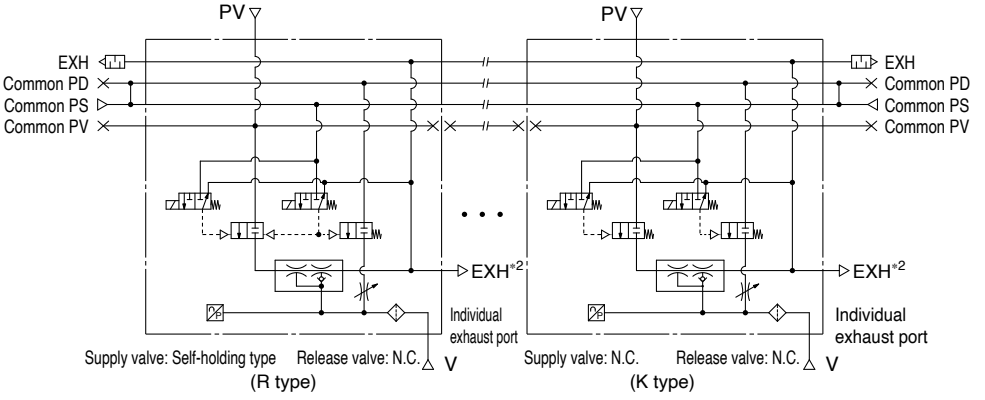


∗1 The complex exhaust is a combined exhaust method of the common exhaust from the end plate and the direct exhaust from each station.

System		Ejector
Body type		Manifold
Exhaust type		Complex exhaust∗1
Application and purpose	Vacuum pressure	PV pressure can be changed per station.
	Exhaust	Released in operating environment
	Release pressure	Same pressure for common PS and common PD

Port combination: Individual PV ≠ Common PS = Common PD

Circuit example

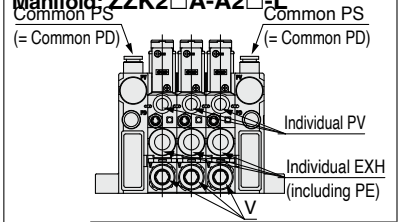


∗2 For complex exhaust type, individual exhaust port is provided to each station

Port layout No. 18

Single unit: ZK2F□(R/E)□(A to J)□A-□-L

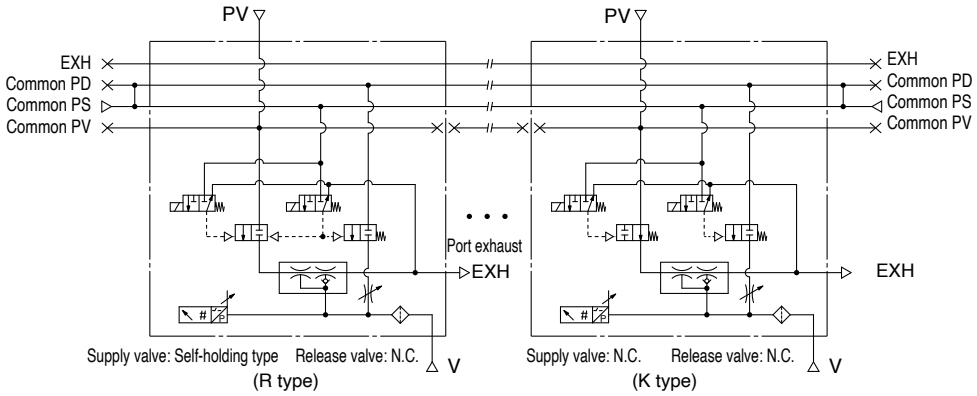
Manifold: ZZK2□A-A2□-L



System		Ejector
Body type		Manifold
Exhaust type		Individual port exhaust
Application and purpose	Vacuum pressure	PV pressure can be changed per station.
	Exhaust	After piping, individual exhaust is necessary.
	Release pressure	Same pressure for common PS and common PD

Port combination: Individual PV ≠ Common PS = Common PD

Circuit example



Refer to page 28 for the purpose of port and the operating pressure range.

● PV: Air pressure supply port/Port for vacuum source (Vacuum pump) ● PS: Pilot pressure supply port
● PD: Release pressure supply port ● V: Vacuum port ● EXH: Exhaust port
● PE: Pilot pressure exhaust port For details ⇒ Page 28

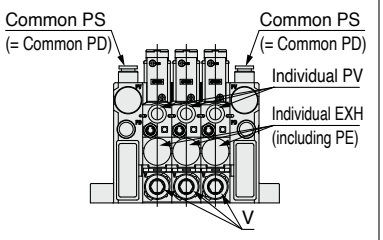
Port Layout

＊ System depends on vacuum source (vacuum pump/ejector).

Option -L

Port layout No. 19

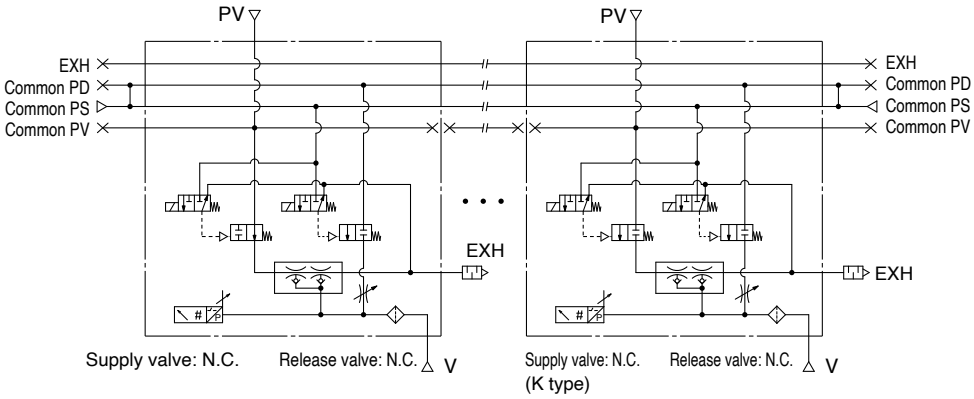
Single unit: ZK2H□$^{E}_{K}$□□□A-□-L ┌K to S, 5, 6
Manifold: ZZK2□A-A2□-L



System		Ejector
Body type		Manifold
Exhaust type		High-noise reduction silencer exhaust
Application and purpose	Vacuum pressure	PV pressure can be changed per station.
	Exhaust	Released in operating environment
	Release pressure	Same pressure for common PS and common PD

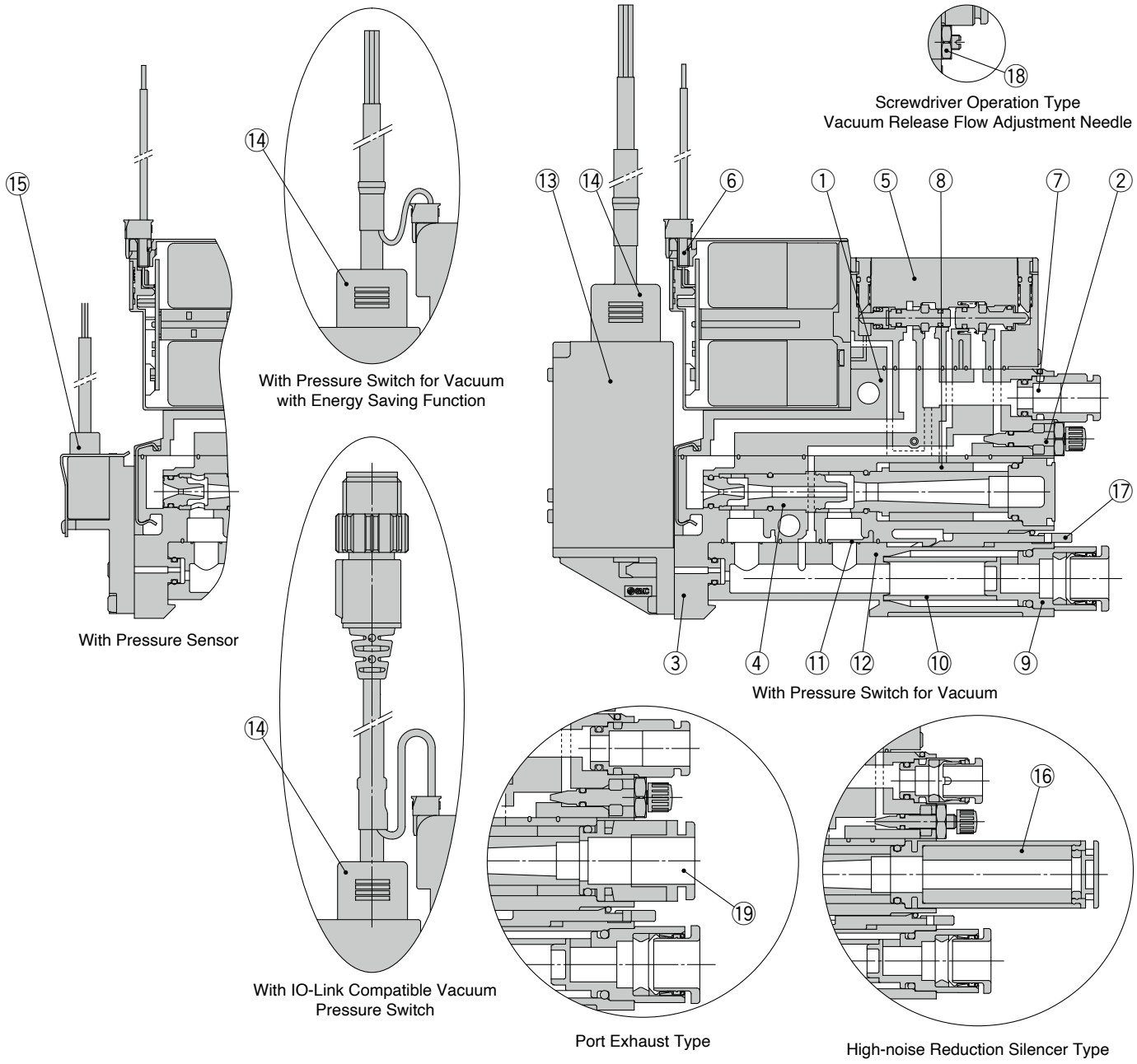
Port combination: Individual PV ≠ Common PS = Common PD

Circuit example



Refer to page 28 for the purpose of port and the operating pressure range.

Construction



Component Parts

No.	Description	Material	Note
1	**Valve body assembly**	PBT	HNBR, NBR and steel are also used.
2	**Needle assembly**	Brass	Electroless nickel plated brass, resin, steel and NBR are used.
3	**Ejector body assembly**	PBT	HNBR, NBR and steel are also used.
4	**Ejector assembly**	PBT	NBR is also used.

Replacement Parts

No.	Description	Note
5	**Valve assembly**	—
6	**Connector assembly**	Connector for solenoid valve 3 wire (For valve type K/R), 2 wire (For valve type J)
7	**One-touch fitting assembly**	Metric size: Ø 6, Inch size: Ø 1/4"
8	**Sound absorbing material**	10 pcs. per set
9	**Vacuum port adapter assembly**	With One-touch fitting and filter element
10	**Filter element**	Nominal filtration rating: 30 μm, 10 pcs. per set
11	**Body gasket**	Gasket integrated with the exhaust interference prevention valve, 10 pcs. per set
12	**Filter case**	Case body: Polycarbonate (Refer to the Specific Product Precautions on page 93.) Clear filter case: without a port for the pressure switch or sensor, Opaque filter case: with a port for the pressure switch or sensor
13	**Vacuum pressure switch assembly**	With 2 screws and 1 gasket
14	**Lead wire with connector**	—
15	**Pressure sensor assembly**	With 2 screws and 1 gasket
16	**High-noise reduction silencer assembly**	With sound absorbing material (High-noise reduction silencer)
17	**Release lever**	10 pcs. per set
18	**Lock nut**	10 pcs. per set
19	**One-touch fitting assembly**	Metric size: Ø 8, Inch size: Ø 5/16"

How to Order Replacement Parts for Single Unit

Valve assembly

▶ p. 43 Construction ⑤

ZK2 − VA [A] [K] [5] [L] A − [ ] − A

❶ ❷ ❸ ❹ ❺

❶ Applicable system

A	Ejector system
P	Vacuum pump system

❷ Valve type

K	Supply valve: N.C., Release valve: N.C.
J	Supply valve: N.C., Release valve: None
R	Supply valve: Self-holding release valve linked, Release valve: N.C.
E*1	Supply valve: N.O., Release valve: N.C.

*1 When "P" is selected for ❶, the "E" type cannot be selected.

❸ Rated voltage

5	24 VDC
6	12 VDC

❹ Wiring

C	Manifold common wiring
L	Individual wiring: With connector assembly (Lead wire length: 300 mm)
LO	Individual wiring: Without connector assembly

❺ Other specifications

C	Vacuum pump system (Valve type R) PE port female thread specification (M3)
–	Specifications other than that listed above

* Select the ZK2-VAA[K/E]□LOA-A for a switch with energy saving function.

Connector assembly

▶ p. 43 Construction ⑥

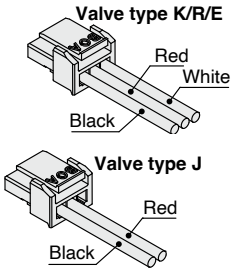
ZK2 − LV [W] [ ] − A

Applicable valve type

W	Valve type K/R/E
S	Valve type J

Lead wire length

–	300 mm
6	600 mm
10	1000 mm
20	2000 mm
30	3000 mm



One-touch fitting assembly (Purchasing order is available in units of 10 pieces.)

▶ p. 43 Construction ⑦

KJH [06] − C2

Port size

06	Ø 6 One-touch fitting	Metric size
07	Ø 1/4" One-touch fitting	Inch size

Sound absorbing material (10 pcs. per set)

▶ p. 43 Construction ⑧

ZK2 − SE1 − 1 − A

Sound absorbing material hole diameter

1	300 μm

Vacuum port adapter assembly (Purchasing order is available in units of 1 piece.)

▶ p. 43 Construction ⑨

ZK2 − VA1S [8] − A

One-touch fitting size

6	Ø 6 One-touch fitting	Metric size
8	Ø 8 One-touch fitting	
7	Ø 1/4" One-touch fitting	Inch size
9	Ø 5/16" One-touch fitting	

Filter element (10 pcs. per set)

▶ p. 43 Construction ⑩

ZK2 − FE1 − 3 − A

Nominal filtration rating

3	30 μm

Body gasket*1 (10 pcs. per set)

▶ p. 43 Construction ⑪

ZK2 − BG5 − [1] − A

Applicable type

1	One check valve type (All specifications other than vacuum switch with energy saving function and exhaust interference prevention valve)
2	Two check valve type (Vacuum switch with energy saving function and exhaust interference prevention valve)

*1 When ZK2-BG5-2-A is mounted, the workpiece cannot be removed until vacuum is released.

Filter case*1

▶ p. 43 Construction ⑫

ZK2 − FC [ ] − A

Port for the pressure switch or sensor

Symbol	Port for the pressure switch or sensor	Filter case colour
P	With port (type with pressure switch or sensor)	Opaque
T	Without port (type without pressure switch or sensor)	Clear

*1 Vacuum port adapter assembly is not included.

How to Order Replacement Parts for Single Unit

Pressure switch for vacuum assembly
(With 2 mounting screws)
▶ p. 43 Construction ⑬

ZK2– ZS [E][A][M][G][ ] – A
❶ ❷ ❸ ❹ ❺

❶ Rated pressure range and function

E	0 to -101 kPa	Pressure switch for vacuum	Open collector 2 outputs	–
F	-100 to 100 kPa			
V		Pressure switch for vacuum with energy saving function	Open collector 1 output	For N.C. supply valve (valve type K)
W				For N.O. supply valve (valve type E)

❷ Output

A	NPN
B	PNP

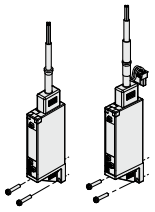
❸ Unit

–	With unit selection function
M	SI unit only*1

*1 Fixed unit: kPa

❹ Lead wire with connector

–	Without	
G	With	When ❶ is E or F: Lead wire with connector for pressure switch for vacuum (Length 2 m)
		When ❶ is V or W: Lead wire with connector for pressure switch for vacuum with energy saving function (Length 2 m)



❺ Mounting*3

–	Mounted to the single unit
L	Mounted to the manifold

*3 The length of the ejector mounting screw included in the package is different. When ordering an ejector without valve, select — for mounting.

IO-Link compatible vacuum pressure switch assembly
▶ p. 43 Construction ⑬

ZK2 – ZS [E][L1][M][H][ ] – A
❶ ❷ ❸ ❹ ❺

❶ Rated pressure range

E	0 to -101 kPa
F	-100 to 100 kPa

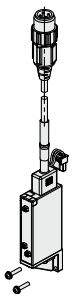
❷ Output

L1	IO-Link (Energy saving function selectable)	For N.C. supply valve (valve type K)
L2		For N.O. supply valve (valve type E)

❸ Unit

–	With unit selection function
M	SI unit only*1

*1 Fixed unit: kPa



❹ Lead wire with connector

–	Without
H	With (Lead wire with connector for IO-Link compatible pressure switch for vacuum, With M12 connector, Length 300 mm)

❺ Mounting*3

–	Mounted to the single unit
L	Mounted to the manifold

*3 The length of the ejector mounting screw included in the package is different.

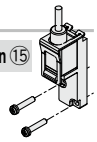
Lead wire with connector
(When individual lead wire is necessary, order with the part number below.)
▶ p. 43 Construction ⑭

- **Lead wire with connector for pressure switch for vacuum**
  ZS – 39 – 5G
- **Lead wire with connector for pressure switch for vacuum with energy saving function**
  ZK2 – LW [A] 20 – A
  Output

A	NPN open collector
B	PNP open collector

- **Lead wire with connector for IO-Link compatible vacuum pressure switch (With M12 connector)**
  ZK2 – LW34 – A

Pressure sensor assembly
(With 2 mounting screws)
▶ p. 43 Construction ⑮



ZK2 – PS [1][ ] – A

Rated pressure range and specifications

1	0 to –101 kPa, Output: 1 to 5 V, Accuracy: ±2 % F.S.
3	–100 to 100 kPa, Output: 1 to 5 V, Accuracy: ±2 % F.S.

Mounting*1

–	Mounted to the single unit
L	Mounted to the manifold

*1 The length of the ejector mounting screw included in the package is different. When ordering an ejector without valve, select — for mounting.

High-noise reduction silencer assembly
▶ p. 43 Construction ⑯

ZK2 – SC3 – [4] – A
Applicable nozzle size

4	For nozzle size 07, 10
6	For nozzle size 12, 15

Sound absorbing material for high-noise reduction silencer
(5 pcs. per set)

ZK2 – SE4 – 6 – A

Release lever (10 pcs. per set)
▶ p. 43 Construction ⑰

ZK2 – RL1 – A

Lock nut (10 pcs. per set)
▶ p. 43 Construction ⑱

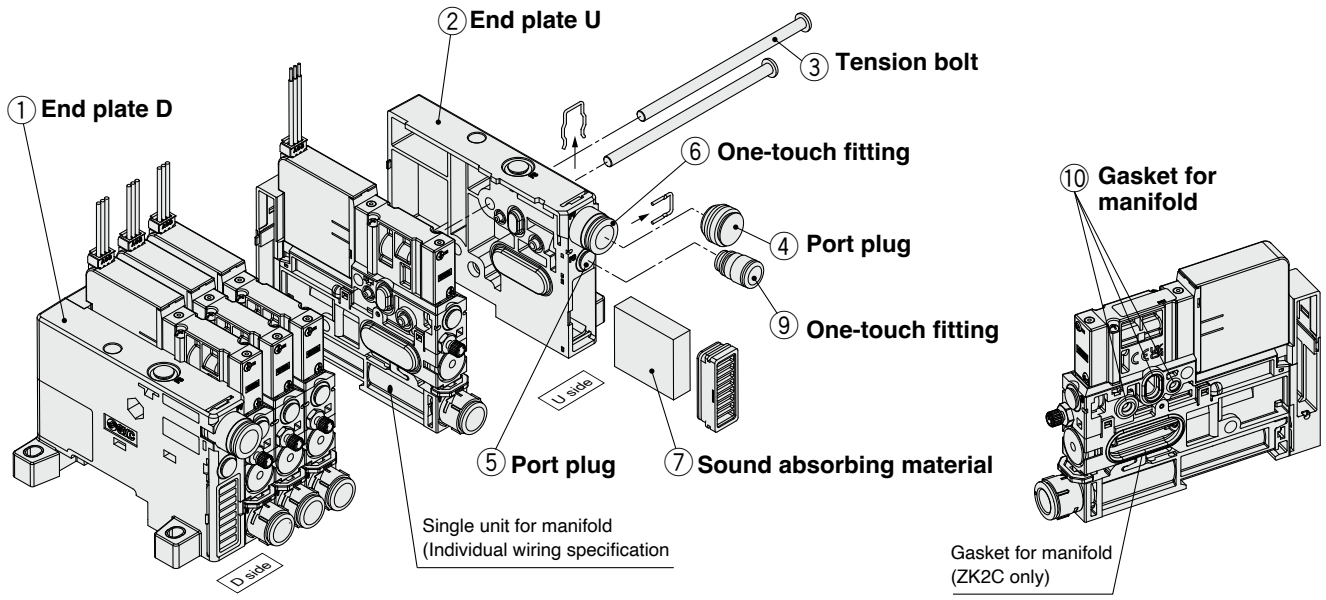
ZK2 – LN1 – A

One-touch fitting assembly
(Purchasing order is available in units of 10 pieces.)
▶ p. 43 Construction ⑲

VVQ1000 – 51A – [C8]
Port size

C8	Ø 8 One-touch fitting	Metric size
N9	Ø 5/16" One-touch fitting	Inch size

Vacuum Unit/*ZK2□A Series*
Exploded View of Manifold



■How to increase manifold stations

[Individual wiring specifications]

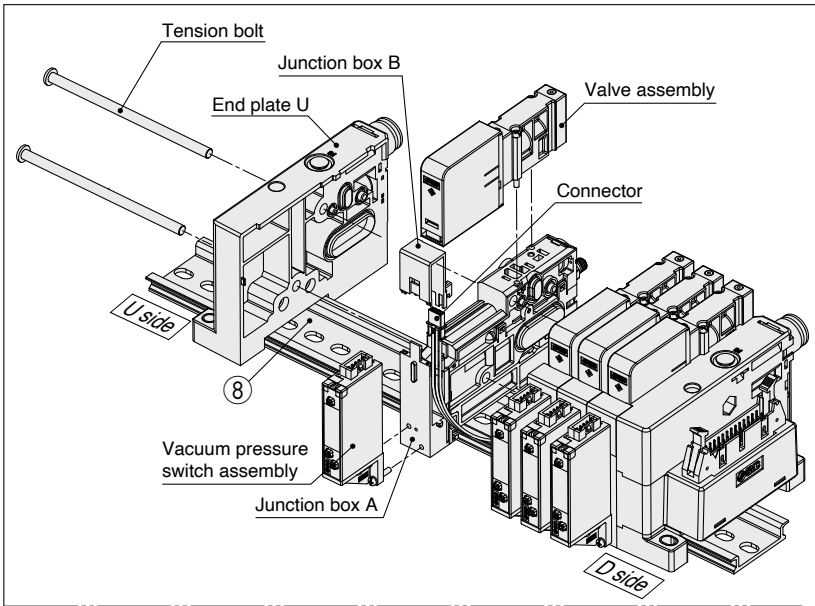
1) Remove two tension bolts.
2) Remove the end plate U. (Be careful not to drop the gasket.)
3) Mount a single unit to the end surface of U side. (Do not let the gasket get caught.)
4) Mount the end plate U with the appropriate length of tension bolts for the number of stations required. (Tightening torque: 0.75 N·m)

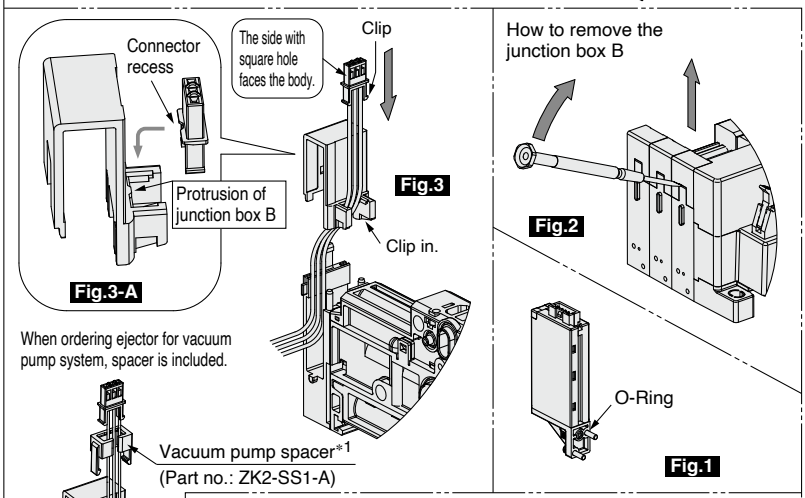
Component Parts

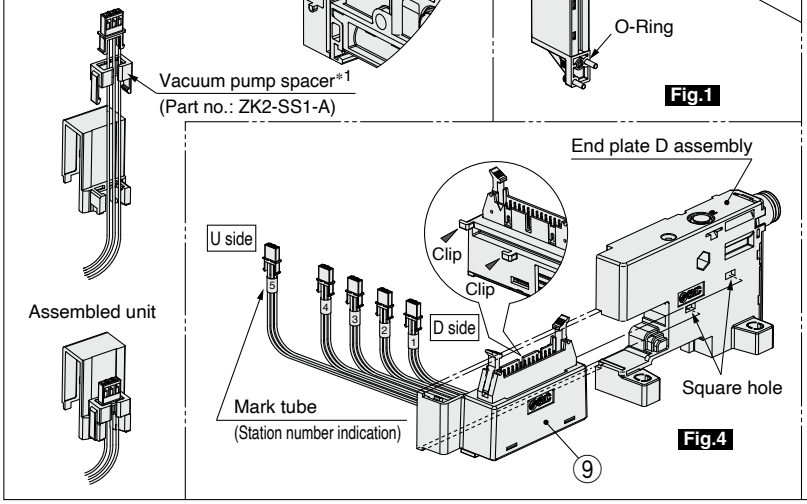
No.	Description	Material	Note
1	**End plate D assembly**	Resin	HNBR, NBR and steel are also used.
2	**End plate U assembly**	Resin	Electroless nickel plated brass, steel and NBR are also used.

Replacement Parts

No.	Description	Note
3	**Tension bolt assembly**	2 pcs. per set
4	**Port plug assembly**	Plug for changing PV port to single side supply type (Common for mm and inch type)
5	**Port plug assembly**	Plug for changing PS or PD port to single side supply type (Common for mm and inch type)
6	**One-touch fitting assembly**	Metric size: Ø 8, Inch size: Ø 5/16"
7	**Sound absorbing material**	2 pcs. per set - Material: Non-woven cloth (Silencer cover is not included.)
8	**DIN rail**	Refer to Dimensions (Refer to pages 62 to 64) for the recommended length for each number of manifolds stations.
9	**One-touch fitting assembly**	Metric size: Ø 6, Inch size: Ø 1/4"
10	**Gasket set for manifold**	10 pcs. per set
11	**Connector housing assembly**	Available connector is even number only. (If you need a connector for odd number, specify the connector of the number you need + 1 station.)







■ How to increase manifold stations

[To increase the number of stations from odd number (1, 3, 5, 7, 9) in common wiring type to even number (2, 4, 6, 8, 10)]

(Common wiring of odd number station has a vacant connector for one station. Easy to add a station.)

1) Remove the tension bolt.
2) Remove the end plate U.
3) Remove the valve assembly of a single unit for extra station(s) for manifold.
4) Remove the switch assembly if it is present. (Be careful not to drop the O-ring. Refer to **Fig.1**)
5) Remove the junction box B (top) using a precision screwdriver. (Refer to **Fig.2**)
6) Mount the extra connector to the junction box B. (Refer to **Fig.3**) (Engage the recess of the connector and the protrusion of the junction box B. (Refer to **Fig.3-A**)
7) Mount a single unit for extra station(s) for manifold to the end surface of U side. (Do not let the gasket or lead wire get caught.)
8) Mount the end plate U with the appropriate length of tension bolts for the number of stations required. (Tightening torque: 0.75 N·m.)
9) Mount the junction box B to the junction box A.
10) Assemble the valve assembly. (Tightening torque: 0.15 N·m)
11) For products with a switch, mount the switch assembly. (Be careful not to drop the O-ring. Tightening torque: 0.08 to 0.10 N·m)

[To increase the number of stations from even number to odd number, or increase two stations or more]

1) Remove the valve assembly for all stations. (Single unit for extra station is also removed.)
2) Remove the switch assembly if it is present. (Be careful not to drop the O-ring. Refer to **Fig.1**)
3) Remove the junction box B (top) for all stations using a precision screwdriver. (Refer to **Fig.2**) (Remove the junction box B from D side.)
4) Remove all connectors mounted to the junction box B. (Be careful not to break the connector clip.)
5) Remove the tension bolt.
6) Remove the end plate D assembly.
7) Remove the connector housing assembly from the end plate D assembly. (Refer to **Fig.4**)
8) Mount the connector housing assembly for extra station(s) to the end plate D assembly. (Refer to **Fig.4**) (Insert two clips of the housing mounting surface to the square holes of the end plate, and slide the connector housing assembly.)
9) Remove the end plate U. (Be careful not to drop the gasket.)
10) Mount a single unit for extra station(s) for manifold to the end surface of U side. Do not let the gasket get caught.
11) Mount the end plate U and D with the appropriate length of tension bolts for the number of stations required. (Tightening torque: 0.75 N·m.)
12) Mount the connector for all stations to the junction box B. (Refer to **Fig.3**) (Engage the recess of the connector and the protrusion of the junction box B. (Refer to **Fig.3-A**)
13) Mount the junction box B to the junction box A.
Push the wires down the side and mount the junction box B to the junction box A following a decreasing mark tube numbers from U side. (Do not let the lead wire get caught.)
14) Assemble the valve assembly. (Tightening torque: 0.15 N·m)
15) For products with a switch, mount the switch assembly. (Be careful not to drop the O-ring. Tightening torque: 0.08 to 0.10 N·m)

*1 When adding a vacuum pump system, the vacuum pump spacer for extra station is required separately.

How to Order Replacement Parts for Manifold

Manifold end plate assembly

▶ Exploded View ①, ②, ③

Assembly number including ①End plate D, ②End plate U and ③Tension bolt assembly (Used for the maintenance of the end plate)

ZZK2 [ ] – A

Manifold end plate assembly

Refer to pages 19, 27, 74, and 76 for the manifold part number.

Tension bolt assembly (2 pcs. per set)

▶ Exploded View ③

ZK2 – TB1 – [05] – A

Applicable stations

01	For 1 station manifold
⋮	⋮
10	For 10 stations manifold

Port plug assembly

▶ Exploded View ④

(Purchasing order is available in units of 1 piece.)

VVQZ2000 – CP

Port plug assembly

▶ Exploded View ⑤

(Purchasing order is available in units of 1 piece.)

ZK2 – MP1C6 – A

One-touch fitting assembly (Purchasing order is available in units of 10 pieces.)

▶ Exploded View ⑥

VVQ1000 – 51A – [C8]

Port size

C8	Ø 8 One-touch fitting	Metric size
N9	Ø 5/16" One-touch fitting	Inch size

One-touch fitting assembly (Purchasing order is available in units of 10 pieces.)

▶ Exploded View ⑨

KJH [06] – C2

Port size

06	Ø 6 One-touch fitting	Metric size
07	Ø 1/4" One-touch fitting	Inch size

Gasket set for manifold (10 pcs. per set)

▶ Exploded View ⑩

ZK2 – BG4 – [ ] – A

Applicable model

1	For ZK2C
2	For ZK2F, ZK2H, ZK2Q

Sound absorbing material (2 pcs. per set)

▶ Exploded View ⑦

ZK2 – SE2 – 1 – A

DIN rail

▶ Exploded View ⑧

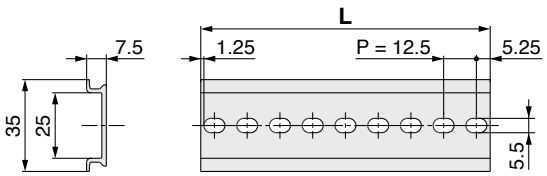
AXT100 – DR – [5]

Length symbol

[1] to **[60]**

L = 23 to L = 760.5

[L = 12.5 x ■ + 10.5]
■: Length symbol 1 to 40



L Dimensions

* When selecting the number, refer to "L6" in dimension table on pages 62 to 64.

No.	1	2	3	4	5	6	7	8	9	10
L Dimension	23	35.5	48	60.5	73	85.5	98	110.5	123	135.5
No.	11	12	13	14	15	16	17	18	19	20
L Dimension	148	160.5	173	185.5	198	210.5	223	235.5	248	260.5
No.	21	22	23	24	25	26	27	28	29	30
L Dimension	273	285.5	298	310.5	323	335.5	348	360.5	373	385.5
No.	31	32	33	34	35	36	37	38	39	40
L Dimension	398	410.5	423	435.5	448	460.5	473	485.5	498	510.5
No.	41	42	43	44	45	46	47	48	49	50
L Dimension	523	535.5	548	560.5	573	585.5	598	610.5	623	635.5
No.	51	52	53	54	55	56	57	58	59	60
L Dimension	648	660.5	673	685.5	698	710.5	723	735.5	748	760.5

Connector housing assembly

▶ Exploded View ⑪

ZK2 – CH [2] [04] – A

Applicable stations

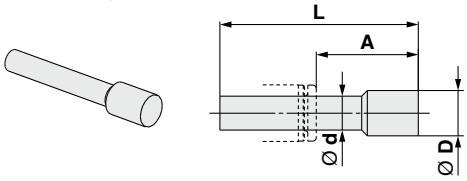
02	For 2 stations manifold
04	For 4 stations manifold
06	For 6 stations manifold
08	For 8 stations manifold
10	For 10 stations manifold

Connector type

1	D sub-connector (25 pins)
2	Flat ribbon cable connector (26 pins)

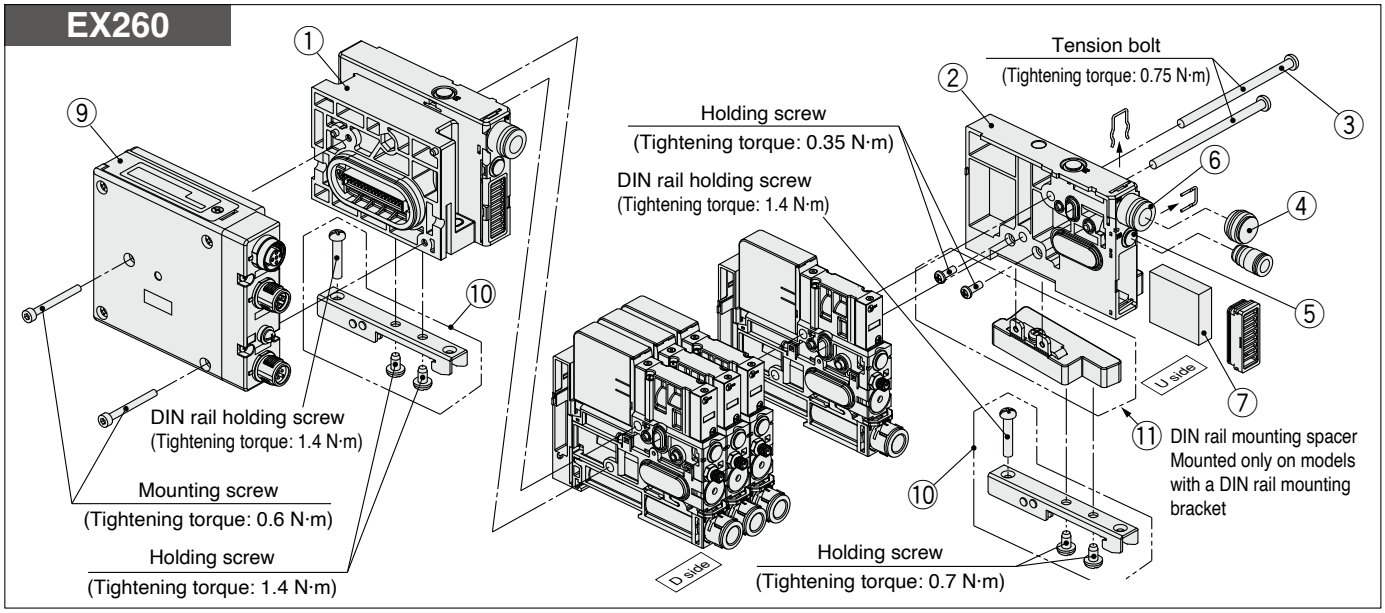
■ Plug (For One-touch fitting) (Purchasing order is available in units of 10 pieces.) Mounted onto ports which are not used (PV, PS, PD, etc.)

KQ2P – [06]



Models and Dimensions

Symbol	Applicable size Ø d	A	L	Ø D	Weight [g]	Note
06	Ø 6	18	35	8	1	White
08	Ø 8	20.5	39	10	2	White
07	Ø 1/4"	18	35	8.5	1	Orange
09	Ø 5/16"	20.5	39	10	2	Orange



Component Parts

No.	Description	Material	Note
1	**End plate D assembly**	Resin	HNBR, NBR and steel are also used.
2	**End plate U assembly**	Resin	Electroless nickel plated brass, steel and NBR are also used.

Common Manifold Replacement Parts **(Refer to page 48 for how to order.)**

No.	Description	Note
3	**Tension bolt assembly**	2 pcs. per set
4	**Port plug assembly**	Plug for changing PV port to single side supply type
5	**Port plug assembly**	Plug for changing PS or PD port to single side supply type
6	**One-touch fitting assembly**	Metric size: Ø 8, Inch size: Ø 5/16"
7	**Sound absorbing material**	2 pcs. per set - Material: Non-woven cloth (Silencer cover is not included.)
8	**DIN rail**	Refer to Dimensions (Refer to page 65) for the recommended length for each number of manifolds stations.

Fieldbus Transmission Specification Replacement Parts

No.	Description	Note
9	**EX260 SI unit**	—
10	**Clamp bracket**	It is used to secure the DIN rail.

How to Order Replacement Parts for Manifold

Fieldbus-compatible manifold end plate assembly

Assembly number including ① End plate D, ② End plate U and ③ Tension bolt assembly
(Used for the maintenance of the end plate)

ZZK2 [01] A – [A] [1] S0 – [ ] – A

❶ ❷ ❸ ❹ ● Manifold end plate assembly

❶ Stations

01	1 station
02	2 stations
⋮	⋮
08	8 stations

❷ System/Port

A	Ejector system	Ø 8 (Common PV)
AN		Ø 5/16" (Common PV)

❸ Exhaust

1	Complex exhaust	Applicable single unit part no.: ZK2C
2	Individual exhaust	Applicable single unit part no.: ZK2F, ZK2H

❹ Option

—	Without option	For details, refer to page 22.
B	With DIN rail mounting bracket for the EX260/EX500	
D	With common release pressure supply (PD) port	
L	Manifold individual supply specification	

⑨ EX260 SI unit (Fieldbus and Industrial Ethernet)

EX260 – S [PR1]

● Communication protocol

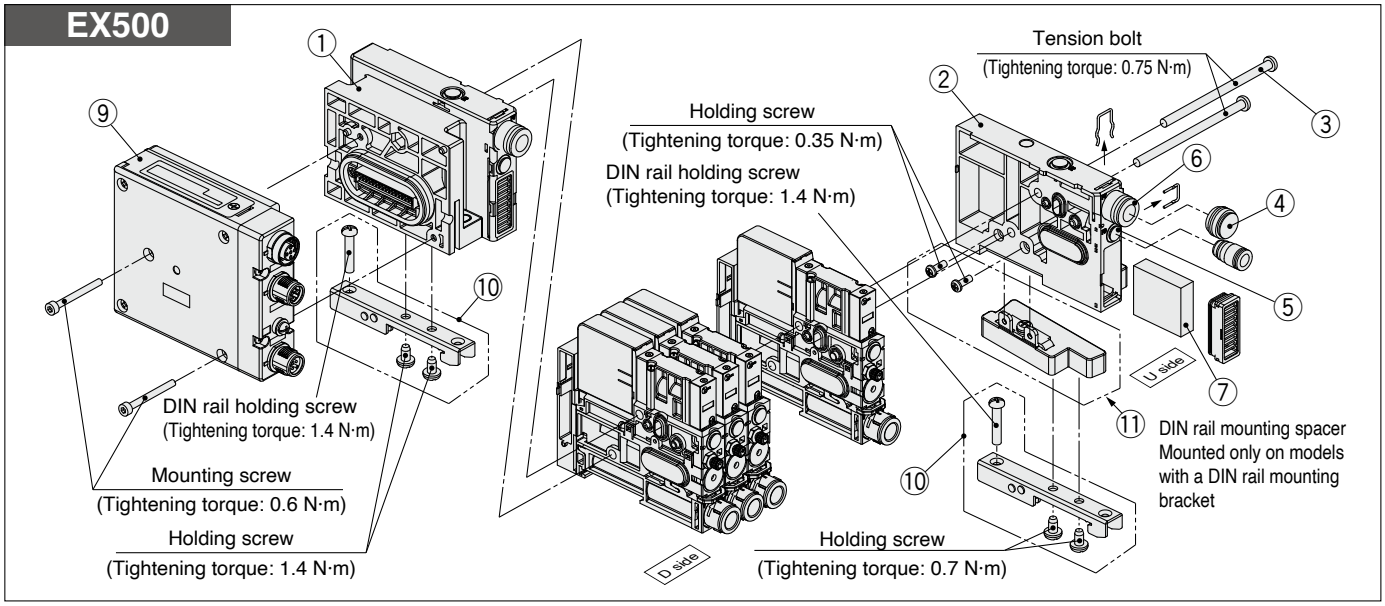
Symbol	Protocol	Number of outputs	SI unit output polarity	Communication connector	Manifold symbol
DN1	DeviceNet®	32	Source/PNP (Negative common)	M12	SQAN
DN2			Sink/NPN (Positive common)		SQA
PR1	PROFIBUS DP	32	Source/PNP (Negative common)	M12	SNAN
PR2			Sink/NPN (Positive common)		SNA
PR5			Source/PNP (Negative common)	D-sub	SNCN
PR6			Sink/NPN (Positive common)		SNC
MJ1	CC-Link	32	Source/PNP (Negative common)	M12	SVAN
MJ2			Sink/NPN (Positive common)		SVA
EC1	EtherCAT	32	Source/PNP (Negative common)	M12	SDAN
EC2			Sink/NPN (Positive common)		SDA
PN1	PROFINET	32	Source/PNP (Negative common)	M12	SFAN
PN2			Sink/NPN (Positive common)		SFA
EN1	EtherNet/IP™	32	Source/PNP (Negative common)	M12	SEAN
EN2			Sink/NPN (Positive common)		SEA
PL1	Ethernet POWERLINK	32	Source/PNP (Negative common)	M12	SGAN
IL1	IO-Link	32	Sink/NPN (Positive common)	M12	SKAN

Clamp bracket

No.	Description	Part number	Note
⑩	**Clamp bracket**	ZK2-DA5-A	2 pcs. per set
⑪	**DIN rail mounting spacer**	ZK2-EU3-A	—

∗ To retrofit a clamp bracket, ⑩ and ⑪ are required.

EX500



Component Parts

No.	Description	Material	Note
1	**End plate D assembly**	Resin	HNBR, NBR and steel are also used.
2	**End plate U assembly**	Resin	Electroless nickel plated brass, steel and NBR are also used.

Common Manifold Replacement Parts (Refer to page 48 for how to order.)

No.	Description	Note
3	**Tension bolt assembly**	2 pcs. per set
4	**Port plug assembly**	Plug for changing PV port to single side supply type
5	**Port plug assembly**	Plug for changing PS or PD port to single side supply type
6	**One-touch fitting assembly**	Metric size: Ø 8, Inch size: Ø 5/16"
7	**Sound absorbing material**	2 pcs. per set - Material: Non-woven cloth (Silencer cover is not included.)
8	**DIN rail**	Refer to Dimensions (Refer to page 66) for the recommended length for each number of manifolds stations.

Fieldbus Transmission Specification Replacement Parts

No.	Description	Note
9	**EX500 SI unit**	—
10	**Clamp bracket**	It is used to secure the DIN rail.

How to Order Replacement Parts for Manifold

Fieldbus-compatible manifold end plate assembly

Assembly number including ① End plate D, ② End plate U and ③ Tension bolt assembly
(Used for the maintenance of the end plate)

ZZK2 [01] A – [A] [1] S0 – [ ] – A

❶ ❷ ❸ ❹ **Manifold end plate assembly**

❶ Stations

01	1 station
02	2 stations
⋮	⋮
08	8 stations

❷ System/Port

A	Ejector system	Ø 8 (Common PV)
AN		Ø 5/16" (Common PV)

❸ Exhaust

1	Complex exhaust	Applicable single unit part no.: ZK2C
2	Individual exhaust	Applicable single unit part no.: ZK2F, ZK2H

❹ Option

—	Without option	For details, refer to page 22.
B	With DIN rail mounting bracket for the EX260/EX500	
D	With common release pressure supply (PD) port	
L	Manifold individual supply specification	

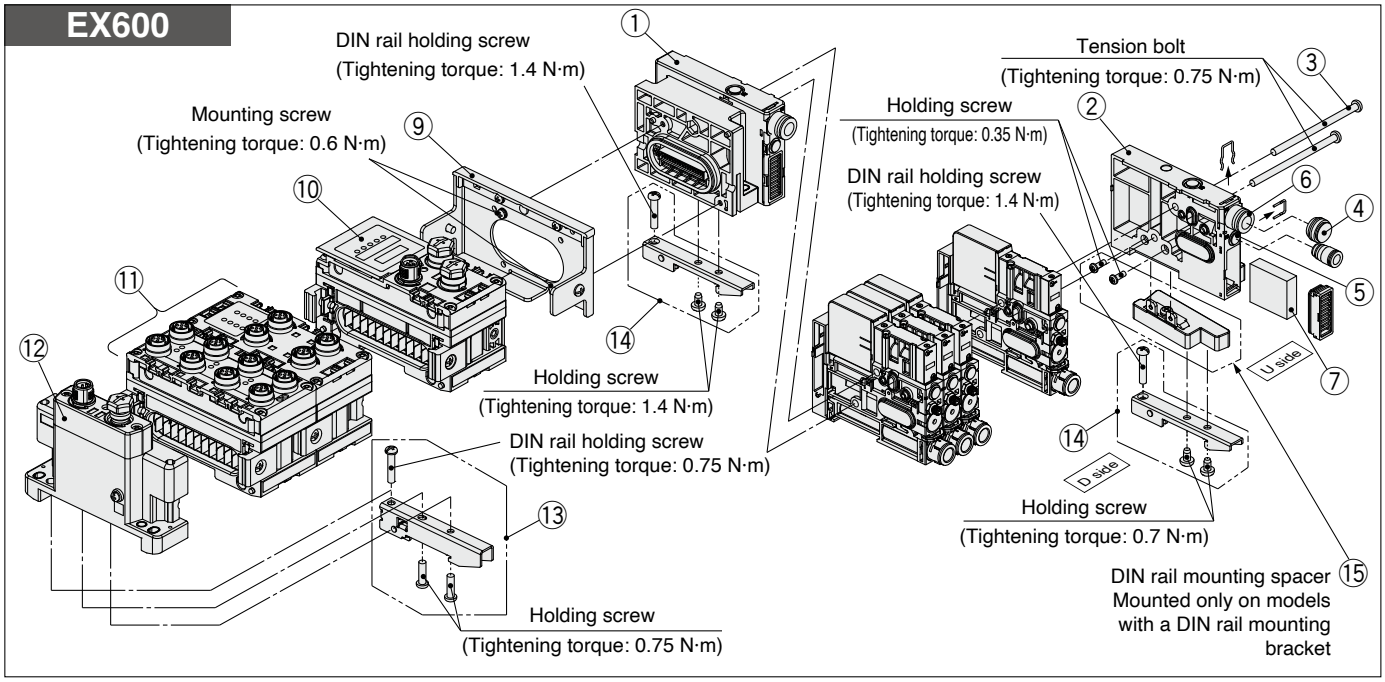
⑨ EX500 SI unit

EX500 – S103

Clamp bracket

No.	Description	Part number	Note
⑩	**Clamp bracket**	ZK2-DA5-A	2 pcs. per set
⑪	**DIN rail mounting spacer**	ZK2-EU3-A	—

∗ To retrofit a clamp bracket, ⑩ and ⑪ are required.



Component Parts

No.	Description	Material	Note
1	**End plate D assembly**	Resin	HNBR, NBR and steel are also used.
2	**End plate U assembly**	Resin	Electroless nickel plated brass, steel and NBR are also used.

Common Manifold Replacement Parts (Refer to page 48 for how to order.)

No.	Description	Note
3	**Tension bolt assembly**	2 pcs. per set
4	**Port plug assembly**	Plug for changing PV port to single side supply type
5	**Port plug assembly**	Plug for changing PS or PD port to single side supply type
6	**One-touch fitting assembly**	Metric size: Ø 8, Inch size: Ø 5/16"
7	**Sound absorbing material**	2 pcs. per set - Material: Non-woven cloth (Silencer cover is not included.)
8	**DIN rail**	Refer to Dimensions (Refer to pages 67 and 68) for the recommended length for each number of manifolds stations.

Fieldbus Transmission Specification Replacement Parts

No.	Description	Note
9	**Valve plate**	—
10	**EX600 SI unit**	—
11	**Digital input/output unit**	—
12	**End plate**	—
13	**Clamp bracket for the EX600**	It is used to secure the DIN rail (for the EX600).
14	**Clamp bracket**	It is used to secure the DIN rail (for the ZK2).

How to Order Replacement Parts for Manifold

Fieldbus-compatible manifold end plate assembly

Assembly number including ① End plate D, ② End plate U and ③ Tension bolt assembly
(Used for the maintenance of the end plate)

ZZK2 ❶01 A- ❷A ❸1 S0- ❹□ - A

Manifold end plate assembly

❶ Stations

01	1 station
02	2 stations
⋮	⋮
08	8 stations

❷ System/Port

A	Ejector system	Ø 8 (Common PV)
AN		Ø 5/16" (Common PV)

❸ Exhaust

1	Complex exhaust	Applicable single unit part no.: ZK2C
2	Individual exhaust	Applicable single unit part no.: ZK2F, ZK2H

❹ Option

—	Without option	For details, refer to page 22.
C	With DIN rail mounting bracket for the EX600	
D	With common release pressure supply (PD) port	
L	Manifold individual supply specification	

∗ Option "C" can only be used with a ZK2 series manifold on its own. It cannot be used with a combined JSY series and ZK2 series manifold.

⑨ Valve plate

EX600-ZMV2

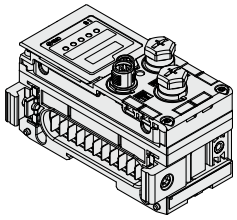
∗ With mounting screws (2 pcs. of M4 x 6 and 2 pcs. of M3 x 8)

⑩ EX600 SI unit

EX600-S□

Communication protocol

Symbol	Protocol	Output polarity
PR1A	PROFIBUS DP	PNP (Negative common)
PR2A		NPN (Positive common)
DN1A	DeviceNet®	PNP (Negative common)
DN2A		NPN (Positive common)
MJ1	CC-Link	PNP (Negative common)
MJ2		NPN (Positive common)
EN7	EtherNet/IP™ (IO-Link unit)	PNP (Negative common)
EN8		NPN (Positive common)
EC3	EtherCAT (IO-Link unit)	PNP (Negative common)
EC4		NPN (Positive common)
PN3	PROFINET (IO-Link unit)	PNP (Negative common)
PN4		NPN (Positive common)



(Wireless compatible)

EX600-W❶EN ❷1

Protocol **Output type**

Symbol	SI unit type	Description
EN	Wireless base module	EtherNet/IP™∗1
PN	Wireless base module	PROFINET∗1
SV	Wireless remote module	—∗1

Symbol	Description
1	PNP (Negative common)
2	NPN (Positive common)

∗1 The wireless system is suitable for use only in a country where it is in accordance with the Radio Act and regulations of that country.

How to Order Replacement Parts for Manifold

⑪ EX600 digital input unit

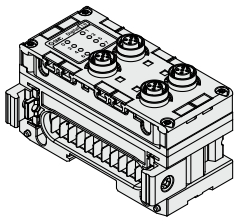
EX600-DX P B

Input type

Symbol	Description
P	PNP
N	NPN

Number of inputs, open-circuit detection, and connector

Symbol	Number of inputs	Open-circuit detection	Connector
B	8	No	M12 connector (5 pins) 4 pcs.
C	8	No	M8 connector (3 pins) 8 pcs.
C1	8	Yes	M8 connector (3 pins) 8 pcs.
D	16	No	M12 connector (5 pins) 8 pcs.
E	16	No	D-sub connector (25 pins)
F	16	No	Spring type terminal block (32 pins)



⑪ EX600 digital output unit

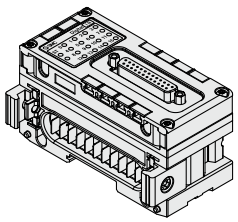
EX600-DY P B

Output type

Symbol	Description
P	PNP
N	NPN

Number of outputs and connector

Symbol	Number of outputs	Connector
B	8	M12 connector (5 pins) 4 pcs.
E	16	D-sub connector (25 pins)
F	16	Spring type terminal block (32 pins)



⑪ EX600 digital input/output unit

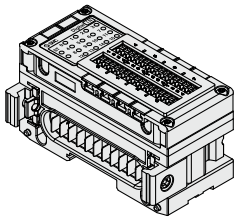
EX600-DM P E

Input/Output type

Symbol	Description
P	PNP
N	NPN

Number of inputs/outputs and connector

Symbol	Number of inputs	Number of outputs	Connector
E	8	8	D-sub connector (25 pins)
F	8	8	Spring type terminal block (32 pins)



⑪ EX600 analogue input/output unit

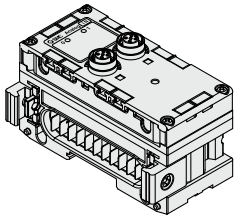
EX600-AX A

Analogue input/output

Symbol	Description
AX	Analogue input
AY	Analogue output

Number of input channels and connector

Symbol	Number of input channels	Connector
A	2 channels	M12 connector (5 pins) 2 pcs.



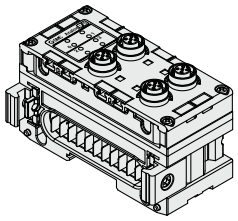
⑪ EX600 analogue input/output unit

EX600-AM B

Analogue input/output

Number of input/output channels and connector

Symbol	Number of input channels	Number of output channels	Connector
B	2 channels	2 channels	M12 connector (5 pins) 4 pcs.



⑪ EX600 IO-Link unit

EX600-L A B 1

Port specification

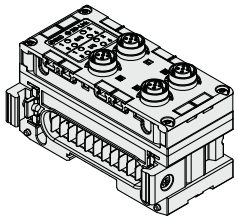
Symbol	Description
A	Port class A
B	Port class B

Number of ports and connector

Symbol	Number of ports	Connector
B	4 ports	M12 connector (5 pins) 4 pcs.

⚠ Caution

The compatible SI unit models are as shown below.
- PROFINET compatible: EX600-SPN3/EX600-SPN4
- EtherNet/IP™ compatible: EX600-SEN7/EX600-SEN8
- EtherCAT compatible: EX600-SEC3/EX600-SEC4



⑫ EX600 end plate

EX600-ED 2 -

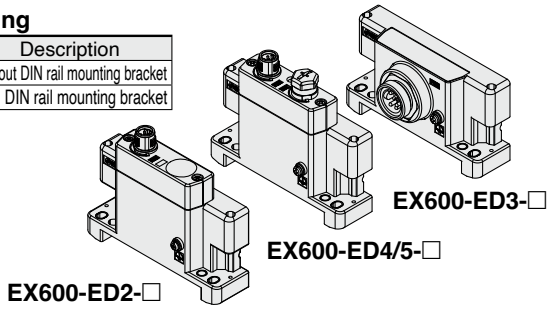
Power connector

Symbol	Connector
2	M12 power supply connector, B-coded
3	7/8 inch power supply connector
4	M12 power supply connector IN/OUT, A-coded, Pin arrangement 1
5	M12 power supply connector IN/OUT, A-coded, Pin arrangement 2

∗ The pin layout for the "4" and "5" pin connectors is different.

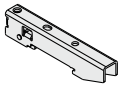
Mounting

Symbol	Description
—	Without DIN rail mounting bracket
3	With DIN rail mounting bracket



⑬ Clamp bracket for EX600

EX600-ZMA3



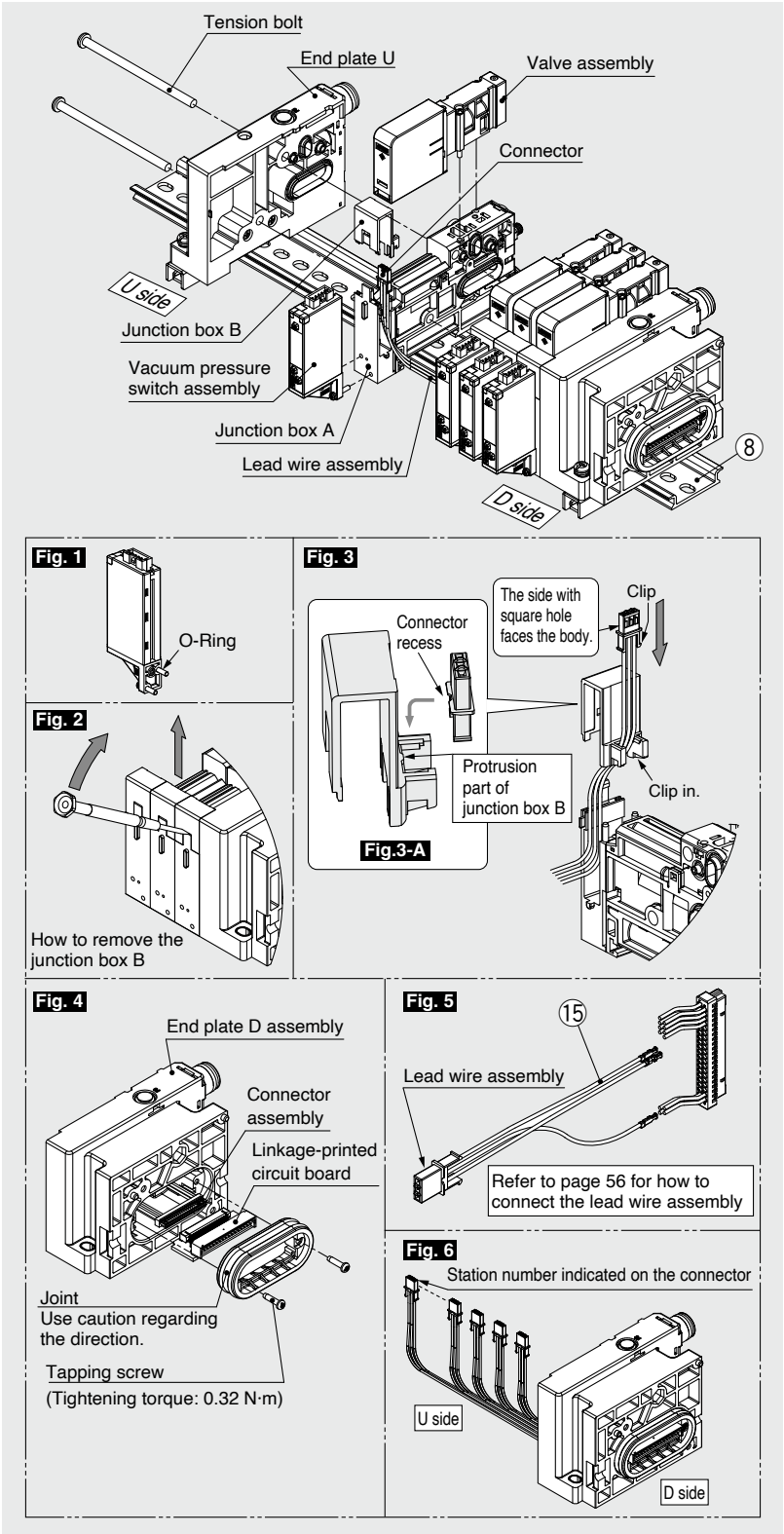
Enclosed parts
Round head screw with washer (M4 x 20) 1 pc.
P-tight screw (4 x 14) 2 pcs.

⑭ Clamp bracket

No.	Description	Part number	Note
⑭	Clamp bracket	ZK2-DA7-A	2 pcs. per set
⑮	DIN rail mounting spacer	ZK2-EU3-A	—

∗ To retrofit a clamp bracket, ⑬, ⑭, and ⑮ are required.

How to Increase Manifold Stations



[To increase the number of stations from an odd number (1, 3, 5, 7) to an even number (2, 4, 6, 8)]
(Odd numbered stations have a vacant lead wire for one station, so additional orders are not required.)

1) Remove the tension bolt.
2) Remove end plate U.
3) Remove the valve assembly from the single unit for manifold to be added.
4) Remove the switch assembly if there is one. (Be careful not to drop the O-ring. Refer to **Fig. 1**.)
5) Remove junction box B (top) using a precision screwdriver. (Refer to **Fig. 2**.)
6) Mount the extra connector to junction box B. (Refer to **Fig. 3**.) (Engage the recess of the connector and the protruding part of junction box B. Refer to **Fig. 3-A**.)
7) Mount the single unit for manifold to be added to the end surface on the U side.
8) Mount end plate U with tension bolts of the appropriate length for the number of stations required. (Tightening torque: 0.75 N·m)
9) Mount junction box B to junction box A.
10) Mount the valve assembly. (Tightening torque: 0.15 N·m)
11) For products with a switch, mount the switch assembly. (Be careful not to drop the O-ring. Tightening torque: 0.08 to 0.10 N·m)

[To increase the number of stations from an even number to an odd number or to increase by 2 stations or more]

1) Remove the valve assemblies from all stations. (Remove from the single units to be added also.)
2) Remove the switch assemblies if there are any. (Be careful not to drop the O-rings. Refer to **Fig. 1**.)
3) Remove junction box B (top) from all stations using a precision screwdriver. (Refer to **Fig. 2**.) (Remove each junction box B from the D side.)
4) Remove all connectors mounted to each junction box B. (Be careful not to break the connector clips.)
5) Remove the tension bolts.
6) Remove the end plate D assembly.
7) Remove the linkage-printed circuit board, and then remove the connector assembly. (Refer to **Fig. 4**.)
8) Connect the lead wire assembly. (Refer to **Fig. 5**.)
9) Remount the connector assembly and linkage-printed circuit board. (Refer to **Fig. 4**.)
10) Remove end plate U. (Be careful not to drop the gasket.)
11) Mount the single units for manifold to be added to the end surface on the U side. (Do not let the gasket get caught.)
12) Mount end plates U and D with tension bolts of the appropriate length for the number of stations required. (Tightening torque: 0.75 N·m)
13) Mount the connectors for all stations to each junction box B. (Refer to **Fig. 3**.) (Engage the recess of the connector and the protruding part of junction box B. Refer to **Fig. 3-A**.)
14) Mount each junction box B to each junction box A.
Push the wires down and mount each junction box B to each junction box A starting with the connector station numbers on the U side. (Refer to **Fig. 6**.) (Do not let the lead wire get caught.)
15) Mount the valve assemblies. (Tightening torque: 0.15 N·m)
16) For products with a switch, mount the switch assemblies. (Be careful not to drop the O-rings. Tightening torque: 0.08 to 0.10 N·m)

⑮ Lead wire assembly

ZK2 − CHS 04 − A

Applicable stations

03	For 3-station manifold
⋮	⋮
08	For 8-station manifold

How to Increase Manifold Stations: Ejector Manifold for Fieldbus System

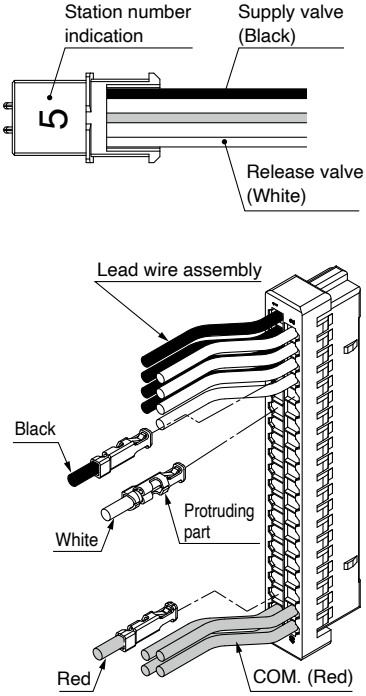
Connect the lead wire assembly to the positions shown in the diagram below.

⚠ Caution 1) After inserting each pin, confirm that the pin is locked by lightly pulling the lead wire.

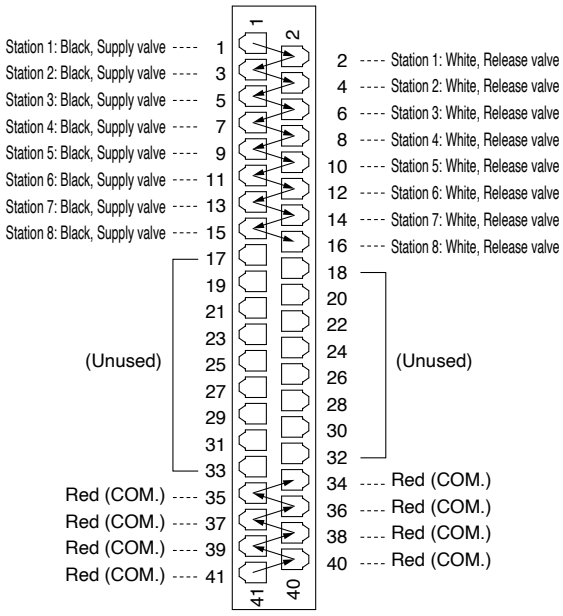
2) Do not pull the lead wire forcefully when connecting. Also, take care that lead wires do not get caught between manifolds when mounting end plates U and D.

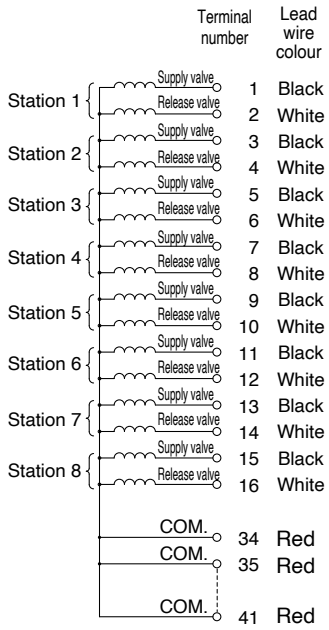
Wiring

Procedure) A station number is indicated on the connector of the lead wire assembly. Refer to the pin arrangement and insert the pins starting with black and then alternating between white and black from the top for the supply valves and the release valves. Also, starting from the bottom, insert the pins according to the corresponding station number for the common.



Pin arrangement



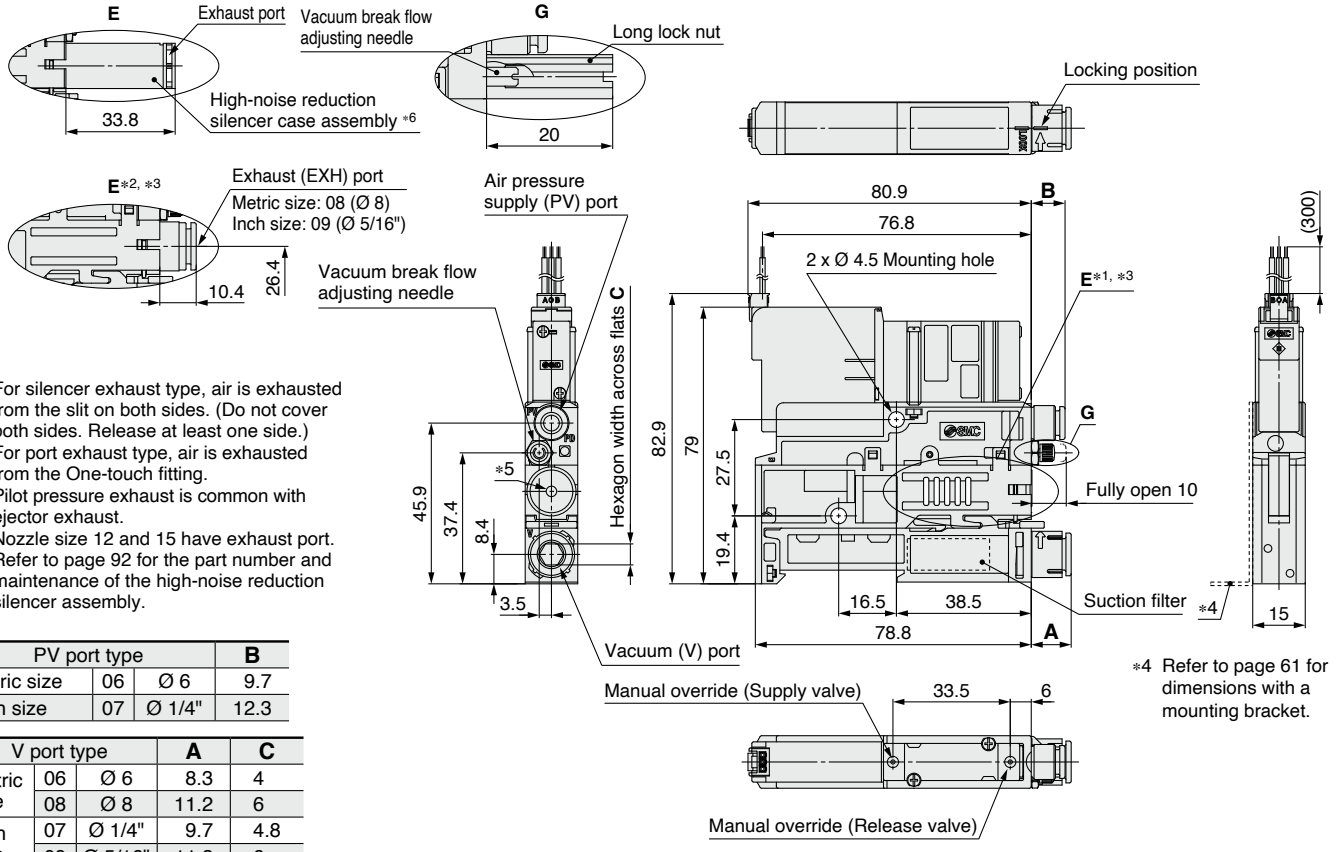


Dimensions: Single Unit

ZK2$^{A}_{B}$□$^{K}_{R}$□NL2A-□

Ejector system, Single unit, With supply valve/release valve, Without pressure sensor/switch

For high-noise reduction silencer exhaust **For screwdriver operation type long lock nut**



*1 For silencer exhaust type, air is exhausted from the slit on both sides. (Do not cover both sides. Release at least one side.)
*2 For port exhaust type, air is exhausted from the One-touch fitting.
*3 Pilot pressure exhaust is common with ejector exhaust.
*5 Nozzle size 12 and 15 have exhaust port.
*6 Refer to page 92 for the part number and maintenance of the high-noise reduction silencer assembly.

*4 Refer to page 61 for dimensions with a mounting bracket.

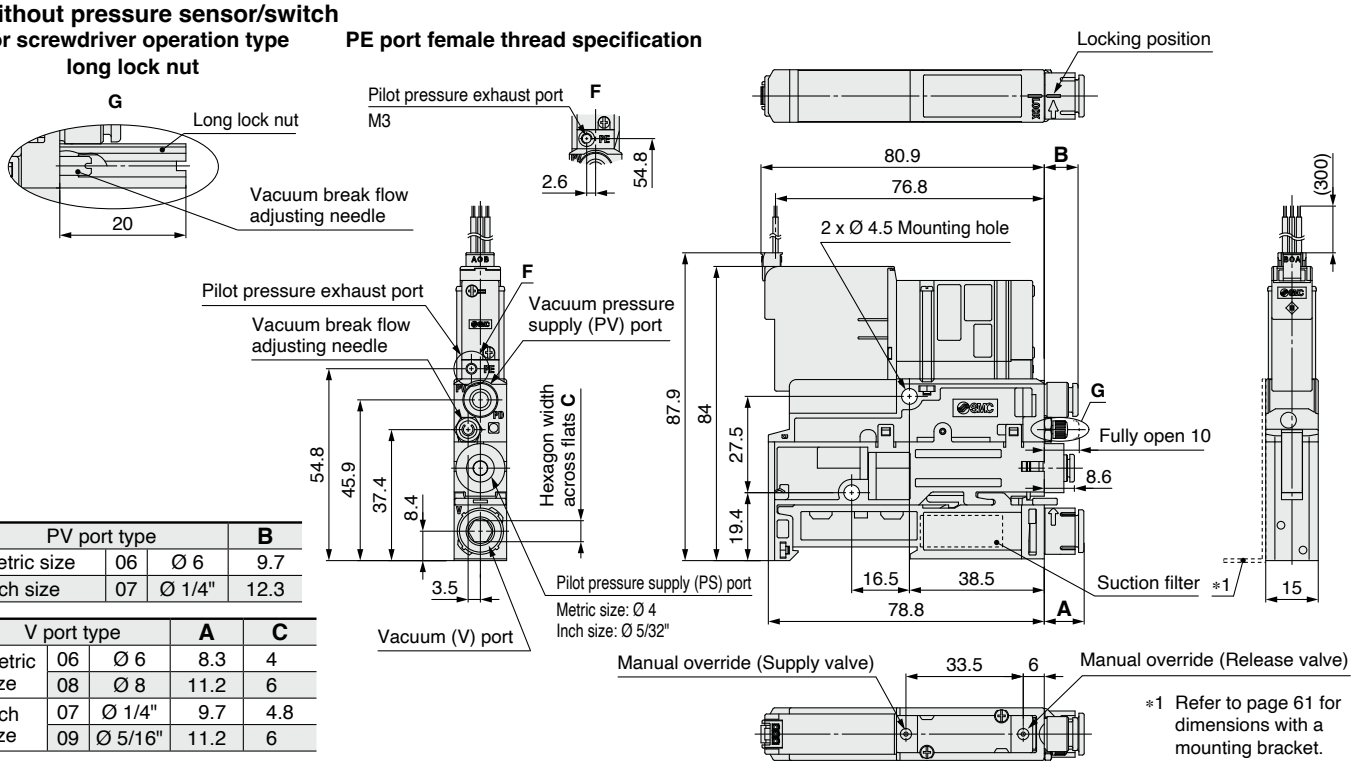
PV port type			B
Metric size	06	Ø 6	9.7
Inch size	07	Ø 1/4"	12.3

V port type			A	C
Metric size	06	Ø 6	8.3	4
	08	Ø 8	11.2	6
Inch size	07	Ø 1/4"	9.7	4.8
	09	Ø 5/16"	11.2	6

ZK2P00$^{K}_{R}$□NL2A-□

Vacuum pump system, Single unit, With supply valve/release valve, Without pressure sensor/switch

For screwdriver operation type long lock nut **PE port female thread specification**



*1 Refer to page 61 for dimensions with a mounting bracket.

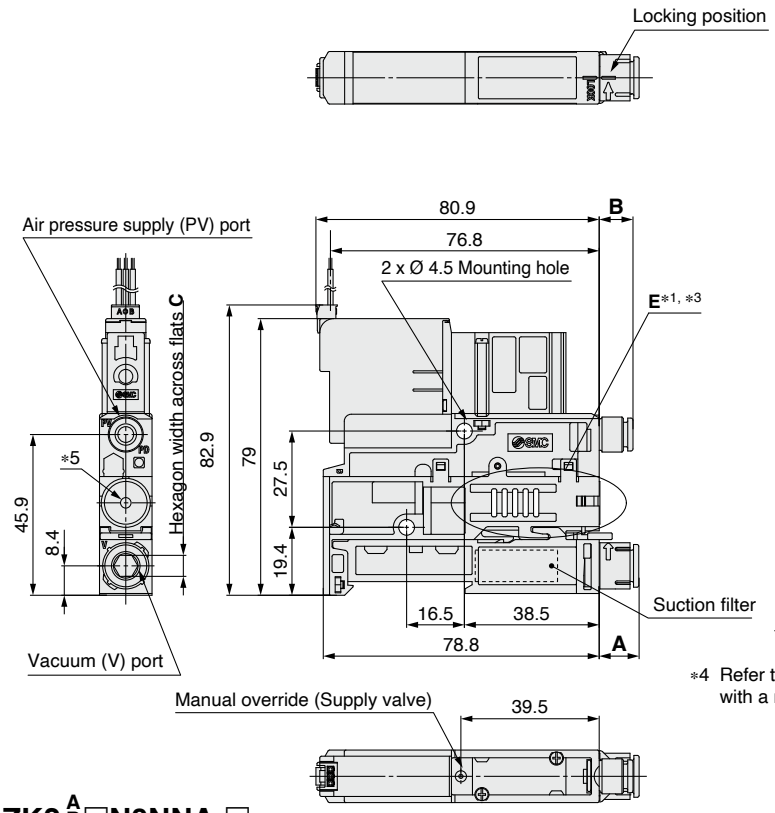
PV port type			B
Metric size	06	Ø 6	9.7
Inch size	07	Ø 1/4"	12.3

V port type			A	C
Metric size	06	Ø 6	8.3	4
	08	Ø 8	11.2	6
Inch size	07	Ø 1/4"	9.7	4.8
	09	Ø 5/16"	11.2	6

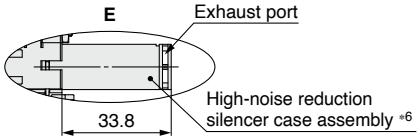
Dimensions: Single Unit

ZK2 A/B/G □J□NL2A-□

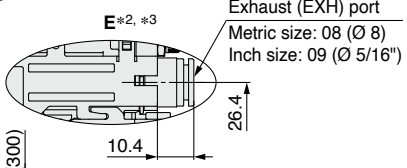
Ejector system, Single unit, With supply valve, Without pressure sensor/switch



For high-noise reduction silencer exhaust



For port exhaust



*4 Refer to page 61 for dimensions with a mounting bracket.

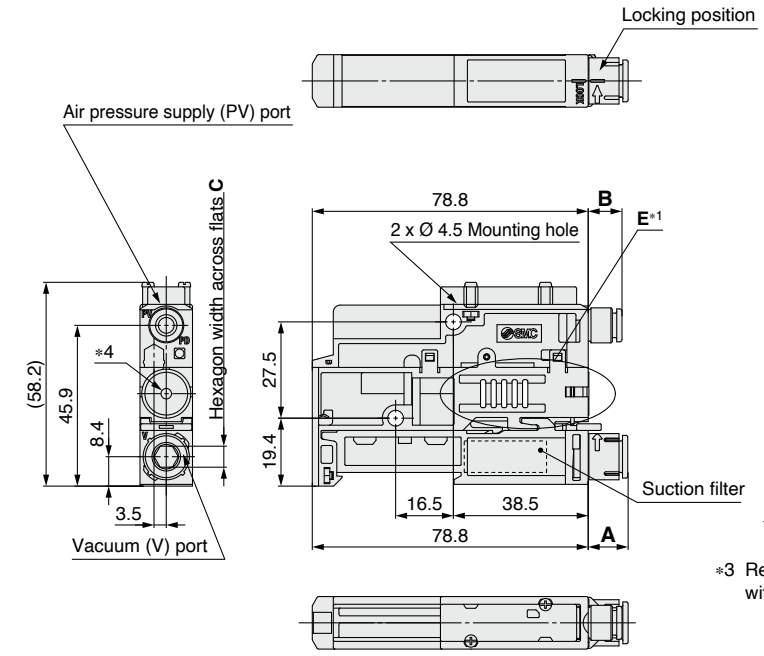
*1 For silencer exhaust type, air is exhausted from the slit on both sides. (Do not cover both sides. Release at least one side.)
*2 For port exhaust type, air is exhausted from the One-touch fitting.
*3 Pilot pressure exhaust is common with ejector exhaust.
*5 Nozzle size 12 and 15 have exhaust port.
*6 Refer to page 92 for the part number and maintenance of the high-noise reduction silencer assembly.

PV port type			B
Metric size	06	Ø 6	9.7
Inch size	07	Ø 1/4"	12.3

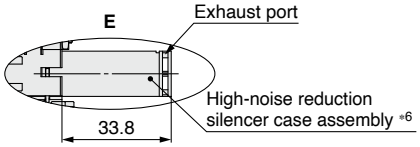
V port type			A	C
Metric size	06	Ø 6	8.3	4
	08	Ø 8	11.2	6
Inch size	07	Ø 1/4"	9.7	4.8
	09	Ø 5/16"	11.2	6

ZK2 A/B/G □N0NNA-□

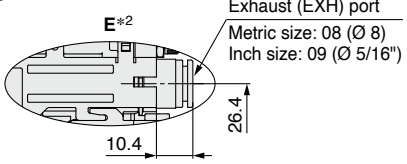
Ejector system, Single unit, Without valve, Without pressure sensor/switch



For high-noise reduction silencer exhaust



For port exhaust



*3 Refer to page 61 for dimensions with a mounting bracket.

*1 For silencer exhaust type, air is exhausted from the slit on both sides. (Do not cover both sides. Release at least one side.)
*2 For port exhaust type, air is exhausted from the One-touch fitting.
*4 Nozzle size 12 and 15 have exhaust port.
*5 Refer to page 92 for the part number and maintenance of the high-noise reduction silencer assembly.

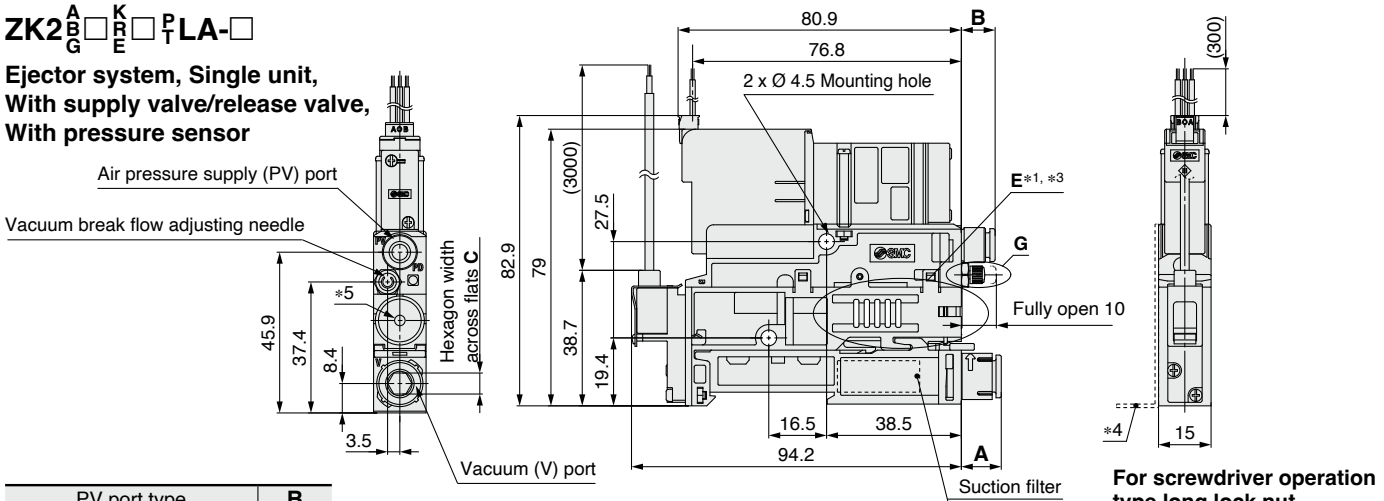
PV port type			B
Metric size	06	Ø 6	9.7
Inch size	07	Ø 1/4"	12.3

V port type			A	C
Metric size	06	Ø 6	8.3	4
	08	Ø 8	11.2	6
Inch size	07	Ø 1/4"	9.7	4.8
	09	Ø 5/16"	11.2	6

Dimensions: Single Unit

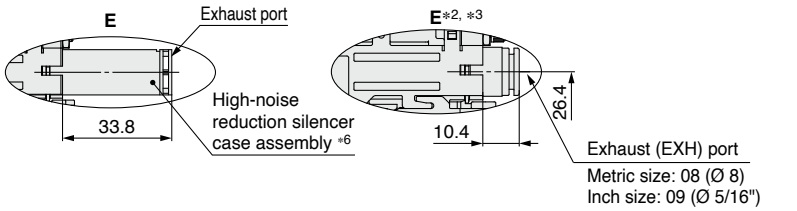
ZK2 A/B/G □ K/R/E □ P/T LA-□

Ejector system, Single unit, With supply valve/release valve, With pressure sensor



PV port type			B
Metric size	06	Ø 6	9.7
Inch size	07	Ø 1/4"	12.3

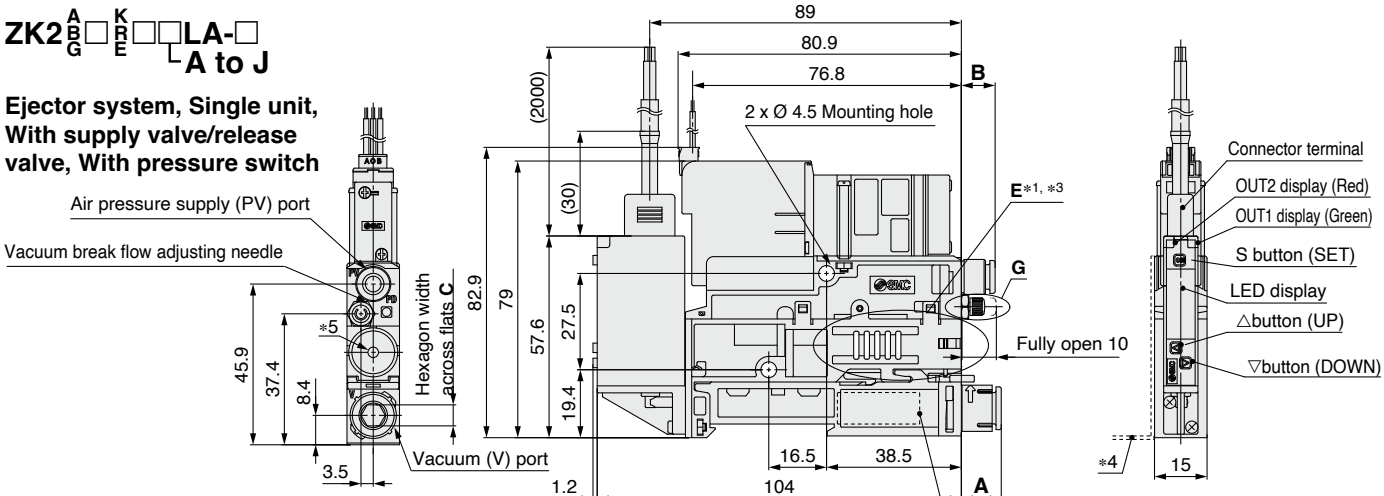
V port type			A	C
Metric size	06	Ø 6	8.3	4
	08	Ø 8	11.2	6
Inch size	07	Ø 1/4"	9.7	4.8
	09	Ø 5/16"	11.2	6



∗1 For silencer exhaust type, air is exhausted from the slit on both sides. (Do not cover both sides. Release at least one side.)
∗2 For port exhaust type, air is exhausted from the One-touch fitting.
∗3 Pilot pressure exhaust is common with ejector exhaust.
∗4 Refer to page 61 for dimensions with a mounting bracket.
∗5 Nozzle size 12 and 15 have exhaust port.
∗6 Refer to page 92 for the part number and maintenance of the high-noise reduction silencer assembly.

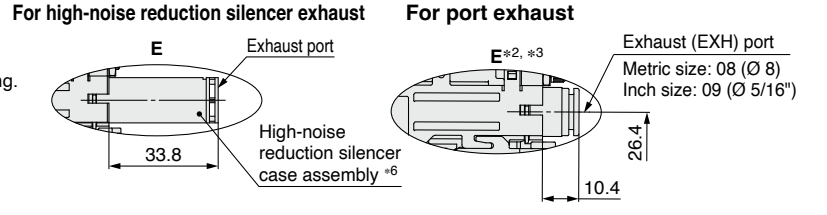
ZK2 A/B/G □ K/R/E □□ L A-□ (A to J)

Ejector system, Single unit, With supply valve/release valve, With pressure switch



PV port type			B
Metric size	06	Ø 6	9.7
Inch size	07	Ø 1/4"	12.3

V port type			A	C
Metric size	06	Ø 6	8.3	4
	08	Ø 8	11.2	6
Inch size	07	Ø 1/4"	9.7	4.8
	09	Ø 5/16"	11.2	6



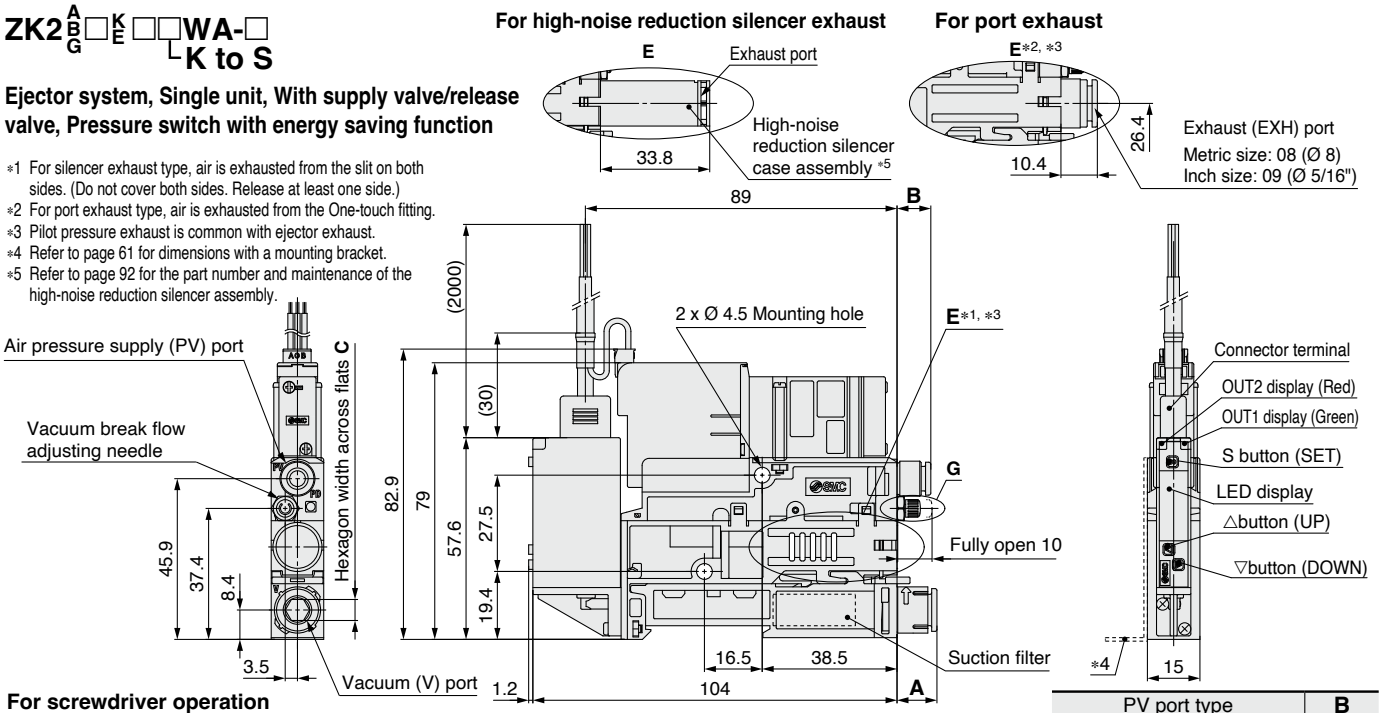
∗1 For silencer exhaust type, air is exhausted from the slit on both sides. (Do not cover both sides. Release at least one side.)
∗2 For port exhaust type, air is exhausted from the One-touch fitting.
∗3 Pilot pressure exhaust is common with ejector exhaust.
∗4 Refer to page 61 for dimensions with a mounting bracket.
∗5 Nozzle size 12 and 15 have exhaust port.
∗6 Refer to page 92 for the part number and maintenance of the high-noise reduction silencer assembly.

Dimensions: Single Unit

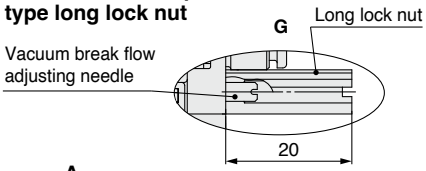
ZK2 A/B/G □ K/E □□WA-□ └K to S

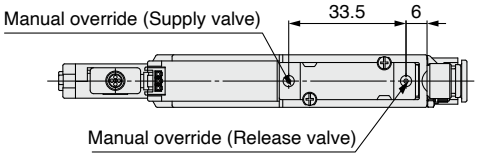
Ejector system, Single unit, With supply valve/release valve, Pressure switch with energy saving function

∗1 For silencer exhaust type, air is exhausted from the slit on both sides. (Do not cover both sides. Release at least one side.)
∗2 For port exhaust type, air is exhausted from the One-touch fitting.
∗3 Pilot pressure exhaust is common with ejector exhaust.
∗4 Refer to page 61 for dimensions with a mounting bracket.
∗5 Refer to page 92 for the part number and maintenance of the high-noise reduction silencer assembly.



For screwdriver operation type long lock nut





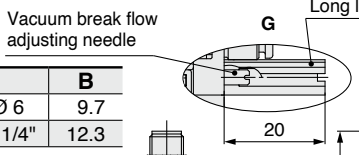
PV port type			B
Metric size	06	Ø 6	9.7
Inch size	07	Ø 1/4"	12.3

V port type			A	C
Metric size	06	Ø 6	8.3	4
	08	Ø 8	11.2	6
Inch size	07	Ø 1/4"	9.7	4.8
	09	Ø 5/16"	11.2	6

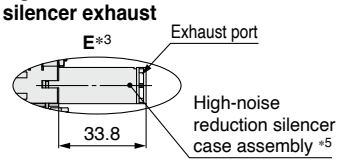
ZK2 A/B/G □ K/E 5□HA-□ └1 to 6

Ejector system, Single unit, With supply valve/release valve, IO-Link compatible pressure switch

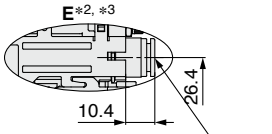
For screwdriver operation type long lock nut



For high-noise reduction silencer exhaust

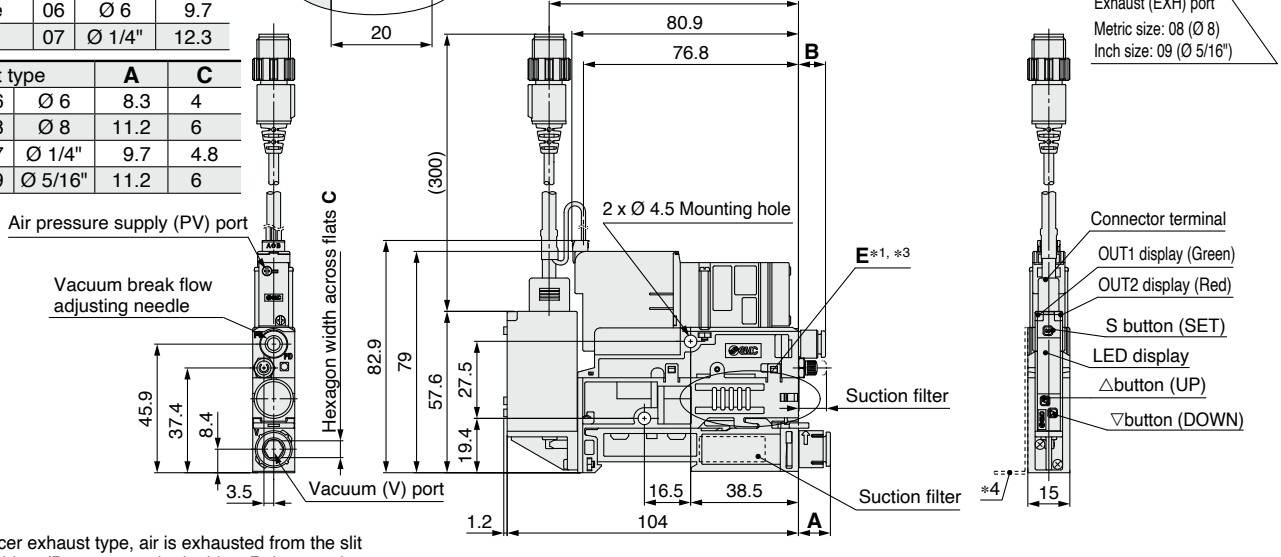


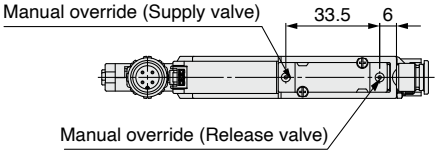
For port exhaust



PV port type			B
Metric size	06	Ø 6	9.7
Inch size	07	Ø 1/4"	12.3

V port type			A	C
Metric size	06	Ø 6	8.3	4
	08	Ø 8	11.2	6
Inch size	07	Ø 1/4"	9.7	4.8
	09	Ø 5/16"	11.2	6

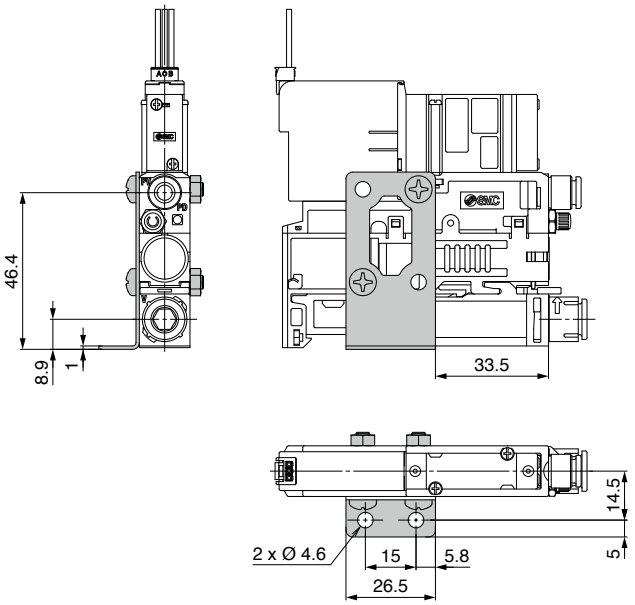


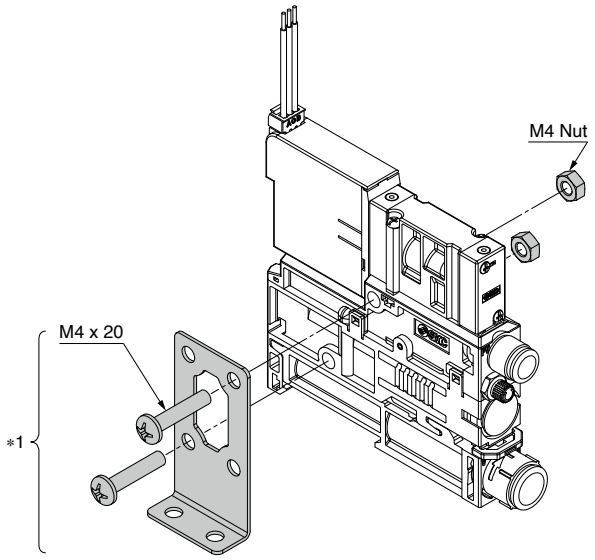


∗1 For silencer exhaust type, air is exhausted from the slit on both sides. (Do not cover both sides. Release at least one side.)
∗2 For port exhaust type, air is exhausted from the One-touch fitting.
∗3 Pilot pressure exhaust is common with ejector exhaust.
∗4 Refer to page 61 for dimensions with a mounting bracket.
∗5 Refer to page 92 for the part number and maintenance of the high-noise reduction silencer assembly.

Dimensions: Single Unit

With bracket



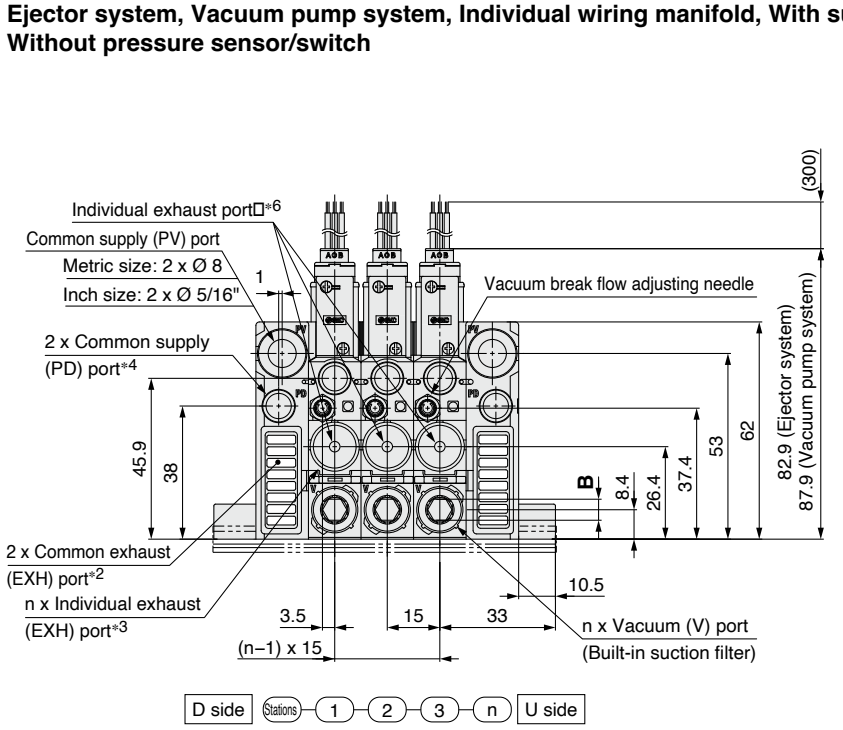


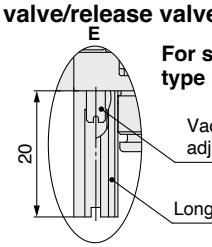
*1 Mounting bracket for single unit (Option), [Nuts and bolts are included.]
Part number: ZK2-BK1-A

Dimensions: Manifold Individual Wiring

ZZK2□A- P/A□L

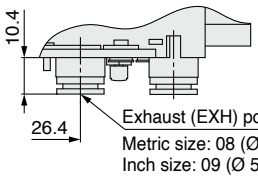
Ejector system, Vacuum pump system, Individual wiring manifold, With supply valve/release valve, Without pressure sensor/switch



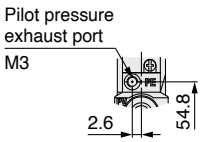


For screwdriver operation type long lock nut

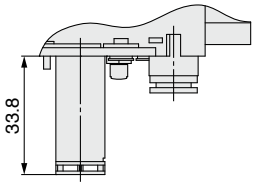
For port exhaust



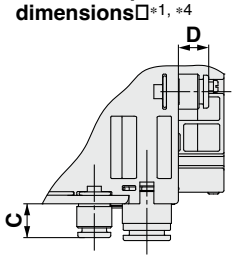
Vacuum pump system PE port female thread specification (M3)

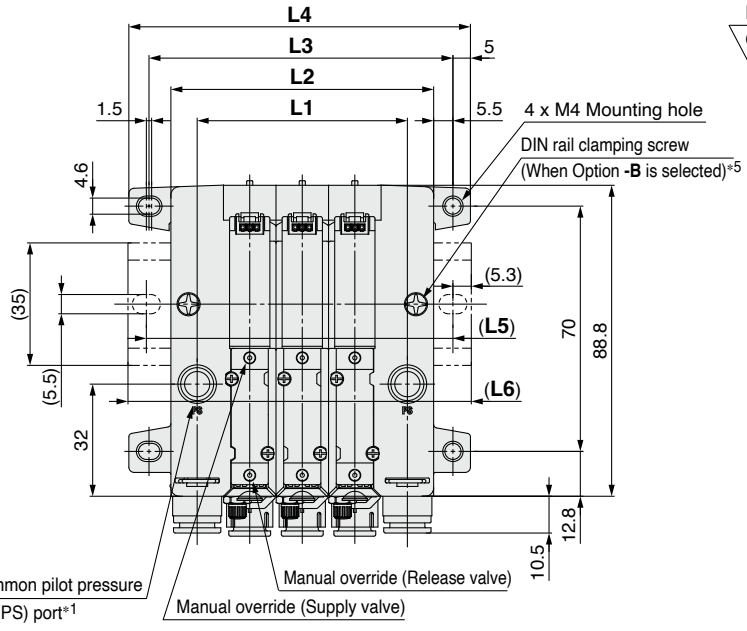


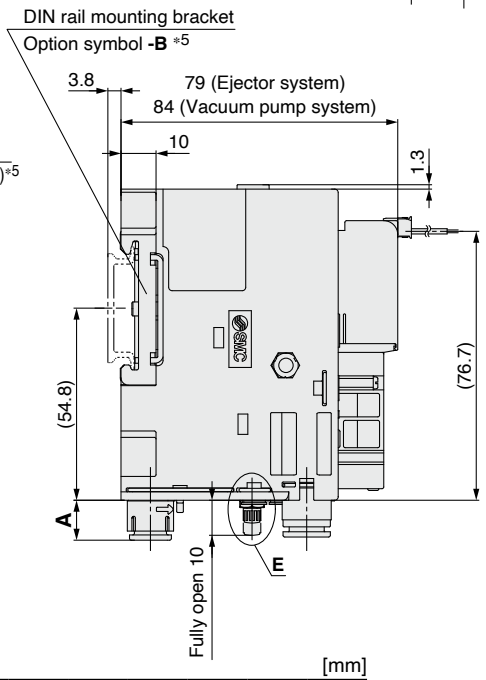
For high-noise reduction silencer exhaust



PS and PD port dimensions□*1, *4







[mm]

Port type		A	Hexagon width across flats B	C	D
Metric size	06	8.3	4	9.7	8.7
	08	11.2	6	—	—
Inch size	07	9.7	4.8	12.3	11.3
	09	11.2	6	—	—

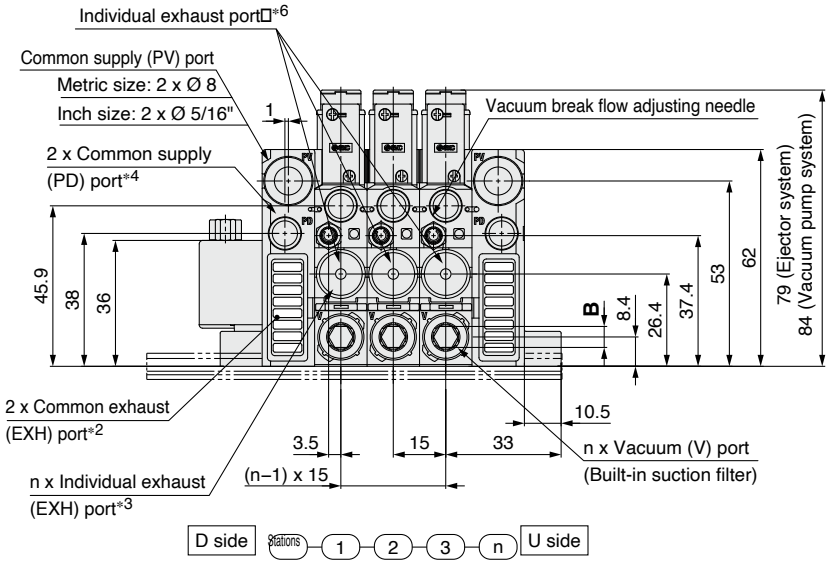
Stations (n)	1	2	3	4	5	6	7	8	9	10
L1	30	45	60	75	90	105	120	135	150	165
L2	45	60	75	90	105	120	135	150	165	180
L3	56.8	71.8	86.8	101.8	116.8	131.8	146.8	161.8	176.8	191.8
L4	67.5	82.5	97.5	112.5	127.5	142.5	157.5	172.5	187.5	202.5
L5	62.5	75	87.5	112.5	125	137.5	150	162.5	187.5	200
L6	73	85.5	98	123	135.5	148	160.5	173	198	210.5

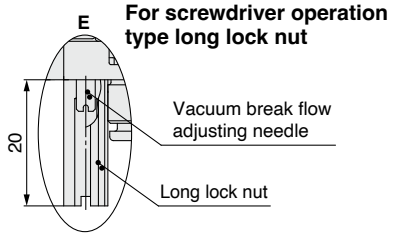
*1 Common pilot pressure supply (PS) port is available for vacuum pump system or option L (Manifold individual supply specification). (mm: Ø 6 inch: Ø 1/4")
*2 Vacuum pump system with individual exhaust port type does not have exhaust port.
*3 When individual exhaust port type is selected (Body type: F)
*4 Only when common PD port type option (Symbol: -D) is selected (mm: Ø 6 inch: Ø 1/4")
*5 To fix the manifold to DIN rail, select an option for the manifold model number.
*6 For complex exhaust type, air is also exhausted from the individual exhaust port of each station in addition to the common exhaust. (Ejector system)

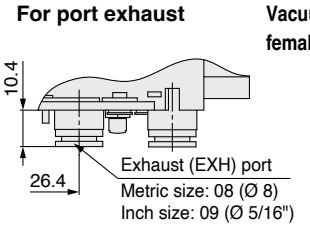
Dimensions: Manifold D-sub Connector

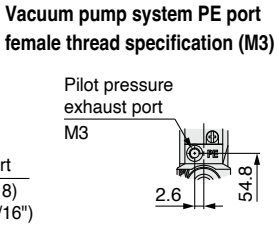
ZZK2□A-$^{P}_{A}$□F

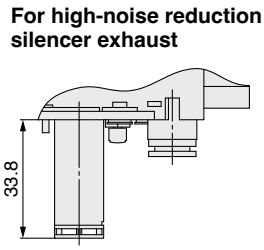
Ejector system, Vacuum pump system, Common wiring manifold, With supply valve/release valve, With pressure sensor

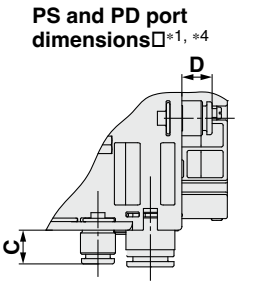


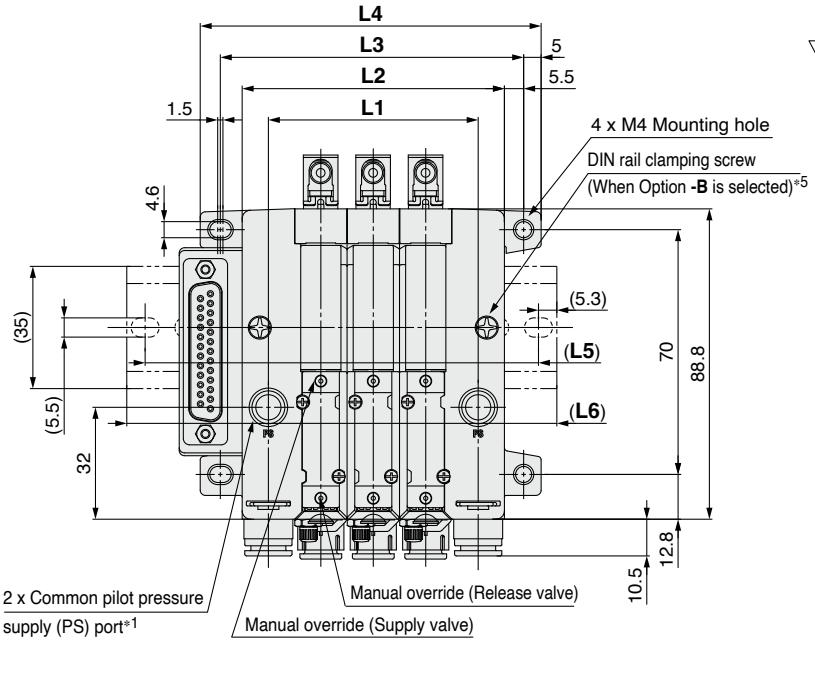


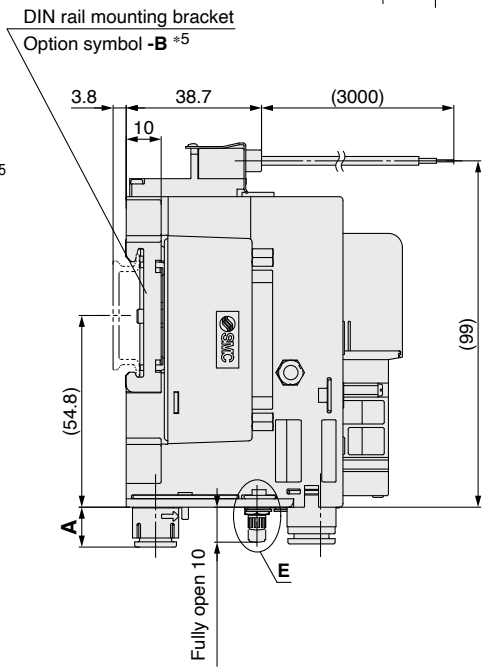












[mm]

Port type		A	Hexagon width across flats B	C	D
Metric size	06	8.3	4	9.7	8.7
	08	11.2	6	—	—
Inch size	07	9.7	4.8	12.3	11.3
	09	11.2	6	—	—

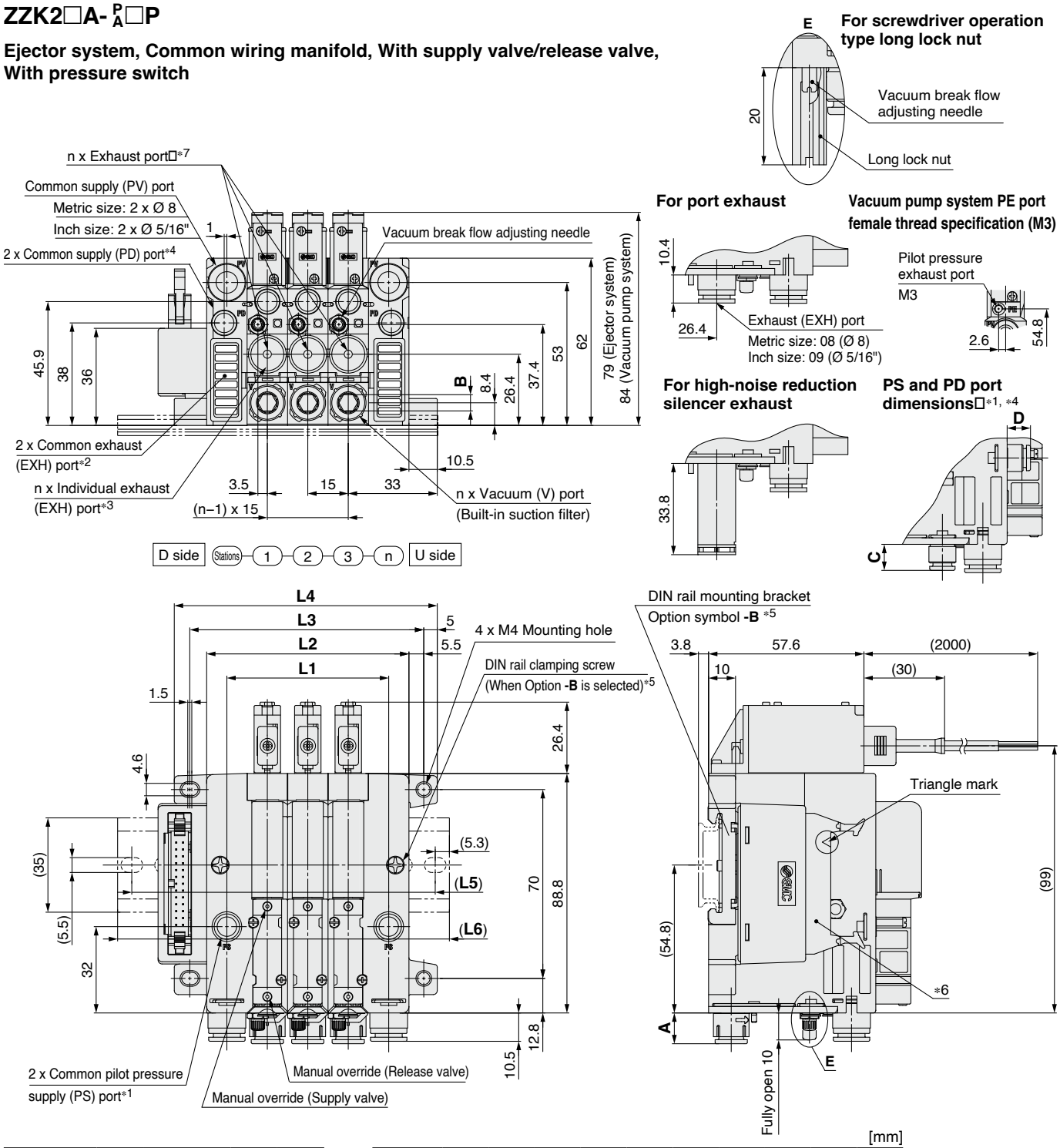
Stations (n)	1	2	3	4	5	6	7	8	9	10
L1	30	45	60	75	90	105	120	135	150	165
L2	45	60	75	90	105	120	135	150	165	180
L3	56.8	71.8	86.8	101.8	116.8	131.8	146.8	161.8	176.8	191.8
L4	73.5	88.5	103.5	118.5	133.5	148.5	163.5	178.5	193.5	208.5
L5	75	100	112.5	125	137.5	150	175	187.5	200	212.5
L6	85.5	110.5	123	135.5	148	160.5	185.5	198	210.5	223

*1 Common pilot pressure supply (PS) port is available for vacuum pump system or option L (Manifold individual supply specification). (mm: Ø 6 inch: Ø 1/4")
*2 Vacuum pump system with individual exhaust port type does not have exhaust port.
*3 When individual exhaust port type is selected (Body type: F)
*4 Only when common PD port type option (Symbol: -D) is selected (mm: Ø 6 inch: Ø 1/4")
*5 To fix the manifold to DIN rail, select an option for the manifold model number.
*6 For complex exhaust type, air is also exhausted from the individual exhaust port of each station in addition to the common exhaust. (Ejector system)

Dimensions: Manifold Flat Ribbon Cable

ZZK2□A-$^{P}_{A}$□P

Ejector system, Common wiring manifold, With supply valve/release valve, With pressure switch



[mm]

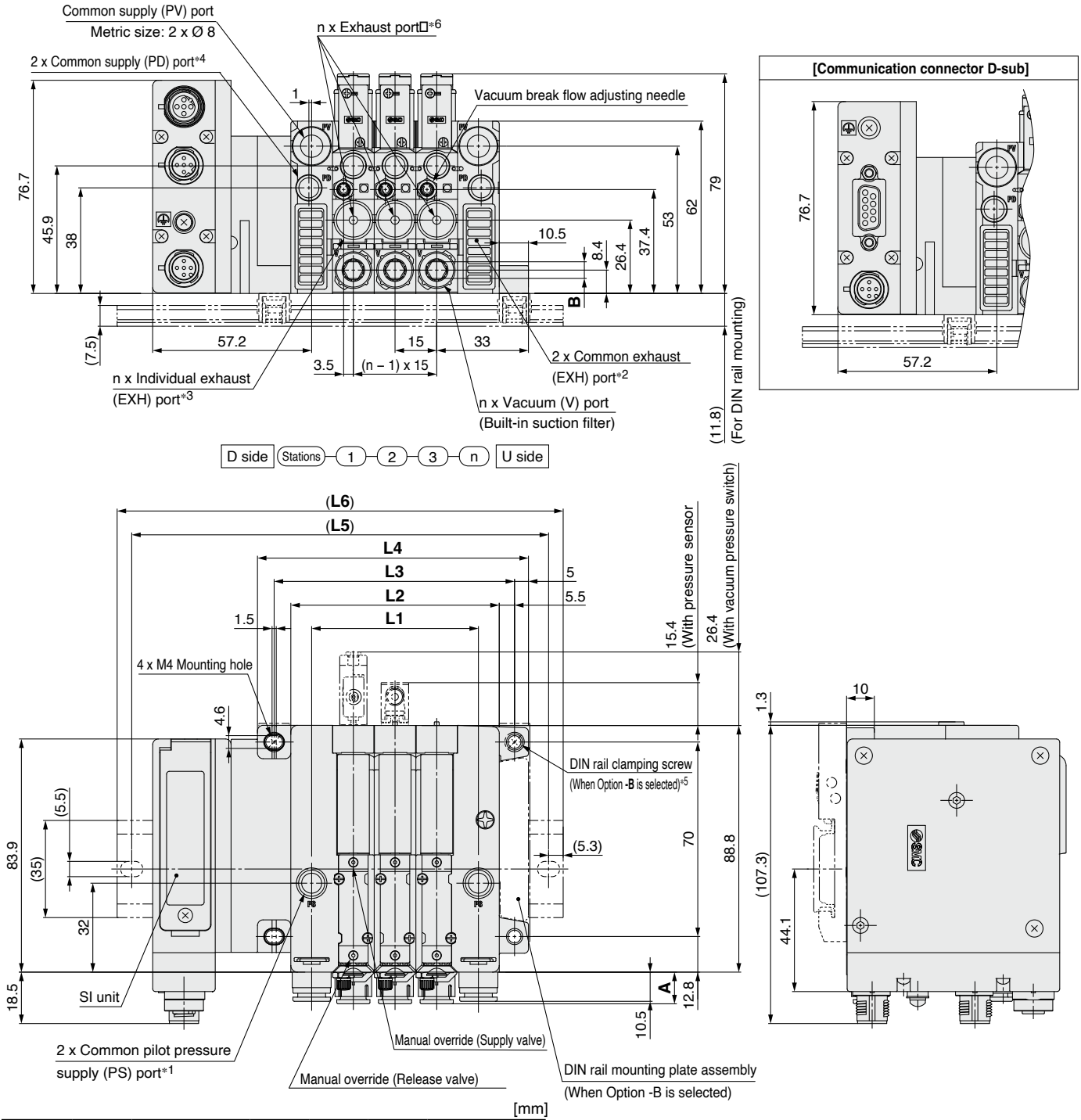
Port type		A	Hexagon width across flats B	C	D
Metric size	06	8.3	4	9.7	8.7
	08	11.2	6	—	—
Inch size	07	9.7	4.8	12.3	11.3
	09	11.2	6	—	—

Stations (n)	1	2	3	4	5	6	7	8	9	10
L1	30	45	60	75	90	105	120	135	150	165
L2	45	60	75	90	105	120	135	150	165	180
L3	56.8	71.8	86.8	101.8	116.8	131.8	146.8	161.8	176.8	191.8
L4	73.5	88.5	103.5	118.5	133.5	148.5	163.5	178.5	193.5	208.5
L5	75	100	112.5	125	137.5	150	175	187.5	200	212.5
L6	85.5	110.5	123	135.5	148	160.5	185.5	198	210.5	223

∗1 Common pilot pressure supply (PS) port is available for vacuum pump system or option L (Manifold individual supply specification). (mm: Ø 6 inch: Ø 1/4")
∗2 Vacuum pump system with individual exhaust port type does not have exhaust port.
∗3 When individual exhaust port type is selected (Body type: F)
∗4 Only when common PD port type option (Symbol: -D) is selected (mm: Ø 6 inch: Ø 1/4")
∗5 To fix the manifold to DIN rail, select an option for the manifold model number.
∗6 Applicable connector: Connector for flat ribbon cable (26P)(MIL-C-83503 compliant)
∗7 For complex exhaust type, air is also exhausted from the individual exhaust port of each station in addition to the common exhaust. (Ejector system)

Dimensions: Manifold Serial Transmission EX260

Ejector system, Serial transmission EX260, With supply valve/release valve, With pressure sensor/switch



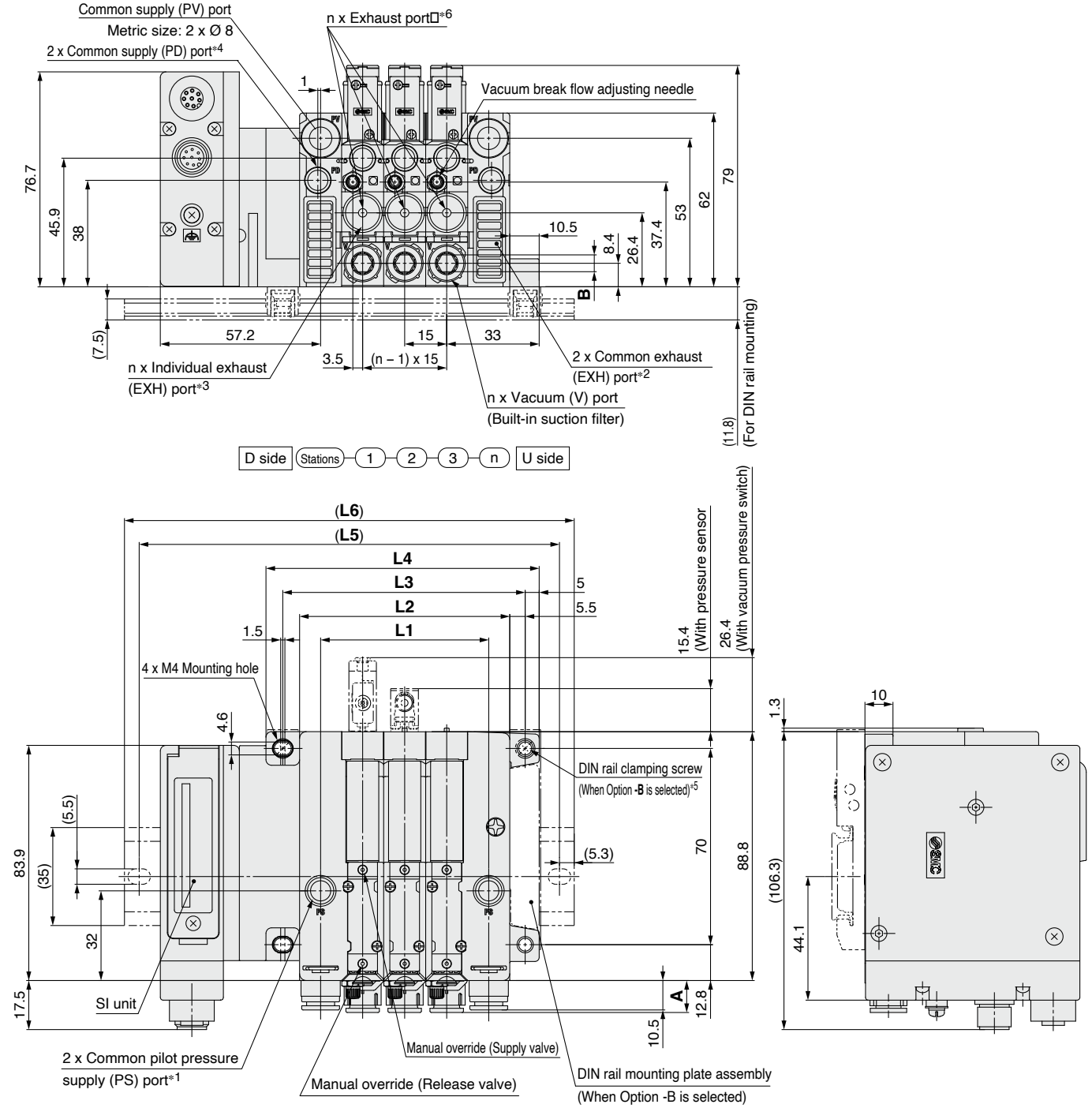
[mm]

Stations	1	2	3	4	5	6	7	8
L1	30	45	60	75	90	105	120	135
L2	45	60	75	90	105	120	135	150
L3	56.5	71.5	86.5	101.5	116.5	131.5	146.5	161.5
L4	67.5	82.5	97.5	112.5	127.5	142.5	157.5	172.5
L5	125	137.5	150	175	187.5	200	212.5	225
L6	135.5	148	160.5	185.5	198	210.5	223	235.5

∗1 The common pilot pressure supply (PS) port is only available when manifold option “L” (manifold individual supply specification) is selected.
∗2 The individual exhaust port type does not have an exhaust port.
∗3 When individual exhaust port type is selected (Body type: F)
∗4 The common supply (PD) port is only available when manifold option “D” is selected.
∗5 To fix the manifold to DIN rail, select an option for the manifold model number.
∗6 For complex exhaust type, air is also exhausted from the individual exhaust port of each station in addition to the common exhaust.
∗ For dimensions of the port exhaust type, high-noise reduction silencer exhaust type, and the type with a PS/PD port, refer to page 62.
∗ Refer to the **Web Catalogue** for detailed dimensions of pressure switches and pressure sensors.

Dimensions: Manifold Serial Transmission EX500 Gateway Decentralised System

Ejector system, Serial transmission EX500, Gateway decentralised system, With supply valve/release valve, With pressure sensor/switch



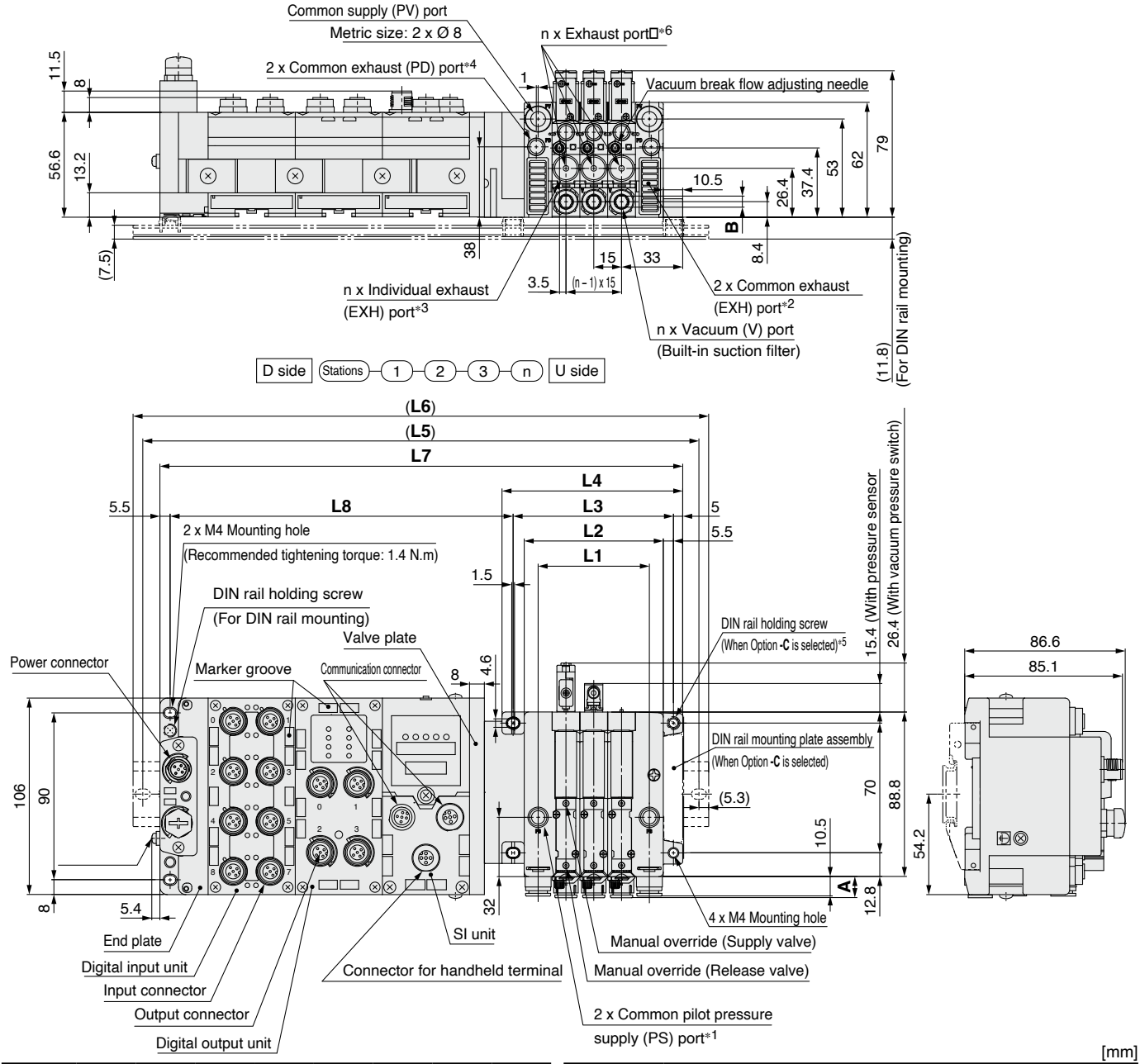
[mm]

Stations	1	2	3	4	5	6	7	8
L1	30	45	60	75	90	105	120	135
L2	45	60	75	90	105	120	135	150
L3	56.5	71.5	86.5	101.5	116.5	131.5	146.5	161.5
L4	67.5	82.5	97.5	112.5	127.5	142.5	157.5	172.5
L5	125	137.5	150	175	187.5	200	212.5	225
L6	135.5	148	160.5	185.5	198	210.5	223	235.5

∗1 The common pilot pressure supply (PS) port is only available when manifold option “L” (manifold individual supply specification) is selected.
∗2 The individual exhaust port type does not have an exhaust port.
∗3 When individual exhaust port type is selected (Body type: F)
∗4 The common supply (PD) port is only available when manifold option “D” is selected.
∗5 To fix the manifold to DIN rail, select an option for the manifold model number.
∗6 For complex exhaust type, air is also exhausted from the individual exhaust port of each station in addition to the common exhaust.
∗ For dimensions of the port exhaust type, high-noise reduction silencer exhaust type, and the type with a PS/PD port, refer to page 62.
∗ Refer to the **Web Catalogue** for detailed dimensions of pressure switches and pressure sensors.

Dimensions: Manifold Serial Transmission EX600 M12 Connector

Ejector system, Serial transmission EX600, M12 connector, With supply valve/release valve, With pressure sensor/switch



[mm]

Stations	1	2	3	4	5	6	7	8
L1	30	45	60	75	90	105	120	135
L2	45	60	75	90	105	120	135	150
L3	56.5	71.5	86.5	101.5	116.5	131.5	146.5	161.5
L4	67.5	82.5	97.5	112.5	127.5	142.5	157.5	172.5

Calculation formula for dimensions
L5 = L6 – 10.5
L7 = 47 x n + L4 + 90.5
L8 = 47 x n + 91

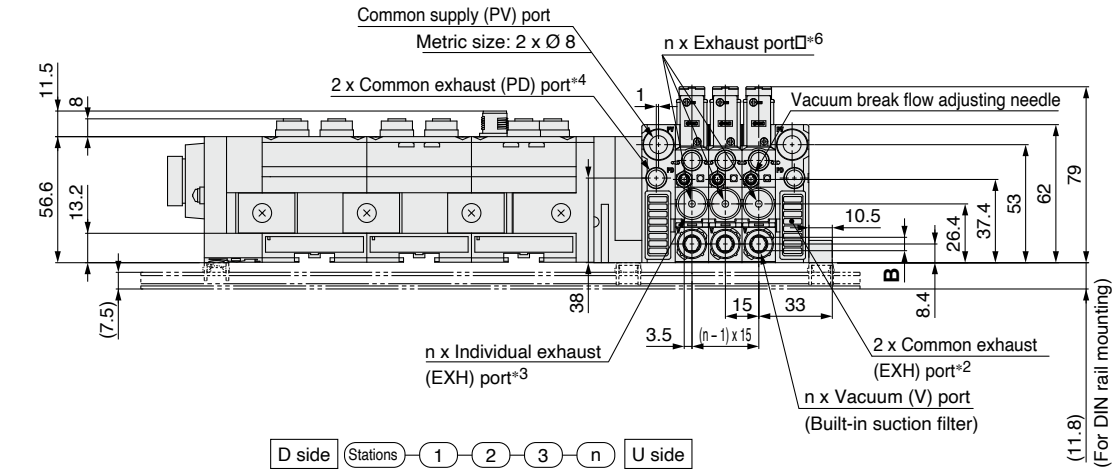
n = I/O unit stations

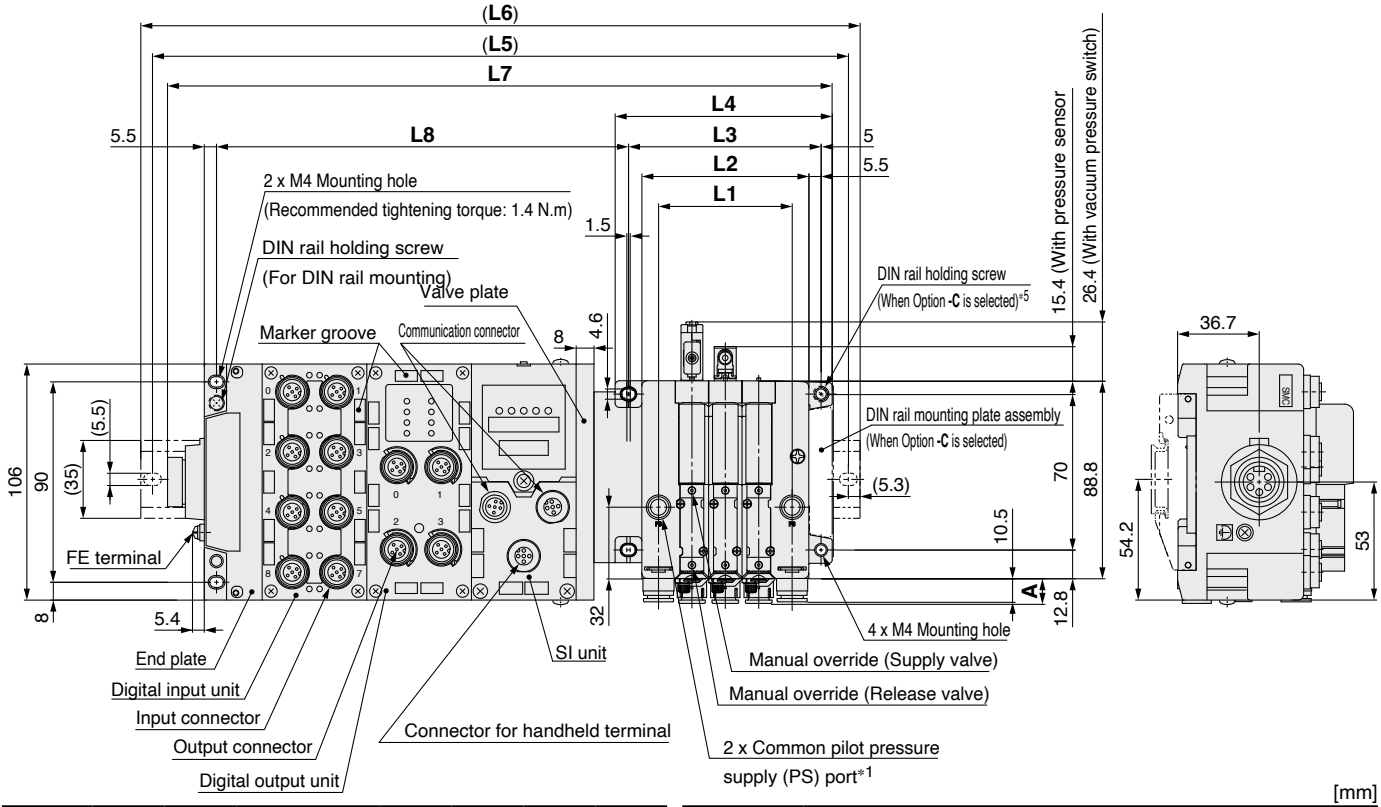
L6		Manifold stations							
		1	2	3	4	5	6	7	8
I/O stations	**0**	185.5	198	223	235.5	248	260.5	273	298
	1	235.5	248	260.5	285.5	298	310.5	323	335.5
	2	285.5	298	310.5	323	335.5	360.5	373	385.5
	3	323	348	360.5	373	385.5	398	423	435.5
	4	373	385.5	410.5	423	435.5	448	460.5	485.5
	5	423	435.5	448	473	485.5	498	510.5	523
	6	473	485.5	498	510.5	535.5	548	560.5	573
	7	510.5	535.5	548	560.5	573	585.5	610.5	623
	8	560.5	573	598	610.5	623	635.5	648	673
	9	610.5	623	635.5	660.5	673	685.5	698	710.5

∗1 The common pilot pressure supply (PS) port is only available when manifold option “L” (manifold individual supply specification) is selected.
∗2 The individual exhaust port type does not have an exhaust port.
∗3 When individual exhaust port type is selected (Body type: F)
∗4 The common supply (PD) port is only available when manifold option “D” is selected.
∗5 To fix the manifold to DIN rail, select an option for the manifold model number.
∗6 For complex exhaust type, air is also exhausted from the individual exhaust port of each station in addition to the common exhaust.
∗ For dimensions of the port exhaust type, high-noise reduction silencer exhaust type, and the type with a PS/PD port, refer to page 62.
∗ Refer to the **Web Catalogue** for detailed dimensions of pressure switches and pressure sensors.
∗ As mounting dimensions L5 and L8 vary depending on the number of connected I/O unit stations, refer to the calculation formula for dimensions.

Dimensions: Manifold Serial Transmission EX600 7/8 Connector

Ejector system, Serial transmission EX600, 7/8 connector, With supply valve/release valve, With pressure sensor/switch





[mm]

Stations	1	2	3	4	5	6	7	8
L1	30	45	60	75	90	105	120	135
L2	45	60	75	90	105	120	135	150
L3	56.5	71.5	86.5	101.5	116.5	131.5	146.5	161.5
L4	67.5	82.5	97.5	112.5	127.5	142.5	157.5	172.5

Calculation formula for dimensions
L5 = L6 – 10.5
L7 = 47 x n + L4 + 107
L8 = 47 x n + 91

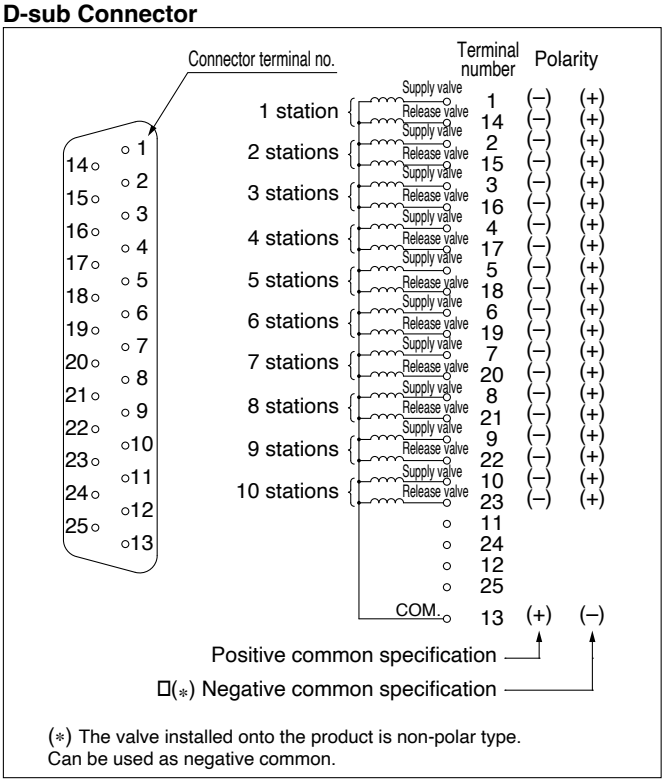
n = I/O unit stations

L6		Manifold stations 1	2	3	4	5	6	7	8
I/O stations	**0**	198	223	235.5	248	260.5	273	298	310.5
	1	248	260.5	285.5	298	310.5	323	335.5	360.5
	2	298	310.5	323	348	360.5	373	385.5	398
	3	348	360.5	373	385.5	410.5	423	435.5	448
	4	398	410.5	423	435.5	448	473	485.5	498
	5	435.5	448	473	485.5	498	510.5	523	548
	6	485.5	498	510.5	535.5	548	560.5	573	585.5
	7	535.5	548	560.5	573	598	610.5	623	635.5
	8	585.5	598	610.5	623	635.5	660.5	673	685.5
	9	623	648	660.5	673	685.5	698	723	735.5

∗1 The common pilot pressure supply (PS) port is only available when manifold option “L” (manifold individual supply specification) is selected.
∗2 The individual exhaust port type does not have an exhaust port.
∗3 When individual exhaust port type is selected (Body type: F)
∗4 The common supply (PD) port is only available when manifold option “D” is selected.
∗5 To fix the manifold to DIN rail, select an option for the manifold model number.
∗6 For complex exhaust type, air is also exhausted from the individual exhaust port of each station in addition to the common exhaust.
∗ For dimensions of the port exhaust type, high-noise reduction silencer exhaust type, and the type with a PS/PD port, refer to page 62.
∗ Refer to the **Web Catalogue** for detailed dimensions of pressure switches and pressure sensors.
∗ As mounting dimensions L5 and L8 vary depending on the number of connected I/O unit stations, refer to the calculation formula for dimensions.

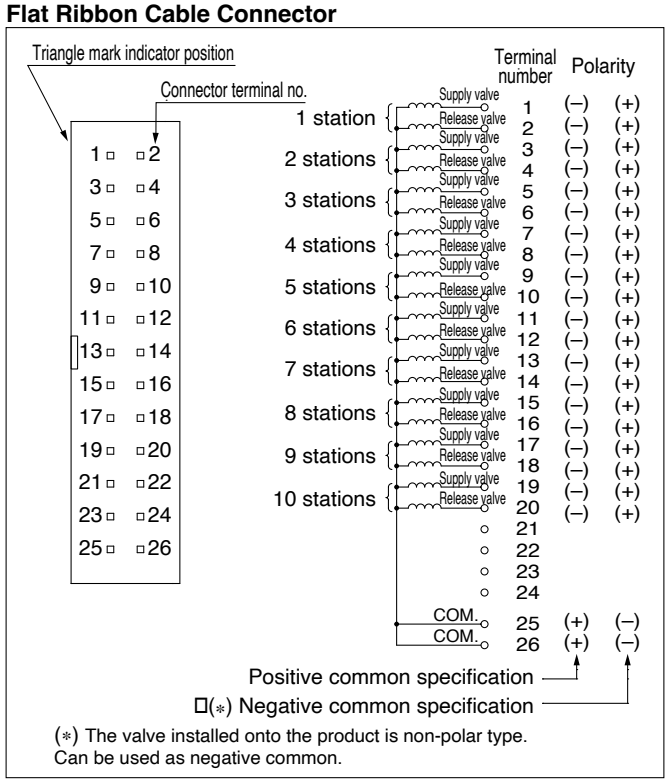
Electrical Wiring Specifications

D-sub Connector



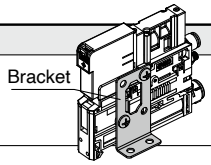
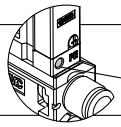
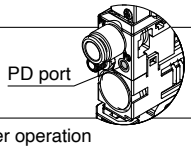
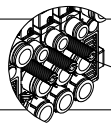
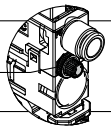
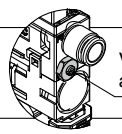
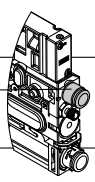
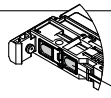
A D-sub connector (25P) conforming to MIL standards is used.

Flat Ribbon Cable Connector



A flat ribbon cable connector (26P) conforming to MIL standards is used.

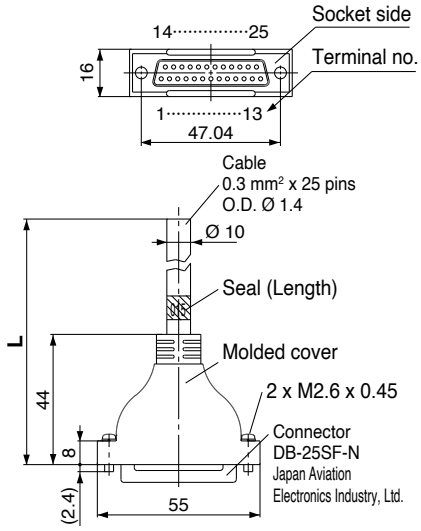
Optional Specifications/Functions/Applications

Symbol	Type		Function/Application
B	Mounting bracket for single unit (nuts and bolts are included)		· Use when a single unit is mounted to the floor in an upright position is requested. (When ordering only bracket, refer to page 61.)
C	Vacuum pump system PE port female thread specification (M3)		· Use for pilot pressure exhaust piping (Standard vacuum pump system is released to the atmosphere.)
D	With individual release pressure supply (PD) port (M3)		· Use when supply pressure for vacuum release is individually requested.
E	Vacuum release flow adjustment needle — Screwdriver operation type long lock nut		· Used when the port position is close to the manifold individual supply and the needle adjustment operation is difficult
J	Vacuum release flow adjustment needle — Round lock nut		· Thicker than standard hexagon type. More suitable for hand tightening. · Round lock nut improves operability when manifold, vacuum pump system, or exhaust port type is used.
K	Vacuum release flow adjustment needle — Screwdriver operation type		· Slotted type improves fine adjustment performance when manifold, vacuum pump system, or exhaust port type is used.
L	Manifold individual supply specification		· Adjust the supply pressure individually for manifold in order to adjust the vacuum pressure reached by each ejector.
P	With manifold common release pressure supply (PD) port		· When selecting “D” (with common release pressure supply (PD) port) for manifold option, supplying a pressure which is different from for common PV to common PD is requested.
W	With exhaust interference prevention valve		· When ejectors are operated individually, exhausted air may flow backward from the V port of ejectors that are turned off. Exhaust interference prevention valve prevents backflow.

Cable Assembly

D-sub Connector

AXT100-DS25- 015 / 030 / 050



D-sub connector cable assembly

Wire Colour by Terminal Number

Terminal number	Lead wire colour	Dot marking
1	Black	None
2	Brown	None
3	Red	None
4	Orange	None
5	Yellow	None
6	Pink	None
7	Blue	None
8	Purple	White
9	Grey	Black
10	White	Black
11	White	Red
12	Yellow	Red
13	Orange	Red
14	Yellow	Black
15	Pink	Black
16	Blue	White
17	Purple	None
18	Grey	None
19	Orange	Black
20	Red	White
21	Brown	White
22	Pink	Red
23	Grey	Red
24	Black	White
25	White	None

D-sub Connector Cable Assembly (Option)

Cable length (**L**)	Assembly part number	Note
1.5 m	AXT100-DS25-015	Cable 0.3 mm² x 25 cores
3 m	AXT100-DS25-030	
5 m	AXT100-DS25-050	

∗ For other commercial connectors, use a 25-pin type with female connector conforming to MIL-C-24308.
∗ Cannot be used for movable wiring

Electrical Characteristics

Item	Property
Conductor resistance Ω/km, 20 °C	65 or less
Voltage limit V, 1 min, AC	1000
Insulation resistance MΩ/km, 20 °C	5 or more

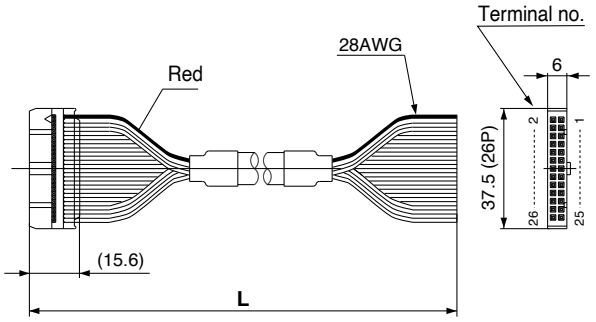
Connector manufacturer's example

- Fujitsu Limited
- Japan Aviation Electronics Industry, Ltd.
- J.S.T. Mfg. Co., Ltd.
- HIROSE ELECTRIC CO., LTD.

∗ The minimum bending inner radius of D-sub connector cable is 20 mm.

Flat Ribbon Cable Connector

AXT100-FC26- 1 / 2 / 3



Flat Ribbon Cable Connector Assembly (Option)

Cable length (**L**)	Assembly part number
	26P
1.5 m	AXT100-FC26-1
3 m	AXT100-FC26-2
5 m	AXT100-FC26-3

∗ For other commercial connectors, use a 26-pin type with strain relief conforming to MIL-C-83503.
∗ Cannot be used for movable wiring

Connector manufacturer's example

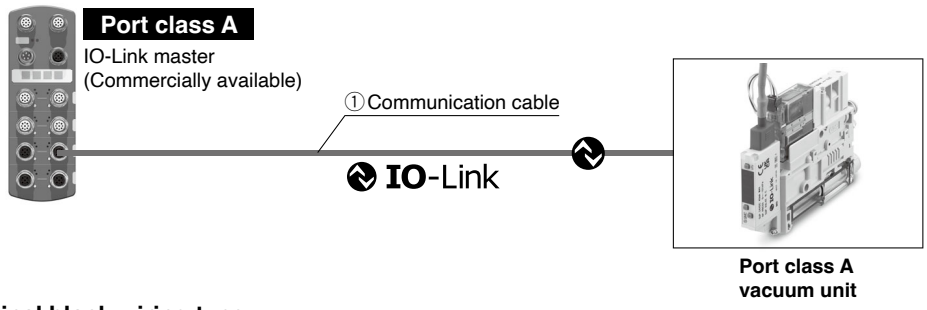
- HIROSE ELECTRIC CO., LTD.
- 3M Japan Limited
- Fujitsu Limited
- Japan Aviation Electronics Industry, Ltd.
- J.S.T. Mfg. Co., Ltd.
- Oki Electric Cable Co., Ltd.

Accessories

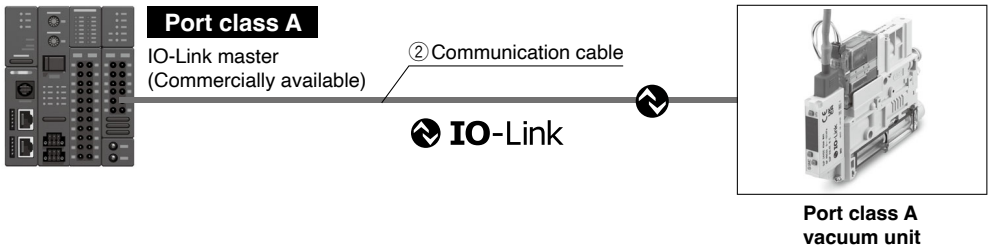
Communication Cable

For IO-Link

Connection examples



Terminal block wiring type

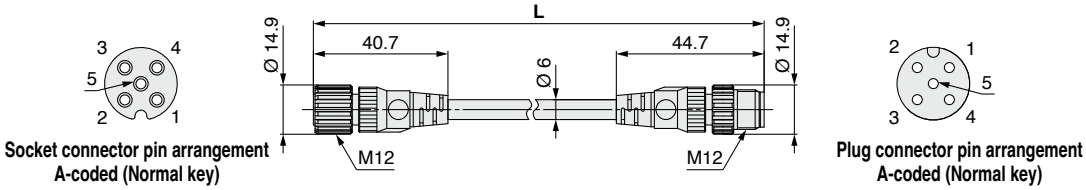


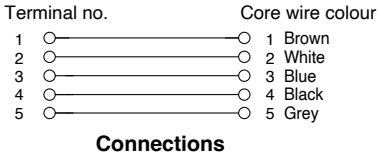
① Communication cable

EX9-AC 005 -SSPS (With connector on both sides (Socket/Plug))

Cable length (L)

005	500 mm
010	1000 mm
020	2000 mm
030	3000 mm
050	5000 mm
100	10000 mm





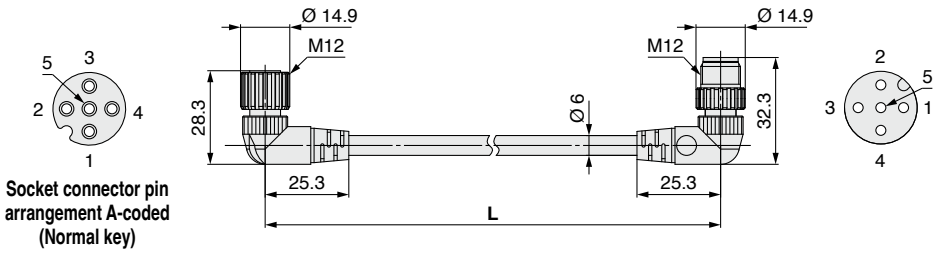
Connections

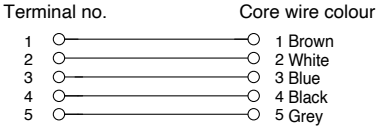
Item	Specifications
Cable O.D.	Ø 6 mm
Conductor nominal cross section	0.3 mm²/AWG22
Wire O.D. (Including conductor)	1.5 mm
Min. bending radius (Fixed)	40 mm

EX9-AC 005 -SAPA (With connector on both sides (Socket/Plug))

Cable length (L)

005	500 mm
010	1000 mm
020	2000 mm
030	3000 mm
050	5000 mm
100	10000 mm





Connections

Item	Specifications
Cable O.D.	Ø 6 mm
Conductor nominal cross section	0.3 mm²/AWG22
Wire O.D. (Including conductor)	1.5 mm
Min. bending radius (Fixed)	40 mm

Communication Cable

For IO-Link

② Communication cable

EX500-AP 050 - S

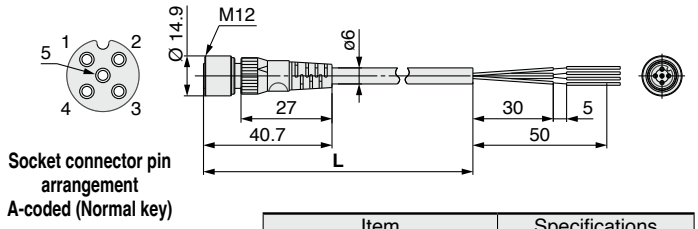
Cable length (L)

010	1000 mm
050	5000 mm

Connector specification

S	Straight
A	Angled

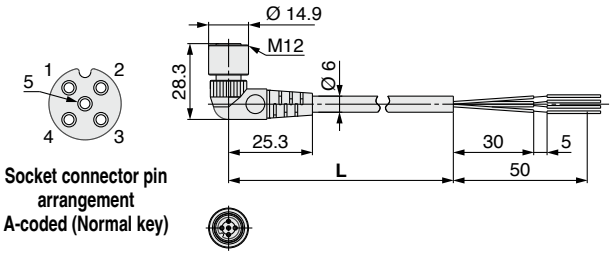
Straight connector type



Socket connector pin arrangement
A-coded (Normal key)

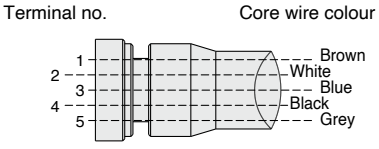
Item	Specifications
Cable O.D.	Ø 6 mm
Conductor nominal cross section	0.3 mm²/AWG22
Wire O.D. (Including insulator)	1.5 mm
Min. bending radius (Fixed)	40 mm

Angled connector type



Socket connector pin arrangement
A-coded (Normal key)

Item	Specifications
Cable O.D.	Ø 6 mm
Conductor nominal cross section	0.3 mm²/AWG22
Wire O.D. (Including insulator)	1.5 mm
Min. bending radius (Fixed)	40 mm



Connections

Air Operated Specification **Vacuum Unit**

ZK2□A Series

Single Unit **Ejector System**

CE UK CA RoHS

Refer to pages 79 to 82 for the port layouts (including circuit examples) and page 87 for the dimensions.

How to Order

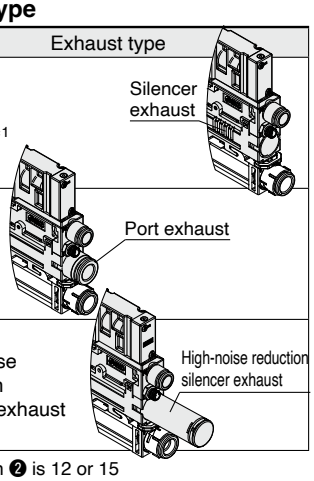
ZK2 G 12 Q 1 B Y A – 08 – □

❶ ❷ ❸ ❹ ❺ ❻

Air Operated — **Supply valve: N.C.** **Release valve: N.C.**

❶ Body/Exhaust type

Symbol	Body	Exhaust type
A	Single unit	Silencer exhaust*1
B		Port exhaust
G		High-noise reduction silencer exhaust



*1 With exhaust port when ❷ is 12 or 15

❷ Nominal nozzle size*2

Symbol	Nominal nozzle size
07	Ø 0.7
10	Ø 1.0
12	Ø 1.2
15	Ø 1.5

*2 Refer to page 78 for the standard supply pressure per nozzle diameter.

❸ Pressure switch for vacuum/Pressure sensor

Symbol	Type	Pressure range [kPa]	Specifications		
			NPN	PNP	With unit selection function*3
			2 outputs		
A	Pressure switch for vacuum	0 to -101	●	–	●
B			●	–	None (SI unit only)
C			–	●	●
D			–	●	None (SI unit only)
E		-100 to 100	●	–	●
F			●	–	None (SI unit only)
H			–	●	●
J			–	●	None (SI unit only)
P	Pressure sensor	0 to -101	Analogue output 1 to 5 V		
T		-100 to 100			
N	Without pressure switch for vacuum/pressure sensor				

*3 The unit for the type without the unit selection function is fixed as kPa.

❹ Connector (Pressure switch for vacuum)

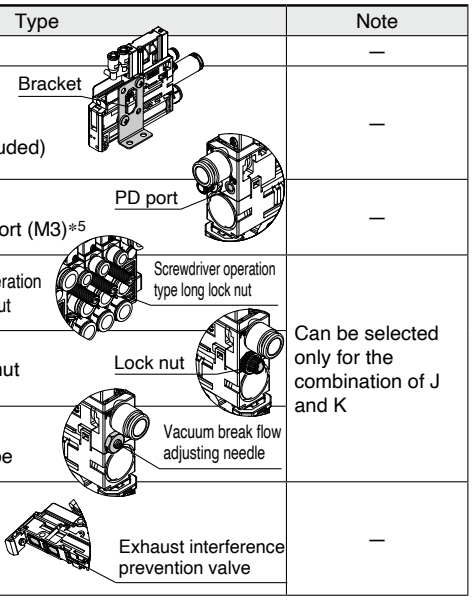
Symbol	For pressure switch for vacuum: 2 m (Lead wire with connector)	Pressure sensor assembly: 3 m (With lead wire)	Note
Y	●		Cannot be selected when ❸ is N
Y1	None		Cannot be selected when ❸ is P, T, or N
N	None		When "N" is selected for ❸

❺ Vacuum (V) port

Symbol	Vacuum (V) port
06	Ø 6
08	Ø 8
07	Ø 1/4"
09	Ø 5/16"

❻ Option*4

Symbol	Type		Note
—	Without option		–
B	Mounting bracket for single unit (nuts and bolts are included)		–
D	With individual release pressure supply (PD) port (M3)*5		–
E	Vacuum release flow adjustment needle*6	Screwdriver operation type long lock nut	Can be selected only for the combination of J and K
J		Round lock nut	
K		Screwdriver operation type	
W	With exhaust interference prevention valve		–



*4 When more than one option is selected, list the option symbols in alphabetical order. (Example -BJ)

*5 Use a One-touch fitting or barb fitting (M-3AU-4) for piping. (O.D.: Within Ø 6.2)

*6 A vacuum release flow adjustment needle is installed as standard. However, select it when improved operability is required.

Air Operated Specification **Vacuum Unit**

ZK2□A Series

For Manifold Ejector System

Refer to pages 80 to 84 for the port layouts (including circuit examples) and page 89 for the dimensions.

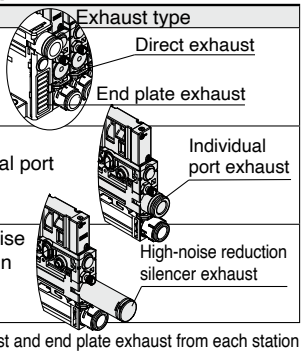
How to Order

Single unit for manifold part number **ZK2 H 12 Q 1 B Y A – 08 – □**

❶ ❷ Air Operated ● ● Supply valve: N.C./Release valve: N.C. ❸ ❹ ❺ ❻

❶ Body/Exhaust type

Symbol	Body	Exhaust type
C	For Manifold	Complex exhaust*1 (Direct exhaust, End plate exhaust)
F		Individual port exhaust (Individual port exhaust)
H		High-noise reduction silencer exhaust (High-noise reduction silencer exhaust)



*1 Combination of direct exhaust and end plate exhaust from each station

❷ Nominal nozzle size*2

Symbol	Nominal nozzle size
07	Ø 0.7
10	Ø 1.0
12	Ø 1.2
15	Ø 1.5

*2 Refer to page 78 for the standard supply pressure per nozzle diameter.

❸ Pressure switch for vacuum/Pressure sensor

Symbol	Type	Pressure range [kPa]	Specifications: NPN (2 outputs)	Specifications: PNP (2 outputs)	Specifications: With unit selection function*3
A	Pressure switch for vacuum	0 to -101	●	—	●
B			●	—	None (SI unit only)
C			—	●	●
D			—	●	None (SI unit only)
E		-100 to 100	●	—	●
F			●	—	None (SI unit only)
H			—	●	●
J			—	●	None (SI unit only)
P	Pressure sensor	0 to -101	Analogue output 1 to 5 V		
T		-100 to 100			
N	Without pressure switch for vacuum/pressure sensor				

*3 The unit for the type without the unit selection function is fixed as kPa.

❹ Connector (Pressure switch for vacuum)

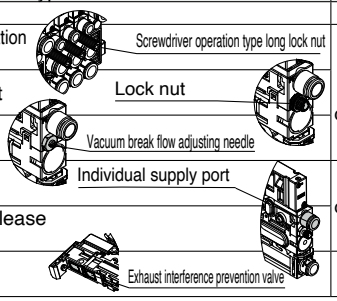
Symbol	For pressure switch for vacuum: 2 m (Lead wire with connector)	Pressure sensor assembly: 3 m (With lead wire)	Note
Y	●		Cannot be selected when ❸ is N
Y1	None		Cannot be selected when ❸ is P, T, or N
N	None		When "N" is selected for ❸

❺ Vacuum (V) port

Symbol	Vacuum (V) port
06	Ø 6
08	Ø 8
07	Ø 1/4"
09	Ø 5/16"

❻ Option*4

Symbol	Type	Note
—	Without option	—
E	Vacuum release flow adjustment needle*5: Screwdriver operation type long lock nut	Can be selected only for the combination of J and K
J	Vacuum release flow adjustment needle*5: Round lock nut	
K	Vacuum release flow adjustment needle*5: Screwdriver operation type	
M	Manifold individual supply specification*6	Multiple options cannot be selected.
P	With manifold common release pressure supply (PD) port	
W	With exhaust interference prevention valve	—



*4 When more than one option is selected, list the option symbols in alphabetical order. (Example -EM)
*5 A vacuum release flow adjustment needle is installed as standard. However, select it when improved operability is required.
*6 When F or H is selected for ❶ and M is selected for the option, the space for adjusting the needle is reduced. Products which can be operated more easily can be specified by option E.

How to Order Valve Manifold Assembly

Manifold part number **ZZK2 04 A – A 2 L – □**

❼ ❽ ❾ ❿

If the manifold parts (set of end plates for both ends and tension bolts) are shipped unassembled, please refer to page 48.

❼ Stations*7

Symbol	Stations
01	1 station
02	2 stations
⋮	⋮
10	10 stations

*7 For adequate performance, the number of stations that can be operated simultaneously depends on the nozzle diameter. Refer to the Max. Number of Manifold Stations that can be Operated Simultaneously on page 78.

❽ System/Port

Symbol	System	Port
A	Ejector system	Ø 8 (Common PV)
AN		Ø 5/16" (Common PV)

❾ Exhaust

Symbol	Exhaust	Note
1	Complex exhaust*8	Select this option when "C" is selected for ❶ Body/Exhaust type.
2	Individual exhaust	Select this option when "H" or "F" is selected for ❶ Body/Exhaust type.

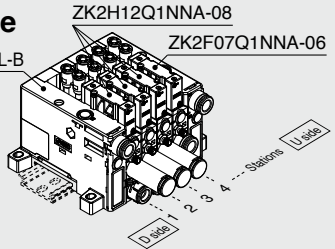
*8 Combination of direct exhaust and end plate exhaust from each station

❿ Option*9

Symbol	Type	Note	
—	Without option	—	
B	With DIN rail mounting bracket	The DIN rail should be ordered separately.	
D	With common release pressure supply (PD) port	Select this option when "P" is selected for ❻ Option.	Multiple options cannot be selected.
M	Manifold individual supply specification	Select this option when "M" is selected for ❻ Option.	

*9 When more than one option is selected, list the option symbols in alphabetical order. (Example -BD)

Example ZK2H12Q1NNA-08, ZK2F07Q1NNA-06, ZZK204A-A2L-B



[1] When shipped, the single unit for manifold is already built into the manifold:
After the manifold part number, specify the single unit for manifold part number from the first station.
In addition, prefix an asterisk to the single unit for manifold part number to indicate that it is to be built into the manifold.
Ex.) ZZK204A-A2L-B ·····1 (Manifold 4 stations)
∗ ZK2H12Q1NNA-08·····3 (Single unit for manifold: Stations 1 to 3)
∗ ZK2F07Q1NNA-06 ·····1 (Single unit for manifold: Station 4)

[2] When only ordering the single unit for manifold: Order using the single unit for manifold part number.
Ex.) ZK2H12Q1NNA-08

- When the manifold is viewed from V port, the first station starts from the left (D side).
- Complex exhaust and individual port exhaust (High-noise reduction silencer exhaust) cannot be mixed in the ejector system manifold.
- The DIN rail should be ordered separately. (Refer to page 48.)

Air Operated Specification **Vacuum Unit**

ZK2□A Series

Single Unit **Vacuum Pump System**

Refer to page 79 for the port layout (including a circuit example) and page 88 for the dimensions.

How to Order

ZK2P00 Q 1 B Y A – 08 – □

❶ ❷ ❸ ❹

Air Operated ● **Supply valve: N.C.**
Release valve: N.C.

❶ Pressure switch for vacuum/Pressure sensor

Symbol	Type	Pressure range [kPa]	Specifications		
			NPN	PNP	With unit selection function*1
			2 outputs		
A	Pressure switch for vacuum	0 to -101	●	–	●
B			●	–	None (SI unit only)
C			–	●	●
D			–	●	None (SI unit only)
E		-100 to 100	●	–	●
F			●	–	None (SI unit only)
H			–	●	●
J			–	●	None (SI unit only)
P	Pressure sensor	0 to -101	Analogue output 1 to 5 V		
T		-100 to 100			
N	Without pressure switch for vacuum/pressure sensor				

*1 The unit for the type without the unit selection function is fixed as kPa.

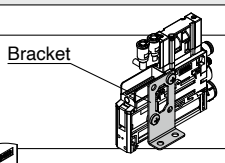
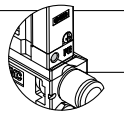
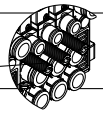
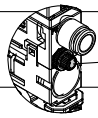
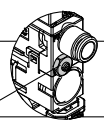
❷ Connector (Pressure switch for vacuum)

Symbol	For pressure switch for vacuum: 2 m (Lead wire with connector)	Pressure sensor assembly: 3 m (With lead wire)	Note
Y	●		Cannot be selected when ❶ is N
Y1	None		Cannot be selected when ❶ is P, T, or N
N	None		When "N" is selected for ❶

❸ Vacuum (V) port

Symbol	Vacuum (V) port
06	Ø 6
08	Ø 8
07	Ø 1/4"
09	Ø 5/16"

❹ Option*2

Symbol	Type		Note
—	Without option		–
B	Mounting bracket for single unit (nuts and bolts are included)		–
C	Vacuum pump system breathing (PE) port female thread specification (M3)		–
E	Vacuum release flow adjustment needle*3 — Screwdriver operation type long lock nut		Can be selected only for the combination of J and K
J	Round lock nut		
K	Screwdriver operation type		

*2 When more than one option is selected, list the option symbols in alphabetical order. (Example -BJ)
*3 A vacuum release flow adjustment needle is installed as standard. However, select it when improved operability is required.

Air Operated Specification **Vacuum Unit**

ZK2□A Series

CE UK CA RoHS

For Manifold **Vacuum Pump System**

Refer to page 79 for the port layout (including a circuit example) and page 89 for the dimensions.

How to Order

Single unit for manifold part number **ZK2Q00 Q 1 B Y A – 08 – □**

❶ ❷ ❸ ❹

Air Operated • • Supply valve: N.C./Release valve: N.C.

❶ Pressure switch for vacuum/Pressure sensor

Symbol	Type	Pressure range [kPa]	Specifications		
			NPN	PNP	With unit selection function*1
			2 outputs		
A	Pressure switch for vacuum	0 to -101	●	–	●
B			●	–	None (SI unit only)
C			–	●	●
D			–	●	None (SI unit only)
E		-100 to 100	●	–	●
F			●	–	None (SI unit only)
H			–	●	●
J			–	●	None (SI unit only)
P	Pressure sensor	0 to -101	Analogue output 1 to 5 V		
T		-100 to 100			
N	Without pressure switch for vacuum/pressure sensor				

*1 The unit for the type without the unit selection function is fixed as kPa.

❷ Connector (Pressure switch for vacuum)

Symbol	For pressure switch for vacuum: 2 m (Lead wire with connector)	Pressure sensor assembly: 3 m (With lead wire)	Note
Y	●		Cannot be selected when ❸ is N
Y1	None		Cannot be selected when ❸ is P, T, or N
N	None		When "N" is selected for ❸

❸ Vacuum (V) port

Symbol	Vacuum (V) port
06	Ø 6
08	Ø 8
07	Ø 1/4"
09	Ø 5/16"

❹ Option*2

Symbol	Type		Note
—	Without option		—
C	Vacuum pump system breathing (PE) port female thread specification (M3)		—
E	Vacuum release flow adjustment needle*3	Screwdriver operation type long lock nut	Can be selected only for the combination of J and K
J		Round lock nut	
K		Screwdriver operation type	

*2 When more than one option is selected, list the option symbols in alphabetical order. (Example -CJ)

*3 A vacuum release flow adjustment needle is installed as standard. However, select it when improved operability is required.

Manifold part number **ZZK2 04 A – Q 2 L – □**

❺ ❻ ❼

If the manifold parts (set of end plates for both ends and tension bolts) are shipped unassembled, please refer to page 48.

❺ Stations

Symbol	Stations
01	1 station
02	2 stations
⋮	⋮
10	10 stations

❻ System/Port

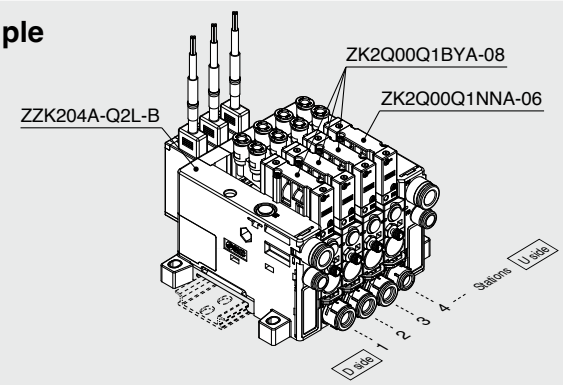
Symbol	System	Port
Q	Vacuum pump system	Ø 8 (Common PV) Ø 6 (Common release pressure)
QN		Ø 5/16" (Common PV) Ø 1/4 (Common release pressure)

❼ Option

Symbol	Type	Note
—	Without option	—
B	With DIN rail mounting bracket	The DIN rail should be ordered separately.

How to Order Valve Manifold Assembly

Example



[1] When shipped, the single unit for manifold is already built into the manifold:
After the manifold part number, specify the single unit for manifold part number from the first station.
In addition, prefix an asterisk to the single unit for manifold part number to indicate that it is to be built into the manifold.

Ex.) ZZK204A-Q2L-B·····1 (Manifold 4 stations)
*** ZK2Q00Q1BYA-08·····3 (Single unit for manifold: Stations 1 to 3)**
*** ZK2Q00Q1NNA-06·····1 (Single unit for manifold: Station 4)**

[2] When only ordering the single unit for manifold:
Order using the single unit for manifold part number.

Ex.) ZK2Q00Q1BYA-08

- When the manifold is viewed from V port, the first station starts from the left (D side).
- The DIN rail should be ordered separately. (Refer to page 48.)

Specifications

General Specifications

Operating temperature range (No condensation)	**-5 to 50 °C**	Without pressure sensor/switch With pressure switch
	0 to 50 °C	With pressure sensor
Fluid		Air
Vibration resistance∗1	**30 m/s²**	Without pressure sensor/switch With pressure sensor
	20 m/s²	With pressure switch
Impact resistance∗2	**150 m/s²**	Without pressure sensor/switch With pressure sensor
	100 m/s²	With pressure switch
Standards		CE/UKCA marking, RoHS

∗1 The characteristics are satisfied when tested for 2 hours in each of the X, Y and Z directions at 10 to 500 Hz without energisation. (Initial value)
∗2 The characteristics are satisfied when tested one time in each of the X, Y and Z directions without energisation. (Initial value)

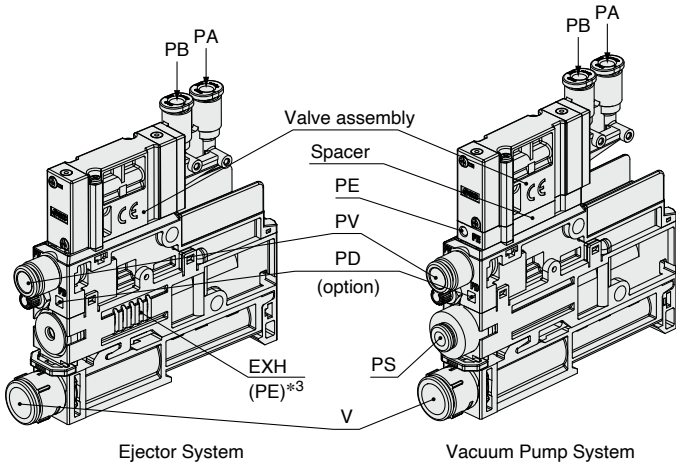
Valve Common Specifications

Model∗3	**ZK2-VA□Q**
Type of actuation	Supply valve: N.C. Release valve: N.C.
Valve configuration	Air operated dual 2-port
Operating pressure range	0.3 to 0.6 MPa
Valve construction	Poppet seal
Manual override	Push type

∗3 Refer to the Valve assembly on page 44 for the valve model number.

Application and Operating Pressure Range of Each Port

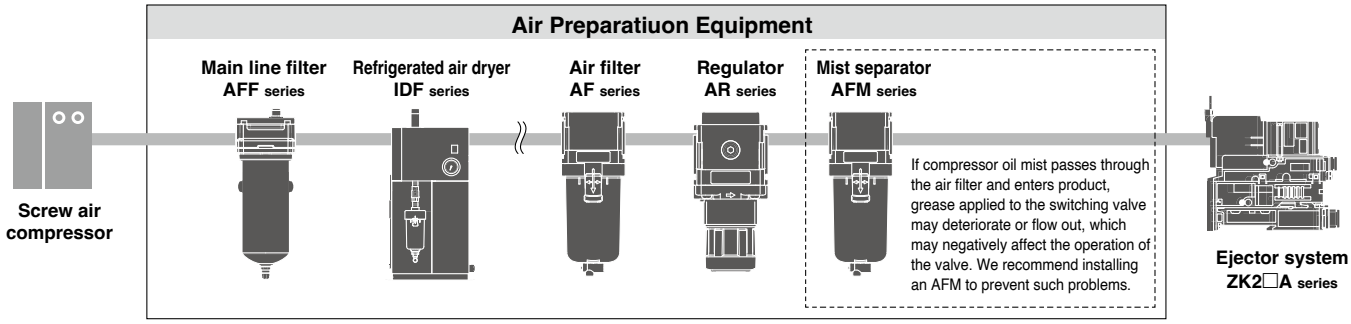
Port	Description	Ejector system	Vacuum pump system
PV	Air pressure supply port	Compressed air supply for operating ejector	—
	(Operating pressure range)	0.3 to 0.6 MPa∗1	—
	Vacuum pressure supply port	—	Vacuum source (Vacuum pump)
	(Operating pressure range)	—	0 to -100 kPa
PA	Supply valve pilot pressure supply port	Compressed air supply for operating supply valve	
	(Operating pressure range)	0.3 to 0.6 MPa	
PB	Release valve pilot pressure supply port	Compressed air supply for operating release valve	
	(Operating pressure range)	0.3 to 0.6 MPa	
PD	Release pressure supply port	Release pressure Compressed air supply for individual setting (Option)	
	(Operating pressure range)	0 to 0.6 MPa (PD ≤ PA/PB)	
V	Vacuum port	For connecting adsorption equipment including pad	
EXH	Exhaust port	Exhaust when ejector operates∗2	—
PE	Breathing port	Exhaust when main valve operates∗3	



∗1 The manifold individual supply specification can be operated at a PV pressure of 0.3 MPa or less.
∗2 For ejectors with silencer, air exhausts from A (slit on both sides). For port exhaust type, air exhausts from B.
∗3 Female thread type (M3) is available by option [C] for breathing (PE) port of the vacuum pump system.

Quality of Supply Air

Supply air containing foreign matter, water, oil, condensate, etc., can cause malfunction of the supply valve and release valve. So, install air preparation equipment on the upstream side of the product (refer to the piping example below) and perform maintenance periodically to control the supply air properly.



Specifications

Ejector Specifications

Item		Model	ZK2□07	ZK2□10	ZK2□12	ZK2□15
Nozzle diameter		[mm]	0.7	1.0	1.2	1.5
Max. suction flow*1	Silencer exhaust/ Complex exhaust	[l/min(ANR)]	29	44	61	67
	Port exhaust	[l/min(ANR)]	34	56	74	89
	High-noise reduction silencer exhaust	[l/min(ANR)]	34	56	72	83
Air consumption*1		[l/min(ANR)]	24	40	58	90
Max. vacuum pressure*1		[kPa]	–91			
Supply pressure range		[MPa]	0.3 to 0.6			
Standard supply pressure		[MPa]	0.35			0.4

*1 Values at the standard supply pressure. Values are based on standard of SMC measurements. They depend on atmospheric pressure (weather, altitude, etc.) and measurement method.

Suction Filter Specifications

Nominal filtration rating	30 μm
Filtration area	510 mm²

Max. Number of Manifold Stations that Can Operate Simultaneously*2

Item		Model (Nozzle size)	ZK2□07	ZK2□10	ZK2□12	ZK2□15
Air pressure supply (PV) port Ø 8, Ø 5/16"	High-noise reduction silencer exhaust, Individual port exhaust	Supply from one side	8	6	6	3
		Supply from both sides	10	9	9	6
	Complex exhaust	Supply from one side	8	5	4	3
		Supply from both sides	10	7	5	5

*2 As long as the number of stations operated simultaneously is the value on the table or less, then the manifold is available up to 10 stations.

Noise Level (Reference values)

Item	Model	ZK2□07	ZK2□10	ZK2□12	ZK2□15
Noise level [dB (A)]	ZK2G (High-noise reduction silencer exhaust)	46	55	63	69
	ZK2A (Silencer exhaust)	59	66	75	76

Actual values under SMC's measurement conditions (Not guaranteed values)

Weight

Single Unit

Single unit model	Weight [g]
ZK2P00Q1NNA (Vacuum pump system, Single unit, Without pressure sensor/switch)	81
ZK2A□Q1NNA (Ejector system, Single unit, Without pressure sensor/switch)	66
ZK2 (One station for manifold, Without pressure sensor/switch)	70

Pressure Sensor/Pressure Switch for Vacuum

Pressure sensor/Pressure switch for vacuum model	Weight [g]
ZK2-PS□-A (Except cable portion)	5
ZK2-ZS□-A (Except lead wire with connector)	14

Manifold Base

	1 station	2 stations	3 stations	4 stations	5 stations	6 stations	7 stations	8 stations	9 stations	10 stations
Weight [g]	129	132	135	138	141	144	147	149	152	155

● Calculation of Weight for the Manifold Type

(Single unit weight x Number of stations) + (Pressure sensor/Pressure switch for vacuum weight x Number of stations) + Manifold base

Example) 5-station manifold with pressure sensors

70 g x 5 pcs. + 5 g x 5 pcs. + 141 g = 516 g

* The ejector exhaust characteristics/flow rate characteristics are the same as those of the model with a valve. Refer to pages 30 to 32 for details.

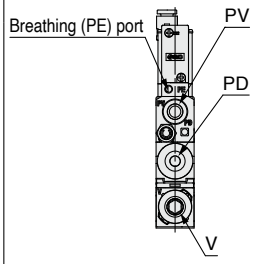
● PV: Air pressure supply port ● PD: Release pressure supply port ● PA: Supply valve pilot pressure supply port
● PB: Release valve pilot pressure supply port ● V: Vacuum port ● EXH: Exhaust port For details ⇒ Page 77

Port Layout

Standard Products

Port layout No. 1

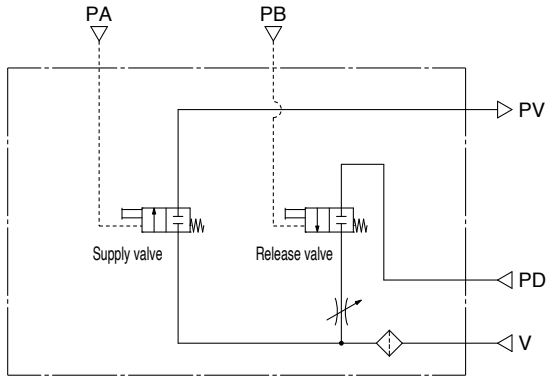
Single unit: ZK2P00Q1□□A-□



System		Vacuum pump
Body type		Single unit
Exhaust type		—
Application and purpose	Vacuum pressure	—
	Exhaust	—
	Release pressure	Supplied from the PD port

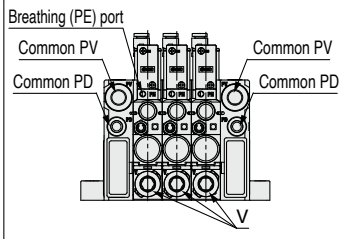
Port combination: PV ≠ PD

Circuit example



Port layout No. 2

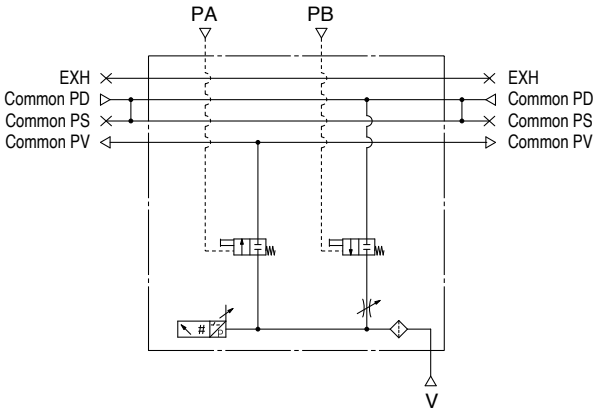
Single unit: ZK2Q00Q1□□A-□
Manifold: ZZK2□A-Q2L



System		Vacuum pump
Body type		Manifold
Exhaust type		—
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	—
	Release pressure	Common for each station

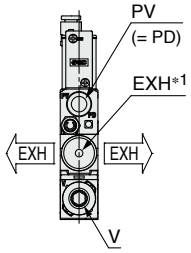
Port combination: Common PV ≠ Common PD

Circuit example



Port layout No. 3

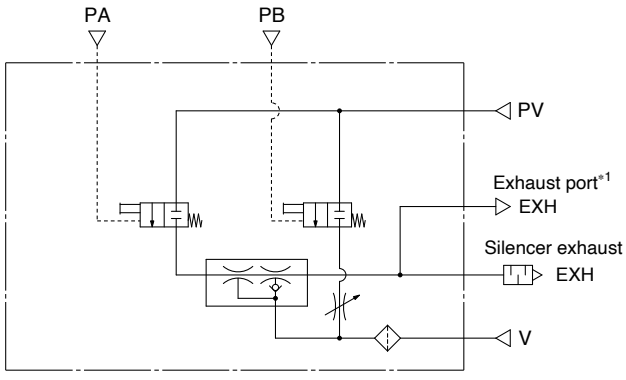
Single unit: ZK2A□Q1□□A-□



System		Ejector
Body type		Single unit
Exhaust type		Silencer exhaust
Application and purpose	Vacuum pressure	—
	Exhaust	Released in operating environment
	Release pressure	Same pressure as PV

Port combination: PV = PD

Circuit example



*1 Nozzle size: 12, 15

Refer to page 77 for the purpose of port and the operating pressure range.

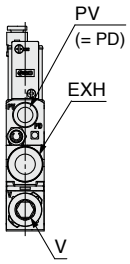
● PV: Air pressure supply port ● PD: Release pressure supply port ● PA: Supply valve pilot pressure supply port
● PB: Release valve pilot pressure supply port ● V: Vacuum port ● EXH: Exhaust port For details ⇒ Page 77

Port Layout

Standard Products

Port layout No. 4

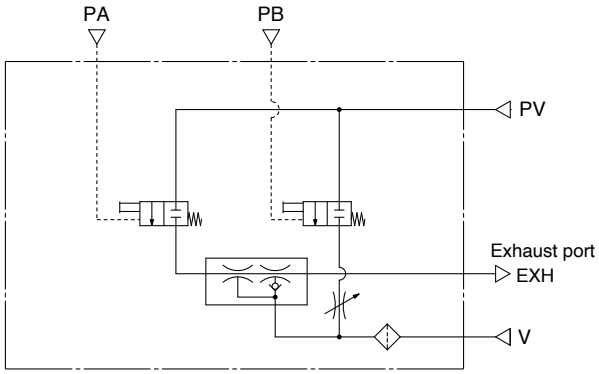
Single unit: ZK2B□Q1□□A-□



System		Ejector
Body type		Single unit
Exhaust type		Port exhaust
Application and purpose	Vacuum pressure	—
	Exhaust	After piping, individual exhaust is necessary.
	Release pressure	Same pressure as PV

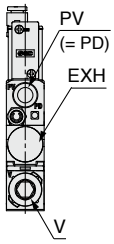
Port combination: PV = PD

Circuit example



Port layout No. 5

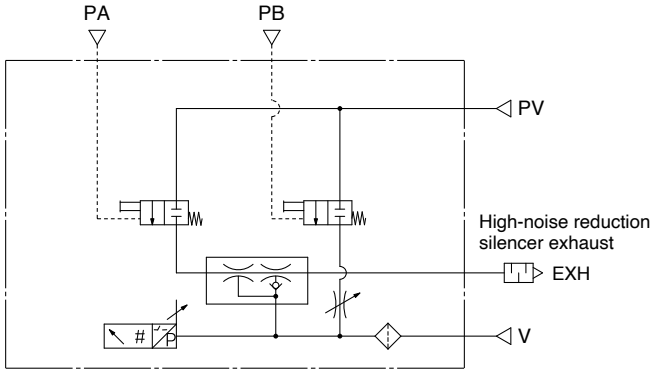
Single unit: ZK2G□Q1□□A-□



System		Ejector
Body type		Single unit
Exhaust type		High-noise reduction silencer exhaust
Application and purpose	Vacuum pressure	—
	Exhaust	Released in operating environment
	Release pressure	Same pressure as PV

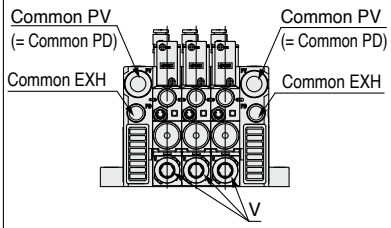
Port combination: PV (= PD)

Circuit example



Port layout No. 6

Single unit: ZK2C□Q1□□A-□
Manifold: ZZK2□A-A1L

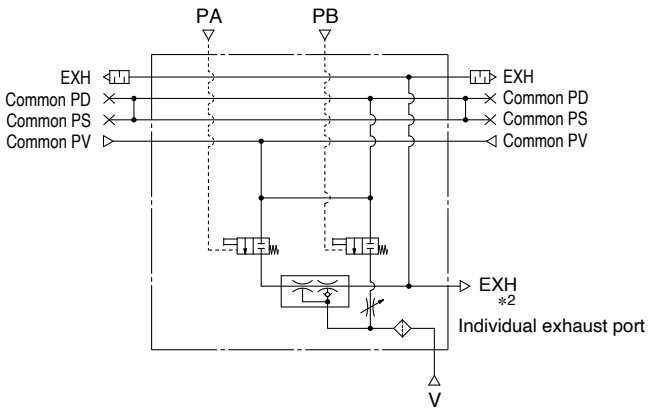


∗1 The complex exhaust is a combined exhaust method of the common exhaust from the end plate and the direct exhaust from each station.

System		Ejector
Body type		Manifold
Exhaust type		Complex exhaust∗1
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	Released in operating environment
	Release pressure	Same pressure as common PV

Port combination: Common PV = Common PD

Circuit example



∗2 For complex exhaust type, individual exhaust port is provided to each station.

Refer to page 77 for the purpose of port and the operating pressure range.

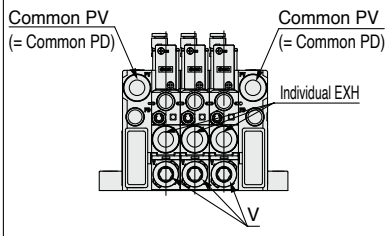
● PV: Air pressure supply port ● PD: Release pressure supply port ● PA: Supply valve pilot pressure supply port
● PB: Release valve pilot pressure supply port ● V: Vacuum port ● EXH: Exhaust port For details ⇒ Page 77

Port Layout

Standard Products

Port layout No. 7

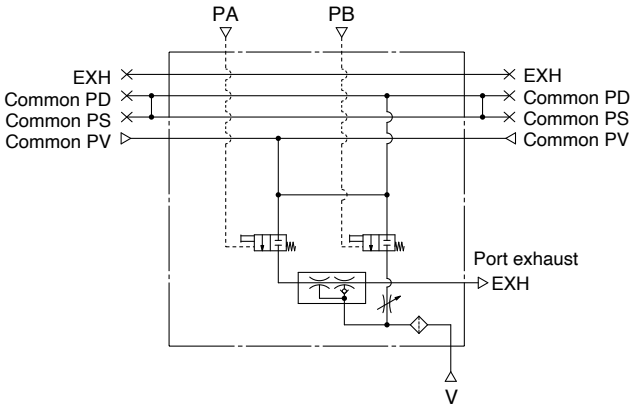
Single unit: ZK2F□Q1□□A-□
Manifold: ZZK2□A-A2L



System		Ejector
Body type		Manifold
Exhaust type		Individual port exhaust
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	After piping, individual exhaust is necessary.
	Release pressure	Same pressure as common PV

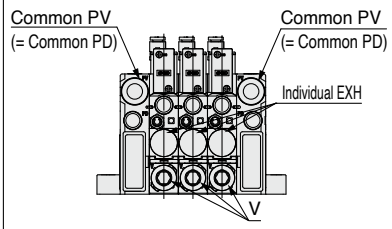
Port combination: Common PV = Common PD

Circuit example



Port layout No. 8

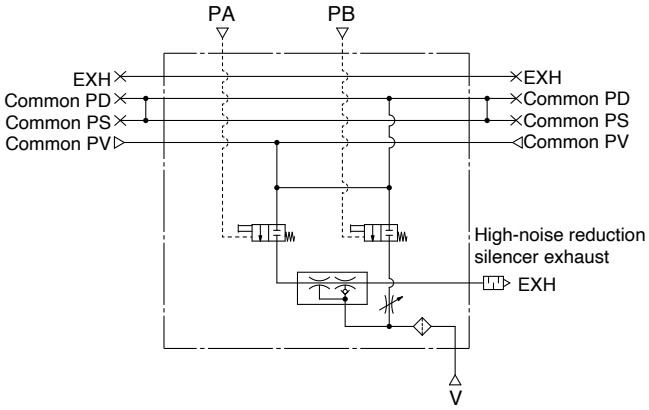
Single unit: ZK2H□Q1□□A-□
Manifold: ZZK2□A-A2L



System		Ejector
Body type		Manifold
Exhaust type		High-noise reduction silencer exhaust
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	Released in operating environment
	Release pressure	Same pressure as common PV

Port combination: Common PV = Common PD

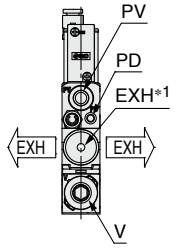
Circuit example



Option -D

Port layout No. 9

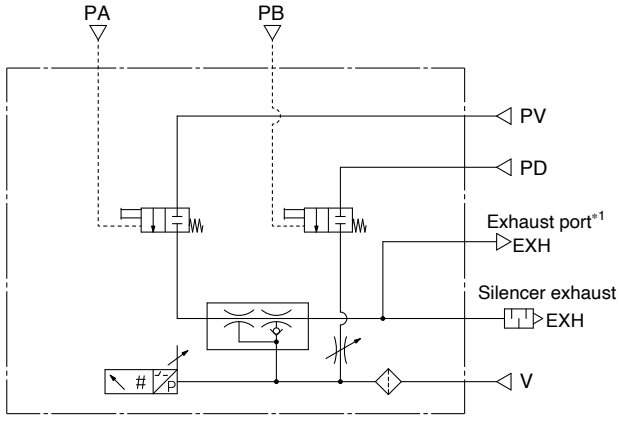
Single unit: ZK2A□Q1□□A-□-D



System		Ejector
Body type		Single unit
Exhaust type		Silencer exhaust
Application and purpose	Vacuum pressure	—
	Exhaust	Released in operating environment
	Release pressure	PD pressure has to be supplied with PS pressure.

Port combination: PV ≠ PD

Circuit example



*1 Nozzle size: 12, 15

Refer to page 77 for the purpose of port and the operating pressure range.

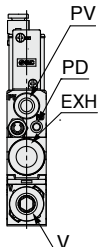
● PV: Air pressure supply port ● PD: Release pressure supply port ● PA: Supply valve pilot pressure supply port
● PB: Release valve pilot pressure supply port ● V: Vacuum port ● EXH: Exhaust port For details ⇒ Page 77

Port Layout

Option -D

Port layout No. 10

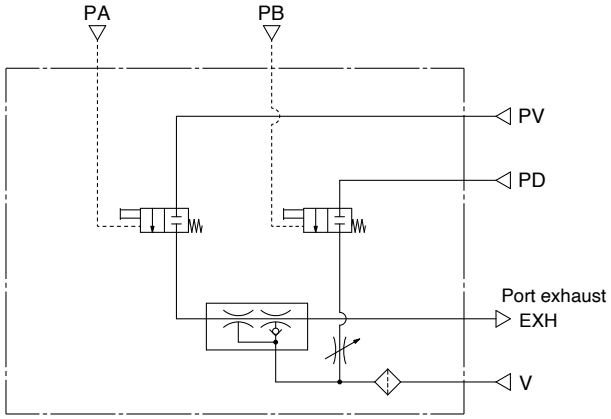
Single unit: ZK2B□Q1□□A-□-D



System		Ejector
Body type		Single unit
Exhaust type		Port exhaust
Application and purpose	Vacuum pressure	—
	Exhaust	After piping, individual exhaust is necessary.
	Release pressure	PD pressure has to be supplied with PV pressure.

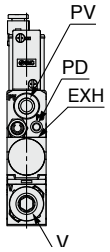
Port combination: PV ≠ PD

Circuit example



Port layout No. 11

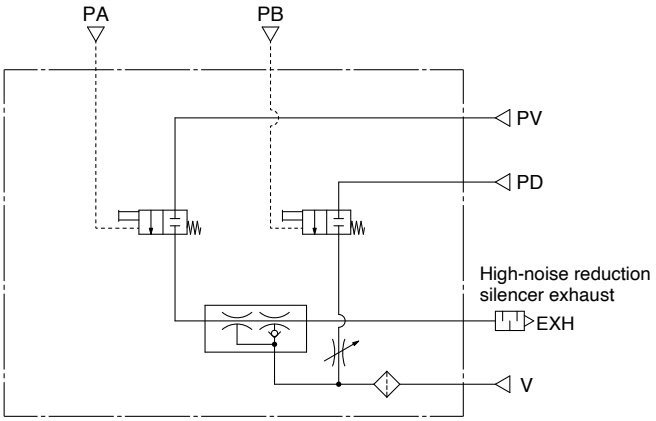
Single unit: ZK2G□Q1□□A-□-D



System		Ejector
Body type		Single unit
Exhaust type		High-noise reduction silencer exhaust
Application and purpose	Vacuum pressure	—
	Exhaust	Released in operating environment
	Release pressure	PD pressure has to be supplied with PV pressure.

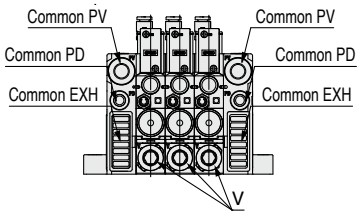
Port combination: PV ≠ PD

Circuit example



Port layout No. 12

Single unit: ZK2C□Q1□□A-□-P
Manifold: ZZK2□A-A1L-D

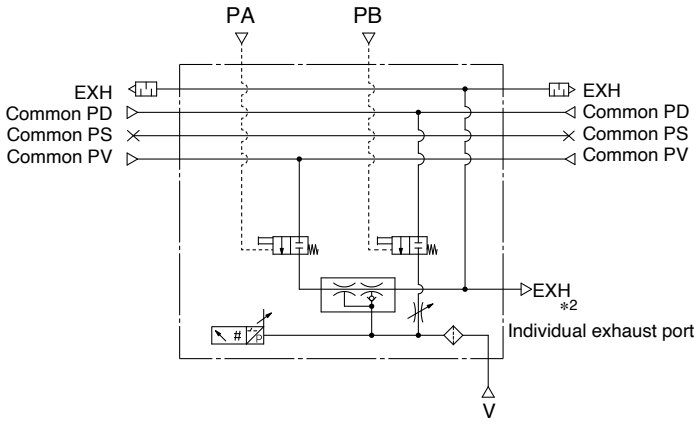


∗1 The complex exhaust is a combined exhaust method of the common exhaust from the end plate and the direct exhaust from each station.

System		Ejector
Body type		Manifold
Exhaust type		Complex exhaust∗1
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	Released in operating environment
	Release pressure	Common PD pressure has to be supplied with common PV.

Port combination: Common PV ≠ Common PD

Circuit example



∗2 For complex exhaust type, individual exhaust port is provided to each station

Refer to page 77 for the purpose of port and the operating pressure range.

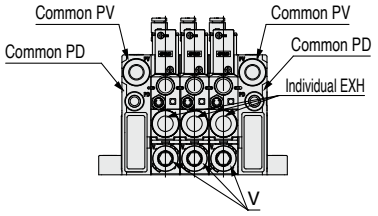
● PV: Air pressure supply port ● PD: Release pressure supply port ● PA: Supply valve pilot pressure supply port
● PB: Release valve pilot pressure supply port ● V: Vacuum port ● EXH: Exhaust port For details ⇒ Page 77

Port Layout

Option -D

Port layout No. 13

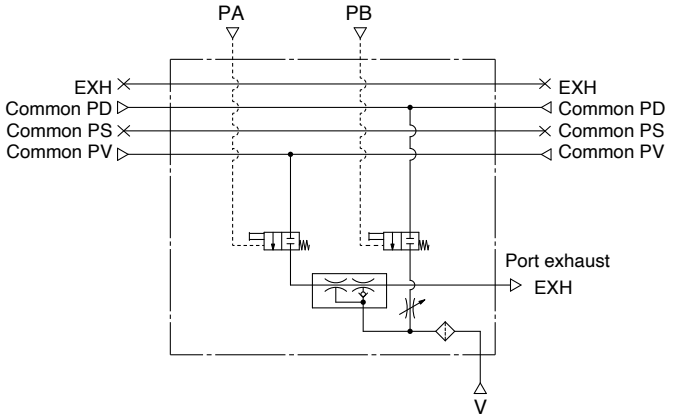
Single unit: ZK2F□Q1□□A-□-P
Manifold: ZZK2□A-A2L-D



System		Ejector
Body type		Manifold
Exhaust type		Individual port exhaust
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	After piping, individual exhaust is necessary.
	Release pressure	Common PD pressure has to be supplied with common PV.

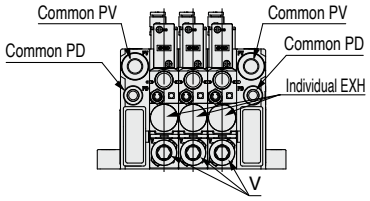
Port combination: Common PV ≠ Common PD

Circuit example



Port layout No. 14

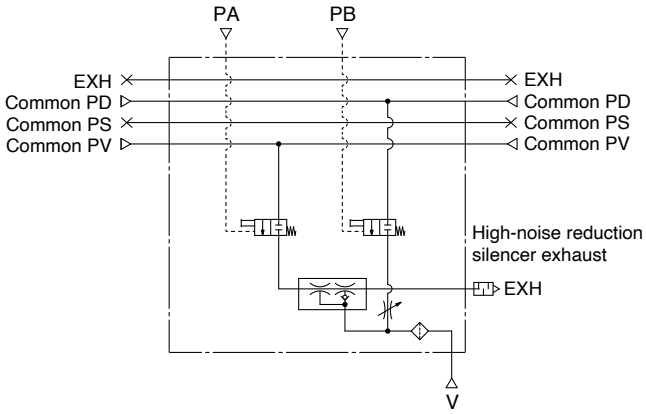
Single unit: ZK2H□Q1□□A-□-P
Manifold: ZZK2□A-A2L-D



System		Ejector
Body type		Manifold
Exhaust type		High-noise reduction silencer exhaust
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	Released in operating environment
	Release pressure	PD pressure has to be supplied with PV pressure.

Port combination: Common PV ≠ Common PD

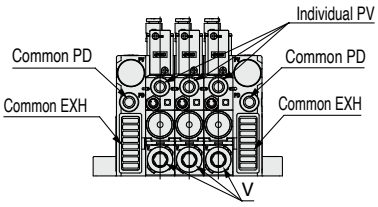
Circuit example



Option -M

Port layout No. 15

Single unit: ZK2C□Q1□□A-□-M
Manifold: ZZK2□A-A1L-M

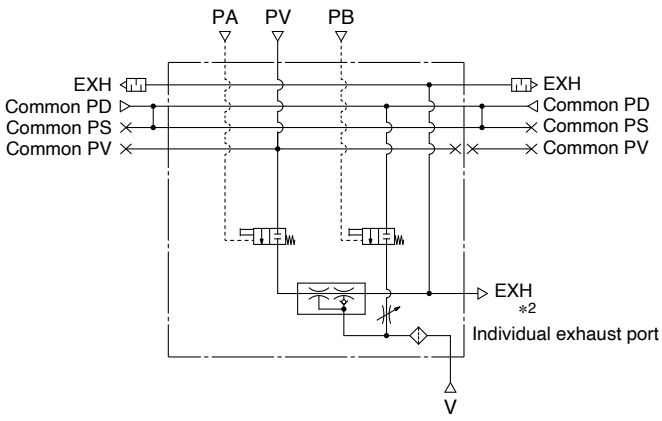


∗1 The complex exhaust is a combined exhaust method of the common exhaust from the end plate and the direct exhaust from each station.

System		Ejector
Body type		Manifold
Exhaust type		Complex exhaust∗1
Application and purpose	Vacuum pressure	PV pressure can be changed per station.
	Exhaust	Released in operating environment
	Release pressure	Common for each station

Port combination: Individual PV ≠ Common PS = Common PD

Circuit example



∗2 For complex exhaust type, individual exhaust port is provided to each station.

Refer to page 77 for the purpose of port and the operating pressure range.

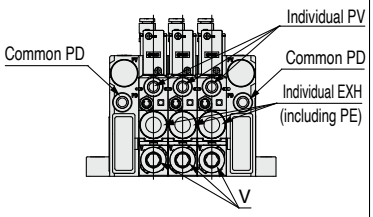
● PV: Air pressure supply port ● PD: Release pressure supply port ● PA: Supply valve pilot pressure supply port
● PB: Release valve pilot pressure supply port ● V: Vacuum port ● EXH: Exhaust port For details ⇒ Page 77

Port Layout

Option -M

Port layout No. 16

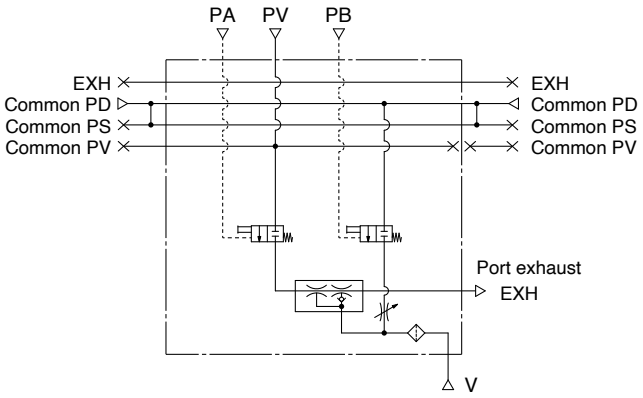
Single unit: ZK2F□Q1□□A-□-M
Manifold: ZZK2□A-A2L-M



System		Ejector
Body type		Manifold
Exhaust type		Individual port exhaust
Application and purpose	Vacuum pressure	PV pressure can be changed per station.
	Exhaust	After piping, individual exhaust is necessary.
	Release pressure	Common for each station

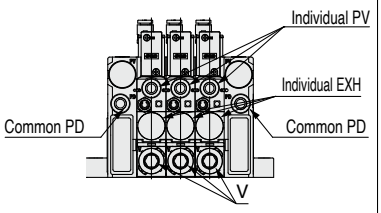
Port combination: Individual PV ≠ Common PS = Common PD

Circuit example



Port layout No. 17

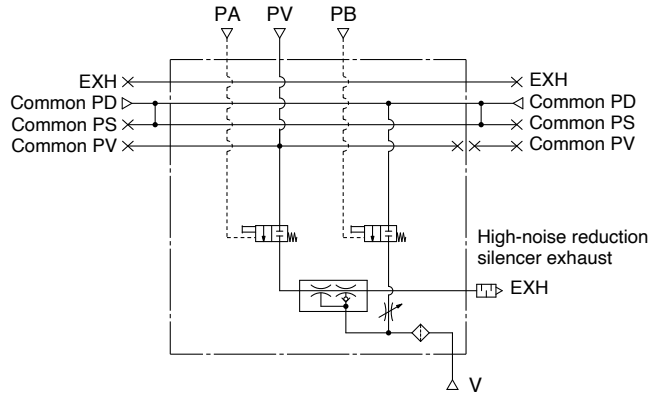
Single unit: ZK2H□Q1□□A-□-M
Manifold: ZZK2□A-A2L-M



System		Ejector
Body type		Manifold
Exhaust type		High-noise reduction silencer exhaust
Application and purpose	Vacuum pressure	PV pressure can be changed per station.
	Exhaust	Released in operating environment
	Release pressure	Common for each station

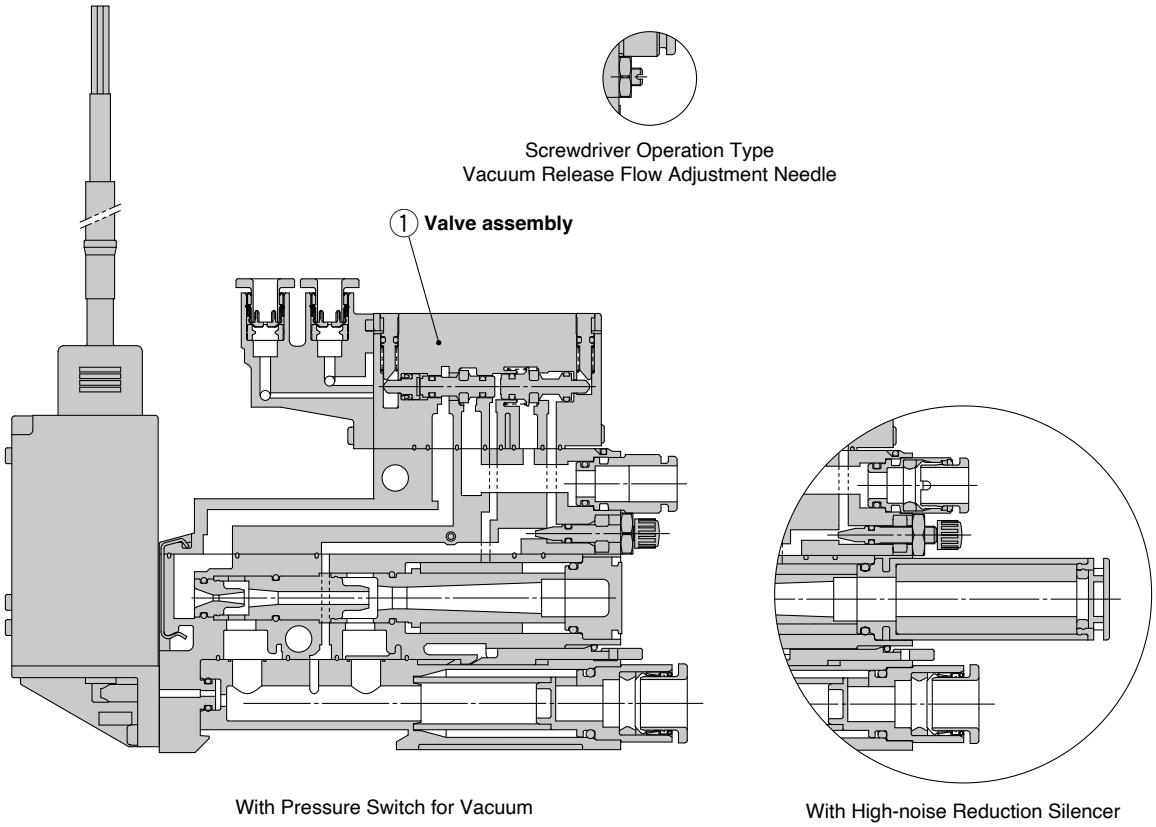
Port combination: Individual PV ≠ Common PS = Common PD

Circuit example



Refer to page 77 for the purpose of port and the operating pressure range.

Construction



With Pressure Switch for Vacuum

With High-noise Reduction Silencer

∗ For details on replacement parts, refer to page 43.

How to Order Replacement Parts for Single Unit

Valve assembly **Construction ①**

ZK2 − VA A Q 1 4 A − A

❶ ❷

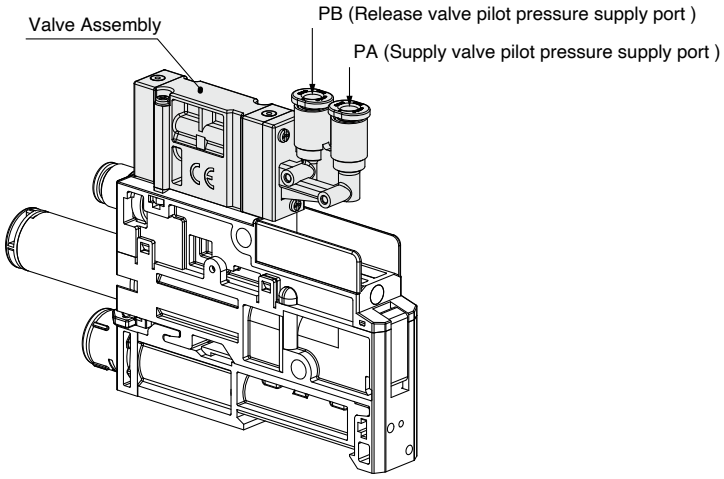
Air Operated **Supply valve: N.C.**
Release valve: N.C.

❶ Applicable system

A	Ejector system
P	Vacuum pump system

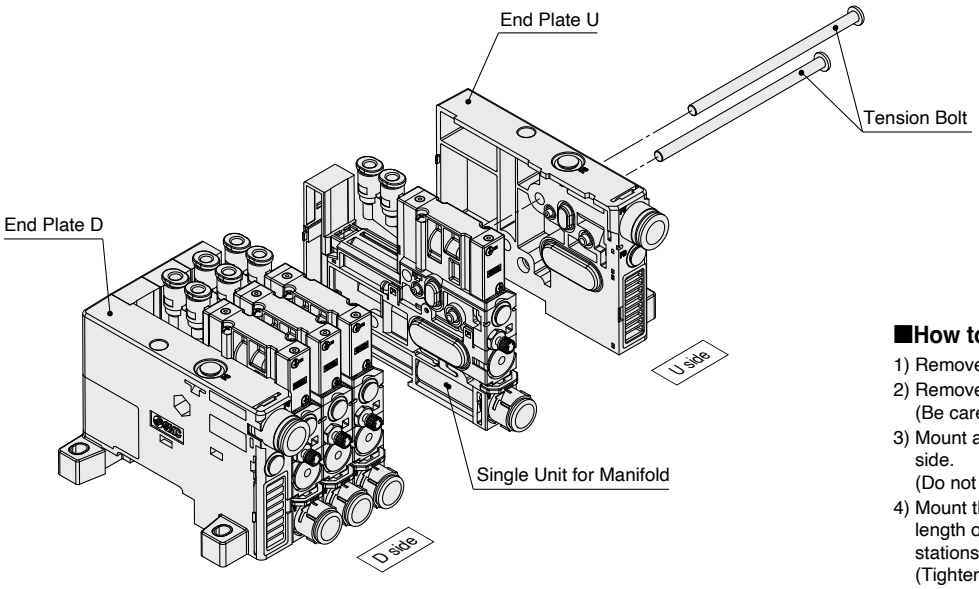
❷ Pilot pressure supply port size

4	Ø 4	Metric size
3	Ø 5/32"	Inch size



Vacuum Unit/*ZK2□A Series*

Exploded View of Manifold



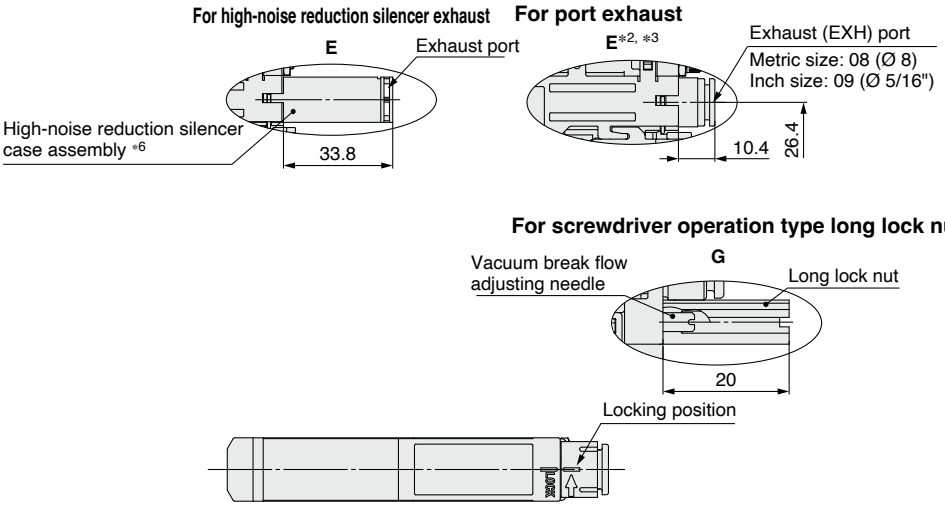
■How to increase manifold stations

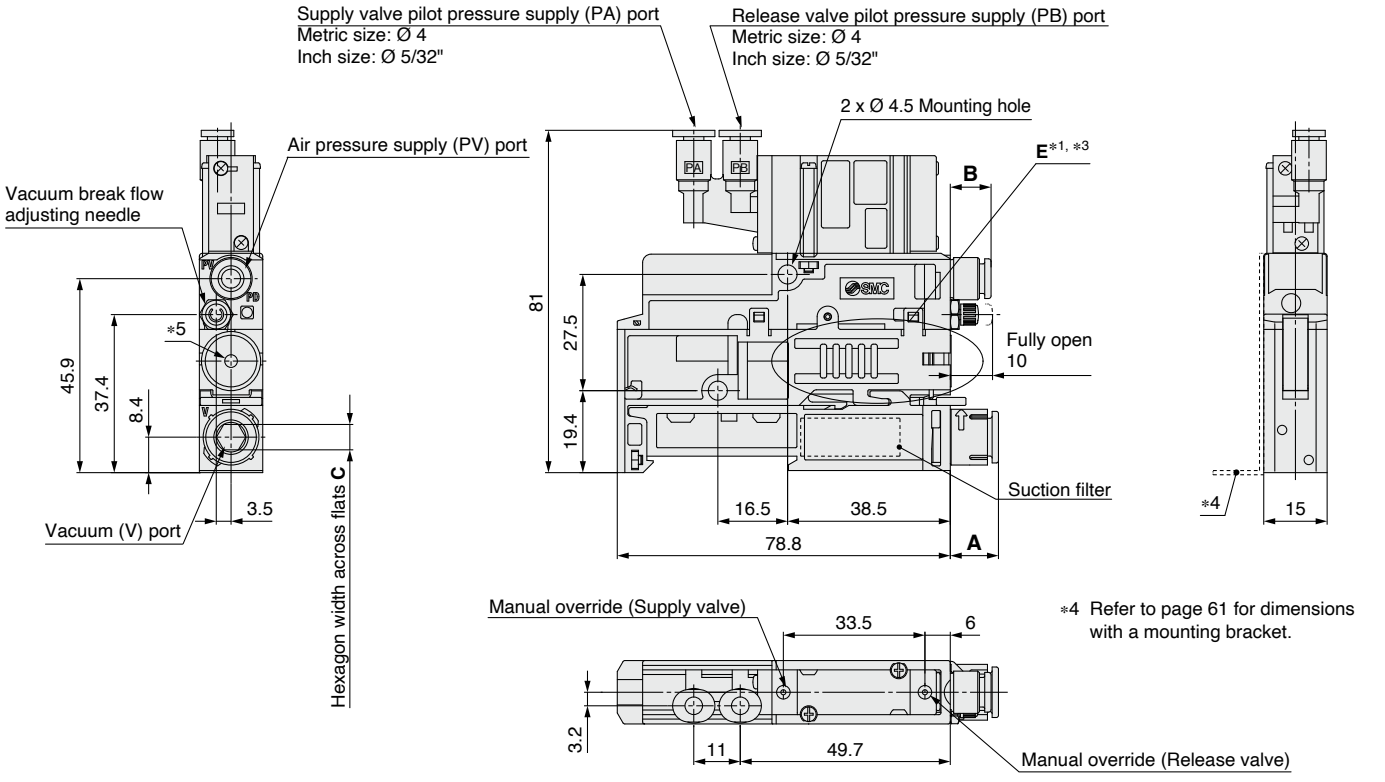
1) Remove two tension bolts.
2) Remove the end plate U.
   (Be careful not to drop the gasket.)
3) Mount a single unit to the end surface of U side.
   (Do not let the gasket get caught.)
4) Mount the end plate U with the appropriate length of tension bolts for the number of stations required.
   (Tightening torque: 0.75 N·m)

* For details on replacement parts, refer to page 46.

Dimensions: Single Unit

ZK2$^{A}_{B}$$_{G}$□Q1NNA-□





*4 Refer to page 61 for dimensions with a mounting bracket.

*1 For silencer exhaust type, air is exhausted from the slit on both sides. (Do not cover both sides. Release at least one side.)
*2 For port exhaust type, air is exhausted from the One-touch fitting.
*3 The breathing air is connected to the ejector exhaust unit.
*5 Nozzle size 12 and 15 have exhaust port.
*6 Refer to page 92 for the part number and maintenance of the high-noise reduction silencer case assembly.

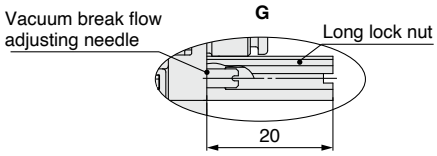
PV port type			B
Metric size	06	Ø 6	9.7
Inch size	07	Ø 1/4"	12.3

V port type			A	C
Metric size	06	Ø 6	8.3	4
	08	Ø 8	11.2	6
Inch size	07	Ø 1/4"	9.7	4.8
	09	Ø 5/16"	11.2	6

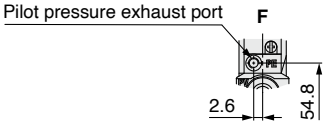
Dimensions: Single Unit

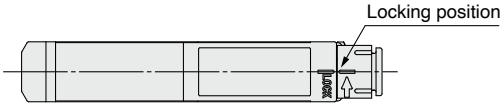
ZK2P00Q1NNA-□

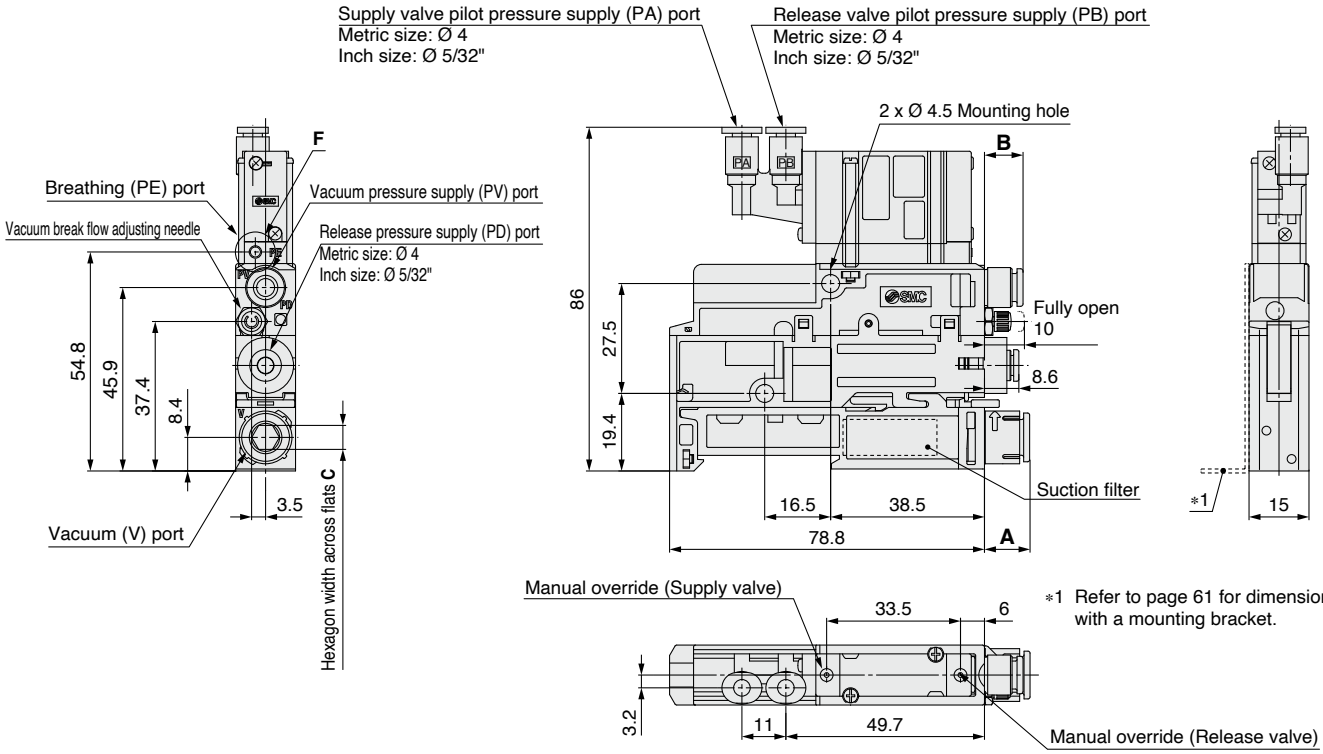
For screwdriver operation type long lock nut



PE port famale thread specification







∗1 Refer to page 61 for dimensions with a mounting bracket.

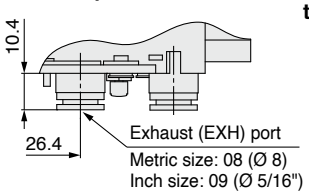
PV port type			B
Metric size	06	Ø 6	9.7
Inch size	07	Ø 1/4"	12.3

V port type			A	C
Metric size	06	Ø 6	8.3	4
	08	Ø 8	11.2	6
Inch size	07	Ø 1/4"	9.7	4.8
	09	Ø 5/16"	11.2	6

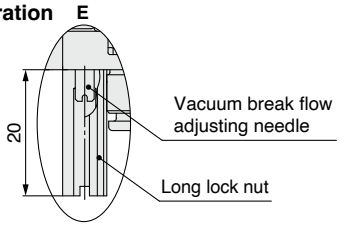
Dimensions: Manifold

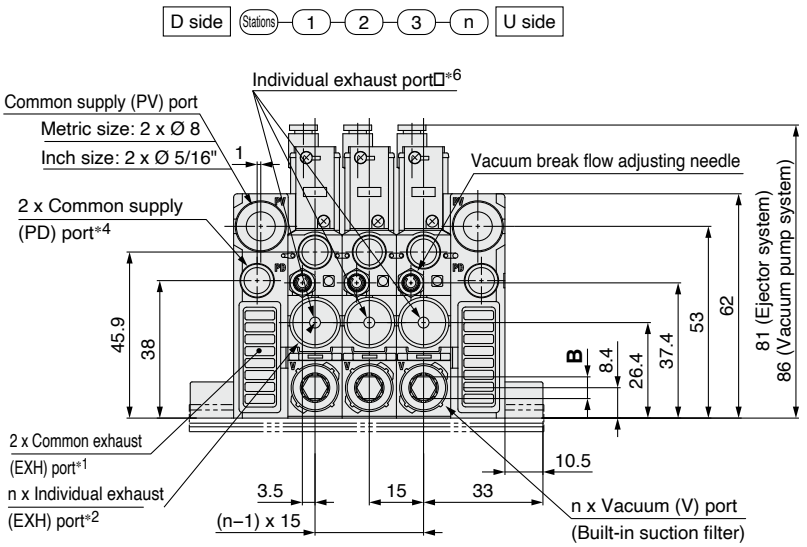
ZZK2□A- $^{A1}_{Q2}$□L

For port exhaust

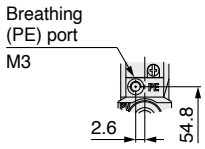


For screwdriver operation type long lock nut

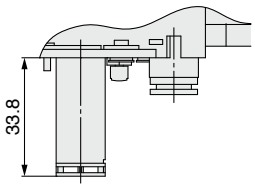




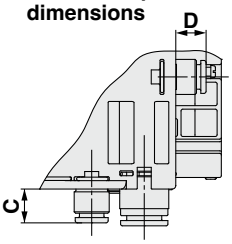
Vacuum pump system PE port female thread specification (M3)

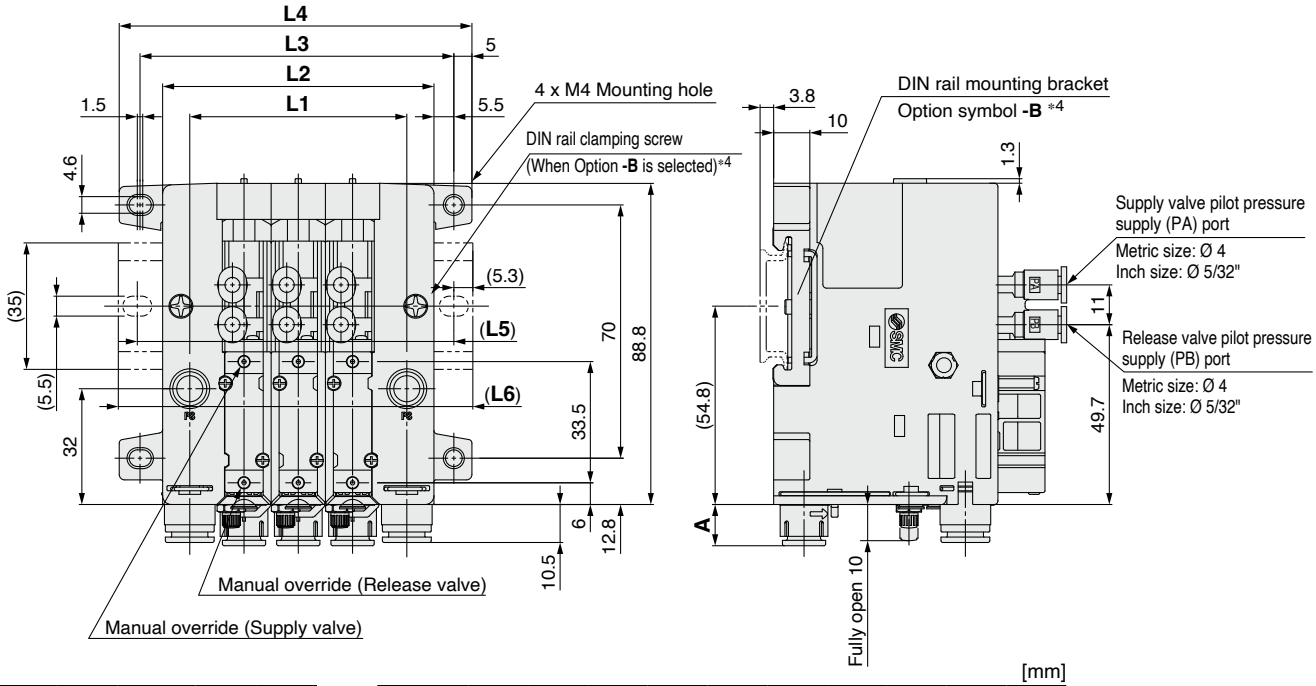


For high-noise reduction silencer exhaust



PS and PD port dimensions





[mm]

Port type		A	Hexagon width across flats B	C	D
Metric size	06	8.3	4	9.7	8.7
	08	11.2	6	—	—
Inch size	07	9.7	4.8	12.3	11.3
	09	11.2	6	—	—

Stations (n)	1	2	3	4	5	6	7	8	9	10
L1	30	45	60	75	90	105	120	135	150	165
L2	45	60	75	90	105	120	135	150	165	180
L3	56.8	71.8	86.8	101.8	116.8	131.8	146.8	161.8	176.8	191.8
L4	67.5	82.5	97.5	112.5	127.5	142.5	157.5	172.5	187.5	202.5
L5	62.5	75	87.5	112.5	125	137.5	150	162.5	187.5	200
L6	73	85.5	98	123	135.5	148	160.5	173	198	210.5

*1 Vacuum pump system with individual exhaust port type does not have exhaust port.
*2 When individual exhaust port type is selected (Body type: F)
*3 Common pilot pressure supply (PD) port is available for vacuum pump system or option D (With manifold common release pressure supply (PD) port). (mm: Ø 6 inch: Ø 1/4")
*4 To fix the manifold to DIN rail, select an option for the manifold model number.
*5 For complex exhaust type, air is also exhausted from the individual exhaust port of each station in addition to the common exhaust. (Ejector system)

ZK2□A Series
Specific Product Precautions 1

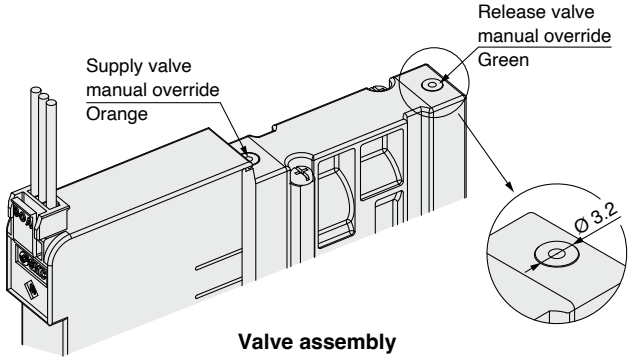
Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smc.eu

Supply Valve / Release Valve

⚠Warning

1. Manual override operation

- Manual override is non-locking push type. Push the manual override with a screwdriver of a diameter smaller than indicated in the diagram until it reaches the end.



Valve assembly

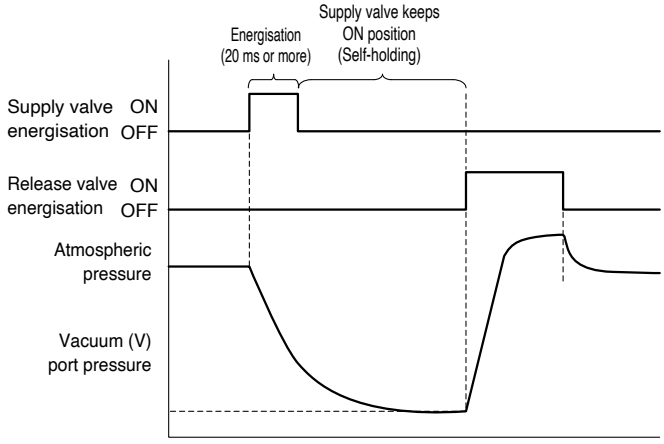
- Confirm that the product operates safely before the manual override is operated.

* When the valve type R is selected, the supply valve can hold the position and will not switch off even if the supply valve manual override operation is finished unless the release valve manual override is pressed.

2. Self-holding function of supply valve (Valve type R)

When the supply valve is energised (20 ms or more), the supply valve keep ON position even after energisation is stopped. When release valve is energised, the supply valve is turned off in conjunction with the operation of the release valve.

* Main valve in the valve assembly is made of elastic seal. Self-holding is performed by friction resistance of the seal. Do not apply impact resistance in the direction of the main valve shaft during the installation to moving parts. When impact is applied, use valve type K. (For vibration and impact, refer to the General Specifications on page 28.)
* In a vacuum pump system, the workpiece may not be released when the vacuum release flow adjustment needle is closed during the use. In addition, the OFF operation of the supply valve may become unstable. Open the vacuum release flow adjustment needle during use.
  If the vacuum release flow adjustment needle is expected to close during use due to a light workpiece, please select PD port type (single unit: manifold option [D] (for manifold: option [P])). Release the PD port to the atmosphere and open the vacuum release flow adjustment needle.
* Valve type R cannot use a pressure switch for vacuum with energy saving function. Use valve type K.



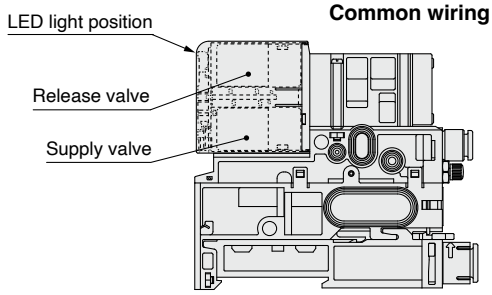
3. Default setting

When the valve assembly (valve types K, J, and R) is delivered, the supply valve is on the OFF position, but it may be on the ON position due to the vibration or impact during transportation or device installation. Turn to the OFF position manually or by energising before use.

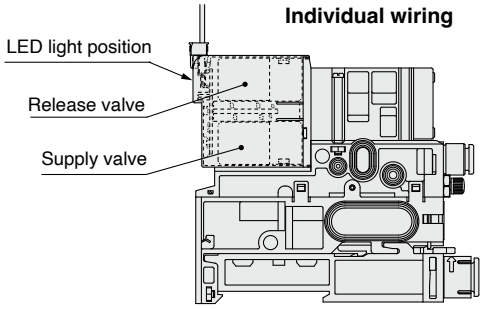
4. LED indication

Red LED turns on when supply valve is energised. Green LED turns on when release valve is energised.
However, for valve type E (supply valve N.O. specification), during vacuum release, the supply valve and release valve are energised at the same time. Because of this, both the "red" and "green" LEDs turn ON, indicating a "yellow-green" colour.

Common wiring



Individual wiring



5. Energisation time

It is recommended that the supply valve and release valve be energised for at least 100 ms. (20 ms or more only for the supply valve of valve type R)

6. Continuous duty

If a supply valve is energised continuously for a long time, the rise in temperature due to heat-up of the coil may cause a decline in solenoid valve performance, reduce service life, or have adverse effects on peripheral equipment. Therefore, if the valve is to be energised for periods of longer than 30 minutes at a time or if during the hours of operation the energised period per day is longer than the de-energised period, we recommend using valve type R (self-holding type supply valve) or valve type E (N.O. supply valve).

7. Air leakage

Zero air leakage is not guaranteed for the supply valve or release valve. Be aware that because there is a chance of air and vacuum leakage, the pressure may change if the V port side is tightly sealed.

ZK2□A Series
Specific Product Precautions 2

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smc.eu

Surge Voltage Intrusion

⚠Caution

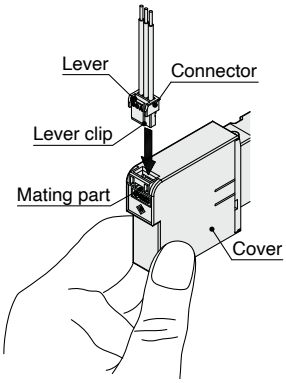
The surge voltage created when the power supply is cut off could apply to the de-energised load equipment through the output circuit. In cases where the energised load equipment has a larger capacity (power consumption) and is connected to the same power supply as the product, the surge voltage could malfunction and/or damage the internal circuit element of the product and the internal device of the output equipment. To avoid this situation, place a diode which can suppress the surge voltage between the COM lines of the load equipment and output equipment.

Wiring

⚠Caution

1. Individual wiring

- To install the connector, hold the cover and insert the connector straight pushing the connector lever with your finger. Ensure that the connector lever clip is properly inserted onto mating part.
- To remove the connector, hold the cover and pull out the connector straight pushing the connector lever clip.

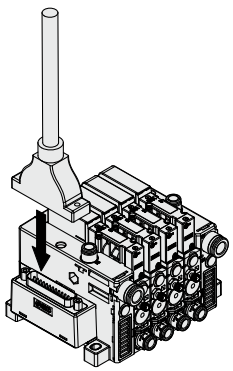


∗ Do not pull the lead wire with a force of 2.5 N or more, as this may damage the connector or cover.

2. Common wiring

- Align the socket connector of the cable and the plug connector of the manifold.
  Insert the socket connector of the cable into the plug connector of the manifold vertically. If the connector is pushed forcibly, the pin will bend and the connector cannot be joined.

Example) D-sub connector

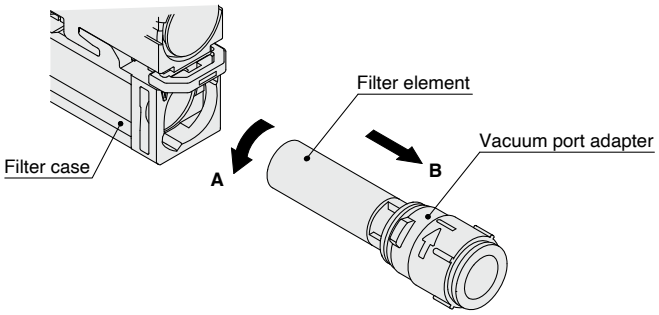


Replacement Procedure

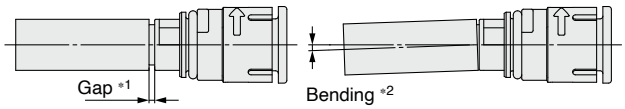
⚠Caution

1. Replacement Procedure for Filter Element

1) To pull out the vacuum port adapter, rotate the adapter by about 90 degrees in direction A and pull in direction B. The adapter can be removed with the suction filter from the filter case.
2) Remove the suction filter from the vacuum port adapter and replace it with a new suction filter.

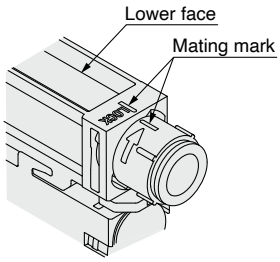


3) When installing the filter, insert the filter to the end so that there is no gap*1 or bending*2 between the filter and the vacuum port adapter. The gap or bending will cause the element to deform inside the case.

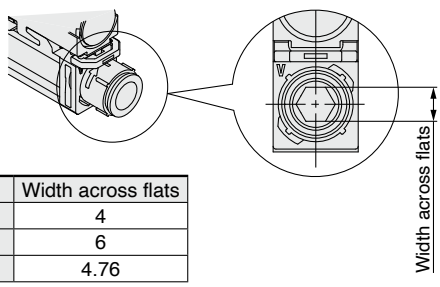


4) Put the filter back into the filter case following this procedure in reverse.

- To mount the vacuum port adapter into the filter case, turn the adapter so that the mating mark of the adapter and the case are aligned. (Rotation stops there.)



- If it is difficult to remove the vacuum port adapter, you can remove the adapter with a hexagon wrench using the hexagonal hole in V port. The table shows the port size and the width across flats.



V port size	Width across flats
Ø 6	4
Ø 8, Ø 5/16"	6
Ø 1/4"	4.76

Specific Product Precautions 3

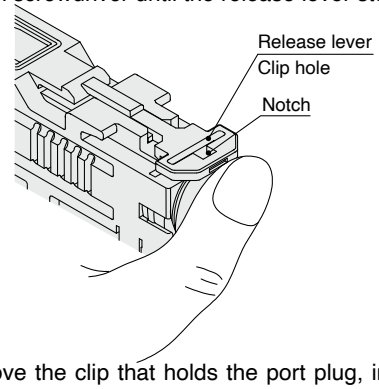
Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smc.eu

Replacement Procedure

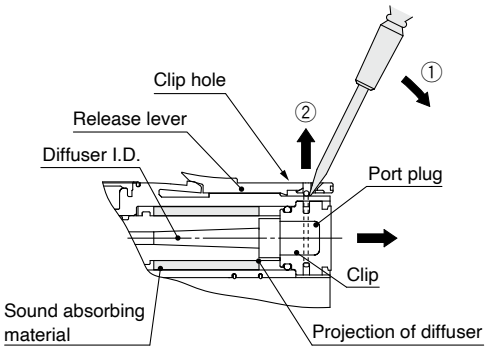
⚠Caution

2. Replacement Procedure for Sound Absorbing Material (for Silencer Exhaust)

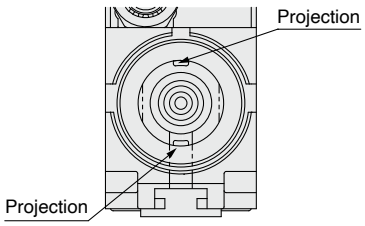
1) Remove the filter case following the procedure of filter case maintenance (page 93).
2) Flip the ejector, push the release lever again with a finger or precision screwdriver until the release lever stops.



3) To remove the clip that holds the port plug, insert a precision screwdriver from the release lever notch. Move the screwdriver in direction (①) to pull out the clip in direction (②).



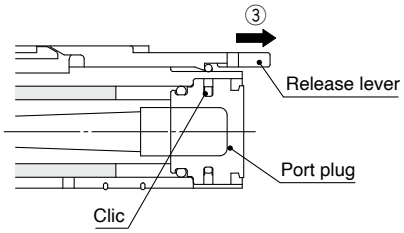
4) Remove the port plug.
5) Remove the sound absorbing material from the slit (hole) at the side of the body by using a precision screwdriver.
6) Insert the new sound absorbing material. Be careful not to scratch the material with the projection of the diffuser assembly.



(Procedure to put parts back together)

7) Insert the port plug and insert the clip into the groove using the lever hole. (Push completely to the end.)
   * Do not pull or bend the two projections at the end surface of the diffuser. These are spacers to prevent the displacement of the diffuser and they may break if force is applied.

8) Return the release lever in direction of ③ until it stops.



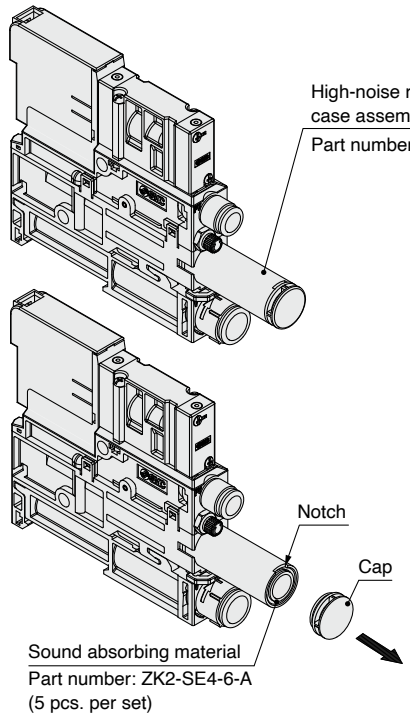
3. Replacement Procedure for High-noise Reduction Silencer Assembly

Refer to the replacement procedure of the sound absorbing material (silencer exhaust) to replace the assembly.

* When a high-noise reduction silencer assembly is attached to body type "A" (silencer exhaust) or body type "C" (complex exhaust), the silencing effect cannot be acquired.

When only replacing the sound absorbing material (for high-noise reduction silencer exhaust)

1) Use the notch to remove the cap.
2) Use a precision screwdriver to remove the sound absorbing material.
3) Insert the new sound absorbing material, and return the cap.



4. Replacement Procedure for Manifold Sound Absorbing Material

Replacement Procedure

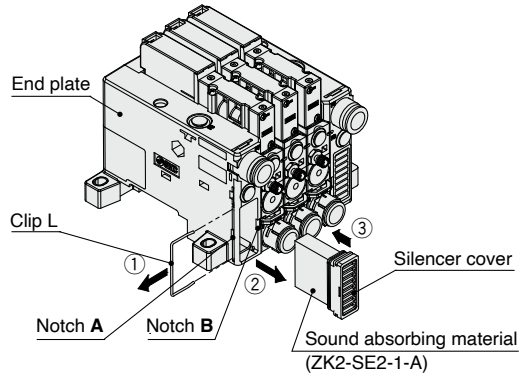
1) Insert a precision screwdriver to notch **A** of the end plate and remove a clip L ①.
2) Insert a precision screwdriver to notch **B** and remove the silencer cover ②.
3) Pull out the sound absorbing material from the silencer cover ③.
4) Mounting of a new sound absorbing material should be performed by following the removal procedure in reverse.

Specific Product Precautions 4

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smc.eu

Replacement Procedure

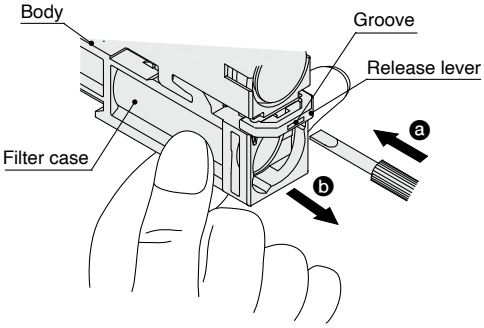
⚠Caution

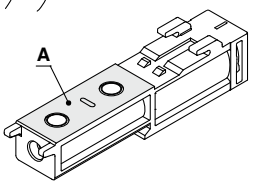


- Ejector system manifold common exhaust type has a sound absorbing material in the end plate. If the sound absorbing material is clogged, ejector performance is deteriorated, leading to suction failure or response delay. Regular replacement of the sound absorbing material is recommended.

5. Filter case maintenance

1) When the filter case is dirty, it can be removed and cleaned. To remove the filter case, insert a precision screwdriver into the groove of the release lever and push in direction (ⓐ), and slide the filter case in direction (ⓑ).





∗ Surface A of the filter case is the sealing surface when vacuum is generated. Handle with care so that the surface is not scratched or damaged.

∗ Filter case is made of polycarbonate. Avoid chemicals such as thinner, carbon tetrachloride, chloroform, acetic ester, aniline, cyclohexane, trichloroethylene, sulfuric acid, lactic acid, water base cutting fluid (alkaline).

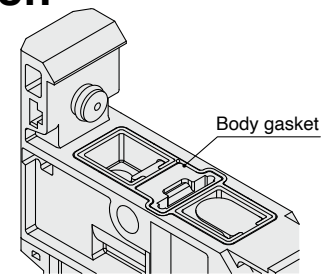
∗ Do not expose the filter case to direct sunlight for a long period of time.

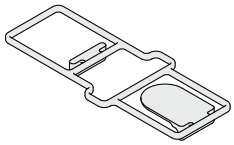
(Procedure to put parts back together)

2) Make sure that the body gasket that matches the product specifications is installed correctly onto the ejector. If they are out of the place, vacuum leakage may occur.

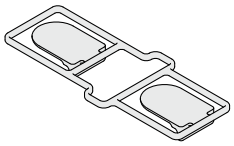
Replacement Procedure

⚠Caution





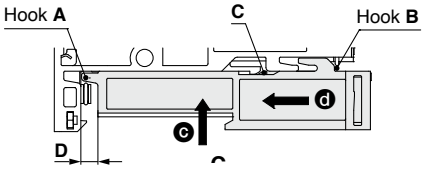
One check valve type
(All specifications other than switch with energy saving function and exhaust interference prevention valve)



Two check valve type
(Switch with energy saving function and exhaust interference prevention valve)

3) Push the filter case in direction (ⓒ). Be careful the filter case hook (**A**) and hook (**B**) do not touch the body of the ejector.

4) Slide the filter case in direction (ⓓ) while pushing the filter case gently in contact with the ejector. Make sure that the clip (**C**) is locked and there is no gap in part (**D**).



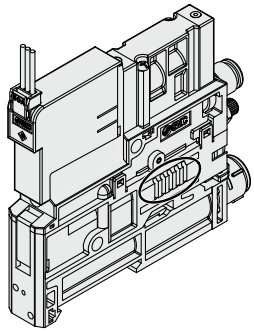
∗ If excess force is applied to the filter case, hook A and B may break. Handle with care.

Ejector Exhaust / Exhaust Noise

⚠Caution

■Ejector Exhaust

- The exhaust resistance should be as small as possible to obtain the full ejector performance. There should be no shield around the exhaust slit for silencer exhaust type. When the product is installed, one of the exhaust slits should be open to atmosphere.



Specific Product Precautions 5

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smc.eu

Ejector Exhaust / Exhaust Noise

⚠Caution

For the port exhaust specification, back pressure may increase and vacuum pressure may decrease depending on the size and length of the piping connected to the exhaust (EXH) port *1).
Ensure that the back pressure does not exceed 0.005 MPa (5 kPa). Do not operate the ejector or apply pressure to the exhaust port with the exhaust port closed. This increases the pressure in the product and can damage the vacuum ejector.

*1 For the nozzle products with a nozzle diameter for a large amount of exhaust air (air consumption + suction flow), such as Ø 1.5 (ZK2□15), precaution should be taken on vacuum pressure decrease. Figure A below shows the relation between the exhaust piping (piping diameter and length) and vacuum pressure When connecting pipes on port exhaust types with an outer diameter of Ø 8 or more, connect them so that the joints do not interfere with each other (Fig. B).

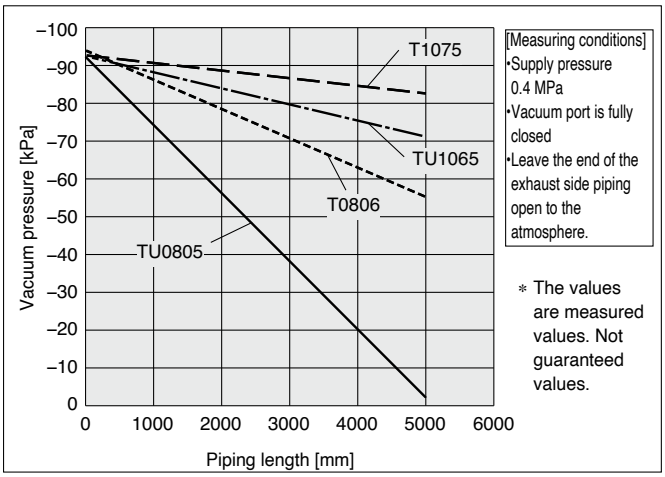


Fig. A. Vacuum pressure for piping (ZK2□15)

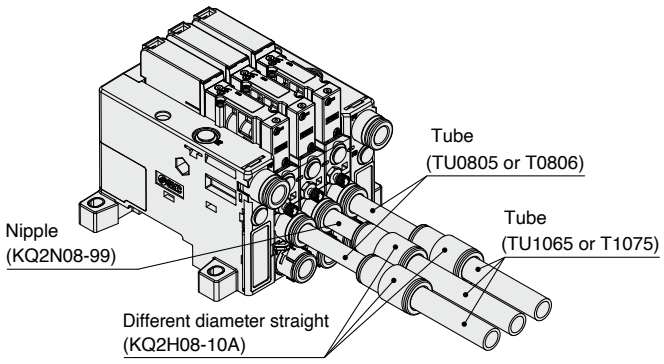


Fig. B Example of piping

- If the sound absorbing material is clogged, it will cause a reduction in the ejector performance.

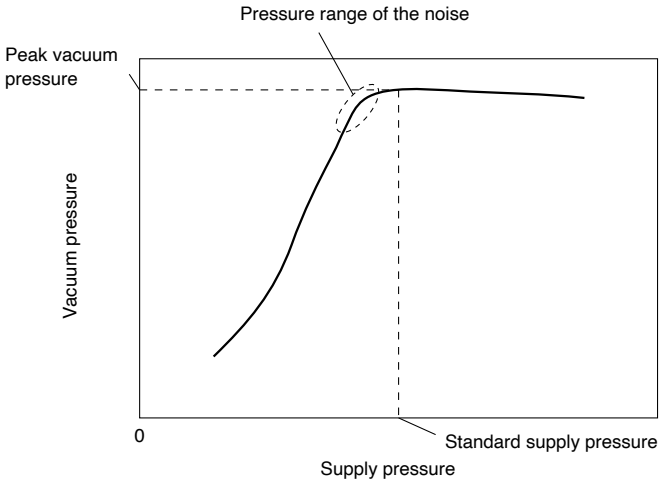
  Sometimes, if the operating environment contains a lot of particles or mist, the replacement of the filter element only is not enough to recover vacuum performance - as the sound absorbing material may be clogged. Replace the sound absorbing material. (Regular replacement of the filter element and the sound absorbing material is recommended.)

Ejector Exhaust / Exhaust Noise

⚠Caution

■ Exhaust Noise

- When vacuum ejector generates vacuum, noise can be heard from the exhaust port when the standard supply pressure is close to the pressure that generates peak vacuum pressure making vacuum pressure unstable. If the vacuum pressure range is adequate for adsorption, there should not be a problem. If the noise causes a problem or affects the setting of the pressure switch, change the supply pressure slightly to avoid the pressure range of the noise.



Operating Supply Pressure

⚠Caution

- Use the product within the specified supply pressure range. Operation over the max. operating pressure can cause damage to the product.

  The parts around the vacuum port of this product are designed to be used with vacuum pressure. With the vacuum pump system, since air is not released to the atmosphere from a silencer, the applied air for vacuum release increases the internal pressure of the vacuum port. Select the vacuum pad which shape allows smooth exhaust of release air to the atmosphere and avoid clogging. (When the internal pressure rises, try to keep the pressure at 0.1 MPa or less.)

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Specific Product Precautions 6

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smc.eu

Port Size

⚠Caution

■Single Unit

- The sizes of the each port are as follows. (Refer to the Application and Operating Pressure Range of Each Port on page 28.)

Port	Size			
	Ejector system		Vacuum pump system	
	Metric	Inch	Metric	Inch
PV	Ø 6	Ø 1/4"	Ø 6	Ø 1/4"
V	Ø 6, Ø 8	Ø 1/4", Ø 5/16"	Ø 6, Ø 8	Ø 1/4", Ø 5/16"
EXH (Port exhaust)	Ø 8	Ø 5/16"	—	—
PE	EXH Common		Port open to atmosphere ∗1	
PS	—	—	Ø 4	Ø 5/32"
PD ∗2	M3	—	M3	—

—: Not applicable

∗1 Air is also exhausted from the pilot valve when the valve type is R. Piping for PE port is available as an option (M3). (Refer to pages 23 to 26.)

∗2 A model with PD port is available as an option. (Refer to pages 12 to 14, 23, and 24.)

■Manifold

- Manifold ports are common at the end plate. Port description and application are the same as the single unit. (Refer to the Application and Operating Pressure Range of Each Port on page 28.)
- Refer to page 29 for the number of stations that can operate simultaneously for each ejector size.
- If one side is not used for air supply, plug the unused port or change to the dedicated port plug assembly as shown below.

	Standard	Port plug assembly
Common PV port	Ø 8 One-touch fitting	VVQZ2000-CP
Common PS port	Ø 6 One-touch fitting	ZK2-MP1C6-A
Common PD port		

∗ There are 4 types of port combination due to the manifold port specification.

	Common EXH port	Common PS/PD ports	Application
ZZK2□A-A□1□	Yes	PS = PD	Ejector common exhaust PV = PS = PD
ZZK2□A-A□1□-D	Yes	PS ≠ PD	Ejector common exhaust PV = PS ≠ PD
ZZK2□A-A□2□ ZZK2□A-P2□	None	PS = PD	Ejector individual exhaust PV = PS = PD
			Vacuum pump system PV ≠ PS = PD
ZZK2□A-A□2□-D ZZK2□A-P2□-D	None	PS ≠ PD	Ejector individual exhaust PV = PS ≠ PD
			Vacuum pump system PV ≠ PS ≠ PD

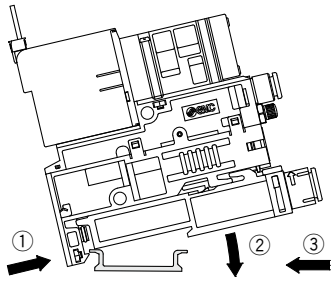
- When PS = PD, the common PS/PD ports on the end plate are used, PS port is equipped with One-touch fitting and PD port is plugged at the time of shipment from the factory. Since the PS and PD are connected inside the end plate, common supply location can be changed by exchanging the One-touch fitting and the plug.
- When PS ≠ PD, PS and PD are not connected inside the end plate. (It is necessary to supply each port individually.)

How to Mount a Single Unit

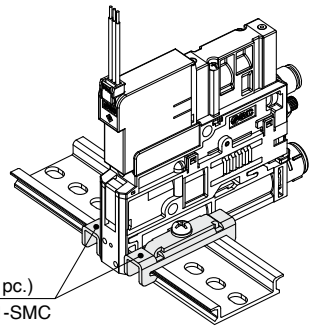
⚠Caution

1. Single unit can be mounted to DIN rail or wall using the holes in the body (2 x Ø 4.5).

- When mounting the ejector to DIN rail, unlock the filter case assembly beforehand. (Refer to the maintenance procedure on page 93.)
- Hook the ejector onto the DIN rail from direction (①).
- Mount the ejector onto the DIN rail by pushing it down in direction (②).
- Push the filter case assembly in direction (③) until it is locked.

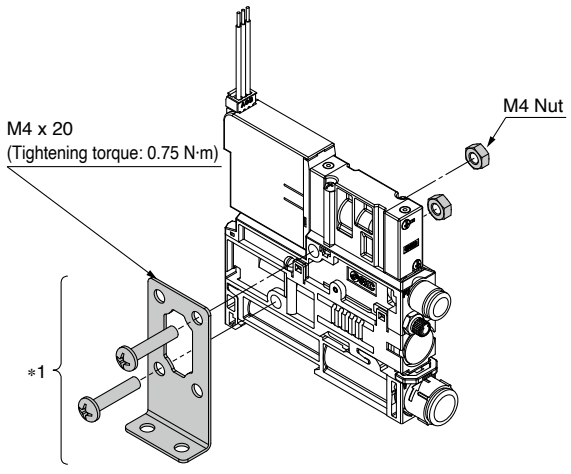


- To hold the ejector onto the DIN rail, hold it from both sides using the stopper brackets.



∗ Purchasing order is available in units of 1 piece. If using the stopper brackets on both sides of the body, order 2.

2. To mount a single unit onto the floor, use the optional bracket.



∗1 Mounting bracket for single unit (Option), [Nuts and bolts are included.]
Part number: ZK2-BK1-A

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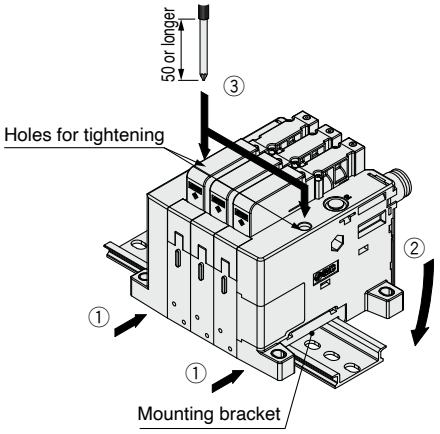
Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smc.eu

How to Mount a Manifold

⚠Caution

- Manifolds can be mounted onto the floor using M4 holes on the end plate.
- It is possible to mount the manifold onto the DIN rail by manifold option.
  - · Hook the mounting bracket of the end plate to DIN rail from direction (①).
  - · Mount the ejector onto the DIN rail by pushing it down in direction (②).
  - · Use a 5 0 mm or longer Phillips screwdriver to tighten the mounting bracket (③). (Tightening torque: 0.9 ±0.1 N·m)
  - · Removal should be performed by following the mounting procedure in reverse.



Vacuum Release Flow Adjustment Needle

⚠Caution

1. The flow rate characteristics show the representative values of the product itself.

They may change depending on piping, circuit and pressure conditions, etc. The flow rate characteristics and the number of needle rotations vary due to the range of the specifications of the product.

2. The needle has a retaining mechanism, so it will not turn further when it reaches the rotation stop position.

Turning the needle too far may cause damage.

3. Do not tighten the knob with tools such as nippers.

This can result in breakage due to idle turning.

4. Do not over tighten the lock nut.

It is possible to tighten the standard lock nut (hexagon) manually. When tightening further with tools, tighten by approximately 15° to 30°. Over tightening may cause breakage.

5. When vacuum release flow adjustment needle screwdriver operation type (-K) is selected as option, make sure the lock nut is not loose to prevent the nut from coming off due to vibration.

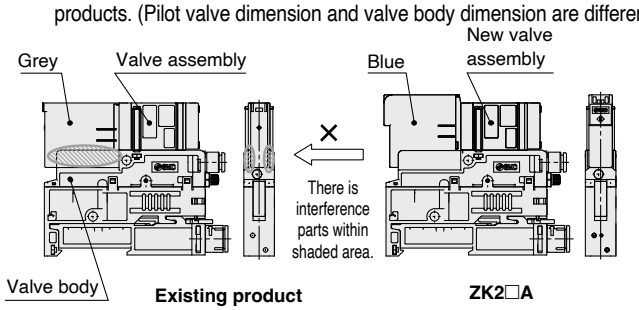
Interchangeability with Existing Product

⚠Caution

When existing product is used, please be careful with the interchangeability between existing product in the table below and ZK2□A.

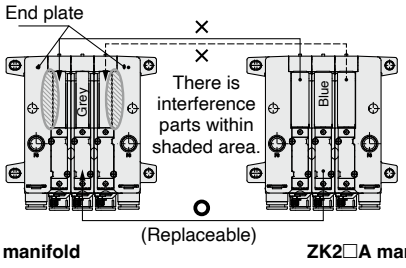
○Single Unit

- New valve assembly of ZK2□A cannot be assembled with the existing products. (Pilot valve dimension and valve body dimension are different.)



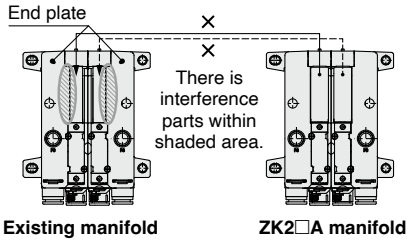
○Manifold of 3 stations or more

- Single unit of ZK2□A for manifold cannot be assembled with the existing manifold. (Pilot valve dimension and end plate dimension are different.)
  By replacing the manifold end plate assembly with the manifold end plate for ZK2□A, a single unit of ZK2□A for manifold can be assembled.
  Manifold end plate assembly number (Refer to page 48.)



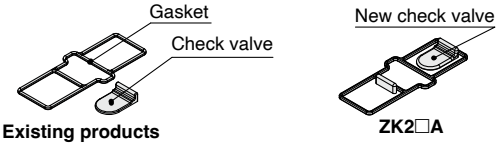
○Manifold of 1 or 2 stations

- A single unit ZK2□A for manifold cannot be assembled with the existing manifold.
  (Pilot valve dimension and end plate dimension are different.)



○Replacement of the check valve

- The check valve and the gasket are separate parts for the conventional product, but ZK2□A is not interchangeable because it is integrated.



■Trademark

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EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

ZK2□A Series
Specific Product Precautions

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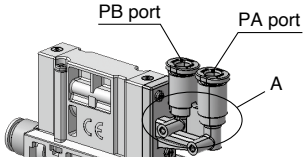
Piping

⚠Caution

1. Install a 3 -port valve, etc., on the inlet side of pilot pressure supply ports "PA" and "PB," and be sure that the product's inlet side residual pressure can be released when the valves are turned OFF. If residual pressure remains, there will be problems switching between the supply valve and the release valve.

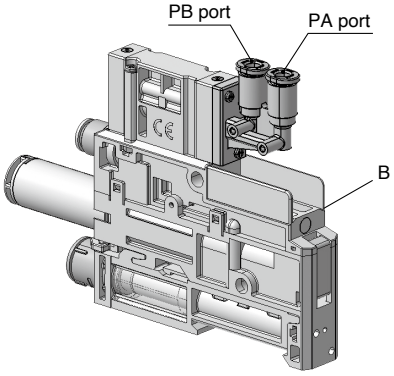
2 . When piping a tube to pilot pressure supply ports "PA" and "PB," hold the A portion of the product with your hands to prevent damage to the product.



Mounting

⚠Caution

As the release buttons of pilot pressure supply ports "PA" and "PB" are oval shaped, when wall mounting on the B surface side, be sure to adjust the release button directions before mounting.



⚠ 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.

Revision History

Edition C	- Supply valve: An N.O. specification has been added. - A Fieldbus system has been added. - An IO-Link compatible pressure switch has been added. - The number of pages has been increased from 56 to 100.	CQ

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