CKD

SM—396159—A

INSTRUCTION MANUAL

SELVACS

Vacuum Ejector Unit

VSJ·VSJM Series

- Please read this instruction manual carefully before using this product, particularly the section describing safety.
- Retain this instruction manual with the product for further consultation whenever necessary.

CKD Corporation

For Safety Use

To use this product safety, basic knowledge of pneumatic equipment, including materials, piping, electrical system and mechanism, is required (to the level pursuant to JIS B 8370 Pneumatic System Rules).

We do not bear any responsibility for accidents caused by any person without such knowledge or arising from improper operation.

Our customers use this product for a very wide range of applications, and we cannot keep track of all of them. Depending on operating conditions, the product may fail to operate to maximum performance, or cause an accident. Thus, before placing an order, examine whether the product meets your application, requirements, and how to use it.

This product incorporates many functions and mechanisms to ensure safety. However, improper operation could result in an accident. To prevent such accidents, **read this operation manual carefully for proper operation.**

Observe the cautions on handling described in this manual, as well as the following instructions:

⚠ CAUTION :

- Before performing an overhaul inspection on the actuator, deactivate residual pressure completely.

- While the actuator is operating, do not step into or place hands in the driving mechanism.

- To prevent an electric shock, do not touch the electric wiring connection (exposed live parts) of the actuator equipped with a solenoid valve or switch.
  Perform an overhaul inspection with the power off. Also, do not touch these live parts with wet hands.

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SELVACS

VSJ・VSJM Series

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1. UNPACKING

⚠ CAUTION :

1) Don't remove a wrapping bag in front of the plumbing implementation sun.
   - When removing a wrapping bag before plumbing connection work, alien substance enters from the plumbing port and causes the breakdown, the malfunction.

(1) Check the model number imprinted on the product to make sure that the product you received is exactly the product you ordered.

(2) Check the exterior of the product for any damage.

2. INSTALLATION

2. 1. Installation environment

⚠ WARNING :

1) Do not use the vacuum devices in an atmosphere containing corrosive gas, inflammable gas, explosive gas, chemicals, seawater, or vapor. Never allow the vacuum system to suck in such substances.

⚠ CAUTION :

1) Avoid use with the following environment.
   - When the temperature around exceeds the use temperature range of the product
   - When air freezes up
   - The place where there are vibration and an impact
   - The place where drop of water and cut oil splash
   - When the dewfall occurs with the temperature change at high humidity
   - When the spray of the sea breeze, seawater hangs
   - When there is an atmosphere of corrode-able gas, liquid and the chemical medicine
   - The place which is exposed to the direct sunlight

2) Use clean air free from drainage or dirt for ejector air supply. Also, never supply air by a lubricator. Impurities or oil contained in compressed air may cause malfunction or performance drop.

(1) The compression air to use the businesslike air to be pure and little moisture for there to be which let through an air filter. Therefore, use a filter for the circuit and the filter be careful of the position of the degree (equal to or less than 5 μm are desirable) of the filtration, the flow rate and the installation and so on.

(2) Regularly discharge the drain which was stagnant in the filter before exceeding a specification line.

2. 2. Installation

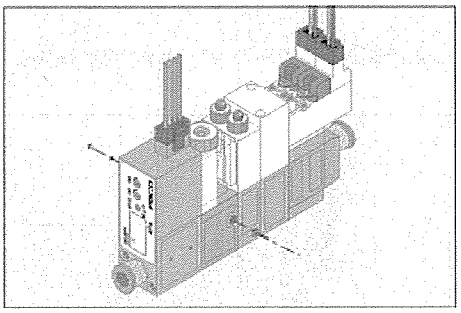
⚠ WARNING :

1) Don't take the way of supporting by the plumbing from the installation of the product.
   ・Fix a main unit in the installation.

⚠ CAUTION :

1) In installing and after installing, don't give the main unit the side load.

(1) The way of fixing VSJ vacuum ejector unit VSJ uses and fixes the hole of the resin main unit for the fixation in the putting with the M3 screw.



2. 3. Piping

⚠ WARNING :

1) Avoid use where there are constant pressures of 0.1MPa or above in the vacuum circuit. Since the vacuum devices are not of explosion-proof structure, such use may cause damage to the device bodies.

2) Avoid such usage as may stop up the exhaust port of the ejector or raise exhaust resistance. Such careless usage may cause the loss or drop of vacuum.

3) Install the piping by checking the ports of the ejector in the manual and by the marking on the body. Mistaken piping may cause damage to the device body.

⚠ CAUTION :

1) The specified supply pressure to ejector is that during ejector operation. Secure the specified level in consideration of pressure drop. If the specified level is not met, then the ejector may emit an abnormal noise at certain supply pressures and become unstable, affecting the sensor and other parts adversely.

2) In selecting the piping and equipment, take into account that the effective sectional area on the supply pressure side of the ejector should be about three times the sectional area of the nozzle diameter. Inadequate supply flow may result in performance drop.

3) Provide the vacuum-side piping as short as possible and with the bore as large as possible. If the piping is long or the bore is small, the response time at suction or release may become loner and the necessary suction flow may not be achieved.

4) Carry out the piping work after checking the JIS symbols stated on the nameplate attached to the main body. If the piping is connected in an incorrect direction, this may cause the customer's equipment to break.

(1) Take care of the following when using nylon or urethane tube.

Use the designated tube and CKD plastic plug (GWP Series). Do not use metal plugs.

Tube outer diameter accuracy

Nylon tube	Within ±0.1mm
Urethane tube (to φ6)	Within ±0.1mm
(φ8 to)	Within $^{+0.1}_{-0.15}$ mm

Use a tube with a hardness of 92° or more. If a tube that does not satisfy diameter accuracy or hardness is used, chucking force may drop or the tube may come off or be difficult to insert.

2. 4. Wiring method

⚠ WARNING :

1) Check that leakage current is 1mA or less when operating the valve. Malfunctions may result from the leakage current and cause problems.

2) When continuously energizing the pilot valve for a long time, heat generated from the coil could cause bums or adversely affect peripheral devices. Contact a CKD sales office representative when using energizing continuously for a long taime.

⚠ CAUTION :

1) Do not excessive tension or bending to the pilot valve or vacuum sensor leads. Wires or connectors may break.

2) Connect the vacuum switch or the ejector with vacuum switch as close to the end of vacuum piping as possible. With much distance between the vacuum switch and the end of vacuum piping, the piping resistance may become large and the vacuum at the sensor may be high even during the non-suction interval. This will cause malfunction of the vacuum switch.

Refer to the enclosed handling manual about the way of using a vacuum sensor with the LED display, note item.

3. USE

⚠ WARNING :

1) Where there is the danger of work dropping, provide some drop prevention means to assure.
2) Watch out for the drop of vacuum due to faulty air supply or power supply. Reduced suction may cause the drop of work. Therefore, take an adequate protective measure.
3) Where two or more pads are used with a single ejector in vacuum circuit, defective suction of one pad may cause the drop of vacuum at the other pad(s).
4) A model with retention type air supply valve (refer to as double solenoid type), must confirm position of change valve by sending signal to or by manually operation of pilot solenoid valve when re-supplying pilot air after shut down once or initial setting because the change valve is placed at neutral position.

⚠ CAUTION :

1) In selecting the piping and equipment, take into account that the effective sectional area on the supply pressure side of the ejector should be about three times the sectional area of the nozzle diameter. Inadequate supply flow may result in performance drop.

(1) Adjusting the relief valve

①See the relief needle opening limit in Table 1, and adjust the relief needle to set the relief pressure.

Table1.Relief needle opening limit

Vacuum characteristics	H : High vacuum medium flow				L : Medium vacuum large flow			E : High vacuum small flow rate		
Nozzle diameter(mm)	0.5	0.7	1.0	1.2	0.5	0.7	1.0	0.7	1.0	1.2
Maximum opening(rotation)	6.5	7.5	8.5	9.0	7.5	8.0	9.0	7.5	8.0	8.5

*1Values in Table 1 apply to rated air pressure. The relief needle opening limit differs based on the supplied air pressure, vacuum properties, and vacuum piping (capacity), etc., so use values in Table 1 as reference.

②After setting the relief needle, confirm that the vacuum properties and vacuum startup time are correct.

*If the relief needle opening limit in Table 1 is exceeded, the vacuum startup time could be delayed, or the correct vacuum degree may not be attained.

③Set the required vacuum release flow rate with the vacuum release flow rate adjustment needle.

*To shorten the vacuum release time, increase the vacuum air release blow rate.

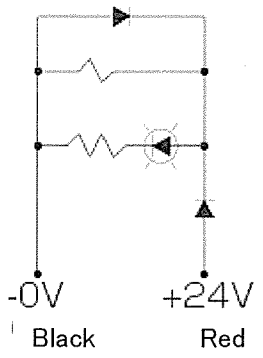
*If the work piece is blown, etc., reduce the vacuum air blow flow rate.

(2) Precautions for using the manifold

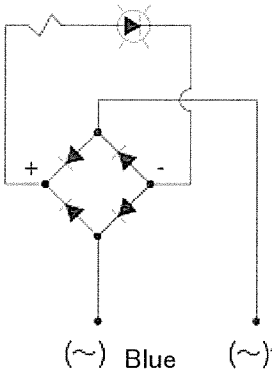
When the number of manifold stations increases, problems such as a drop in vacuum performance due to insufficient air supply, a drop in vacuum performance due to insufficient exhaust port capacity, or entry of exhaust into the vacuum port could occur. The number of stations operated simultaneously differs based on the nozzle size and vacuum performance, etc. Contact CKD Sale for details.

(3) Electric circuit (Solenoid valve)

24VDC
Supply, vacuum release valve



100VAC
Supply, vacuum release valve



4. MAINTENANCE

4. 1. Check

⚠ WARNING :

1) Before servicing the product, turn power OFF, stop the compressed air supply, and check that there is no residual pressure.
2) Please do the maintenance check to the filter element of the vacuum filter of Ejector regularly. It causes the performance decrease or the trouble by stopped up of the element.

⚠ CAUTION :

1) Please execute the daily check and the periodic check in premeditation so that the maintenance management is correctly executed.

4. 2. Maintenance

⚠ CAUTION :

1) lease understand well and execute "Element exchange" of the text to the clearing work of the element.
2) Detaching for the maintenance of the cartridge fitting and the element is possible by pulling out the locking pin. Please confirm the thing that the locking pin has been surely inserted after it installs it.

(1) The clear filter cover is PCT. Avoid using in areas where exposure to chemicals (see the following table) is possible.