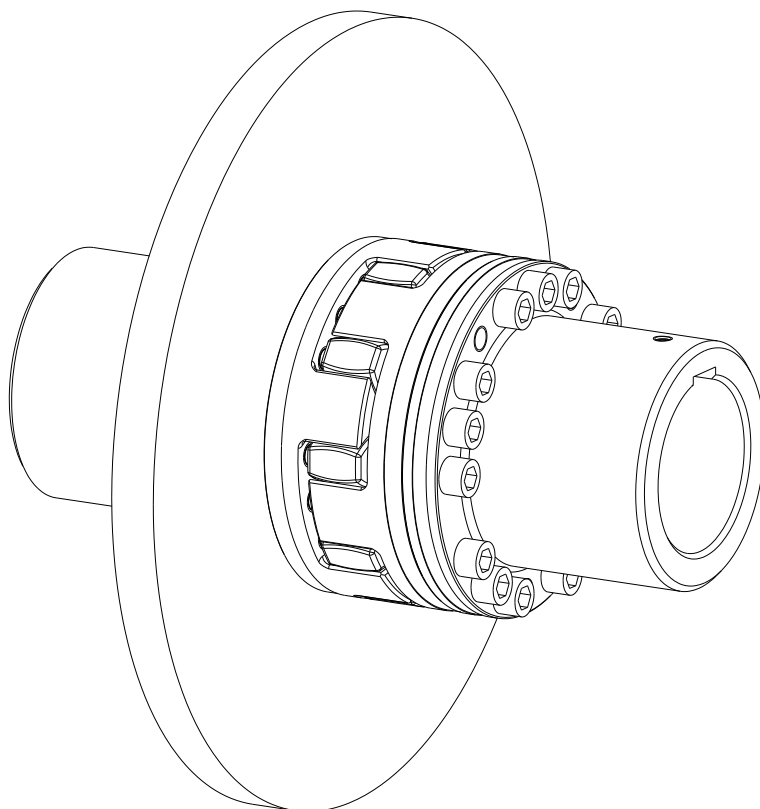




ROTEX®

Torsionally flexible jaw-type couplings
AFN-SB spec.
and their combinations
for finish bored, pilot bored and unbored couplings



 KTR-Group	ROTEX® Operating/Assembly instructions Type AFN-SB-spez.	KTR-N 40223 EN Sheet: 2 of 14 Edition: 7
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ROTEX® is a torsionally flexible jaw coupling. It is able to compensate for shaft misalignment, for example caused by manufacturing inaccuracies, thermal expansion, etc.
Type AFN-SB spec. allows to replace the spider or brake disk without dismounting the driving or driven machine.

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Please observe protection note ISO 16016.	Drawn: 2026-02-18 Pz Verified: 2026-02-26 Pz	Replacing: KTR-N dated 2025-02-26 Replaced by:
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Replacing:	KTR-N dated 2025-02-26
Replaced by:	

**2 Advice****2.1 General advice**

Read carefully through these operating/assembly instructions before you start up the coupling.

Pay special attention to the safety instructions!

The operating/assembly instructions are part of your product. Store them carefully and close to the coupling. The copyright for these operating/assembly instructions remains with KTR.

2.2 Safety and advice symbols

Warning of personal injury

This symbol indicates notes which may contribute to preventing bodily injuries or serious bodily injuries that may result in death.



Warning of product damages

This symbol indicates notes which may contribute to preventing material or machine damage.



General advice

This symbol indicates notes which may contribute to preventing adverse results or conditions.



Warning of hot surfaces

This symbol indicates notes which may contribute to preventing burns with hot surfaces resulting in light to serious bodily injuries.

2.3 General hazard warnings

With assembly, operation and maintenance of the coupling it must be made sure that the entire drive train is secured against accidental switch-on. You may be seriously hurt by rotating parts. Make absolutely sure to read and observe the following safety instructions.

- All operations on and with the coupling must be performed taking into account "safety first".
- Make sure to switch off the power pack before you perform your work on the coupling.
- Secure the power pack against accidental switch-on, e. g. by providing warning signs at the place of switch-on or removing the fuse for current supply.
- Do not reach into the operating area of the coupling as long as it is in operation.
- Secure the coupling against accidental contact. Provide for the necessary protection devices and covers.

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2 Advice

2.4 Intended use

You may only assemble, operate and maintain the coupling if you

- have carefully read through the operating/assembly instructions and understood them
- had technical training
- are authorized by your company

The coupling may only be used in accordance with the technical data (see chapter 1). Unauthorized modifications on the coupling design are not admissible. We will not assume liability for any damage that may arise. In the interest of further development we reserve the right for technical modifications.

The **ROTEX® AFN-SB spec.** described in here corresponds to the technical status at the time of printing of these operating/assembly instructions.

2.5 Coupling selection



For a permanent and failure-free operation of the coupling it must be selected according to the selection instructions (according to DIN 740 part 2) for the particular application (see catalogue drive technology "ROTEX®").

If the operating conditions (performance, speed, modifications on engine and machine) change, the coupling selection must be reviewed.

Please make sure that the technical data regarding torque refer to the spider only. The transmittable torque of the shaft-hub-connection must be reviewed by the customer and is subject to his responsibility.

For drives subjected to torsional vibrations (drives with cyclic stress due to torsional vibrations) it is necessary to perform a torsional vibration calculation to ensure a reliable selection. Typical drives subjected to torsional vibrations are e. g. drives with diesel engines, piston pumps, piston compressors etc. If requested, KTR will perform the coupling selection and the torsional vibration calculation.

2.6 Reference to EC Machinery Directive 2006/42/EG

The couplings supplied by KTR should be considered as components, not machines or partly completed machines according to EC Machinery Directive 2006/42/EC. Consequently KTR does not have to issue a declaration of incorporation. For details about safe assembly, start-up and safe operation refer to the present operating/assembly instructions considering the warnings.

3 Storage, transport and packaging

3.1 Storage

The couplings are supplied in preserved condition and can be stored in a dry and roofed place for a period of 6 - 9 months.

The features of the coupling spiders (elastomers) remain unchanged for up to 5 years with favourable storage conditions.



The storage rooms must not include any ozone-generating devices like e. g. fluorescent light sources, mercury-vapour lamps or electrical high-voltage appliances.

Humid storage rooms are not suitable.

Make sure that condensation is not generated. The best relative air humidity is less than 65 %.

Please observe protection note ISO 16016.	Drawn: 2026-02-18 Pz Verified: 2026-02-26 Pz	Replacing: KTR-N dated 2025-02-26 Replaced by:
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3 Storage, transport and packaging

3.2 Transport and packaging



In order to avoid any injuries and any kind of damage always make use of proper transport and lifting equipment.

The couplings are packed differently each depending on size, number and kind of transport. Unless otherwise contractually agreed, packaging will follow the in-house packaging specifications of KTR.

4 Assembly

The coupling is generally supplied in individual parts. Before assembly the coupling must be inspected for completeness.

4.1 Components of the coupling

Components of ROTEX®, shaft coupling type No. 001

Component	Quantity	Description
1a	see table 1	Cap screws DIN EN ISO 4762 - MxLM
1b	see table 1	Cap screws DIN EN ISO 4762 - MxLM1
2	1	Spider
3Na	2	Driving flange N type A
4Nv	1	Coupling flange N lengthened
4Nx	1	Coupling flange N spec.
5	2	Setscrews DIN EN ISO 4029
15Nx	1	SB brake disk N

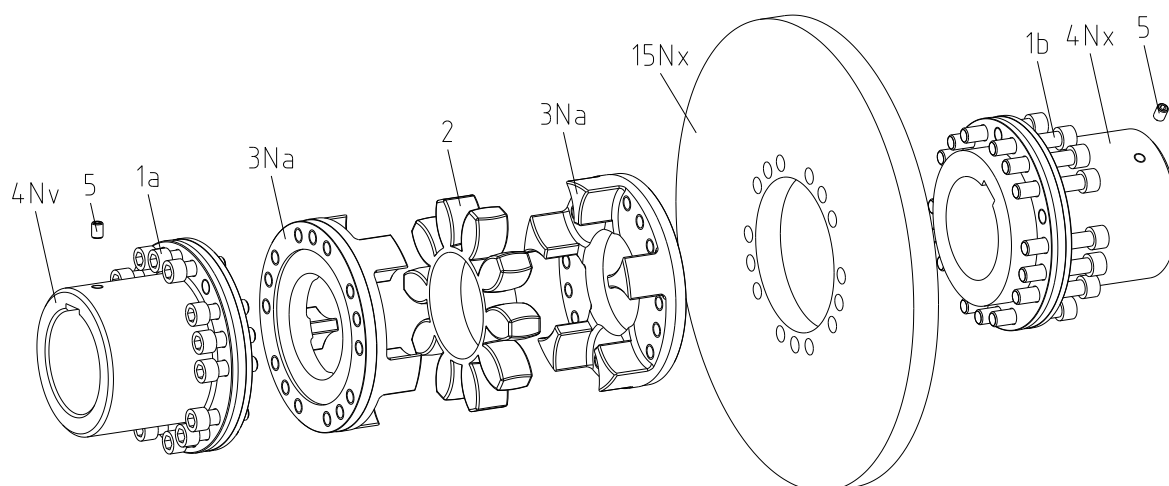


Illustration 2: ROTEX®, type AFN-SB spec.

Features of standard spiders

Spider hardness (Shore)	98 Shore A	
	T-PUR® (purple)	PUR (red)
Marking (colour)		



4 Assembly

4.2 Advice for finish bore



The maximum permissible bore diameters D (see table 1 in chapter 1 - technical data) must not be exceeded. If these figures are disregarded, the coupling may tear. Rotating particles may cause danger to life.

- Bores on the coupling flange machined by the customer have to observe concentricity or axial runout, respectively (see illustration 3).
- Make absolutely sure to observe the figures for $\varnothing D$.
- Please review the length of the centering spigot LX (see table 3). $LX = B3 + LZ$
- Carefully align the coupling flanges when the finish bores are drilled.
- Please provide for a setscrew according to DIN EN ISO 4029 with a cup point or an end plate to fasten the coupling flanges axially.

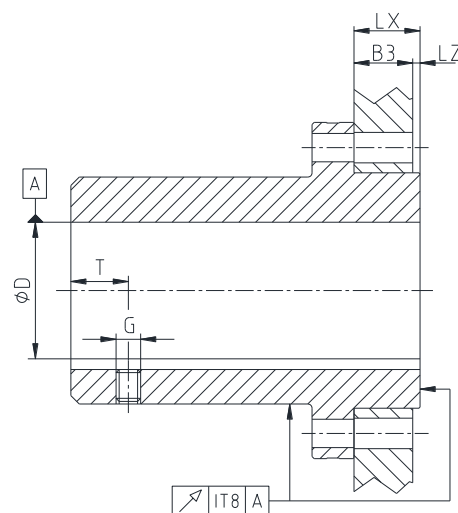


Illustration 3: Concentricity and axial runout

$B3$ = width of brake disk
 LZ = pilot length of driving flange



The customer bears the sole responsibility for all machining processes performed subsequently on unbored or pilot bored as well as finish machined coupling components and spare parts. KTR does not assume any warranty claims resulting from insufficient remachining.

Table 3: Dimensions LZ

Size	65	75	90	100	110	125	140	160	180
Dimension LZ in mm	1.0 +0.2	1.5 +0.2	1.5 +0.2	1.5 +0.2	2.0 +0.2	2.0 +0.2	2.5 +0.2	2.5 +0.2	3.0 +0.2

Table 4: Setscrews DIN EN ISO 4029

Size	65	75	90	100	110	125	140	160	180
Dimension G in mm	M 10	M 10	M 12	M 12	M 16	M 16	M 20	M 20	M 20
Dimension T in mm	20	25	30	30	35	40	45	50	50
Tightening torque T_A in Nm	17	17	40	40	80	80	140	140	140

Table 5: Recommended fit pairs acc to DIN 748/1

Bore in mm		Shaft tolerance	Bore tolerance
above	up to		
	50	k6	H7
50		m6	(KTR standard)

If a feather keyway is intended to be used in the hub, it should correspond to the tolerance ISO JS9 (KTR standard) with normal operating conditions or ISO P9 with sophisticated operating conditions (frequently alternating torsional direction, shock loads, etc.).

The transmittable torque of the shaft-hub-connection must be reviewed by the customer and is subject to his responsibility.



4 Assembly

4.3 Assembly of the coupling



We recommend to inspect bores, shaft, keyway and feather key for dimensional accuracy before assembly.



Heating the coupling flanges lightly (approx. 80 °C) allows for an easier mounting on the shaft.



**Touching the heated coupling flanges causes burns.
 Wear safety gloves.**



**With the assembly make sure that the distance dimension E or DBSE (see table 1) is observed to allow for axial clearance of the spider when in operation.
 Disregarding this advice may cause damage to the coupling.**

- Mount the coupling flanges (component 4Nv and 4Nx) onto the shaft of driving and driven side. The coupling flange (component 4Nx) for the assembly of the brake disk (component 15Nx) has to be mounted to the shaft end which has the bigger mass moment of inertia (see illustration 4).
- The internal sides of the coupling flanges (component 4Nv and 4Nx) must be flush with the front sides of the shafts (see illustration 4).
- Shift the power packs in axial direction until the distance dimension DBSE has been achieved (see illustration 4).
- Fasten the coupling flanges (component 4Nv and 4Nx) by tightening the setscrews DIN EN ISO 4029 with a cup point (tightening torque see table 4) or an end plate.
- Mount the brake disk (component 15Nx) onto the centering shoulder of the coupling flange (component 4Nx) (see illustration 5).
- Stick the driving flanges (component 3Na) and the spider (component 2) together (see illustration 6).
- Install the components stuck together between the coupling flanges (component 4Nv and 4Nx) (see illustration 7) and hand-tighten the components with the cap screws (component 1a and 1b) first.
- Tighten the screws at the tightening torques T_A specified in table 1 by means of a suitable torque key.
- Center the spider (component 2) between the driving flanges (component 3Na) and check the dimensions E and S (see illustration 1).

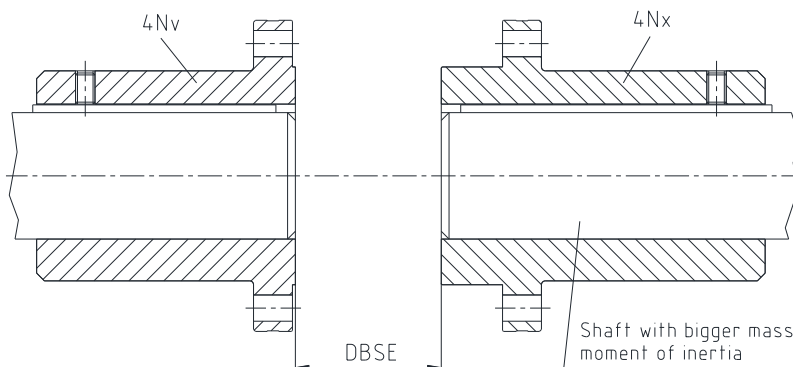


Illustration 4: Assembly of coupling flanges

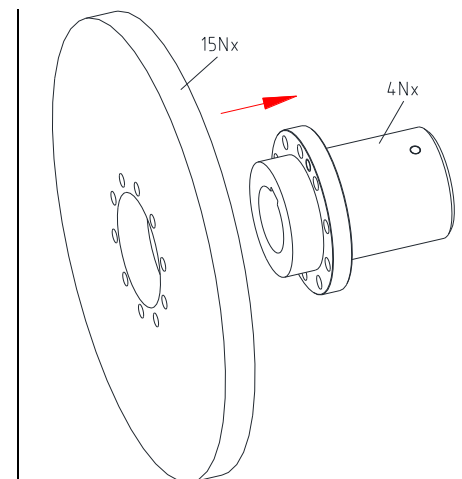


Illustration 5



4 Assembly

4.3 Assembly of the coupling

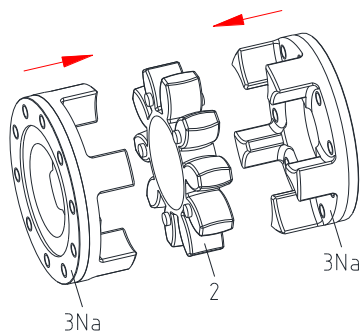


Illustration 6

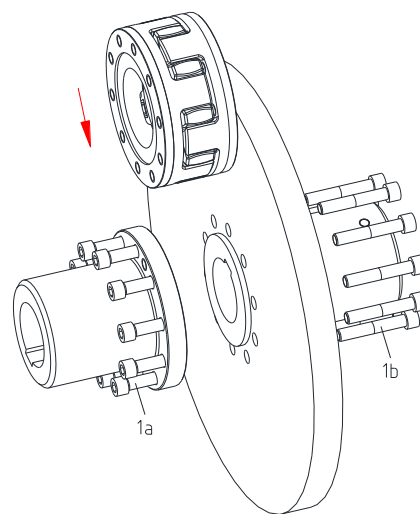


Illustration 7



Having started up the coupling, the wear of the spider must be inspected at regular maintenance intervals and the spider must be replaced, if necessary.

4.4 Displacements - alignment of the coupling

The displacement figures specified in table 6 provide for sufficient safety to compensate for external influences like, for example, thermal expansion or foundation settling.

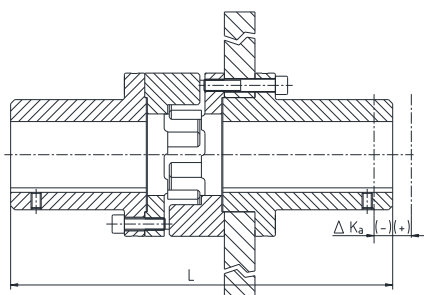


In order to ensure a long service life of the coupling, the shaft ends must be accurately aligned. Absolutely observe the specified displacement figures (see table 6). If the figures are exceeded, the coupling will be damaged.

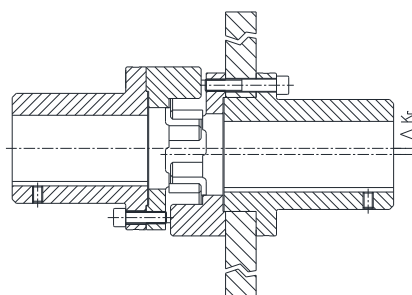
The more accurate the alignment of the coupling, the longer is its service life.

Please note:

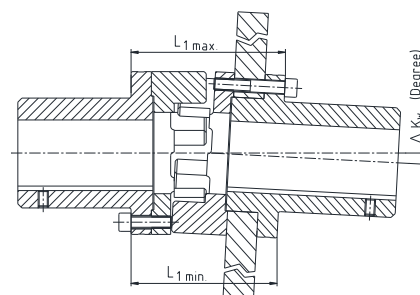
- The displacement figures specified in table 6 are maximum figures which must not arise in parallel. If radial and angular displacements arise simultaneously, the permissible displacement figures may only be used proportionally (see illustration 9).
- Inspect with a dial gauge, ruler or feeler gauge whether the permissible displacement figures specified in table 6 can be observed.



Axial displacements



Radial displacements



Angular displacements

$$L_{\max} = L + \Delta K_a \text{ in mm}$$

Illustration 8: Displacements

$$\Delta K_w = L_{1\max} - L_{1\min} \text{ in mm}$$



4 Assembly

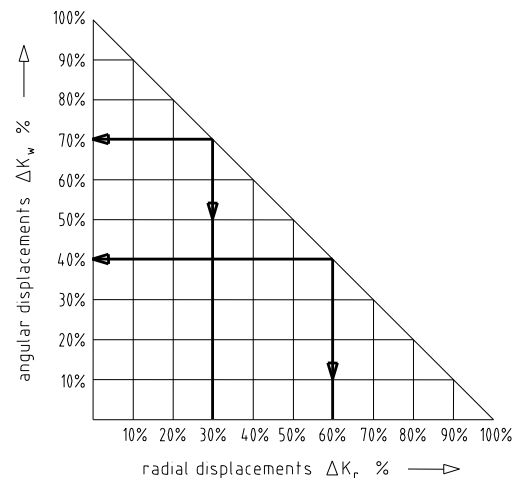
4.4 Displacements - alignment of the couplings

Examples of the displacement combinations specified in illustration 9:

Example 1:
 $\Delta K_r = 30 \%$
 $\Delta K_w = 70 \%$

Example 2:
 $\Delta K_r = 60 \%$
 $\Delta K_w = 40 \%$

Illustration 9:
 Combinations of displacement



$$\Delta K_{\text{total}} = \Delta K_r + \Delta K_w \leq 100 \%$$

Table 6: Displacement figures for 98 Shore A

Size		65	75	90	100	110	125	140	160	180
Max. axial displacement ΔK_a in mm		-1.0 +2.6	-1.5 +3.0	-1.5 +3.4	-1.5 +3.8	-2.0 +4.2	-2.0 +4.6	-2.0 +5.0	-2.5 +5.7	-3.0 +6.4
Max. radial displacement ΔK_r in mm with n=	1500 rpm	0.42	0.48	0.50	0.52	0.55	0.60	0.62	0.64	0.68
	3000 rpm	0.28	0.32	0.34	0.36	0.38	-	-	-	-
Max. angular displacement ΔK_w with n = 1500 rpm	in degrees	1.2	1.2	1.2	1.2	1.3	1.3	1.2	1.2	1.2
	in mm	2.70	3.30	4.30	4.80	5.60	6.50	6.60	7.60	9.00
Max. angular displacement ΔK_w with n = 3000 rpm	in degrees	1.1	1.1	1.1	1.1	1.2	-	-	-	-
	in mm	2.30	2.90	3.80	4.20	5.00	-	-	-	-

5 Start-up

Before start-up of the coupling, inspect the tightening of the setscrews in the coupling flanges, the alignment and the distance dimension E or DBSE and adjust, if necessary, and also inspect all screw connections for the tightening torques specified, dependent on the type of coupling.



The setscrews to fasten the flange hubs as well as all screw connections must be secured against working loose additionally, e. g. conglomerating with Loctite (average strength).

Finally the coupling protection against accidental contact must be fitted. It is required in accordance with DIN EN ISO 12100 (Safety of Machinery) and must protect against

- access with a little finger
- falling down of solid foreign objects.

The coupling protection is not part of KTR's scope of delivery and is the customer's responsibility. It must have sufficient distance to the rotating components to safely avoid contact. Depending on the outside diameter DH of the coupling, we recommend the following minimum distance:

ØDH to 50 mm = 6 mm, ØDH 50 mm to 120 mm = 10 mm, ØDH from 120 mm = 15 mm.

5 Start-up

Please check whether a proper enclosure (ignition protection, coupling protection, contact protection) has been mounted and the operation of the coupling is not affected by the enclosure. The same applies for test runs and rotational direction inspections.

The cover may provide for openings intended for necessary heat dissipation. These openings must comply with DIN EN ISO 13857.

The cover must be electrically conductive and included in the equipotential bonding. Bellhousings (magnesium share below 7.5 %) made of aluminium and damping rings (NBR) can be used as connecting element between pump and electric motor. The cover may only be taken off with standstill of the unit.

During operation of the coupling, pay attention to

- different operating noise
- vibrations occurring.



If you note any irregularities with the coupling during operation, the drive unit must be switched off immediately. The cause of the breakdown must be specified by means of the table „Breakdowns“ and, if possible, be eliminated according to the proposals. The potential breakdowns specified can be hints only. To find out the cause all operating factors and machine components must be considered.

6 Breakdowns, causes and elimination

The below-mentioned failures can lead to a use of the **ROTEX®** coupling other than intended. In addition to the specifications given in these operating/assembly instructions make sure to avoid such failures.

The errors listed can only be clues to search for the failures. When searching for the failure the adjacent components must generally be considered.

General failures with improper use:

- Important data for the coupling selection were not forwarded.
- The calculation of the shaft-hub-connection was disregarded.
- Coupling components with damage occurred during transport are assembled.
- If the heated coupling flanges are assembled, the permissible temperature is exceeded.
- The clearance of the components to be assembled is not coordinated with one another.
- Tightening torques are fallen below/exceeded.
- Components are mixed up by mistake/assembled incorrectly.
- A wrong or no spider is inserted in the coupling.
- No original **KTR** components (purchased parts) are used.
- Old/already worn out spiders or spiders stored for too long are used.
- Maintenance intervals are not observed.



6 Breakdowns, causes and elimination

Breakdowns	Causes	Elimination
Different operating noise and/or vibrations occurring	Misalignment	1) Set the unit out of operation 2) Eliminate the reason for the misalignment (e. g. loose foundation bolts, fracture of the engine mount, heat expansion of unit components, modification of the installation dimension E of the coupling) 3) For inspection of wear see item inspection
	Wear of spider, short-term torque transmission due to metal contact	1) Set the unit out of operation 2) Disassemble the coupling and remove residues of the spider 3) Inspect coupling components and replace coupling components that have been damaged 4) Insert spider, assemble coupling components 5) Inspect alignment, adjust if necessary
	Screws for axial fastening of hubs working loose	1) Set the unit out of operation 2) Inspect alignment of coupling 3) Tighten the screws to fasten the hubs and secure against working loose 4) For inspection of wear see item inspection
Fracture of cams	Wear of spider, torque transmission due to metal contact	1) Set the unit out of operation 2) Replace complete coupling 3) Inspect alignment
	Fracture of the cams due to high impact energy/overload	1) Set the unit out of operation 2) Replace complete coupling 3) Inspect alignment 4) Find out the reason for overload
	Operating parameters do not comply with the performance of the coupling	1) Set the unit out of operation 2) Review the operating parameters and select a bigger coupling (consider mounting space) 3) Assemble new coupling size 4) Inspect alignment
	Operating error of the unit	1) Set the unit out of operation 2) Replace complete coupling 3) Inspect alignment 4) Instruct and train the service staff
Early wear of spider	Misalignment	1) Set the unit out of operation 2) Eliminate the reason for the misalignment (e. g. loose foundation bolts, fracture of the engine mount, heat expansion of unit components, modification of the installation dimension E of the coupling) 3) For inspection of wear see item inspection
	e. g. contact with aggressive liquids/oils, ozone influence, too high/low ambient temperatures etc. causing physical modification of the spider	1) Set the unit out of operation 2) Disassemble the coupling and remove residues of the spider 3) Inspect coupling components and replace coupling components that have been damaged 4) Insert spider, assemble coupling components 5) Inspect alignment, adjust if necessary 6) Make sure that further physical modifications of the spider are excluded
	Ambient/contact temperatures which are too high for the spider, max. permissible e. g. with T-PUR® T ₄ = -50 °C/+120 °C	1) Set the unit out of operation 2) Disassemble the coupling and remove residues of the spider 3) Inspect coupling components and replace coupling components that have been damaged 4) Insert spider, assemble coupling components 5) Inspect alignment, adjust if necessary 6) Inspect and adjust ambient/contact temperature (correct by using other spider materials, if necessary)
Early wear of spider (liquefaction of material inside the spider cam)	Vibrations of drive	1) Set the unit out of operation 2) Disassemble the coupling and remove residues of the spider 3) Inspect coupling components and replace coupling components that have been damaged 4) Insert spider, assemble coupling components 5) Inspect alignment, adjust if necessary 6) Find out the reason for the vibrations (possibly corrective by spider with lower or higher Shore hardness)



7 Disposal

In respect of environmental protection we would ask you to dispose of the packaging resp. products on termination of their service life in accordance with the legal regulations and standards that apply.

- **Metal**
Any metal components have to be cleaned and disposed of by scrap metal.
- **Nylon materials**
Nylon materials must be collected and disposed of by a waste disposal company.

8 Maintenance and service

ROTEX® is a low-maintenance coupling. We recommend to perform a visual inspection on the coupling **at least once a year**. Please pay special attention to the condition of the coupling spiders.

- Since the flexible machine bearings of the driving and driven side settle with increasing load time, inspect the alignment of the coupling and re-align the coupling, if necessary.
- The coupling components must be inspected for damages.
- The screw connections must be visually inspected.

8.1 Standard values of wear

In case of backlash > X mm, the flexible spider must be replaced.

Monitoring of the general condition of the coupling can be done both at standstill and during operation. If the coupling is tested during operation, the operator must ensure an appropriate and proven test procedure (e. g. stroboscopic lamp, high-speed camera, etc.) which is definitely comparable to testing at standstill. If any distinctive features occur, an inspection must be made with the machine stopped.

Reaching the limits for replacing depends on the operating conditions and the existing operating parameters.



In order to ensure a long service life of the coupling, the shaft ends must be accurately aligned.

Absolutely observe the specified displacement figures (see table 6).

If the figures are exceeded, the coupling will be damaged.

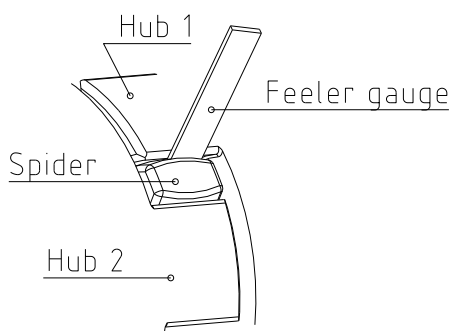


Illustration 10: Inspection of the limit of wear

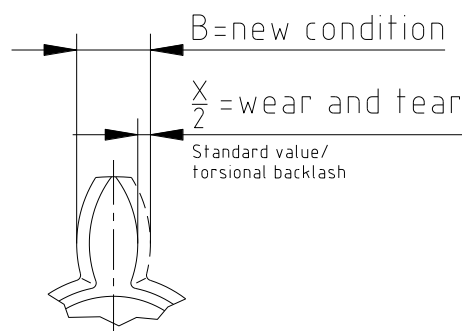


Illustration 11: Wear of spider



8 Maintenance and service

8.1 Standard values of wear

Table 7:

Size	Limits of wear in mm			Size	Limits of wear in mm		
	Friction	Tooth thickness			Friction	Tooth thickness	
	X _{max.}	B _{max.}	B _{min.}		X _{max.}	B _{max.}	B _{min.}
65	5	22.2	17.2	125	10	47.8	37.8
75	6	25.8	19.8	140	12	52.1	40.1
90	8	32.3	24.3	160	14	60.3	46.3
100	9	37	28	180	14	68	54
110	9	42.8	33.8				



Illustration 10 clearly shows how the wear of the coupling can be measured in a user-friendly way when installed.

Please note that the figure "B" (as new condition or after a longer operating period) can only be measured when the coupling is dismantled. This requires axial shifting of the driving or driven side (e. g. electric motor, gearbox, compressor, ...), since the ROTEX® is an axial plug-in coupling.

We recommend performing the procedure by means of a feeler gauge, since the procedure described above is considered to be hardly practicable and rather highly time-consuming specifically when inspecting several plants/machines.

9 Spares inventory, customer service addresses

A basic requirement to ensure the readiness for use of the coupling is a stock of the most important spare parts on site.

Contact addresses of the KTR partners for spare parts and orders can be obtained from the KTR homepage at www.ktr.com.



KTR does not assume any liability or warranty for the use of spare parts and accessories which are not provided by KTR and for the damages which may incur as a result.

KTR Systems GmbH

Carl-Zeiss-Str. 25

D-48432 Rheine

Phone: +49 5971 798-0

E-mail: mail@ktr.com