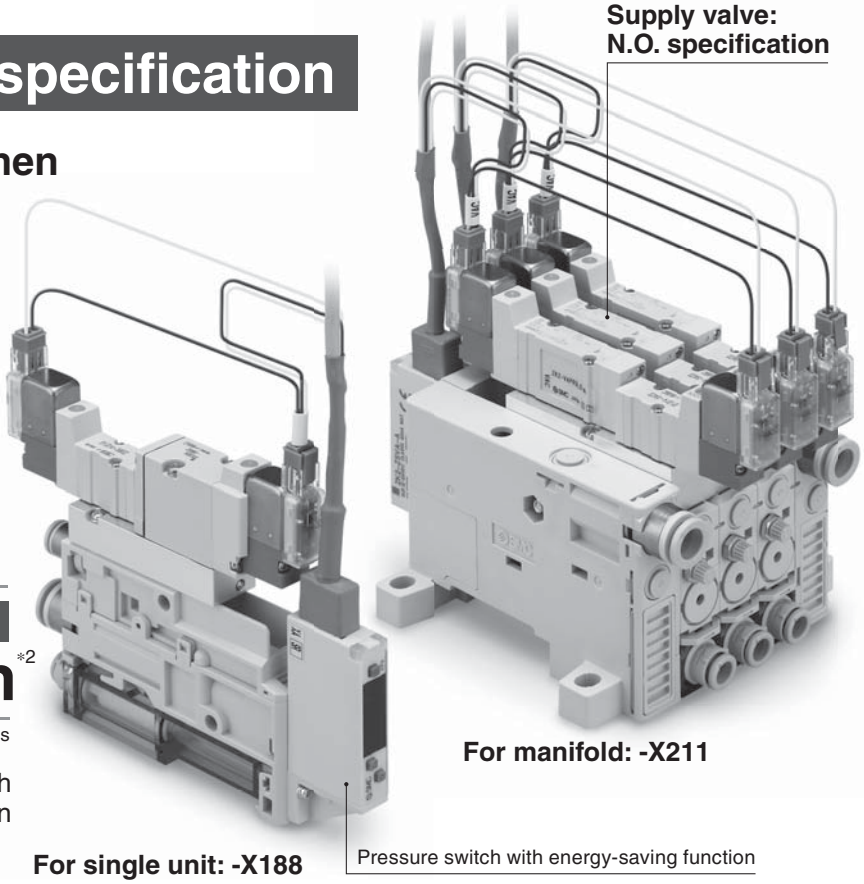
Vacuum Ejector

Supply valve: N.O. specification

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



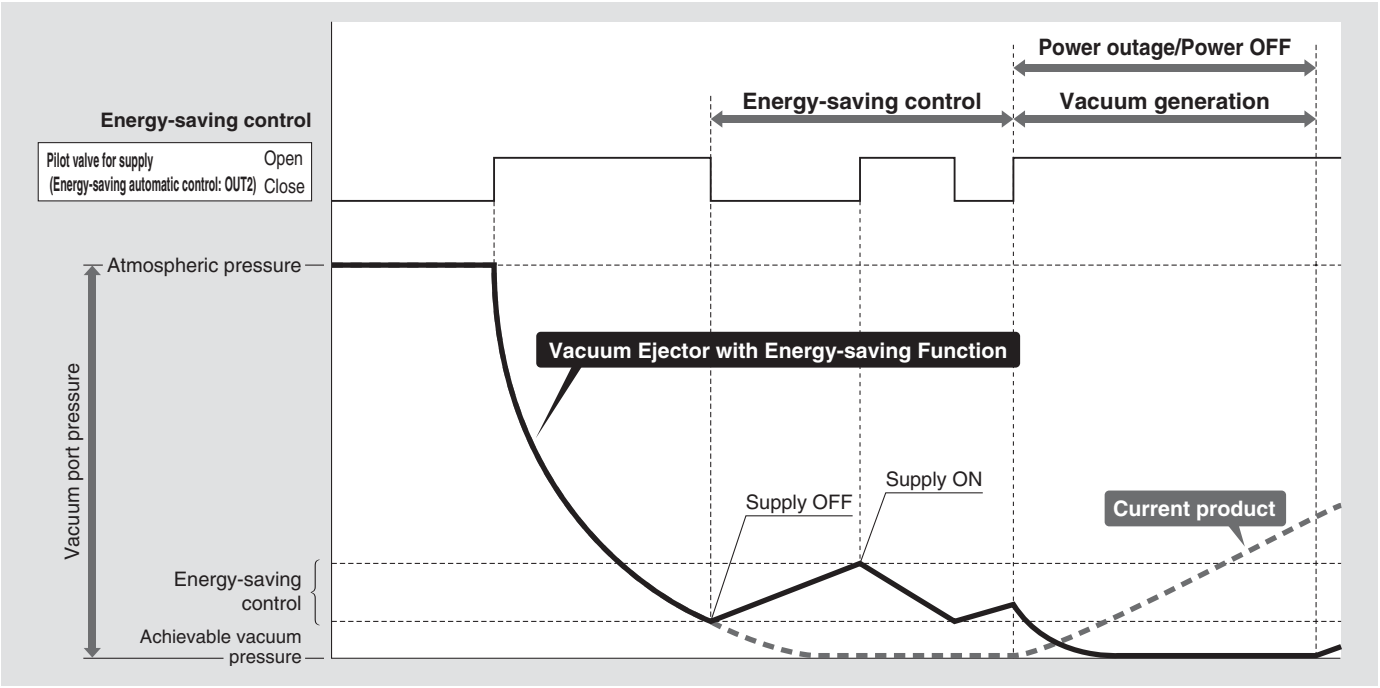
Vacuum ejector with energy-saving function

90 Air consumption % reduction*2

*2 Based on SMC's measuring conditions

The digital pressure switch for vacuum with energy-saving function cuts supply air when the pressure reaches the desired vacuum.

● Typical Operation Pattern



ZK2□-X188: For Single Unit
ZK2□-X211: For Manifold

Vacuum Ejector with Energy-saving Function

ZK2□-X188
ZK2□-X211

How to Order Single Unit

Single unit ZK2 A 12 A 5 MO Z K W – 06 – □ – X188

For manifold ZK2 C 12 A 5 MO Z K W – 06 – □ – X211

❶ ❷ ❸ ❹ ❺ ❻

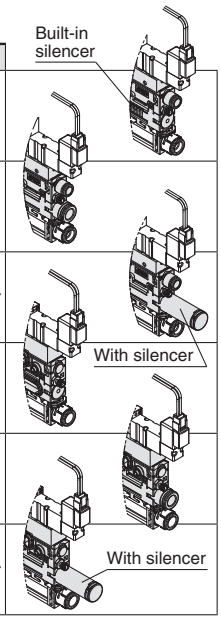
(Refer to page 2 for How to Order Manifold.)

- ❶ ❷ **Supply valve: N.O./Release valve: N.C.**
- ❸ **With light/surge voltage suppressor**
- ❹ **Rated voltage*4: 24 VDC**
- ❺ **M plug connector, Without connector**

*4 Rated voltage for the supply and release valve

❶ System/Body type

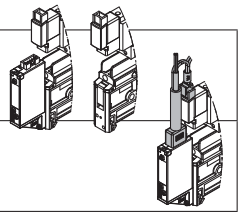
Symbol	System	Body type	Exhaust type
A	Ejector system	Single unit	Silencer exhaust
B			Port exhaust*1
G			High-noise reduction silencer exhaust
C		For manifold	Complex exhaust*2
F			Individual port exhaust*1
H			High-noise reduction silencer exhaust



*1 Port size: Ø 8 (mm), Ø 5/16" (inch)
*2 The complex exhaust method combines the common exhaust from the end plate and the direct exhaust from each station.

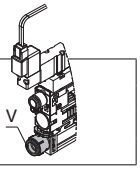
❹ Digital pressure switch for vacuum connector specifications

Symbol	Lead wire with connector for pressure switch
L3	None
W	With lead wire for switch with energy-saving function



❺ Vacuum (V) port*6

Symbol	Type	Port size
06	Metric size	Ø 6 One-touch fitting
08		Ø 8 One-touch fitting
07	Inch size	Ø 1/4" One-touch fitting
09		Ø 5/16" One-touch fitting



*6 Supply port (PV) size of single unit: Ø 6 (mm), Ø 1/4" (inch)

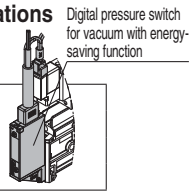
❷ Nominal nozzle size

Symbol	System	Nominal size
07	Ejector system*3	Ø 0.7
10		Ø 1.0
12		Ø 1.2
15		Ø 1.5

*3 Standard supply pressure for nozzle size
07 to 12: 0.35 MPa
15: 0.4 MPa (ZK2□-X188)
0.45 MPa (ZK2□-X211)

❸ Digital pressure switch for vacuum specifications

Symbol	Type	Pressure range [kPa]	Specifications	
K	Digital pressure switch for vacuum with energy-saving function	–100 to 100	NPN 1 output	Unit selection function
Q				SI unit only*5
R			PNP 1 output	Unit selection function
S				SI unit only*5



*5 Fixed unit: kPa

❻ Optional specifications (Single unit)*7

Symbol	Type
—	Without option
B	With one bracket for mounting a single unit (Mounting screws are attached.)
D	With individual release pressure supply (PD) port*8
E	Long lock nut specification: Screwdriver operation type*9
J	Vacuum break flow-adjusting needle: Round lock nut type
K	Vacuum break flow-adjusting needle: Screwdriver operation type

*7 When more than one option is selected, list the option symbols in alphabetical order. Example) -BJ
Refer to the **Web Catalogue** for Function/Application.
*8 Only M3 is available for the PD port size. Use a One-touch fitting or barb fitting (M-3AU-4) for piping. (O.D.: Within Ø 6.2)
*9 Combinations of "EJ," "EK," and "EJK" are not available.

❻ Optional specifications (For manifold)*10, *11

Symbol	Type
—	Without option
E	Long lock nut specification: Screwdriver operation type
J	Vacuum break flow-adjusting needle: Round lock nut type
K	Vacuum break flow-adjusting needle: Screwdriver operation type
L	Manifold individual supply specification*12
P	With common release pressure supply (PD) port*13

*10 When more than one option is selected, list the option symbols in alphabetical order. Example) -JK
*11 For ❶ System/Body type "F" or "H," when "L" is selected for ❻ Optional specifications, the vacuum break flow-adjusting needle option "E," "K," or "JK" can be additionally selected for increased workability.
*12 Select the body for the manifold. Select "-L" for the manifold type. When the common supply and individual supply are mixed, please contact SMC.
*13 When "-D" is selected as a manifold option, select option "-P" for the single unit model number.
* Combinations of "EJ," "EK," and "EJK" are not available.

How to Order Manifold

ZZK2 04 – A 1 L – □ – X211

❶ ❷ ❸ ❹

● Individual wiring specification

❶ Stations

Symbol	Stations
01	1 station
⋮	⋮
10	10 stations

❷ System (Port combination)

Symbol	System	Port	Standard
A	Ejector system	Common PV: Ø 8	Metric size
AN		Common PV: Ø 5/16"	Inch size

❸ Exhaust

Symbol	Type
1	Ejector system: Complex exhaust∗1, ∗3
2	Ejector system: Individual exhaust∗2 (Individual port exhaust, High-noise reduction silencer exhaust)

∗1 Select "C" for ❶ System/Body type for the single unit model number. Air is exhausted not only from the end plate but also from the exhaust of each station.
∗2 Select "F" or "H" for ❶ System/Body type for the single unit model number.
∗3 The complex exhaust method combines the common exhaust from the end plate and the direct exhaust from each station.

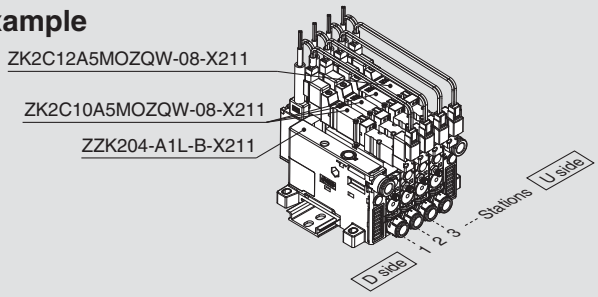
❹ Option∗4

Symbol	Type
—	Without option
B	With DIN rail mounting bracket∗5
D	With common release pressure supply (PD) port∗6
L	Manifold individual supply specification∗7

∗4 When more than one option is selected, list the option symbols in alphabetical order.
∗5 Select "-B" for DIN rail mounting.
∗6 When "-D" is selected for the manifold model number, select option "-P" for the ejector system single unit model number.
∗7 When "-L (individual supply)" is selected for ❻ Optional specifications for the single unit model number, specify "-L" for the manifold, too.
∗ A combination of "DL" is not available.

How to Order Valve Manifold Assembly

Example



ZZK204-A1L-B-X211 ····· 1 set (Manifold part number)
∗ ZK2C10A5MOZQW-08-X211 ····· 3 sets (Nominal nozzle size: Ø 1.0)
∗ ZK2C12A5MOZQW-08-X211 ····· 1 set (Nominal nozzle size: Ø 1.2)
►The asterisk denotes the symbol for the assembly. Prefix to the single unit part number.

· When the manifold is viewed from the 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.
· The DIN rail should be ordered separately. (Refer to the ZK2 series in the **Web Catalogue**.)
∗ Some of the units can be replaced by single units for the standard manifold. (Note that single units for manifold ZK2□-X211 cannot be used for the standard manifold.)

Valve Specifications

	Supply valve		Release valve
	ZK2□-X188	**ZK2□-X211**	
Solenoid valve model	SYJ524-5MOZ-Q	SYJ325-5MOZ-Q	SYJ314-5MOZ-Q
Type of actuation	N.O.		N.C.
Operating pressure range	0.15 MPa to 0.6 MPa		
Rated voltage	24 VDC		
Power consumption	0.4 W		

Ejector Specifications

Item		Model /	**ZK2□07-X188 / ZK2□07-X211**	**ZK2□10-X188 / ZK2□10-X211**	**ZK2□12-X188 / ZK2□12-X211**	**ZK2□15-X188 / ZK2□15-X211**
Nozzle diameter		**[mm]**	0.7	1.0	1.2	1.5
Max. suction flow∗1	**Port exhaust**	**[l/min (ANR)]**	34	56	74	89
	Silencer exhaust/Complex exhaust	**[l/min (ANR)]**	29	44	61	67
	High-noise reduction silencer exhaust	**[l/min (ANR)]**	34	56	72	83
Air consumption∗1		**[l/min (ANR)]**	24	40	58	90
Maximum vacuum pressure∗1		**[kPa]**	–91			
Supply pressure range		**[MPa]**	0.15 to 0.6			
Standard supply pressure		**[MPa]**	0.35			0.4 (For X188) / 0.45 (For X211)

∗1 Values are based on SMC's measurement standards. They depend on atmospheric pressure (weather, altitude, etc.) and the measurement method.

Manifold Weight

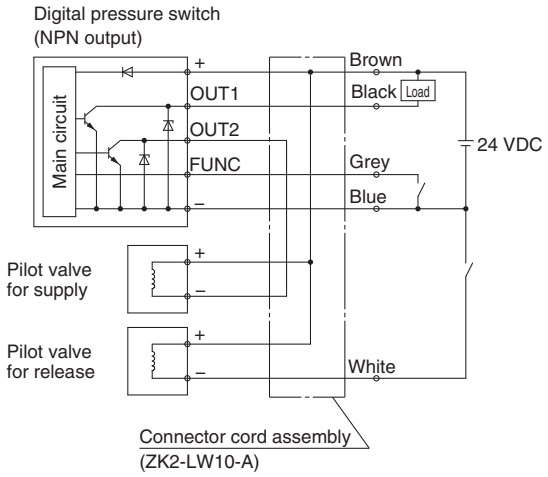
	1 station	2 stations	3 stations	4 stations	5 stations	6 stations	7 stations	8 stations	9 stations	10 stations
Weight [g]	345	560	780	1000	1215	1435	1650	1875	2100	2320

Single unit weight: 200 g (With vacuum pressure switch)

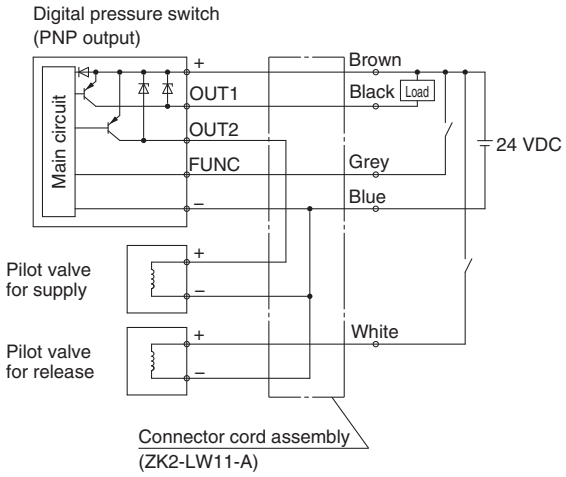
Specifications not listed are the same as those of the standard product. For details, refer to the **Web Catalogue**.

Wiring Examples

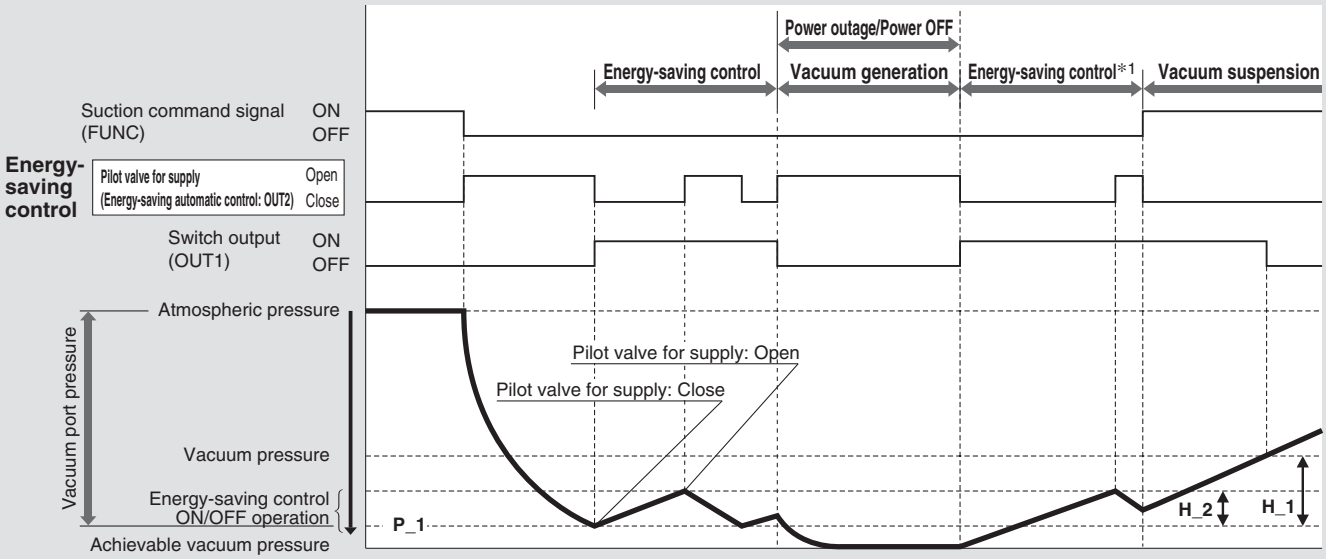
For digital pressure switch for vacuum specifications: K, Q



For digital pressure switch for vacuum specifications: R, S



Timing Chart (Typical operation pattern)



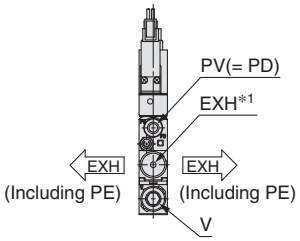
*1 A minute after the power supply is turned on again, the energy-saving control and the switch's output (OUT1) are initiated.

Port Layout

-X188

Port layout no. 1

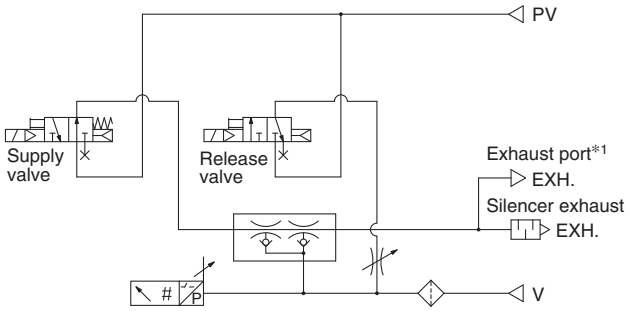
Single unit: ZK2A□A5MOZ□□-□-□-X188



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

Port combination: PV = PD

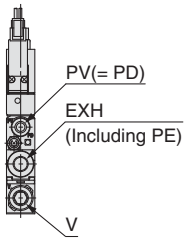
Circuit example



*1 Nozzle size: 12, 15

Port layout no. 2

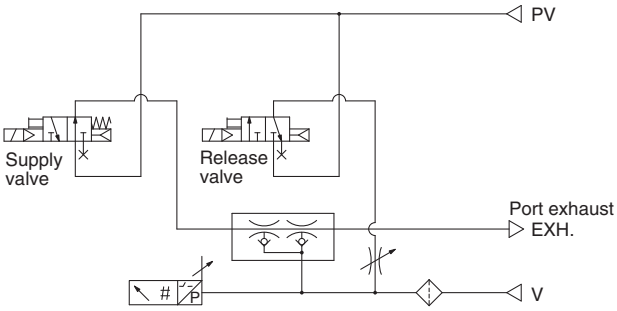
Single unit: ZK2B□A5MOZ□□-□-□-X188



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

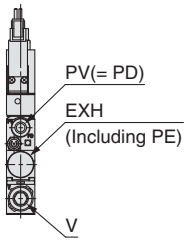
Port combination: PV = PD

Circuit example



Port layout no. 3

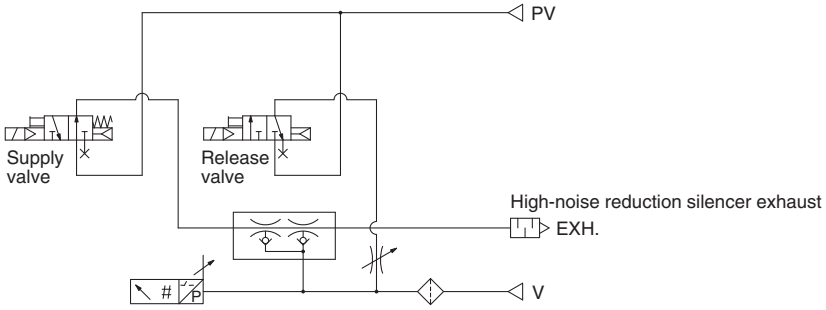
Single unit: ZK2G□A5MOZ□□-□-□-X188



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

Port combination: PV = PD

Circuit example

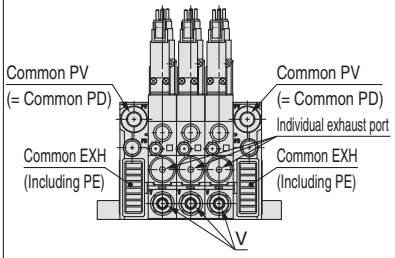


Port Layout

-X211

Port layout no. 4

Single unit: ZK2C□A5MOZ□□-□-□-X211
Manifold: ZZK2□□-A□1L-□-X211

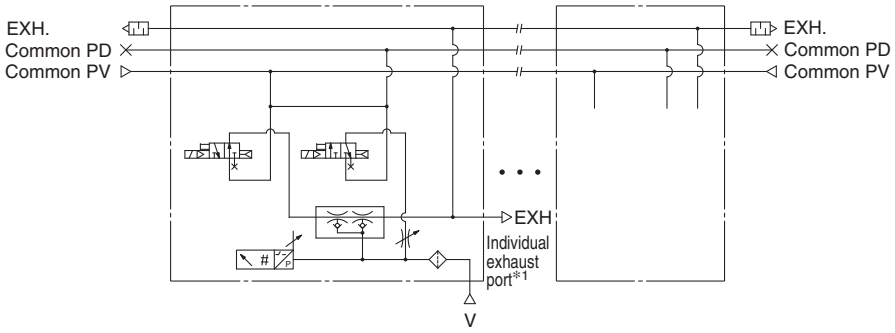


∗1 The complex exhaust method combines the common exhaust from the end plate and the direct exhaust from each station.

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

Port combination: Common PV = Common PD

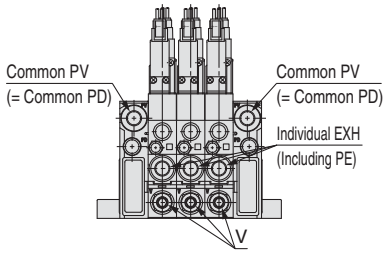
Circuit example



∗1 For the complex exhaust type, an individual exhaust port is provided to each station.

Port layout no. 5

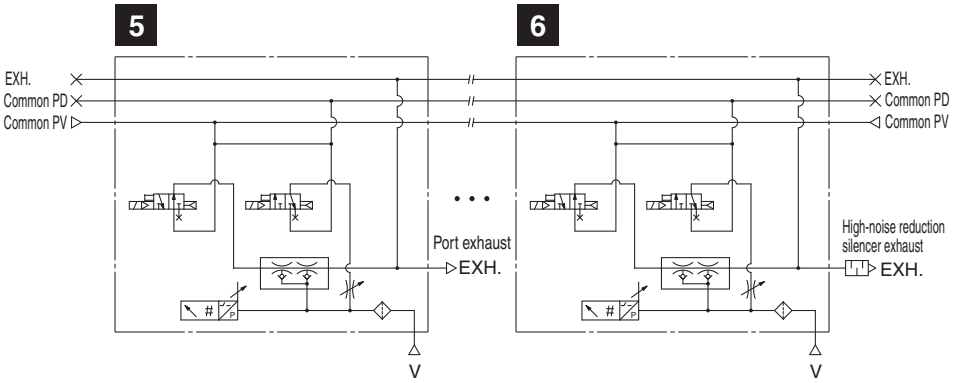
Single unit: ZK2F□A5MOZ□□-□-□-X211
Manifold: ZZK2□□-A□2L-□-X211



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

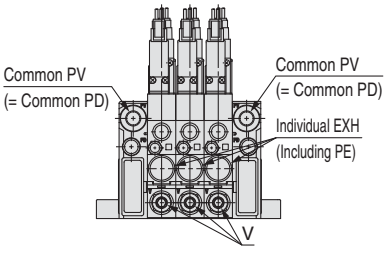
Port combination: Common PV = Common PD

Circuit example



Port layout no. 6

Single unit: ZK2H□A5MOZ□□-□-□-X211
Manifold: ZZK2□□-A□2L-□-X211



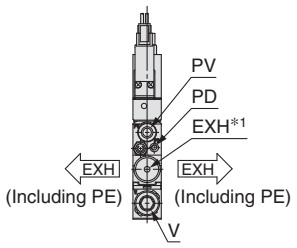
System		Ejector
Body type		Manifold
Exhaust type		High-noise reduction silencer exhaust
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	Released within the operating environment
	Release pressure	Same pressure as common PV

Port Layout

Option -D

Port layout no. 7

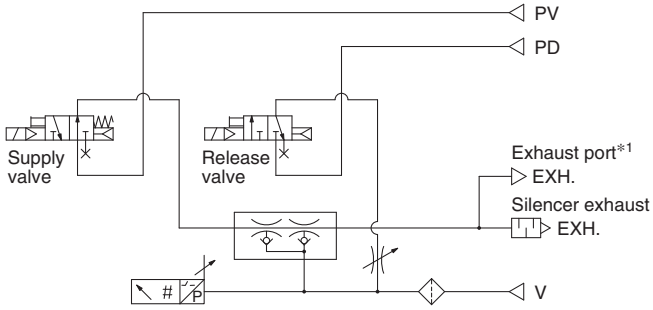
Single unit: ZK2A□A5MOZ□□-□-□D-X188



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

Port combination: PV ≠ PD

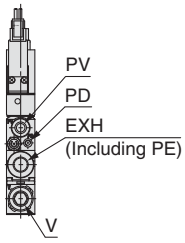
Circuit example



*1 Nozzle size: 12, 15

Port layout no. 8

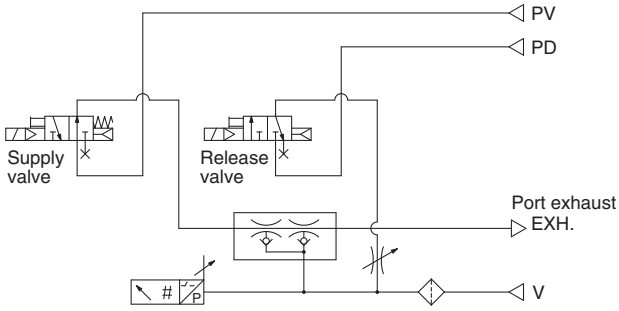
Single unit: ZK2B□A5MOZ□□-□-□D-X188



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.

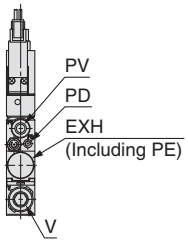
Port combination: PV ≠ PD

Circuit example



Port layout no. 9

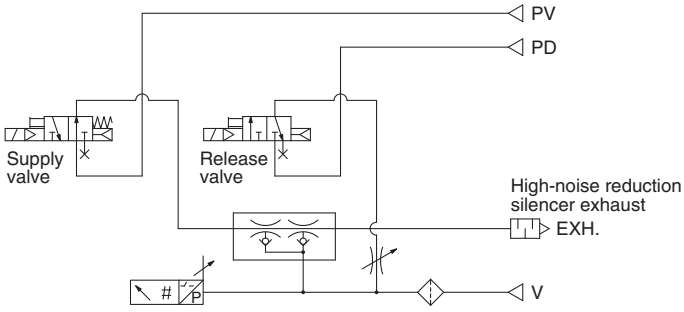
Single unit: ZK2G□A5MOZ□□-□-□D-X188



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

Port combination: PV ≠ PD

Circuit example

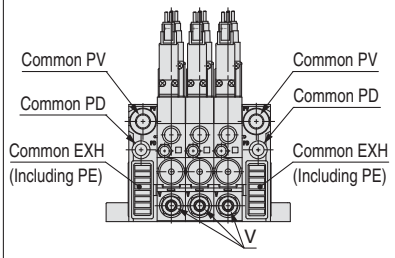


Port Layout

Option -D

Port layout no. 10

Single unit: ZK2C□A5MOZ□□-□-□P-X211
Manifold: ZZK2□□-A□1L-□D-X211

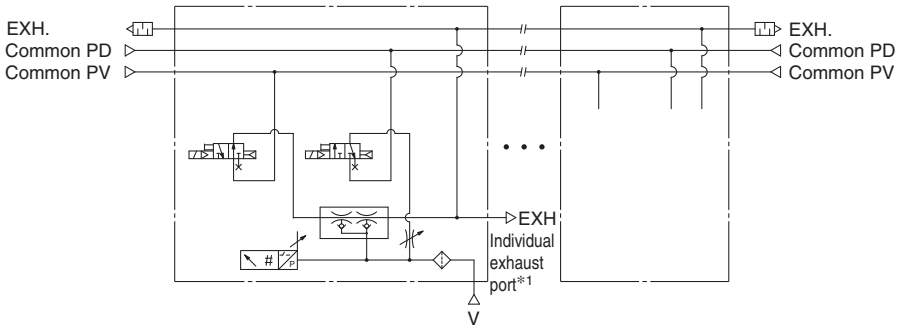


∗1 The complex exhaust method combines the common exhaust from the end plate and the direct exhaust from each station.

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

Port combination: Common PV ≠ Common PD

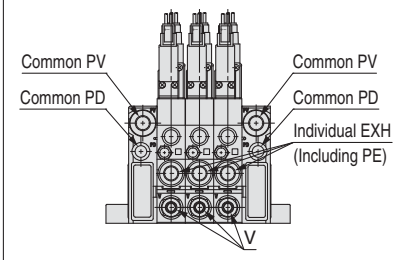
Circuit example



∗1 For the complex exhaust type, an individual exhaust port is provided to each station.

Port layout no. 11

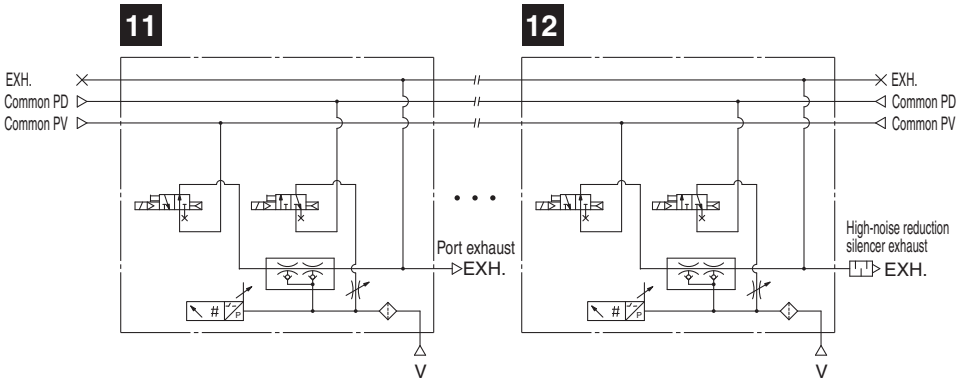
Single unit: ZK2F□A5MOZ□□-□-□P-X211
Manifold: ZZK2□□-A□2L-□D-X211



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.

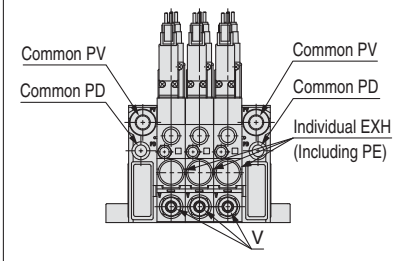
Port combination: Common PV ≠ Common PD

Circuit example



Port layout no. 12

Single unit: ZK2H□A5MOZ□□-□-□P-X211
Manifold: ZZK2□□-A□2L-□D-X211



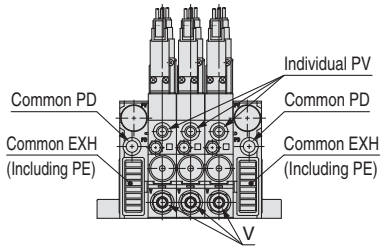
System		Ejector
Body type		Manifold
Exhaust type		High-noise reduction silencer exhaust
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	Released within the operating environment
	Release pressure	Common PD pressure has to be supplied with common PV.

Port Layout

Option -L

Port layout no. 13

Single unit: ZK2C□A5MOZ□□-□-□L-X211
Manifold: ZZK2□□-A□1L-□L-X211

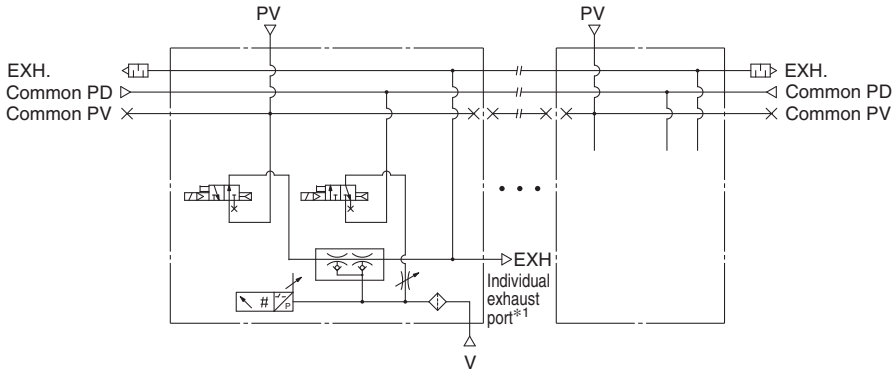


∗1 The complex exhaust method combines the common exhaust from the end plate and the direct exhaust from each station.

System		Ejector
Body type		Manifold
Exhaust type		Complex exhaust∗1
Application and purpose	Vacuum pressure	PV pressure can be changed per station.
	Exhaust	Released within the operating environment
	Release pressure	Common PD pressure has to be supplied with individual PV.

Port combination: Individual PV ≠ Common PD

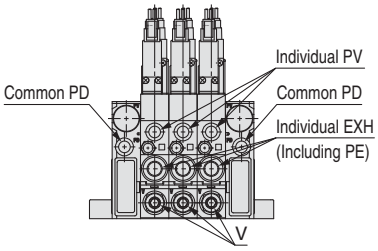
Circuit example



∗1 For the complex exhaust type, an individual exhaust port is provided to each station.

Port layout no. 14

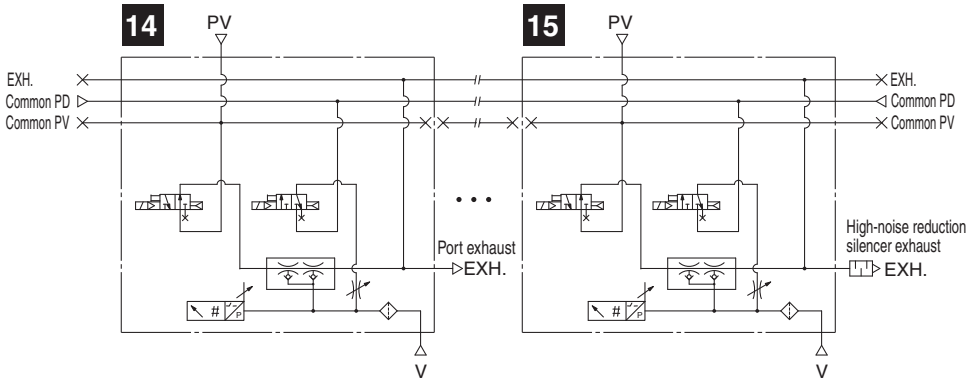
Single unit: ZK2F□A5MOZ□□-□-□L-X211
Manifold: ZZK2□□-A□2L-□L-X211



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 PD pressure has to be supplied with individual PV.

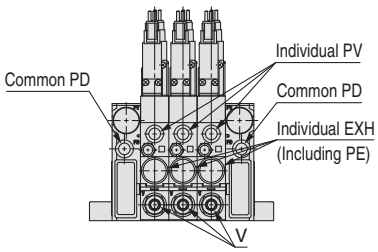
Port combination: Individual PV ≠ Common PD

Circuit example



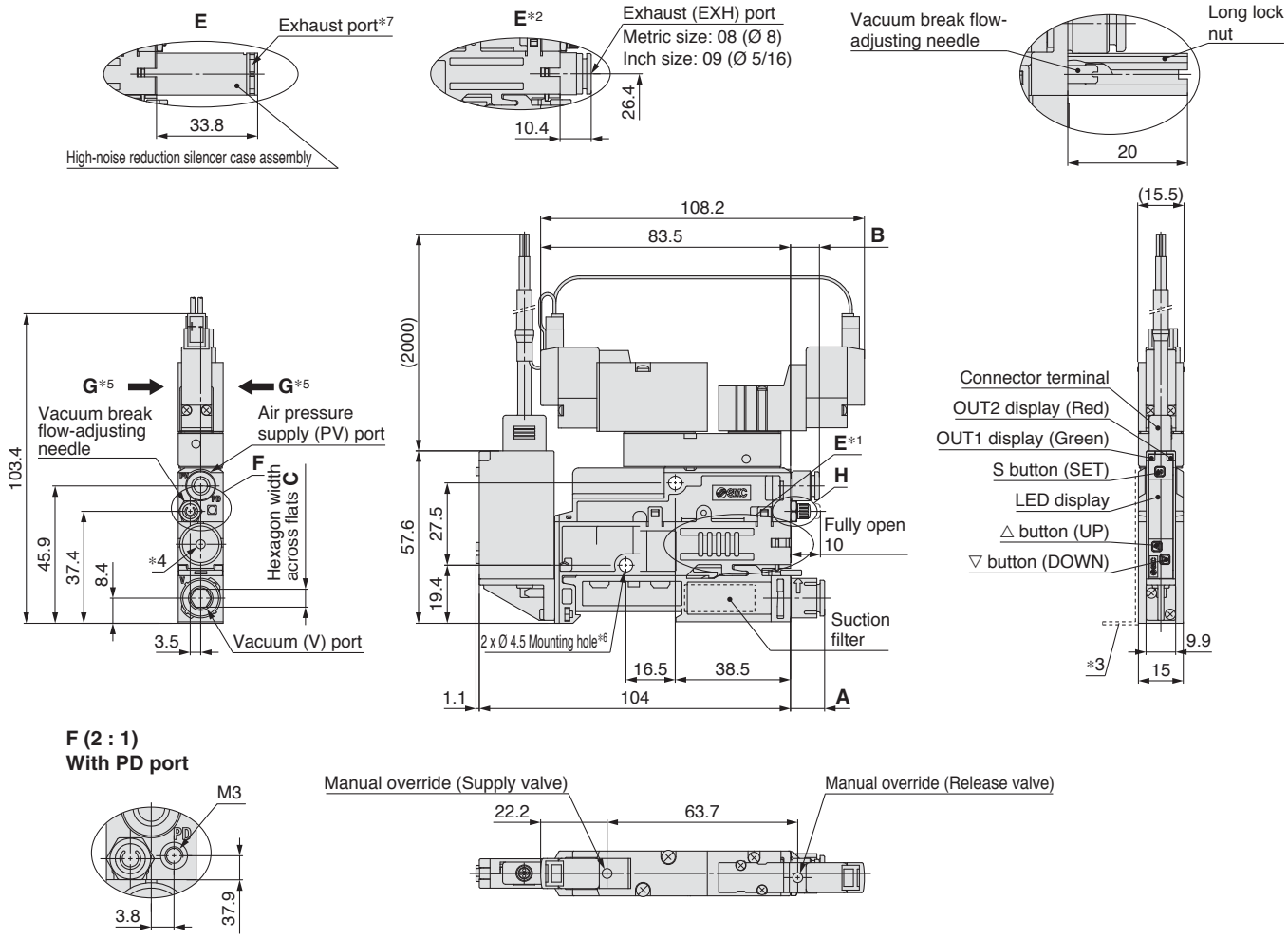
Port layout no. 15

Single unit: ZK2H□A5MOZ□□-□-□L-X211
Manifold: ZZK2□□-A□2L-□L-X211



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 within the operating environment
	Release pressure	Common PD pressure has to be supplied with individual PV.

Dimensions: Single Unit

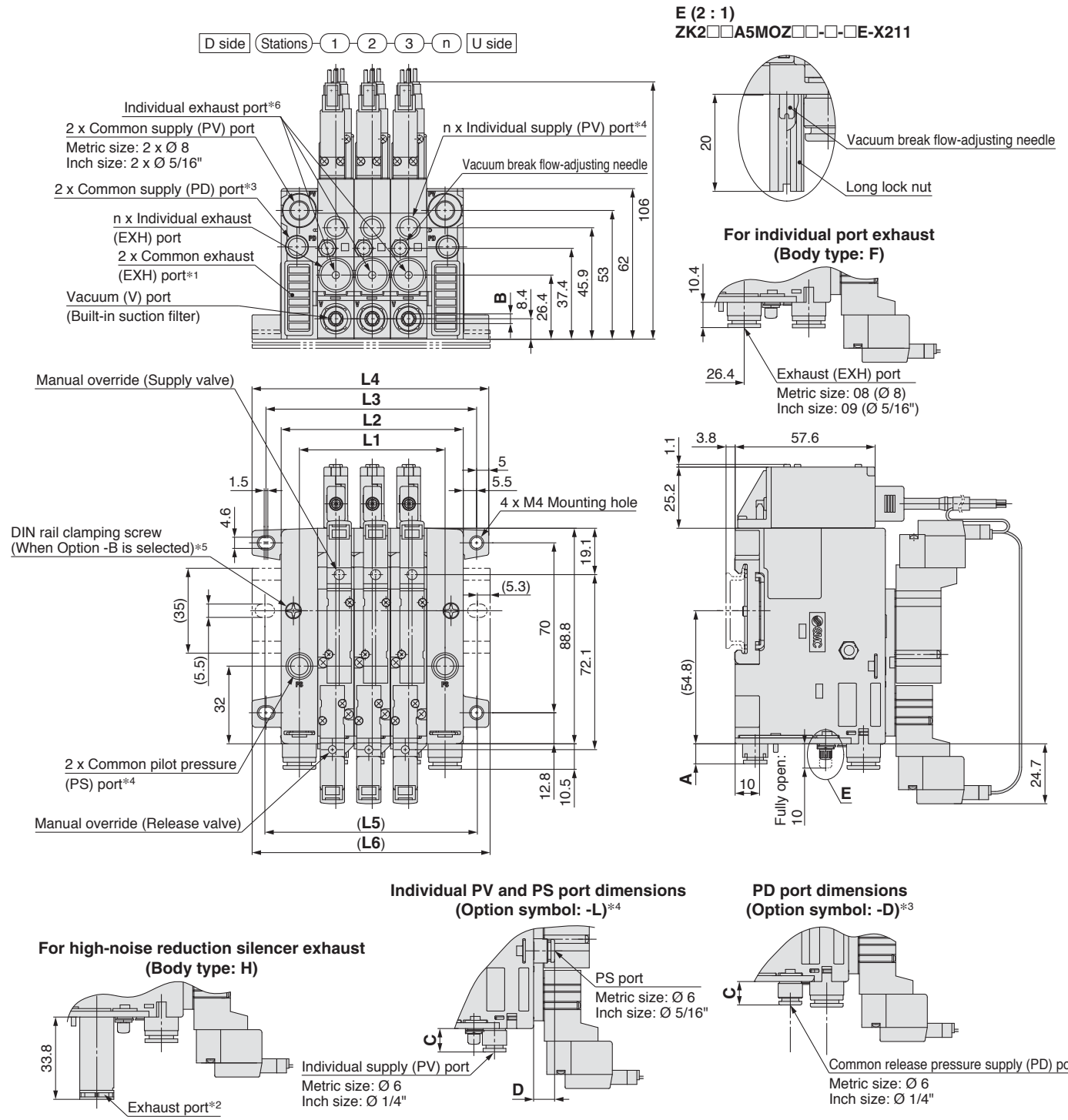


V Port Dimensions

V port type			A	B	C
Metric size	06	Ø 6	8.25	9.7	4
	08	Ø 8	11.4		6
Inch size	07	Ø 1/4"	10.8	12.3	4.76
	09	Ø 5/16"	11.4		6

*1 For the silencer exhaust type, air is exhausted from the slit on both sides. (Do not cover both sides. Allow release from at least one side.)
*2 For the port exhaust type, air is exhausted from the One-touch fitting.
*3 Refer to the **Web Catalogue** for dimensions with a mounting bracket.
*4 Nozzle sizes 12 and 15 have an exhaust port.
*5 Do not apply any external force in the directions of the arrows shown beside G.
*6 When the product is mounted by using a 2 x Ø 4.5 mounting hole, it is recommended that the M4 screw be tightened with a tightening torque of 0.73 to 0.75 N·m.
*7 Do not block the exhaust port. Otherwise, backflow of exhausted air, which can cause the failure of the product, may occur.
* These figures show the ZK2A□A5MOZ□W-□-□-X188.

Dimensions: Manifold



Port Dimensions

[mm]

V port type			A	B (Hexagon width across flats)	C	D
Metric size	06	Ø 6	8.3	4	9.7	8.7
	08	Ø 8	11.4	6		
Inch size	07	Ø 1/4"	10.8	4.76	12.3	11.3
	09	Ø 5/16"	11.4	6		

Manifold Dimensions

[mm]

Stations	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 The individual port exhaust type and high-noise reduction silencer exhaust type do not have exhaust ports.
*2 Do not block the exhaust port. Otherwise, backflow of exhausted air, which can cause the failure of the product, may occur.
*3 Only when common PD port type option (Symbol: -D) is selected (mm: Ø 6 inch: Ø 1/4")
*4 Only when the individual supply specification (Symbol: -L) is selected (mm: Ø 6 inch: Ø 1/4")
*5 To secure the manifold to the DIN rail, select an option for the manifold model number.
*6 For the complex exhaust type, air is also exhausted from the individual exhaust port of each station in addition to the common exhaust.

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