

**Installation and operating instructions for
torsionally stiff gear coupling RDZ ... EEO**

E 06.701e



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Important

Before installation and commissioning of the product takes place, these installation and operating instructions must be read carefully. Notes of caution and hazard warnings are to be paid particular attention to.

These installation and operating instructions apply on condition that the product meets the selection criteria for its proper use. The selection and dimensioning of the product are not the subject of these installation and operating instructions.

If these installation and operating instructions are not observed or are interpreted wrongly, this shall invalidate any product liability and warranty of RINGSPANN GmbH; the same also applies in the case that our product is taken apart or changed.

These installation and operating instructions are to be kept in a safe place and must, in the event of onward delivery of our product – be it individually or as part of a machine – be passed on along with the product so that the user has access to them.

Safety information

- The installation and commissioning of our product may only be carried out by trained personnel.
- Repair work may only be performed by the manufacturer or by authorised RINGSPANN agencies.
- If there is suspected malfunctioning, the product, or the machine into which it is built, must be taken out of operation immediately and RINGSPANN GmbH or an authorised RINGSPANN agency is to be informed.
- The power supply is to be switched off during work on electrical components.
- Rotating parts must be secured by the buyer against unintentional touching.
- In the case of supplies made to a foreign country, the safety regulations applicable in that country are to be taken into consideration.

German original version!

If there should be any discrepancies between the German original and versions of these installation and operating instructions in other languages, the German version shall take precedence.

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1. General information

1.1. Function

The main task of the torsionally stiff gear coupling consists in transferring the torque of one shaft end onto another element. Additionally, the coupling is designed to compensate angular, radial and axial misalignments.

1.2. General safety instructions

Safety takes the highest priority for all works with and on the coupling.

To ensure this, the following safety instructions must be observed:

- During installation and maintenance work, the drive motor must be secured against unintended start-up and the load side against turning back.
- Accidental touching of the coupling during operation must be prevented with a suitable cover or protective device.
- Do not reach into the working area of the coupling during operation.

1.3. Other applicable provisions, standards etc.

The couplings are designed on the basis of DIN 740, part 2 (see RINGSPANN catalogue "shaft coupling"). If the operating conditions (e.g. output, speed) should change, the original design of the coupling must be reviewed along with the load-bearing capacity of the shafts and the used shaft-hub-connections.

1.4. Classification in accordance with EC Machinery Directive 2006/42/EC

The coupling type RDZ...EEO is a machine element. Since machine elements do not fall under EC Machinery Directive 2006/42/EC, RINGSPANN does not draw up a declaration of incorporation. All important information with regards to the installation, commissioning and operation is explained in the following.

2. Design and function / parts list

2.1. Labelling

Depending on the coupling size, the parts are labelled as follows:

Hubs:

- RINGSPANN logo
- Abbreviated designation

2.2. Dimensions

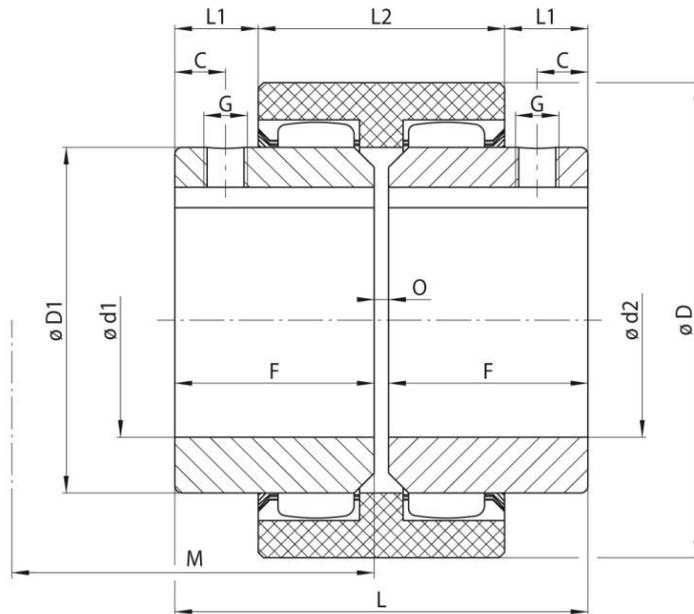


Figure 2.1: Drawing RDZ...EEO

Size	D mm	D1 mm	F mm	L mm	L1 mm	L2 mm	O mm	M mm	Weight with max. bore kg
014	40	25	23	50	6.5	37	4	37	0.10
019	48	32	25	54	8.5	37	4	37	0.23
024	52	36	26	56	7.5	41	4	41	0.32
028	66	44	40	84	19	46	4	46	0.74
032	76	50	40	84	18	48	4	48	0.95
038	83	58	40	84	18	48	4	48	1.23
042	92	65	42	88	19	50	4	50	1.50
048	95	68	50	104	27	50	4	50	1.81
065	132	96	55	114	23	68	4	68	4.35

Table 2.1: Dimensions RDZ...EEO

2.3. Parts list

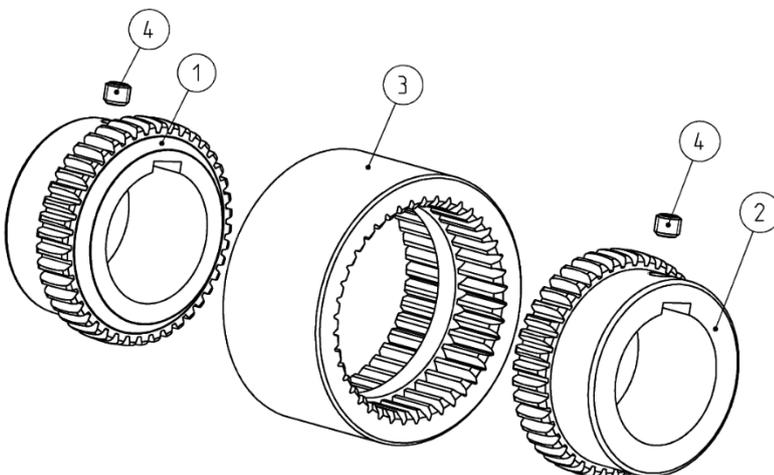


Figure 2.2: RDZ...EEO

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Position	Quantity	Description
1	1	Hub
2	1	Hub
3	1	Sleeve
4	2	Set screws DIN EN ISO 4029

Table 2.2: Parts list RDZ..EEO

3. Intended use

The coupling may only be installed, operated and serviced if

- the operating instructions have been read and understood,
- the executing person possesses the necessary qualifications,
- authorisation has been given by the company.

The coupling typ RDZ...EEO may only be operated within the operating limits specified in section "7. Technical prerequisite for reliable operation".

RINGSPANN shall not assume any liability for damages that result from unauthorised constructional changes or an unintended use.

4. Warning signs / impermissible use

An impermissible use is given if:

- the shaft-hub-connection was not designed correctly
- the coupling hubs have been thermally overloaded during assembly
- the fit pair for parts to be joined has not been coordinated correctly
- the parameters necessary for the selection of the coupling were not communicated
- the tightening torques of the locking screws do not correspond with the specifications
- the coupling is wrongly fitted
- parts from other manufacturers are used
- damaged coupling parts are used.

The further operation of coupling typ RDZ...EEO is not permissible under the following conditions:

- if the permissible limits of use torque, speed, permissible misalignments, ...) are exceeded
- exceeding or falling below the permissible temperature limits
- if the wear limit of the parts is reached
- changed running noises or the occurrence of vibrations

If the unit should be operated despite the aforementioned states, it can result in damages to the coupling and the drivetrain.

	<p>Attention! RINGSPANN shall not assume any liability for any damages that result in the event of any impermissible use.</p>
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5. Condition as delivered

Couplings are generally delivered ready-for-installation in individual parts. Upon customer request, pre-bored hubs are also available. If the hub bores are manufactured by the customer, the information in chapter 7.3 must be observed.

6. Storage

The coupling hubs can be stored in a room that has a roof and is dry. The hubs are delivered in preserved condition and can be stored for up to 6 months. In the event of a longer storage, the corrosion protection should be refreshed.

Under the correct storage conditions, the properties of the coupling sleeves remain unchanged for up to 5 years.

Optimum service life of the coupling is given if the storage rooms:

- have a roof and are dry,
- are free of ozone-producing equipment,
- have a relative humidity of less than 65 %,
- are free of condensation.

7. Technical prerequisite for reliable operation

7.1. Technical specifications

Size	Nominal torque T_{KN} Nm	Nominal power at 100 min ⁻¹ P_{K100} kW	Max. speed n_{max} min ⁻¹	Moment of inertia with max. bore J_K kgm ²	Max. permissible misalignments		
					Axial ΔK_a [mm]	Radial ΔK_r [mm]	Angular ΔK_w [°]
014	10	0,10	14000	0,26	± 1	0,3	1
019	16	0,17	11800	0,47		0,3	
024	20	0,21	10600	0,93		0,4	
028	45	0,47	8500	3,09		0,4	
032	60	0,63	7500	5,48		0,4	
038	80	0,84	6700	8,68		0,4	
042	100	1,00	6000	14,28		0,4	
048	140	1,50	5600	18,34		0,4	
065	380	4,00	4000	84,80		0,4	

Table 7.1: Permissible operating parameters

7.2. Permissible misalignments

The maximum permissible misalignment values (table 7.1) must be adhered to and may not occur at the same time. In the event of the simultaneous occurrence of radial and angular offset, misalignments need to be exploited differently percentage-wise (see figure 7.1). If not observed, damage to the coupling may result.

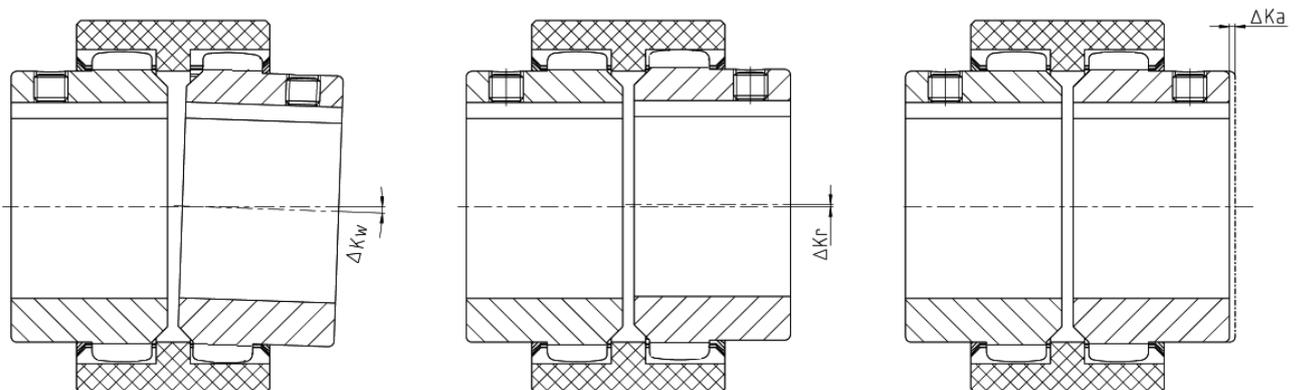


Figure 7.1: Misalignment types

Figure 7.2 shows the relationship for radial (K_r) and angular misalignments (K_w) occurring at the same time:

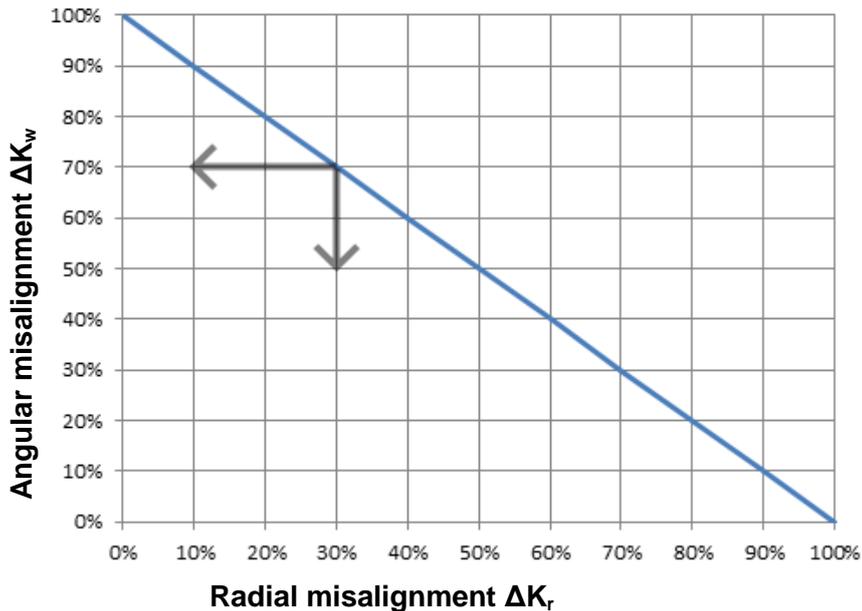


Figure 7.2: Misalignment combination

The misalignment as a percentage is calculated as follows:

$$\Delta K[\%] = \frac{\Delta K}{\text{max. permissible displacement}} * 100$$

7.3. Manufacturing the hub bore



Life-threatening danger!
The max. permissible bore diameters specified in table 7.2 may not be exceeded. If the permissible values are exceeded, the hub could tear during operation. Here, there is life-threatening danger due to flying parts.

When manufacturing the hub bore, it must be ensured that:

- the hub is precisely aligned,
- the form and positional tolerances in accordance with DIN ISO 286 are adhered to (see figure 7.3).



Attention!
The operator bears the sole responsibility for damages that may occur as a result of defective rework on the unbored / pre-bored coupling parts .

		014	019	024	028	032	038	042	048	065
Bore d1/d2 [mm]	min.	6	11	11	11	11	11	11	11	11
	max.	15	20	24	28	32	38	42	48	65

Table 7.2: Permissible bore diameter

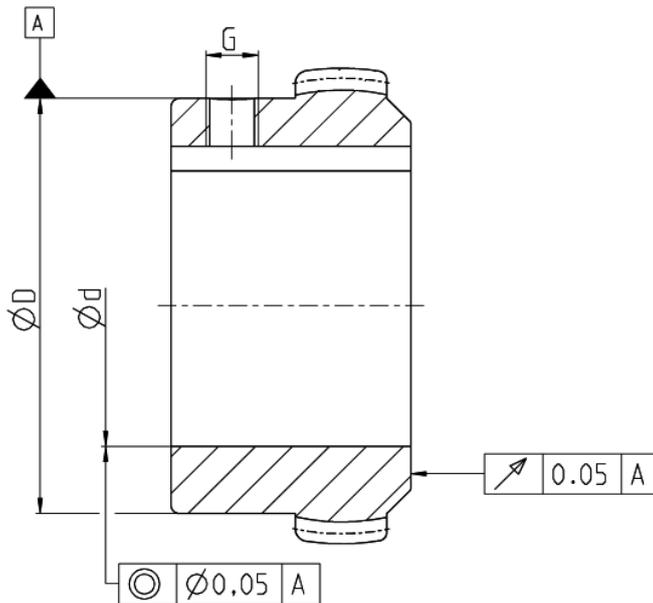


Figure 7.3: Specifications for the form and positional tolerance of the bore

The design and inspection of the keyway connection falls to the operator and is his responsibility. The gear coupling RDZ...EEO in the catalogue are designed with bore tolerance H7 and a keyway nut in accordance with DIN 6885, sheet 1. Deviating fits are possible and should be communicated to RINGSPANN as part of any query.

The following fit pair in accordance with DIN 748/1 is recommended:

Bore [mm]	Shaft tolerance	Bore tolerance
≤ 50	k6	H7
> 50	m6	

Table 7.3: Recommended fit pairs

Locking screws in accordance with DIN EN ISO 4029 should be used for axial securing. Here the following applies:

Bore d1/d2 [mm]	from	9	22	38	58
	to	22	38	58	65
Size locking screw		M5	M6	M10	M12
Tightening torque [Nm]		2	4	17	40

Table 7.4: Size and tightening torques of the locking screws



Attention!

RINGSPANN shall not assume any liability for any resulting damages that arise from work carried out by the operator .

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8. Assembly

8.1. General assembly instructions

Before beginning with assembly, check for the completeness of the delivery (see chapter 2.3 Parts list) and the dimensional accuracy of the bores, the shaft, the nut and the keyway (see 7. Technical prerequisite for reliable operation). The parts are to be cleaned of preservative agents.

8.2. Assembly description

1. Mount the hubs (items 1 and 2) on the input and output shafts so that the shaft ends are flush with the inner plane surfaces.
→ facilitated sliding onto the shaft can be achieved by heating up the hub (approx. 80°C)
2. Slide the sleeve onto the tothing of one of the hubs



Attention!

Use suitable means of protection when working with the heated hubs. Touching the heated hubs without safety gloves causes burns .

3. Slide the units in axial direction until the O measure is achieved (see chapter 2.2 Dimensions)
→ since measure O cannot be directly measured, it should be checked across the entire length L.
→ if O is not adhered to, the coupling may be damaged.
→ Tighten the set screws in accordance with DIN EN ISO 4029 with the respective tightening torque (see table 7.4),
→ Check the alignment

The given misalignments should be measured with suitable measuring equipment, e.g. dial gauge, straightedge, feeler gauge or depth gauge.

The remaining misalignments should generally be as small as possible. When commissioning, the actual misalignments should be no more than 25% of the max. permissible misalignment figures (see table 7.1 Technical specifications). The remaining 75% of misalignments provide security against external influences that arise during operation, such as deformation in the machine and thermal expansion.



Information

The better the alignment, the longer the service life of the coupling.

8.3. Alignment

The remaining misalignments should generally be as small as possible. The size of the misalignments that may occur during assembly are specified in table 8.2.



Attention!

When putting it into operation, the actual misalignments should be no more than 25% of the max. permissible misalignment values (see chapter 7.2 Permissible misalignments). The remaining 75% of misalignments provide security

ty against external influences that arise during operation, such as deformation in the machine and thermal expansion.

$$I = L_{max} - L_{min}$$

Size	Angular misalignment		Radial misalignment ΔK_r [mm]	Axial misalignment ΔK_a [mm]
	Angle for each teeth pair ΔK_w [°]	Indicator value I [mm]		
0014	$\pm 0.25^\circ$	0.11	0.075	± 0.25
0019		0.14		
0024		0.16		
0028		0.19	0.1	
0032		0.22		
0038		0.25		
0042		0.28		
0048		0.30		
0065		0.42		

Table 8.2: Permissible initial offsets RDZ ... EEO

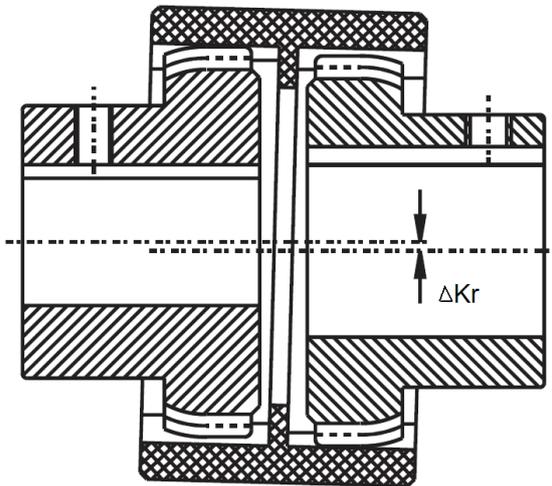


Figure 8.1: Radial misalignment

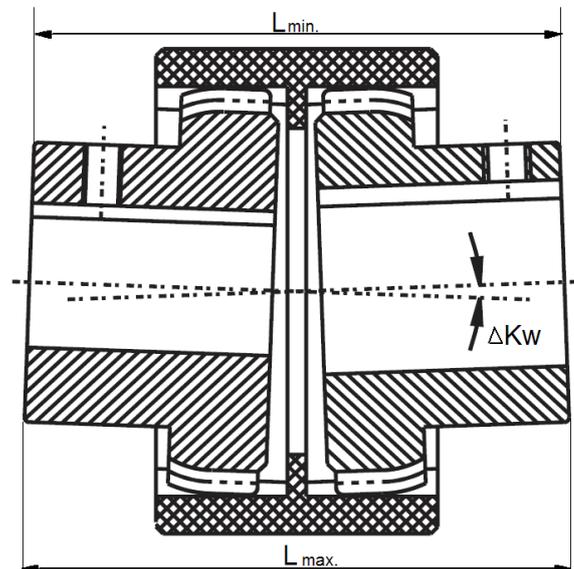


Figure 8.2: Angular misalignment

9. Start-up

Before putting it into operation for the first time, the following parameters need to be checked:

- the tightening torque of the set screws,
- the alignment of the coupling,
- the clearance O.

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The operator has the task of attaching a suitable coupling protection to prevent the unintended touching of the coupling during operation. It may only be removed when the machine is at a standstill.

During commissioning, attention must be paid to vibrations and running noises. If any vibrations or unusual running noises should occur, the drive unit must be immediately switched off.

10. Operational disturbances

The possible operational disturbances are listed in the following table. In order to remedy them, **first bring the unit to a standstill** and then follow the further instructions in the column "Remedy". This table only provides a starting point for the search for the cause. All neighbouring components should also be subjected to an examination.

Disturbances	Causes	Remedy
Changes in sounds or vibrations	Alignment error	<ol style="list-style-type: none"> 1) Eliminate the cause of the alignment error 2) Carry out wear inspection 3) Re-align the coupling
	Locking screws for axial securing are loose	<ol style="list-style-type: none"> 1) Check alignment 2) Tighten locking screws to the specified tightening torque and secure against loosening 3) Carry out wear inspection
Break of the plastic sleeve / toothing	Break of the sleeve due to high / sudden overload peaks	<ol style="list-style-type: none"> 1) Disassemble coupling 2) Remove residues of the sleeve 3) Insert new sleeve 4) Tighten locking screws 5) Check alignment 6) Find and eliminate cause for the overload
	Wrong coupling selected, coupling output not sufficient	<ol style="list-style-type: none"> 1) Check the design of the coupling 2) Select larger coupling 3) Install new coupling 4) Check alignment
	Operating error when operating the facility	<ol style="list-style-type: none"> 1) Disassemble coupling 2) Remove residues of the sleeve 3) Insert new sleeve 4) Tighten locking screws 5) Check alignment 6) Instruct and train operating staff
Excessive wear to the sleeve toothing	Vibrations in the drivetrain	<ol style="list-style-type: none"> 1) Disassemble coupling 2) Check coupling and replace damaged parts 3) Install coupling 4) Align coupling 5) Eliminate the cause of vibrations

	Deployment at too high ambient / contact temperatures	<ol style="list-style-type: none"> 1) Disassemble coupling 2) Check coupling and replace damaged parts 3) Install coupling 4) Align coupling 5) Check and adjust ambient / contact temperature
	Change in physical properties of the sleeve due to influence of aggressive media and/or ozone influence, as well as too high/low ambient temperature	<ol style="list-style-type: none"> 1) Disassemble coupling 2) Check coupling and replace damaged parts 3) Install coupling 4) Align coupling 5) Take the necessary measures to ensure that the sleeve properties cannot be further negatively influenced

Table 10.1: Operational disturbances

11. Maintenance and repair

The coupling must be regularly inspected. The scope of the inspection includes:

- examining the coupling alignment,
- examining the coupling for damages,
- check the axial securing,
- check the torsional backlash.

The tightening torques of the locking screws must be examined at regular intervals.

To ensure that the coupling can be safely operated, the specified wear values may not be exceeded. The wear due to torsional backlash is measured for the gear coupling RDZ...EEO.

Size	0014	0019	0024	0028	0032	0038	0042	0048	0065
Torsional backlash X_{\max} mm	1.3	1.4	1.5	1.6	1.7	1.7	1.7	1.8	2.5

Table 11.1: Wear limit per hub

The inspection of these wear values is to be carried out as follows:

- Turn hub (item 1) in one direction of rotation
- Make a marking on the hub (item 1) and sleeve (item 3) as shown in figure 11.1 (a)
- Turn the hub (item 1) in the other direction of rotation until stop
- The markings move apart
- Measure the distance X_{\max} (see figure.1 (b)) between the markings and compare with table 11.1
- If value X_{\max} is reached, the sleeve needs to be replaced.



Attention!

The wear measurement needs to be carried out on both hub for coupling RDZ...EEO.

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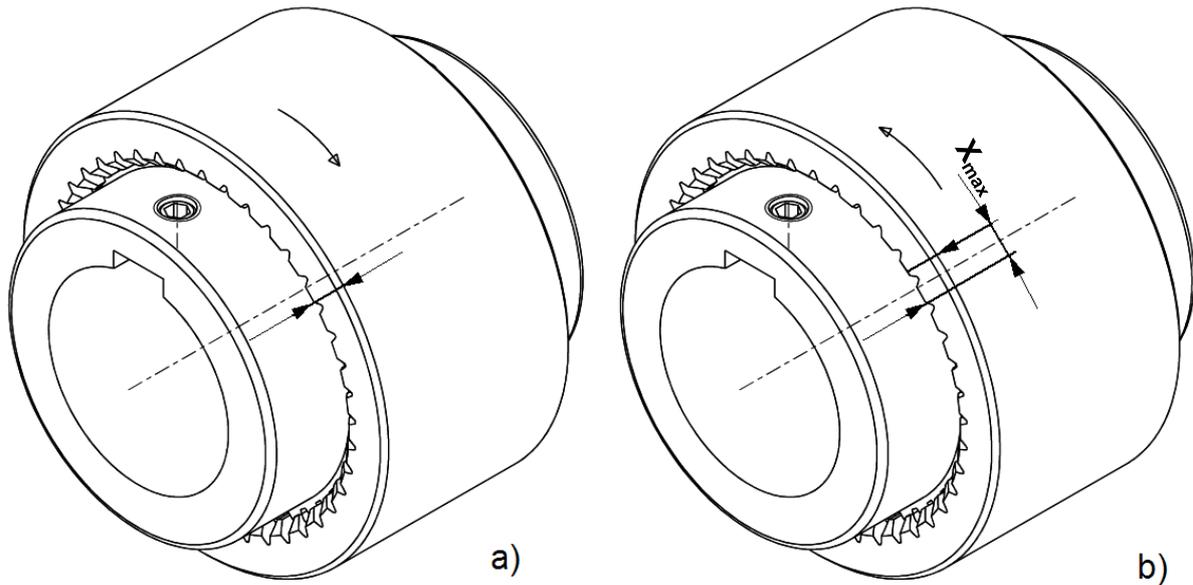


Figure 11.1: Checking the wear limit

12. Spare part stockpiling

In order to keep disturbances in operation to a minimum, it is advisable to keep a stock of spare parts directly at the deployment site in order to be able to guarantee optimal operational capability.



Attention !

RINGSPANN shall not assume any liability for any occurring damages if spare parts from other manufacturers are used .

13. Disposal

At the end of its operating life:

- plastics must be disposed of via a disposal company,
- metals must be cleaned and disposed of properly with other scrap metal
- please also properly dispose of the packaging.