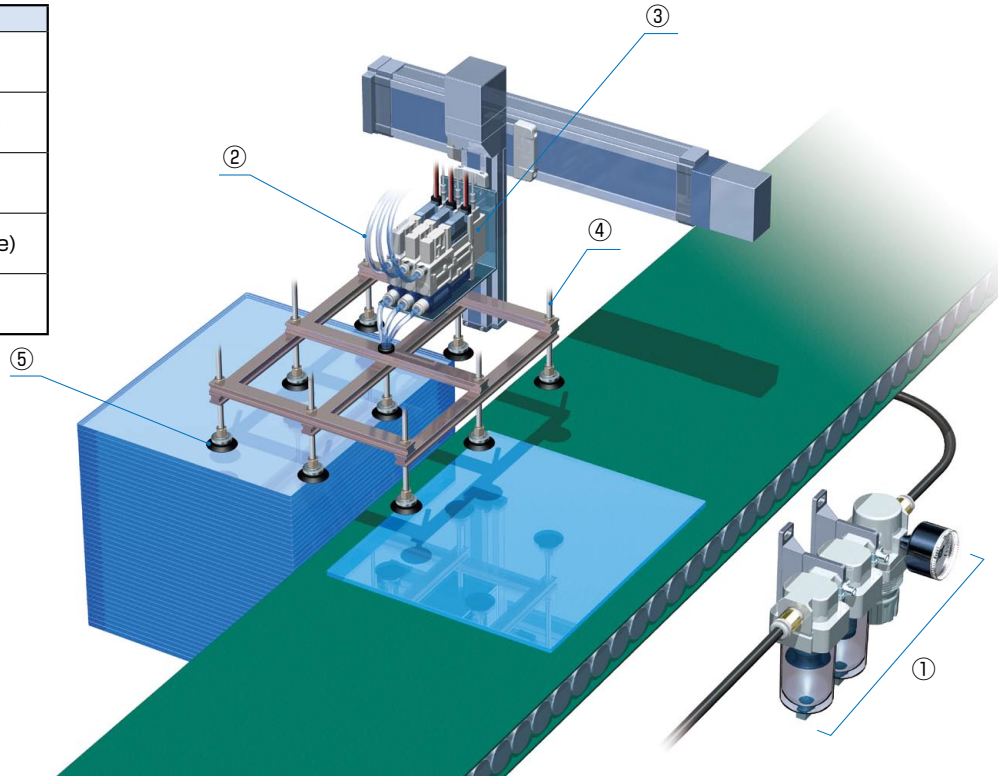




| Check location | Description |
|----------------|----------------------|
| ① | Filter/Regulator |
| ② | Tubing (Supply side) |
| ③ | Ejector module |
| ④ | Tubing (Vacuum side) |
| ⑤ | Vacuum Pad |



Before checking

Refer to Table (1), and confirm that all tubes are correctly connected to the “ejector unit.”

| Check location | | Detailed status | [Probable cause] and Actions |
|----------------------|--------------------|--|---|
| ① Filter/Regulator | | <input type="checkbox"/> Element is dirty. Drain is over the “DRAIN LEVEL.” | [Insufficient pressure and flow rates] • Replace air filter elements • Discharge drain. • Replace bowl assembly |
| | | <input type="checkbox"/> Supply pressure is set below pressure range specification. | [Insufficient pressure and flow rates] • Set within supply pressure range. |
| | | <input type="checkbox"/> Pressure gauge is deviating abnormally. | [Insufficient pressure and flow rates] • Take measures against pulsation. • Check the size of device. |
| ② Supply side/Tubing | | <input type="checkbox"/> There is bending or flattening of tubing. | [Insufficient pressure and flow rates] • Reconnect tubing • Replace tubing |
| | | <input type="checkbox"/> Air leaks from tube connection portion. | [Insufficient pressure and flow rates] • Reconnect tubing→ Check cut surface of tubing. • Replace tubing |
| ③ Ejector module | Ejector | <input type="checkbox"/> Silencer (exhaust) is clogged or dirty. | [Operation trouble by back pressure]→ Refer to table (4) • Remove foreign (drain) objects • Replace sound absorbing material |
| | Ejector | <input type="checkbox"/> Nozzle or diffuser is clogged. | [Operation trouble by back pressure] • Remove foreign objects • Replace ejector assembly |
| | Air suction filter | <input type="checkbox"/> Element is clogged or dirty. | [Insufficient suction flow rate]→ Refer to table (5) • Replace element |
| ④ Vacuum side/Tubing | | <input type="checkbox"/> There is bending or flattening of tubing. | [Insufficient pressure and flow rates] • Reconnect tubing. • Replace tubing |
| | | <input type="checkbox"/> Air leaks from tube connection portion. | [Insufficient pressure and flow rates] • Reconnect tubing→ Check cut surface of tubing. • Replace tubing |
| ⑤ Vacuum Pad | | <input type="checkbox"/> Vacuum pad adsorption surface has deteriorated or is worn. | [Leakage] • Replace vacuum pads |
| | | <input type="checkbox"/> There is leakage due to deformation of a workpiece during adsorption. | [Leakage] • Reconsider pad type • Reconsider vacuum ejector |
| | | <input type="checkbox"/> Vacuum pressure deteriorates when picking up multiple workpieces. (There is leakage caused by parallel usage of vacuum pads.) | [Deterioration of pressure or flow rate due to flowing around of air] • Reconsider tubing → Vacuum saving valve Consider using (Series ZP2V). |

Refer to Table (1), and confirm that all tubes are correctly connected to the “ejector unit.”

| Check location | | Detailed status | [Probable cause] and Actions |
|----------------------|-------|--|---|
| ① Filter/Regulator | | <input type="checkbox"/> IN and OUT tubing is connected in reverse. | [Insufficient pressure and flow rates] · Reconnect tubing. |
| | | <input type="checkbox"/> Being used below the pressure range specification. | [Insufficient pressure and flow rates] · Set within supply pressure range. |
| ② Supply side/Tubing | | <input type="checkbox"/> There is bending or flattening in tubing. | [Insufficient pressure and flow rates] · Reconnect tubing. · Replace tubing. |
| ③ Ejector module | Valve | <input type="checkbox"/> Specified power is not supplied. | [Insufficient voltage] [Broken wire] · Check the power supply |
| | | <input type="checkbox"/> Light does not turn ON with electric signal. | |
| | | <input type="checkbox"/> Cannot be switched by manual operation of the solenoid valve. | [Catching of foreign matter]→ Refer to table (2) · Replace solenoid valves (Valve assembly) |
| | | <input type="checkbox"/> PE port is plugged. | [Operation trouble caused by pilot back pressure] → Refer to table (1) · Open or attach silencer. |
| | | [When using ZA/ZB/ZQ series latching type] <input type="checkbox"/> Solenoid is not set in original position. | [Not set in original position] → Refer to table (3) |
| ④ Vacuum side/Tubing | | <input type="checkbox"/> There is bending or flattening of tubing. | [Insufficient pressure and flow rates] · Reconnect tubing. · Replace tubing. |

Table (1) Description and Application of Each Port

| Port | Description | Application | Port | Description | Application |
|------|---|---|------|-----------------------------|--|
| PV | Vacuum supply port | Supply port of compressed air for ejector operation | V | Vacuum port | Port to connect pads, etc. |
| PS | Pilot pressure supply port | Port which is not used in ejector system | EXH | Exhaust port | Exhaust port used during ejector operation |
| PD | Individual release pressure supply port | Supply port for individual setting of release pressure (Option) | PE | Pilot pressure exhaust port | Exhaust port used during valve switching operation |

| | ZX | ZR | ZQ | ZB | ZK2 |
|-------------------------|----|----|----|----|-----|
| Single Unit | | | | | |
| Manifold Specifications | | | | | |

Table (2) "Release flow rate adjustment needle" and "Manual override" Operation Position ➡ Vacuum break flow adjustment needle ➡ Manual override

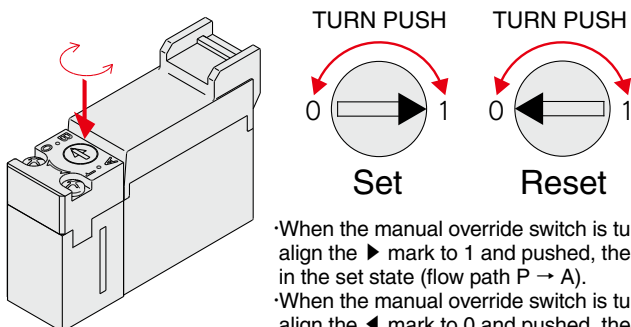
| ZX | ZR | ZQ | ZB | ZK2 |
|----|----|----|----|-----|
| | | | | |

Table (3) Notes for "Latching type"

The position may have changed to the set position due to impact during transfer or mounting. Confirm the original position by supplying power or manual override before use.

| Latching | Operating | Indicator light (when energized) |
|----------|-------------------|----------------------------------|
| Set | Vacuum generation | Orange |
| Reset | Vacuum suspension | Green |

■ Push-lock Type (Tool required) (Latching Type)



- When the manual override switch is turned to the right to align the ► mark to 1 and pushed, the switch can be locked in the set state (flow path P → A).
- When the manual override switch is turned to the left to align the ◀ mark to 0 and pushed, the switch returns to the reset state (flow path A → R). (Reset state when shipped)

Turn the manual override switch first then push. If the manual override switch is turned forcibly while pushed it will cause damage.

Table (4) How to remove the sound absorbing material

➔ Sound absorbing material

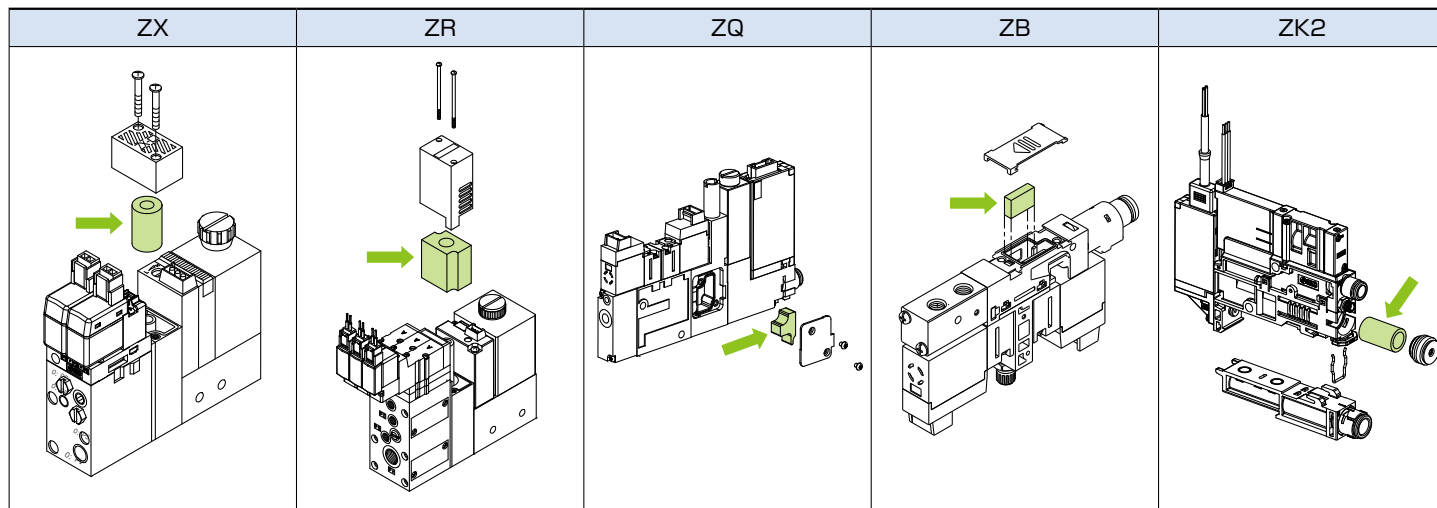
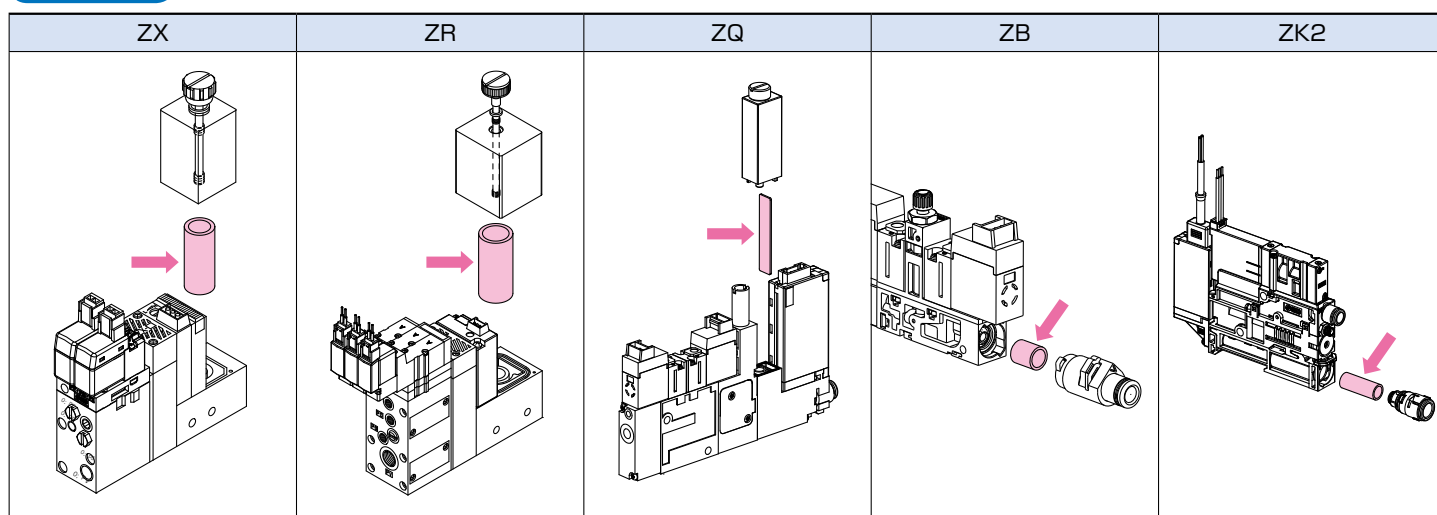
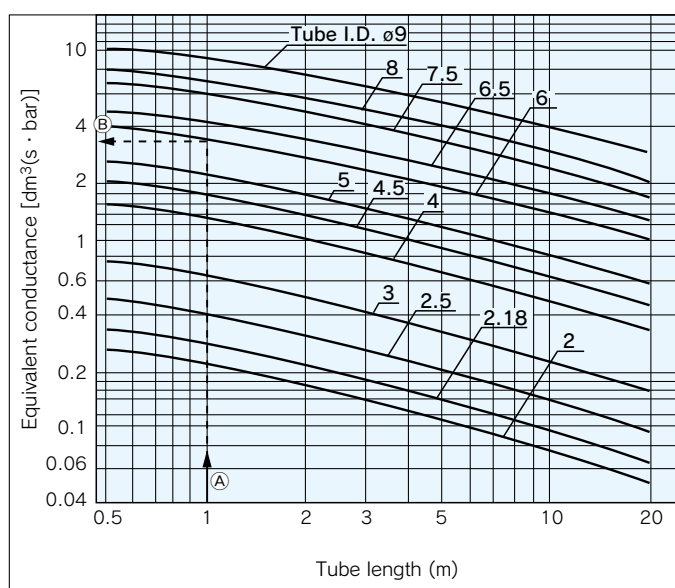


Table (5) How to remove the air suction filter

➔ Air suction filter



Selection Graph Conductance by Tube I.D.



How to read the graph

Example: Tube size $\phi 8/\phi 6$ and 1 meter length

<Selection Procedure>

By extending leftward from the point at which the 1 meter tube length on the horizontal axis intersects the line for a tube I.D. $\phi 6$, the equivalent conductance of approximately 3.6 [dm³/(s·bar)] can be obtained on the vertical axis.

Equivalent conductance ≈ 3.6 [dm³/(s·bar)]

◎ = Excellent --- Not affected at all, or almost no effect
 ○ = Good --- Affected a little, but adequate resistance depending on conditions
 △ = Avoid usage if possible
 × = Unsuitable for usage. Severely affected.

● Rubber Material and Properties

| General name | NBR (Nitrile rubber) | Silicone rubber | Urethane rubber | FKM (Fluoro rubber) | CR (Chloroprene rubber) | EPR (Ethylene-propylene rubber) | Conductive NBR (Nitrile rubber) | Conductive silicone rubber | Conductive silicone sponge | Conductive CR sponge (Chloroprene sponge) | |
|--------------------------------------|--|--|-------------------------------|---|---|--|--|--|--|---|-----------------------|
| Main features | Good oil resistance, abrasion resistance, and aging resistance | Excellent heat resistance, and cold resistance | Excellent mechanical strength | Best heat resistance, and chemical resistance | Well balanced weather resistance, ozone resistance, and chemical resistance | Good aging resistance, ozone resistance, and electrical properties | Good oil resistance, abrasion resistance, and aging resistance. Conductive | Excellent heat resistance, and cold resistance. Conductive | Excellent heat insulation, and impact resilience | Excellent impact resilience, and sound insulation. Flame retardance | |
| Pure gum property (specific gravity) | 1.00-1.20 | 0.95-0.98 | 1.00-1.30 | 1.80-1.82 | 1.15-1.25 | 0.86-0.87 | 1.00-1.20 | 0.95-0.98 | 0.4g/cm ³ | 0.161g/cm ³ | |
| Physical properties of blended gum | Impact resilience | ○ | ◎ | ◎ | △ | ◎ | ○ | ◎ | × to △ | × to △ | |
| | Abrasion resistance | ◎ | × to △ | ◎ | ◎ | ◎ | ○ | ◎ | × to △ | × | |
| | Tear resistance | ○ | × to △ | ◎ | ○ | ○ | △ | ○ | × to △ | × | |
| | Flex crack resistance | ○ | × to ○ | ◎ | ○ | ○ | ○ | ○ | × to ○ | × | |
| | Maximum operation temperature °C | 120 | 200 | 60 | 250 | 150 | 150 | 100 | 200 | 180 | |
| | Minimum operation temperature °C | 0 | -30 | 0 | 0 | -40 | -20 | 0 | -10 | -30 | |
| | Volume resistivity (Ωcm) | — | — | — | — | — | — | 10 ⁴ or less | 10 ⁴ or less | 4.8 x 10 ⁴ | 3.8 x 10 ⁴ |
| | Heat aging | ○ | ◎ | △ | ◎ | ○ | ○ | ○ | ◎ | △ | |
| | Weather resistance | ○ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | △ | |
| | Ozone resistance | △ | ◎ | ◎ | ◎ | ○ | ◎ | △ | ◎ | △ | |
| Gas permeability resistance | ○ | × to △ | × to △ | × to △ | ○ | × to △ | ○ | × to △ | × | | |
| Chemical resistance | Gasoline/Gas oil | ◎ | × to △ | ◎ | ◎ | ○ | × | ◎ | × to △ | × | |
| | Benzene/Toluene | × to △ | × | × to △ | ◎ | × to △ | × | × to △ | × | × | |
| | Alcohol | ◎ | ◎ | △ | △ to ◎ | ◎ | ◎ | ◎ | ◎ | △ | |
| | Ether | × to △ | × to △ | × | × to △ | × to △ | ○ | × to △ | × to △ | × | |
| | Ketone (MEK) | × | ○ | × | × | △ to ○ | ◎ | × | ○ | × | |
| | Ethyl acetate | × to △ | △ | × to △ | × | × to △ | ◎ | × to △ | △ | × | |
| Alkaline resistance | Water | ◎ | ○ | △ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | |
| | Organic acid | × to △ | ○ | × | △ to ○ | × to △ | × | × to △ | ○ | × | |
| | Organic acid of high concentration | △ to ○ | △ | × | ◎ | ○ | ○ | △ to ○ | △ | × | |
| | Organic acid of low concentration | ○ | ○ | △ | ◎ | ◎ | ◎ | ○ | ○ | × | |
| | Strong alkali | ○ | ◎ | × | ○ | ◎ | ◎ | ○ | ◎ | △ | |
| | Weak alkali | ○ | ◎ | × | ○ | ◎ | ◎ | ○ | ◎ | △ | |

* The indicated physical properties, chemical resistance and other numerical values are only approximate values used for reference. They are not guaranteed values.
 · The above general characteristics may change according to the working conditions and the working environment.
 · When determining the material, carry out adequate confirmation and verification in advance.
 · SMC will not bear responsibility concerning the accuracy of data or any damage arising from this data.

● Color and Identification (ZP/ZP2)

| General name | NBR (Nitrile rubber) | Silicone rubber | Urethane rubber | FKM (Fluoro rubber) | CR (Chloroprene rubber) | EPR (Ethylene-propylene rubber) | Conductive NBR (Nitrile rubber) | Conductive silicone rubber | Conductive silicone sponge | Conductive CR sponge (Chloroprene sponge) |
|-------------------------------|----------------------|---|-----------------|----------------------|-------------------------|---------------------------------|---------------------------------|----------------------------|----------------------------|---|
| Color of rubber | Black | White | Brown | Black | Black | Black | Black | Black | Black | Black |
| Identification (Dot or stamp) | — | — | — | · Green 1 dot · F | · Red 1 dot · C | · E | · Silver 1 dot | · Silver 2 dots | — | — |
| Rubber hardness HS (±5°) | A50/S | Other than Heavy duty A40/S Heavy duty A50/S | A60/S | A60/S | A50/S | A50/S | A50/S | A50/S | 20 | 15 |

● Color and Identification (ZP3)

| General name | NBR (Nitrile rubber) | Silicone rubber | Urethane rubber | FKM (Fluoro rubber) | Conductive NBR (Nitrile rubber) | Conductive silicone rubber |
|--------------------------|----------------------|-----------------|-----------------|---------------------|---------------------------------|----------------------------|
| Color of rubber | Black | White | Brown | Black | Black | Black |
| Identification (Dot) | — | — | — | · Green 1 dot | · Silver 1 dot | · Pink 1 dot |
| Rubber hardness HS (±5°) | A60/S | | | | | |

Note) The hardness of rubber shall conform to JIS K 6253. The hardness of sponge shall conform to SRIS 0101.