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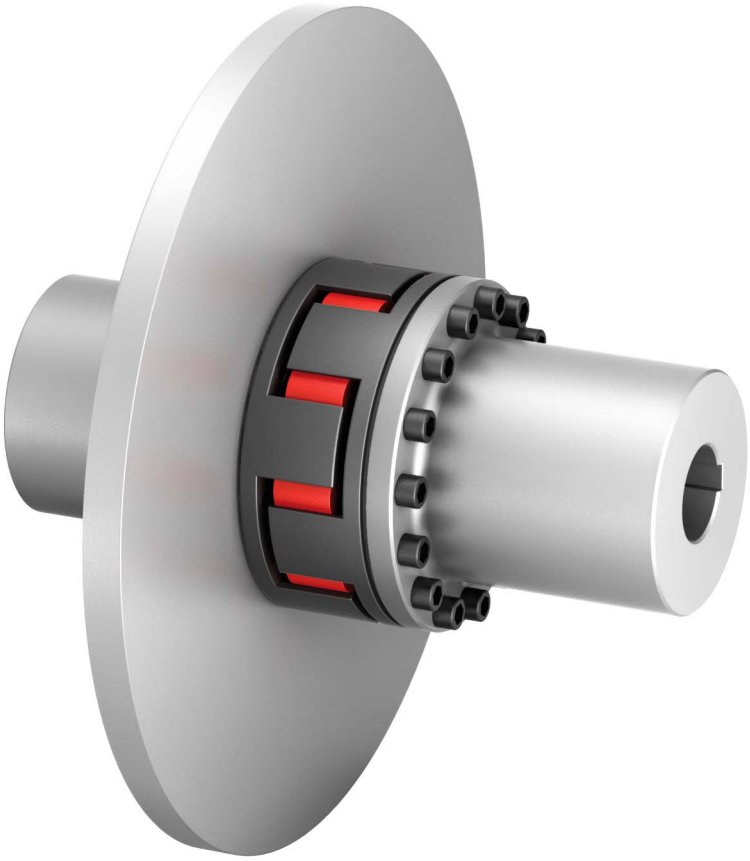
RINGFEDER

Elastomer Jaw Couplings
RINGFEDER® TNS SDDL-5-BS

Installation and Operation Manual



Partner for Performance

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Chapter **Page**

1 Safety Instructions

This installation and operation manual 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.
Take care that all persons being charged with the installation, operation, maintenance and repair of the coupling have read and understood this manual and that all instructions contained therein are carefully observed in order to:

- avoid danger to life and limb of the user or third persons,
- ensure the operational safety of the coupling,
- preclude operation failures and environmental damages due to wrong handling and misuse.

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

Make sure that appropriate transportation means and tools are at disposal.

The coupling shall be operated, mounted, maintained and repaired by authorized, trained and instructed personnel only.

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, while brake drums are generally 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 damages resulting from the use of accessories and parts that are not originally manufactured by RINGFEDER POWER TRANSMISSION.

2 Technical Description

The RINGFEDER® TNS SDDL-5-BS coupling is a torsionally flexible, puncture proof claw coupling with removable intermediate part comprising the claw rings with brake disk and the buffer ring.
It compensates for angular, radial and axial shaft misalignments within defined limits. The coupling transmits torque through elastic buffers loaded in shear. These buffers come in Perbunan (Pb) or polyurethane (Vk), as a standard Vk60D, and are connected to each other to form an elastic buffer ring.
This buffer ring dampens shocks and torsional vibrations and is resistant to oil.
Buffer rings made of Perbunan are electrically conductive.
The two-parted construction of both coupling halves allows radial mounting and dismounting of the intermediate part. The buffer ring can, therefore, be replaced without having to displace the connected machines.
When the intermediate part 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

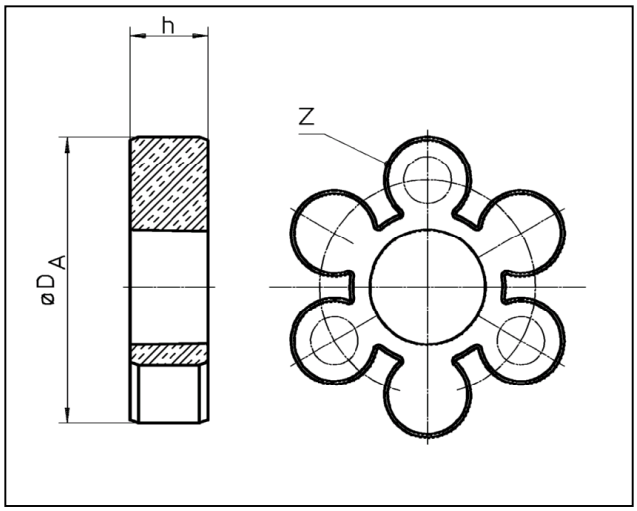
- The coupling must only be operated in normal industrial atmospheres. Since aggressive media may attack the coupling components, screws and elastic buffer rings, they represent a risk for the operational safety of the coupling. Consult RINGFEDER POWER TRANSMISSION in such cases.
- In order to ensure 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.
- Except for the production of a finish bore with keyway, no further modifications 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 delivery contract.
- Any change in the operation conditions or service parameters requires the verification of the coupling design.

3 Coupling Marking

3.1 Marking of Buffer Rings

The buffer rings are marked on the face of one buffer element as follows:
- Coupling size and material abbreviation (Vk for Polyurethane or Pb for Perbunan)
- Year of construction

- Pb72 = buffer ring of Perbunan, 72 Shore(A) / black
- Pb82 = buffer ring of Perbunan, 82 Shore(A) / black
- VkB = buffer ring of Polyurethane, 83 Shore(A) / blue
- VkR = buffer ring of Polyurethane, 93 Shore(A) / red
- Vk60D = buffer ring of Polyurethane, 60 Shore(D) white/beige



Size	D_A [mm]	h [mm]	z
50	48	12	4
70	70	18	6
85	82	18	6
100	100	20	6
125	121	25	6
145	139	30	6
170	166	30	8
200	194	35	8
230	222	35	10
260	253	45	10
300	294	50	10
360	350	55	12
400	393	55	14

4 Storage

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

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

5 Construction

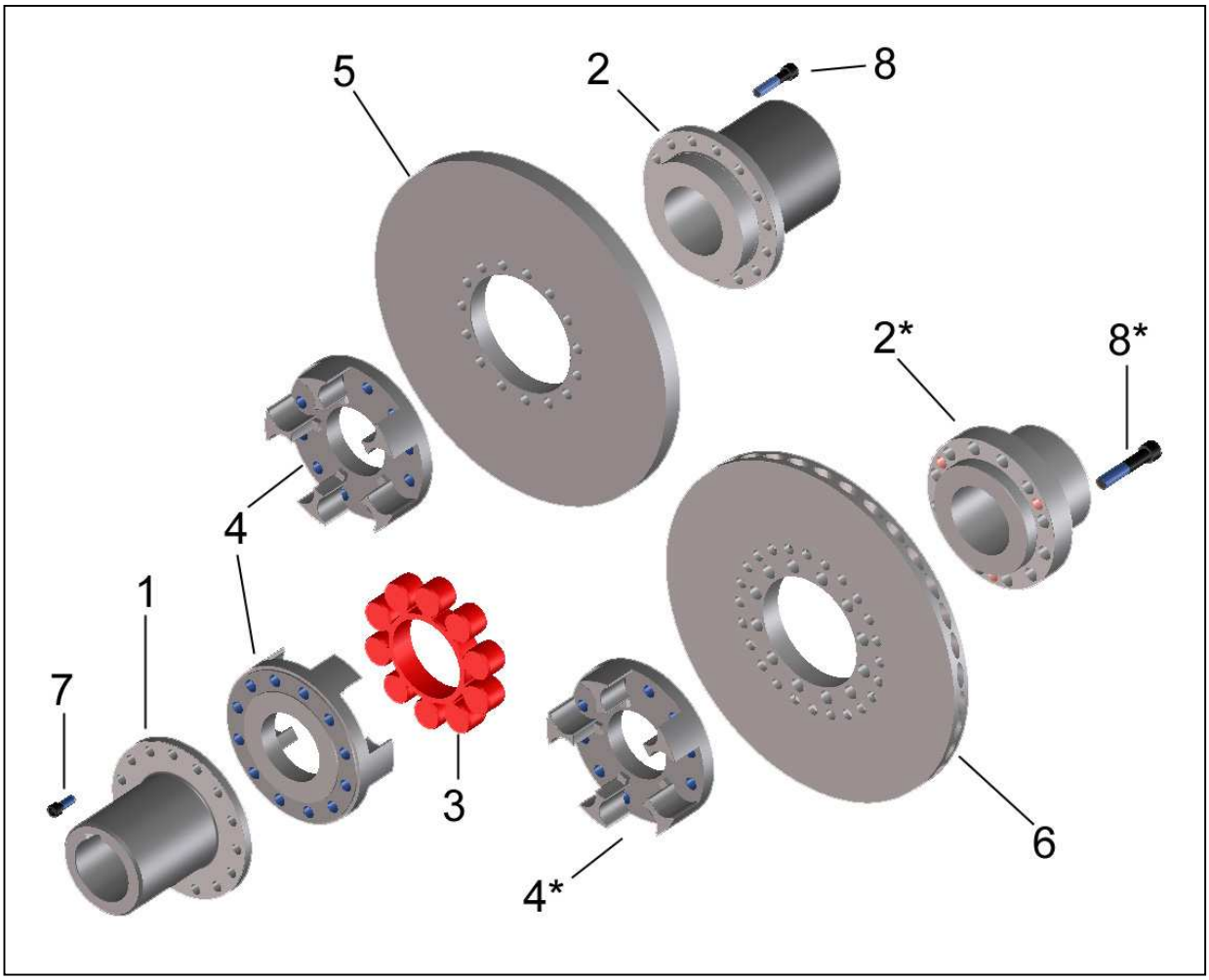


Fig. 1 Construction RINGFEDER® TNS SDDL-5-BS

1 Flange hub SDDL-5 part 368
2 Flange hub SDDL-5 Bs.-connection part 369
2* Flange hub SDDL Bs.- connection part 370
3 Elastic buffer ring part 020
4 Claw ring SDD-5 part 360
4* Claw ring SDD part 344
5 Brake disk part 505
6 Brake disk BSV part 507 (ventilated), BSP 508 (full disk)
7 Cheese head screw DIN 912
8 Cheese head screw DIN 912 for BS connection
8* Cheese head screw DIN 912 for BSV / BSP connection

Note:
Flange hub (Pos. 1) and removable claw rings (Pos. 4), as well as claw rings (Pos. 4,4*), brake disc (Pos. 5,6) and flange hub (Pos. 2,2*) are bolted to each other when supplied. Balanced parts are match marked to each other

6 Technical Data

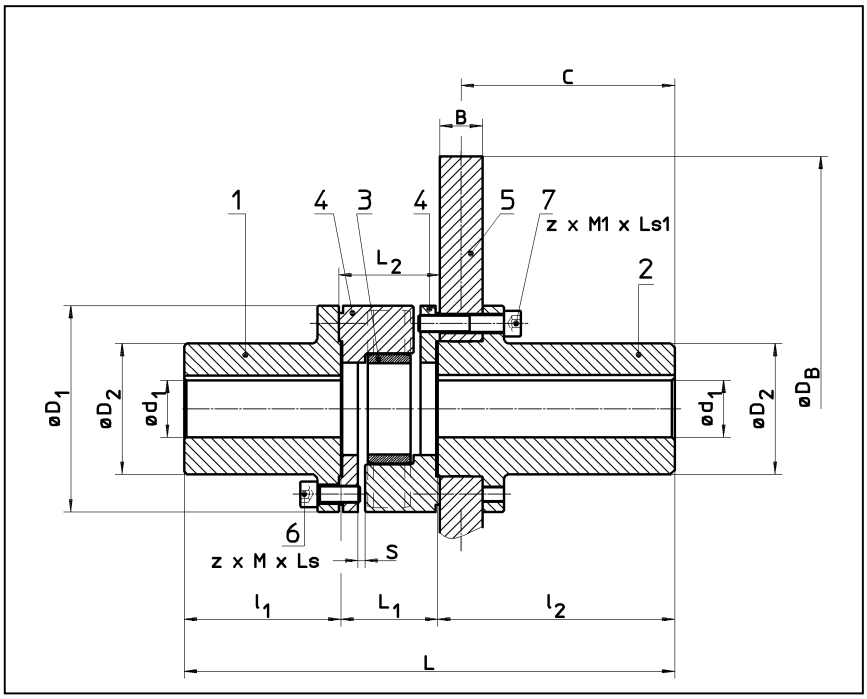


Fig. 2 RINGFEDER® TNS SDDL-5-BS

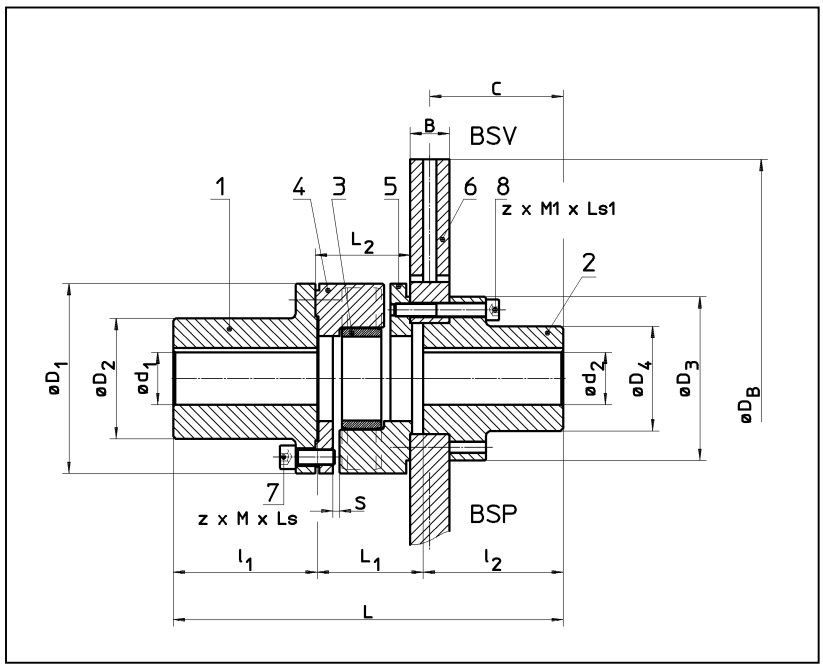


Fig. 3 RINGFEDER® TNS SDDL-5-BS

Table 1 Technical Data:

Size	T_{Knenn} Pb72 [Nm]	T_{Knom} Pb72 [Nm]	T_{Knenn} Pb82 [Nm]	T_{Knom} Pb82 [Nm]	T_{Knenn} VkR [Nm]	T_{Knom} VkR [Nm]	T_{Knenn} Vk60D [Nm]	T_{Knom} Vk60D [Nm]
100	40	120	70	210	130	390	195	585
125	70	210	128	385	250	750	370	1110
145	120	360	220	660	400	1200	600	1800
170	180	540	340	1020	630	1890	950	2850
200	330	990	590	1770	1100	3300	1650	4950
230	500	1500	900	2700	1700	5150	2580	7740
260	800	2400	1400	4200	2650	7950	3980	11940
300	1180	3540	2090	6270	3900	11700	5850	17550
360	1940	5820	3450	10350	6500	19500	9700	29100
400	2670	8010	4750	14250	8900	26700	13350	40050

- Pb72 = buffer ring of - 72 Shore(A) / black
- Pb82 = buffer ring of - 82 Shore(A) / black
- VkB = buffer ring of Polyurethane / blue
- VkR = buffer ring of Polyurethane / red
- Vk60D = buffer ring of Polyurethane / white-beige

Table 2 SDDL-5-BS

Size	D_B-B [mm]	d_1,d_2 max [mm]	D_1 [mm]	D_2 [mm]	l_1 [mm]	l_2 [mm]	L [mm]	L_1 [mm]	L_2 [mm]	S [mm]	C [mm]	Z x M x Ls DIN 912 8.8	Z x M x Ls1 DIN 912 8.8	M_A [Nm]	m unbored [kg]
145	355-30	65	145	92	110	166,5	344,5	68	71+2,5	5	150	9 x M12 x 30	9 x M12 x 60	85	43,0
	400-30														49,3
170	400-30	75	170	110	140	166,5	374,5	68	71+3,0	5	150	12 x M12 x 30	12 x M12 x 70	85	59,9
	450-30														67,7
	500-30														76,5
200	450-30	95	200	135	170	207,0	454,0	77	81+3,0	6	190	12 x M14 x 30	12 x M14 x 60	135	89,3
	500-30														98,1
	560-30														109,9
230	500-30	110	230	160	170	207,5	458,5	81	86+3,5	7	190	15 x M14 x 35	15 x M14 x 65	135	118,6
	560-30														130,3
	630-30														145,8
	710-30														165,6
260	630-30	125	260	180	210	212,5	518,5	96	101+4,0	8	195	15 x M16 x 40	15 x M16 x 70	210	178,1
	710-30														198,0
300	710-30	140	300	200	210	212,5	535,5	113	118+4,0	8	195	15 x M20 x 50	15 x M20 x 80	425	233,7
	800-30														258,8
	800-40										190		15 x M20 x 90		295,7
360	800-30	160	360	225	250	252,5	627,5	125	130+4,0	8	235	12 x M24 x 55	12 x M24 x 85	730	337,7
	800-40										230		12 x M24 x 95		374,0
	1000-40														462,7
400	800-30	160	400	225	250	252,5	627,5	125	130+4,0	8	235	14 x M24 x 55	14 x M24 x 85	730	355,5
	800-40										230		14 x M24 x 95		391,8
	1000-40														480,5

Size	D_B - B [mm]	S [mm]	C [mm]	Z x M x Ls DIN 912 8.8	M_A [Nm]	Z x M x Ls1 DIN 912 8.8	M_A [Nm]
125	315V30	5	102	9 x M10 x 25	49	9 x M10 x 70	49
145	315V30	5	102	9 x M12 x 30	85	9 x M10 x 70	49
	355V30					9 x M12 x 75	85
170	400V30	5	102	12 x M12 x 30	85	9 x M14 x 75	135
	450V30		135			12 x M16 x 80	210
230	500V30	7	135	15 x M14 x 35	135	12 x M18 x 90	300
	550V30						
260	550V30	8	135	15 x M16 x 40	210	12 x M18 x 90	300
	630V30					12 x M20 x 95	425
	710V30					12 x M22 x 100	580
300	710V30	8	135	15 x M20 x 50	425	12 x M22 x 100	580
	800V30					12 x M24 x 100	730
	630V42		141			12 x M24 x 110	
360	800V30	8	135	12 x M24 x 55	730	12 x M24 x 100	730
	630V42		141			12 x M24 x 110	
400	800V42	8	181	14 x M24 x 55	730	12 x M30 x 120	1450
	1000V42						

The torques T_{Knom} and T_{Kmax}. are valid for:

- Ambient temperatures of –30℃ up to +30℃ for Polyurethane (Vk),
- Ambient temperatures of -30℃ up to + 60℃ 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 steel parts of the coupling.

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. Do not use tools which cause sparks when mounting the parts!**
- **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, the covers for couplings used should be made of stainless steel!**
- **As a minimum, the covers have to fulfil the requirements of protection type IP2X.**
- **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® TNS 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

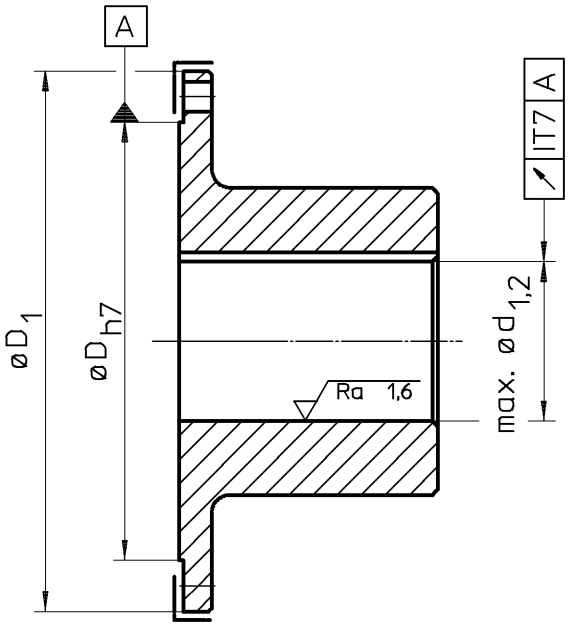
7.2 Finish Bores

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

- Clean and remove all preservatives from the flange hub.
- Mount the flange hub between the surfaces marked with ⌈ and carefully align the flange hub.
- The values for $ød_{1,}$ $ød_{2max}$ listed in table 2 and 3 are 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 Coupling Installation

- Remove the elastic buffer ring (Fig 4, Pos. 1).
- Remove the corrosion protection agent from the brake disk / drum.
- Prior to installation, carefully clean the bores of the flange 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 flange hub complete with the claw rings attached in the proper position on the shaft ends (Fig 4, Pos. 2).

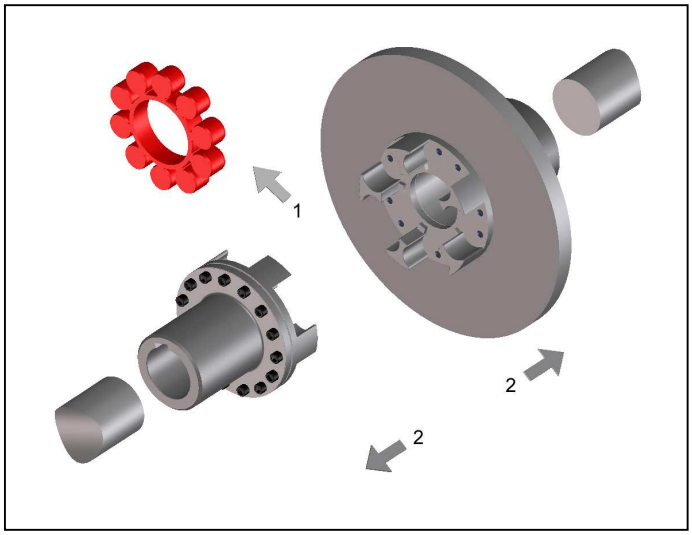


Fig. 4

Note:
To facilitate mounting, the hubs can be uniformly heated to 80℃ to 120℃. Take care not to damage the identification sticker (see chapter 3 ‘Coupling Marking’)!

- **Warning!**
- Only work with gloves to protect against burning by hot coupling components!

- Mount the hubs in such a manner that the shaft end is flush with the inner bore opening (Fig 5). Protruding shaft ends prevent radial mounting and dismounting of the claw rings.
  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

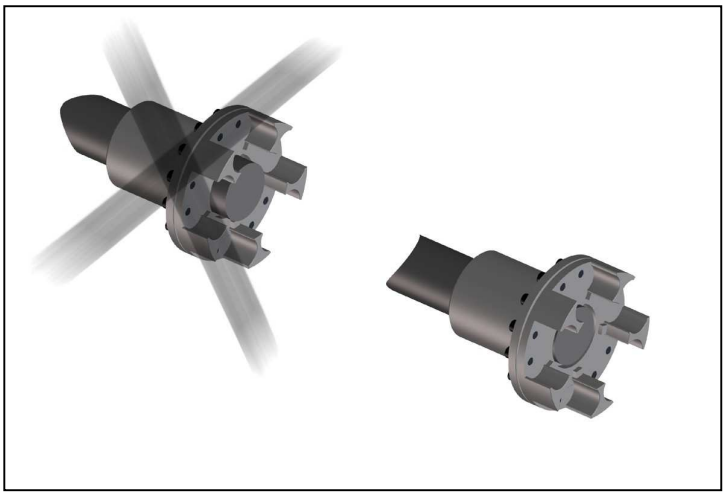


Fig. 5

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

- To facilitate mounting, the buffer ring can be coated with a lubricant (e. g. talcum for Perbunan Pb, or commercial roller bearing grease for polyurethane Vk).
- Install the buffer ring on one of the coupling halves.
- Push the shaft ends with the mounted coupling halves together (Fig 6).
- Align the coupling in accordance with the instructions given in chapter 8 ‘Coupling Alignment’.

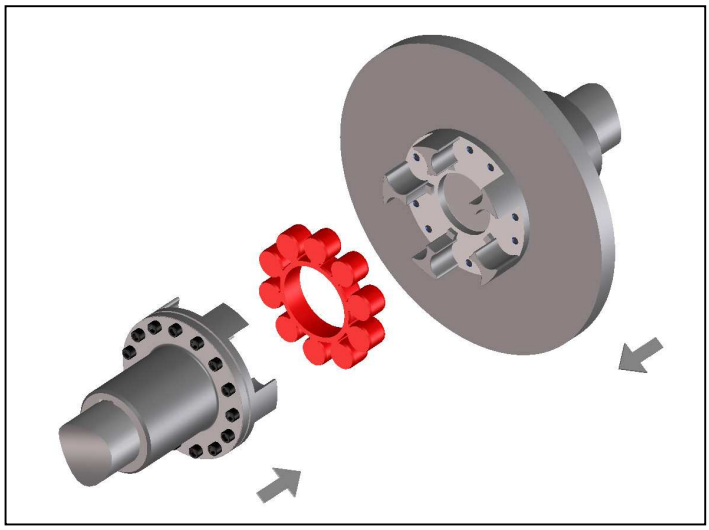


Fig. 6

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.

- Place the claw rings with the buffer in their proper position as marked. When joining the parts pay attention that they do not get canted at the centering seat (Fig 7).

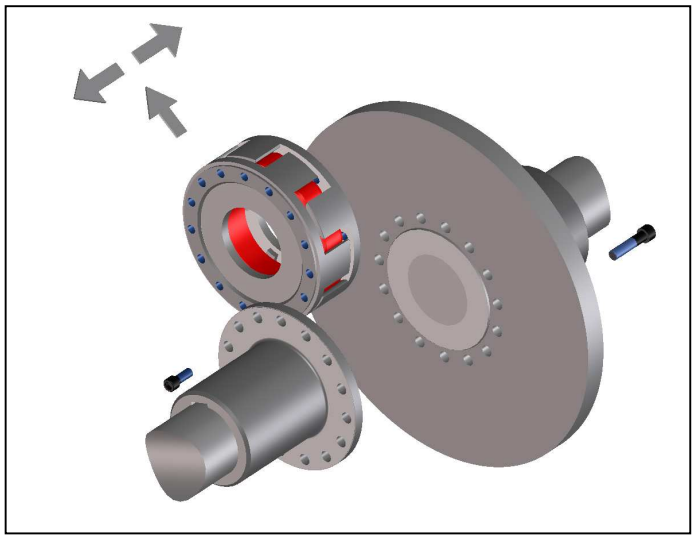


Fig. 7

- Slightly tighten the screws in a uniform manner
- Tighten the screws to the tightening torque M_A specified in table 2 and 3 (Fig 8).
- Align the coupling according to the instructions given in chapter 8 ‘Coupling Alignment’

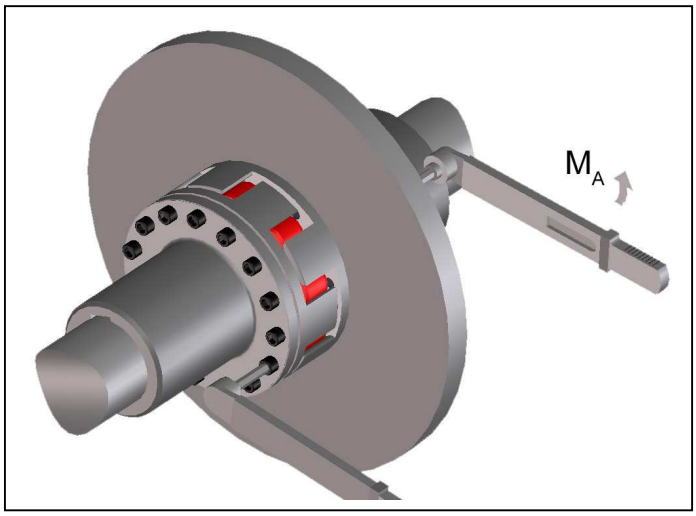


Bild / Fig. 8

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 buffer ring and reduces the risks when operating the coupling.**
- **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 misalignments stated in tables 4 to 6 are guiding values. We recommend not to fully utilise these values during the alignment, so that in operation sufficient reserves remain for thermal expansions, foundation settlements etc.
  In special applications with high demands on quiet running characteristics or higher speeds, alignment accuracies of $\leq 0{,}1$ mm may be necessary for the three alignment levels.
- If the coupling is mounted in a closed housing/ guard, so that alignment at a later point of time will no longer be possible, make sure that the geometry and the fitting accuracy of the contact surfaces ensure true alignment of the shafts within the specified tolerances during service

8.1 Angular Misalignment ΔK_w

- Measure one complete revolution (360°) on the face of the outer diameter. Determine the largest deviation K_{w1} and the smallest deviation K_{w2} (Fig 9). Calculate the angular misalignment: $\Delta K_w = K_{w1} - K_{w2}$.
- The values are applicable for a reference speed of 1500 rpm.

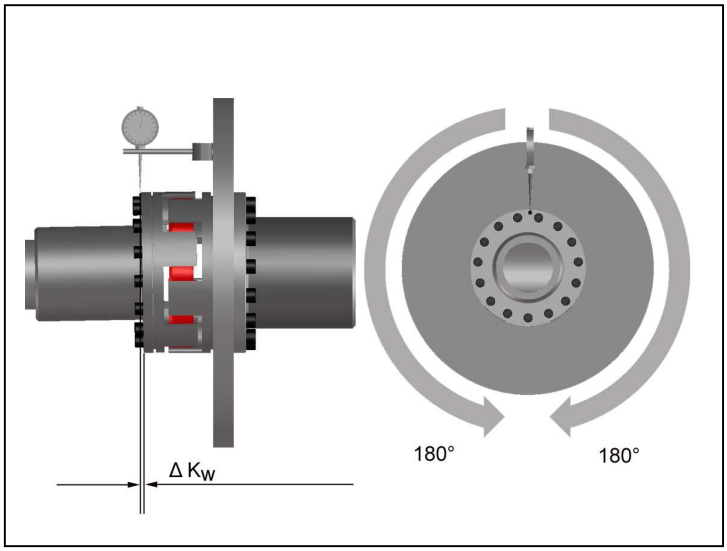


Fig. 9

Table 4 Maximum permissible angular misalignment values:

Size	125	145	170	200	230	260	300	360	400
$\Delta K_{w\,max}$ [mm]	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6

8.2 Radial Misalignment ΔK_r

- Measure one complete revolution (360°). Determine the largest deviation K_{r1} and the smallest deviation K_{r2} (Fig 10). Calculate the radial misalignment $\Delta K_r = 0{,}5 \times (K_{r1} - K_{r2})$. Observe the preceding sign of the measured values.
- The values are applicable for a reference speed of 1500 rpm.

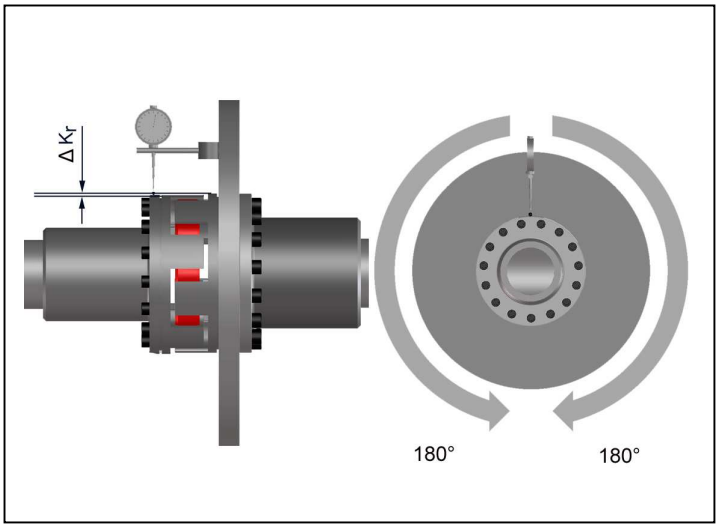


Fig. 10

Table 5 Maximum permissible radial misalignment values:

Size	125	145	170	200	230	260	300	360	400
$\Delta K_{r\,max}$ [mm]	0,7	0,7	0,7	0,8	0,8	0,9	0,9	1,0	1,0

8.3 Axial Misalignment

- Measure the axial claw overlap ‘h’ as shown in Fig. 11.
- The dimension of ‘h’ must be in between the values h_{min} and h_{max} stated in table 6.

ATTENTION!

If the installation dimension remains over ‘h’, the intermediate pieces can not be lifted out!
Consult RINGFEDER POWER TRANSMISSION if larger axial misalignments are expected during operation.

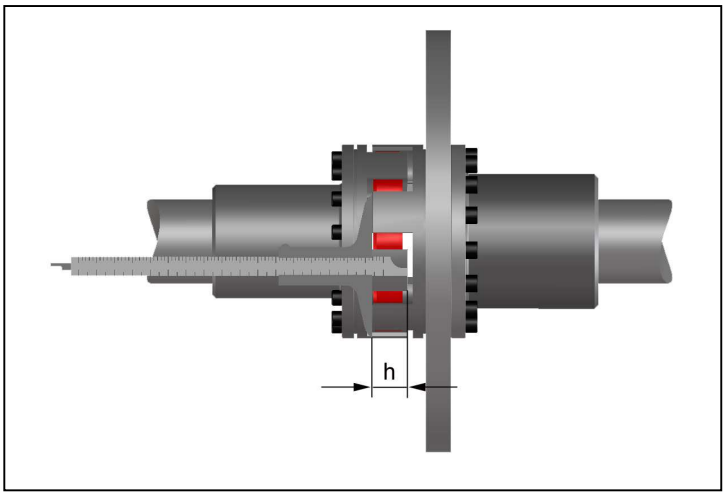


Fig. 11

Table 6 Recommended axial alignment values:

Size	125	145	170	200	230	260	300	360	400
h_{max} [mm]	29	34	34	40	41	52	57	62	62
h_{min} [mm]	26,5	31,5	31	37	37,5	48	53	58	58

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 what leads 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, the covers for couplings used should be made of stainless steel!**
- **The covers have to comply with 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 impair the proper operation of the coupling.**

While operating the coupling, pay attention to:
- Changes in operation noises
- Occurring vibrations

Attention!
- **Disconnect the drive immediately, if any irregularities are observed while operating the coupling!**
- Identify the cause for the problem using table 7 '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 7 Operation Faults and Possible Causes:

Trouble	Cause	Risk Warning	Correction
Irregular running noises/ vibrations	Alignment fault	Strong heating of the coupling. Rash abrasion of the elastic buffers. Extended reaction forces to enclosed aggregates.	- Disconnect drive - Remove cause for alignment fault - Re-align coupling - Inspect elastomer for wear
	Elastomer worn out	Coupling claws clash together, risk of ignition due to spark formation. Extended reaction forces.	- Disconnect drive - Check coupling components for damages and replace parts, if necessary - Replace elastomer
	Unbalance	Strong heating of the coupling. Rash abrasion of the elastic buffers. Extended reaction forces.	- Disconnect drive - Verify balance state of plant components and correct it, if necessary - Inspect elastomer for wear
	Loose screw connections	Loose parts may fly away and cause severe damage.	- 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 elastomer for wear
Premature wear of elastomer	Alignment fault	Strong heating of the coupling. Extended reaction forces to enclosed aggregates.	- Disconnect drive - Remove cause for alignment fault - Re-align coupling - Inspect elastomer for wear
	Unacceptable temperatures	Material properties of the elastic buffers deteriorate. The negotiability is derogated.	- Disconnect drive - Replace elastomer - Re-align coupling - Adjust ambient temperature
	Contact with aggressive products	Material properties of the elastic buffers deteriorate. The negotiability is derogated.	- Disconnect drive - Check coupling parts for damages and replace parts, if necessary - Replace elastomer - Verify alignment of coupling - Prevent contact with aggressive products

Trouble	Cause	Risk Warning	Correction
	Torsional vibrations in the drive line	Strong heating of the coupling. Rash abrasion of the elastic buffers. Extended reaction forces.	- Disconnect drive - Analyse and eliminate cause for torsional vibrations - Check coupling parts for damages and replace parts, if necessary - Replace elastomer and consult RINGFEDER POWER TRANSMISSION concerning eventual use of another Shore-hardness - Verify coupling alignment
Claw breakage	Wear limit of elastomer exceeded ===> contact with claws	Coupling is destroyed. Enclosed aggregates may be affected.	- Disconnect drive - Replace coupling - Inspect the elastomer for wear at shorter intervals
	Overload due to too high torque	Coupling is destroyed. Enclosed aggregates may be affected.	- 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!**
- **Improperly tightened screws may cause parts to fly off what leads to most serious personal injuries and property damages!**
- **Before putting the coupling into operation, check alignment and inspect 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, the covers for couplings used in explosive atmospheres should be made of stainless steel!**
- **The covers have to comply with 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 impair the proper function of the coupling!**

- Remove the fastening elements of the claw rings.
- Push the claw rings (part 360, 344) out of the centerings of the flange hubs (part 368 resp. 369, 370) against the elastic buffer ring.
- Remove the claw rings together with the buffer ring. For larger couplings use appropriate mounting tools and lifting appliances such as e. g. cranes and pulley blocks.

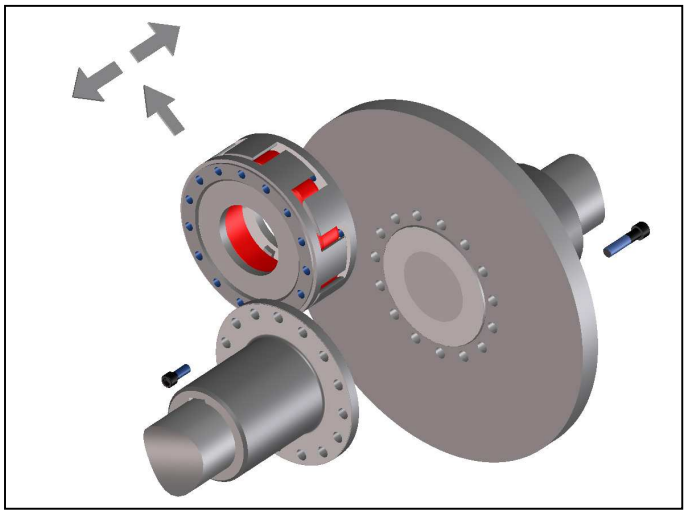


Fig. 12

- **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!**

- Mount a new intermediate ring after having checked the direction of rotation.
- To facilitate mounting, the new buffer ring can be coated with a lubricant (e. g. talcum for Perbunan Pb, or commercial roller bearing grease for polyurethane Vk).

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.

- Place the claw rings in their proper positions as marked. Take care that the parts do not get canted at the centering seat when joining them.
- Slightly tighten the screws in a uniform manner.
- Tighten the screws to the proper torque M_A specified in table 2 and 3 (Fig 13).
- Check the alignment according to the instructions given in chapter 8 ‘Coupling Alignment’.

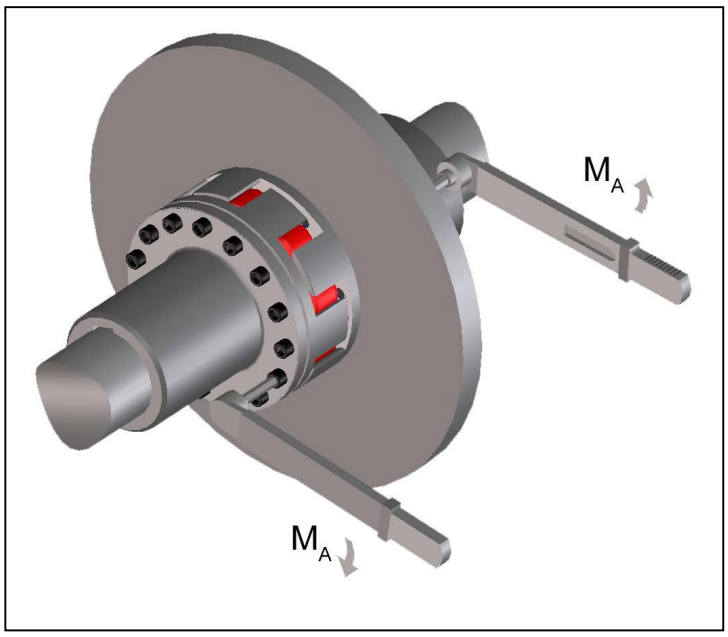


Fig. 13

10 Maintenance

The flexible coupling RINGFEDER® TNS SDDL-5-BS only requires little maintenance during operation. The elastic buffer ring is subject to wear. The time at which the wear limit of the elastic buffer ring is reached depends on the service parameters and application condi-tions.

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

- alignment of coupling,
- state of the elastomer, and
- remove dust deposits from coupling parts and buffer ring.

10.1 Wear Inspection on the Buffer Ring

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

Perform a visual inspection and a wear inspection of the buffer ring after 2000 hours, or after 3 months at latest, after the first start-up of the equip-ment. If only minor wear or no wear is observed, further inspections of the plant can be carried out at regular intervals of 4000 hours, however, at least once a year, if the operating modes and conditions of the plant remain unchanged. However, should you observe excessive wear on the occasion of this first inspection already, check whether the cause for the problem is listed in table 6 ‘Operation faults and possible causes’. In such a case, the inspection intervals must be adapted to the prevailing service conditions.

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

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

10.2 Wear inspection while the equipment is at standstill

- To inspect the wear of the elastomer, the plant has to be shut down and must be unloaded. Turn the coupling halves in such a manner that the claws rest without clearance at the buffer of the elastic ring.
- Measure the claw distance 'V' in circumferential direction across the buffers to which the claws rest on both sides (Fig. 14). The adjacent buffers do not contact the claws.
- Repeat this measurement on the adjacent buffers after having turned the couplings halves against each other in opposed direction.
- If the dimension 'V' attains or exceeds the value 'V_{min}' listed in table 8 for the individual coupling sizes, the elastic buffer ring has to be replaced immediately.

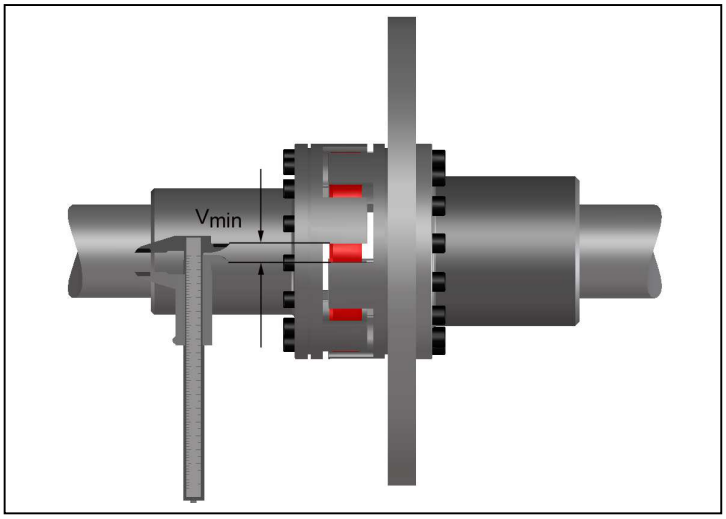


Fig. 14

Table 8 Dimension V_{min} for wear measurement while the plant is at standstill:

Size	125	145	170	200	230	260	300	360	400
V_{min} [mm]	12,7	13,8	13,6	14,3	15,4	15,3	12,1	12,1	15,4

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

10.3 Replacement of the elastic buffer ring

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

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

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

- Remove the fastening elements of the claw rings.
- Push the claw rings (part 360, 344) out of the centerings of the flange hubs (part 368 resp. 369, 370) against the elastic buffer ring.
- Remove the intermediate complete with the elastic ring. For larger coupling sizes use appropriate mounting tools and lifting appliances such as cranes or pulley blocks.
- To facilitate mounting, the new elastic buffer ring can be coated with a lubricant before installing it (e. g. talcum for Perbunan Pb, or commercial roller bearing grease for Polyurethane Vk)
- Mount a new buffer ring of correct material and size.

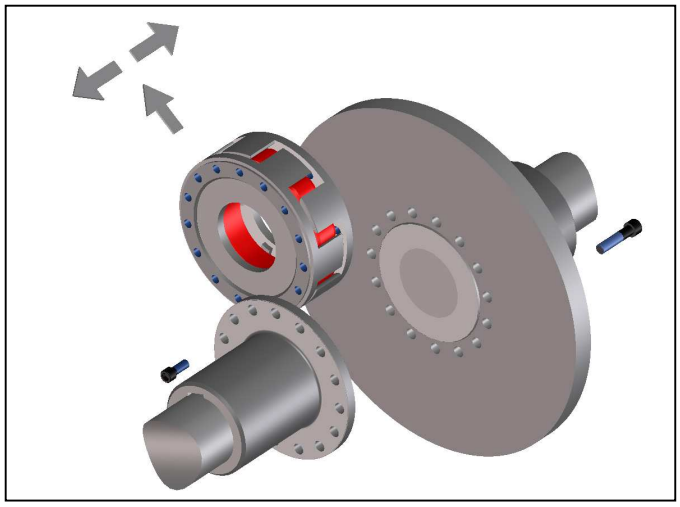


Fig. 15

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

- Place the intermediate parts in their proper position as marked. Make sure that the parts do not get canted at the centering seats when joining them (Fig. 15).
- Slightly tighten the screws.
- Tighten the screwed connections of the claw rings to the proper torque M_A specified in table 2 and 3 (Fig. 8).
- 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, the covers for couplings used in explosive atmospheres should be made of stainless steel.**
- **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 must be arranged in accordance with the regulations and laws of the country where the equipment is installed.

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