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1 General

The operating manual (OM) is a constituent part of the coupling delivery and should be made available to the coupling user.

CENTA products correspond to the quality standard according to DIN EN ISO 9001:2000.

CENTA continually develop and refine its product and as such, reserve the right for technical modifications.

IMPORTANT!
CENTA will not assume liability for damages and malfunctions resulting from disregarding the OM.

The copyright of this OM remains with CENTA Transmissions Ltd

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2 Safety

This OM should enable the user to:
- handle the coupling safely and allow it to function properly
- use the coupling rationally
- maintain the coupling properly

Thus the OM has to be read and understood carefully by the responsible persons before working.

IMPORTANT!
For installation, dis-assembly, commissioning, operation, maintenance and repair work it is essential that the valid safety and accident prevention regulations, which apply at the respective place of use, are followed. The purchaser / user bears the responsibility for following these regulations.

2.1 Safety instructions

In the following chapters of this OM, warnings are marked by pictograms.

The following words (according to ANSI Z535.4) are used by the cautions:

DANGER!
Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING!
Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION!
Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
2.2 Qualification of the personal in charge

All of the functions of this OM may only be performed by qualified, specially trained and authorised persons.

---

**WARNING!**
Injuries and material damages can occur through:
- Any work on the coupling, which is not described in this OM.

*Implement only work, which is described in these OM.*

---

2.3 Specified use

---

**WARNING!**
The couplings are exclusively designed for specific applications. They may only be used under these predefined conditions. See chapter 4.2, 6 and 8.

Every coupling must be guarded according to any valid Health and Safety regulations. About this see chapter 7. This guard is not part of the scope of supply from CENTA.

---

2.4 Not-specified use

---

**WARNING!**
Injuries and material damages can occur through:
- improper high torque
- improper high or low speed
- excess ambient temperature
- improper surrounding ambients
- improper guarding

*Use coupling only for designed application.*

CENTA takes no liability for damages, resulting from improper application.
If you want to use CENTA couplings for other than the contractual application, you need approval (address see page 3).
3 Delivery, transport, storage and disposal

3.1 Delivery

After delivery the coupling has to be:
- Checked, to ensure it is as ordered.
- examined for damage in transit (immediately complain to the carrier).

3.2 Transport

CAUTION!
Injuries and material damages can occur through:
- Incorrect transportation of the coupling.

Transport coupling carefully.

If transport damage is evident:
- Inspect the coupling carefully for damage.
- Consult with manufacturer (address see page 3) if damage has occurred

3.3 Storage

IMPORTANT!
Rubber elements are marked with a manufacturing date. They may be stored starting from this date to a maximum of 5 years.

CAUTION!
Damage of rubber elements can occur through exposure to:
Ozone, heat, light, moisture, solvents or incorrect storage.

IMPORTANT!
Couplings or rubber elements have to be stored in horizontal position and free of any deformation. Do not store vertically. Check the packaging annually and replace packaging as needed.
3.3.1 Storage area

Requirements of the storage area:
- moderately ventilated and dust free
- moisture (max. 65% air humidity)
- store at a moderate temperature (-10°C to +25°C)
- store free from ozone-producing mechanisms, e.g. sources of light and electric motors
- store free of UV sources of light and direct sun exposure
- store free of chemical contaminants.

Further details can be found in DIN 7716.

3.3.2 Storage of coupling or elastic elements

- Remove parts
- Check the wax protection on the steel parts and renew if necessary
- Wrap parts (stored for a lengthy period, place dehydration agent and seal it into foil cover)
- Store up parts

3.4 Disposal

RECYCLING!
It is important to ensure the safe and non-polluting disposal of operating and auxiliary materials, the packaging materials as well as any exchange parts. When doing this the local recycling options and regulations should be observed.

For disposal it is best to separate the coupling parts as far as possible and to sort them according to material type.
4 Technical description

4.1 Characteristics

- Simple and compact
- Low weight, low moment of inertia
- High performance, high-speed range, large bores permitted rupture proof
- Large angle of twist with progressive characteristic curve (approx. 6°-8° at nominal torque)
- High elasticity and considerable flexibility in any direction (radial, axial, angular) with low counter forces on shaft and bearings.
- The CENTAFLEX–A is shock and vibration absorbing
- The torque is transmitted backlash free
- The coupling requires no maintenance, the rubber parts suffer no wear, providing long useful life with no dirt produced by rubber particles
- The rubber element is air ventilated all around; the heat generated is easily conducted away keeping the rubber element cool.
- The Centaflex Series A has ATEX Approval
- The element is a 50shore Rubber

4.1.1 Design

The Centaflex Series A Coupling is a rubber segment flexible coupling with alternate segments bolted to a flywheel adaptor and then a hub. The segments are connected with rubber to provide the torque transmitting element.
4.2 Technical data

The performance data is shown in Table 4-1.

Mass: \( m = 13 \text{ kg} \)
Allowable ambient temperature: max. 80 °C

<table>
<thead>
<tr>
<th>Size</th>
<th>Nominal Torque ( T_{KN} ) [Nm]</th>
<th>Maximum Torque ( T_{Kmax} ) [Nm]</th>
<th>Maximum Speed ( n ) [rpm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>700</td>
<td>2100</td>
<td>4000</td>
</tr>
</tbody>
</table>

**Table 4-1 Performance data CF-A-050**

<table>
<thead>
<tr>
<th>Mis-Alignment Setting for 1500rpm and below</th>
<th>Setting</th>
<th>Running</th>
<th>Transient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axial mm</td>
<td>+/-0.5</td>
<td>+/-1.0</td>
<td>+/- 3.0</td>
</tr>
<tr>
<td>Radial mm</td>
<td>+/-0.5</td>
<td>+/- 1.0</td>
<td>+/- 2.0</td>
</tr>
<tr>
<td>Conical Degree</td>
<td>+/-0.5</td>
<td>+/- 1.0</td>
<td>+/- 2.0</td>
</tr>
</tbody>
</table>

Refer to Section 8.1 for High Speed Running
5 Alignment of the connecting engines and pumps

WARNING!
For increased life of the driving shafts and couplings, the connecting engines and pumps should be aligned as exactly as possible, in order to permit operational displacement values being as high as possible. The total displacement is a combination of axial, radial and angular misalignment; the angular misalignment can occur in two levels (horizontally and vertically).

5.1 Axial misalignment

\[ \Delta K_A \max = \pm 0.5 \text{mm} \]

figure 5-1 Axial misalignment

5.2 Radial misalignment

\[ \Delta K_R \max = 0.5 \text{ mm} \]

figure 5-2 Radial misalignment

5.3 Angular misalignment

\[ \Delta K_W \max = 0.5^\circ \]

figure 5-3 Angular misalignment

SEE APPENDIX A FOR STEP BY STEP ALIGNMENT METHOD
6 Installation

6.1 General installation hints

Any installation operation omitted will impair the security of the coupling.

It is the responsibility of the user to advise the manufacturer immediately of any changes, and gain approval from them (address see page 3).

---

**WARNING!**
Injuries can occur through:

- Unguarded rotating parts

Switch off drive before working and secure drive against restarting.

---

**CAUTION!**
Material damages can occur through:

Liquid anaerobic adhesives (for example Loctite) for screw-locking

*Such screw-locking devices may not be used.*

*(Dry patch adhesives as supplied by Centa are acceptable)*
6.2 Installation of the coupling

The coupling comes in two parts.
1. Engine Flywheel Plate
2. Pump half coupling- preassembled.

Bolt Flywheel Adaptor to Engine.-Refer to Engine Builder Manual for relevant bolt torques. If none available

<table>
<thead>
<tr>
<th>SAE Grade 8</th>
<th>½ inch UNC</th>
<th>142Nm</th>
<th>1230lb.in</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO4762-8.8</td>
<td>M12</td>
<td>70Nm</td>
<td>620lb.in</td>
</tr>
<tr>
<td>ISO4762-12.9</td>
<td>M12</td>
<td>120Nm</td>
<td>1050lb.in</td>
</tr>
</tbody>
</table>
➢ Push Coupling Hub onto pump shaft so that the hub is flush with the shaft end.

➢ Tighten GrubScrew 16 Nm

➢ The coupling is ready to be 'plugged together.

➢ Check tightening torque in turn to ensure all bolts are tightened evenly.

➢ Align (chapter 5) and finally bolt down engine or pump.

---

**WARNING!**

Injuries can occur through:
- Unguarded rotating parts

*Protect coupling with a cover.*

**Exception:**
The coupling is already covered through existing housings.
7 Commissioning

**WARNING!**
Injuries and material damages can occur through:
- Loose bolt connections

*Before commissioning, the tightening torque of all bolts must be checked and corrected as necessary.*

**WARNING!**
Injuries can occur through:
- Unguarded rotating parts

*Protect coupling with a cover.*

**Exception:**
The coupling is already covered through existing housings

This cover must fulfil the following criteria:
- Protect persons against access to rotating parts
- Retain rotating parts in the event of an accident
- Ensure sufficient ventilation of the coupling

The cover must be made of rigid steel. To ensure sufficient ventilation of the coupling, the guards should be provided with regularly-spaced openings. On safety grounds, these ventilation holes should not exceed those shown in Table 7-1.

<table>
<thead>
<tr>
<th>part</th>
<th>circular holes [mm]</th>
<th>rectangular holes [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>top surface of covering</td>
<td>ø 4</td>
<td>7</td>
</tr>
<tr>
<td>side parts of covering</td>
<td>ø 8</td>
<td>8</td>
</tr>
</tbody>
</table>

*Table 7-1 Form and size of ventilation openings*

The covers must be at a minimum distance of 15 mm from the rotating parts. The cover must be electrically conductive and be included in the earth bonding.

Before continuous operation, the system must be subject to a trial run.
8 Operation

**WARNING!**
Injuries and material damages can occur through:
- Changes in running noise
- Any vibrations which arise

*Shut the system down immediately.*

Locate and remedy the disturbance and its cause.
A troubleshooting guide is shown in table 8-1.
It is absolutely necessary to analyse the whole system if issues arise.

8.1 Operational misalignment

The operating alignment condition is a function of the combined axial and radial mis-alignments, and whilst should be ‘best possible’, should also be within the operational mis-alignment envelope shown in Diagram 8-1.

Reduce alignment values according to above for high speed.

*diagram 8-1 Operational misalignment*
8.2

**Troubleshooting**

<table>
<thead>
<tr>
<th>Faults</th>
<th>Possible causes</th>
<th>Removal</th>
</tr>
</thead>
</table>
| Running noises or vibrations   | Alignment fault           | 1. Switch-off system  
2. Check and if necessary correct alignment  
3. Trial run                     |
|                                | Loose bolts               | 1. Switch-off system  
2. Check and if necessary correct alignment  
3. Check and if necessary correct tightening torques  
4. Trial run                     |
| Break of rubber element        | Alignment fault           | 1. Switch-off system  
2. Replace coupling  
3. Check and if necessary correct alignment  
4. Trial run                     |
|                                | Undue high speed          | 1. Switch-off system  
2. Verify working moment of system and nominal torque of coupling  
3. Mount stronger coupling  
4. Trial run                     |

*table 8-1 Troubleshooting chart*

For further queries or questions, please contact us (see page 3).
9 Servicing

The coupling is maintenance-free. We recommend a visual inspection with the regular maintenance intervals of the entire system.

WARNING!
Injuries can occur through:
- Unguarded rotating parts

Turn off drive before working and secure drive against restarting.

The following inspections have to be carried out:

After 1,000 hrs operational service, a thorough visual in-situ inspection of the rubber elements and shafts is required.

Visual check of the CENTAFLEX-rubber elements (figure 9-1). The zones which are marked by arrows have to be checked for cracks and for adhesion of rubber and metal parts. In these zones creases (wrinkles) are considered to be normal.

If the cracks are deeper than 3 mm or if the rubber-metal connection is loosening, the rubber elements have to be exchanged.

IMPORTANT!
Exchange the rubber elements when damaged, and certainly after 5 operational years.
figure 9-1 Example of distress zones at CF-A-rubber element – marked by arrows

For changing the rubber elements:

- Dismantle coupling as described in chapter 10.
- Dis-assemble coupling as described in chapter 10.
- Replace defective parts.
- Assemble coupling as described in chapter 6.
- Install coupling as described in chapter 6.
10 Dismantling

**WARNING!**
Injuries can occur through:
- Unguarded rotating parts

*Switch off drive before working and secure drive against restarting.*

Loosen and remove radial bolts from rubber elements
- Position new rubber elements onto hub.
- Insert radial bolts into radial holes of the rubber elements and tighten by 2-3 threads.
- When all radial bolts are located, tighten all radial bolts equally and in turn, ensuring the elements are located on the spring dowels.
- Tightening torque **220**×10 Nm.

Installation of coupling is described in chapter 6.
13 Declaration of Conformity

Declaration of conformity

In terms of the Directive 94/9/EG of April 23, 1994, and legal regulations issued for the implementation of this directive

The manufacturer: CENTA Antriebe Kirschey GmbH Bergische Straße 7, D-42781 Haan,

declares that in this operating manual described explosion proof CENTAFLEX-A® couplings
are devices and meet the basic safety and health standards according to article 1 (3) b) of 94/9/EG standards and according to appendix II of the standards 94/9/EG. The couplings meet the safety and health requirements with the following standards:

EN 1127-1
EN 13463-1, prEN 13463-5

The identification of our CENTAFLEX-A® couplings includes the following data:

drive shaft:  
II 2G c IIB T3/T4/T5/T6-20°C ≤ Ta ≤+80°C/71°C/43°C/31°C
II 2D c T 115°C/I M2 c -20°C ≤ Ta ≤ +80°C

coupling:  
II 2G c IIB T3/T4/T5/T6-20°C ≤ Ta ≤+80°C/80°C/59°C/47°C
II 2D c T 115°C/I M2 c -20°C ≤ Ta ≤ +80°C

CENTA takes for granted that the installation and the operation of the coupling corresponds to the appropriate application, as shown in the operating and mounting Instruction. According to article 8 (1) b) ii) of the 94/9/EG standards the technical documentation is available at:

TÜV CERT Zertifizierungsstelle der TÜV Anlagentechnik GmbH
Am Grauen Stein
51105 Köln

Haan, 05.03.04  i.A. Rainer Brandes  i.V. Frank Helwig
APPENDIX A

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Basic Alignment Method

Centaflex CF-A-Couplings
Check Radial Alignment

• This is a basic method, but sufficient to give an adequate alignment with coupling in-situ.
• It involves measuring the radial distance from the hub to the Outer diameter of the element.
Radial Alignment

• These measurements are taken ‘over’ the axial bolts. All three measurements are to be within 0.5mm

• (Shown is a 3 segment design – similar procedure for 4 element design)
Conical Alignment

- This measurement is taken ‘over’ the radial bolt.
- All three measurements are to be within 0.5mm
- (Shown is a 3 segment design – similar procedure for 4 element design)
Axial Alignment

- Axial Alignment is controlled by the ‘axial pins’ so provided the Conical alignments are all the same and the element has a small clearance on the backplate, the element is axially aligned.
- A straight edge across two radial segments and one axial segment will indicate good axial alignment if all three touch the straight edge.