

### Design considerations/selection

#### Warning

##### ① Please confirm the specifications.

The products listed in this sample are only designed for use in compressed air systems (including vacuum).

If the pressure and temperature exceed the specification range of this product, it may cause poor operation and damage. Please do not use (see specifications).

When using fluids other than compressed air (including vacuum), please contact our company. Any damage caused when used beyond the specified range cannot be guaranteed to occur unexpectedly.

##### ② Due to power outages or gas supply failures, accidents may occur due to reduced vacuum levels, and safety design should be implemented accordingly.

The decrease in vacuum degree, insufficient suction force of the suction cup, and detachment of the workpiece during transportation can cause damage to human body and mechanical devices. Comprehensive safety measures such as fall prevention should be implemented.

##### ③ Vacuum switching valves and vacuum breaking valves should use vacuum specifications for vacuum piping.

If vacuum specification valves are not used, air leakage or poor operation may occur. Please make sure to use components with vacuum specifications.

##### ④ A vacuum generator with appropriate suction flow rate should be selected.

<In situations where there is leakage from the workpiece or piping>If the suction flow rate is insufficient, poor adsorption will occur,<Pipeline length or occasion of piping>As the piping volume increases, the adsorption response time will become longer.

Please refer to technical information to select a suitable vacuum generator for suction flow rate.

##### ⑤ If the suction flow rate is too high, it will be difficult to set the direct air switch.

For small workpieces that are several millimeters in size, selecting a vacuum generator with excessive suction flow rate in one day will make it difficult to set the vacuum pressure switch due to the small difference between the vacuum pressure when not suction, so it is necessary to choose a suitable vacuum generator.

##### ⑥ In situations where one vacuum generator drives two or more suction cups, once the workpiece on one suction cup falls off, the workpiece on the other suction cups will also fall off.

Because the workpiece on one suction cup falls off, the vacuum degree decreases, and the workpiece on other suction cups will also fall off.

##### ⑦ When the suction cup and workpiece detach, vacuum damage must be carried out. Please confirm that it has changed to atmospheric state.

Please do not force separation under vacuum, as the suction cup may crack, tear, deform, or detach from the connecting parts.

##### ⑧ When the workpiece is being sucked or after being sucked, be careful not to apply lateral force to the suction surface of the suction cup due to the rotation and sliding of the workpiece.

The suction cup may crack, tear, deform, or detach from the connecting parts

### Design considerations/selection

##### ⑨ Prohibition of disassembly and renovation

Do not disassemble or modify the main body (including post-processing) for maintenance purposes. To avoid personal injury and accidents When disassembling and assembling parts for replacement, it is necessary to strictly follow the user manual sample

##### ⑩ Vacuum retention of one-way valves

Our company cannot provide any guarantee regarding the use of a one-way valve to maintain the adsorption of the workpiece. Please take other safety measures to prevent workpieces from falling during power outages.

When using a one-way valve to prevent interference from the exhaust of adjacent vacuum generators, you can inquire with our company.

##### ⑪ Regarding the leakage of the main valve

The main valve used in the vacuum generator and vacuum pump system cannot guarantee zero leakage. When air leakage becomes a problem, please consult our company.

##### ⑫ The vacuum suction cup cannot guarantee zero leakage (vacuum retention).

#### Pay attention

##### ① Setting of vacuum filters

Vacuum components not only need to suck in workpieces, but also dust and water droplets around them, so it is necessary to prevent these from entering the interior of the components. Even for units with filters, in situations with a large amount of dust, etc., larger filters should be added. Also, in situations where water droplets may be inhaled, a vacuum water droplet separator should be used.

##### ② The maximum vacuum degree of a vacuum generator is influenced by the atmospheric pressure of the place of use.

The atmospheric pressure varies with altitude and climate, so the actual maximum vacuum may not reach the values recorded in the specifications.

##### ③ Please refer to the precautions for each sample for directional control components, driving components, and other related components.

##### ④ In areas with vibration, the flow adjustment needle valve may become loose if damaged, so do not use in areas with vibration. In places of vibration, lock nut type can be used. You can inquire about the model from our company.

##### ⑤ Foreign objects may get into the suction cup.

When forming suction cups, great attention is paid to the mixing of foreign objects, but it is difficult to completely remove foreign objects in the finished product. Therefore, if the foreign objects are very small and the quantity is not large, they will be considered as qualified products before leaving the factory.



### Design considerations/selection

#### ⚠ Pay attention

- ⑥ **White powdery crystals or liquids may appear on the surface of rubber.**

Powder is called spray frost, and liquid is called spray liquid. Even if frost (spray liquid) is produced, there is no problem with its use. This phenomenon is caused by the ingredients of rubber (which vary depending on the rubber material, such as vulcanizing agents/anti-aging agents/oxidation inhibitors/softeners/release agents, etc.). In addition, this phenomenon is also affected by environmental changes (temperature difference/light (fluorescent lamps)/humidity, etc.), so it cannot be generated in a specific period.

### Install

#### ⚠ Warning

- ① **User manual**  
Please install and use this product after carefully reading and correctly understanding the content. Please keep it safe for use at any time
- ② **Ensuring maintenance space**  
Please ensure the necessary space for maintenance inspections
- ③ **Tightening of threads and strict adherence to tightening torque**  
During installation, the threads should be tightened according to the recommended torque
- ④ **When installing the suction cup, please firmly fix it**  
If loosened, there is a risk of malfunction
- ⑤ **When the rotation of the suction cup is used to transport workpieces/when there is a deviation in the center of gravity of the suction position of the suction cup, please pay attention to it**  
There is a risk of failure due to the loosening of screws caused by rotation and the rotation of the suction cup. Additionally, as needed, use anti loosening adhesive on the screw area
- ⑥ **By using a shaking head suction cup structure, operations can be avoided in the direction of rotation**  
There is a risk of malfunction due to wear and tear
- ⑦ **Buffer used to alleviate the load on the suction cup (for horizontal lifting)**  
Tilting and vertical lifting may cause poor movement
- ⑧ **After sliding the buffer (stroke), confirm that it has returned to the initial state before proceeding to the next step of operation (engineering)**  
Possible occurrence of poor movement
- ⑨ **When the suction cup is squeezed onto the workpiece, do not apply impact or excessive force**  
Otherwise, it will accelerate the deformation, cracking, and wear of the suction cup. When the suction cup is squeezed onto the workpiece,

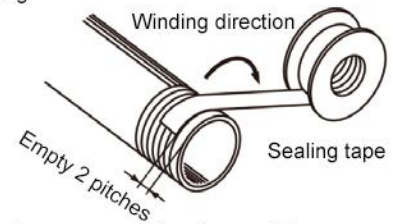
### Install

- ⑩ **The exhaust port of the vacuum generator must not be blocked.**  
If the exhaust port is blocked during installation, vacuum cannot be generated. Also, it is not allowed to block the exhaust port for the purpose of workpiece detachment. This may cause product damage.

### Piping

#### ⚠ Pay attention

- ① **Disposal before piping.**  
Before piping, thoroughly blow (rinse) or wash the chips, chip oil, dust, etc. inside the pipe.
- ② **The winding method of sealing tape**  
Pipes and fittings are threaded connections, and it is not allowed to mix chips and sealing tape fragments from pipe threads into the interior of the pipes.  
When using sealing tape, the thread head should be left with 1.5-2 pitches free without curling.



- ③ **Conduct sufficient effective cross-sectional area piping.**  
The vacuum piping side selects components and piping with sufficient effective cross-sectional area based on the maximum suction flow through the vacuum generator.  
Also, do not throttle or leak in the piping. Consider the maximum air consumption of the vacuum generator and the air consumption of other air circuits when designing the air source.
- ④ **The piping cannot be spiral.**  
Spiral piping should not appear on both the vacuum and supply sides, and should be as short and straight as possible. An increase in piping volume leads to a longer response time.
- ⑤ **The effective cross-sectional area of the piping on the exhaust side of the vacuum generator should be large.**  
Once the exhaust is throttled, the performance of the vacuum generator deteriorates.
- ⑥ **The piping should not be damaged or bent due to damage.**

### Air source

#### ⚠ Warning

- ① **About the types of fluids**  
When using fluids, please use compressed air, where fluids other than compressed air are used. Please check with our company.

## Air source

Additionally, please use clean compressed air that has been removed from moisture, oil, and condensate

### ② Regarding the management of air supply

Compressed air containing a large amount of water, oil, and condensate is the cause of poor operation of pneumatic components. Please set up air filters, air dryers, oil mist separators, etc. (Recommended quality level of system NO.CD or above in the purification component selection guide of BestPneumatics Volume 6). In addition, directional control components and driving components are used in situations where compressed air is used for oil supply. In order to supply air to vacuum components before oil supply, please set up separate piping. If oil flows into the vacuum generator/vacuum pump system, mufflers, nozzles, and waveguides, blockage may occur, resulting in poor performance.

### ③ Condensate discharge management

Once the condensate from the condensate collector and air filter is forgotten to be discharged, the cooling water will flow out of the outlet side, causing poor operation of the pneumatic components. In situations where condensate discharge management is difficult, it is recommended to use a compressed air filter with automatic drainage. Please refer to our company's "Compressed Air Purification System" for details on the properties of compressed air

### ④ The type of air

When compressed air contains chemicals, synthetic oils containing organic solvents, salts, corrosive gases, etc., it can become a cause of damage and poor operation. Please do not use it

## Using environment

### Warning

- ① It shall not be used in environments with corrosive gases, chemicals, organic solvents, seawater, water, or water vapor, or in places where the above substances are attached.
- ② Do not use in places that generate vibration or impact.
- ③ Do not use in places with explosive and flammable gases to avoid fire and explosion. This product is not an explosion-proof structure.
- ④ In situations where direct sunlight is present, protective covers should be added.
- ⑤ In situations where there is a heat source around, radiation heat should be shielded.
- ⑥ Suitable protective measures should be taken in places with water droplets, oil, and welding slag splashes attached.
- ⑦ In situations where the vacuum unit is surrounded and has been powered on for a long time, heat dissipation measures should be taken to ensure that the operating temperature of the vacuum unit is within the specified range.

## Using environment

### Pay attention

- ① Under certain conditions, a vacuum generator may produce intermittent sounds (abnormal sounds) from the exhaust and unstable vacuum pressure.

Even when used in this state, there is no problem with the function of the vacuum generator. In situations where intermittent sound is more important, considering the impact on the action of the vacuum pressure switch, let the supply pressure of the vacuum generator slightly increase or decrease, and use a supply pressure that does not produce intermittent sound.

## Maintenance check

### Warning

- ① Maintenance and inspection should be carried out according to the steps in the user manual.  
Once used incorrectly, it may cause poor operation and damage to components and devices
- ② Maintenance tasks  
Once compressed air is used incorrectly, it is dangerous. While complying with product specifications, the replacement of filter elements and other maintenance should be carried out by people who have sufficient knowledge and experience in pneumatic components.
- ③ Discharge of condensate water  
The condensate at the condensate collector, air filter, vacuum water droplet separator, etc. should be discharged regularly.
- ④ Disassemble components and supply and exhaust compressed air  
After confirming that measures have been taken to prevent the workpiece from falling down and falling out, cut off the air and power supply, and only after the compressed air in the system has been emptied can the components be disassembled. Also, when reinstalling and replacing components before restarting, it is necessary to confirm that the components can function properly.
- ⑤ Regular maintenance should be carried out on the vacuum filter and muffler.  
If the holes of the filter and muffler are blocked, the performance of the vacuum generator will be reduced. Especially in dusty environments, vacuum filters with high processing flow should be used.
- ⑥ Leakage of the pneumatic circuit, blockage of the eyelets, wear, cracking, deterioration of the suction cups, and poor sliding of the buffer (such as wear and scratches on the sliding part) may cause malfunctions. Please perform regular maintenance.
- ⑦ When adsorbing special shaped/spherical workpieces, it is necessary to press the suction cup.  
Even if it can be sucked in at the beginning, there is a risk of deformation, cracking, and wear of the suction cup, which can cause malfunctions. Please make sure to conduct regular maintenance inspections.