Rotary Valves RV-S

Maintenance Manual
Rotary Valves. Maintenance Manual

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1. PRODUCT DESCRIPTION

RV-S rotary valves are designed for controlled feeding or discharging of products in powder or granular form, from silos, hoppers, pneumatic conveying systems, filters or cyclones. The RV-S rotary valve consist of a 6 bladed rotor mounted in a 3 mm sheet metal powder coated valve housing. The rotor blades include hard wearing 8 mm rubber sheet, bolted onto rotor shaft sheet profiles. The rotor is directly connected to the geared motor.

1.1. How it works

The rotor of the rotary valve rotates counterclockwise with a constant speed of about 20 rpm, transporting the waste product that is separated from the air, in for example a cyclone, in powder or granular form, from the top to the bottom of the rotary valve. Due to the airtight compartments, there is no pressure loss in the installation. The waste product is then discharged from the bottom of the rotary valve into a discharging device, like a conveying belt or a suction pipe, where it is transported for waste management. It can also be discharged directly into a container of Big-Bag.
Separated waste product

Rotor

Discharging device
### 1.2. Overall Dimensions

<table>
<thead>
<tr>
<th>TYPE</th>
<th>A (mm)</th>
<th>B (mm)</th>
<th>C (mm)</th>
<th>D (mm)</th>
<th>E (mm)</th>
<th>F (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RV25S</td>
<td>250</td>
<td>316</td>
<td>150 (1 \times 150)</td>
<td>286</td>
<td>420</td>
<td>772</td>
</tr>
<tr>
<td>RV50S</td>
<td>500</td>
<td>566</td>
<td>450 (3 \times 150)</td>
<td>536</td>
<td>527</td>
<td>1129</td>
</tr>
<tr>
<td>RV75S</td>
<td>750</td>
<td>816</td>
<td>600 (4 \times 150)</td>
<td>786</td>
<td>527</td>
<td>1379</td>
</tr>
<tr>
<td>RV100S</td>
<td>1000</td>
<td>1066</td>
<td>900 (6 \times 150)</td>
<td>1036</td>
<td>527</td>
<td>1629</td>
</tr>
<tr>
<td>RV150S</td>
<td>1500</td>
<td>1566</td>
<td>1350 (9 \times 150)</td>
<td>1536</td>
<td>527</td>
<td>2129</td>
</tr>
</tbody>
</table>
### 1.3. Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>Mass (kg)</th>
<th>Volume (m³)</th>
<th>Motor power (kW)</th>
<th>Rotation (rpm)</th>
<th>Flow through capacity with fill up at 50% (m³/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RV25S</td>
<td>48</td>
<td>0.012</td>
<td>0.37</td>
<td>21</td>
<td>10</td>
</tr>
<tr>
<td>RV50S</td>
<td>63</td>
<td>0.015</td>
<td>0.55</td>
<td>21</td>
<td>20</td>
</tr>
<tr>
<td>RV75S</td>
<td>77</td>
<td>0.018</td>
<td>0.55</td>
<td>21</td>
<td>32</td>
</tr>
<tr>
<td>RV100S</td>
<td>91</td>
<td>0.021</td>
<td>0.55</td>
<td>21</td>
<td>42</td>
</tr>
<tr>
<td>RV150S</td>
<td>119</td>
<td>0.028</td>
<td>0.55</td>
<td>21</td>
<td>63</td>
</tr>
</tbody>
</table>

* Different motor power (0.37kW to 0.75kW) and reductor speeds (up to 40rpm) available on request.

![Graph showing volume in m³/h in function of depression level in system](image)
1.4. Main parts

<table>
<thead>
<tr>
<th>Part No</th>
<th>Part</th>
<th>Item description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>ST37, powder coated RAL 5010</td>
</tr>
<tr>
<td>2</td>
<td>Rotor</td>
<td>6 rubber blade rotor supported on a powder coated metal axle</td>
</tr>
<tr>
<td>3</td>
<td>Cover</td>
<td>ST37, powder coated</td>
</tr>
<tr>
<td>4</td>
<td>Geared motor</td>
<td>0.55kw</td>
</tr>
<tr>
<td>5</td>
<td>Bearing housing</td>
<td>Cast iron square-flanges housing</td>
</tr>
<tr>
<td>6</td>
<td>Rotation disc</td>
<td>painted steel discs in RED and YELLOW</td>
</tr>
<tr>
<td>7</td>
<td>detector holder</td>
<td>Galvanized steel</td>
</tr>
<tr>
<td>8</td>
<td>Rotation detector</td>
<td>Two options (see Chapter 1.4.Options, point 1.4.1. Rotation Sensor)</td>
</tr>
<tr>
<td>9</td>
<td>Bolt M8 x 12</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Serrated washer M8</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Bolt M10 x 20</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Washer M10</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Bolt M8 x 20</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Washer M8</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Hexagon nut M8</td>
<td></td>
</tr>
</tbody>
</table>
1.5. Options

1.5.1. Rotation detector

Rotation detector choice options:

- ABS Housing Fork Shaped with 10mm slot size.

- Stainless steel housing M18.

<table>
<thead>
<tr>
<th>Type</th>
<th>Housing (mm)</th>
<th>Output Function</th>
<th>Output</th>
<th>System</th>
<th>Connection</th>
<th>Mounting</th>
<th>Sensing Range (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing Fork Shaped detector</td>
<td>16 x 20 x 1</td>
<td>NO (Normally Open)</td>
<td>DC NPN</td>
<td>Proximity Sensor</td>
<td>Cable</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>M18 Housing detector</td>
<td>M18 x 50</td>
<td>NO (Normally Open)</td>
<td>DC NPN</td>
<td>Proximity Sensor</td>
<td>Cable</td>
<td>Flush</td>
<td>From 4 to 6</td>
</tr>
</tbody>
</table>

*The holder is adapted to both options, so the rotation detector can be changed without changing any other parts.*
2. INSTALLATION

The installation, connection, start-up and maintenance of the RV- S rotary valves have to be performed by qualified personnel only. For heavy parts use the right equipment and do not work alone.

2.1. Connecting the rotary valve to the ducting

Use sealing on the rotary valve’s square flange and attach the rotary valve to the duct with M10 fasteners.

2.2. Connecting the geared motor

CAUTION! Before connecting the motor to any power supply, make sure that it is stopped and that all electrical connections are disconnected. NOTE : all electrical manipulations should be performed by qualified personnel only.

Connect the motor to the main power supply (free of voltage), considering the pertaining consideration of implemented restrictions. Always refer to the motor identification plate ; Type of current, main voltage and frequency have to be compliant to the data on the plate. Deviations in graph and symmetry increase the motor temperature and can affect the electromagnetic compatibility.
Also consider: Type of duty, type of protection of the geared motor, and rotation direction: CW at connection L1-U1, L2-V1, L3-W1. Change direction of rotation: exchange of 2 main cables (L1⇔L2).

Make earth connections.

2.3. Connecting the detector

**CAUTION!** Before making any connection, make sure that the rotary valve is stopped and that all electrical connections are disconnected. **NOTE:** all electrical manipulations should be performed by qualified personnel only.

Make the rotation detector electrical connections.

![Diagram of NPN - Make switching and NPN - Break switching](image)

Make earth connections.
3. MAINTENANCE AND TROUBLESHOOTING

3.1. Maintenance

Clean and check the performance of the rotary valves regularly.

<table>
<thead>
<tr>
<th>Rotary valve's parts</th>
<th>Maintenance description</th>
<th>Time/ period*</th>
<th>Page/ Chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotary valve general</td>
<td>Clean and check the rotary valve</td>
<td>Every 3-6 months</td>
<td>p. 08 / 3.1.1.</td>
</tr>
<tr>
<td>Rotation detector</td>
<td>Check for its good working</td>
<td>Every 3-6 months</td>
<td></td>
</tr>
<tr>
<td>Bearing housing</td>
<td>Check and grease bearings</td>
<td>Every 3-6 months</td>
<td></td>
</tr>
<tr>
<td>Geared motor</td>
<td>Clean and check gear motor</td>
<td>Every 3-6 months</td>
<td>p. 11/ c. 3.1.2.</td>
</tr>
</tbody>
</table>

* These are suggested periods; please refer to the manufacturer’s documents for more detailed information.

3.1.1. Cleaning and checking the rotary valve.

**CAUTION!** Before any manipulation to the rotary valve, make sure that the motor is stopped and that all electrical connections are disconnected.

**Step 1:** Unscrew the bolts that hold the geared motor (7) to the rotary valve cover (3).

Take out the geared motor.

**Step 2:** Unscrew the screws and nuts that hold the cover (3) to the rotary valve body (1).
Step 3: Unscrew the bolts that hold the axle (9) to the bearing housing (5) and take out the rotation disc (4) as well by unscrewing the central bolt which attaches it to the axle (9).

Step 4: Take out the rotor (2) from the body (1).

Step 5: Check the integrity of all inner components and clean the parts that need to be cleaned.

Step 6: Reassemble the rotary valve by introducing the rotor (2) into the body (1) again.
Step 7: Attach the axle (9) to the bearing housing (5). Mount the rotation disc (4) to the axle again.

Step 8: Secure the cover (3) to the body (1) with bolts and nuts again.

*Parts initially secured with sealing might require removing excess deposits for a good air-tightness. Make sure to use sealing when reassembling the rotary valve as originally assembled.
**Step 9**: Insert the geared motor (7) in the rotor axle (2) again and screw it with M10 bolts to the cover plate (3).

### 3.1.2. Cleaning and checking the gear motor.

**CAUTION!** Before any manipulation to the rotary valve, make sure that the motor is stopped and that all electrical connections are disconnected. NOTE: all electrical manipulations should be performed by qualified personnel only.

*Step 1*: Take out the geared motor (7). Follow the steps in Chapter 3.1.1., Step 1.
- Clean drive, dust layers larger than 5mm are inadmissible.
- Clean the air intakes
- Check seals, replace if damaged.
- Check for oil spills or leakage.

*Step 2*: Fit the geared motor (7) into the rotary valve. Follow *the Step 9 in Chapter 3.1.1.*
3.2. Troubleshooting

<table>
<thead>
<tr>
<th>Rotary valve parts</th>
<th>Trouble description</th>
<th>Suggested solution</th>
<th>Page/ Chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber flap</td>
<td>Rubber flap material deterioration</td>
<td>Replace the rubber flap</td>
<td>p. 12/ c. 3.2.1.</td>
</tr>
<tr>
<td>Rotation detector</td>
<td>Rotation detector is not working</td>
<td>Replace the rotation detector</td>
<td>p. 17/ c. 3.2.2.</td>
</tr>
<tr>
<td>Bearing housing</td>
<td>Bearing housing deterioration</td>
<td>Replace the bearing housing</td>
<td>p. 20/ c. 3.2.3.</td>
</tr>
<tr>
<td>Gaskets</td>
<td>Gasket material deterioration</td>
<td>Replace the gasket</td>
<td>p. 22/ c. 3.2.4.</td>
</tr>
</tbody>
</table>

3.2.1. Replacing the rubber flaps.

**CAUTION!** Before any manipulation to the rotary valve, make sure that the motor is stopped and that all electrical connections are disconnected. NOTE: All electrical manipulations should be performed by qualified personnel only.

*Step 1:* Take out the rotor (2) from the body. Follow the steps in Chapter 3.1.1. (from Step 1 to Step 4).

*Step 2:* Unscrew the rotor blades (11).

*Step 3:* Take the rubber flap (12) out.
Step 5: Introduce the new flap (12) into the metal vane (13) gap. Make sure that the holes are aligned and the flap is in the right direction.

Step 6: bolt the new rubber flap (11) with M6 fastening again.
Step 7: Reintroduce the rotor into the body. Reassemble the rotary valve following the steps in Chapter 3.1.1. (from Step 6 to Step 9).

3.2.2. Replacing the rotation detector.

CAUTION! Before any manipulation to the rotary valve, make sure that the motor is stopped and that all electrical connections are disconnected. NOTE: all electrical manipulations should be performed by qualified personnel only.

Step 1: Unscrew the bearing housing (5).
Step 2: Slide out the detector holder (10) and the rotation detector (6).

Step 3: Unscrew the rotation detector (6) from the rotation detector holder (10) and replace it with the new one.

- **OPTION1**: Fork shaped housing detector

- **OPTION2**: M18 housing detector

* Distance between the front of the rotation detector (6) and the disc (4) needs to be within 4 and 6 mm.
Step 4: Screw the new rotation detector to the holder.

Step 5: Reposition the detector holder (10) to the rotary valve, between the bearing housing (5) and the rotary valve body (1), and secure it with M10 bolts.

Step 7: Re-establish the electrical connections.

3.2.3. Replacing the bearing

CAUTION! Before any manipulation to the rotary valve, make sure that the motor is stopped and that all electrical connections are disconnected.

Step 1: Unscrew the bolts that hold the axle (9) to the bearing housing (5) and take out the rotation disc (4) as well by unscrewing the central bolt which attaches it to the axle (9).
Step 2: Unscrew the bearing housing (5) and take it out. If necessary, set aside the rotation detector holder (10).

Step 3: Replace the bearing housing (5).

Step 4: Fit the bearing to the rotary valve body (1) with the M10 bolts and washers. Make sure the rotation detector holder (10) is ready to be attached with the bearing housing as well.

Step 5: Attach the axle (9) to the bearing housing (5). Fix the rotation disc (4) to the rotor axle (9) again.
3.2.4. Replacing the gaskets

**CAUTION!** Before any manipulation to the rotary valve, make sure that the motor is stopped and that all electrical connections are disconnected.

*Step 1:* Take out the rotor (2) from the body (1). Follow the steps in *Chapter 3.1.1.* (from Step 1 to Step 4).

*Step 2:* Take the gaskets (14) off the axle (9).

*Step 3:* Introduce the new gaskets (14) onto the axle (9).
Step 4: Re-assemble the rotary valve following the steps in Chapter 3.1.1. (from Step 6 to Step 9).
4. DISMANTLING & RECYCLING

When dismantling a unit, be sure to keep in mind the following important information:

As the unit is dismantled, set aside all still functioning parts in order to re-use them on another unit.

You should always separate the different materials depending on their type: iron, rubber, oils, greases, etc...

Recyclable parts must be disposed of in the appropriate containers or brought to a local recycling company.

The rubbish must be collected in special containers with appropriate labels and disposed of in compliance with the national laws and/or local legislations in force.

**CAUTION!** It is strictly forbidden to dispose of toxic wastes in municipal sewerage and drain systems. This concerns all oils, greases, and other toxic materials in liquid or solid form.
5. SPARE PARTS

For spare parts please contact the Formula Air Group.

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www.vinaduct.com
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NOTE: All drawings and references contained within this manual are non-contractual and are subject to change without prior notice at the discretion of the Formula Air group and its partners.
6. ADDITIONAL REFERENCES

Geared motor technical data.
Rotation detector technical data.
Bearing housing technical data.