Cylinder with piston rod
Round cylinder, corrosion-resistant
CRDG/CRDSW
Foreword

These repair instructions are valid for the cylinders with piston rod listed on the title page to the exclusion of any liability claims.

Deviations compared to the descriptions in these repair instructions may arise depending on the design and/or modification status of the cylinder with piston rod. The user must check this prior to carrying out the repair and take the deviations into consideration if necessary.

These repair instructions have been prepared with care.
Festo AG & Co. KG does not, however, accept liability for any errors in these repair instructions or their consequences. Likewise no liability is accepted for direct or consequential damage resulting from improper use of the products.
More detailed information on this can be found in chapter 8 “Liability”.

The relevant regulations on occupational safety, safety engineering and interference suppression as well as the stipulations contained in these repair instructions must be observed when working on the products.
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1 Important information

1.1 About these repair instructions

This document contains important information about the professional repair of the cylinder with piston rod of the type CRDG/CRDSW. The cylinder with piston rod CRDG/CRDSW is fully repairable in the event of damage due to normal wear. The complete cylinder must be repaired in the event of damage to the cylinder barrel.

Before carrying out a repair, the relevant chapter in these instructions must be read in full and followed consistently.

For reasons of clarity, these repair instructions do not contain complete detailed information. The following documents should therefore also be available when repairing the cylinder with piston rod:

- **Operating instructions for the respective cylinder with piston rod**
  Contain information about the control sections and connections of the cylinder with piston rod as well as the function, structure, application, installation, commissioning, maintenance and care, etc. Can be found on the Festo website (www.festo.com).

- **Spare parts documentation**
  Contains an overview of the spare and wearing parts as well as information on their installation. Can be found in the online spare parts catalogue on the Festo website (spareparts.festo.com).

1.2 Pictograms used in these repair instructions

- **Warning**
  This sign indicates a dangerous situation for people and/or the product. Failure to observe this warning can result in injury to people and/or damage to the device.

- **Note**
  This sign provides important tips and information that can make your work easier.

- **Environment**
  This sign provides information on the steps required for environmentally friendly use of materials and equipment, as well as the guidelines and regulations that may need to be observed.

- **Accessories**
  This sign contains information on accessories and attachments relevant to the context.

- **Documents**
  This sign contains references to other chapters or documents containing additional information.
1.3 General safety information

Warning
The cylinder with piston rod must only be repaired by authorised and trained staff in accordance with the specifications in the technical documentation and using genuine spare parts.
Installation and repair by unauthorised and untrained staff, repairs using non-genuine spare parts as well as without the technical documentation required for installation and/or repair are dangerous and therefore not permitted.
Repairs must only be carried out in conjunction with these repair instructions as well as the respective operating instructions for the device.

Note
Instead of carrying out the repair yourself, your local Festo sales office offers the option of having the repair carried out by Festo.

Environment
Components and equipment replaced as part of a repair must be disposed of in accordance with the locally valid environmental protection regulations.

2 General product description

2.1 Functional description

The piston moves in the cylinder barrel when the cylinder chamber is pressurised. The piston rod transmits the movement to the outside. The advanced piston rod is retracted again when the other cylinder chamber is pressurised.

![Diagram of cylinder components]

1. Piston rod seal
2. Sealing seat
3. Bearing
4. O-ring
5. Slotted nut
6. Piston rod
7. Male thread for mounting the cylinder
8. Front air supply connection
9. Cylinder barrel
10. Rear air supply connection
2.2 Type codes (identifying the features of a cylinder)

The precise features of a cylinder with piston rod can be identified with the help of the rating plate on the cylinder. The type designation is directly beneath the Festo logo and describes the cylinder’s features separated by a hyphen (-).

**EXAMPLE:**

```
CRDG-32-100-P-A
```

The type designation on this rating plate provides the following information:

**CRDG** Cylinder of the type CRDG

**32** Piston diameter 32 mm

**100** Stroke 100 mm

**P** Elastic cushioning rings/pads at both ends

**A** Sensing option (magnetic piston)

**Note**

A list and description of all possible equipment features of the cylinder with piston rod can be found in the data sheet. It is available on the Festo website ([www.festo.com](http://www.festo.com)).

2.3 Mounting directions

This diagram provides an overview of the orientation directions for the cylinder with piston rod.

**Orientation:**

- Festo = product identification (rating plate) as reference point
- O = top
- U = underneath
- R = right
- L = left
- V = front
- H = rear
This diagram is intended only to provide an overview of the individual components. To order spare and wearing parts, please use the online spare parts catalogue on the Festo website (spareparts.festo.com).

<table>
<thead>
<tr>
<th>Item</th>
<th>Designation</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hex nut</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Piston rod seal</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Sealing seat</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Bearing</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>O-ring</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Slotted nut</td>
<td></td>
</tr>
</tbody>
</table>
4 Repair steps

4.1 Preparation

• Before starting the repair, remove any attachments in accordance with the instructions in the accompanying operating instructions.
• Keep your working environment tidy.
• Only use the spare parts and assembly aids (grease, screw locking agent, etc.) provided in the wearing parts kit.

Warning
Make sure that the sealing seat cannot suddenly come flying off.
• Remove the non-return valves and tubing connection from the cylinder and depressurise the cylinder completely so that any pressure present is not suddenly released when the cylinder is opened.

To prevent damage to sealing rims or guide surfaces, do not use pointed or sharp-edged assembly aids.

4.2 Visual inspection

Check the cylinder for visible damage that might impair its function (e.g. warping of the piston rod) as well as deposits and scoring. The entire cylinder must be replaced if the cylinder barrel is showing significant damage.

4.3 Repairing the cylinder CRDG/CRDSW-...

Note
The following cylinders cannot be repaired:
• CRDG-12-...-P-A
• CRDG-16-...-P-A
• CRDG-20-...-P-A
• CRDG-25-...-P-A

The description in this section can be used to repair cylinders of the type CRDG/CRDSW-... with a piston diameter of ≥ 32 mm and the following features:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Elastic cushioning rings/pads at both ends</td>
</tr>
<tr>
<td>A</td>
<td>External position sensing</td>
</tr>
</tbody>
</table>

4.3.1 Structure of the sealing seat

1 Sealing seat
2 Piston rod seal
3 O-ring
4 Bearing
4.3.2 Removing the sealing seat

- Loosen the sealing seat in the bearing cap and screw it out.
- Pull the sealing seat away from the piston rod.
- Remove any residue of the screw locking agent from the thread of the sealing seat.
- Pull the piston rod as far as possible out of the cylinder barrel.
- Check the piston rod for damage. The entire cylinder must be replaced if the piston rod is showing significant damage.

4.3.3 Greasing the piston rod

- Clean the piston rod as described in section 5.1 “Cleaning”.
- Apply the grease contained in the wearing parts kit to the surface of the piston rod\(^1\).
  \(^1\) See section 5.2.2 “Thin grease film”

4.3.4 Repairing and installing the sealing seat

- Remove the piston rod seal \(^1\) from the sealing seat \(^2\).
- Remove the O-ring \(^3\) from the groove of the sealing seat.

⚠️ Warning

Check the plastic bearing in the sealing seat for visible damage that might impair its function, such as deposits and scoring. The bearing must be replaced if the plain bearing is showing significant damage.

📝 Note

The plastic bearing is not included in the wearing parts kit and must be ordered separately (spareparts.festo.com).
• **Only if the plastic bearing is defective**
  – Push the plastic bearing \(1\) out of the sealing seat \(2\) using an appropriate tool.

• Clean the seat of the piston rod seal \(1\).
• Clean the seat of the O-ring \(2\).

• **Only if the plastic bearing is defective**
  – Push the plastic bearing \(1\) into the sealing seat \(2\) using an appropriate tool.

**Note**

Note the mounting direction in the sealing seat (the side chamfered on the outside facing the cylinder).

• Grease the new piston rod seal as follows:

<table>
<thead>
<tr>
<th>Area</th>
<th>Greasing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Grease reservoir(^{1}) for piston rod</td>
<td>Fill 2/3 with grease</td>
</tr>
<tr>
<td>2) External surface for sealing seat</td>
<td>Thin film(^{2})</td>
</tr>
<tr>
<td>3) Grease reservoir(^{3}) for bearing</td>
<td>Fill 2/3 with grease</td>
</tr>
</tbody>
</table>

\(^{1}\) See section 5.2.3 “Grease reservoir”.
\(^{2}\) See section 5.2.2 “Thin grease film”.

• Insert the piston rod seal into the sealing seat using an appropriate pressure piece.

**Note**

Note the mounting direction (individual sealing lips facing out).
• Grease the new O-ring and insert it into the groove of the sealing seat.

• To protect the bearing and seal, place the appropriate mounting sleeve on the thread of the piston rod to prevent damage (see section 7.2 "Special tools").

• Apply the screw locking agent contained in the wearing parts kit to the thread of the sealing seat.

• Guide the sealing seat over the mounting sleeve onto the piston rod as far as the bearing cap.

• Tighten the sealing seat in the bearing cap with the corresponding torque (see table).

<table>
<thead>
<tr>
<th>Type</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRDG/CRDSW-32</td>
<td>15 Nm</td>
</tr>
<tr>
<td>CRDG/CRDSW-40</td>
<td>35 Nm</td>
</tr>
<tr>
<td>CRDG/CRDSW-50</td>
<td>50 Nm</td>
</tr>
<tr>
<td>CRDG/CRDSW-63</td>
<td>50 Nm</td>
</tr>
</tbody>
</table>

• Perform a functional test as per the operating instructions (enclosed with the cylinder or can be called up on the Festo website ([www.festo.com](http://www.festo.com))) and commission the repaired cylinder.
5 Cleaning and greasing

5.1 Cleaning

The seals are designed so that the lubricant film applied to them will be effective for the service life of the seal. In order for this so-called lifetime lubrication to be retained, the cylinder must be thoroughly cleaned of all foreign particles, machining residues and old lubricants before it is greased.

![Warning]

Festo recommends Loctite 7063 and Loctite 7070 for cleaning.
When using other cleaning agents, make sure that they do not corrode the seals of the cylinder with piston rod.
In case of doubt, check the resistance of the seals using the data on the Festo website [www.festo.com](http://www.festo.com).

5.2 Greasing

The various components and seals of the cylinder with piston rod require different levels of greasing depending on a number of factors.

5.2.1 Extremely thin grease film

A barely continuous film of grease covers the bearing surface. The grease can give a sheen to the surface; however, the colour of the grease must not darken it.

**Recommendation:**
Apply the grease using a cloth or similar dipped in the grease.
Remove the excess grease from the seal system components (e.g. by drawing the assembled piston with the piston rod once fully through the greased cylinder barrel) and then remove the excess from the seal components by wiping it off.

5.2.2 Thin grease film

A film of grease covers the bearing surface so that the grease colour darkens the surface slightly.

**Recommendation:**
Apply the grease with a soft brush or similar.

5.2.3 Grease reservoir

There is a certain amount of oil enclosed between two sealing rims or in enclosed ring volumes.

6 Maintenance and care

Clean any dirt from the piston rod using a soft cloth.

All non-abrasive cleaning agents are permitted. The cylinders are also maintenance-free as they have been lubricated for life. Regular removal of the lubricant on the surface of the piston rod reduces its service life.
7 Tools

This section provides an overview of the tools and aids required to repair the cylinder with piston rod.

7.1 Standard tools

The following standard tools among others are required to repair the cylinder with piston rod:

- Screwdriver
- Wrench
- Torque wrench (see tables in the corresponding repair steps for values)

7.2 Special tools

The following special tools are required to repair and service the cylinder with piston rod:

<table>
<thead>
<tr>
<th>Designation</th>
<th>Additional information</th>
<th>Photo</th>
</tr>
</thead>
</table>
| Mounting sleeve for piston rod | The mounting sleeve for piston rods for protecting the piston rod seal and the bearing in the bearing cap while the repair is being carried out must be produced by the customer.  
The schematic diagram can be found in the information brochure “Accessories, equipment and tools” (7Accessories_a_en). |       |

Documents

Further information on the special tools and schematic diagrams can be found in the information brochure “Accessories, equipment and tools” (7Accessories_a_en). It can be found in the online spare parts catalogue on the Festo website (http://spareparts.festo.com/xdkj/data/SPC/0/PDF_SAFE/Hilfsmittel.pdf).

8 Liability

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