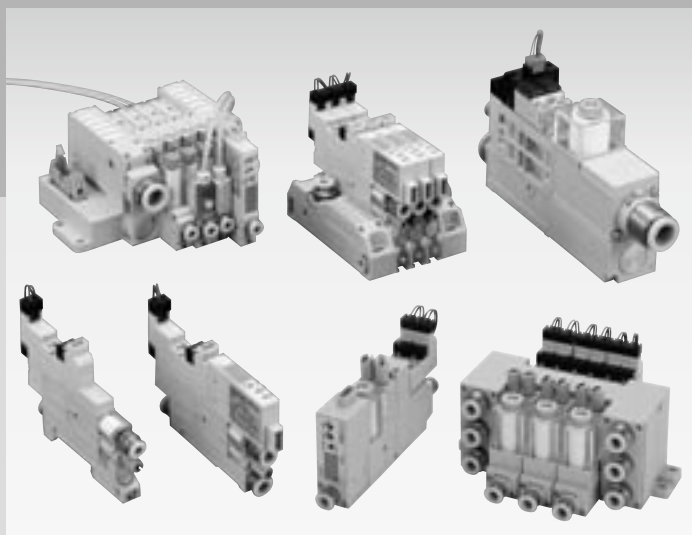


Vacuum pump system type VS*P

■ Vacuum component



CONTENTS

Series variation	166
● 20 mm width universal type (VSJP/VSJPM)	168
● 10.5 mm width universal type (VSXP/VXPM)	184
● 31.5 mm width discrete type (VSQP)	214
● 11 mm pitch manifold dedicated type (VSZPM)	226

Vacuum pump system

VSJP
VSJPM

VSXP
VSXPM

VSQP

VSZPM

●: Provided as standard ○: Option

Model	Series	Model no.	Piping method			Components						Nozzle diameter ϕ (1/10mm)						Page
			Discrete	Manifold		Vacuum control valve	Valve for break	Vacuum switch	Vacuum filter	Silencer	Check valve	05	07	10	12	15	20	
				Individual wiring	Reduced wiring													
Vacuum pump system type Vacuum changeover unit	VSJP/VSJPM Series 20 mm width universal type unit • Enable to control air flow and pressure for vacuum break. • The vacuum break time can be shortened with the vacuum break circuit relief function. • Self hold type is standard for vacuum solenoid valve.	VSJP	●			●	●	○	●								Vacuum valve effective area 3.5mm ² (ϕ 4), 5mm ² (ϕ 6)	168
		VSJPM		●		●	●	○	●									
	VSXP/VSXPM Series 10.5 mm width universal type unit • Compact and slim vacuum unit. • Either direct fixing or DIN rail installation is possible. • High cycles are possible with 3-way vacuum valves (optional).	VSXP	●			●	●	○	●								Vacuum valve effective area 2 way valve specifications: 3.5mm ² (ϕ 4), 4.5mm ² (ϕ 6) 3 way valve specifications: 3.0mm ² (ϕ 4), 3.6mm ² (ϕ 6)	184
		VSXPM		●		●	●	○	●									
	VSQP Series 31.5 mm width dedicated unit • Large vacuum units are optimum to control high flow. • Normal open and normal close are used as standards for vacuum solenoid valve.	VSQP	●			●	●	○	●								Vacuum valve effective area 16.5mm ²	214
VSZPM Series 11 mm pitch manifold dedicated unit • Wire-saving vacuum unit for manifold. • Air consumption is reduced by suppressing valve energy consumption to 0.55 W. • Compatible with a wide range of applications and broad vacuum sensor variations.	VSZPM			●	●	●	○	●								Vacuum valve effective area 4.5mm ²	226	

Vacuum pump system

Vacuum pump system

VSJP
VSJPM

VSJP
VSJPM

VSXP
VSXPM

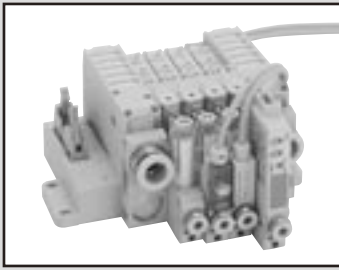
VSXP
VSXPM

VSQP

VSQP

VSZPM

VSZPM



Compact and light weight vacuum changeover unit dedicated for manifolds - greatly reduces vacuum break time

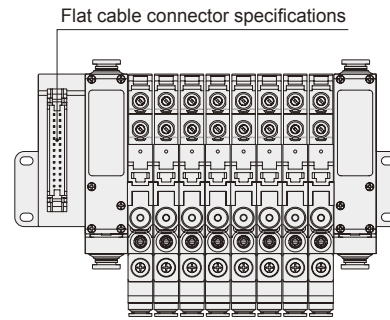
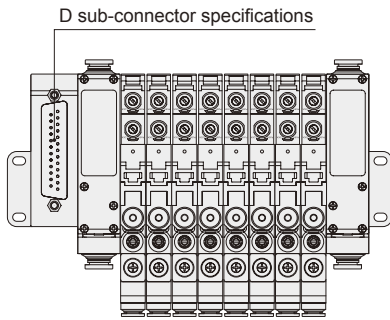
VSZPM Series



Features

- Atmospheric pressure break of large flow rates is possible by installing an atmospheric pressure break valve, thereby greatly reducing the vacuum break time.
- Wiring for the supply valve and break valve are bundled collectively.

Vacuum pump system



VSJP
VSJPM

VSXP
VSXPM

- Either a single solenoid or self-holding supply valve is selected.

VSQP

- This energy-conserving suppresses the valve consumption to 0.55 W.

VSZPM

- The diverse lineup of vacuum switch variations is compatible with different applications.



Analog switch



1 point switch
Vacuum switch



1 point switch with LED display
Vacuum switch



2 point switch with LED display
Vacuum switch

- Manifold stations are increased, allowing specification changes to be handled flexibly.
- Maintenance is easy with the structure taking serviceability into consideration.
- Either the standard push-in joint or female screw piping is selected based on the application.

Specifications

Descriptions	VSZPM
Working fluid	Air
Working pressure range MPa	0.3 to 0.7
Ambient temperature range °C	5 to 50
Working vacuum pressure range kPa	0 to -100

Solenoid valve specifications

● Pilot valve

Descriptions	Valve for vacuum supply	Valve for vacuum break
Actuation	Direct operation	
Valve structure	Rubber sealant, poppet valve	
Rated voltage	24 VDC	
Allowable voltage fluctuation range	21.6 to 26.4 VDC	
Surge protective circuit	Surge absorber	
Power consumption	0.55W (with LED)	
Operational indicator light	During coil excitation: red LED ON	During coil excitation: yellow green LED ON
Manual override	Push & lock type	
Wiring method	D sub-connector, flat cable connector	

● Switching valve

Descriptions	Valve for vacuum supply		Valve for vacuum break
Actuation	Indirect operation with pilot valve		
Valve structure	Rubber sealant, poppet valve		
Valve function	Single solenoid	Self hold	Single solenoid
Valve type	Normally closed		
Withstanding pressure	1.05MPa		
Lubrication	Not required		
Effective sectional area (Cv flow factor)	4.5mm ² (0.24)		3.5mm ² (0.19)
Response time	OFF → ON	10msec	10msec
	ON → OFF	15msec	15msec

Vacuum pump system

VSJP
VSJPM

VSXP
VSXPM

VSQP

VSZPM

Vacuum switch specifications

Descriptions	LED with display		Without display	Separate type	Analog	
	2 point switch output	1 point switch output	1 point switch output	Pressure indication gauge with switch		
Current consumption	40mA		20mA	50mA	20mA	
Pressure detection method	Diffused semiconductor pressure sensor			-	Diffused semiconductor pressure sensor	
Working pressure range	-100 to 0kPa		-	-	-100 to 0kPa	
Set pressure range	-99 to 0kPa		-	-999 to 999counts	-	
Withstanding pressure	0.2MPa		-	-	0.2MPa	
Storage temperature range	-20 to 80°C		-20 to 70°C			
Operating temperature range	0 to 50°C		-10 to 60°C	-10 to 50°C	-10 to 60°C	
Operation humidity range	35 to 85%RH					
Power voltage	12 to 24 VDC ±10% ripple P-P 10% or less		10.8 to 30 VDC (including ripple)			
Protective structure	IEC standards IP40 or equivalent					
Switch output point	2	1	1	2	-	
Switch operation precision	±0.3%F.S. Max. (at Ta = 25°C)				-	
Hysteresis	Fixing	Variable	Fixing	Variable	-	
Switch output	NPN open collector output				-	
Analog output	Output voltage	-	1 to 5V	-	1 to 5V	
	Zero point voltage	-	1±01 V	-	1±01 V	
	Span voltage	-	4±0.1 V	-	4±0.1 V	
	Output current	-	1mA or less	-	0.5mA or less	1mA or less
	LIN/HYS	-	±0.5%F.S. Max.	-	±0.5%F.S. Max.	
Indicator	0 to -99kPa (2 digit red LED display)		-	3 digit red LED display	-	
Number of displays	Approx. 4 times/sec.		-	Approx. 4 times/sec.	-	
Display precision	±3%F.S. ±2digit		-	±1%F.S.	-	
Resolution	1digit		-	1digit	-	
Switch operational indicator light	Red LED turns ON when SW1 output is ON			Green LED turns ON when SW1 output is ON	-	
	Green LED turns ON when SW2 output is ON			Red LED turns ON when SW2 output is ON	-	

Vacuum break function

Descriptions	Vacuum break valve
Break air flow	0 to 50ℓ/min. (ANR) 0.5MPa supply

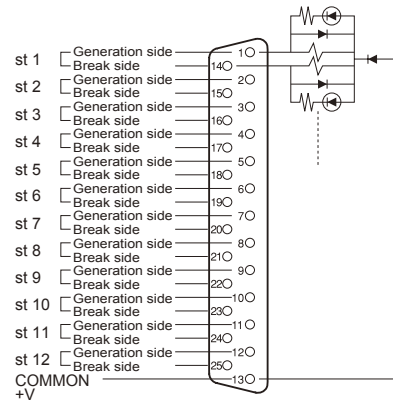
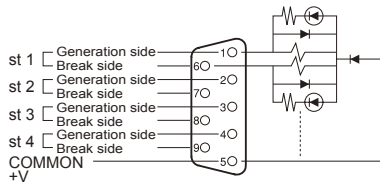
Vacuum filter specifications

Descriptions	Vacuum filter
Element material	PVF (poly-vinyl formal)
Filtration	10μm
Element area	660mm ²
Replacement filter element model no.	VSZM-E

Electric circuit (solenoid valve)

● D sub-connector
9 pin

25 pin

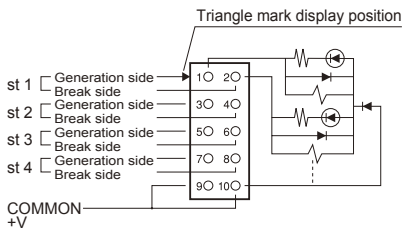


Vacuum pump system

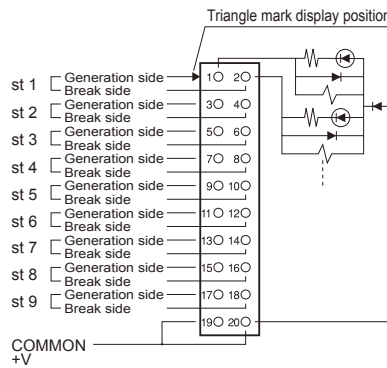
● Flat cable connector
10 pin

20 pin

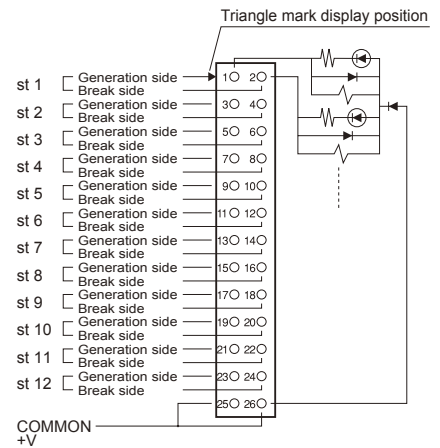
26 pin



(Note) COMMON (+V) pins No. 9 and 10 are short-circuited internally.



(Note) COMMON (+V) pins No. 19 and 20 are short-circuited internally.



(Note) COMMON (+V) pins No. 25 and 26 are short-circuited internally.

VSJP
VSJPM

VSXP
VSXPM

VSQP

VSZPM

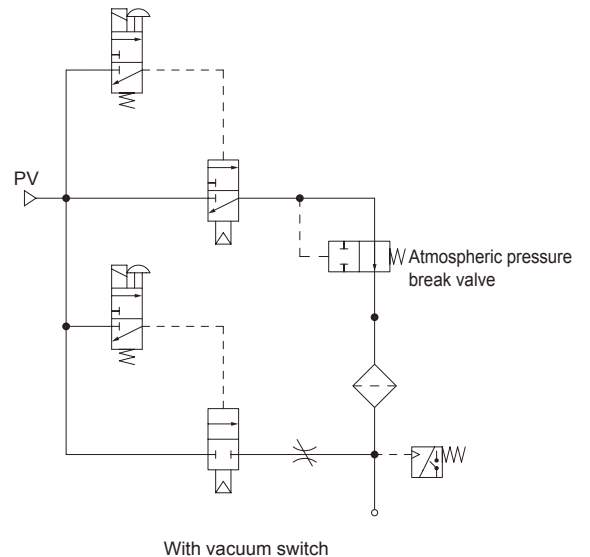
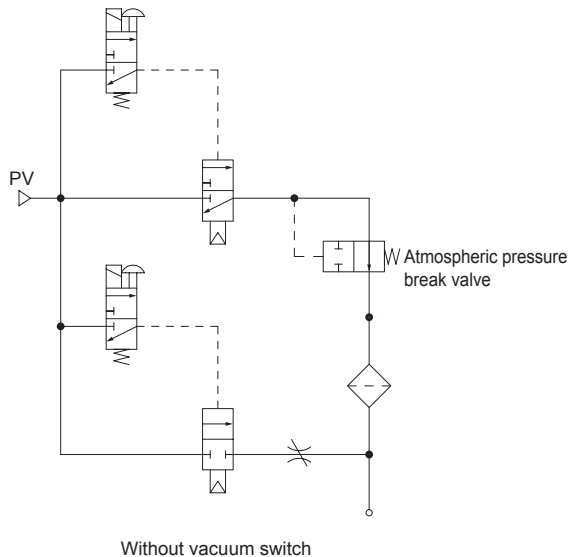
Note 1: Generation side ... Vacuum generation side coil

Note 2: Break side ... Vacuum break side coil

Circuit diagram

● Normally closed type

● Self hold type



How to order

- 11mm pitch manifold dedicated vacuum changeover unit

VSZPM - M5 6 10 - 3 - 12 - DA - F 26

- 11mm pitch manifold dedicated vacuum changeover unit, pump unit assembly

VSZPM - M5 ————— DA

- 11mm pitch manifold dedicated vacuum changeover unit, valve unit assembly

VSZPM ————— V - 3

- 11mm pitch, manifold dedicated vacuum changeover unit, manifold only

VSZPM — 10 10 — 8 — F 20

Ⓔ Wiring specifications

Ⓔ Number of manifold stations Ⓕ Number of connector pin designation

Vacuum pump system

VSJP
VSJPM

VSXP
VSXPM

VSQP

VSZPM

Symbol	Descriptions	Type			
		Manifold	Pump unit assembly	Valve unit assembly	Only manifold

Ⓐ Vacuum port (V)

Ⓑ Air supply port (PS)

Ⓒ Vacuum supply port (PV)

Ⓓ Solenoid valve voltage

Ⓕ Vacuum switch specifications

⚠ Note on model no. selection

Note 1: Indicate "Mixed manifold specifications" when selecting mixed specifications. Refer to page 236 for details.

Note 2: For Ⓕ "20" and "26", Ⓒ "D" can not be selected.

For Ⓕ "25", Ⓒ "F" can not be selected.

- Model no.

· Filter element

VSZM-E

· Silencer element

VSZM-SE

Separate table 1

Number of connector pin designation	
Blank	For flat cable specifications 2 to 4 stations: 10 pins 5 to 9 stations: 20 pins 10 to 12 stations: 26 pins For D sub-connector specifications 2 to 4 stations: 9 pins 5 to 12 stations: 25 pins
20	20 pin flat cable connector (max. 9 stations)
26	26 pin flat cable connector (max.12 stations)
25	25 pin D sub-connector (max.12 stations)

Symbol	Descriptions	Manifold	Pump unit assembly	Valve unit assembly	Only manifold
Ⓐ Vacuum port (V) Note 1					
4	ø4 push-in joint	●	●		
6	ø6 push-in joint	●	●		
M5	M5 x 0.8	●	●		
CX	For mix joint (indicate details in specification sheet)	●			

Ⓑ Air supply port (PS)					
4	ø4 push-in joint	●			●
6	ø6 push-in joint	●			●
8	ø8 push-in joint	●			●

Ⓒ Vacuum supply port (PV)					
6	ø6 push-in joint common exhaust	●			●
8	ø8 push-in joint common exhaust	●			●
10	ø10 push-in joint common exhaust	●			●

Ⓓ Solenoid valve voltage					
3	24 VDC	●		●	

Ⓔ Number of manifold stations					
2	2 stations	●			●
to	to				
12	12 stations				

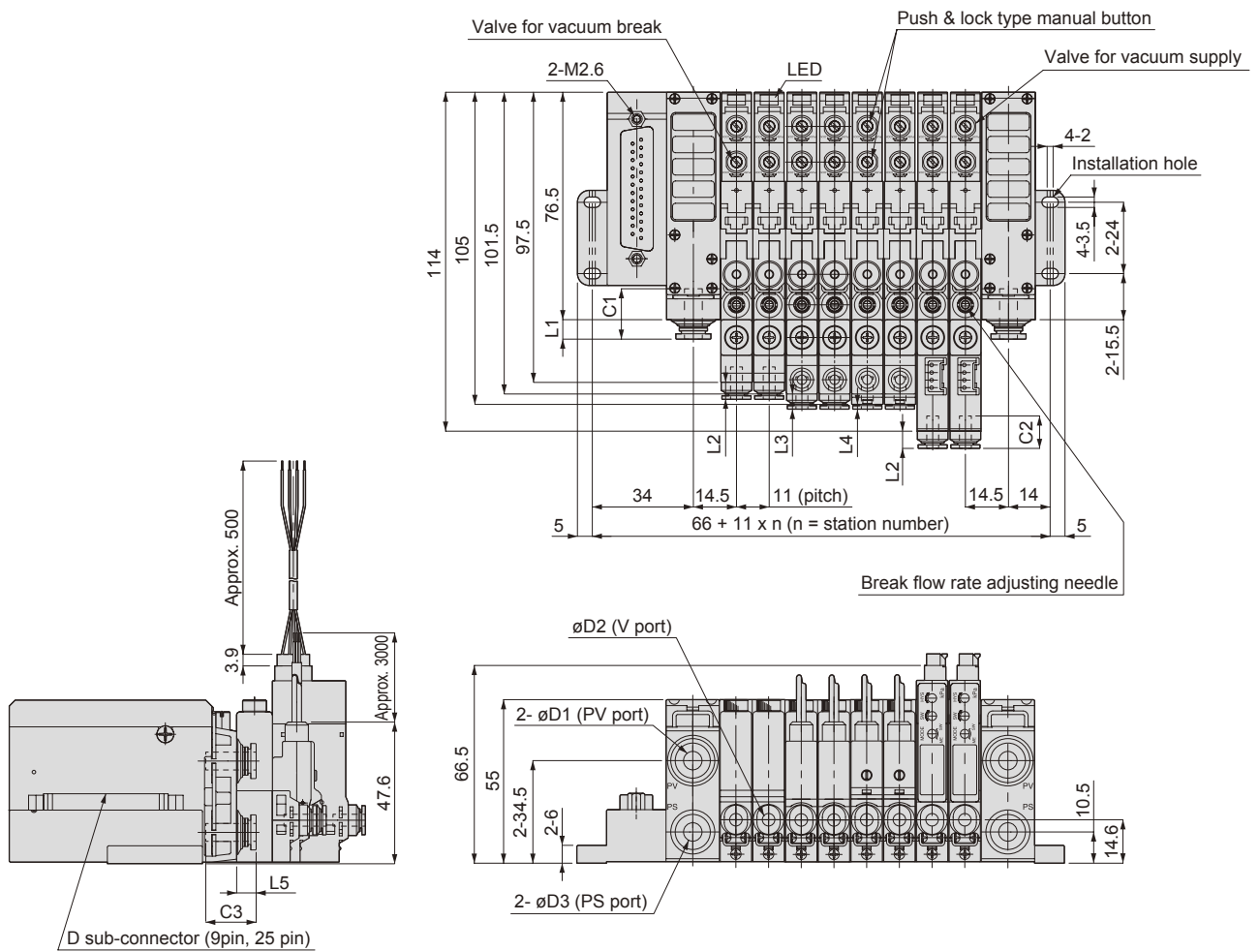
Ⓕ Vacuum switch specifications Note 1					
Blank	Without vacuum switch	●	●		
DW	2-point NPN output with LED display	●	●		
DA	1-point NPN output + analog output with LED display	●	●		
S	1-point NPN output without display	●	●		
V1	Analog output for negative pressure	●	●		
V2	Separate type LED indicator + analog output for negative pressure	●	●		
R1	Analog output for compound pressure	●	●		
R2	Separate type LED indicator + analog output for compound pressure	●	●		
Z	For mix specifications (indicate details in specification sheet)	●			

Ⓖ Wiring specifications Note 2					
F	Flat cable connector	●			●
D	D sub-connector	●			●

Ⓕ Number of connector pin designation Note 2					
Refer to Separate table 1 for number of connector pin designation		●			●

Dimensions

● D sub-connector specifications



Vacuum pump system
VSJP
VSJPM
VSXP
VSXPM
VSQP
VSZPM

Unit: mm

PV port øD1	C1	L1	V port øD2	C2	L2	L3	L4	PS port øD3	C3	L5
6	17	6.6	4	11.2	6.1	5.4	1.9	4	14.9	2
8	18.2	8.1	6	10	8.9	8.2	4.7	6	17	6.6
10	20.7	11.7	M5 (female thread)	-	4	3.3	-0.2	8	18.2	8.1

Dimensions

● Flat cable connector specifications

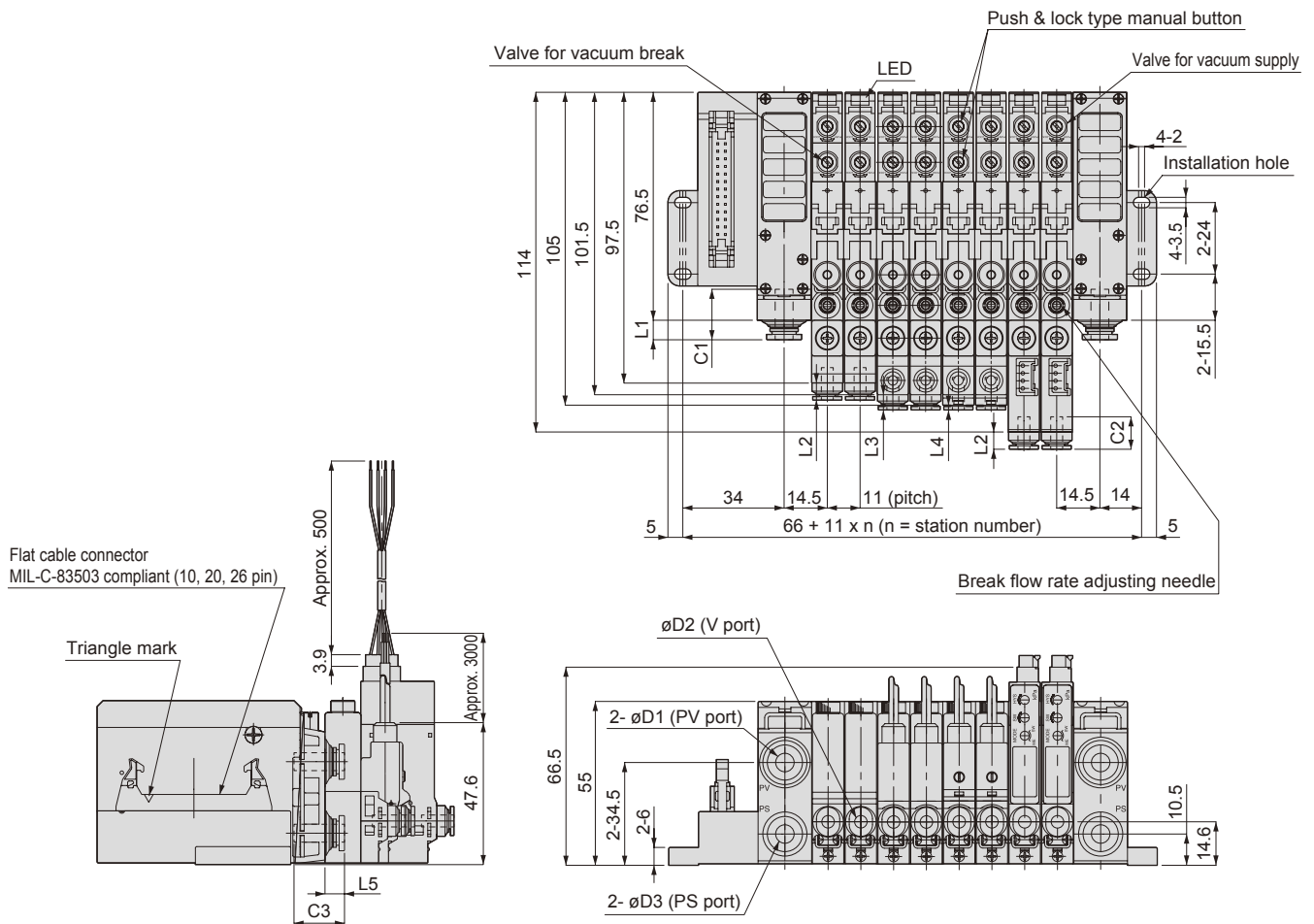
Vacuum pump system

VSJP
VSJPM

VXSP
VXSPM

VSQP

VSZPM



Unit: mm

PV port øD1	C1	L1	V port øD2	C2	L2	L3	L4	PS port øD3	C3	L5
6	17	6.6	4	11.2	6.1	5.4	1.9	4	14.9	2
8	18.2	8.1	6	10	8.9	8.2	4.7	6	17	6.6
10	20.7	11.7	M5 (female thread)	-	4	3.3	-0.2	8	18.2	8.1

Safety precautions

Refer to Intro 13 for general precautions of vacuum system components.

WARNING

- Check that the leakage current is 1mA or less when operating valves. Malfunctions may result from the leakage current and cause problems.
- Vacuum leaks are tolerated with the vacuum changeover unit (VSZP). Provide separate safety measures if the vacuum must be held for a long time.
- When continuously energizing the pilot valve for a long time, heat generated from the coil could cause burns or adversely affect peripheral devices. Contact your nearest CKD sales office when using energizing continuously for long times.
- Stop the supplied air and release the residual pressure before attaching or removing the unit from the manifold.
- Do not use this product where there is excessive vibration or impact. The product could malfunction or break. (Keep vibration at an acceleration of 49m/s^2 or less.)

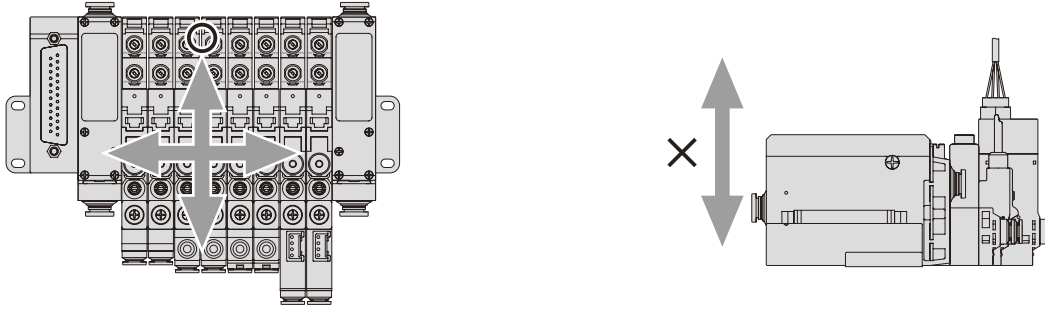
CAUTIONS

- Do not apply excessive tension or bending to the valve or vacuum switch leads. Wires or connectors may break.
- Compressed air contains large amounts of drainage (water, oxidized oil, tar, foreign matter, etc.). The drainage may adversely affect performance. Dehumidify air with an after cooler and dryer and improve air quality.
- Do not use the lubricator.
- Rust etc. in the pipe may result in operation faults. Install a $5\ \mu\text{m}$ or smaller filter preceding the supply port. Flush pipes before use and at appropriate cycle.
- Avoid using this vacuum changeover unit in environments with corrosive or flammable gas. Do not use this unit for fluids.
- When placing or replacing the cartridge joint, remove all matter on the seal, and insert the lock pin securely. Read and understand Precautions in this manual before using.
- When using the manifold's silencer specifications, performance could drop or problems could occur if the element is clogged. Regularly service and inspect the element.
- Before installing each unit on the manifold, remove all matter on the seal, and securely fix with screws. Read and understand Precautions in this manual before using.
- Check electrical circuit diagrams in this manual before wiring the D-sub connector and flat cable connector.
- With the manifold, vacuum performance could drop or problems could occur depending on working conditions. Read and understand Precautions of the Manifold in this manual before using.
- Methods not moving all units simultaneously will cause the ejector exhaust in the moving ejector to flow into the unit's vacuum port. This can cause problems with exhaust, so contact CKD.

How to use

1. Installation

If the installing position vibrates, install so that the vibrating direction is at right angles to the switching valve.



Vacuum pump system

2. Adjusting the vacuum break air flow rate

When the vacuum break air flow rate adjusting needle is turned right (CW), the flow rate decreases, and when turned left (CCW), the flow rate increases. After adjusting, securely tighten the lock nut with a tightening torque of 0.1 to 0.3 N·m.

CCW: Increases vacuum break air flow rate

CW: Decreases vacuum break air flow rate



VSJP
VSJPM

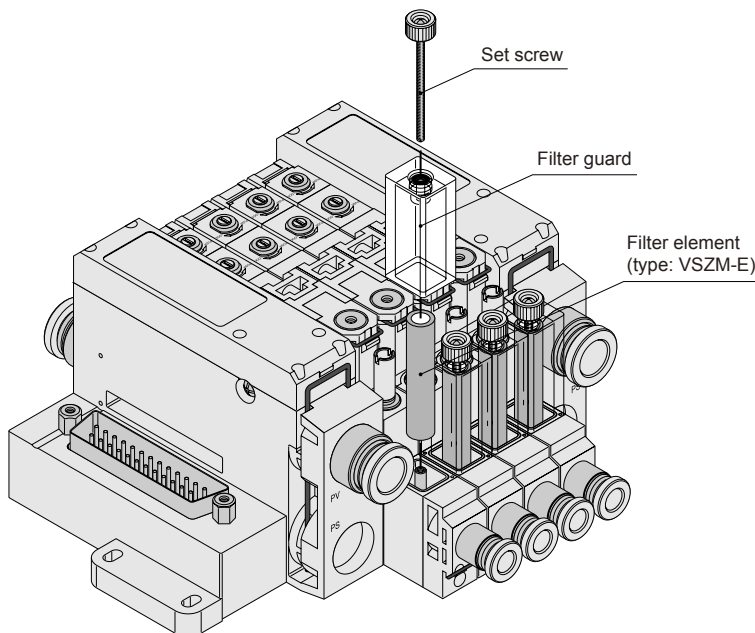
VSXP
VSXPM

VSQP

VSZPM

3. Replacing the filter element

Remove the fixing screw and replace the filter element. After replacing the filter element, confirm that the filter packing is attached, and securely fix with a tightening torque of 0.3 to 0.5N·m.



How to use

4. Removing from and installing onto the manifold

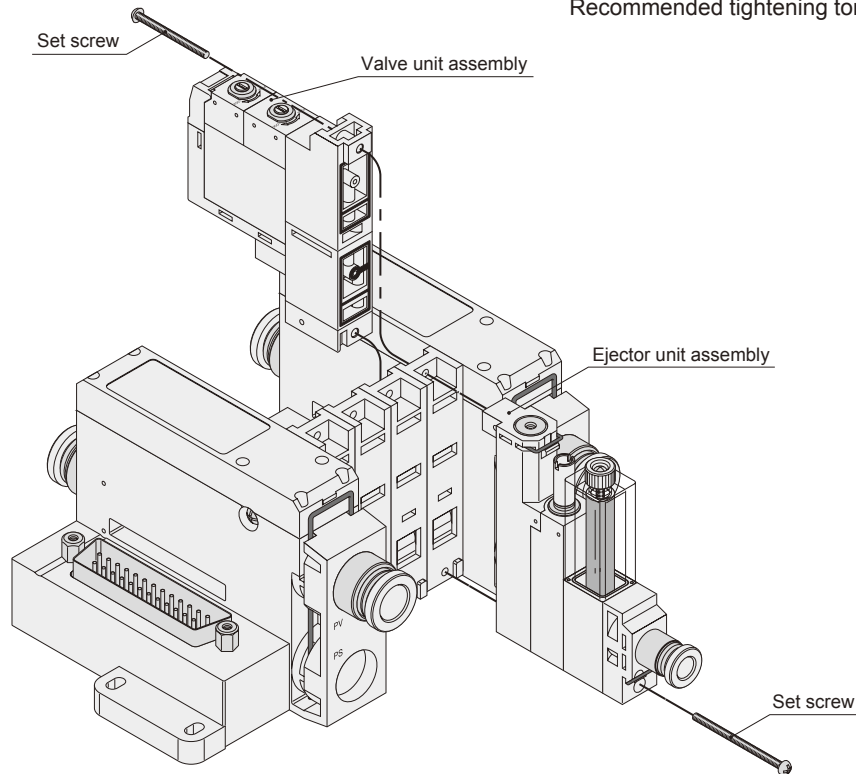
[Removal]

Remove units from the manifold as follows:

- ① Stop the supply air, and release pressure in pipes.
- ② Remove the two fixing screws with an appropriate tool.
- ③ Remove each unit from the manifold.

[Installation]

- ① Check that packing is attached, and that no foreign matter adheres.
 - ② Install each unit on the manifold.
 - ③ Confirm that each unit is accurately positioned and set.
 - ④ Tighten the two fixing screws with an appropriate tool.
- (Note) Gradually and alternately tighten the two screws.
Recommended tightening torque: 0.4 to 0.5N·m

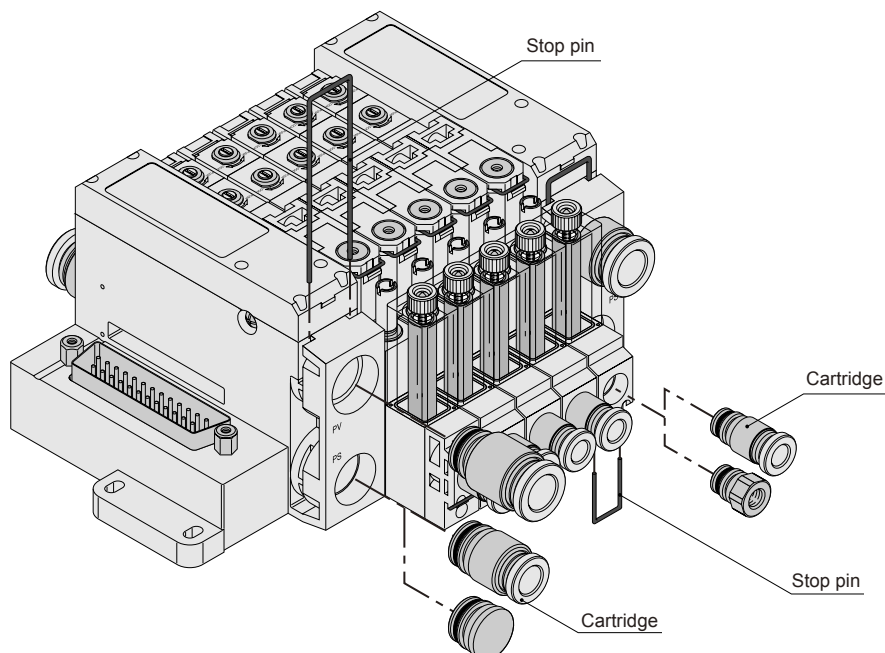


5. Replacing the cartridge joint

The cartridge joint and M5 female screw are replaced as follows:

- ① Pull out the set pin with a flat-tip screwdriver, etc.
- ② Pull the cartridge out in the connection direction.

(Note) Before installing the cartridge in the unit, check that no dirt or lint, etc., is caught on the O-ring.



Preparing the VSZPM mixed manifold specifications

- Mix manifold model no. (example)

VSZPM - ^ACX - ^B6 - ^C8 - ^D3 - ^E5 - ^FZ - ^GF - ^H26

- Mix manifold specifications (example)

Vacuum changeover unit model no. ^A ^F	Layout												Quantity	
	1	2	3	4	5	6	7	8	9	10	11	12		
VSZPM- ^A 6- ^F DW	○	○												2
VSZPM- ^A 6- ^F DA			○		○									2
VSZPM- ^A 4- ^F				○										1
VSZPM- ^A - ^F														
VSZPM- ^A - ^F														

Vacuum pump system

VSJP
VSJPM

<Specifications when only output port size joints are mixed>

- Mix manifold model no. (example)

VSZPM - ^ACX - ^B6 - ^C6 - ^D3 - ^E5 - ^FDW - ^GF - ^H26

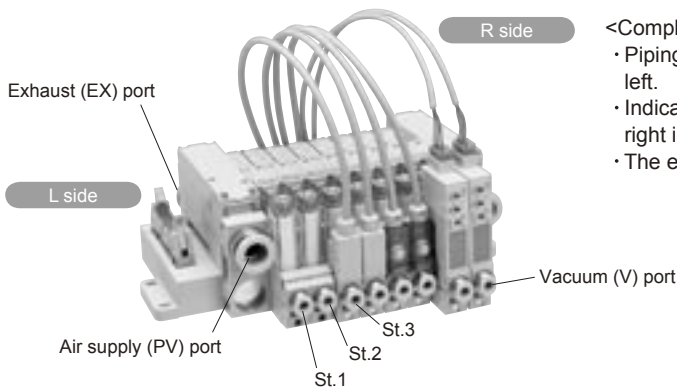
- Mix manifold specifications (example)

Vacuum changeover unit model no. ^A ^F	Layout												Quantity	
	1	2	3	4	5	6	7	8	9	10	11	12		
VSZPM- ^A M5- ^F DW	○	○												2
VSZPM- ^A 6- ^F DW			○		○									2
VSZPM- ^A 4- ^F DW				○										1
VSZPM- ^A - ^F														
VSZPM- ^A - ^F														

VSXP
VSXPM

VSQP

VSZPM



<Completing the form>

- Piping locations start from the vacuum port, and are set in order from the left.
- Indicate the total number of designated product models required at the far right in the table.
- The electronic connector assembly is fixed on the L side of the manifold.

VSZPM mix manifold specifications

Contact _____ Quantity _____ Set _____ Request date / /

Issue / /

Your company name _____

Slip No. _____ Order No. _____

Contact _____ Messrs. _____

Purchase order No. _____

● Mix manifold model no.

VSZPM - ^A ^B ^C - ^D - ^E - ^F - ^G ^H

A Vacuum port (V)	
4	ø4 push-in joint
6	ø6 push-in joint
M5	M5 x 0.8
CX	For mix joint (indicate details in specification sheet)
B Air supply port (PS)	
4	ø4 push-in joint
6	ø6 push-in joint
8	ø8 push-in joint
C Vacuum supply port (PV)	
6	ø6 push-in joint
8	ø8 push-in joint
10	ø10 push-in joint
D Solenoid valve voltage	
3	24 VDC
E Number of manifold stations	
2 to 12	2 stations to 12 stations

F Vacuum switch specifications	
Blank	Without vacuum switch
DW	2-point NPN output with LED display
DA	1-point NPN output + analog output with LED display
S	1-point NPN output without display
V1	Analog output for negative pressure
R1	Analog output for compound pressure
Z	For mix specifications (indicate details in specification sheet)

G Wiring specifications	
F	Flat cable connector
D	D sub-connector

H Number of connector pin designation	
Blank	Flat cable connector specifications
	2 to 4 stations 10 pin
	5 to 9 stations 20 pin
	10 to 12 stations 26 pin
Blank	For D sub-connector specifications
	2 to 4 stations 9 pin
	5 to 12 stations 25 pin
20	20 pin flat cable connector (max. 9 stations)
26	26 pin flat cable connector (max. 12 stations)
25	25 pin D sub-connector (max. 12 stations)

Vacuum pump system

VSJP
VSJPM

VSXP
VSXPM

VSQP

VSZPM

● Mix manifold specifications

Vacuum changeover unit model no. ^A <input type="text"/> ^F <input type="text"/>	Layout												Quantity
	1	2	3	4	5	6	7	8	9	10	11	12	
VSZPM- <input type="text"/> - <input type="text"/>													
VSZPM- <input type="text"/> - <input type="text"/>													
VSZPM- <input type="text"/> - <input type="text"/>													
VSZPM- <input type="text"/> - <input type="text"/>													
VSZPM- <input type="text"/> - <input type="text"/>													