

## CENTAFLEX-A

Assembly and operating instructions

008M-00012...00600

M008-00080-EN

Rev. 1



---

## Contents

<b>1</b>	<b>General remarks .....</b>	<b>5</b>
<b>2</b>	<b>Safety .....</b>	<b>6</b>
2.1	Safety remarks .....	6
2.1.1	Signal words .....	6
2.1.2	Pictograms .....	7
2.2	Qualification of deployed personnel .....	7
2.3	Intended application.....	7
2.4	Application not in compliance with the intended use .....	9
<b>3</b>	<b>Delivery, transport, storage and disposal .....</b>	<b>10</b>
3.1	Delivery .....	10
3.2	Transport.....	10
3.3	Storage .....	10
3.3.1	Storage location.....	11
3.3.2	Storage of couplings / flexible elements .....	11
3.4	Disposal.....	11
<b>4</b>	<b>Technical description .....</b>	<b>12</b>
4.1	Characteristics.....	12
4.2	Specifications .....	12
<b>5</b>	<b>Aligning the driving and the driven unit .....</b>	<b>13</b>
5.1	Axial alignment.....	13
5.2	Radial alignment.....	13
5.3	Angular alignment.....	13
<b>6</b>	<b>Mounting .....</b>	<b>14</b>
6.1	General assembly instruction.....	14
6.2	Mounting the adapter (if necessary) .....	16
6.3	Preparing the propeller shaft for the mounting of the coupling .....	17
6.4	Aligning the driving and the driven unit .....	19
6.5	Mounting the coupling .....	19
6.5.1	Screwing together the coupling and the adapter (4) using the screws (20) .....	20
6.5.2	Calculating the maximum screw-in depth of the screws in the coupling.....	21
6.5.3	Screwing together the coupling and the transmission flange (A) using the screws (E) .....	24
6.5.4	Screwing together the coupling and the transmission flange (A) using the stud screws (25) .....	26
6.6	Mounting the propeller shaft.....	28
6.7	After completed mounting.....	29



---

<b>7</b>	<b>Operation.....</b>	<b>30</b>
7.1	Operating faults, root causes and remedy .....	30
7.2	Admissible overall misalignment of the coupling .....	30
<b>8</b>	<b>Care and maintenance .....</b>	<b>31</b>
8.1	Work to be performed .....	31
8.1.1	Cleaning the coupling .....	31
8.1.2	Visual inspection of the coupling .....	31
8.1.3	Visual inspection of the rubber element .....	31
8.1.4	Inspection of the screw connections .....	32
8.2	Replace defective parts.....	33
<b>9</b>	<b>Dismantling .....</b>	<b>34</b>
9.1	General dismantling instructions .....	34
9.2	Dismantling the propeller shaft.....	35
9.3	Dismantling the coupling .....	35
9.3.1	Dismantling the adapter (4) and the screws (20) from the coupling.....	35
9.3.2	Dismantling the transmission flange (A) and the screws (E) from the coupling.....	35
9.3.3	Dismantling the transmission flange (A) and the stud screws (25) from the coupling.....	35
9.4	Dismantling the adapter (if necessary) .....	36
9.5	Reassembling the coupling.....	36
<b>10</b>	<b>Wearing and spare parts.....</b>	<b>37</b>
<b>11</b>	<b>Annex .....</b>	<b>38</b>
11.1	CENTA data sheet D013-016 (unlubricated screw connections) .....	38
11.2	CENTA data sheet D013-019 (screw connections with microencapsulated screw locking medium).....	39
11.3	CENTA data sheet D008-906 Declaration of incorporation according to the EC Machinery Directive 2006/42/EC, Appendix II B.....	40



## Index of illustrations

Fig. 6-1 Mounting the adapter .....	16
Fig. 6-2 Preparing the propeller shaft for the mounting of the coupling .....	17
Fig. 6-4 Screwing together the coupling and the adapter (4) using the screws (20) .....	20
Fig. 6-5 Maximum screw-in depth $T_{max}$ of the screws in the coupling .....	21
Fig. 6-6 Screwing together the coupling and the transmission flange (A) using the screws (E) .....	24
Fig. 6-7 Screwing together the coupling and the transmission flange (A) using the stud screws (25) .....	26
Fig. 6-8 Mounting the propeller shaft .....	28
Fig. 8-1 Examples of wear zones at the CENTAFLEX-A rubber element indicated by arrows .....	32

## Index of tables

Table 2-1 Shape and size of ventilation holes .....	8
Table 6-1 Installation dimensions .....	18
Table 6-2 $\varnothing X$ for screw-in depth in the coupling .....	23
Table 7-1 Troubleshooting table .....	30
Table 8-1 Permissible crack depth at the CENTAFLEX-A-rubber element (Sizes 00001 to 00600) .....	32

## Index of formulas

Formula 6-1 Auxiliary dimension $K_{min}$ .....	18
---	----



## **1 General remarks**

These assembly and operating instructions form a constituent part of the coupling delivery and must be kept in an easily accessible place at all times.

CENTA products are developed and produced to quality standard DIN EN ISO 9001:2000.

In the interests of further development, CENTA reserves the right to make technical changes.



### **IMPORTANT**

CENTA is unable to accept liability for damage and operating faults caused by failure to observe the operating instructions.

These operating instructions are protected under copyright to CENTA Antriebe Kirschey GmbH.

In case of technical questions, please enquire with our head office:

**CENTA Antriebe  
Kirschey GmbH**  
Bergische Strasse 7  
42781 Haan  
GERMANY  
Phone +49-2129-912-0  
Fax +49-2129-2790  
[centa@centa.de](mailto:centa@centa.de)  
[www.centa.info](http://www.centa.info)

## 2 Safety

The purpose of these operating instructions is to enable users to:

- use the coupling safely and correctly
- maximize efficiency
- ensure that care and maintenance are carried out correctly

For this reason, these operating instructions must be thoroughly read and understood prior to work on and with the coupling.

### WARNING



#### **Injury and material damage can occur as a result of:**

- Failure to adhere to the safety and accident prevention regulations valid at the relevant installation site

The safety and accident prevention regulations valid at the installation site in question must be adhered to when performing any of the tasks described in these operating instructions.

### 2.1 Safety remarks

In these operating instructions, safety remarks are indicated by a pictogram and a signal word.

#### 2.1.1 Signal words

The following signal words are used in the safety remarks:

#### **DANGER**

Denotes the immediate threat of danger.  
If not prevented, fatal or extremely serious injuries can result.

#### **WARNING**

Denotes a potentially dangerous situation.  
If not prevented, fatal or extremely serious injuries can result.

#### **CAUTION**

Denotes a potentially dangerous situation.  
If not prevented, minor injuries and/damage to property may result.

#### **IMPORTANT**

Denotes application tips and particularly useful information. This is not a signal word denoting a dangerous or damaging situation.

### 2.1.2 Pictograms

Possible pictograms in the safety precautions:



Warning of a hazardous area



Do not switch



Use protective gloves



Use protective goggles

### 2.2 Qualification of deployed personnel

All the work described in these operating instructions may only be performed by authorized persons with adequate training and instruction.

#### WARNING



**Injury and material damage can occur as a result of:**

- Work at the coupling which is not described in these instructions
- Only carry out work which is described in these operating instructions.

### 2.3 Intended application

#### WARNING



**Injury and material damage can occur as a result of:**

- Application not in compliance with the intended use
- The couplings are intended exclusively for use in accordance with the relevant design. They may only be used under the specified conditions.

**WARNING**



**Injuries can occur as a result of:**

- Contact with rotating parts

Shield the coupling in accordance with the applicable accident prevention regulations with an enclosure.

**Exception:**

The coupling is encased by the driving and driven units.

**The scope of delivery provided by CENTA does not include a protective enclosure.**

This enclosure must fulfil the following criteria:

- Provide protection against persons gaining access to rotating parts
- Restrain any rotating parts which may be work loose
- Guarantee sufficient ventilation for the coupling

This enclosure must be made of stable steel components. In order to ensure adequate ventilation for the coupling, the enclosure must be fitted with regular openings. For safety reasons, these openings must not exceed the dimensions outlined in table 2-1.

<b>Component</b>	<b>Circular openings [mm]</b>	<b>Rectangular openings [mm]</b>
Top of the enclosure	Ø 8	□ 8
Side elements of the enclosure	Ø 8	□ 8


*Table 2-1 Shape and size of ventilation holes*

The enclosures must be positioned a minimum of 15 mm distant from rotating parts. The enclosure must be electrically conductive and be included in the equipotential bonding.

Before commencing long-term operation, the plant must successfully complete a test run.



**2.4 Application not in compliance with the intended use**

<b>WARNING</b>	
	<p><b>Injury and material damage can occur as a result of:</b></p> <ul style="list-style-type: none"><li>▪ Inadmissibly high torque</li><li>▪ Inadmissibly high or low speeds</li><li>▪ Exceeding the specified ambient temperature</li><li>▪ Inadmissible ambient medium</li><li>▪ Inadmissible coupling enclosure</li><li>▪ Exceeding the admissible overall misalignment values</li></ul> <p>Only use the coupling for the specified application.</p>

CENTA bears no liability for damage resulting from application not in compliance with the intended use of the equipment.

Should there be a change of plant parameters, the coupling design must be reviewed by CENTA (address see chapter 1).



### 3 Delivery, transport, storage and disposal

#### 3.1 Delivery

After delivery, the coupling:

- must be checked for completeness and correctness of the delivery.
- must be examined for possible transport damage (which must be reported immediately to the carrier).



#### 3.2 Transport

<b>CAUTION</b>	
	<p><b>Injury and material damage can occur as a result of:</b></p> <ul style="list-style-type: none"> <li>▪ Incorrect transportation of couplings</li> </ul> <p>Ensure that the coupling is correctly transported.</p>
<b>CAUTION</b>	
	<p><b>Material damage to coupling components can occur as a result of:</b></p> <ul style="list-style-type: none"> <li>▪ Contact with sharp-edged objects</li> </ul> <p>Protect coupling components for transportation. Only hoist coupling components with nylon belts or ropes. Always cushion parts when supporting them from below.</p>

Following transportation damage:

- Check the coupling carefully for damage.
- Consult the manufacturer (Address see chapter 1).

#### 3.3 Storage

<b>CAUTION</b>	
	<p><b>Material damage to elastic elements and rubber parts can occur as a result of:</b></p> <ul style="list-style-type: none"> <li>▪ Incorrect storage</li> </ul> <p>These parts must be stored laid flat and so they cannot distort, and protected from ozone, heat, light, moisture and solvents.</p>
 <b>IMPORTANT</b>	
<p>Rubber parts are marked where possible with their production date. From this date, they may only be stored for a maximum of 5 years.</p>	

**3.3.1 Storage location**

Requirements imposed on the storage location:


- Moderately ventilated and low in dust
- Dry (max. 65% humidity)
- Temperature stabilized (-10°C to +25°C)
- Free of ozone-producing devices such as light sources and electric motors
- Free of UV light sources and direct sunlight
- Do not store solvents and disinfectants, fuels or lubricants, acids, chemicals etc. in the same location

For more details, refer to DIN 7716.

**3.3.2 Storage of couplings / flexible elements**

- Unpack the parts.
- Check the packaging for damage. Replace if necessary.
- Check that the wax protection on steel components is intact. If necessary, patch or renew.
- Package the parts (for prolonged periods of storage, enclose desiccant and weld into film).
- Place the parts into storage.

**3.4 Disposal**

<b>RECYCLING</b>	
	Ensure safe, environmentally responsible disposal of operating supplies and exchange parts. For this, locally provided recycling facilities and regulations must be utilized.

For disposal, the coupling parts must be separated where possible and sorted according to material type.



## **4 Technical description**

### **4.1 Characteristics**

The CENTA coupling series CF-M, -AM, -AGM and -ACV have the following advantages and characteristics:

- Highly torsional elasticity; backlash-free; the torsional vibrations of the drive are damped, especially at low drive speed.
- Sound is damped up to 5 dBA and more, the rubber element of the coupling does not conduct the sound vibration of the drive. Reduced vibration protects all components, especially the electronic equipment.
- The couplings compensate misalignments of any kind, especially angular misalignments, resulting in lower wear of the shaft bearing and the gear.
- The thrust of the propeller (respectively the draft of the propeller at reverse rotation) is transferred from the propeller shaft to the gear respectively to the hull (CF-AGM/ACV).
- The coupling is attached to the cylindrical propeller shaft using a safely dimensioned clamping hub, so that no complex adaption of the propeller shaft is necessary. A length adjustment is easy and the profile of the propeller shaft is not affected by a feather keyway or a bore.
- Simple mounting: The flange connection and the hub will be delivered completely finished or pre-mounted (with appropriate adapter flange).
- The couplings are electrically isolating and protect from damages resulting from electrolysis.

### **4.2 Specifications**

The specifications can be found in the catalogue and the dimensions in the installation drawing.

## 5 Aligning the driving and the driven unit



### IMPORTANT

- The units should be aligned during assembly.
- The overall misalignment is composed of the misalignment and the operating misalignment. The permissible overall misalignment values can be found in chapter 7.2 and must not be exceeded.  
Align the units that are to be connected as accurately as possible. In this way, a long service life for the coupling and maximum operating misalignment values can be achieved.  
After completion of assembly, check the alignment of the coupling again and if necessary correct.

### 5.1 Axial alignment

Permissible axial alignment tolerance (see figure 6-2):

$$\Delta K_{A \max} = \pm 2 \text{ mm}$$

### 5.2 Radial alignment

Permissible radial alignment tolerance (see figure 6-2):

$$\Delta K_{R \max} = 0,1 \text{ mm}$$

### 5.3 Angular alignment






Permissible angular alignment tolerance (see figure 6-2):

$$\Delta K_{W \max} = 0,5^\circ$$

## 6 Mounting

### 6.1 General assembly instruction

Any work method which impairs the safety of the coupling is prohibited.  
The user undertakes to notify the manufacturer immediately of any changes occurring at the coupling which could impair safety (address see chapter 1).

<b>WARNING</b>	
	<p><b>Injuries can occur as a result of:</b></p> <ul style="list-style-type: none"> <li>▪ Contact with rotating parts</li> </ul> <p>Before starting work at the coupling, switch off the plant and secure against unintentional start-up.</p>
<b>WARNING</b>	
	<p><b>Injury and material damage can occur as a result of:</b></p> <ul style="list-style-type: none"> <li>▪ Assembly of the coupling in the wrong sequence</li> </ul> <p>Only ever assemble the coupling in the described sequence.</p>
<b>WARNING</b>	
	<p><b>Injury and material damage can occur as a result of:</b></p> <ul style="list-style-type: none"> <li>▪ Falling coupling components</li> </ul> <p>Secure coupling components against falling to the floor.</p>
<b>CAUTION</b>	
	<p><b>Material damage to coupling components can occur as a result of:</b></p> <ul style="list-style-type: none"> <li>▪ Contact with sharp-edged objects</li> </ul> <p>Protect coupling components for transportation. Only hoist coupling components with nylon belts or ropes. Always cushion parts when supporting them from below.</p>
<b>CAUTION</b>	
	<p><b>Material damage can occur as a result of:</b></p> <ul style="list-style-type: none"> <li>▪ Soiled joint surfaces</li> </ul> <p>The surfaces that are to be joined must be free of dirt, preservatives and lubricants.</p>

**CAUTION**

**Material damage to coupling components can occur as a result of:**

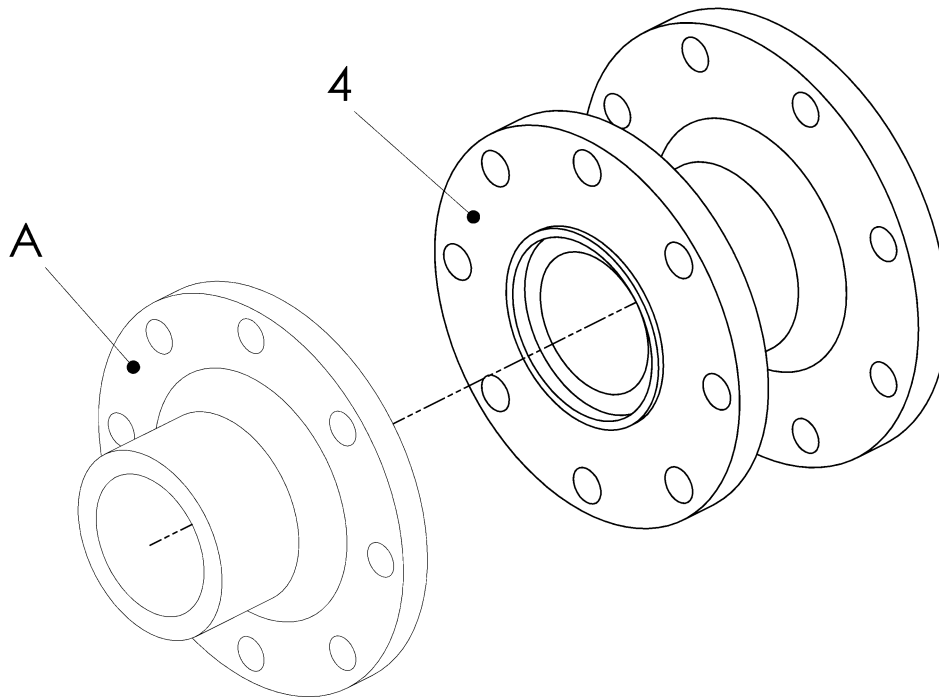
- Anaerobic adhesives (e.g. Loctite) used for screw locking

This type of screw locking medium may not be in contact with rubber parts.

**IMPORTANT**

- Screw preparation and tightening torque levels in accordance with CENTA data sheet D013-016 (see chapter 11.1).
- Use suitable lifting devices for assembly.
- The following assembly stages are described for coupling 008M-00140.
- Part illustration and marking may differ slightly from installation drawing and delivery state.

## 6.2 Mounting the adapter (if necessary)



*Fig. 6-1 Mounting the adapter*

Item	Info	Designation	Remark
4		Adapter	If ordered
A		Transmission flange	Customer part



### **IMPORTANT**

Tightening torques for elements to connect couplings with customer parts could deviate from CENTA data sheet D013-016.  
Consider specifications on installation drawing.

- Push the adapter (4) onto/into the centring of the transmission flange (A).
- Screw together the adapter (4) and the transmission flange (A).



### 6.3 Preparing the propeller shaft for the mounting of the coupling

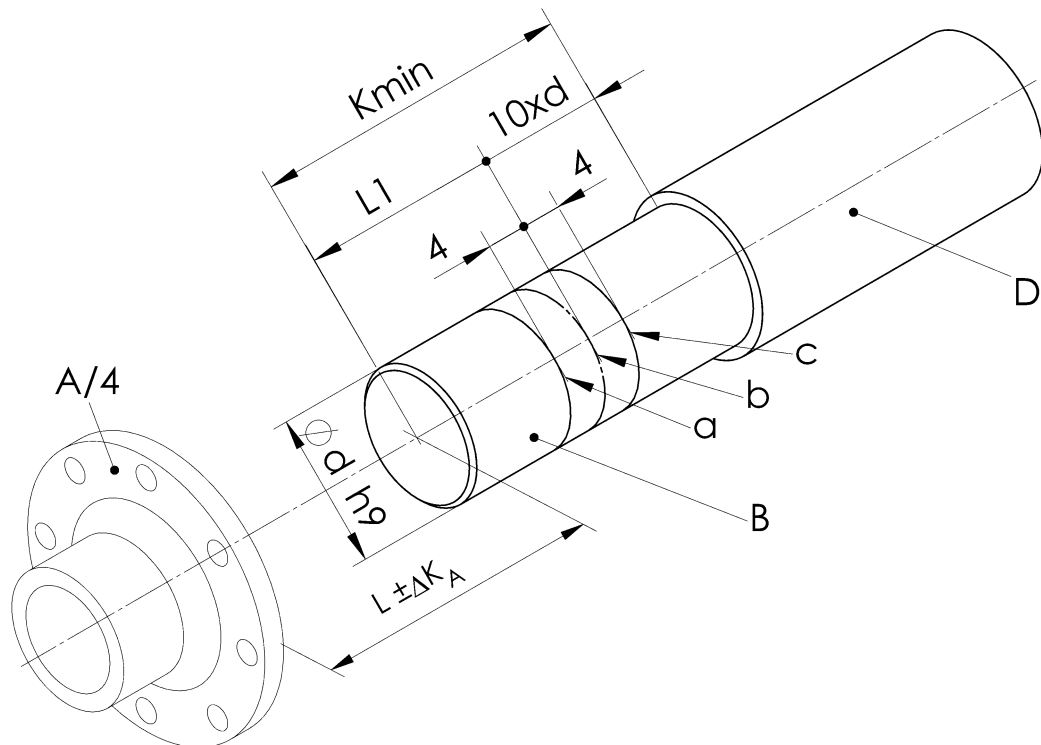


Fig. 6-2 Preparing the propeller shaft for the mounting of the coupling

Item	Info	Designation	Remark
4		Adapter	If ordered
A		Transmission flange	Customer part
B		Propeller shaft	Customer part
D		Stern tube	Customer part
$K_{min}$		Minimal length by which the propeller shaft has to stick out of the stern tube	To be calculate by using formula 6-1
L		Installation dimension between adapter/transmission flange (4/A) and Propeller shaft (B)	See table 6-1
L1		Installation dimension	See table 6-1
	a	Mark in direction transmission	
	b	Mark: Dimension L1	
	c	Mark in direction propeller	
	$\varnothing d$	Diameter of the shaft (B)	Tolerance of the shaft: h9 or better

**CAUTION**



**Material damage can occur as a result of:**

- Mounting the coupling onto propeller shafts which are too short
- Mount coupling onto propeller shafts only which are long enough. The shaft length must not be shorter than the dimension **K<sub>min</sub>**.

- Position the propeller shaft (B) axially in the stern tube (D) according to the customer instructions so that the installation dimension  $L \pm 2$  mm is achieved.
- Additionally ensure that the propeller shaft (B) sticks out of the stern tube (D) by dimension **K<sub>min</sub>** at least. By doing so, the installation dimension  $L \pm 2$  mm shall not be modified.  
The dimension **K<sub>min</sub>** can be calculated by using the following formula.

$$K_{\min} = L1 + (10 \cdot d)$$

$$K_{\min} = \quad + (10 \cdot \quad )$$

$$K_{\min} = \text{=====}$$

*Formula 6-1 Auxiliary dimension K<sub>min</sub>*

- Ensure that the propeller shaft (B) does not slip out of the stern tube (D).
- Degrease the surface of the propeller shaft (B).
- Mark the propeller shaft (B) at a distance **L1** with the mark (b) using a felt tip pen. The dimension **L1** can be found in the following table.

<b>Coupling size CF-AM</b>	<b>L1 [mm]</b>	<b>L [mm]</b>
00012 / 00022	57	42
00028	55	47
00030 / 00050 / 00080	70	55
00140	83	55
00200	90	72
00250	100	72
00400	120	79
00600	135	97

*Table 6-1 Installation dimensions*

- Mark the propeller shaft (B) at a distance of 4 mm to the mark (b) with the marks (a and c) using a felt tip pen.
- Push the propeller shaft (B) into the stern tube (D) by the dimension **L1 + 50 mm**.
- Ensure that the shaft (B) will not shift.

#### **6.4 Aligning the driving and the driven unit**

- Align the driving unit and the driven unit (see chapter 5).
- Lock the position of the driving and the driven unit using dowel pins or anything similar to make sure, that the aligned position of the driving and the driven unit will not change.

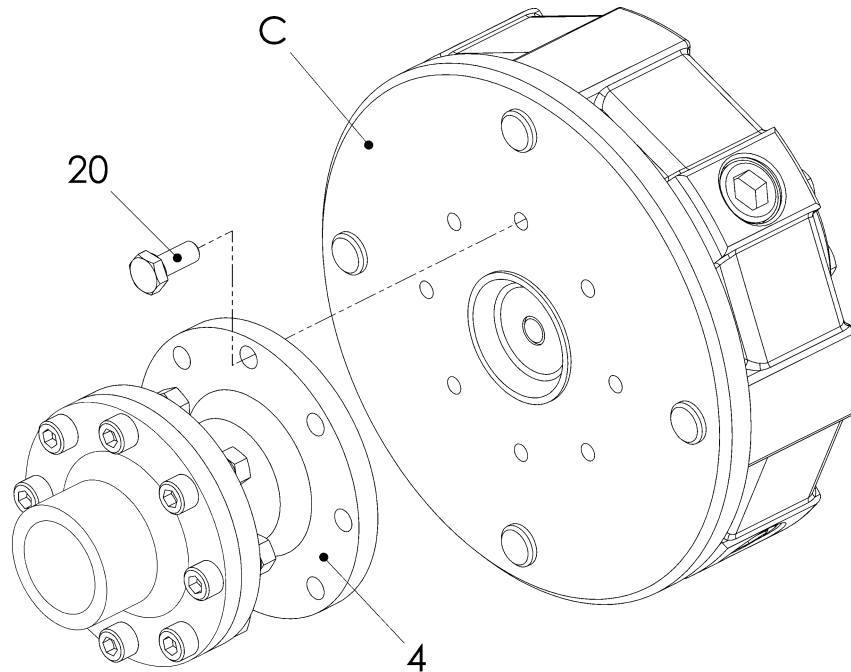
#### **6.5 Mounting the coupling**

- Mount the coupling as appropriate for the supplied design (see installation drawing).
  - Screwing together the coupling and the adapter (4) using the screws (20), see chapter 6.5.1.
  - Calculating the maximum screw-in depth of the screws in the coupling, see chapter 6.5.2.
  - Screwing together the coupling and the transmission flange (A) using the screws (E), see chapter 6.5.3.
  - Screwing together the coupling and the transmission flange (A) using the stud screws (25), see chapter 6.5.4.

**6.5.1 Screwing together the coupling and the adapter (4) using the screws (20)**

** IMPORTANT**

Only mount the coupling according to this chapter, if **all** parts (coupling, adapter **and** screws) are scope of supply of CENTA.




*Fig. 6-3 Screwing together the coupling and the adapter (4) using the screws (20)*

Item	Info	Designation	Remark
4		Adapter	If ordered
20		Screw	If ordered
C		Coupling	Pre-mounted by CENTA

- Push the coupling (C) into the centring of the adapter (4).
- Screw the adapter (4) to the coupling (C) using the screws (20).

6.5.2 Calculating the maximum screw-in depth of the screws in the coupling

<b>CAUTION</b>	
	<p><b>Damages to the coupling can occur as a result of:</b></p> <ul style="list-style-type: none"> <li>▪ Screws and / or stud screws which are screwed-in too deep into the coupling</li> </ul> <p>Ensure that the screws and/or stud screws have the correct screw-in length. If necessary, shorten the screws and / or stud screws.</p> <p>The minimum screw-in length <math>S_{min}</math> is:  <math>0,9 \times</math> thread diameter M (see installation drawing).</p> <p>The maximum screw-in length of a screw <math>S_{max}</math> corresponds to the maximum screw-in depth <math>T_{max}</math>, see table 6-2.</p>

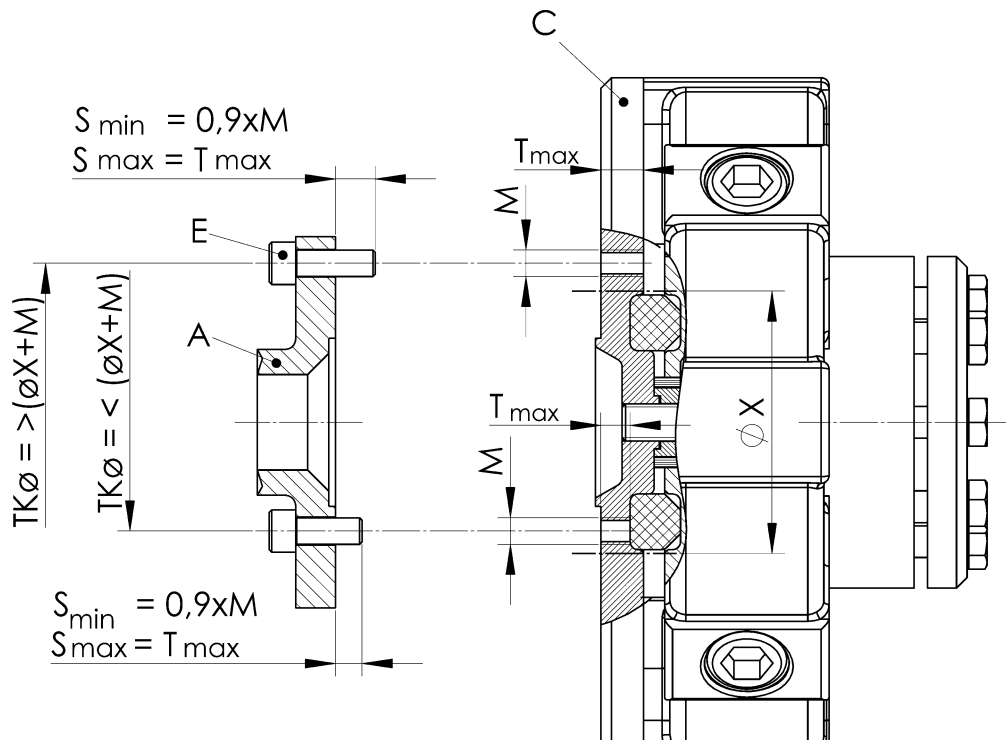


Fig. 6-4 Maximum screw-in depth  $T_{max}$  of the screws in the coupling



---

Item	Info	Designation	Remark
A		Transmission flange	Customer part
C		Coupling	Pre-mounted by CENTA
E		Screw	Customer part
M		Thread diameter	
S <sub>max</sub>		Maximum screw-in length of the screw	
S <sub>min</sub>		Minimum screw-in length of the screw	
T <sub>max</sub>		Maximum screw-in depth	
TK $\emptyset$		Pitch circle diameter	
$\emptyset X$		Diameter	See table 6-2

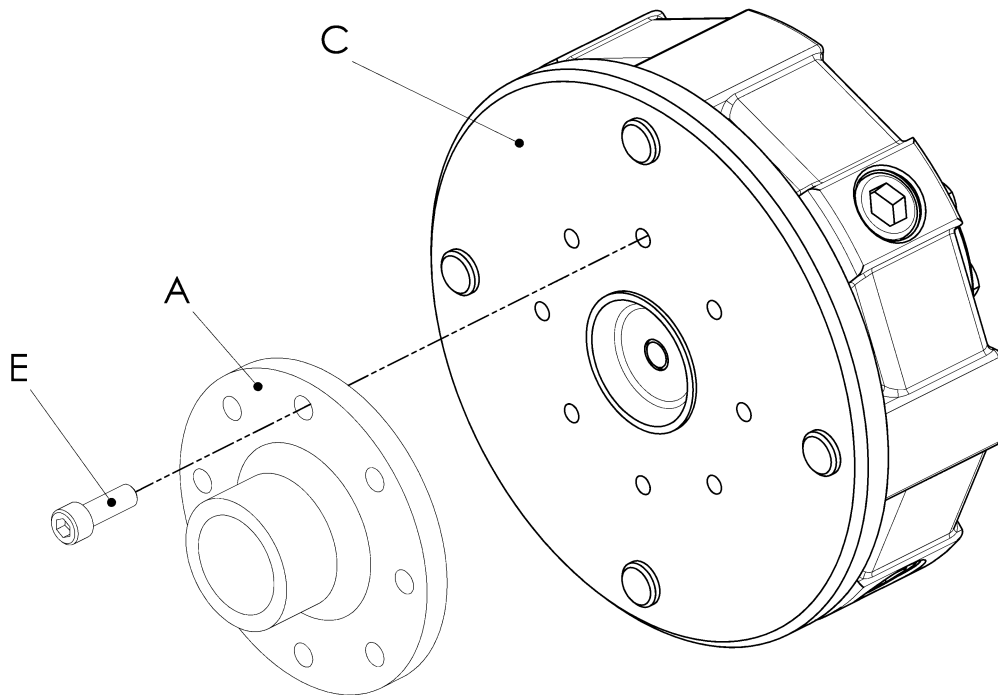


Coupling size CF-AM	$\varnothing X$ [mm]	Screw-in depth $t_{max}$ [mm]
00012	> 72	15
	< 72	10
00022	> 71	15
	< 71	8
00028	> 82	15
	< 82	11
00030 / 00050 00080 / 00140	> 98	15
	< 98	11
00200	> 137	26
	< 137	21
00250	> 144	26
	< 144	21
00400	> 144	27
	< 144	23
00600		30

Table 6-2  $\varnothing X$  for screw-in depth in the coupling

- According to figure 6-4 and table 6-2, select the proper screw (E).

**6.5.3 Screwing together the coupling and the transmission flange (A) using the screws (E)**



*Fig. 6-5 Screwing together the coupling and the transmission flange (A) using the screws (E)*

<b>Item</b>	<b>Info</b>	<b>Designation</b>	<b>Remark</b>
A		Transmission flange	Customer part
C		Coupling	Pre-mounted by CENTA
E		Screw	See chapter 6.5.1



**CAUTION****Damages to the coupling can occur as a result of:**

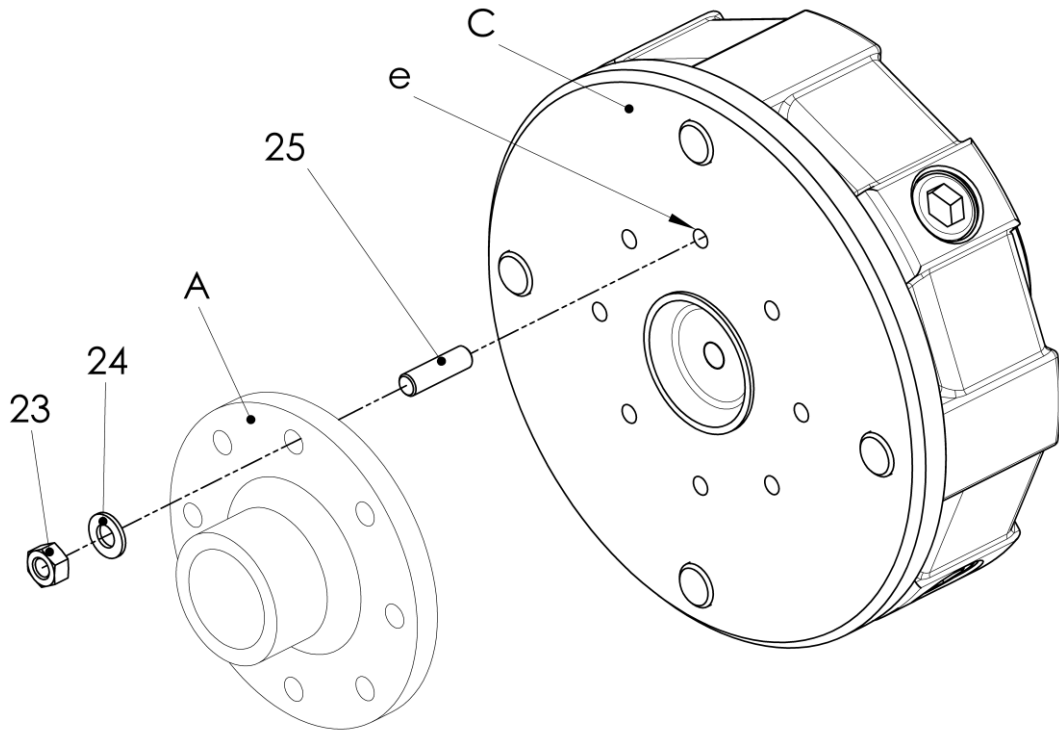
- Screws and / or stud screws which are screwed-in too deep into the coupling

Ensure that the screws and/or stud screws have the correct screw-in length. If necessary, shorten the screws and / or stud screws.

The minimum screw-in length  $S_{min}$  is:  
0,9 x thread diameter M (see installation drawing).

The maximum screw-in length of a screw  $S_{max}$  corresponds to the maximum screw-in depth  $T_{max}$ , see table 6-2.

- Push the coupling (C) into the centring of the transmission flange (A).
- Screw the transmission flange (A) to the coupling (C) using the screws (E).

**6.5.4 Screwing together the coupling and the transmission flange (A) using the stud screws (25)**


*Fig. 6-6 Screwing together the coupling and the transmission flange (A) using the stud screws (25)*

Item	Info	Designation	Remark
23		Nut	If ordered
24		Washer	If ordered
25		Stud screw	If ordered
A		Transmission flange	
C		Coupling	Pre-mounted by CENTA
	e	Maximum screw depth	

**CAUTION****Damages to the coupling can occur as a result of:**

- Screws and / or stud screws which are screwed-in too deep into the coupling

Ensure that the screws and/or stud screws have the correct screw-in length. If necessary, shorten the screws and / or stud screws.

The minimum screw-in length  $S_{min}$  is:  
0,9 x thread diameter M (see installation drawing).

The maximum screw-in length of a screw  $S_{max}$  corresponds to the maximum screw-in depth  $T_{max}$ , see table 6-2.

- Apply a liquid screw locking medium onto the short threaded end of the stud screws (25; length of the short threaded end = 1x thread diameter of the stud screw).
- Screw the stud screws (25) into the coupling (C) using the short threaded ends.
- Push the coupling (C) into the centring of the transmission flange (A).
- Screw together the transmission flange (A) and the coupling (C) using the stud screws (25), washers (24) and nuts (23).

## 6.6 Mounting the propeller shaft

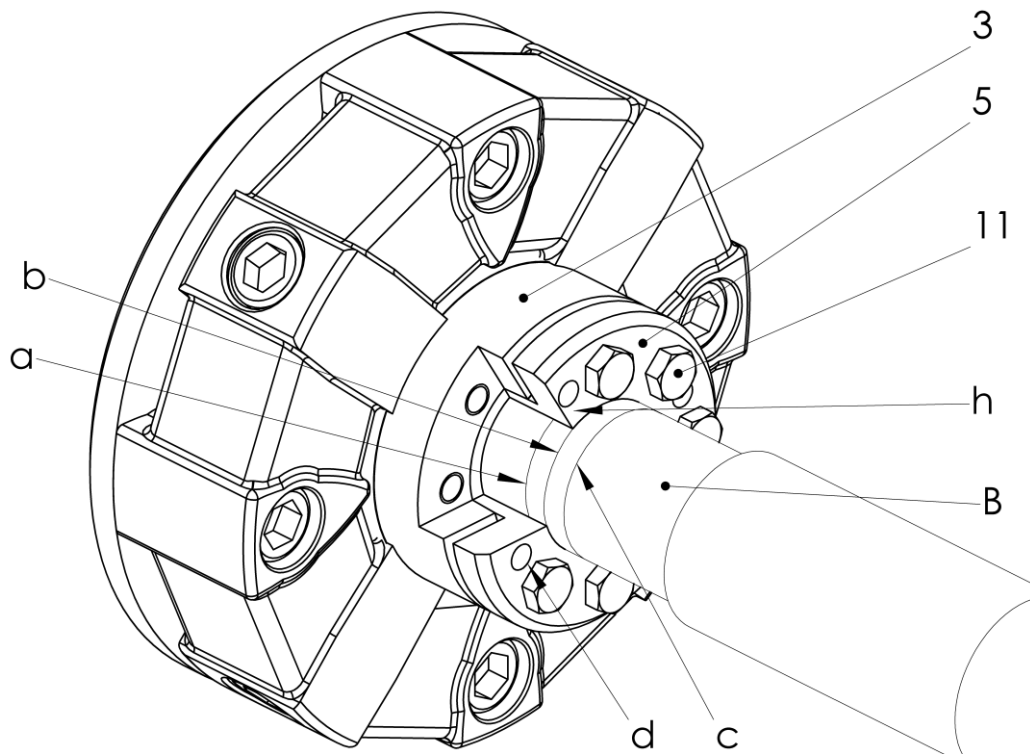


Fig. 6-7 Mounting the propeller shaft


Item	Info	Designation	Remark
3		Hub	
5		Hub	
11		Screw	
B		Propeller shaft	
	a	Mark in direction of the transmission	
	b	Mark dimension L1	
	c	Mark in direction of the propeller	
	d	Forcing thread	
	h	Face of the clamping hub	

- Clean and degrease the drilling of the hub (5).
- Push the propeller shaft (B) into the hub (5), until the mark (b) and the face of the hub (h) are aligned.
- Evenly tighten screws (11) in three steps crosswise, until the tightening torque (see installation drawing) has been achieved for all screws.  
First step: 40 % of the specified tightening torque.  
Second step: 60 % of the specified tightening torque.  
Third step: 100 % of the specified tightening torque.
- Check the tightening torque of all screws (11) one after the other.
- Check the position of the propeller shaft (B).  
The face (h) of the hub (5) has to be positioned between the marks (a and c).

**If differences occur (see figure 6-7):**

- Loosen the screws (11) and unscrew evenly approximately 10 mm.
- Unscrew one screw (11) for each forcing thread (d) and screw it loosely into a forcing thread (d).
- Push the hub (5) out of the hub (3) using the screws (11) in the forcing threads (d).
- Reposition the propeller shaft (B) in the hub (5). Push the propeller shaft (B) into the hub (5) up to the mark (b). If necessary adjust the axial position of the shaft (B).
- Tighten the screws (11) as described above.
- Check the position of the propeller shaft (B) again.  
If the face (h) of the hub (5) is not positioned between the marks (a und c), repeat the mounting step "If differences occur".

**6.7 After completed mounting**

<b>WARNING</b>	
	<p><b>Injury and material damage can occur as a result of:</b></p> <ul style="list-style-type: none"><li>▪ Loose screw connections</li></ul> <p>Before commissioning, the tightening torque levels of all screws must be checked and corrected if necessary.</p>

Before commencing long-term operation, the plant must successfully complete a test run.

## 7 Operation

### WARNING



**Injury and material damage can occur as a result of:**

- Worn coupling components

If the running noises change and/or vibrations occur turn the plant off immediately.

Determine the fault and its root cause, and remedy.  
The troubleshooting process is simplified by the table in the next chapter.  
On principle in case of a fault, an analysis of the entire plant should be performed.

### 7.1 Operating faults, root causes and remedy

Faults	Possible root causes	Remedy
Prior to all kinds of remedies		<ul style="list-style-type: none"> <li>• Switch off the plant</li> </ul>
Running noises or vibrations in the unit	Alignment error	<ul style="list-style-type: none"> <li>• Check alignment and correct</li> <li>• Check screw torque levels and correct</li> </ul>
	Loose screws	
Rubber element damaged	Alignment error	<ul style="list-style-type: none"> <li>• Replace defective parts</li> <li>• Check alignment and correct</li> <li>• Eliminate the cause for inadmissibly high torque</li> </ul>
	Inadmissibly high torque	
After all remedies		<ul style="list-style-type: none"> <li>• Trial run</li> </ul>

*Table 7-1 Troubleshooting table*

In case of uncertainty or if you have questions, please contact our head office (address see chapter 1).

### 7.2 Admissible overall misalignment of the coupling

The overall misalignment values can be found in the catalogue.

## 8 Care and maintenance

### WARNING

**Injuries can occur as a result of:**

- Contact with rotating parts

Before starting work at the coupling, switch off the plant and secure against unintentional start-up.

The coupling requires low maintenance. We recommend a visual inspection at the regular scheduled maintenance intervals for the whole unit.

### 8.1 Work to be performed

#### 8.1.1 Cleaning the coupling

- Remove any loose dirt from the coupling.

#### 8.1.2 Visual inspection of the coupling

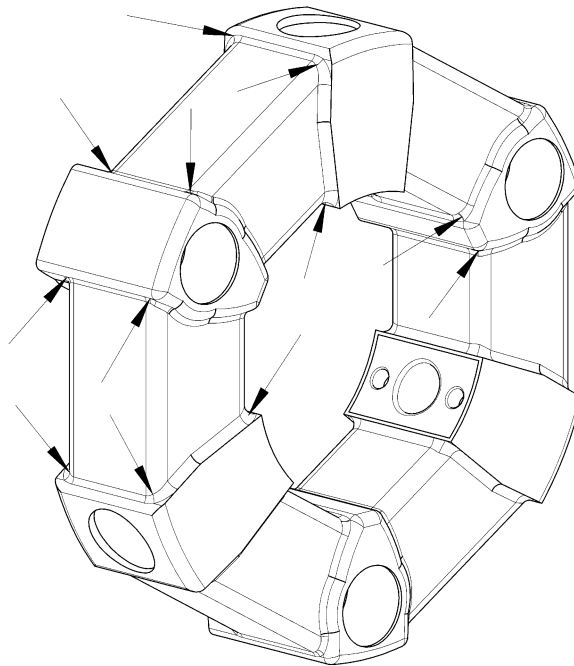
- Inspect the coupling for cracks, chips or missing parts.
- Replace faulty and missing parts.

#### 8.1.3 Visual inspection of the rubber element

**IMPORTANT**

Let the rubber element / the rubber elements exclusively be replaced by service partners!

Visual inspection of the CENTAFLEX-A rubber element (see fig. below). Pay particular attention to cracks or to the adhesion of rubber and metal parts in the zones indicated by the arrows. Pressure folds (creasing) in these zones may be considered normal.



*Fig. 8-1 Examples of wear zones at the CENTAFLEX-A rubber element indicated by arrows*

In the event of cracks, deeper than permissible (see table below) or rubber-to-metal connections have become detached, the rubber parts must be exchanged.

<b>CENTAFLEX-A Sizes</b>	<b>permissible crack depth [mm]</b>
<b>00001 / 00002 / 00004 / 00008 / 00012</b>	1.5
<b>00016 / 00022 / 00025 / 00028 / 00030 / 00050</b>	2.0
<b>00080 / 00090 / 00140 / 00200 / 00250</b>	3.0
<b>00400 / 00600</b>	5.0

*Table 8-1 Permissible crack depth at the CENTAFLEX-A-rubber element  
(Sizes 00001 to 00600)*

**8.1.4 Inspection of the screw connections**

- Check the tightening torque levels of all screws and if necessary, correct.



**8.2 Replace defective parts****IMPORTANT**

Exchange the rubber elements in the event of damage.

- Remove the coupling as described in chapter 9.
- Let the wearing parts exclusively be replaced by service partners.

**IMPORTANT**

Use exclusively **new** screws supplied by CENTA.  
These are coated with microencapsulated adhesive which serves as a screw locking medium.

- Mount the coupling as described in chapter 6.

## 9 Dismantling

### 9.1 General dismantling instructions

Any work method which impairs the safety of the coupling is prohibited.  
The user undertakes to notify the manufacturer immediately of any changes occurring at the coupling which could impair safety (address see chapter 1).



#### **IMPORTANT**

The coupling is dismantled in reverse order to the assembly process.  
Please refer to the illustrations in chapter 6.

#### **WARNING**



##### **Injuries can occur as a result of:**

- Contact with rotating parts

Before starting work at the coupling, switch off the plant and secure against unintentional start-up.

#### **WARNING**



##### **Injury and material damage can occur as a result of:**

- Dismantling of the coupling in the wrong sequence

Only ever dismantle the coupling in the described sequence.

#### **WARNING**



##### **Injury and material damage can occur as a result of:**

- Falling coupling components

Secure coupling components against falling to the floor.

#### **CAUTION**



##### **Material damage to coupling components can occur as a result of:**

- Contact with sharp-edged objects

Protect coupling components for transportation.

Only hoist coupling components with nylon belts or ropes.

Always cushion parts when supporting them from below.



#### **IMPORTANT**

Use suitable lifting devices for dismantling.

## **9.2 Dismantling the propeller shaft**

### **See Fig. 6-7:**

- Loosen the screws (11) and evenly unscrew them approximately 10 mm.
- For each forcing thread (d) unscrew a screw and loosely screw it into the forcing thread (d).
- Push the hub (5) out of the hub (3) using the screws (11) in the forcing threads (d).
- Pull the propeller shaft (B) off the hub (5).
- Ensure that the propeller shaft (B) does not slip out of the stern tube (D).

## **9.3 Dismantling the coupling**

- Dismantle the coupling as appropriate for the supplied design (see installation drawing).
  - Dismantling the adapter (4) and the screws (20) from the coupling, see chapter 9.3.1.
  - Dismantling the transmission flange (A) and the screws (E) from the coupling, see chapter 9.3.2.
  - Dismantling the transmission flange (A) and the stud screws (25) from the coupling, see chapter 9.3.3.

### **9.3.1 Dismantling the adapter (4) and the screws (20) from the coupling**

#### **See fig. 6-3:**

- Loosen and remove the screws (20) of the connection adapter (4) and coupling (C).
- Pull the coupling (C) off the centring of the adapter (4) and remove.

### **9.3.2 Dismantling the transmission flange (A) and the screws (E) from the coupling**

#### **See fig. 6-5:**

- Loosen and remove the screws (E) of the connection transmission flange (A) and coupling (C).
- Pull the coupling (C) off the centring of the transmission flange (A) and remove.

### **9.3.3 Dismantling the transmission flange (A) and the stud screws (25) from the coupling**

#### **See fig. 6-6:**

- Loosen the nuts (23) of the connection transmission flange (A) and coupling (C) and remove along with the washers (24).
- Pull the coupling (C) off the centring of the transmission flange (A) and remove.
- Loosen the stud screws (25) and remove them out of the coupling (C; if necessary).

**9.4 Dismantling the adapter (if necessary)****See fig. 6-1:**

- Loosen and remove the screws of the connection transmission flange (A) and adapter (4).
- Pull the adapter (4) off the centring of the transmission flange (A) and remove.

**9.5 Reassembling the coupling**

- Reassemble the coupling as described in chapter 6.

## 10 Wearing and spare parts

### WARNING

**Injury and material damage can occur as a result of:**

- Mounting and/or utilization of non-original CENTA parts
- Never use parts from other manufacturers.

A stock of the most important wearing and spare parts is the most important condition to ensure that the coupling is functional and ready for operation at all times.

We only provide a warranty for CENTA original parts.

**Wearing parts of this coupling:**

- Rubber element
- Rubber elements of the bearing

**IMPORTANT**

Let the rubber element / the rubber elements exclusively be replaced by service partners!

**IMPORTANT**

Use exclusively **new** screws supplied by CENTA.  
These are coated with microencapsulated adhesive which serves as a screw locking medium.

When ordering a spare, specify:

- Order no.
- Coupling order no.
- Drawing no.



## 11 Annex

### 11.1 CENTA data sheet D013-016 (unlubricated screw connections)

**Validity:**

For all non-dynamically stressed screw connections with **not lubricated** shank bolts in accordance with ISO 4014, ISO 4017 and ISO 4762 (DIN 912) with metric standard thread in accordance with DIN ISO 262, unless other specifications are given on CENTA documents.

**Preparation of parts that are to be screwed together:**

The joining areas must be free of dirt, preservatives and lubricants.

**Preparation of screws that ARE NOT secured with liquid screw locking medium:**

Use screws as delivered.

**Preparation of screws that ARE secured with liquid screw locking medium:**

Remove all grease from the thread.

**Screw tightening method:**

Screw in (by hand with torque wrench).

d	Thread size			d	Thread size		
	Strength class	Tightening torques			Strength class	Tightening torques	
		[Nm] ±5%	[in lbs] ±5%			[Nm] ±5%	[in lbs] ±5%
M6	8.8	10	90	M22	8.8	470	4160
	10.9	14	125		10.9	670	5930
	12.9	17	150		12.9	780	6900
M8	8.8	23	205	M24	8.8	600	5310
	10.9	34	300		10.9	850	7520
	12.9	40	350		12.9	1000	8850
M10	8.8	46	410	M27	8.8	750	6640
	10.9	68	600		10.9	1070	9470
	12.9	79	700		12.9	1250	11060
M12	8.8	79	700	M30	8.8	1000	8850
	10.9	117	1050		10.9	1450	12830
	12.9	135	1200		12.9	1700	15050
M14	8.8	125	1100	M33	8.8	1400	12400
	10.9	185	1650		10.9	1950	17250
	12.9	215	1900		12.9	2300	20350
M16	8.8	195	1725	M36	8.8	1750	15500
	10.9	280	2500		10.9	2500	22150
	12.9	330	2900		12.9	3000	26550
M18	8.8	245	2200	M39	8.8	2300	20350
	10.9	350	3100		10.9	3300	29200
	12.9	410	3600		12.9	3800	33650
M20	8.8	350	3100				
	10.9	490	4350				
	12.9	580	5150				



## 11.2 CENTA data sheet D013-019 (screw connections with microencapsulated screw locking medium)

### Validity:

For all non-dynamically stressed screw connections with **screws\*** in accordance with ISO 4014, ISO 4017, ISO 4762 (DIN 912) and ISO 6912 with metric standard thread in accordance with DIN ISO 262 and **socket bolts\*** with metric standard thread in accordance with DIN ISO 262, unless other specifications are given on CENTA documents.

\* The threads are coated with microencapsulated screw locking medium.

### Preparation of parts that are to be screwed together:

The joining areas must be free of dirt, preservatives and lubricants.

### Preparation of screws with microencapsulated screw locking medium:

Give the screws extra lubrication with grease under the screw head.

### Screw tightening method:

Screw in (by hand with torque wrench).

### Curing time for the microencapsulated screw locking medium:

To ensure optimum screw locking, after tightening the curing time for the microencapsulated screw locking medium must be observed:

- Appr. 4-5 hours at room temperature (20°C)
- Higher temperatures will accelerate the curing time (e.g. 15 minutes at 70°C created by a hot air blower)

After 24 hours, the microencapsulated screw locking medium is completely cured.

Thread size	Strength class	Tightening torques		Thread size	Strength class	Tightening torques			
		[Nm] ±5%	[in Ibs] ±5%			[Nm] ±5%	[in Ibs] ±5%		
<b>M6</b>	<b>8.8</b>	10	90	<b>M18</b>	<b>10.9</b>	300	2650		
<b>M8</b>		25	220			<b>M20</b>	500	4450	
<b>M10</b>		50	440				610**	5400**	
<b>M12</b>		85	750				<b>M22</b>	820	7250
<b>M14</b>		140	1250				<b>M24</b>	1050	9300
<b>M16</b>		220	1950				<b>M27</b>	1550	13700

\*\* only for: CENTAFLEX-A size 400  
CENTAFLEX-T size 36x/46x



**11.3 CENTA data sheet D008-906**

**Declaration of incorporation according to the EC Machinery Directive 2006/42/EC, Appendix II B**

Manufacturer:

**CENTA Antriebe  
Kirschey GmbH**

Bergische Strasse 7  
42781 Haan / GERMANY

Contact:

Phone +49-2129-912-0

Fax +49-2129-2790

centa@centa.de

www.centa.info

We herewith declare that the **incomplete** machine

Product: Highly elastic coupling CENTAMAX-S

Model / series code: CF-AM / 008M

Installation size: 12...800

Design: all

Serial number: according to shipping documents, if applicable

- provided this is possible as far as the scope of supply is concerned - complies with the following basic requirements of the **Machinery Directive 2006/42/EC** Appendix I, subchapters 1.1.2, 1.1.3, 1.1.5, 1.3.2, 1.3.3, 1.3.4 und 1.5.4.

In addition, we declare that the special technical documents for this incomplete machine were compiled according to Appendix VII Part B and undertake to forward these to the market monitoring authorities by request via our "Documentation Department".

Commissioning of the incomplete machine is interdicted until the incomplete machine has been incorporated in a machine and the latter complies with the provisions of the EC Machinery Directive and the EC Declaration of Conformity according to Appendix II A is on hand.

The declaration is invalidated by every modification to the delivered parts.

Authorised representative for the compilation of the relevant technical documents:

*i.A. J. Anderseck*

by order of Gunnar Anderseck  
(Authorised Person Documentation)

Declaration of incorporation was issued:

*i.v. J. Exner*

by proxy Dipl.-Ing. Jochen Exner  
(Design Management)

Haan, 11.12.2009