

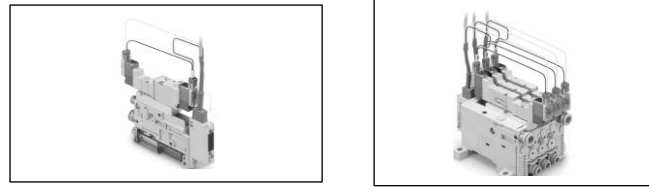


ORIGINAL INSTRUCTIONS

Instruction Manual

Vacuum Ejector Supply valve N.O.

Series ZK2#A-X188/X211



The intended use of the vacuum ejector/manifold is to generate vacuum and control the operation of suction and release.

1 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.

- ⁽¹⁾ ISO 4414: Pneumatic fluid power - General rules relating to systems.
- ISO 4413: Hydraulic fluid power - General rules relating to systems.
- 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.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

Caution	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
Warning	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
Danger	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Warning

- Always ensure compliance with relevant safety laws and standards.
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

2 Specifications

2.1 General specifications

Ambient Temperature range	5 to 50°C
Fluid	Air

2.2 Valve specifications

Parameter	Supply valve	Release valve
Solenoid valve model ^{Note 1)}	SYJ524-5MOZ-Q SY325-5MOZ-Q	SYJ314-5MOZ-Q
Type	N.O.	N.C.
Operating pressure range	0.15 to 0.6	
Rated Voltage	24VDC	
Power consumption ^{Note 1)}	0.4W	

Note 1) For details, refer to web catalogue of SYJ and SY series and 3/4/5-port solenoid valve precautions.

2 Specifications - continued

2.3 Pressure Switch Specification

Rated pressure range	-100 to 100 kPa	
Set Pressure range	-105 to 105 kPa	
Proof pressure	500KPa	
Smallest settable increment	0.1KPa	
Power supply voltage	12 to 24 VDC ±10%, Ripple (p-p) 10% or less (Protected against reverse connection)	
Current consumption	40mA or less	
Switch Output	Output type	NPN or PNP open collector OUT 1: General-purpose, OUT 2: Valve control
	Max. load current	80mA
	Max. applied voltage	26.4 VDC
	Residual Voltage	2 V or less (at load current of 80 mA)
	Response time	2.5ms or less
Short circuit protection	Yes	
Repeatability	±0.2%F.S. ±1 digit	
Hysteresis (Hysteresis Mode)	Variable from 0 ⁽¹⁾	
Temperature characteristic	±2%F.S (at 25°C in an operating temperature range of 5 and 50°C)	
Indicator light	Lights up when output is turned ON. OUT1: Green, OUT2: Red	
Environment	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

Note 1) If the applied pressure fluctuates around the set value, the hysteresis must be set to a value more than the amount of fluctuation or chattering will occur.

2.4 Ejector specifications

Model	ZK2#07	ZK2#10	ZK2#12	ZK2#15	
Nozzle diameter [mm]	0.7	1.0	1.2	1.5	
Max Suction flow [L/min]	Port Exhaust	34	56	74	89
	Silencer Exhaust	29	44	67	67
	High-noise reductions	34	56	72	83
Air consumption ^{Note 1)} [L/min]	24	40	58	90	
Maximum Vacuum pressure ^{Note 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)		

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

3 Installation

3.1 Installation

The Installation and mounting of ZK2#A-X188/X211 is same as standard ZK2A.

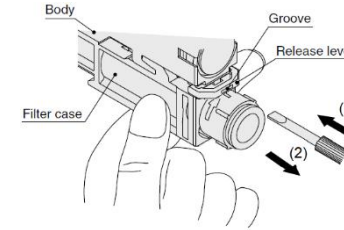
Warning

- Do not install the product unless the safety instructions have been read and understood.

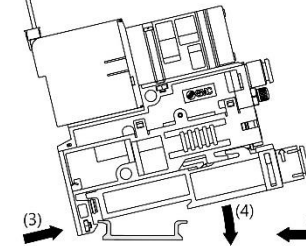
3.1.1 Single Unit

(A) DIN rail mounting

1) Insert a precision screwdriver into the groove of the release lever and push in direction (1) and slide the filter case in direction (2).

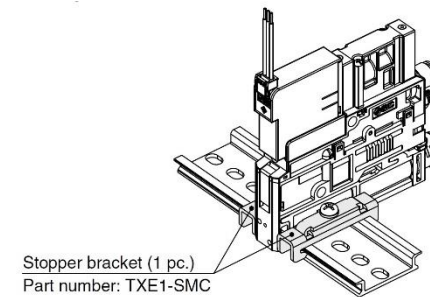


2) Hook the ejector onto the DIN rail from direction (3) and mount the ejector onto the DIN rail by pushing it down in direction (4).



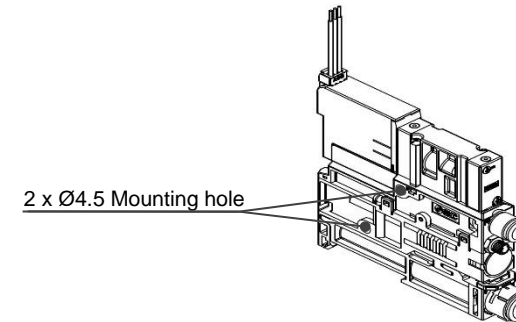
3) Push the filter case assembly in direction (5) until it is locked.

4) To hold the ejector onto the DIN rail, hold it from both sides using the stopper brackets.



(B) Direct mounting

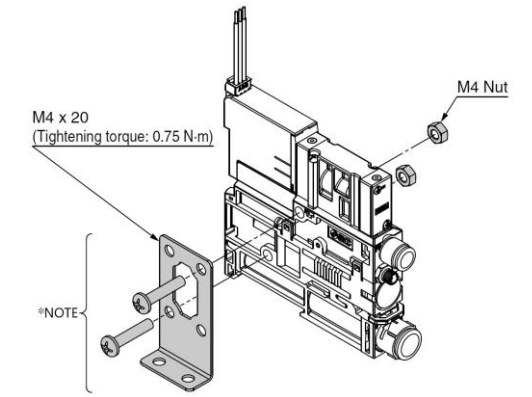
1) Mount and tighten the body using the holes in the body (2 x Ø4.5mm)



(C) Bracket Mounting

1) Fix the body with the brackets before mounting, using the holes in body (2 x Ø4.5mm).
2) Mount the body using the holes in the brackets.

3 Installation - continued

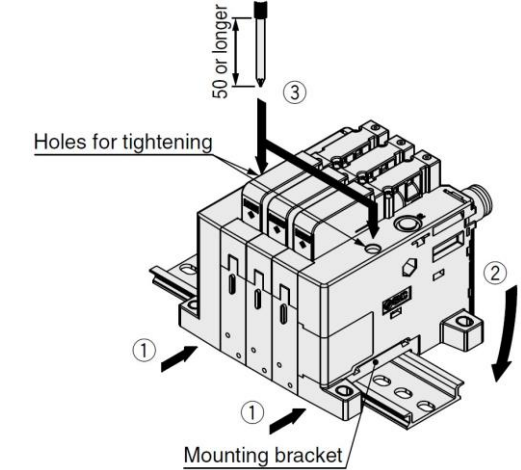


Note) Mounting bracket for single unit (option) [Nuts and bolts included] Part number: ZK2-BK1-A

3.1.2 Manifold

(A) DIN rail mounting (Option)

1) Hook the mounting bracket of the end plate to DIN rail from direction 1.
2) Mount the ejector onto the DIN rail by pushing it down in direction 2.
3) Use a 50 mm or longer Phillips screwdriver to tighten the mounting bracket 3 (Tightening torque: 0.9 ±0.1 Nm).



3.2 Environment

Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product's specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product's specifications.

3.3 Piping

Caution

- Before connecting piping make sure to clean up chips, cutting oil, dust etc.
- When installing piping or fittings, ensure sealant material does not enter inside the port. When using seal tape, leave 1 thread exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.

3.4 Lubrication

Caution

- SMC products have been lubricated for life at manufacture, and do not require lubrication in service.
- If a lubricant is used in the system, refer to catalogue for details.

4 Settings

For information on setting of pressure switch for vacuum with energy saving function, refer to the ZK2-ZSV####-A-X188 operation manual on SMC website.

5 How to Order

Refer to catalogue for 'How to Order'.

6 Outline Dimensions

Refer to catalogue for outline dimensions.

7 Maintenance

7.1 General maintenance

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.

Implement the maintenance and checks shown below in order to use the ejector system safely and in an appropriate way for a long period of time.

- Maintenance should be performed according to the procedure indicated in the Operation Manual. Improper handling can cause damage and malfunction of equipment and machinery.

- Maintenance work
Compressed air can be dangerous when handled incorrectly. Therefore, in addition to observing the product specifications, replacement of elements and other maintenance activities should be performed by personnel with sufficient knowledge and experience pertaining to pneumatic equipment.
- Draining
Remove condensate from air filters and mist separators regularly. If the collected drainage is drained to the downstream side, it can stick inside of the product, causing operation failure and failure to reach the specified vacuum pressure.
- Replace the filter element built into the ejector and the vacuum pump system and the silencer regularly (refer to the replacement procedure in Operational Manual available on www.smcworld.com). It is recommended to replace the filter element and the silencer when the pressure drop reaches 5kPa as a guideline. The replacement cycle varies depending on the operating conditions, operating environment and supply air quality. However, if there is a vacuum pressure drop and/or delay in the vacuum (adsorption) response time which causes problem with the settings during operation, stop the operation of the product and replace the element regardless of the above-mentioned replacement guideline.
- Operation in an environment where there is a lot of dust in the air
The processing capacity of the filter element built into the product may be insufficient. It is recommended to use SMC's air suction filter (ZFA, ZFB, ZFC series) in order to avoid problems beforehand.
- Check before and after the maintenance work

When the product is to be removed, turn off the power supply, and be sure to cut off the supply pressure and exhaust the compressed air. Confirm that the air is released to atmosphere. When mounting the product after the maintenance work, supply compressed air, connect to the power, check if it functions properly and have a leakage inspection. Especially for valve type R, be sure to check that the supply valve is OFF in the initial condition because it is possible that it is ON due to vibration.

7 Maintenance - continued

- Do not disassemble or modify the product, other than the replacement of parts specified in the operation manual.
- Tighten to the specified tightening torque.
If the tightening torque is exceeded, the product, the mounting screws, brackets and the pressure switch can be broken. Insufficient torque can cause displacement of the product and the pressure switch from each proper position and loosening of the mounting screws.
- Be sure to ground the frame ground (FG) terminal when using a commercially available switching power supply.
- Eliminate any dust left in the piping by using a blast of air before connecting the piping to the product. Otherwise, failure or malfunction may occur.
- If the fluid contains foreign matter, install and connect a filter or mist separator to the inlet. Otherwise, failure, malfunction or inaccurate measurements from the pressure switch may occur.

8 Limitations of Use

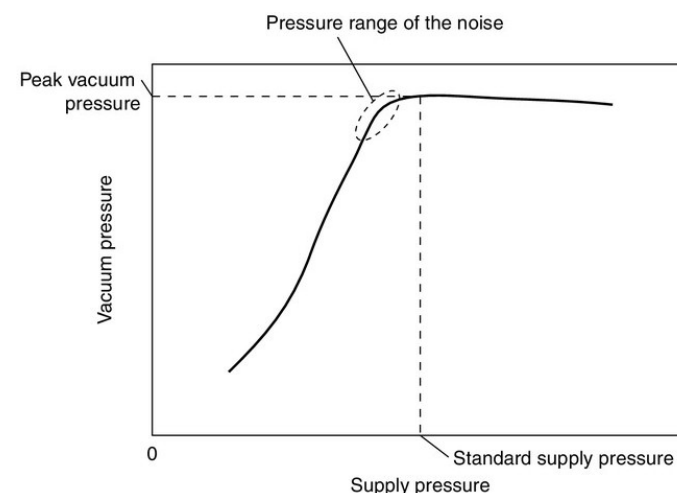
8.1 Limited warranty and disclaimer/compliance requirements

Refer to Handling Precautions for SMC Products.

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.



9 Product Disposal

This product shall not be disposed of as municipal waste. Check your local regulations and guidelines to dispose this product correctly, in order to reduce the impact on human health and the environment.

10 Contacts

Refer to www.smcworld.com or www.smc.eu for your local distributor/importer.

SMC Corporation

URL : <https://www.smcworld.com> (Global) <https://www.smc.eu> (Europe)
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