

CENTAFLEX-A

Assembly and operating instructions

CF-AGM/ACV

M008-00069-EN

Rev. 1



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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.

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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.

Component	Circular openings [mm]	Rectangular openings [mm]
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

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

CAUTION	
	<p>Injury and material damage can occur as a result of:</p> <ul style="list-style-type: none">▪ Incorrect transportation of couplings <p>Ensure that the coupling is correctly transported.</p>
CAUTION	
	<p>Material damage to coupling components can occur as a result of:</p> <ul style="list-style-type: none">▪ Contact with sharp-edged objects <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

CAUTION	
	<p>Material damage to elastic elements and rubber parts can occur as a result of:</p> <ul style="list-style-type: none">▪ Incorrect storage <p>These parts must be stored laid flat and so they cannot distort, and protected from ozone, heat, light, moisture and solvents.</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

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

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



4 Technical description

4.1 Characteristics

The CENTAFLEX-AGM/-ACV coupling is used in boats and ships, and is mounted between the motor/transmission and propeller shaft.

Transmission of torque is performed by a maintenance-free, highly elastic universal joint shaft.

The propeller thrust is transmitted directly via a thrust bearing and an elastically screw-mounted flange to the body of the boat. For this reason, the motor is free of propeller forces and can be mounted in highly elastic bearings.

Additional benefits of a CENTAFLEX-AGM/-ACV coupling are:

- Highly smooth transmission of torque and propeller thrust.
- Substantial displacement and alignment errors are elastically compensated.
- Power transmission via vulcanized rubber without metal link.
- Vibrations are dampened and structure-borne noise stopped; Attenuation of sound values to 5 db (A) and higher.

4.2 Specifications

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

4.3 Design

4.3.1 CF-AGM

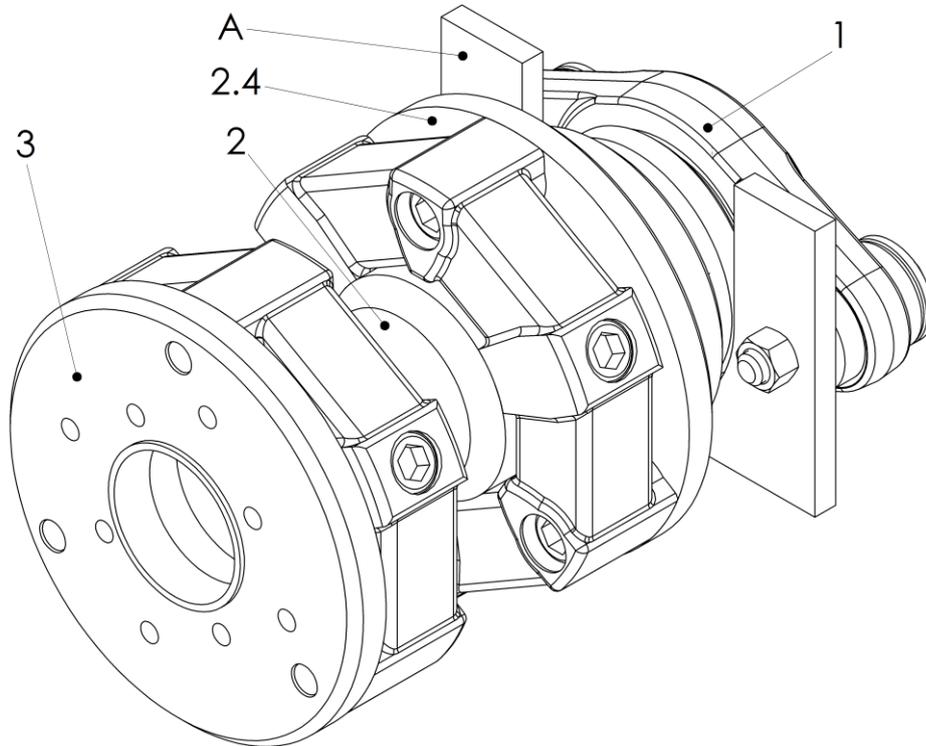


Fig. 4-1 CF-AGM

Item	Info	Designation	Remark
1		Bearing	
2		Drive shaft	
2.4		Hub	
3		Adapter	
A		Bulkhead	Customer part

4.3.2 CF-ACV

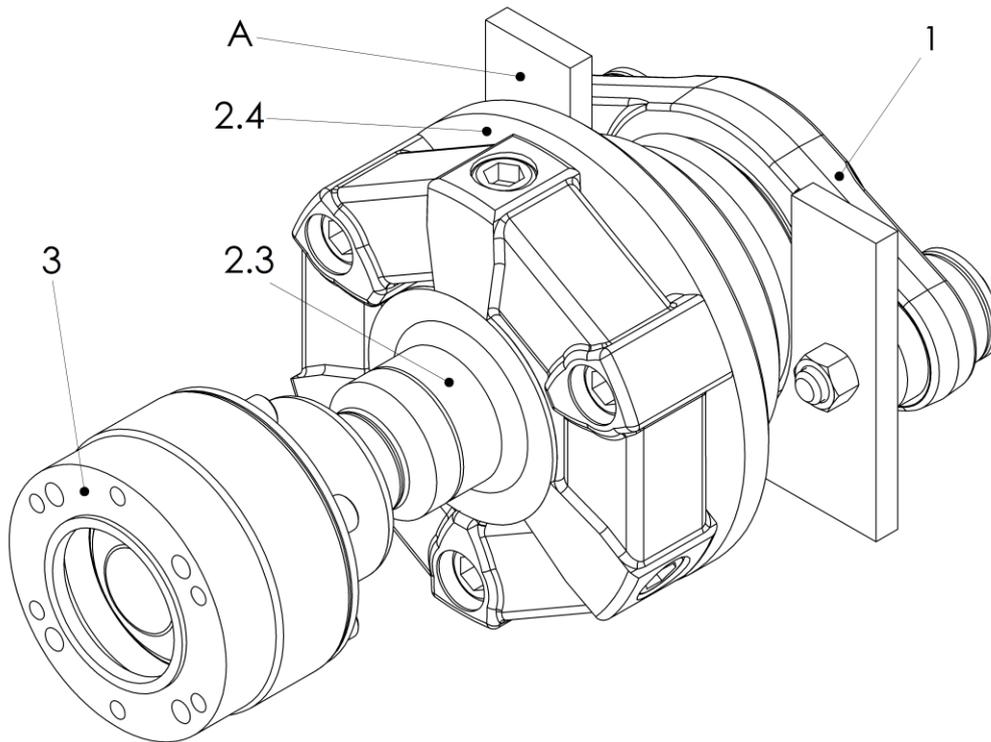


Fig. 4-2 CF-ACV

Item	Info	Designation	Remark
1		Bearing	
2.3		Joint	
2.4		Hub	
3		Adapter	
A		Bulkhead	Customer part

5 Alignment of the units being connected



IMPORTANT

- Align the units during the assembly.
- 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.
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.
- All permissible alignment tolerances apply to arrangements at operating temperatures.
If the arrangement would be aligned at a different temperature, there would be additional deviations in the arrangement, which were produced by the difference between the aligning and operating temperature.
For alignment, this has to be taken into account.
- After completion of assembly, check the alignment of the coupling again and correct, if necessary.

6 Mounting

6.1 General assembly 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).

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

- Use suitable lifting devices for assembly.
- Screw preparation and tightening torque levels for the screws Items 2.10 and 2.11 in accordance with CENTA data sheet D013-016 (see chapter 11.1), **but** all the other screws in accordance with CENTA data sheet D013-019 (see chapter 11.2)
- Elements for connection of the coupling to customer components do not form part of the delivery.
- The following assembly stages are described for coupling CF-AGM/ACV.
- Part illustration and marking may differ slightly from installation drawing and delivery state.

 **IMPORTANT**

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

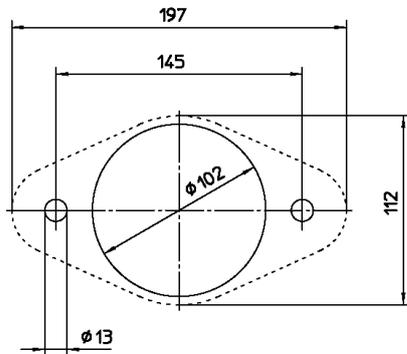
 **IMPORTANT**

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

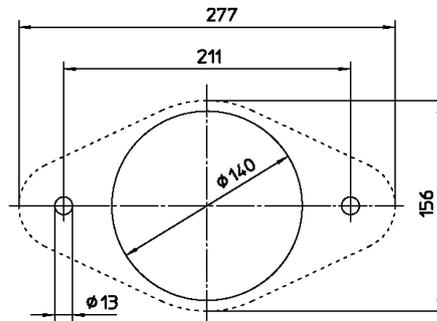
- Appr. 4-5 hours at room temperature (20°C)
- Higher temperatures will accelerate the curing time (e.g. 15 minutes at 70°C created by a hot air blower)

After 24 hours, the adhesive is completely cured.

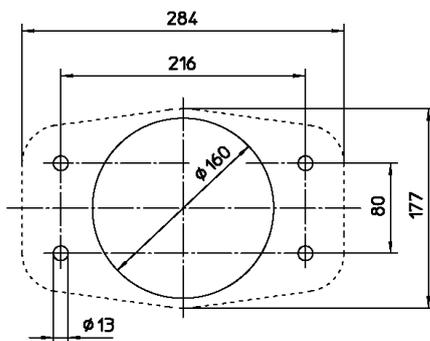
6.2 Mounting the bearing CENTA-TB



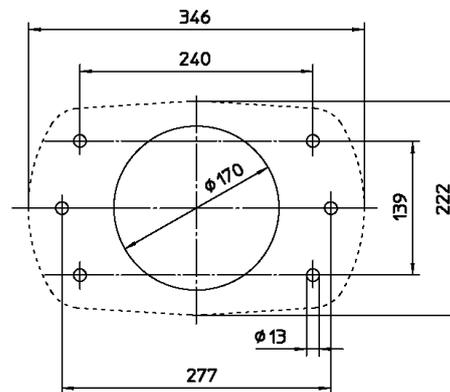
CENTA-TB 1 / 2



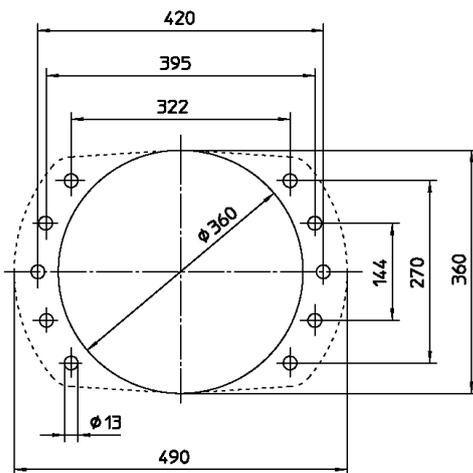
CENTA-TB 3



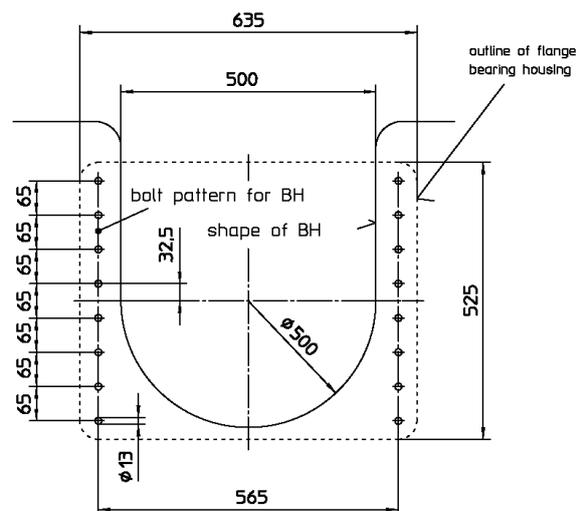
CENTA-TB 4



CENTA-TB 5



CENTA-TB 6



CENTA-TB 7

Fig. 6-1 Overview of bolt pattern for bulkhead fitting

 IMPORTANT

The bulkhead to which the bearing CENTA-TB is fastened must have enough strength to take up the propeller thrust. For bulkheads made of fibre composite materials, the permissible contact pressure must be ensured by a suitable, resistant base.

CENTA-TB Size	Max. bulkhead thickness X [mm]	With supplied screws	Tightening torque	
			[Nm] ±5%	[in lbs] ±5%
1	12	ISO4014-8.8 M12x70	79	700
2	12	ISO4014-8.8 M12x70		
3	15	ISO4014-8.8 M12x80		
4	15	ISO4014-8.8 M12x80		
5	15	ISO4014-8.8 M12x80		
6	25	ISO4014-8.8 M12x90		
7	25	ISO4014-8.8 M12x90		

Table 6-1 Bulkhead fitting

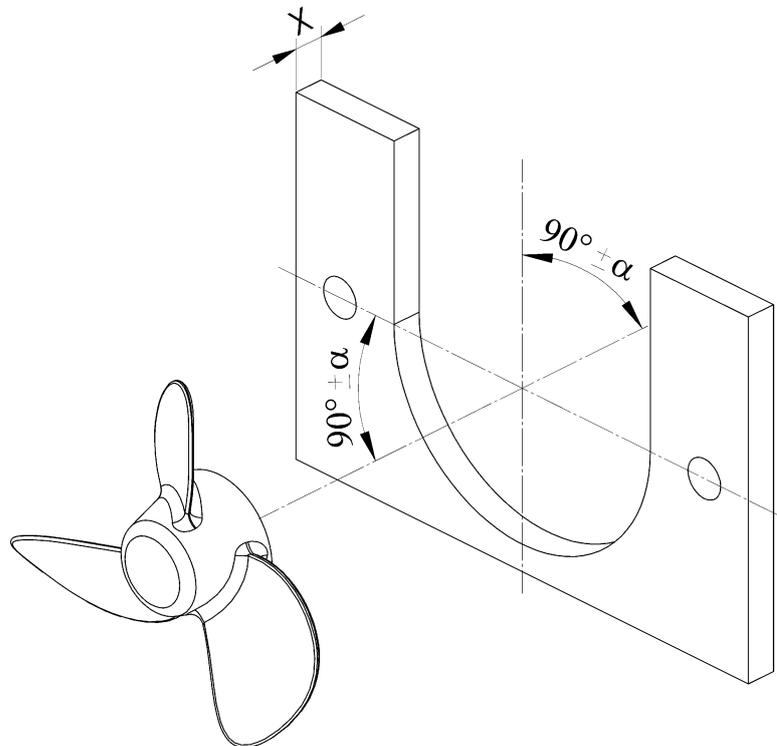


Fig. 6-2 Installation angle of the bearing

- Check the bulkhead thickness **X** in relation to the delivered screws length table 6-1. Use longer screws of strength 8.8 for thicker bulkheads.
- Prepare the bulkhead (A) according to the overview figure 6-1.

 **IMPORTANT**

The maximum installation angle of the bearing (figure 6-2) may not exceed **90° ± α** according to the values of table 6-2.

Bearing	Maximum angular tolerance α [°]
CENTA-TB-1	±4
CENTA-TB-2	±3
CENTA-TB-3	±2,5
CENTA-TB-4	±2,5
CENTA-TB-5	±2,5
CENTA-TB-6	±2,5
CENTA-TB-7	±2,5

Table 6-2 Installation angle tolerance of the bearing

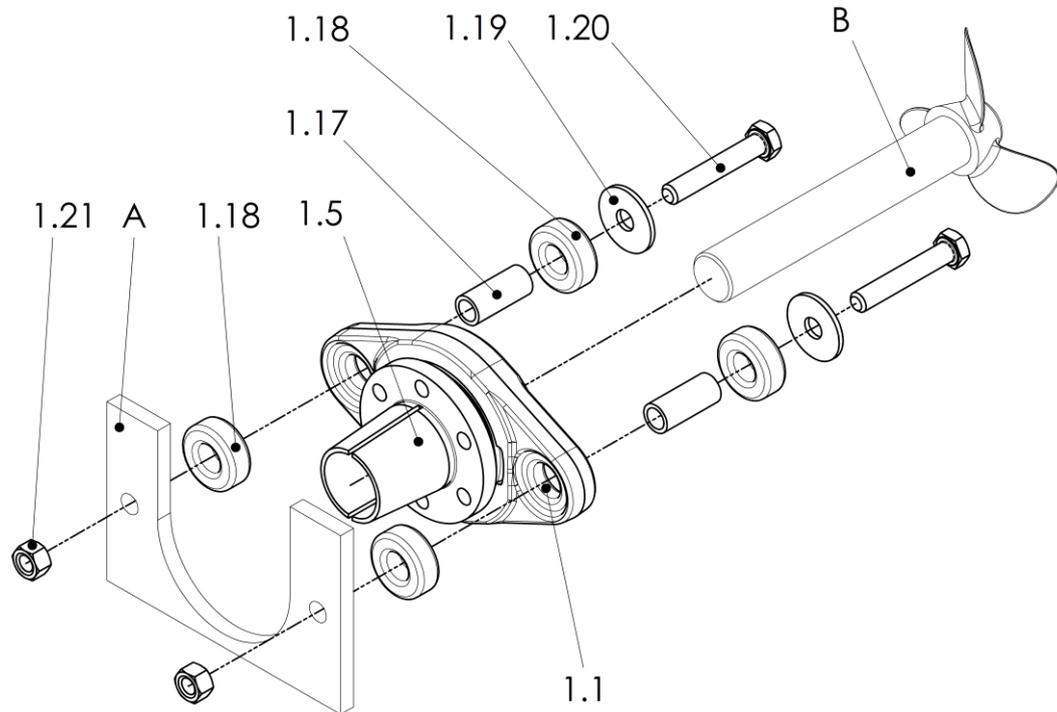


Fig. 6-3 Mounting the bearing to the bulkhead (CENTA-TB-2)

Item	Info	Designation	Remark
1		Bearing consisting of items 1.1 – 1.21	
1.1		Housing	
1.5		Hub	
1.17		Bush	
1.18		Rubber bush	
1.19		Washer	
1.20		Screw ISO4014-8.8 M12	
1.21		Nut ISO4032-8 M12	
A		Bulkhead	Customer part
B		Propeller shaft	Customer part tolerance h9 or better

- Screw the bearing (1).
Use a screw locking medium (e.g. Loctite).
Tightening torque: **79 Nm (700 in lbs)**.

6.3 Mounting the hub

 IMPORTANT

The bush, the drilling of the hub and the propeller shaft must be free of oil, grease and dirt.

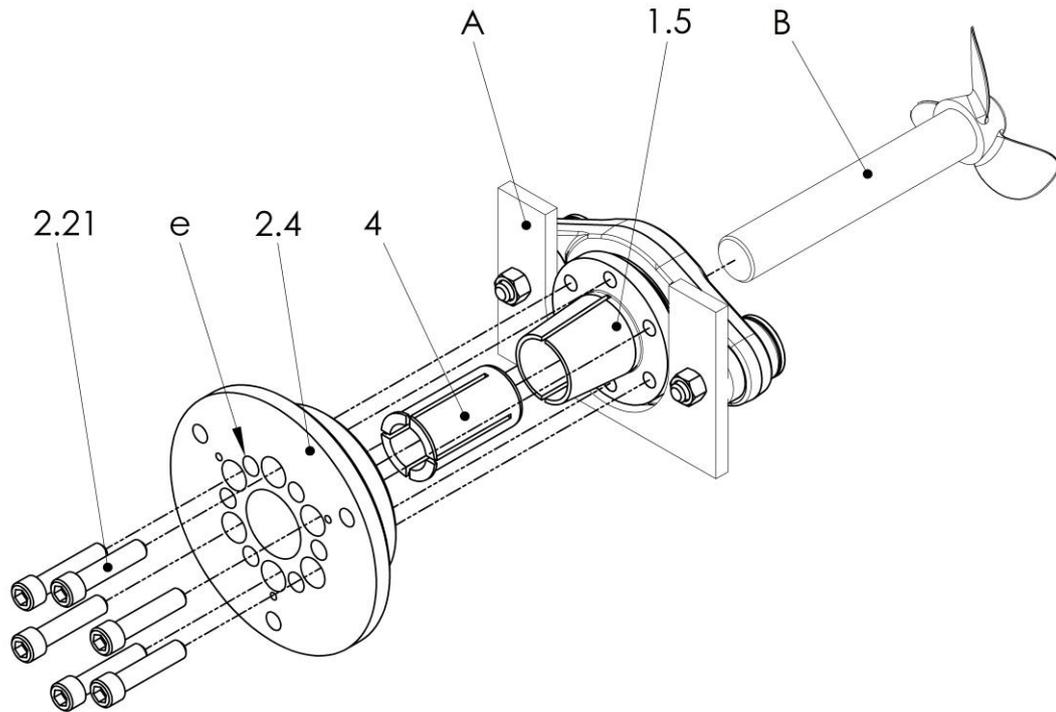


Fig. 6-4 Mounting the hub

Item	Info	Designation	Remark
1.5		Hub	
2.4		Hub	
2.21		Screw ISO4762-8.8 M12x55 VC	
4		Bush	
A		Bulkhead	Customer part
B		Propeller shaft	Customer part tolerance h9 or better
	e	Thread M12	For dismantling

- Insert the bush (4) into the hub (1.5) and push against the stop. (at hubs (1.5) with largest drilling diameter, no bush (4) exists).
- Push the propeller shaft (B) into the hub (1.5) with the bush (4).
- The end of the propeller shaft (B) must be flush with the bush (4) or hub (1.5) [without bush (4)] (Fig. 6-5).

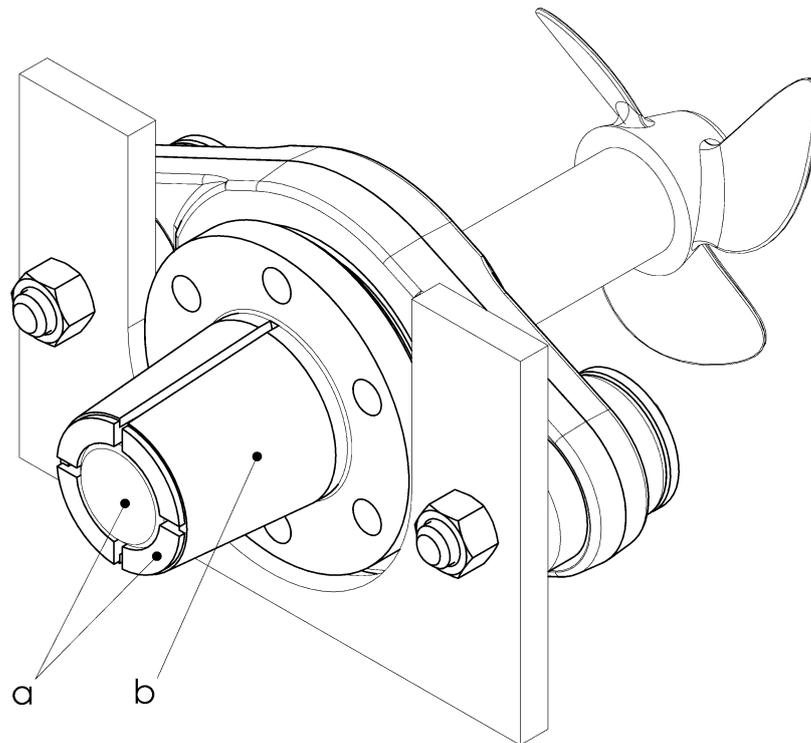


Fig. 6-5 Propeller shaft and bush are flush before mounting

Item	Info	Designation	Remark
	a		Flush mounted
	b		Cone of the hub (1.5)

- Lightly grease **only** the cone (b; fig. 6-5) of the hub (1.5).

See Fig. 6-4:

- Push the hub (2.4) onto the hub (1.5).
- Evenly tighten the screws (2.21) crosswise by several steps until the tightening torque has been achieved for all screws (2.21) (see data sheet D013-016, chapter 11.1).
- Check the tightening torque of all screws one after the other.
- Check the position of the propeller shaft (B; Fig. 6-6).

If differences occur:

- Dismantling the hub (2.4).
- Positioning the propeller shaft (B).
- Mounting again the hub (2.4).
- Checking the position of the propeller shaft (B).

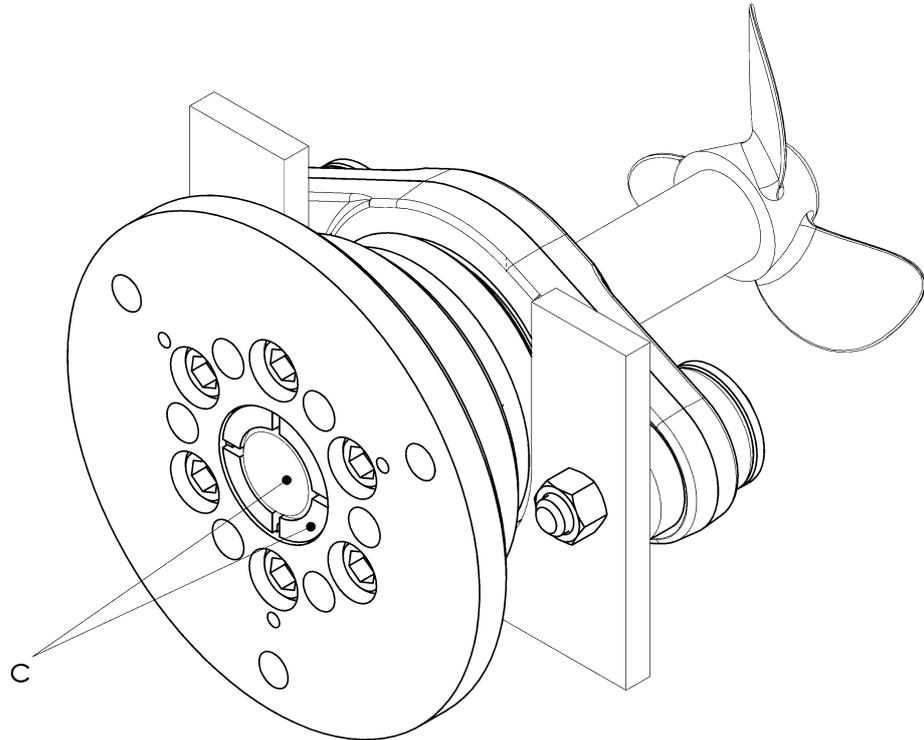


Fig. 6-6 Propeller shaft and bush are flush after mounting

Item	Info	Designation	Remark
	C		flush ± 5 mm

6.4 Mounting the adapter (3)

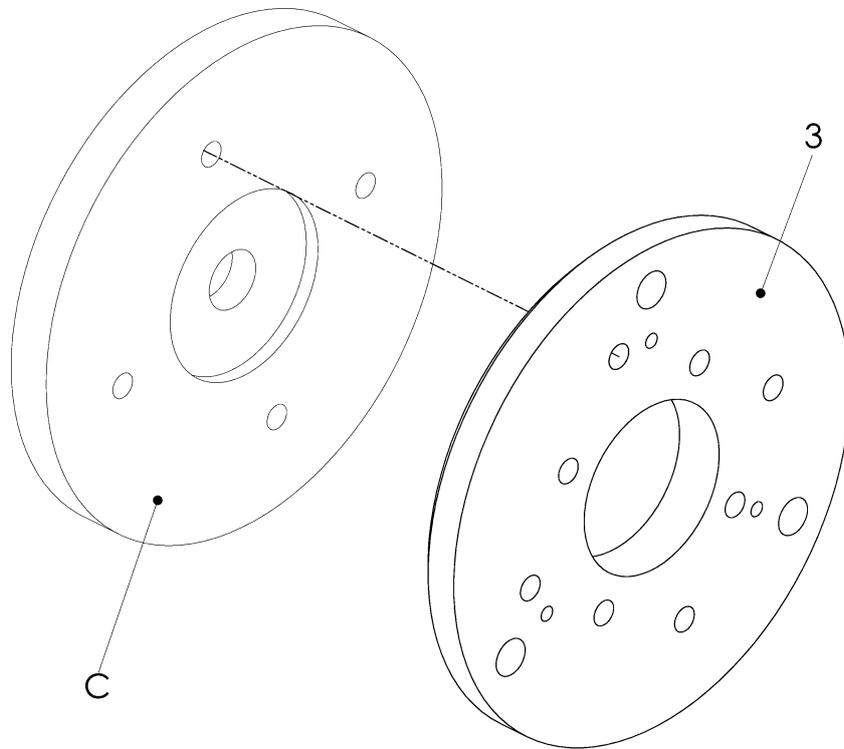


Fig. 6-7 Mounting the adapter (3)

Item	Info	Designation	Remark
3		Adapter	
C		Gearbox flange	Costumer part

- Push the adapter (3) onto/into the centring of the gearbox flange (C).
- Screw the adapter (3) and the gearbox flange (C).

6.5 Mounting the adapter (5; if necessary)

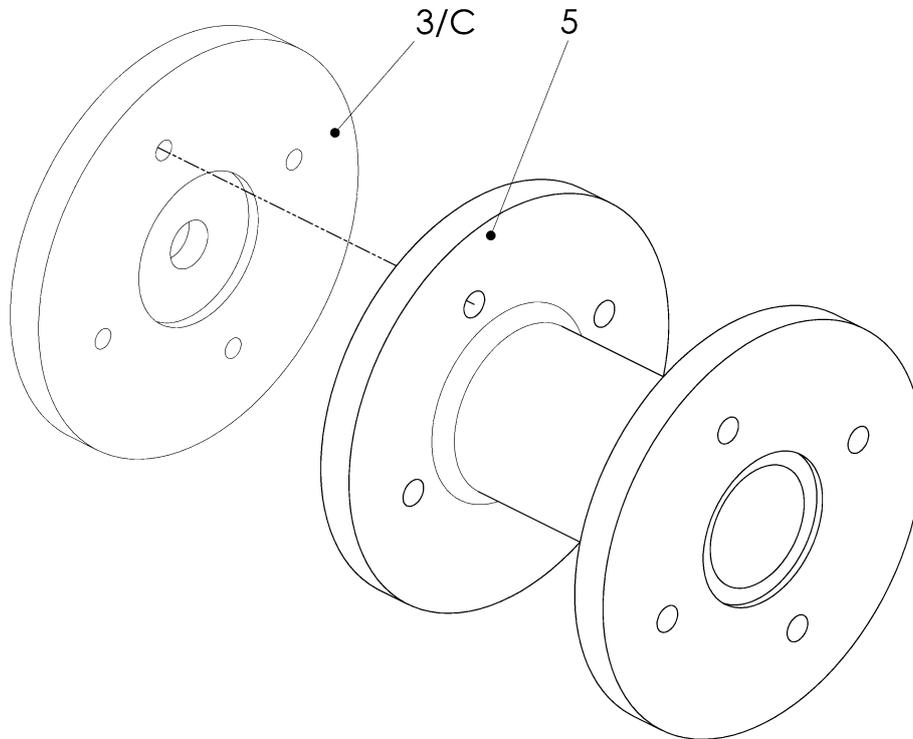


Fig. 6-8 Mounting the adapter (5; if necessary)

Item	Info	Designation	Remark
3		Adapter	
5		Adapter	
C		Gearbox flange	Customer part

- Push the adapter (5) onto/into the centring of the adapter/gearbox flange (3/C; see installation drawing).
- Screw the adapter (5) and the adapter/gearbox flange (3/C).

6.6 Mounting the drive shaft of the CF-AGM

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

Use exclusively **new** screws supplied by CENTA.

These are coated with microencapsulated adhesive which serves as a screw locking medium.

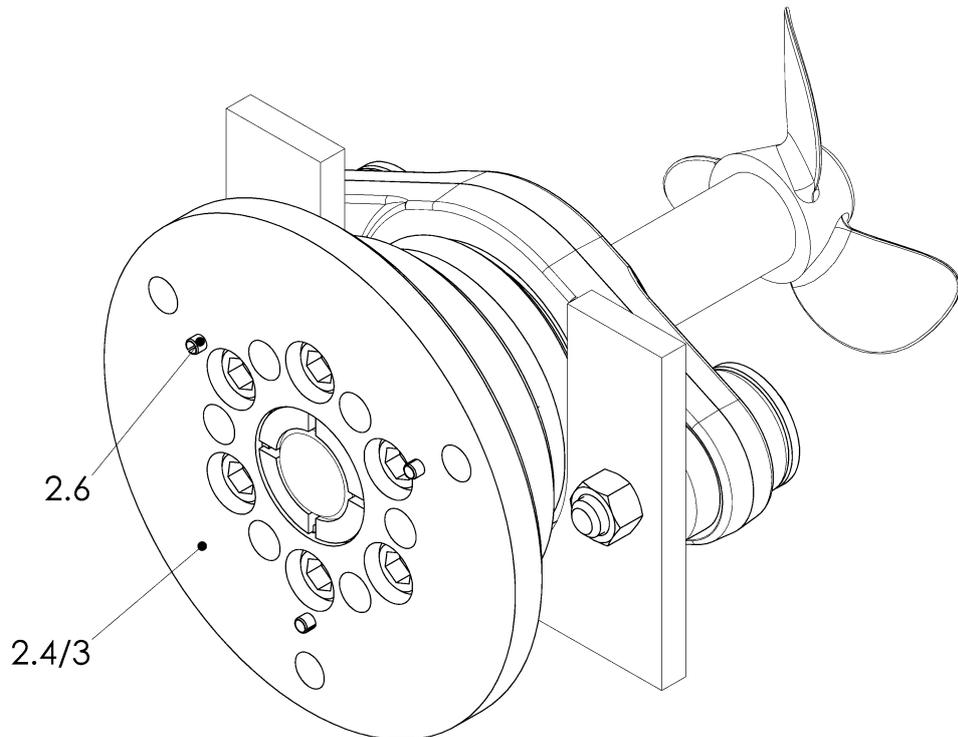


Fig. 6-9 Driving the spring pin

Item	Info	Designation	Remark
2.4		Hub	
2.16		Spring pin DIN7346 5x10	
3		Adapter	

- Drive in the spring pins (2.16) into the adapter (3).
- Drive in the spring pins (2.16) into the hub (2.4).

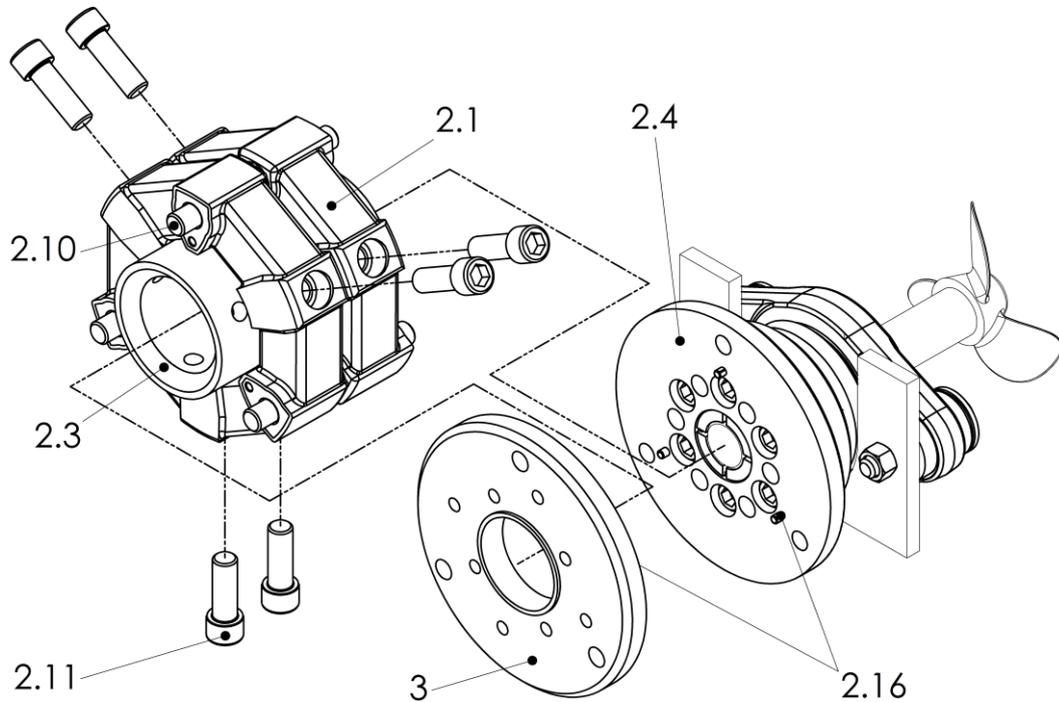


Fig. 6-10 Mounting the set with the rubber element

Item	Info	Designation	Remark
2.1		Rubber element	
2.3		Tube	
2.4		Hub	
2.10		Screw ISO4762 MK	
2.11		Screw ISO4762 MK	
2.16		Spring pin DIN7346 5x10	
3		Adapter	

- Push the screw (2.10) into the rubber element (2.1).
- Push the rubber elements (2.1) centred onto the tube (2.3).
- Position the tube (2.3) with the rubber elements (2.1) between the hub (2.4) and the adapter (3).
- Position the rubber elements (2.1) one after the other and screw them to the hub (2.4) using the screws (2.10). By this ensure the correct fitting of the spring pins (2.16) in the connected parts.

Screw preparation and tightening torque see data sheet D013-019 (Chapter 11.2).

- Push the screws (2.11) into the rubber elements (2.1) and turn them first 2 to 3 threads into the tube (2.3).
Tighten all screws (2.11), ensuring that the radial parts of the rubber elements (2.1) are correctly positioned on the tube (2.3).
Screw preparation and tightening torque see data sheet D013-019 (Chapter 11.2).

**IMPORTANT**

To ensure optimum screw locking, after tightening the curing time for the microencapsulated adhesive 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 adhesive is completely cured.

6.7 Mounting the drive shaft for the CF-ACV**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**

- Use exclusively **new** screws supplied by CENTA. These are coated with microencapsulated adhesive which serves as a screw locking medium.
- Screws for the connection of the Homokineten with the premounted adaptor and the gearbox flange are not included in delivery.

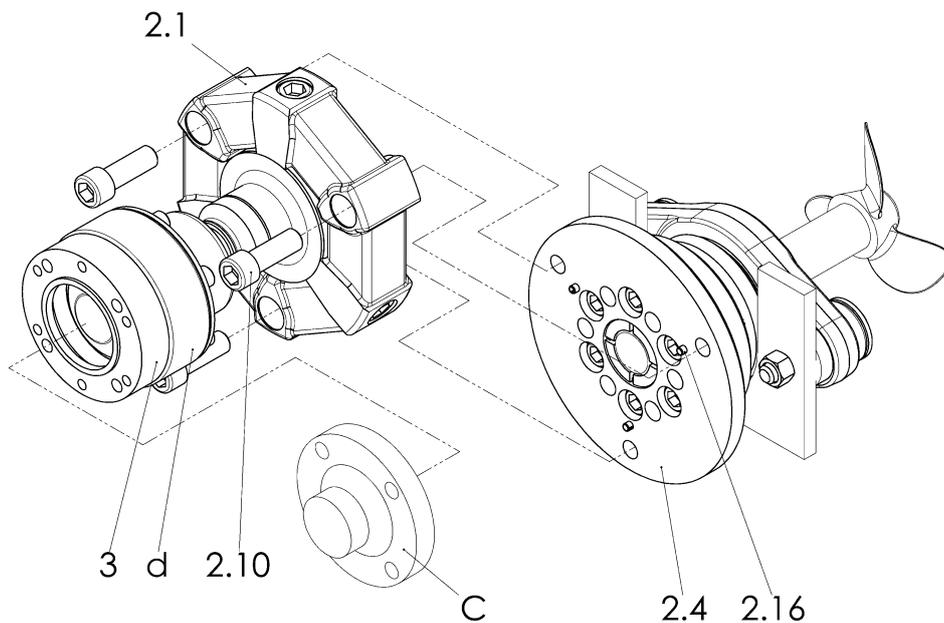


Fig. 6-11 Mounting the Homokinete to the rubber element

Item	Info	Designation	Remark
2.1		Rubber element	
2.4		Hub	
2.10		Screw ISO4762 MK	
2.16		Spring pin DIN7346 5x10	
3		Adapter	
C		Gearbox flange	Customer part
	d	Homokinet	

- Drive in the spring pins (2.16) into the hub (2.4).
- Push the Homokinet (d) with the pre-mounted adapter (3) into centring of the gearbox flange (C).
- Screw the Homokinet (d) to the pre-mounted adapter (3) and the gearbox flange (C; strength class of screws: 10.9).
Screw preparation and tightening torque see data sheet D013-016 (Chapter 11.1).
- Position the rubber element (2.1) and screw it to the hub (2.4) using the screws (2.10). By this ensure the correct fitting of the spring pins (2.16) in the connected parts.
Screw preparation and tightening torque see data sheet D013-019 (Chapter 11.1).



IMPORTANT

To ensure optimum screw locking, after tightening the curing time for the microencapsulated adhesive 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 adhesive is completely cured.

6.8 After completed mounting

WARNING



Injury and material damage can occur as a result of:

- Loose screw connections

Before commissioning, the tightening torque levels of all screws must be checked and corrected if necessary.

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"> • Switch off the plant
Running noises or vibrations in the unit	Alignment error	<ul style="list-style-type: none"> • Check alignment and correct • Check screw torque levels and correct
	Loose screws	
Rubber element damaged	Alignment error	<ul style="list-style-type: none"> • Replace defective parts • Check alignment and correct • Eliminate the cause for inadmissibly high torque
	Inadmissibly high torque	
Hub slippage	Propeller shaft and hub/bush are not flush	<ul style="list-style-type: none"> • Dismantle the coupling • Reposition the propeller shaft flush to hub/bush • Mounting the coupling
	Final tightening torque of screws is not reached	
After all remedies		<ul style="list-style-type: none"> • Trial run

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

7.2 Overall misalignment

The overall misalignment is composed of the **align misalignment** and **operation misalignment**.

7.2.1 Allowable axial overall misalignment values of the CF-AGM and CF-ACV

Size	CF-AGM		CF-ACV	
	$\Delta K_{A \text{ AGM max}}$ [mm]	$l_{c \text{ AGM}}$ [mm]	$\Delta K_{A \text{ ACV max}}$ [mm]	$l_{c \text{ ACV}}$ [mm]
8	±8	74	±8	94,5
16	±10	82	±6	116
25	±10	94	±11	136
30	±10	114	±8	145
50	±10	114	±12	141
80	±6	114	±12,5	178,5
140	±10	152	±12,5	217
200	±10	157	±12	212
250	±10	177	±15	301,5
400	±10	235	±15	299,5
600	±10	260	±15	350

Table 7-1 Allowable axial overall misalignment values

The maximum allowable axial overall misalignment values ΔK_A can be found in the table 7-2.



Angle	CF-AGM										
	8	16	25	30	50	80	140	200	250	400	600
1,05	±2,9	±4,6	±4,4	±6,2	±6,2	±2,1	±5,6	±5,3	±4,9	±6,6	±10,7
1,1	±2,9	±4,6	±4,4	±6,1	±6,1	±2,0	±5,5	±5,1	±4,7	±6,5	±10,5
1,2	±2,7	±4,4	±4,2	±5,9	±5,9	±1,9	±5,3	±4,9	±4,4	±6,1	±10,1
1,3	±2,6	±4,3	±4,1	±5,7	±5,7	±1,7	±5,1	±4,6	±4,2	±5,8	±9,7
1,4	±2,5	±4,2	±3,9	±5,6	±5,6	±1,5	±4,8	±4,3	±3,9	±5,5	±9,3
1,5	±2,4	±4,0	±3,8	±5,4	±5,4	±1,3	±4,6	±4,1	±3,6	±5,2	±8,9
1,6	±2,3	±3,9	±3,6	±5,2	±5,2	±1,1	±4,4	±3,8	±3,3	±4,9	±8,5
1,7	±2,2	±3,8	±3,5	±5,0	±5,0	±1,0	±4,2	±3,6	±3,0	±4,5	±8,1
1,8	±2,1	±3,7	±3,3	±4,9	±4,9	±0,8	±3,9	±3,3	±2,7	±4,2	±7,6
1,9	±2,0	±3,5	±3,2	±4,7	±4,7	±0,6	±3,7	±3,0	±2,4	±3,9	±7,2
2,0	±1,9	±3,4	±3,0	±4,5	±4,5	±0,4	±3,5	±2,8	±2,1	±3,6	±6,8
2,1	±1,8	±3,3	±2,9	±4,4	±4,4	±0,3	±3,3	±2,5	±1,8	±3,3	±6,4
2,2	±1,7	±3,1	±2,8	±4,2	±4,2	-	±3,0	±2,3	±1,5	±2,9	±6,0
2,3	±1,6	±3,0	±2,6	±4,0	±4,0	-	±2,8	±2,0	±1,2	±2,6	±5,6
2,4	±1,5	±2,9	±2,5	±3,8	±3,8	-	±2,6	±1,8	±0,9	±2,3	±5,2
2,5	±1,4	±2,7	±2,3	±3,7	±3,7	-	±2,4	±1,5	±0,6	±2,0	±4,8
2,6	±1,3	±2,6	±2,2	±3,5	±3,5	-	±2,1	±1,2	±0,3	±1,7	±4,4
2,7	±1,2	±2,5	±2,0	±3,3	±3,3	-	±1,9	±1,0	-	±1,3	±4,0
2,8	±1,1	±2,4	±1,9	±3,1	±3,1	-	±1,7	±0,7	-	±1,0	±3,6
2,9	±1,0	±2,2	±1,7	±3,0	±3,0	-	±1,5	±0,5	-	±0,7	±3,2
3,0	±0,9	±2,1	±1,6	±2,8	±2,8	-	±1,2	±0,2	-	±0,4	±2,8

Table 7-2 Allowable axial displacement with existing angular misalignment

In the existing angular misalignment, reduces the allowable axial misalignment. The allowed values can be found in table 7-3.

7.2.2 Allowable angular and radial overall misalignment CF-AGM and CF-ACV

The maximum allowable angular overall misalignment values α and β can be found in the table 7-4 (see fig. 7-1 and fig. 7-2).

The maximum allowable radial operating misalignment values ΔK_R will be calculated from the length l_c (see Table 7-2) and the angle α or β (see Table 7-3).

$$\Delta K_{R\ AGM} = \tan \alpha \circ (l_{c\ AGM})$$

Formula 7-1 Radial operating misalignment AGM

$$\Delta K_{R\ ACV} = \tan \alpha \circ (l_{c\ ACV})$$

Formula 7-2 Radial operating misalignment ACV

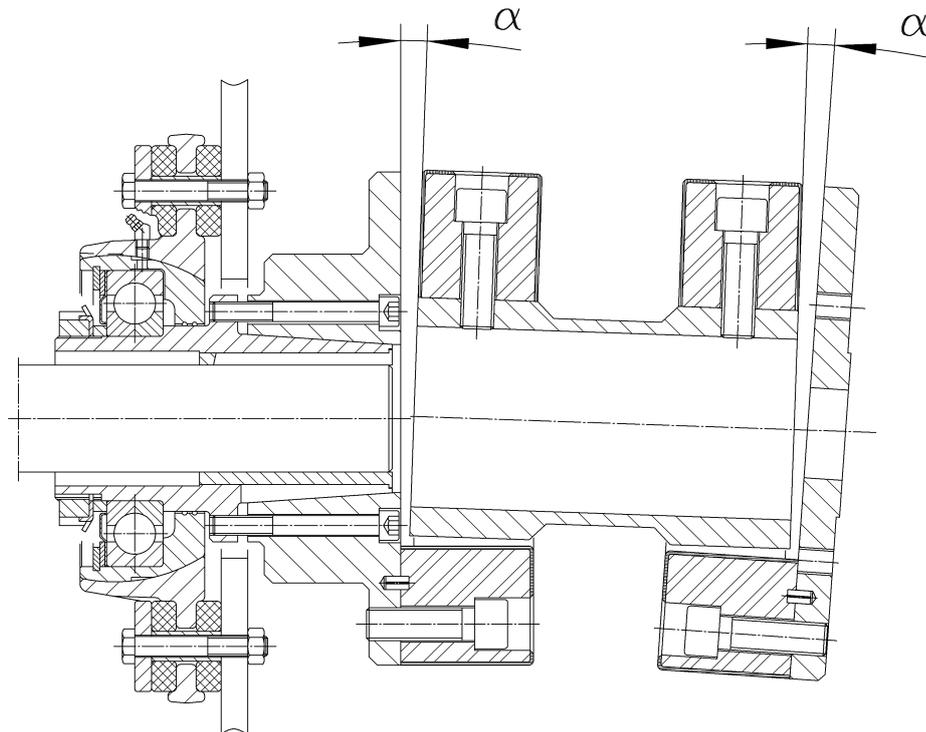


Fig. 7-1 CF-AGM

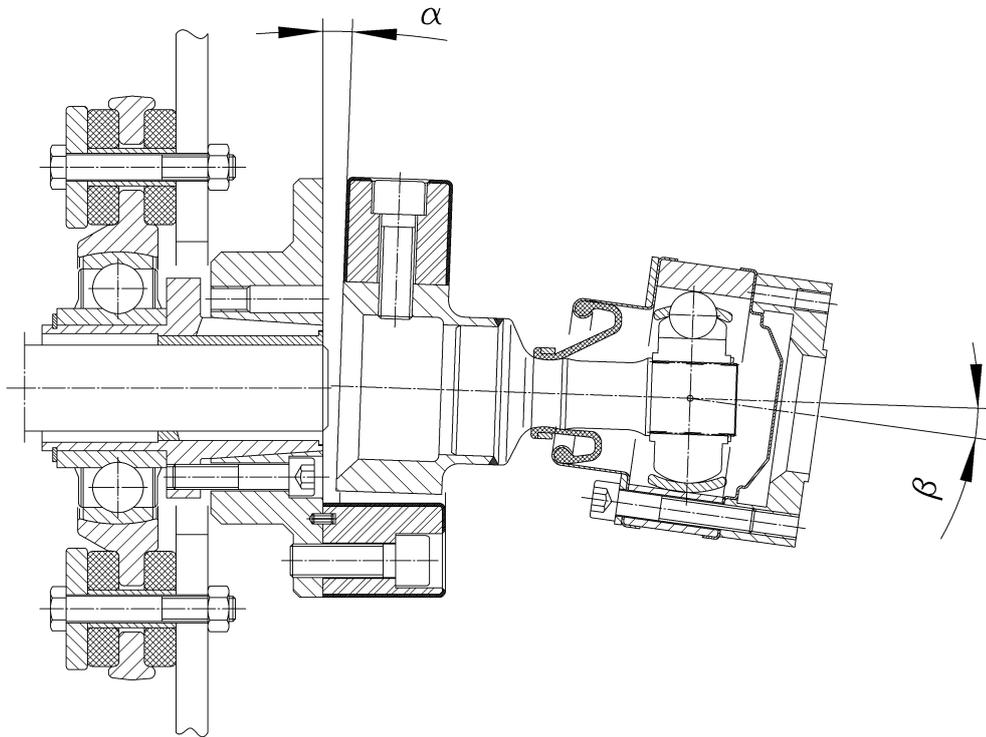


Fig. 7-2 CF-ACV

Size	Speed [min ⁻¹]	Angle															
		500	600	700	800	900	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
8	α_{max} [°]	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	β_{min} [°]	1,5															
	β_{max} [°]	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
16	α_{max} [°]	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	β_{min} [°]	1,5															
	β_{max} [°]	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
25	α_{max} [°]	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	β_{min} [°]	1,5															
	β_{max} [°]	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
30	α_{max} [°]	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	β_{min} [°]	1,5															
	β_{max} [°]	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
50	α_{max} [°]	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	β_{min} [°]	1,5															
	β_{max} [°]	8	8	8	8	7	6,5	6	5,5	5	4,5	4	4	4	4	3,5	3,5
80	α_{max} [°]	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	β_{min} [°]	1,5															
	β_{max} [°]	8	8	8	8	8	7,5	7	6,5	5,5	5	4,5	4	4	4	4	4
140	α_{max} [°]	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	β_{min} [°]	1,5															
	β_{max} [°]	8	8	8	8	8	8	8	7,5	7	6,5	5,5	5	4,5	4,5	4,5	4,5
200	α_{max} [°]	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
	β_{min} [°]	1,5															
	β_{max} [°]	8	8	8	8	8	7,5	7	6	5,5	5	4,5	4,5	4,5	4,5	4,5	4,5
250	α_{max} [°]	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5	1,5
	β_{min} [°]	1,5															
	β_{max} [°]	5	5	5	5	5	5	4	4	4	4	4	4	3,5	3,5	3	3
400	α_{max} [°]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	β_{min} [°]	1															
	β_{max} [°]	5	5	5	5	5	5	4	4	4	4	4	4	3,5	3,5	3	3
600	α_{max} [°]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	β_{min} [°]	1															
	β_{max} [°]	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4

Table 7-3 Overall misalignment

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

Visual inspection of the CENTAFLEX 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.

In the event of cracks more than 3 mm deep or rubber-to-metal connections have become detached, the rubber parts must be exchanged.

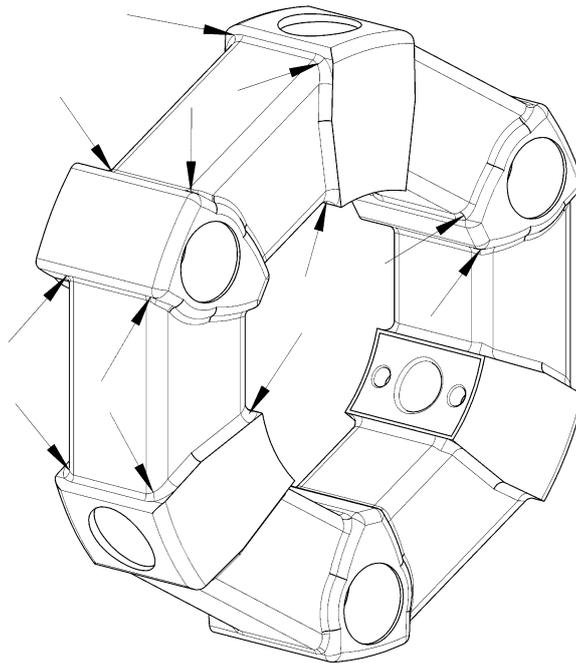


Fig. 8-1 Examples of wear zones at the CF-A rubber element indicated by arrows

8.1.4 Inspection of the screw connections

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

8.1.5 Relubricating the bearing

 IMPORTANT
<p>Only use grease Isoflex Topas L 152 (Art.-Nr. 004144) produced by company Klüber Lubrication München KG.</p>

With normal operating application is a lubrication only after approx. 4000 operating hours is necessary.

Bearing	Grease quantity [cm ³]
CENTA-TB-1 to -TB-4	maintenance free
CENTA-TB-5	18
CENTA-TB-6	125
CENTA-TB-7	375

Table 8-1 Grease quantity for relubrication

- Clean the lubricating nipple on the bearing.
- Relubricate according to table 8-1.

8.2 Replacing defective parts

 IMPORTANT
<p>Exchange the rubber elements in the event of damage, but not later than 5 of years of operation.</p>

- Remove the coupling as described in chapter 9.
- Replace wearing parts.

 IMPORTANT
<p>Use exclusively new screws supplied by CENTA. These are coated with microencapsulated adhesive which serves as a screw locking medium.</p>

- 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 drive shaft of the CF-ACV**See fig. 6-11:**

- Loosen and remove the screws of the connection Homokinet (d) and gearbox flange (C).
- Loosen and remove the screws (2.10) from the rubber element (2.1).
- Remove the Homokinet (d) with the pre-mounted adapter (3) from the gearbox flange (C).
- Loosen and remove the screws (2.10) from the rubber element (2.1).
- Remove the rubber element (2.1) from the Homokinet (d).
- Pull the spring spin (2.16) from the adapter (3) and the hub (2.4) and remove.

9.3 Dismantling the drive shaft of the CF-AGM**See fig. 6-10:**

- Loosen and remove the screws (2.10) from the rubber element (2.1).
- Loosen and remove the screws (2.11) from the rubber element (2.1).
- Push the rubber element (2.1) centered on the tube (2.3).
- Remove the tube (2.3) with the rubber element (2.1) between the hub (2.4) and the adapter (3).
- Remove the rubber elements (2.1) from the tube (2.3).

9.4 Dismantling the adapter (5; if necessary)**See fig. 6-8:**

- Loosen and remove the screws off the connection adapter (5) and the adapter/gearbox flange (3/C).
- Pull the adapter (5) off/out of the centring adapter/gearbox flange (3; C) and remove.

9.5 Dismantling the adapter (3)**See fig. 6-7:**

- Loosen and remove the screws of the connection adapter (3) and the gearbox flange (C).
- Pull the adapter (3) from/out the centring gearbox flange (C) and remove.

9.6 Dismantling the hub**See fig. 6-4:**

- Loosen and remove the screws (2.21) of the connection hub (2.4) and hub (1.5).
- Screw the screws (2.21) into the forcing threads (e) of the hub (2.4).
- Force away the hub (2.4).
- Remove the hub (2.4) from the hub (1.5).
- Remove the propeller shaft (B) out of the hub (1.5).

9.7 Dismantling the bearing CENTA-TB**See fig. 6-3:**

- Loosen and remove the screws (1.20) of the connection housing (1.1) and bulkhead (A).
- Remove the housing (1.1) from the bulkhead (A).

9.8 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 part of this coupling CF-AGM:

- Bearing
- Rubber element

Wearing part of this coupling CF-ACV:

- Bearing
- Rubber element
- Homokinet



IMPORTANT

When exchanging, all screw connections of the rubber elements must be renewed. These must be ordered separately.



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%		
M6	8.8	10	90	M18	10.9	300	2650		
M8		25	220			M20	500	4450	
M10		50	440				610**	5400**	
M12		85	750				M22	820	7250
M14		140	1250				M24	1050	9300
M16		220	1950				M27	1550	13700

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



11.3 CENTA data sheet D008-907

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 drive shaft CENTAFLEX-A

Model / series code: CF-AGM / 008G

Installation size: 8...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 and 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



11.4 CENTA data sheet D008-909

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 drive shaft CENTAFLEX-A

Model / series code: CF-ACV / 008V

Installation size: 8-05-1...600-60-7

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 and 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