Series 6100

Diaphragm Actuator

70-17-40-06-EN
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1. General

1.1 Introduction to Actuator

A) The Honeywell pneumatic diaphragm actuator has been designed to meet the requirements of valve operation.

B) Honeywell pneumatic diaphragm actuator has been designed for easy maintenance and piping.

C) Honeywell Pneumatic Diaphragm Actuator boasts a long life span and has few faults. To use the system to its full life span, you should install it correctly according to the manual and maintain it according to the prescribed procedures while using it.

D) The most important feature of the Honeywell pneumatic diaphragm actuator is the size of actuators that have been manufactured to meet the requirements of piping. The volume of the actuator was designed to be small compared to the output torque so as to enable piping in a narrow space.

◆ RECOMMENDATIONS

Engineers who have professional assembly capabilities are required to maintain Diaphragm Actuator. Therefore, it is more economical to request repairs of the valves to Honeywell. As the valves repaired by Honeywell are thoroughly tested and warranted, you are recommended to entrust Honeywell with repairs.

To avoid possible injury to personnel or damage to valve parts, WARNING and CAUTION notes must be strictly followed. Modifying this product, substituting non-factory parts or using maintenance procedures other than outlined could drastically affect performance, be hazardous to personnel and equipment and may void existing warranties.
1.2 Characteristics of Actuator

The Honeywell pneumatic actuator is a reversible type that allows simple switching of the valve action on site. (See Fig 1.1); Air Fail Close ↔ Air To Open

![Diagram](image)

Fig 1.1 Valve Action Switching

2. Storage

A) Do not throw, drop or drag the actuator when transporting it.

B) Keep all parts of the actuator in a well-ventilated place protected from fire, rain and wind.
   
   Store the valve at a temperature between -29°C (-20°F) and 48°C (120°F).
   
   The storage area must be protected from flooding.

C) Operate the elastomer (O-ring type) of pneumatic actuator at least once every six months to prevent their functional degeneration. Operate it to the full stroke even under general operation conditions at least three times a month.
3. Operation

3.1 Inspections before Operation

A) Check whether there is any leak from all connections including the air pipe connections.
B) Check whether the attached manual hand wheel is at the Neutral position.
C) Check whether the air pressure required for valve operation is accurately set.
   (Diaphragm Actuator: 4.0 kgf/cm², Special specification: 5.0 kgf/cm²)

- WARNING -

① Remove air pressure from the actuator before using the manual hand wheel. If you use
   the hand wheel without removing air pressure, it may not work normally and its weak
   part may get damaged by overstrain.

② If the manual hand wheel is not at the Neutral position during control operation, it may
   not work normally and its weak part may get damaged.

③ If you use a pressure higher than the specified pressure on the name plate, the rubber
   and O-rings of the actuator may be damaged and cause operation problems.
4. Maintenance and Repair

REGULAR INSPECTION
Repair and inspect as described below. If any malfunction occurs, take appropriate measures according to the preventive maintenance procedures and troubleshooting in Chapter 6. Also, disassemble and inspect the system during the regular overhaul period, and replace parts if necessary.

◆ RECOMMENDATIONS
The life span of the valve can increase if you replace parts according to their replacement cycles. Refer to the Part Replacement Cycle Sheet shown below.

<table>
<thead>
<tr>
<th>Part Replacement Cycle Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item Name</td>
</tr>
<tr>
<td>Diaphragm Rubber</td>
</tr>
<tr>
<td>Diaphragm O-ring</td>
</tr>
</tbody>
</table>

IRREGULAR INSPECTIONS
① Are there abnormal noise, vibration or hunting?
② Does air pressure escape from actuator?
③ Are there any loose bolts and nuts?

4.1 General

- WARNING -

To prevent human injuries and damages to control system, close the block valve, remove instrument air and signals from the valve and open the bypass valve to switch over the pressure from the line to the bypass. Then slowly unfasten the bolts from the pipe until the internal pressure of the body is completely released and remove the valve before disassembling the driving unit.
4.2 Disassembly and Assembly of Actuator

GENERAL INFORMATION
For the Honeywell pneumatic diaphragm actuator, air pressure is supplied into the actuator chamber, and the spindle moves in a straight line to activate the valve. This procedure is to adjust the valve position to the required position by responding to control signals using air pressure.

- WARNING -

① The components of a spring return type actuator are pressed down by a spring. Take general safety measures and disassemble correctly. Otherwise, injuries and damages may result.

② Remove the spindle from the plate while taking care not to damage the spindle surface.

4.2.1 Disassembly (See Fig 4.1)

① Remove actuator from the valve.
② Release the air pressure from inside the actuator and disconnect the air piping.
③ Replace 2 tension bolts and remove the others.
④ Slowly remove the remaining 2 bolts while keeping the actuator spring without load.
⑤ Remove the diaphragm cover.
⑥ Remove the back plate, and then remove the diaphragm rubber and plate from the spindle.
⑦ Visually check the O-ring and rubber for damages, and replace them if necessary.

4.2.2 Assembly (See Fig 4.1)

Assemble in the reverse sequence of the disassembly.
Fig. 4.1 Actuator Disassembly & Assembly Diagram

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of Parts</th>
<th>Drawing No.</th>
<th>Material</th>
<th>QTY</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Spring</td>
<td>DS800A020</td>
<td>SW0-V</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Cap</td>
<td>DR800A080</td>
<td>SS41</td>
<td>1</td>
<td></td>
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<tr>
<td>3</td>
<td>Diaphragm</td>
<td>DA900A020</td>
<td>EPDM+POLYESTER</td>
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<tr>
<td>4</td>
<td>Gasket</td>
<td>DA800A020</td>
<td>OILLET</td>
<td>1</td>
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<tr>
<td>5</td>
<td>Bearing Nut</td>
<td>DA700A020</td>
<td>SUS 304</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Spindle</td>
<td>DG00A090</td>
<td>SUS 304</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Diaphragm Plate</td>
<td>DG400A090</td>
<td>AGC</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Diaphragm Case</td>
<td>DG900A020</td>
<td>SS41</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Spring Case</td>
<td>DA900A090</td>
<td>AGC</td>
<td>1</td>
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<tr>
<td>10</td>
<td>Buck Platte</td>
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<td>SS41</td>
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<tr>
<td>11</td>
<td>O-Dash</td>
<td>DA700A020</td>
<td>BC6</td>
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<tr>
<td>12</td>
<td>O-Ring</td>
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<tr>
<td>13</td>
<td>O-Ring</td>
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<td>NBR</td>
<td>1</td>
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</tbody>
</table>
5. Preventive Maintenance and Troubleshooting

♣ NOTE
Check and replace actuator rubber and O-ring once every 5 years depending on the frequency of use. For other parts, replace them to prevent damages to other devices when they show a wearing sign.

5.1 Troubleshooting
Table 5.1 shows some remedies to general problems that may occur at the site while using diaphragm actuator. For more serious problems, transport the system to the factory.

Table 5.1

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>When actuator does not operate</td>
<td>1. Check the air pressure supplied to the actuator.</td>
</tr>
<tr>
<td></td>
<td>2. Remove the actuator and check rubber and O-ring.</td>
</tr>
<tr>
<td>Leak from actuator components</td>
<td>1. Fasten the bolts on the diaphragm frame.</td>
</tr>
<tr>
<td></td>
<td>2. Disassemble the actuator. Check the O-ring and rubber, and replace them</td>
</tr>
<tr>
<td></td>
<td>with new ones if they are damaged.</td>
</tr>
<tr>
<td>The stroke time is delayed.</td>
<td>1. Check the air pressure supplied to the actuator.</td>
</tr>
<tr>
<td></td>
<td>2. Check the air pressure of the filter regulator.</td>
</tr>
<tr>
<td></td>
<td>3. Check the adjustment of accessories such as positioner and solenoid.</td>
</tr>
</tbody>
</table>
6. Others

<table>
<thead>
<tr>
<th>SIZE</th>
<th>ØB</th>
<th>ØD</th>
<th>h [R]</th>
<th>h [D]</th>
<th>h1</th>
<th>h2</th>
<th>h3</th>
<th>H</th>
<th>H/W</th>
<th>STROKE</th>
<th>H/W + H</th>
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<td>130</td>
<td>200</td>
<td>129</td>
<td>95</td>
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<td>230</td>
<td>20</td>
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<tr>
<td>T-2</td>
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<td>T-3S</td>
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<td>38</td>
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</tbody>
</table>
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