Vacuum Ejector

CE RoHS

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

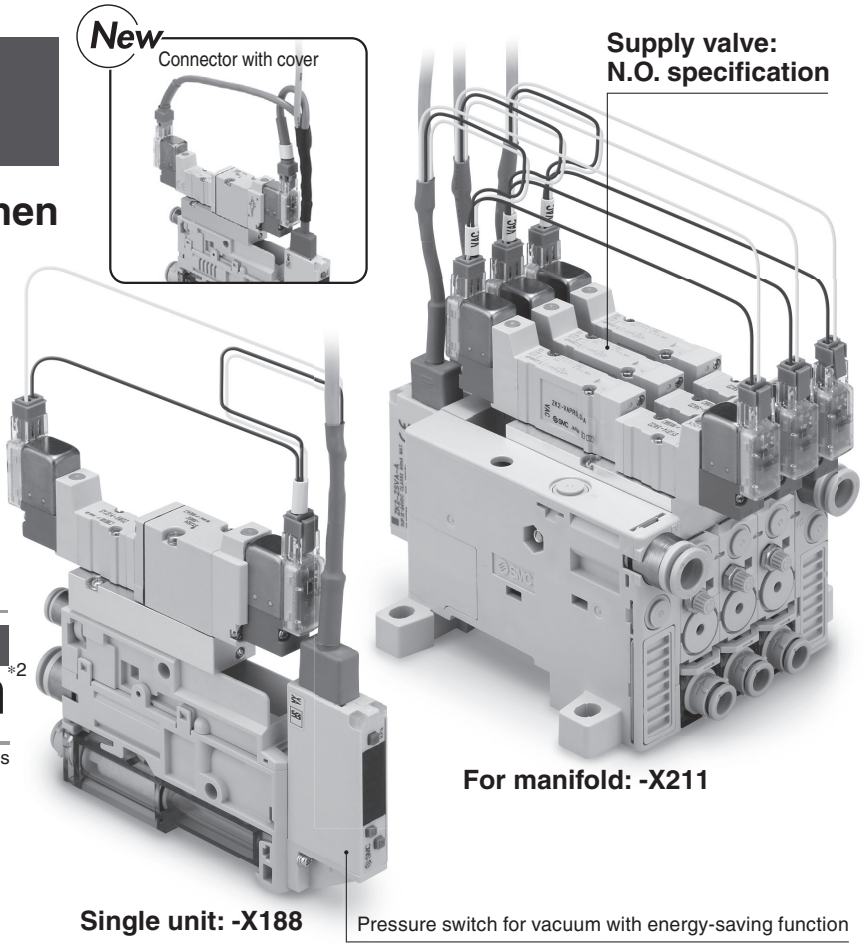
*1 Supposing the supply pressure is being maintained

Vacuum ejector with energy-saving function

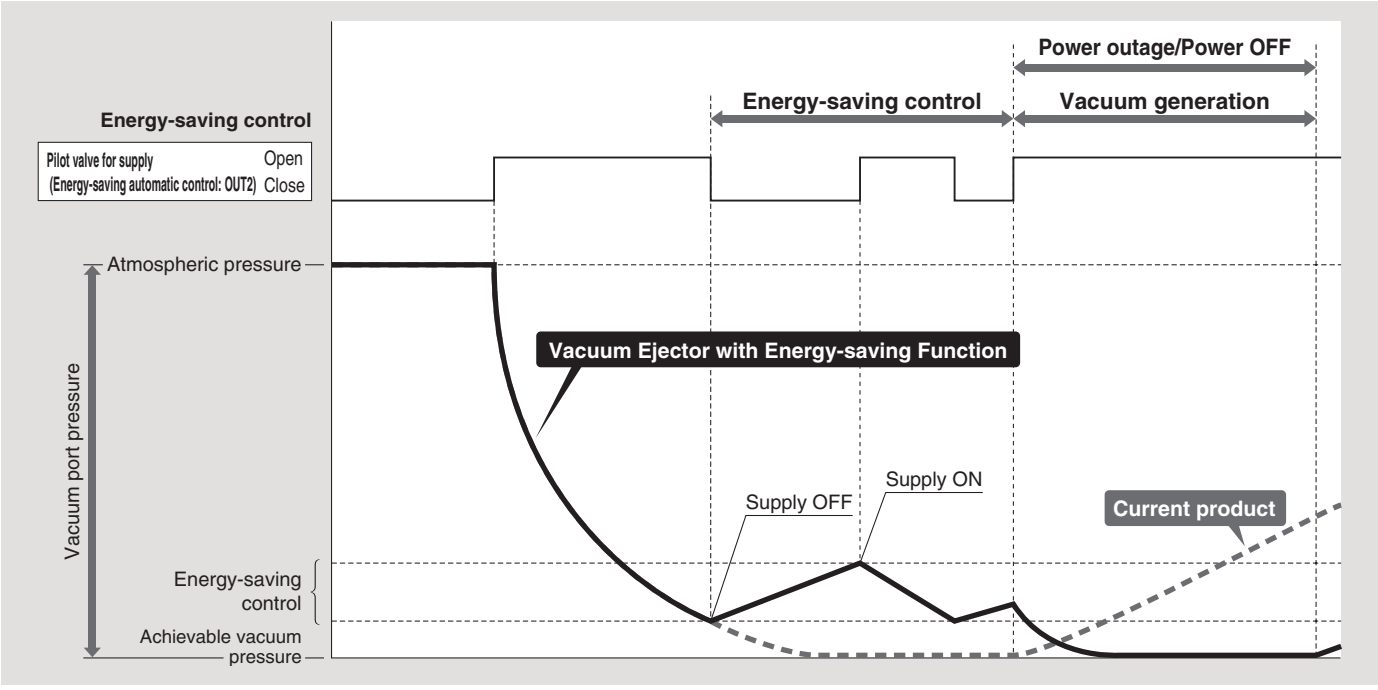
93 Air consumption % reduction*2

*2 Based on SMC's measuring conditions

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



● Typical Operation Pattern



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

SMC

Vacuum Ejector with Energy-saving Function

ZK2□A-X188
ZK2□A-X211

How to Order

Refer to page 2 for How to Order Manifold.

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

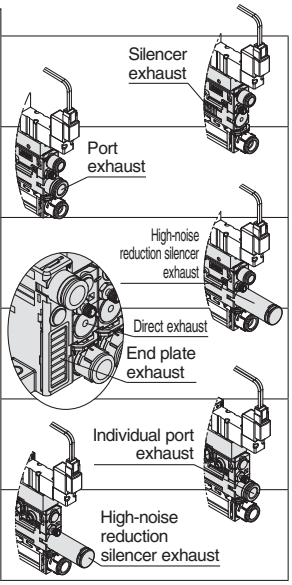
For manifold ZK2 **C** **12** **A** **5** **MO** **Z** **K** **W** A − **06** − □ − X211

❶ ❷ ❸ ❹ ❺ ❻

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

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

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

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

❸ Pressure switch for vacuum with energy-saving function

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

❹ Connector

Symbol	For pressure switch for vacuum with energy-saving function: 2 m (Lead wire with connector)
W	●
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 Optional specifications (Single unit)∗4

Symbol	Type		Note
—	Without option		—
B	Mounting bracket for single unit (nuts and bolts are included)		—
E	Vacuum break flow adjusting needle	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	
H	Connector with cover		Cannot be selected when ❹ is L3

∗4 When more than one option is selected, list the option symbols in alphabetical order.
However, for Option "H," add the symbol to the end of the model number. (Ex.: -BJH)
Refer to the **Web Catalogue** of the ZK2□A series for further details on functions and applications.

❻ Optional specifications (For manifold)∗5

Symbol	Type		Note
—	Without option		—
E	Vacuum break flow adjusting needle	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	
L	Manifold individual supply specification∗6		—
H	Connector with cover		Cannot be selected when ❹ is L3

∗5 When more than one option is selected, list the option symbols in alphabetical order.
However, for Option "H," add the symbol to the end of the model number. (Ex.: -ELH)
Refer to the **Web Catalogue** of the ZK2□A series for further details on functions and applications.
∗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.

Refer to page 1 for the ejector installed to the manifold.

How to Order Manifold

ZZK2 [04] A – [A] [1] L – [ ] – [ ] – X211

❶ ❷ ❸ ❹ ❺

● Individual wiring specification

❶ Stations

Symbol	Stations
01	1 station
⋮	⋮
10	10 stations

∗ 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 in the **Web Catalogue** fo the ZK2□A series.

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∗1	ZK2C
2	Individual exhaust	ZK2F, ZK2H

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

❹ Option∗2

Symbol	Type
—	Without option
B	With DIN rail mounting bracket∗3
L	Manifold individual supply specification∗4

∗2 When more than one option is selected, list the option symbols in alphabetical order. (Ex.: -BD)
Refer to the **Web Catalogue** of the ZK2□A series for further details on functions and applications.
∗3 The DIN rail should be ordered separately.
∗4 Be sure to select Option "L" if the Option "L" was selected for the optional specifications (for manifold) on page 1.

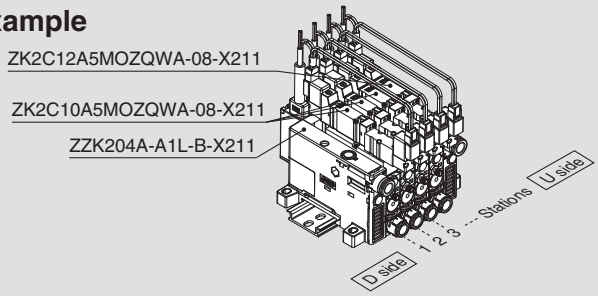
❺ Manifold Assembly (Delivery condition)

Symbol	Type
—	Individual units assembled delivered as a manifold
A	Delivered as individual parts (not assembled)∗5

∗5 Kit consists of end plates for both ends and tension bolts.

How to Order Valve Manifold Assembly

Example



ZZK204A-A1L-B-X211 ····· 1 set (Manifold part number)
∗ ZK2C10A5MOZQWA-08-X211 ····· 3 sets (Nominal nozzle size: Ø 1.0)
∗ ZK2C12A5MOZQWA-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 □A series in the **Web Catalogue**.)

Valve Specifications

	Supply valve		Release valve
	ZK2□A-X188	**ZK2□A-X211**	
Solenoid valve model∗6	SYJ524-5MOZ-Q	SY325-5MOZ-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		

∗6 For details, refer to the Web Catalogue of each model

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∗7	**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∗7		**[l/min (ANR)]**		24	40	58	90
Maximum vacuum pressure∗7		**[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)

∗7 Values are based on SMC's measurement standards. They depend on atmospheric pressure (weather, altitude, etc.) and the measurement method.

Manifold Weight

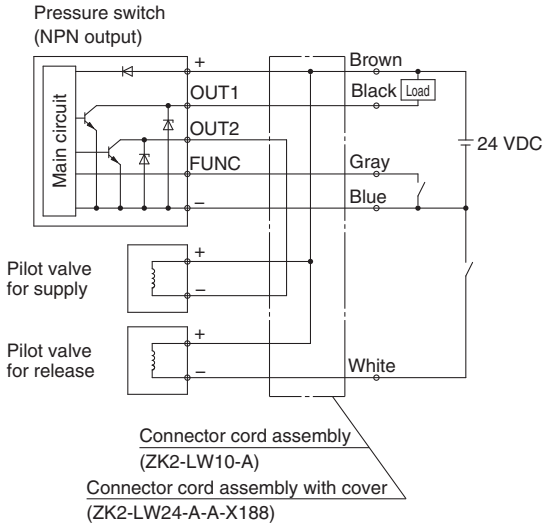
	1 station	2 stations	3 stations	4 stations	5 stations	6 stations	7 stations	8 stations	9 stations	10 stations
Weight [g]	345	560	780	1000	1215	1435	1650	1875	2100	2320

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

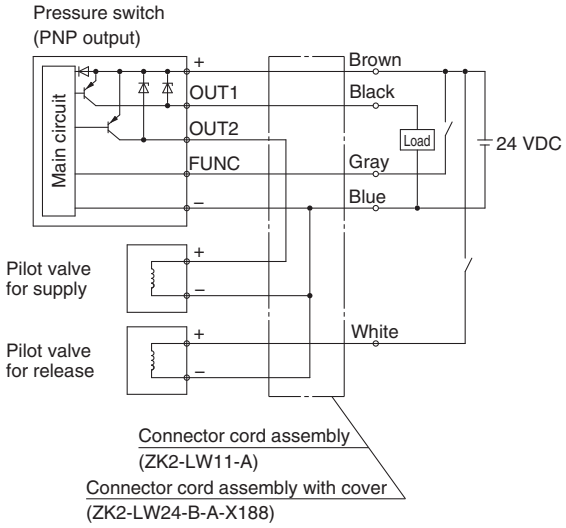
Specifications not listed are the same as those of the standard product. For details, refer to the **Web Catalogue**.

Wiring Examples

For pressure switch for vacuum with energy-saving function: K, Q (NPN specification) (ZK2-ZSVA□□□-A-X188)

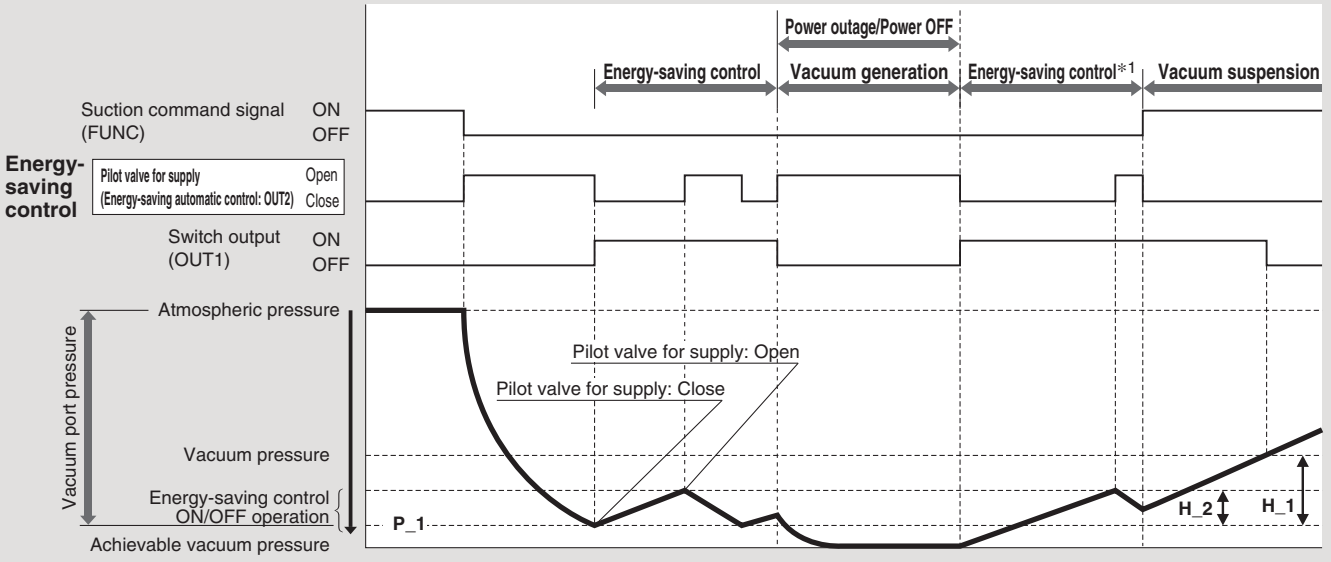


For pressure switch for vacuum with energy-saving function: R, S (PNP specification) (ZK2-ZSVB□□□-A-X188)



∗ The pressure switch for vacuum with energy-saving function and the connector cord assembly with cover are the same for both the ZK2□A-X188 and the ZK2□A-X211.

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.

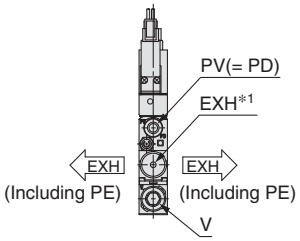
∗ For further details on the pressure switch for vacuum with energy-saving function, refer to the ZK2-ZSV□□□□-A-X188 operation manual on the SMC website.

Port Layout

-X188

Port layout no. 1

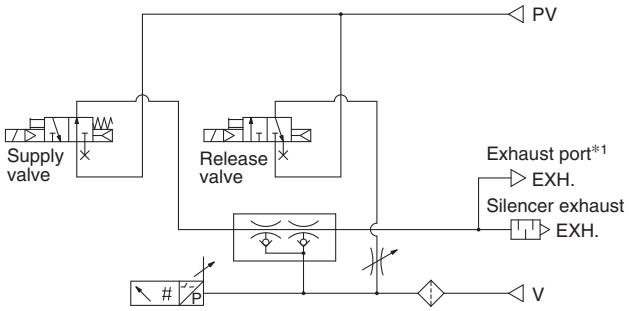
Single unit: ZK2A□A5MOZ□□A-□-□-X188



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

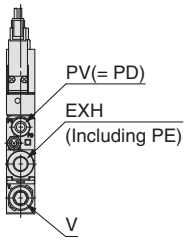
Circuit example



*1 Nozzle size: 12, 15

Port layout no. 2

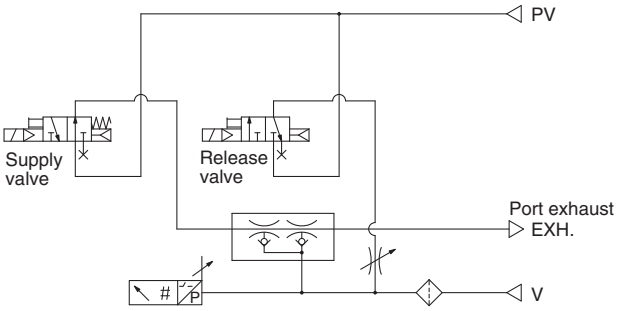
Single unit: ZK2B□A5MOZ□□A-□-□-X188



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

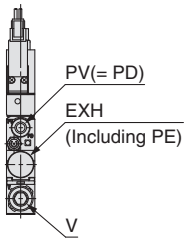
Port combination: PV = PD

Circuit example



Port layout no. 3

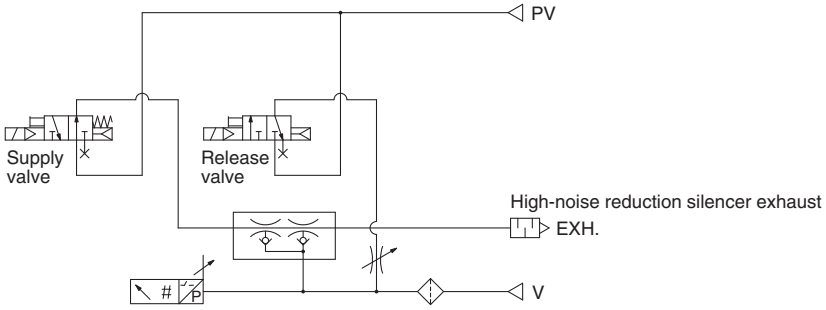
Single unit: ZK2G□A5MOZ□□A-□-□-X188



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

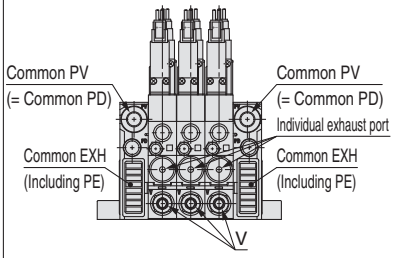


Port Layout

-X211

Port layout no. 4

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

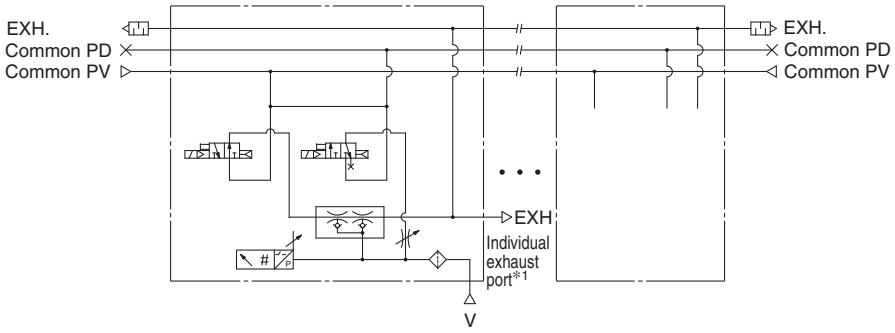


∗1 The complex exhaust method combines the common exhaust from the end plate and the direct exhaust from each station.

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

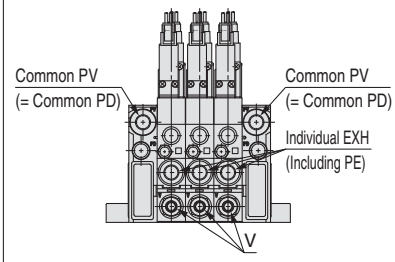
Circuit example



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

Port layout no. 5

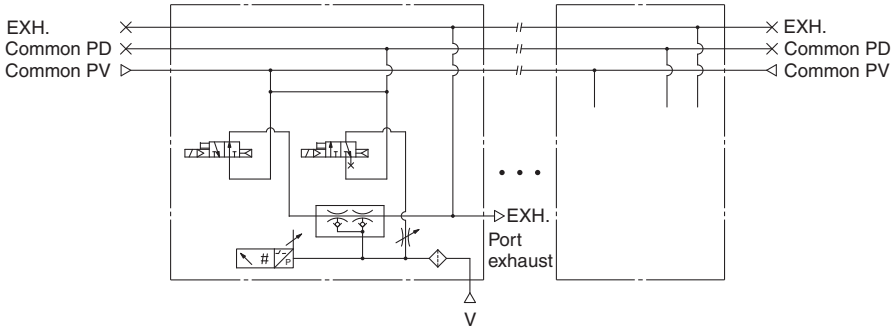
Single unit: ZK2F□A5MOZ□□A-□-□-X211
Manifold: ZZK2□□A-A□2L-□-X211



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

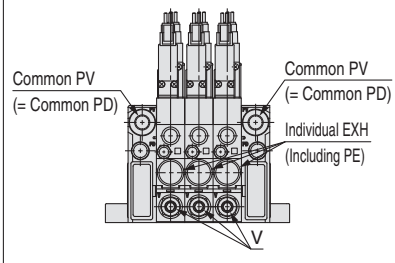
Port combination: Common PV = Common PD

Circuit example



Port layout no. 6

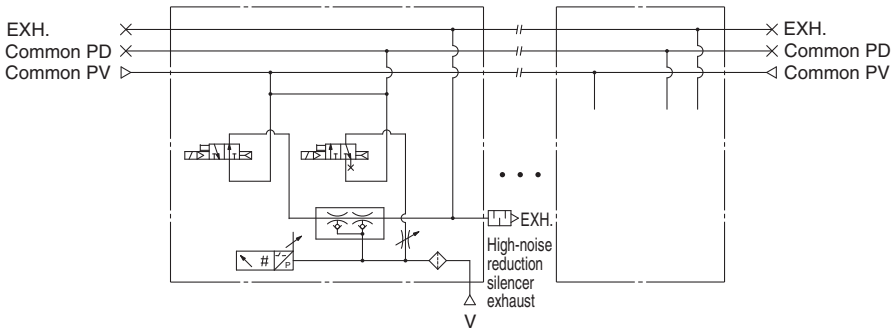
Single unit: ZK2H□A5MOZ□□A-□-□-X211
Manifold: ZZK2□□A-A□2L-□-X211



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 combination: Common PV = Common PD

Circuit example

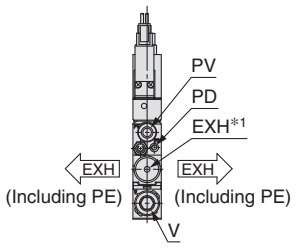


Port Layout

Option -D

Port layout no. 7

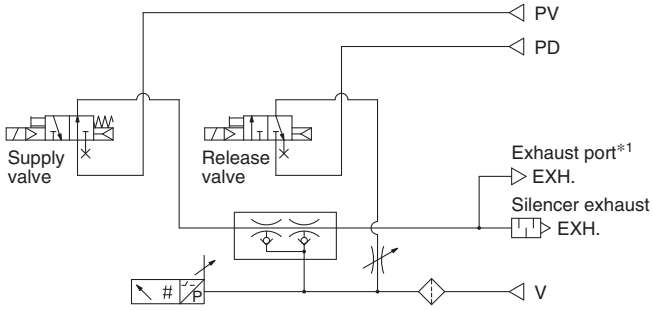
Single unit: ZK2A□A5MOZ□□-□-□D-X188



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

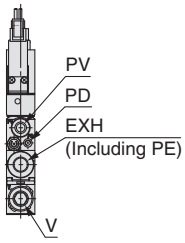
Circuit example



*1 Nozzle size: 12, 15

Port layout no. 8

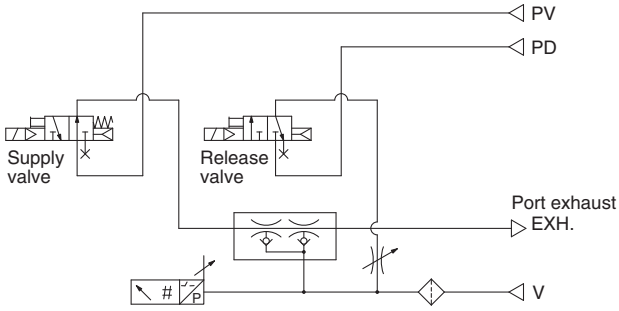
Single unit: ZK2B□A5MOZ□□-□-□D-X188



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.

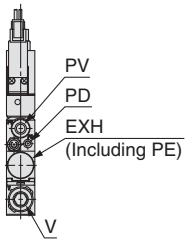
Port combination: PV ≠ PD

Circuit example



Port layout no. 9

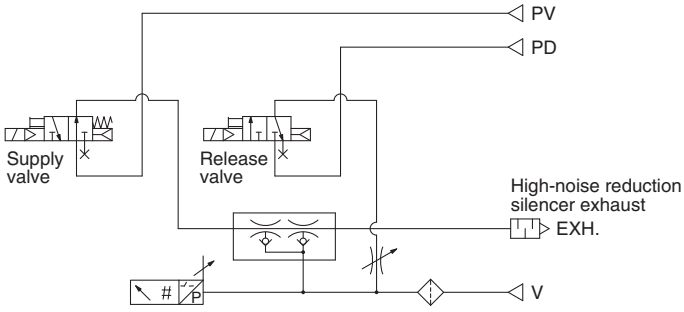
Single unit: ZK2G□A5MOZ□□-□-□D-X188



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

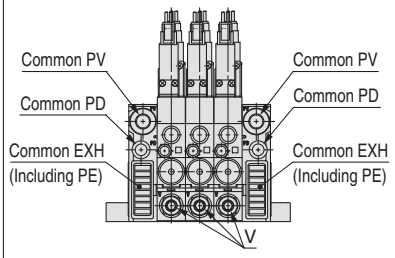


Port Layout

Option -D

Port layout no. 10

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

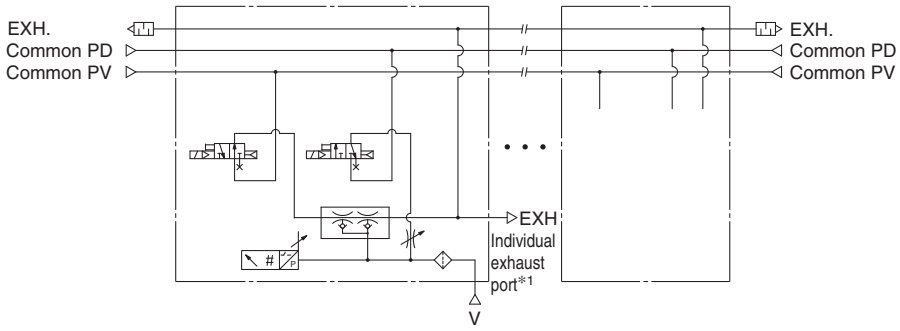


∗1 The complex exhaust method combines the common exhaust from the end plate and the direct exhaust from each station.

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

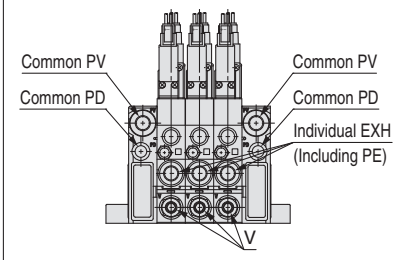
Circuit example



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

Port layout no. 11

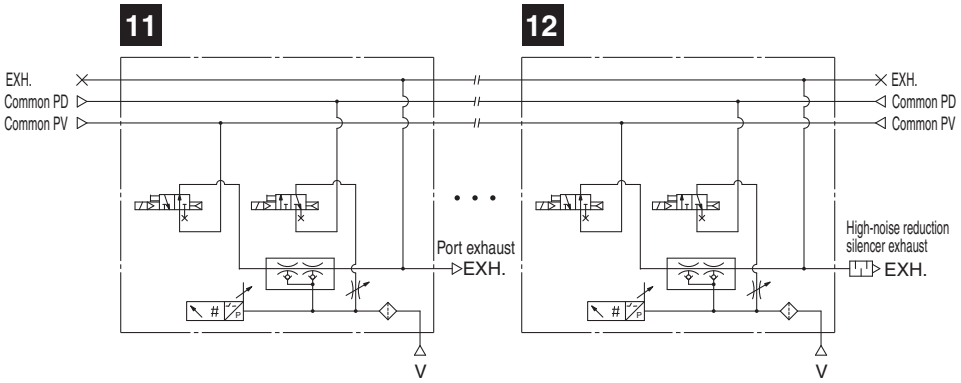
Single unit: ZK2F□A5MOZ□□-□-□P-X211
Manifold: ZZK2□□-A□2L-□D-X211



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.

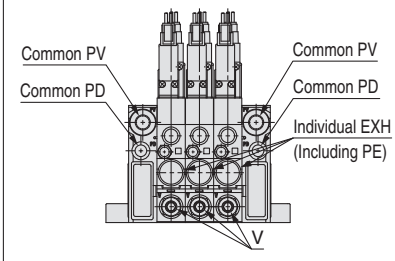
Port combination: Common PV ≠ Common PD

Circuit example



Port layout no. 12

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



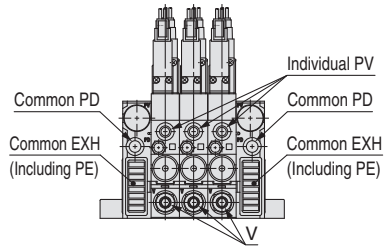
System		Ejector
Body type		Manifold
Exhaust type		High-noise reduction silencer exhaust
Application and purpose	Vacuum pressure	Common for each station
	Exhaust	Released within the operating environment
	Release pressure	Common PD pressure has to be supplied with common PV.

Port Layout

Option -L

Port layout no. 13

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

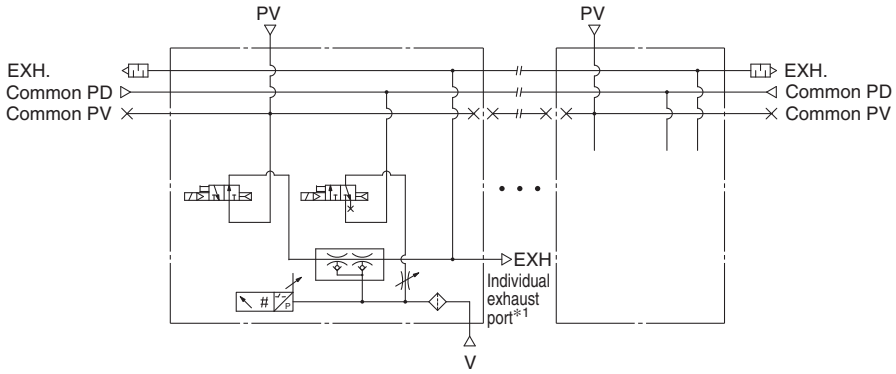


∗1 The complex exhaust method combines the common exhaust from the end plate and the direct exhaust from each station.

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

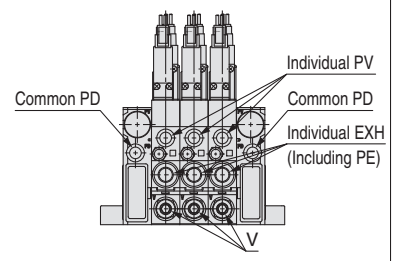
Circuit example



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

Port layout no. 14

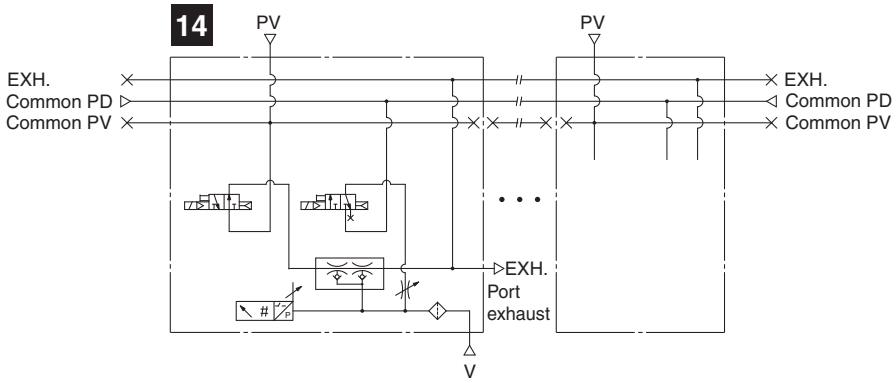
Single unit: ZK2F□A5MOZ□□A-□-□L-X211
Manifold: ZZK2□□A-A□2L-□L-X211



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.

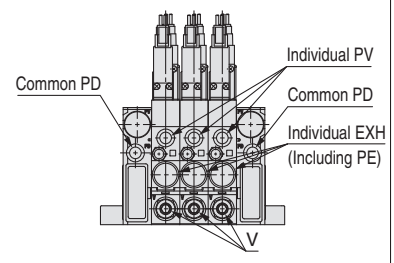
Port combination: Individual PV ≠ Common PD

Circuit example



Port layout no. 15

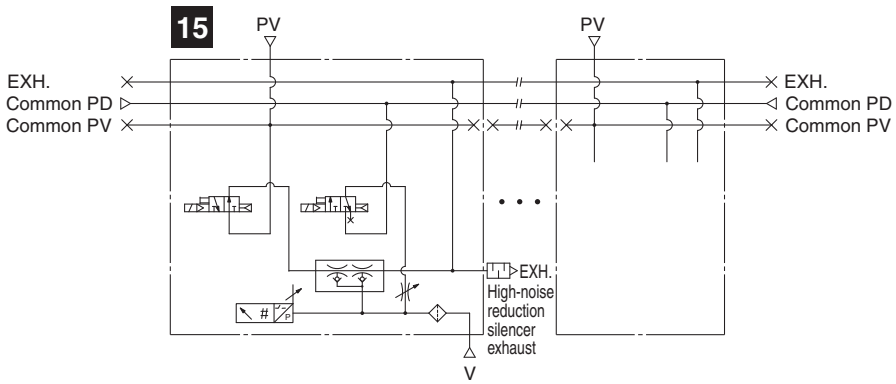
Single unit: ZK2H□A5MOZ□□A-□-□L-X211
Manifold: ZZK2□□A-A□2L-□L-X211



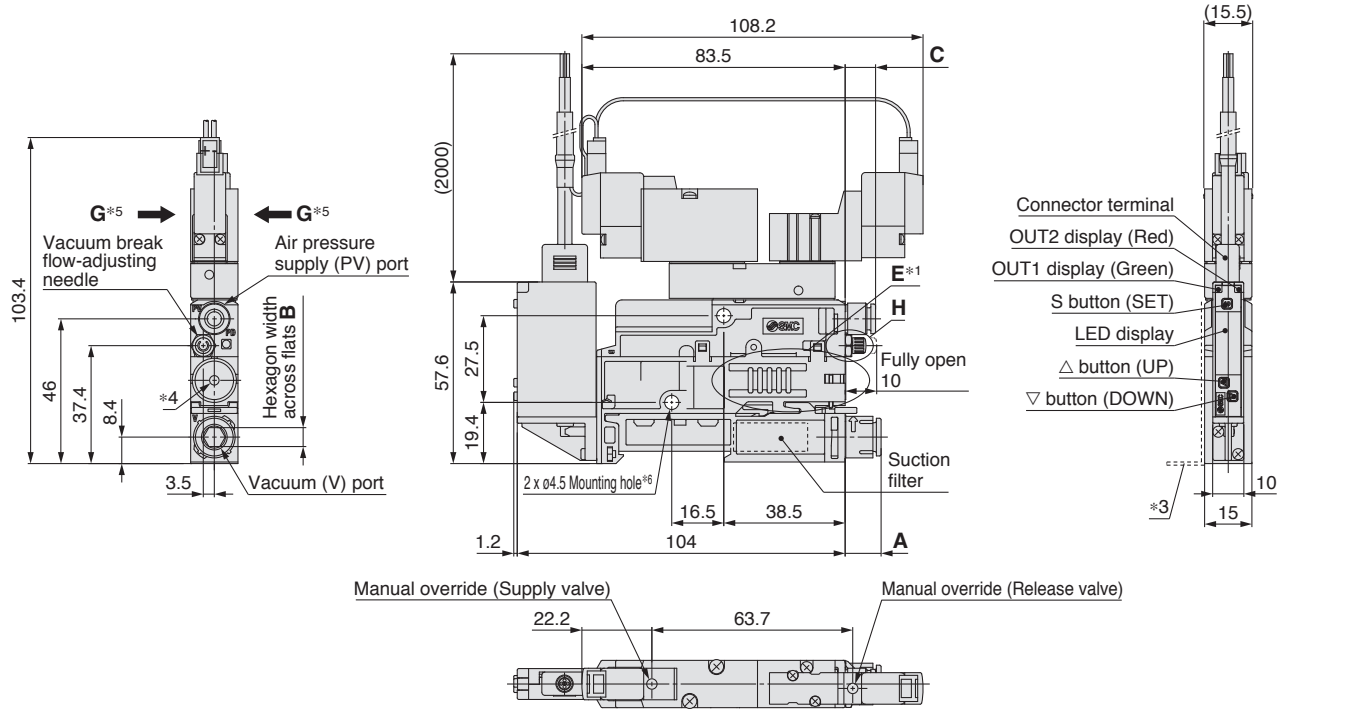
System		Ejector
Body type		Manifold
Exhaust type		High-noise reduction silencer exhaust
Application and purpose	Vacuum pressure	PV pressure can be changed per station.
	Exhaust	Released within the operating environment
	Release pressure	Common PD pressure has to be supplied with individual PV.

Port combination: Individual PV ≠ Common PD

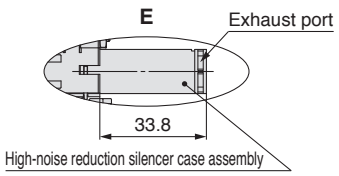
Circuit example



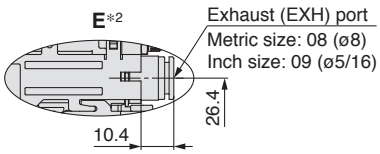
Dimensions: Single Unit



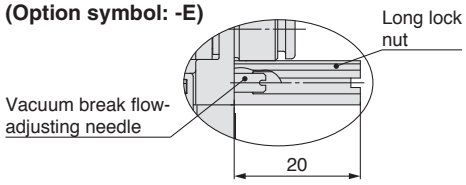
For high-noise reduction silencer exhaust (Body type: G)



For port exhaust (Body type: B)



H (2 : 1)
For screwdriver operation type long lock nut (Option symbol: -E)

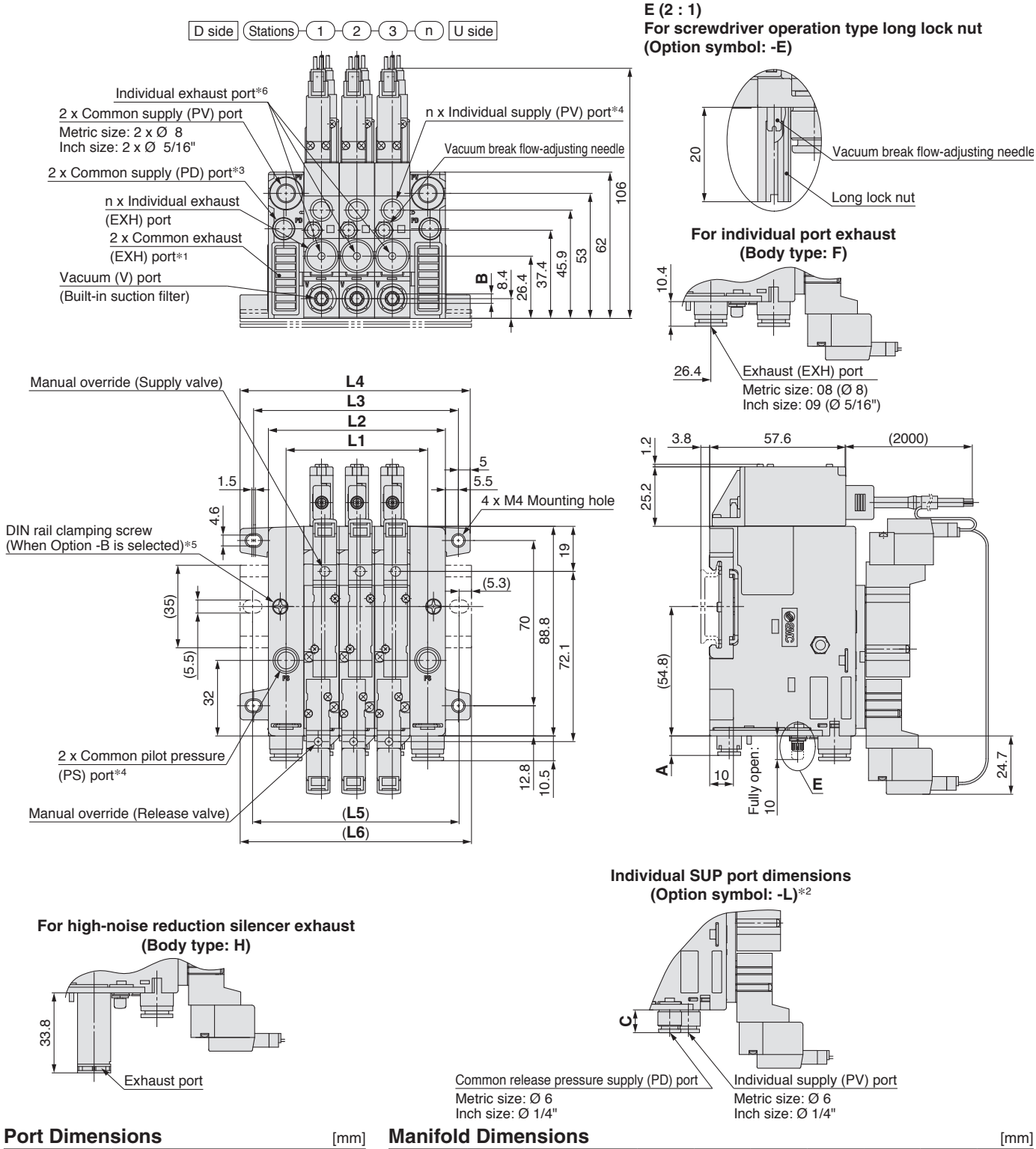


Port Dimensions

V port type		A	B	C
Metric size	06	8.3	4	9.7
	08	11.4	6	
Inch size	07	10.8	4.8	12.3
	09	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** of the ZK2□A series 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.
* These figures show the ZK2A□A5MOZ□WA-08-□-X188.

Dimensions: Manifold



Port Dimensions

[mm]

V port type		A	B (Hexagon width across flats)	C
Metric size	06	8.3	4	9.7
	08	11.4	6	
Inch size	07	10.8	4.8	12.3
	09	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 Only when the individual supply specification (Symbol: -L) is selected
∗3 To secure the manifold to the DIN rail, select an option for the manifold model number.
∗4 For the complex exhaust type, air is also exhausted from the individual exhaust port of each station in addition to the common exhaust port.

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