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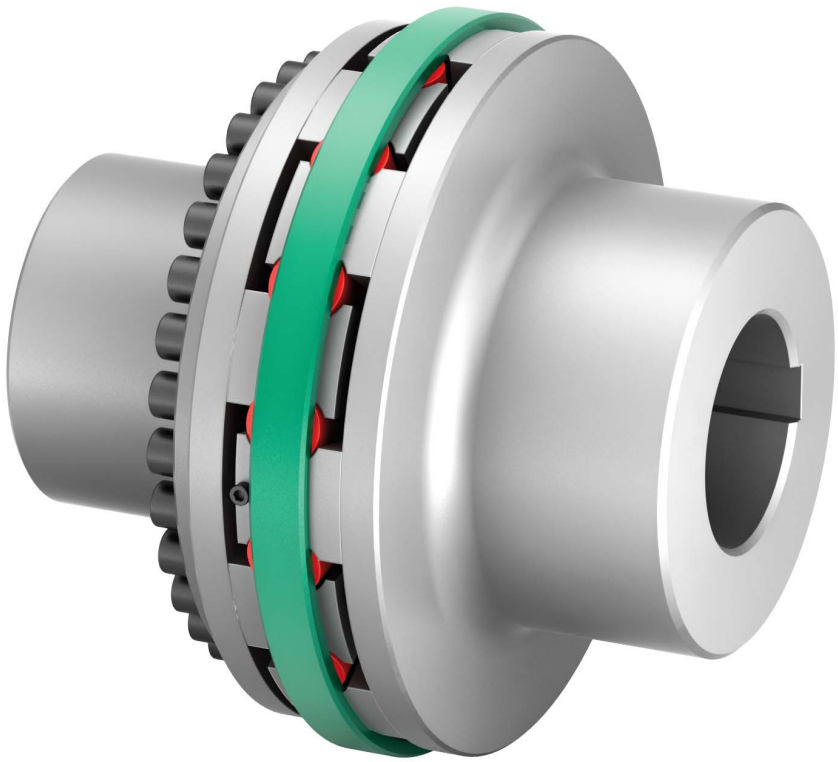
RINGFEDER

Elastomer Jaw Couplings
RINGFEDER® TNB BHD

Installation and Operation Manual



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Chapter **Page**

1 Safety Instructions

This installation and operation manual (IOM) is an essential component of the coupling delivery. Always keep this manual in a readily accessible place near the coupling.
The German version of this manual is the predominant and binding version.

Make sure that all persons being charged with the installation, operation, maintenance and repair of the coupling read and understand this IOM and that all instructions contained herein are carefully observed in order to:

- Avoid danger to life and limb of the user and third parties.
- Ensure the operational safety of the coupling.
- Preclude operation failures and environmental damage due to wrong handling and misuse.

The relevant instructions and regulations regarding safety at work and environmental protection must be observed while transporting mounting and dismounting the coupling.

The coupling may only be operated, mounted, serviced and maintained by authorised and trained personnel.

The user must take into account that the bolting elements of coupling parts may be adversely affected by the heat produced by a brake disk/ brake drum due to the resultant friction. Make sure that the combination of the employed brake lining with the material of the brake disk/ brake drum does not lead to sparks or impermissible thermal growth. The brake disk is normally made of steel, and the brake drum is normally made of cast iron with nodular graphite. In case of any doubt, please consult the supplier!

In the interest of further development, we reserve the right to carry out modifications serving the technical progress.

We do not assume any liability or warranty for any damage resulting from the use of accessories and parts that are not originally manufactured by RINGFEDER POWER TRANSMISSION.

2 Function

The RINGFEDER® TNB BHD coupling is a torsionally flexible, puncture proof claw coupling. It compensates for angular, radial and axial shaft misalignments within defined limits. The coupling transmits torque through elastic buffers loaded in compression. These buffers come in perbunan (PB) or polyurethane (Vk), as a standard VkR.
These elastic buffers dampen shocks and torsional vibrations and are resistant to oil. Buffers made of perbunan are electrically conductive.
One of the coupling halves consists of a flange hub to which a claw ring is bolted. When the claw ring is removed, it is easily possible to check the rotational direction of the drive.
The coupling is suitable for use in every direction of rotation and installation position.

2.1 Intended application

- The coupling must only be operated in normal industrial atmospheres. Since aggressive media may attack the coupling components, screws and elastic buffer rings, they repre- s ent a risk for the operational safety of the coupling. Consult RINGFEDER POWER TRANSMISSION in such cases.
- In order to ensure trouble-free and reliable operation, the coupling has to be sized according to the design specifications, e.g. according to DIN 740, part 2, (or acc. to Product Paper & Tech Paper ”Elastomer Jaw Couplings“), with a service factor appropriate for the service conditions.
- Exceptfor the production of a finish bore with keyway, no furthermodifications are allowed to be carried out on the coupling!
- The coupling shall only be used and operated within the frame of the conditions as defined in the performance or deliverycontract.
- Any change in the operation conditions or service parameters requires the verification of the coupling design.

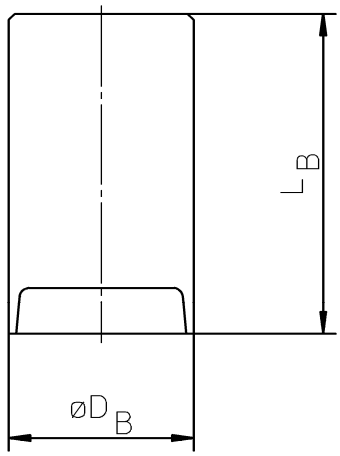
3 Coupling Marking

3.1 Elastic buffers

The elastic buffers are labelled at the front end with:
- Coupling size and material code (Vk for Polyurethane or Pb for Perbunan)

- Pb82 = Perbunan with a hardness of approx. 82 Shore(A) / black
- VkR = Polyurethane with a hardness of approx. 93 Shore(A) / red
- VkW = Polyurethane with a hardness of approx. 96 Shore(A) / white

The table contains the size and quantity Z for each coupling:



Größe	D_B [mm]	L_B [mm]	Z
240	40	49,5	10
300	50	63	10
350	50	70	12
400	55	79	12
450	55	79	14
500	60	104	14
550	60	104	16
600	60	104	18
650	65	113	18
700	70	139	16
800	70	139	20
900	70	139	24
1050	70	139	28
1275	70	139	34

In case of particularly high balance requirements, the elastic buffers are weight balanced per set for each coupling.
Do not mix these buffers with those of other couplings and do not replace single buffers of a set.

4 Storage

On receipt of the goods, immediately check that all parts are on hand and are as ordered. Shipping damage and / or missing parts have to be reported in writing.

The coupling parts can be stored as delivered in a dry place under roof at normal ambient temperatures for a period of 6 months. Storage for a longer time requires the application of a long-term preservation (please consult RINGFEDER POWER TRANSMISSION). The elastic buffers must not be exposed to ozonic media, direct sun light or intensive light sources with UV-light. The relative humidity must not exceed 65%. If the parts are properly stored, the quality characteristics of the elastic buffers remain almost unchanged for up to three years.

5 Construction

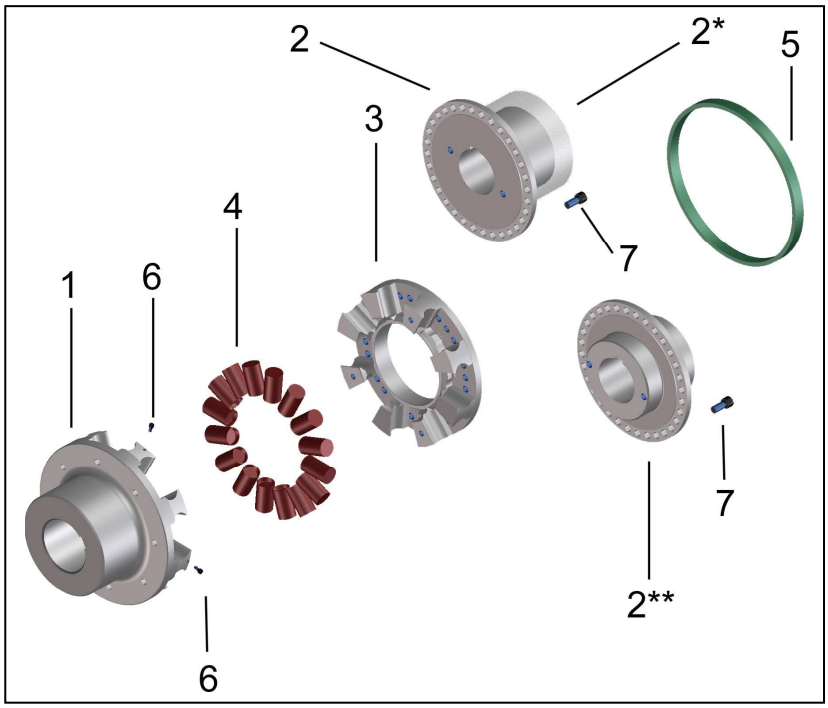


Fig. 1 Construction of RINGFEDER® TNB BHD

1 Coupling hub BH with shoulder for retaining ring, part 401
2 Flanged hub BHDD, part 411
2* Reinforced flanged hub BHDD, part 424
2** Concealed flanged hub BHDDV, part 423
3 Claw ring, part 434
4 Elastic buffers, part 043
5 Retaining ring, part 408 / GFK
6 Locking screw
7 Cheese head screw DIN 912

Note:
Flange hub (part 2) and claw ring (part 3) are delivered in bolted state.
Balanced parts are match marked to each other

6 Technical Data

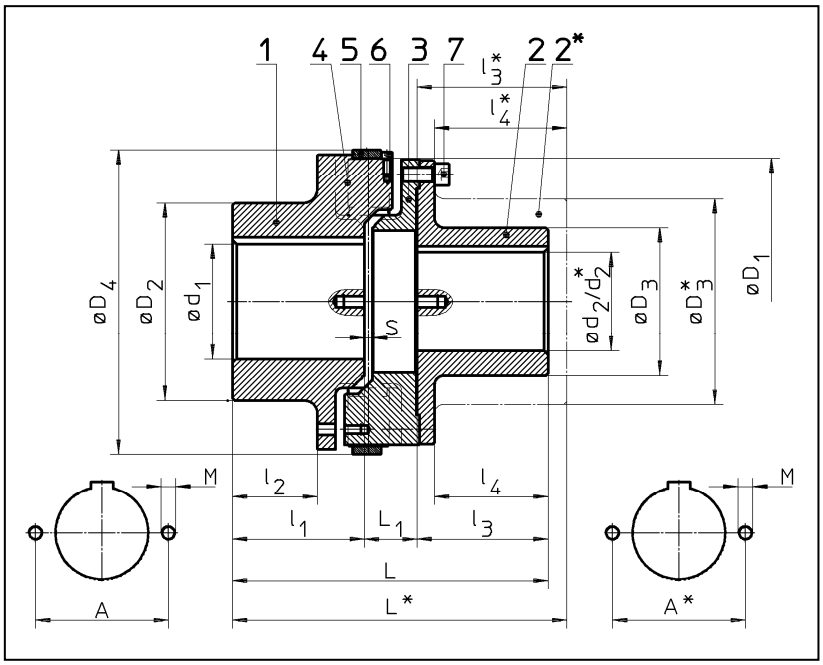


Fig. 2 RINGFEDER® TNB BHD

Table 1 Technical data RINGFEDER® TNB BHD:

Size	D_1	d_1 max	d_2, d_2* max	D_2	D_3, D_3*	D_4	L, L*	L_1	l_1	l_2	l_3, l_3*	l_4, l_4*	S	Puller hole M	A	A*	m
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
BHD	350	160	120	240	180	370	424	64	180	123	180	159	10	M16		145	141
BHD*			170		250		475				231	210				220	190
BHD	450	200	170	300	250	470	489	71	218	154	200	177	10	M20	230	210	271
BHD*			205		300		528				239	216				265	322
BHD	550	240	200	350	280	580	567,5	83	256,5	183,5	228	199	14	M24	275	245	441
BHD*			240		350		618,5				279	250				310	534
BHD	650	260	250	400	350	680	637,5	93	286,5	202,5	258	225	14	M27	330	310	692
BHD*			265		385		678,5				299	266				340	764
BHD	700	300	260	450	370	740	727	102	327	234	298	263	14	M30	340	315	930
BHD*			310		450		774				345	310				400	1094
BHD	800	330	320	490	450	840	797	102	357	264	338	303	14	M30	430	380	1295
BHD*			340		490		824				365	330				440	1405
BHD	900	360	340	540	480	940	853	108	407	307	338	297	14	M30	510	400	1698
BHD*			400		590		914				399	358				540	2045
BHD	1050	400	500	600	700	1100	1128	113	450	345	565	519	14	M33	550	570	3433
BHD	1275	500	600	750	900	1325	1358	118	565	455	675	624	14	M36	600	725	6342

weight m with unbored hubs

Tabelle 3 Technical data:

Size		Standard design:				Couplings with enlarged axial move:			
BHD	n_{max} [min^{-1}]	Pb82		VkR		Pb82		VkR	
		T_{Knom} [Nm]	T_{Kmax} [Nm]	T_{Knom} [Nm]	T_{Kmax} [Nm]	T_{Knm} [Nm]	T_{Kmax} [Nm]	T_{Knom} [Nm]	T_{Kmax} [Nm]
350	2650	3400	10200	10000	31500	65%			
450	2000	6850	20500	21000	62000				
550	2350	13200	39600	45000	135000				
650	1950	19700	59000	65000	176000				
700	2150	26700	80000	90000	275000				
800	2000	39000	118000	120000	380000				
900	1850	54000	162500	180000	550000				
1050	900	73500	220500	245000	735000				
1275	750	108375	325125	361000	1083000				

The torques T_{Knom} and T_{Kmax}. are valid for:
- Ambient temperatures of –30°C up to +30°C for Polyurethane (Vk),
- Ambient temperatures of –30°C up to +60°C for Perbunan (Pb),
- Operation within the range of the specified alignment values.

For determining the size of the coupling according to DIN 740, part 2, (or to Product Paper & Tech Paper ”Elastomer Jaw Couplings“) various factors have to be taken into account:
- the temperature factor $S\upsilon$ in case of higher temperatures,
- the start-up factor Sz depending on the frequency of starts,
- the shock factor S_A, S_L depending on the service conditions.

For circumferential speeds above 22 m/s, referred to the nominal size of the coupling, we recommend balancing the coupling hubs.

7 Installation

7.1 To be observed prior to installation:

- **Danger of injuries!**
- **Disconnect the drive before carrying out any work on the coupling!**
- **Secure the drive against unintentional re-start and rotation!**
- **Incorrectly tightened bolts can cause serious personal injuries and property damages!**
- **Assemble the coupling outside of the danger zone. Take care that suitable transportation means are at disposal and that the transportation ways are free of obstacles.**
- **In compliance with accident prevention regulations, you are obliged to protect all freely rotating parts by means of permanently installed guards/ covers against unintentional contact and falling down objects.**
- **To avoid sparks, covers made of stainless steel should be used!**
- **The covers have to fulfil the requirements of protection type IP2X as a minimum.**
- **The covers have to be designed to prevent dust from depositing on the coupling.**
- **The cover must not contact the coupling or impair the proper function of the coupling**

- Make sure that the speeds, torques and ambient temperatures as stated in chapter 6 ‘Technical Data’ are not exceeded.
- The maximum permissible bore diameters must not be exceeded.
- Check whether the shaft-hub connections safely transmit the occurring operating torques.
- The standard tolerance of RINGFEDER® TNB for finish bores is fit H7.
- Standard keyways comply with DIN 6885, sheet 1.
- Check the dimensions and tolerances of shafts, hub bores, keys and keyways.
- Set screws as required.

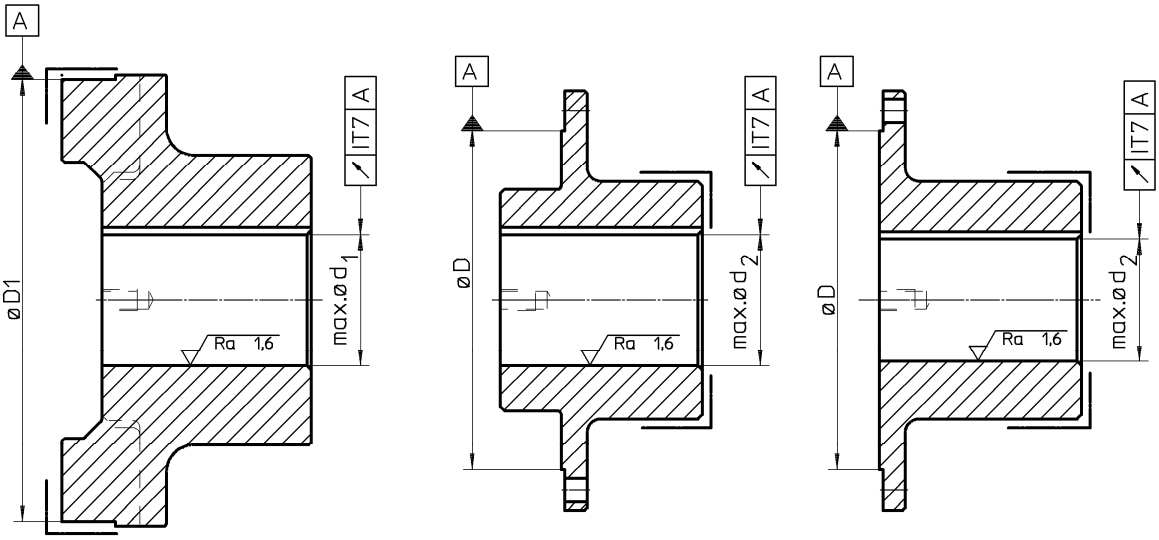
7.2 Finish Bores

The following procedure has to be observed to produce a finish bore in a coupling hub/flange hub:

- Clean and remove all preservatives from the coupling hub and flange hub.
- Mount the coupling hub and flange hub in between the surfaces marked with ⌈ and carefully align the coupling hub and flange hub .
- The values for $\varnothing d_{1max}$/ $\varnothing d_{2max}$ and $\varnothing d_2{}^*{}_{max}$ listed in table 1 and 2are valid for keyed connections according to DIN 6885/1 and must not be exceeded.
- Select the bore fit so that an interference fit such as H7/m6 results when mating it with the shaft tolerance.
- Axially lock the hub, for example by means of a setscrew on the back of the hub above the keyway.

Consult RINGFEDER POWER TRANSMISSION in case of other shaft-hub connections.

- **The stated maximum bore diameters are valid for keyed connections according to DIN 6885/1 and must not be exceeded.**
- **If these values are exceeded, the coupling can break.**
- **Flying off coupling fragments are a danger to life!**



7.3 Installation of coupling

- Unscrew the locking screws at the retaining ring (Fig. 4, Pos.1) and deposit the ring on the free shaft end opposed to that hub.
- Take out the elastic buffers (Fig. 4, Pos. 2).
- Prior to installation, carefully clean the bores of the coupling hubs and the shaft ends. The surfaces must be clean, dry and free of grease.
- For larger couplings use suitable mounting tools and hoisting devices such as cranes or pulley blocks.
- Mount the coupling hubs in the proper position on the shaft ends (Fig. 4, Pos.3).
- If coupling is installed vertically the hub with the shoulder for the retaining ring must be mounted on the lower shaft end.

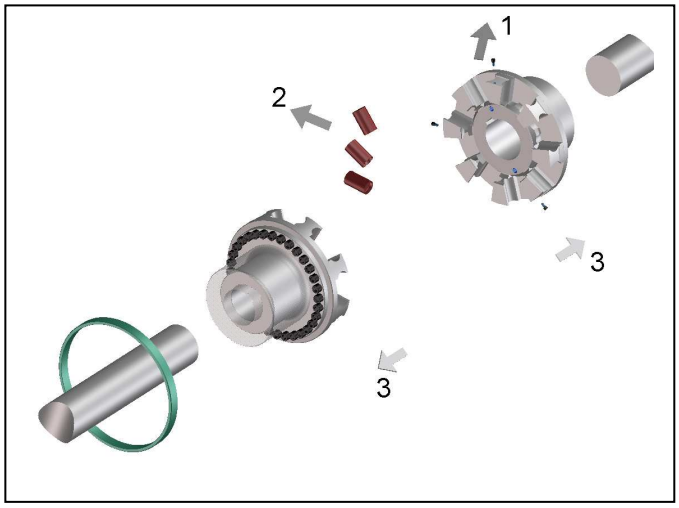


Fig. 4

Note:
To facilitate mounting, the hubs can be uniformly heated to 80°C to 120°C.

- **Warning!**
- **Always wear heat-resistant gloves to protect yourself against injuries due to hot coupling components!**

- Mount the hubs in such a manner that the shaft ends are flush with the inner bore openings (Fig. 5).
  Observe deviant agreements, which may exist!
- When tightening setscrews, secure them with an adhesive, such as e.g. Loctite 222, to prevent the screws from working loose and dropping out.

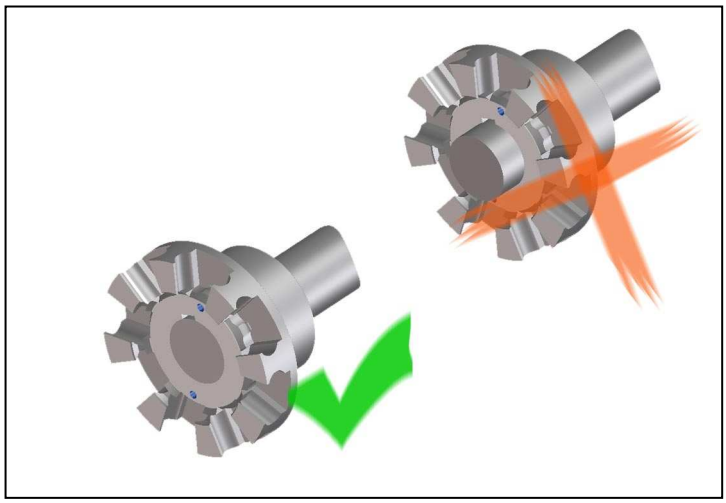


Fig. 5

ATTENTION!
Let the hot hubs cool down to ambient temperature, before inserting the buffers.

- Push together the shaft ends with the mounted coupling halves while observing the mounting dimension ‘h’ acc. to table 7 (Fig. 6).
- To facilitate mounting, the elastic buffers can be coated with a lubricant (for ex. talcum for Perbunan Pb, or commercial roller bearing grease for polyurethane Vk).
- Mount the buffers with the hollow pointing inwards (Fig. 6, Pos. 4).
- Push on the retaining ring until it contacts the hub face, so that the ring is seated centrically above the elastic buffers. (Fig. 6, Pos. 4).

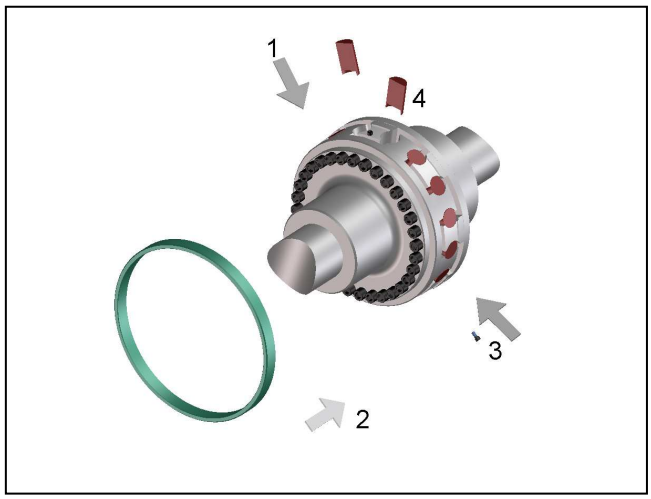


Fig. 6

- Tighten the locking screws at the retaining ring (Fig. 6, Pos. 3) to the tightening torque M_A specified in table 4.
- Align the coupling in accordance with the instructions given in chapter 8 ‘Coupling Alignment’

Table 4 Tightening torque M_A for retaining ring screws:

Size	350	450	550	650	700	800	900	1050	1275
DIN 912 8.8	M8	M10	M10	M10	M12	M12	M12	M12	M12
M_A [Nm]	25	49	49	49	86	86	86	86	86

8 Coupling Alignment

- **Danger of injuries!**

- **Disconnect the drive before carrying out any work on the coupling.**
- **Secure the drive against unintentional re-start and rotation!**
- **Note:**
- **Accurate alignment of the coupling prolongs the lifetime of the elastic buffers.**
- **It is of utmost importance to observe the recommended alignment values. Exceeding the permissible misalignment values results in coupling damages and failures!**

- When aligning the cold equipment take into account the expected thermal growth of the components, so that the permissible misalignment values for the coupling are not exceeded in operation.
- Be aware that the coupling under misalignment imposes restoring forces on the adjacent shafts and bearings. Take into account that the larger the misalignment, the greater the restoring forces will be.
- The maximum permissible misalignment values stated in the tables 5 to 7 are guiding values. It is advisable not to fully utilize these values when aligning the equipment in order to have sufficient reserves for thermal growth, foundation settlings etc. during operation.
- In special applications involving high demands on quiet running characteristics or higher speeds, alignment accuracies of ≤ 0.1 mm may be necessary for the three misalignment levels.
- If the coupling is fitted into a closed housing or guard, so that re-alignment at a later point of time is no longer possible, make sure that the geometry and fitting accuracy of the contact faces ensure precise alignment of the shafts within the stated tolerances during operation.

8.1 Angular misalignment ΔK_w

- Measure one complete rotation (360°) on the face of the outer diameter. Determine the largest deviation K_{w1} and the smallest deviation K_{w2} (Fig. 7).
- Calculate the angular misalignment $\Delta K_w = K_{w1} - K_{w2}$.
- The values according to table 5 are valid for a reference speed of 1500 rpm.

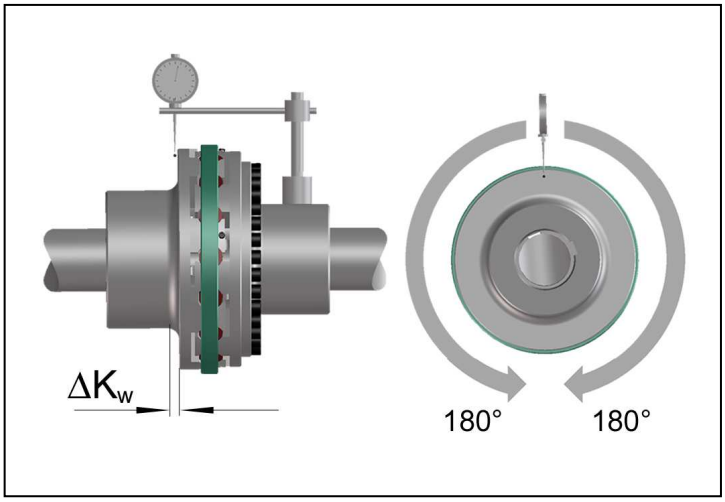


Fig. 7

Table 5 Recommended angular alignment values:

Size	350	450	550	650	700	800	900	1050	1275
$\Delta K_{w\,max}$ [mm]	1,0	1,0	1,0	1,25	1,25	1,25	1,25	1,25	1,25

8.2 Radial misalignment ΔKr

- Measure one complete revolution (360°). Determine the largest deviation K_{r1} and the smallest deviation K_{r2} (Fig 8).
- Calculate the radial misalignment $\Delta K_r = 0{,}5 \times (K_{r1} - K_{r2})$. Observe the preceding sign of the measured values.
- The values according to table 6 are valid for a reference speed of 1500 rpm.

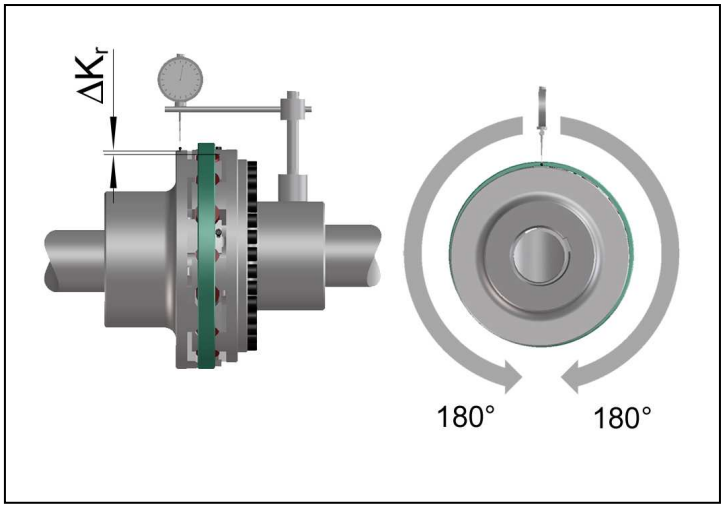


Fig. 8

Table 6 Recommended radial alignment values:

Size	350	450	550	650	700	800	900	1050	1275
$\Delta K_{r\,max}$ [mm]	0,35	0,4	0,55	0,55	0,55	0,65	0,7	0,7	0,75

8.3 Axial misalignment

- Measure the axial flange distance ‘h’ according to fig. 9.
- When aligning observe the flange distance dimension ‘h’ with the max. permissible tolerance X according to table 7.

ATTENTION!

The axial clearance may reach twice the values in operation.

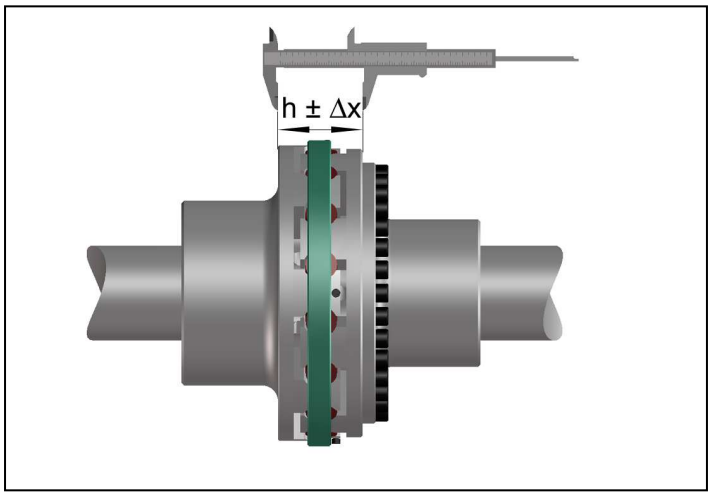


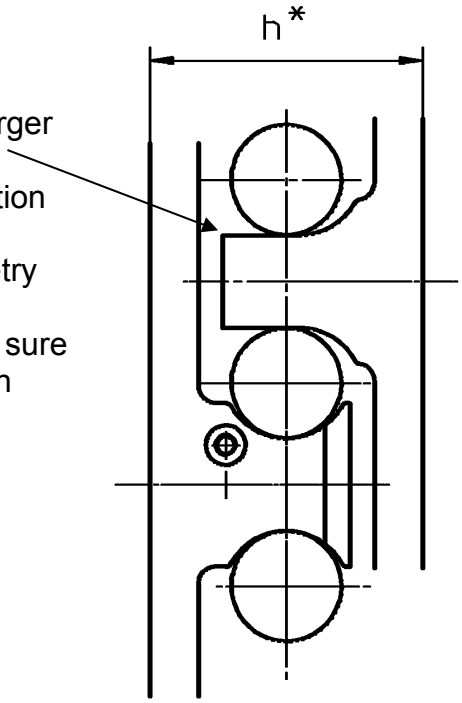
Fig. 9

Table 7 Recommended axial alignment values:

Size	350	450	550	650	700	800	900	1050	1275
h [mm]	124	138	160	182	200	200	214	224	234
ΔX [mm]	0,5	0,5	0,5	0,7	0,7	0,7	0,7	0,7	0,75

8.4 Couplings with enlarged axial clearance

Couplings with straight claw parts in a claw ring allow a larger axial clearance at reduced coupling torques. Set the axial dimension ‘h’ as specified in the order-related documentation and layout drawing!
As the elastic buffers are not enclosed by the claw geometry on one side, larger torsion angles result when torque is applied and at displacement of the coupling halves. Make sure to observe the max. permissible buffer wear for this design acc. to table 12!



If the coupling is operated at a higher speed than the reference speed of 1500 rpm, the recommended alignment values stated in the tables have to be reduced accordingly.

Example for coupling size BHD-550 with an operation speed of 1800 rpm:

Ratio of reference speed to operation speed: 1500/1800 = 5/6.

Alignment values acc. to the tables for 1500 rpm:
ΔK_w = 1,0mm ΔK_r = 0,55mm ΔX = 0,5mm

New alignment values for 1800 rpm:
ΔK_w -new = ΔK_w x 5/6 = 1,0mm x 5/6 ΔK_w-new = 0,83mm
ΔK_r -new = ΔK_r x 5/6 = 0,55mm x 5/6 ΔK_r-new = 0,45mm
ΔX-new = ΔX x 5/6 = 0,5mm x 5/6 ΔX-new = 0,41mm

9 Operation

When operating the coupling, its specific technical data have to be carefully observed (see chapter 6 'Technical Data'). These values must never be exceeded without the prior written approval by RINGFEDER POWER TRANSMISSION.
In order to ensure trouble-free and reliable performance of the coupling, the coupling has to be designed according to the selection specifications, e.g. according to DIN 740, part 2, (or acc. to Product Paper & Tech Paper "Elastomer Jaw Couplings" with a service factor appropriate to the service conditions.

Any change in the service conditions or service parameters always necessitates the verification of the coupling design.

- **Danger of injuries!**
- **Disconnect the drive before carrying out any work on the coupling!**
- **Secure the drive against unintentional re-start and rotation!**
- **Improperly tightened screws may cause parts to fly off leading to most serious personal injuries and property damages!**
- **Before putting the coupling into operation, check the alignment and all screwed connections for correct tightening torque and firm fit!**
- **Before starting up the equipment, install all protective guards in order to avoid unintentional contact with freely moving or rotating parts.**
- **To avoid sparks, covers made of stainless steel should be used!**
- **The covers have to fulfil the requirements of protection type IP2X as a minimum.**
- **The cover shall be designed to prevent dust from depositing on the coupling parts.**
- **The cover must not touch the coupling and must not impair the proper function of the coupling.**

While operating the coupling, pay attention to:
- Changes in operating noises
- Vibrations

Attention!
- **Disconnect the drive immediately, if any irregularities are observed while operating the coupling!**
- Identify the cause for the problem using table 8 “Operation Faults and Possible Causes“ and correct the fault.
  The listed problems are some examples to assist you in troubleshooting.
- **All the machinery components and operation modes have to be considered for the determination and correction of faults!**

Table 8 Operation Faults and Possible Causes:

Trouble	Cause	Risk Warning	Correction
Irregular running noises/ vibrations	Alignment fault	Considerable increase of coupling temperature. Premature wear of elastic buffers. Increased reaction forces act on connected machines.	- Disconnect drive - Remove cause for alignment fault - Re-align coupling - Inspect elastic buffers for wear
	Elastic buffers worn out	Coupling claws strike against each other. Spark formation, claw fracture, increased reaction forces	- Disconnect drive - Check coupling components for damages and replace parts, if necessary - Replace elastic buffers
	Unbalance	Considerable increase in coupling temperature. Premature wear of elastic buffers. Increased reaction forces act on connected machines	- Disconnect drive - Verify balance state of plant components and correct it, if necessary - Inspect elastic buffers for wear
	Loose screw connections	Flying off parts can cause serious injuries and considerable damages.	- Disconnect drive - Check coupling parts for damages, replace parts, if necessary - Verify alignment of coupling - Tighten screws to the specified tightening torque and secure them against working loose, if necessary - Inspect elastic buffers for wear

Trouble	Cause	Risk Warning	Correction
Premature wear of elastic buffers	Alignment fault	Considerable increase in coupling temperature. Increased reaction forces act on connected machines	- Disconnect drive - Remove cause for alignment fault - Re-align coupling - Inspect elastic buffers for wear
	Unacceptable temperatures	Material properties of elastic buffers change. The torque transmission capability is adversely affected.	- Disconnect drive - Replace elastic buffers - Re-align coupling - Adjust ambient temperature
	Contact with aggressive products	Material properties of elastic buffers change. The torque transmission capability is adversely affected	- Disconnect drive - Check coupling parts for damages and replace parts, if necessary - Replace elastic buffers - Verify alignment of coupling - Prevent contact with aggressive products
	Torsional vibrations in the drive line	Considerable increase in coupling temperature. Premature wear of elastic buffers. Increased reaction forces act on connected machines.	- Disconnect drive - Analyse and eliminate cause for torsional vibrations - Check coupling parts for damages and replace parts, if necessary - Replace elastic buffers and consult RINGFEDER POWER TRANSMISSION concerning eventual use of another Shore-hardness - Verify coupling alignment
Claw breakage	Wear limit of elastic buffers exceeded ===> contact of claws	Coupling is destroyed. Connected machines can be affected, too.	- Disconnect drive - Replace coupling - Inspect the elastic buffers for wear at shorter intervals
	Overload due to too high torque	Coupling is destroyed. Connected machines can be affected, too	- Disconnect drive - Verify coupling design in cooperation with RINGFEDER POWER TRANSMISSION - Replace coupling - Install larger coupling, if necessary

9.1 Check of Direction of Rotation

- **Danger of Injuries!**
- **Disconnect the drive before carrying out any work on the coupling!**
- **Secure the drive against unintentional re-start and rotation!**

- Loosen the locking screws (Fig. 10, Pos. 1) at the outer diameter of the retaining ring and push it backward (Fig. 10, Pos. 2).
- Take out the elastic buffers (Fig.10, Pos. 3).
- Remove the cheese head screws from the flange hub (Fig. 10, Pos. 4). This separates the claw ring from the flange hub.
- Pull out the claw ring (Fig. 10, Pos. 5) with the cheese head screws (Fig. 10, Pos. 6) of its centering. A gap must result in between the claw ring and the flange hub, so that these parts are no longer in contact.

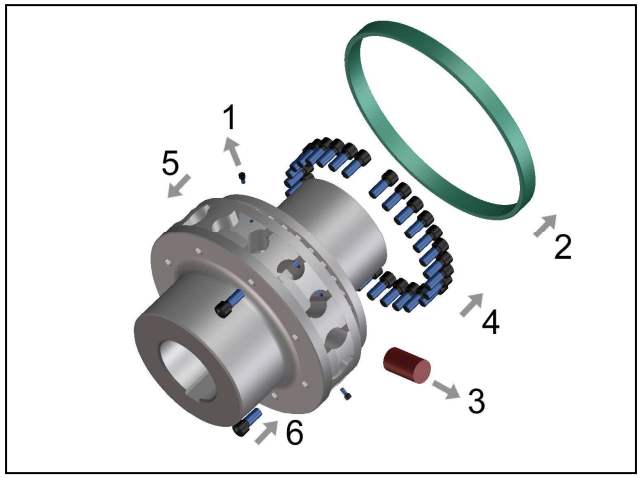


Fig. 10

- **Attention!**
- **Make sure that the shaft ends cannot move axially while checking the direction of rotation.**
- **The rotating coupling half must not contact the stationary coupling half!**

- After having checked the direction of rotation, remove the cheese head screws (Fig. 10, Pos. 6) and install the claw ring to the flange hub using the cheese head screws (Fig. 10, Pos. 4).
- Install the claw ring in the marked position.
- Make sure that the parts do not get canted at the centering seat while mounting them.
- Ensure that the parts are re-assembled in their original positions.

Attention!
The contact surfaces of the claw rings and flange hubs must be clean, dry and free of grease. Balanced parts are match marked to each other.

- Tighten the bolts uniformly.
- Tighten the bolts to the torque M_A specified in table 9 (Fig. 11).
- Mount the buffers with the hollow pointing inwards (Fig. 6). To facilitate mounting, the elastic buffers can be coated with a lubricant (for ex. talcum for perbunan Pb, or commercial roller bearing grease for polyurethane Vk).
- Check the alignment according to the instructions given in chapter 8 'Coupling Alignment'.
- Advance the retaining ring (Fig. 6, Pos. 2) up to the contact face at the coupling hub, so that the ring is seated centrically above the elastic buffers.

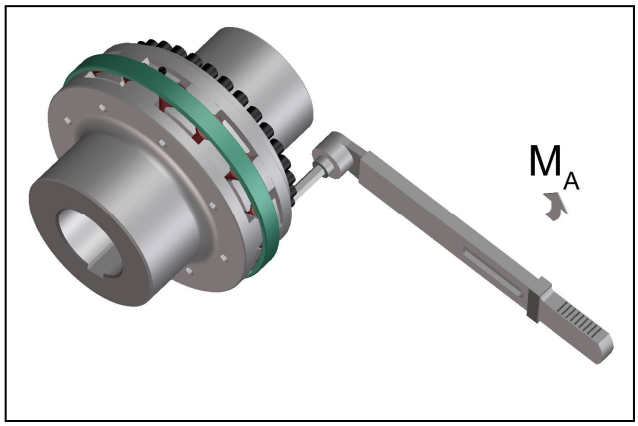


Fig. 11

- Install the retaining ring with the locking screws at the claws of the coupling hub. Tighten the screws with the tightening torque M_A specified in table 4.

Table 9 Tightening torques M_A for the screwed connections of the claw rings:

Size	350	450	550	650	700	800	900	1050	1275
DIN 912- 10.9	M18	M20	M24	M27	M30	M30	M30	M33	M36
M_A [Nm]	300	440	700	950	1400	1400	1400	2800	3700

10 Maintenance

The flexible coupling RINGFEDER® TNB BHD only requires little maintenance during operation. The elastic buffers are subject to wear. The time at which the wear limit of the elastic buffers is reached depends on the service parameters and application conditions.

On the occasion of routine inspections or maintenance of the equipment, check:

- Alignment of coupling,
- State of elastomer
- Firm fit of the fastening elements
- Missing parts
- Remove dust deposits from coupling parts and buffers

10.1 Inspection and maintenance intervals

- **Danger of injuries!**
- **Disconnect the drive before carrying out any work on the coupling!**
- **Secure the drive against unintentional re-start and rotation!**

Perform wear checks, inspections and maintenance operations according to the intervals stated in table 10. If excessive wear is already detected on the occasion of the first inspection, check whether the cause for the problem is listed in table 8 “Operation faults and possible causes”. In such a case the inspection intervals must be adapted to the prevailing service conditions. Special operation conditions may necessitate to perform inspections and maintenance operations at shorter intervals than stated

Table 10 Inspection and Maintenance Intervals

Industry		
1st inspection	after 4 weeks	visual inspection and wear check of elastomer
1st maintenance	after 6 months	visual inspection and wear check of elastomer
2nd maintenance	after 12 months	visual inspection and wear check of elastomer removal of dust deposits from coupling components
each further maintenance	every 12 months	visual inspection and wear check of elastomer removal of dust deposits from coupling components
Mines		
1st inspection	after 4 weeks	visual inspection and wear check of elastomer
1st maintenance	after 6 months	visual inspection and wear check of elastomer
2nd maintenance	after 6 months	visual inspection and wear check of elastomer removal of dust deposits from coupling components
each further maintenance	every 6 months	visual inspection and wear check of elastomer removal of dust deposits from coupling components

On the occasion of maintenance operations on the drive equipment, however, after 3 years at latest:

- Replace the elastic buffers.
- If the wear limit has been reached or exceeded, replace the buffers immediately, irrespective of the inspection intervals of the equipment.
- Check coupling alignment.
- Remove dust deposits from coupling components and buffers

10.2 Wear Inspection on elastic buffers

- If the elastic buffers are considerably deformed or have cracked, the buffers must be replaced.
- If the wear limit has been reached or exceeded, replace the buffers immediately. Check the wear of the buffers by determining the min. diameter PD_{min} of each buffer.
- If the coupling has a distinct torsional backlash, we recommend to replace the elastic buffers.

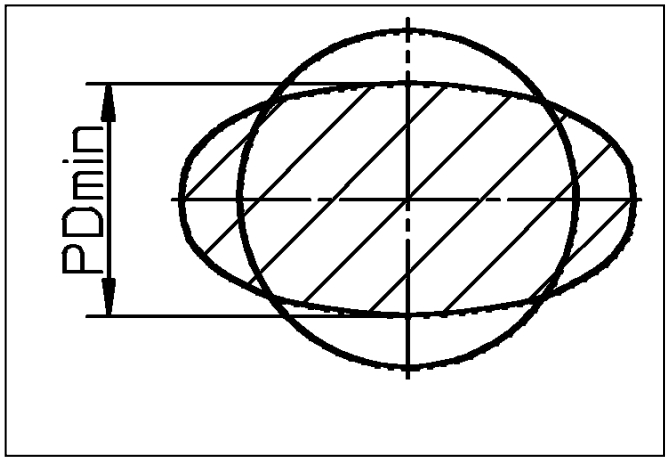


Fig. 12

Table 11 Min. buffer thickness PD_{min}:

Size	350	450	550	650	700	800	900	1050	1275
PD_{min} [mm]	47	52	56	61	66	66	66	66	66

10.3 Wear inspection on elastic buffers in case of enlarged axial clearance

Couplings with straight claw parts in a claw ring allow a larger axial clearance at reduced coupling torques (see 8.4). As the elastic buffers are not enclosed by the claw geometry on one side, larger torsion angles result when torque is applied and at displacement of the coupling halves. Make sure to observe the max. permissible buffer wear for this design acc. to table 12!

Table 12 Min. buffer thickness PD_{min} for couplings with enlarged axial clearance:

Size	350	450	550	650	700	800	900	1050	1275
PD_{min} [mm]	49	54	59	64	69	69	69	69	69

Upon completion of the wear measurement, re-install all the protective devices and covers

10.4 Replacement of elastic buffers

- **Danger of injuries!**
- **Disconnect the drive before carrying out any work on the coupling!**
- **Secure the drive against unintentional re-start and rotation!**

- At first remove the locking screws (Fig.13, Pos. 3) and then the retaining ring (Fig.13, Pos. 2).
- Remove the buffers part 043.
- To facilitate mounting, the new elastic buffers can be coated with a lubricant before installing them (e.g. talcum for perbunan Pb, or commercial roller bearing grease for polyurethane Vk).
- Mount new buffers of correct size with the hollow pointing inwards (Fig. 13, Pos. 4).
- Push on the retaining ring until it contacts the hub face, so that the ring is seated centrically above the elastic buffers and tighten the locking screws to the torque M_A specified in table 4.

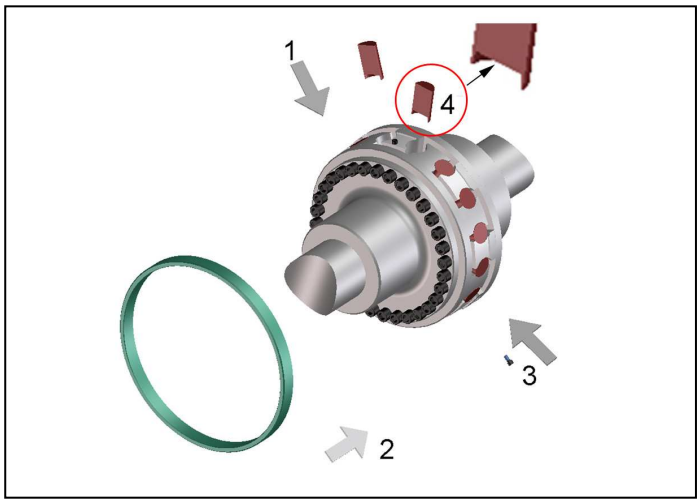


Fig. 13

- Check the alignment of the coupling according to the instructions given in chapter 8 ‘Coupling Alignment’.

Warning!

- **Before putting the equipment into service, all safety guards must be installed to prevent unintentional contact with freely rotating parts.**
- **To avoid sparks, covers made of stainless steel should be used.**
- **The covers have to fulfil the requirements of protection type IP2X as a minimum.**
- **The covers have to be designed to prevent dust from depositing on the coupling parts.**
- **The cover must not touch the coupling and impair the proper operation of the coupling.**

We do not assume any responsibility or warranty for any damages resulting from the use of accessories or spare parts, which have not originally been manufactured by RINGFEDER POWER TRANSMISSION

11 Disposal

Disposal of the parts has to be arranged in accordance with the specific regulations of the country where the parts are installed.

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