Thank you for choosing this SMC product. This operation manual provides essential information to ensure its optimum performance and lifespan. Please read it before using the product. Keep this manual accessible and refer to it if problems occur. Please refer to the latest catalogue, drawings and maintenance procedures for product configuration and specifications.

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>VBA10A</th>
<th>VBA11A</th>
<th>VBA20A</th>
<th>VBA22A</th>
<th>VBA40A</th>
<th>VBA42A</th>
<th>VBA43A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure increase ratio</td>
<td>MAX:2</td>
<td>2 to 4</td>
<td>MAX:2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating fluid</td>
<td>Compressed air</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set pressure range</td>
<td>0.2 to 2.0MPa</td>
<td>0.2 to 1.0MPa</td>
<td>0.2 to 1.6MPa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplied pressure range</td>
<td>0.1 to 1.0MPa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proof pressure</td>
<td>2MPa</td>
<td>9MPa</td>
<td>2.4MPa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature and operating fluid temperature</td>
<td>-20°C to 60°C</td>
<td>(No freezing)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubrication</td>
<td>Lubrication is not allowed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounting posture</td>
<td>Horizontal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governor* (pressure adjusting mechanism)</td>
<td>Handle-operated type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The default pressure of the handle is 0. When the air is supplied, the pressure is relieved.

![Diagram](image)

Before piping, flush pipes to remove cutting chips, cutting oil, and dust which may cause malfunction or lower the durability of the booster regulator.

**CAUTION**

- Do not install the product where it can be exposed to rain or direct sunlight.
- Do not install the product where it can be affected by vibration.

**Operation Precautions**

- **Before requesting service**
- **Operation Precautions**
- **Handling Precautions**

- Handle-operated type
- Air-actuated type
- Handle-operated type

**Dealing With Residual Pressure**

- Release the residual pressure relief valve on the inlet side of the booster regulator after operation is stopped. Stop unnecessary motion of the booster regulator to prevent switching failure that occurs below the minimum operating pressure.

**WARNING**

- **Warning about error of the outlet pressure.**
- **Even though the booster valve cannot correctly boost the pressure due to the valve reaching the end of its life or malfunctioning, supply air continues coming out from OUT port and the exhaust port.**
- **Even when the booster valve operates correctly, the outlet pressure could exceed its set range depending on the governor adjustment, which may lead to unexpected accidents.**

- **Release the supply pressure with the residual pressure relief valve after operation is stopped.** Stop unnecessary motion of the booster regulator to prevent switching failure that occurs below the minimum operating pressure.,
Pressure operation

- The outlet pressure increase when handle is rotated in the [+] direction.
- The outlet pressure decrease when handle is rotated in the [-] direction.
- The handle is locked when it is pushed down (PUSH), and released when it is pulled up (PULL).
- When decreasing the outlet pressure, air leaks from the handle due to the relief mechanism.

Air operated type

Connect a regulator to the pilot port as shown below. AR20 and AW20 is recommended for the pilot regulator.

![Diagram of air operated type]

Troubleshooting

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Possible cause</th>
<th>Time of occurrence</th>
<th>Countermeasures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leakageage from the handle (Relief doesn’t stop)</td>
<td>Inlet pressure is higher than the set pressure.</td>
<td>Beginning</td>
<td>Set the pressure to the inlet pressure or more with the handle. If the inlet pressure fluctuation is large, stabilize it with a regulator.</td>
</tr>
<tr>
<td>Pressure doesn’t increase.</td>
<td>Sealing failure of the governor due to foreign matter.</td>
<td>Middle</td>
<td>Disassemble the governor and remove the foreign matter (Refer to the maintenance procedure).</td>
</tr>
<tr>
<td></td>
<td>IN and OUT piping connected the wrong way round.</td>
<td>Beginning</td>
<td>Reconnect the piping property.</td>
</tr>
<tr>
<td></td>
<td>Insufficient supply of inlet pressure and flow rate.</td>
<td>Middle</td>
<td>□ Decrease the operating pressure and flow rate.</td>
</tr>
<tr>
<td></td>
<td>Outlet flow rate (amount used) is too much.</td>
<td></td>
<td>□ Change the size of the booster valve (from VBA2 to VBA4).</td>
</tr>
<tr>
<td></td>
<td>The silencer is clogged.</td>
<td></td>
<td>□ Increase the number of the booster valve (for parallel and series).</td>
</tr>
<tr>
<td></td>
<td>The handle is turning idly (handle breakage).</td>
<td>Beginning</td>
<td>Remove the handle and rotate the square nut with a spanner wrench.</td>
</tr>
<tr>
<td>Operation doesn’t stop.</td>
<td>The booster valve stopped because the pressure was lower than the minimum operating pressure.</td>
<td>Middle</td>
<td>Relieve the supply pressure after the operation is stopped. If the inlet pressure fluctuation is large, stabilize it with a regulator.</td>
</tr>
<tr>
<td></td>
<td>(Intermediate stop of the directional control valve)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Operation is stopped due to intrusion of foreign matter.</td>
<td>Beginning</td>
<td>□ Supply air and increase the exhaust pressure while holding the exhaust port with your finger. Then release your finger quickly.</td>
</tr>
<tr>
<td></td>
<td>(Intermediate stop of the directional control valve due to increase in internal resistance.)</td>
<td>Middle later</td>
<td>Relieve the air from IN and OUT ports. After that, supply the air again and increase the pressure rapidly.</td>
</tr>
<tr>
<td></td>
<td>Sealing is worn out or broken due to intrusion of foreign matter or lubrication running out.</td>
<td>Middle later</td>
<td>Change the seals (Refer to the maintenance procedure).</td>
</tr>
</tbody>
</table>

- As shown in the drawing on the right, the outlet pressure is twice as much as the pilot pressure.

⚠️ WARNING ⚠️

- Operate the booster regulator within its maximum operating pressure and set pressure range.
- Do not rotate the handle to a pressure exceeding the max. set pressure.
- Do not supply 0.5MPa or more of pilot pressure for VBA22A and VBA42A. When the inlet pressure becomes 0.5MPa or more, the outlet pressure will increase and finally exceed the operating pressure range. The lower limit of the set pressure should be the inlet pressure plus 0.1MPa or more. When the booster regulator is operated with the minimum operating pressure (0.1MPa) or less, the directional control valve may stop at the intermediate position.

⚠️ CAUTION ⚠️

- The pressure of the handle is set to 0 before shipment. When the air is supplied, the pressure is relieved.
- It is not possible to reduce the pressure to the inlet pressure or less. A regulator function is not installed.
- There are upper and lower limits to the handle operation. If the handle is rotated too much, it will break.

Selection

- Since the booster regulator is a compressor that uses air as power, air is consumed. The air consumption is approx. 1.2 times (ratio of intensified pressure 2) and approx. 2.7 times (ratio of intensified pressure 4) as much as air consumed on the outlet side. Therefore, inlet air supply should be approx. 2.2 times (ratio of intensified pressure 2) and approx. 3.7 times (ratio of intensified pressure 4) as much as air consumed on the outlet side. For long term continuous operation, the booster regulator’s lifespan must be verified. The life expectancy of a booster regulator depends on the operational cycle. Thus the more frequently the actuator operates in the outlet side, or the higher the pressure, the shorter the life expectancy will be.

Before requesting service

- Handle operation type
- Air operated type

Wrapping up

Select

- The life of the booster regulator depends on the air quality and operating conditions. The following are signs that it is reaching the end of the life.
  - □ Even when the outlet flow rate is 0, the booster regulator doesn’t stop. (When the interval of the exhaust noise is less than 30 seconds, the seals are being worn out or damaged.)
  - □ Sliding noise. (abnormal noise) (This indicates that the Lubrication is running out.)
  - □ The silencer mounted on the exhaust turns black due to dirt. (Seals are getting worn out, so particles get stuck in the silencer.)

- Maintenance
  - □ Only personnel who are fully trained and experienced in pneumatically operated machinery and equipment should perform the maintenance in accordance with the maintenance manual.
  - □ Refer to the maintenance manual for the replacement parts.

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