

Partner for Performance



Steel Disc Couplings



RINGFEDER® TND

EN 12.2023

Product Paper & Tech Paper





Machine Building



Aviation & Aerospace



Process Technology

Welcome

Your System Partner for Drive and Damping Technology

We say what we mean and mean what we say.

We see things from our customers' perspective.

We are considerate of our employees and their families as well as of our environment and society.



Movement



Energy



Extraction

RINGFEDER POWER TRANSMISSION is the international market leader in niche markets for drive and damping technology. We develop, manufacture and supply superior Shaft-Hub Connections, Damping Components, Couplings, Brake Systems and Bearing Housings for highest functionality and durability requirements in a wide range of technology sectors worldwide. Not only do we always provide our ambitious customers with competent advice based on over 100 years of experience and expertise, but also realize need-based, application-oriented solutions together with them that guarantee safe, failure-free and economic machine and plant operation – with our aspiration to be **Partner for Performance**.

Our customer promise for your specific use case:

- Excellent know-how for maximum performance and reliability
- Best cost-benefit ratio
- Short reaction times and high product availability



Quality & Expertise
One century of competence and experience

Reliability & Trust
From the requirement to the optimum result

**Customer
Benefit**

Digital & Online
Always find the right information instantly

Anytime & Anywhere
Locally on-site for you worldwide

Quality & Expertise

One century of competence and experience

As pioneer and market leader for premium systems and components of drive and damping technology, we stand for outstanding professional competence, superior product and service quality as well as excellent customer focus. For your advantage, we consistently combine highest quality standards, continuous optimization and profound consulting – no matter how, where and when forces must be transmitted or damped.

Reliability & Trust

From the requirement to the optimum result

Whether customized special design or proven standard type, highly specific individual or holistic system solution: As a competent, professional and service-oriented partner, we support and accompany you from the initial clarification of your requirements to the successful completion of your purpose – and, of course, also beyond.



Your Projects, Our Drive

Anytime & Anywhere

Locally on-site for you worldwide

Thanks to national and international development, manufacturing and sales locations as well as a worldwide service and partner network, we are at your side around the globe directly and locally with qualified technical support and fast product availability – around the clock, seven days a week, of course also and particularly in urgent maintenance and repair cases.

Digital & Online

Always find the right information instantly

Discover the latest company and product information, download CAD models, brochures and data sheets, use our calculation and selection program for shaft-hub connections, arrange a video consultation appointment with one of our specialists and much more – quickly, easily, with no obligation and at any time. Convince yourself on our website at www.ringfeder.com.

Steel Disc Couplings

RINGFEDER® TND



Torsionally rigid, absolutely backlash-free **RINGFEDER® TND** Steel Disc Couplings are suitable for the most diverse applications and particularly ideal for all drive tasks requiring freedom from wear and maintenance as well as excellent misalignment compensation and positioning accuracy. The core component of these powerful couplings are disc packs developed on the basis of in-depth FEM analysis. They consist of multiple circular, torsionally flexible single discs made of stainless spring steel which are connected by means of high-precision sleeves to form a compact unit. High-strength fitting screws alternately connect the disc packs, if necessary via mounted spacers, with the input-side and output-side coupling hub, so that the required torque is transmitted reliably, precisely and safely by the steel discs which are loaded by tension and compression. The high-precision sleeves with their specifically produced relief grooves decisively contribute to minimizing load peaks that mainly affect the outer discs when shaft misalignments occur.

Depending on the coupling size, two different disc packs are available: The type HD (High Deflection) for increased compensation capability at occurring shaft misalignments, and the type HT (High Torque) with larger power density for higher requirements on transmissible torque. Thanks to the unitized design of this series and the extensive, highly flexible modular system, including various hub types, mounting options as well as spacer variants and lengths, there is always one coupling version available that is optimally suited for the individual application of our users. Moreover, customized special solutions can also be realized at short delivery times in specific case of need.

| TND Type | TND HSH | TND HDH | TND XSX | TND XDX | TND HDV | TND VDV | TND OCO | TND QCO |
|---|----------------|---------|-----------------|---------|---------------|---------|--------------|----------------|
| Available Sizes | 11 | | 7 | | 9 | | 4 | 2 |
| Transmissible Torque | 170-130,000 Nm | | 750-36,000 Nm | | 170-36,000 Nm | | 170-1,350 Nm | 750-1,350 Nm |
| HD disc pack | 170-130,000 Nm | | 750-36,000 Nm | | 170-36,000 Nm | | 170-1,350 Nm | 750-1,350 Nm |
| HT disc pack | 230-44,000 Nm | | 1,050-44,000 Nm | | 230-44,000 Nm | | 230-1,750 Nm | 1,050-1,750 Nm |
| Compensation of Shaft Misalignment | | | | | | | | |
| Angular | ● | | ● | | ● | | ● | |
| Axial | ● | | ● | | ● | | ● | |
| Radial | ● | | ● | | ● | | ● | |
| Hub Type | | | | | | | | |
| Standard hubs with keyway | ● | | | | ● | | ● | |
| Inverted hubs with keyway | | | | | ● | | | |
| Hubs with shrink discs | | | ● | | | | ● | |
| Spacer Variant | | | | | | | | |
| Without | ● | | ● | | | | | |
| Compact | | | | | | | ● | |
| Standard lengths | ● | | ● | | ● | | | |
| Custom lengths up to 3 meters | ● | | ● | | ● | | | |

● Yes ○ Partly

Disc packs of the HT type are not equally available for all coupling sizes.

One Coupling Series, Numerous Advantages

Zero Backlash

RINGFEDER® Steel Disc Couplings transmit the required torque in both directions with zero backlash – an indispensable precondition for their use in machines and plants with synchronous operation, frequent starts and stops or reversing operation. They are also the perfect choice for applications requiring the highest positioning accuracies and for variable-speed drives.

Torsional Stiffness

The premium-quality all-steel construction and the optimal design of the disc packs, made of corrosion-resistant spring steel, ensure an outstanding torsional stiffness. This makes RINGFEDER® Steel Disc Couplings particularly designated for use in drive lines running at very high speeds and accelerations.

Misalignment Compensation

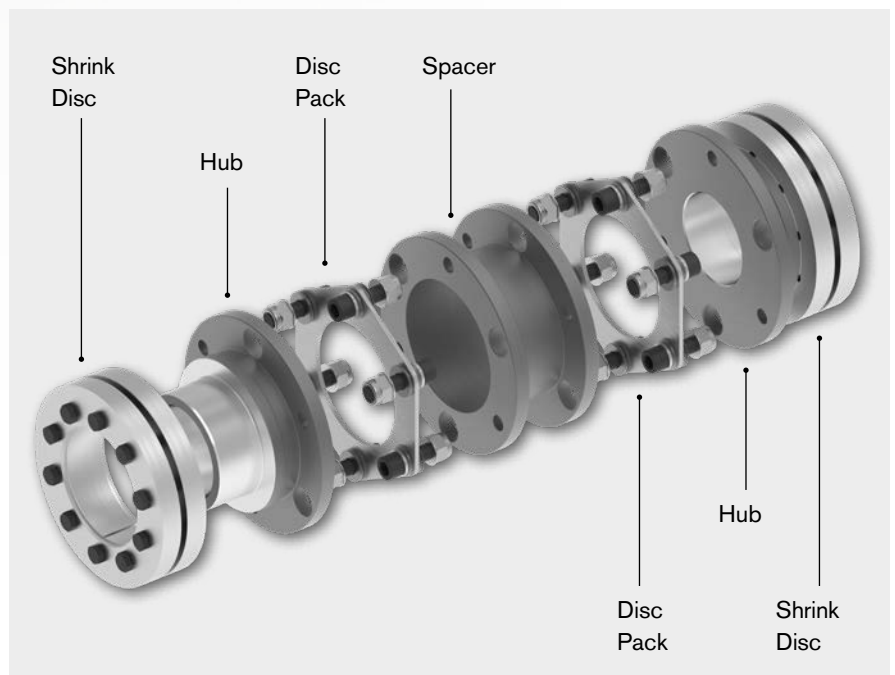
The FEM-optimized high-strength steel disc packs as well as their reliable attachment to the coupling hubs and possible spacers not only ensure extremely precise torque transmission by means of a combination of frictional and positive locking. They also effectively compensate for angular, axial, and, depending on the coupling type, radial shaft misalignment with minimum restoring forces.

Running Accuracy

First-class material quality combined with advanced machining processes at very tight production tolerances and a compact design, ensure the highest concentricity accuracies resulting in a particularly smooth and quiet running behavior at low vibration levels – even in drive applications involving enormous rotational speeds or irregular rotational forces.

Freedom from Wear and Maintenance

Provided that the stated selection and operation criteria are adhered to, RINGFEDER® Steel Disc Couplings are not subject to wear and do not require cleaning or lubrication. When properly in-



stalled, they are expected to have a virtually infinite service life. Their superior operational reliability precludes cost-intensive repairs and plant downtimes.

Temperature Resistance

Thanks to their all-steel construction and the resulting resilience, RINGFEDER® Steel Disc Couplings impress with maximum performance and reliability, even under extreme thermal loads. They can be installed in temperatures ranging from -20 °C to 240 °C and are, therefore, also suitable for use in high-temperature pump systems.



**Maximum Safety in
Explosion-Endangered
Areas**

RINGFEDER® Steel Disc Couplings can of course be supplied in compliance with ATEX according to Product Directive 2014/34/EU and DIN EN ISO 80079-36:2016 if required.

Disclaimer of liability

All technical details and notes are non-binding and cannot be used as a basis for legal claims. The users are obligated to determine whether the represented products meet their requirements. We reserve the right to carry out modifications at any time in the interests of technical progress.



Coupling Configuration

From the outset, the RINGFEDER® TND series has been designed as a highly flexible modular system so that customers will always benefit from a coupling solution that is optimally suited to their specific application requirements. Customized special designs made-to-order which go beyond the individualization and selection options of the standard coupling types offered can thus be realized efficiently upon request. Generally, every coupling type is composed of an input-side

and output-side coupling hub as well as a connecting element that is either embodied by a single disc pack or by a spacer with two disc packs attached on both sides. The modular design principle and the resulting combination possibilities are also reflected in the denomination of the different coupling types: The three-letter name of a specific coupling type is derived from the respective manifestation of both the hubs and the connecting elements.

Coupling Hubs

RINGFEDER® Steel Disc Couplings comprise an input-side and output-side coupling hub of various construction types. Depending on the type, the hubs are mounted onto the shafts by either using keyways or RINGFEDER® Shrink Discs. The conventionally and thus typically used hub type is the standard hub designated by the letter H. If the hub diameter is reduced such that the hub is inverted when mounted and is hence hidden in the spacer, this hub type is designated with the letter V. The shaft-hub connection is established by a keyway for both H-Hubs and V-Hubs..

As shafts with very smooth surfaces are increasingly being used in today's compact gear units, a higher contact pressure of the hub onto the shaft is required to ensure safe and reliable torque transmission by frictional locking. To this end, the back side of the H-Hubs

is specifically prepared by suitable machining to be equipped with high-quality RINGFEDER® Shrink Discs. The resulting hub type is designated with the letter X. The specific assignment of three-part shrink discs of the RfN 4061 series to the individual coupling sizes allows for quick and easy selection of a suitable shrink disc.

In the case of couplings with a short length and a compact-spacer, two disc packs are fastened to the spacer by means of longer fitting screws that pass through the spacer. For geometrical reasons, this special kind of screw connection necessitates an opening of the hub flanges. Depending on the type of the shaft-hub connection, these hubs are either designated with the letter O (connection by keyway) or with the letter Q (connection by RINGFEDER® Shrink Disc).



Hub H
Standard Hub



Hub V
Inverted Hub



Hub O
Standard Hub with
Open Flange



Hub X
Hub with Shrink Disc



Hub Q
Hub with Open Flange
and Shrink Disc

Connecting Elements

Depending on the coupling type, either a single disc pack or spacers of different variants with two disc packs screwed to them on both sides serve as connecting elements between the hubs. Single disc packs are designated with the letter S. Spacers with the double number of disc packs are designated with the letters D or C respectively.

Coupling types with a single disc pack have single-jointed designs and are only capable of compensating angular and axial shaft misalignments between the connected aggregates, whereas double-jointed designs with two disc packs can also accommodate

radial misalignments. Spacers with the designation D are available in various standard lengths as well as customized special lengths of up to 3 meters which allow for the adaptation to prevailing site conditions and provide for the ability to bridge even very long shaft distances. The designation D describes a particularly short, compact-spacer that can be mounted and dismantled radially.

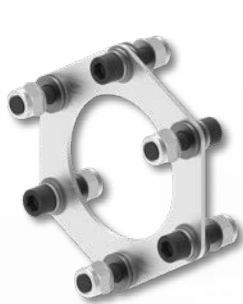
In coupling types equipped with either a spacer D or C, one disc pack each is alternately connected to the spacer and one coupling hub, thus achieving the function of a double-cardanic system.

Disc Packs

The FEM-optimized disc packs are the characteristic and functional key element of the RINGFEDER® Steel Disc Couplings. The packs are comprised of multiple circular single discs of the same thickness made of corrosion resistant spring steel. These discs are firmly connected to form a compact unit by means of precision sleeves. To reduce stress peaks that are mainly applied to the outer discs when shaft misalignments occur, the precision sleeves are equipped with specially produced relief grooves. High-strength fitting screws alternately connect the disc packs with the coupling hubs and any mounted spacers. The bolt circle, the number of screwing points and the width of the disc packs determine the level of torque that can be transmitted, whereas the distance of the disc packs to each other and the thickness of the single discs define the capability to compensate for shaft misalignments. Depending on the preference and application-specific requirements, customers may choose from two different disc pack types as a function of the coupling size:

The type HD (High Deflection) with thin single discs for increased compensation capability at occurring shaft misalignment. Up to and including the coupling size 169, this type allows for continuous operation at an angular misalignment of up to 1.0 degrees under consideration of the coupling dimensioning details.

The type HT (High Torque) is used if higher requirements are placed on the torque that can be transmitted. By virtue of thicker single discs, the torque capacity is increased by up to 30 % and a higher power density is hence obtained. With due consideration of the coupling dimensioning details, continuous operation at an angular misalignment of maximal 0.7 degrees is possible for coupling sizes up to and including 169.



6 Screwing Points
Size 47-169



8 Screwing Points
Size 205-316



Spacer D with 2 Disc Packs



Compact-Spacer C with 2 Disc Packs

Screwing

The disc packs are typically connected by means of high-strength special screws. Depending on the coupling size, hexagon socket screws or hexagon head screws are used.

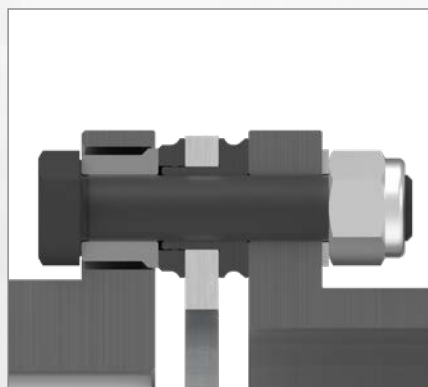
The contact pressure of the disc pack on the other coupling components, which is generated by the screw tightening torque, provides for friction-locked transmission of the required torque. It is therefore necessary that the contact surfaces are dry and free

from any matter like preservative agents or paint. Up to and including the coupling size 98, hardened washers are fitted below the screw heads. From size 118 up, such washers are also used underneath the self-locking nuts.

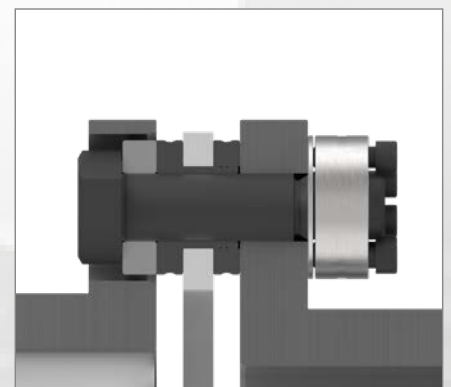
In ambient temperatures above 80°C, the typically used self-locking nuts with plastic insert have to be replaced by all-steel nuts.



Hexagon Socket Screws
Size 47-141

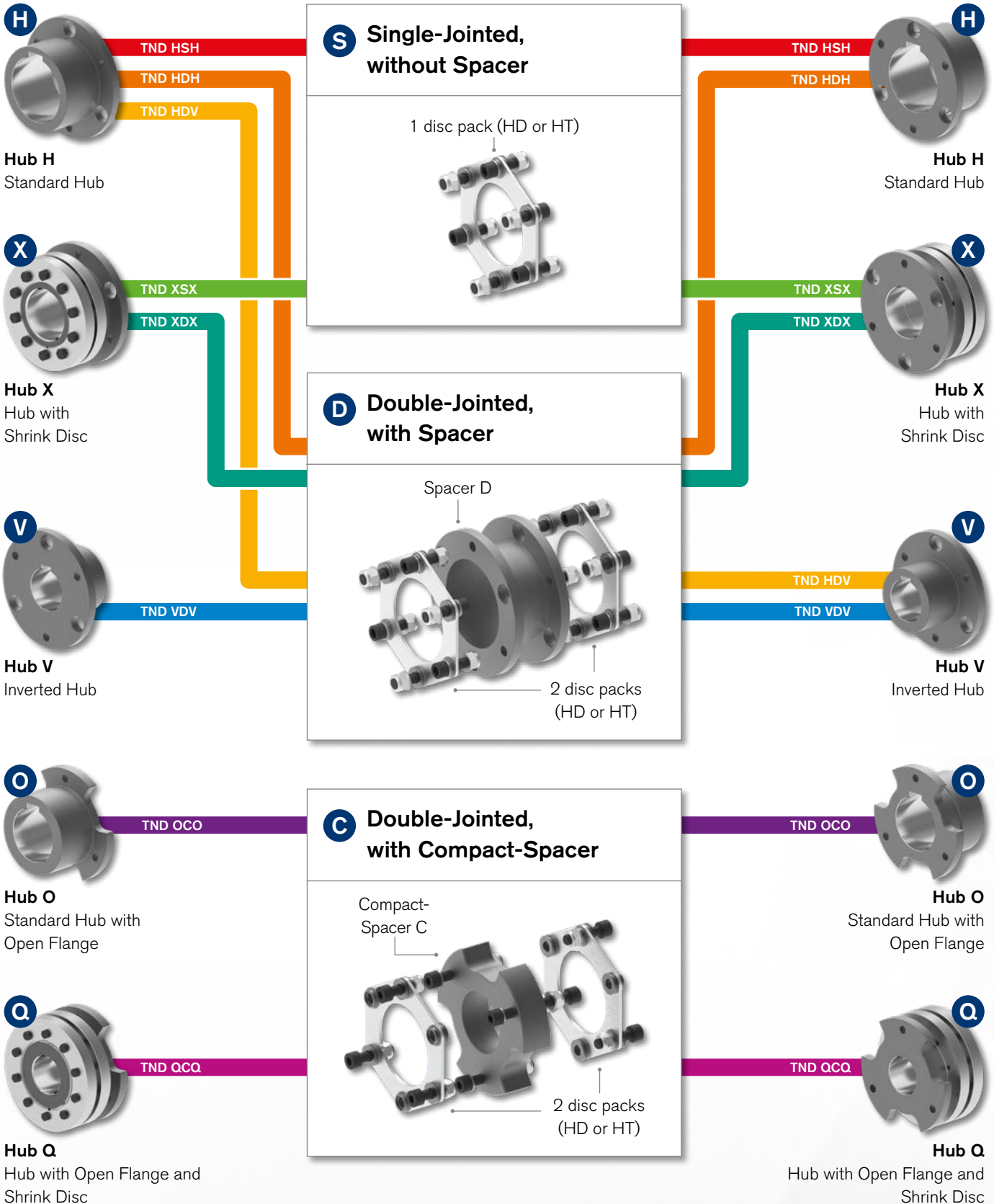


Hexagon Head Screws
Size 169-254



Hexagon Socket Screws with Special Nut
Size 262-316

Modular System



The smart modular system of the RINGFEDER® TND series guarantees users maximum flexibility and customizability to fulfil the specific requirements of their individual drive task. By virtue of the various combination possibilities and multiple extension options, further coupling types are realizable in addition to those depicted

above. These include other hub combinations, the replacement of hubs by connecting flanges or functional supplements like brake discs or brake drums as well as anti-flail devices. Furthermore, the couplings can also be installed vertically by using simple supports.

Selection Guide

The selection of the correct coupling size is based on the torque to be transmitted and the given shaft dimensions. In addition, other conditions of the specific application situation have to be considered, e.g. operating speed, shaft misalignments and the need for spacers to accommodate larger shaft distances.

Always make sure that the specified limit values are never exceeded at any operating condition. Should you have questions or need technical support, please contact our experts in Engineering and Sales.

The nominal torque T_{KN} of the RINGFEDER® TND Steel Disc Couplings can be transmitted continuously if the specified selection and operating criteria are met. Coupling dimensioning is based

on the nominal torque T_N and the maximum torque T_{max} of the machinery.

1. Calculate the nominal torque of the machine to be transmitted T_N

Equation 1)

$$T_N = 9,550 \cdot P_N / n_N$$

T_N = Nominal torque of machine [Nm]
 P_N = Machine power [kW]
 n_N = Operating speed [1/min]

2. Determine the required nominal torque for the coupling T_{KN}

Equation 2)

$$T_{KN} \geq T_N \cdot S_\vartheta \cdot S_f$$

T_{KN} = Nominal torque of coupling [Nm] acc. to data in the Tech Paper
 T_N = Nominal torque of machine [Nm] acc. to Equation 1)
 S_ϑ = Temperature factor [-] acc. to Table 1)
 S_f = Service factor [-] $S_A \cdot S_L$
 S_A = Load factor on drive side
 S_L = Load factor of output side

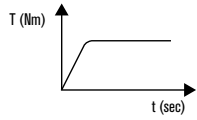
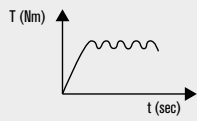
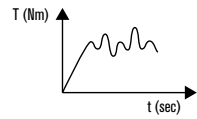
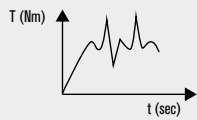
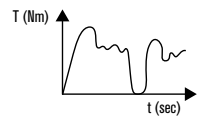
To prevent damage to the self-locking nuts of the screwing of the disc pack, ambient temperatures above 80 °C have to be communicated to RINGFEDER POWER TRANSMISSION beforehand. Specifically designed coupling versions are available for temperatures below -20 °C and above 240 °C.

Table 1: Temperature Factor S_ϑ

| Ambient Temperature Range ϑ [°C] | Temperature Factor S_ϑ |
|--|----------------------------------|
| -20 °C < ϑ < 160 °C | 1.0 |
| 160 °C < ϑ < 190 °C | 1.1 |
| 190 °C < ϑ < 240 °C | 1.3 |

S_A is the load factor for the input side. It defaults to $S_A = 1$ for electric motor drives. $S_A > 1$ applies to drives by combustion engines and it is recommended to check the selection of the coupling size by means of a detailed torsional vibration analysis. Please contact the expert team of RINGFEDER POWER TRANSMISSION for further guidance.

Table 2: Load Factor Output Side

| Torque Characteristics at Operating Point on Output Side | Torque Curve | Min. Load Factor S_L |
|--|---|------------------------|
| Constant, uniform torque load, without torque variations |  | 1.1 |
| Uniform with little torque variations; slight shocks |  | 1.5 |
| Non-uniform, also API 671, API 610 moderate shocks |  | 1.75 |
| Non-uniform, fluctuating, heavy shocks |  | 2 |
| Other torque patterns and reversing operation |  | 2.5 |

3. Check the impact of short-term torque peaks acting on the coupling

Equation 3)

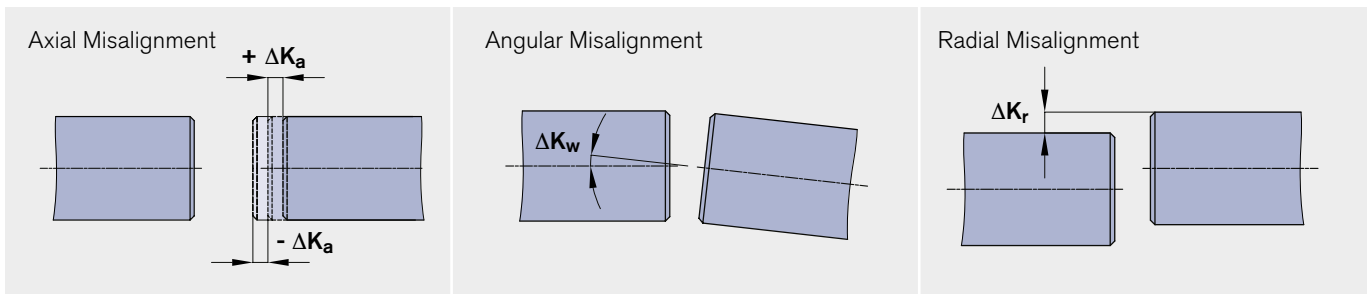
$$1.75 \cdot T_{KN} = T_{Kmax} > T_{max} \cdot S_{\vartheta} \cdot S_z$$

T_{KN} = Nominal torque of coupling [Nm] acc. to data in the Tech Paper
 T_{max} = Max. torque of machine* [Nm]
 * e.g. at the start of an electric motor: $T_{max} = T_{Kipp}$
 T_{Kipp} = Tipping torque by starting with directly engaged asynchronous motor, e.g. $T_{Kipp} \sim 2 \cdot T_N$; please observe the specific details provided by the motor supplier.
 S_z = 1.5 is applicable for reversing torque; otherwise: $S_z = 1$

4. Make certain that the coupling is capable of handling the occurring shaft misalignments

Existing or expected angular, axial and radial shaft misalignments shall not exceed the maximum values as specified in the Tech Papers of the individual coupling types. Coupling types with one single disc pack are capable of compensating angular and axial shaft misalignments. Couplings equipped with two disc packs can also compensate radial shaft misalignment. The individual misalignment values are interdependent; to ensure safe and continuous

transmission of the required torque, the maximum misalignment values may not occur simultaneously. If one of the misalignment values is close to the permissible limit value, this will have an effect on the misalignment values in other directions and on the torque that can be transmitted. The selection of a coupling with larger misalignment capacities is therefore recommended.



4.1 Couplings with one disc pack (e.g. coupling type TND HSH)

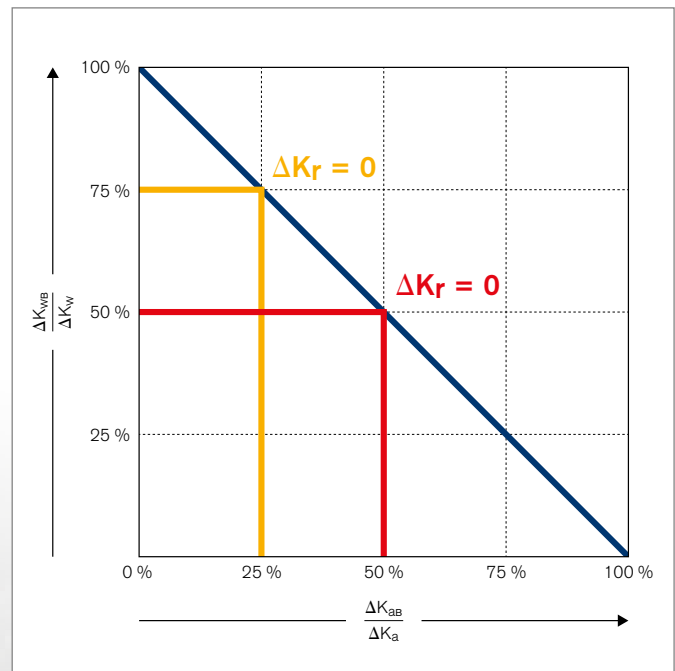
Couplings with one single disc pack are capable of accommodating axial and angular misalignment, but not radial shaft misalignment. Accordingly, the following equation applies:

Equation 4)

$$\frac{\Delta K_{aB}}{\Delta K_a} + \frac{\Delta K_{wB}}{\Delta K_w} \leq 1 \text{ und } \Delta K_{rB} = 0$$

ΔK_a = Max. axial misalignment [mm] acc. to data in the Tech Paper
 ΔK_w = Max. angular misalignment [deg.] acc. to data in the Tech Paper
 ΔK_r = Max. radial misalignment [mm]
 Index B = Value in state of operation

Diagram 1: Misalignment Chart for Couplings with one Disc Pack (Single-Jointed Design)



4.2 Couplings with two disk packs (e.g. coupling type TND HDH)

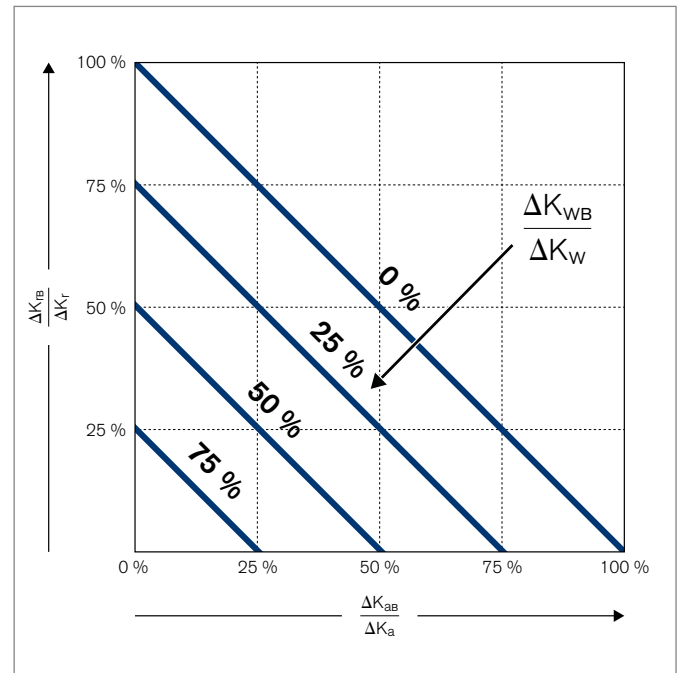
Couplings with two disc packs are able to compensate for axial, angular and radial shaft misalignment. Accordingly, the following equation applies:

Equation 5)

$$\frac{\Delta K_{aB}}{\Delta K_a} + \frac{\Delta K_{wB}}{\Delta K_w} + \frac{\Delta K_{rB}}{\Delta K_r} \leq 1$$

ΔK_a = Max. axial misalignment [mm] acc. to data in the Tech Paper
 ΔK_w = Max. angular misalignment [deg.] acc. to data in the Tech Paper
 ΔK_r = Max. radial misalignment as a function of the angle [mm] acc. to data in the Tech Paper
 Index B = Value in state of operation

Diagram 2: Misalignment Chart for Couplings with two Disc Packs (Double-Jointed Design)



The following equation applies per disc pack:

Equation 6)

$$\Delta K_{WRB} \leq 1/2 \cdot \Delta K_w - \Delta K_{WB}$$

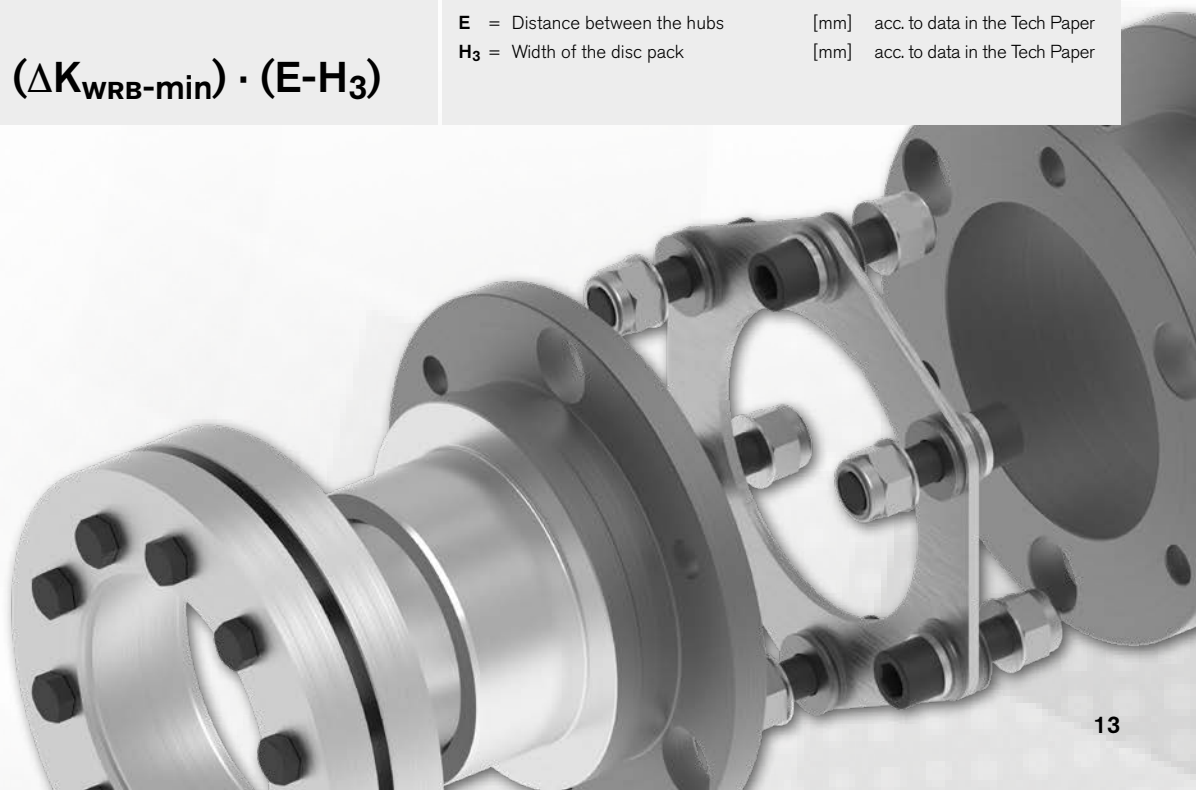
ΔK_w = Max. angular misalignment [deg.] acc. to data in the Tech Paper
 ΔK_{WB} = Machine-related angular misalignment in state of operation [deg.]
 ΔK_{WRB} = Angle due to radial misalignment [deg.]

To calculate the maximum radial misalignment which can be continuously transmitted by the coupling, the lowest value of $\Delta K_{WRB-min}$ is used to determine ΔK_{rB} .

Equation 7)

$$\Delta K_{rB} = \tan(\Delta K_{WRB-min}) \cdot (E - H_3)$$

E = Distance between the hubs [mm] acc. to data in the Tech Paper
 H_3 = Width of the disc pack [mm] acc. to data in the Tech Paper



5. Check the hub bores and operating speeds to prevent exceeding permissible maximum values

Arrangement of the coupling components

The coupling hubs have to be mounted onto the shafts to be connected in accordance with the respective coupling type. It is recommended to mount the coupling hubs flush with the shaft ends to establish the most solid shaft-hub connection.

Bores

The values for d_{1kmax}/d_{2kmax} (max. bore diameter) indicated in the Tech Papers for the individual coupling types apply to keyed connections according to DIN 6885-1. These values may only be exceeded upon prior review and approval by RINGFEDER POWER TRANSMISSION. The maximum possible bore diameters for connections with square keys according to ANSI B17.1 are to be reduced upon consultation with RINGFEDER POWER TRANSMISSION.

In order to achieve sufficient concentricity, the bore fit must be selected so that the shaft tolerance pairing results in a tight fit or interference fit (e.g. H7/m6) or tighter. Detailed data needs to be provided for hydraulically fitted shaft-hub connections.

6. Check whether dynamic effects need to be considered

Bearing of shaft ends

Bearings are required for the shafts ends to be connected directly in front of and behind the coupling.

Balancing

On account of the extremely high manufacturing precision of the coupling components, balancing of the coupling is only required for applications involving very high operating speeds or because of sensitivity of the driving and driven units. From a peripheral speed of 30 m/s, separate balancing of the individual coupling parts is recommended.

Without further instructions on balancing, the coupling parts are balanced individually according to DIN 21940-11 in quality G 6,3 at 1,500 1/min. The hubs are balanced half key (before grooving) and spacers are balanced without screwed-on disc packs.

Critical operating speed

On account of the coupling construction, the fastening of a spacer between two disc packs will result in a system susceptible to dynamic excitation. In order to prevent the operating accuracy from being adversely affected by axial vibrations, the bending critical speed has to be verified in the case of operating speeds of 3,500 1/min and higher, and spacer lengths of 1.2 meters and longer.

Fastening on the shafts

RINGFEDER® Steel Disc Couplings with standard or inverted hubs come with keyways according to DIN 6885-1 and a keyway width tolerance P9 as standard (tolerance JS9 upon customer specification). In addition, axial securing, e.g. via set screws or distance rings, needs to be provided for use with longer shaft ends. Keyways according to ANSI B17.1, keyways with special dimensions or other keyway tolerances can also be realized upon request.

For couplings with hubs of the designation X and Q, the hub is fastened by RINGFEDER® Shrink Discs of the three-part series RfN 4061 which are placed on the back of the hubs. By tightening the high-strength locking screws, the tapered thrust rings of the shrink disc are axially clamped against each other on an inner ring, so that pressure is applied from outside via the hub onto the joint between shaft and hub. This provides for backlash-free transmission of the torque by frictional locking. The transmissible torque of these coupling types can be obtained from their corresponding Tech Papers.

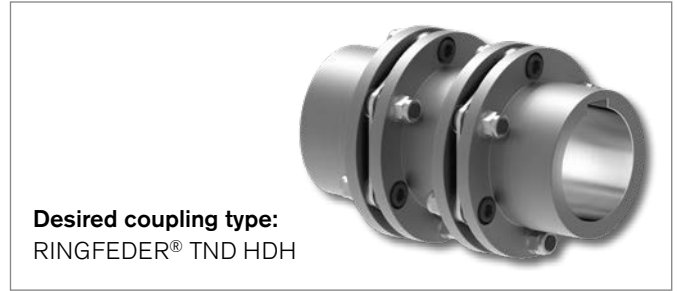
Important!

It is mandatory to observe the stated selection and operation criteria as well as the instructions contained in the respective assembly and operation manuals. Should you have any questions or need technical support, please consult our experts in Sales and Engineering.



Example 1

A RINGFEDER® Steel Disc Coupling is required for an agitator operating in an ambient temperature of 180 °C. An electric motor type 315M with an input shaft diameter of 80 mm drives the output shaft, diameter 85 mm, with a power of 132 kW and a speed of 1,460 1/min. The distance between the shaft ends is 100 mm and the load should be transmitted via a keyed connection.



| | | |
|--|--|---------------------|
| Machine power $P_N =$ | 132 kW for the el. motor type 315 M | |
| Operating speed $n_N =$ | 1,460 1/min | |
| Nominal torque of machine $T_N =$ | $9,550 \cdot P_N / n_N = 9,550 \cdot 132 / 1,460 = 864 \text{ Nm}$ | acc. to Equation 1) |
| Ambient temperature $\vartheta =$ | 180 °C | acc. to Table 1) |
| → Temperature factor $S_\vartheta =$ | 1.1 | acc. to Table 1) |
| → Load factor $S_L =$ | non-uniform torque curve, moderate shocks = 1.75 | acc. to Table 2) |
| Required nominal torque of coupling $T_{KN} =$ | $T_N \cdot S_\vartheta \cdot S_L = 864 \text{ Nm} \cdot 1.1 \cdot 1.75 = 1,663 \text{ Nm}$ | acc. to Equation 2) |

| | | |
|--------------------------------------|--|---------------------|
| For non-reversing torque S_z | 1 | |
| Ambient temperature $\vartheta =$ | 180 °C | acc. to Table 1) |
| → Temperature factor $S_\vartheta =$ | 1,1 | acc. to Table 1) |
| Max. torque of machine $T_{max} =$ | $T_{Kipp} = 2.5 \cdot T_N = 2.5 \cdot 864 \text{ Nm} = 2,160 \text{ Nm}$ | |
| Max. torque $T_{Kmax} =$ | $2,160 \text{ Nm} \cdot 1 \cdot 1.1 = 2,376 \text{ Nm}$ | acc. to Equation 3) |

Since a keyed connection is requested and because the shaft distance has to be bridged by a spacer, the steel disc coupling type

TND HDH is selected. To match the shaft distance of 100 mm, a spacer length of 100 mm ($E = 100 \text{ mm}$) is required.

| Coupling Selection: TND HDH, Size 118, Spacer Length $E = 100 \text{ mm}$ | |
|---|---------------------|
| $T_{KN} \text{ Drive} = 1,663 \text{ Nm} \leq 2,400 \text{ Nm} = T_{KN} \text{ Coupling}$ | |
| $T_{Kmax} 2,376 \text{ Nm} \leq 1.75 \cdot 2,400 \text{ Nm} = 4,200 \text{ Nm}$ | acc. to Equation 3) |
| $n_N 1,460 \text{ 1/min} \leq 5,250 \text{ 1/min}$ | |

The shafts are aligned according to the below mentioned misalignment values which are expected to occur during operation. On this basis, the utilization of the maximum possible misalignment com-

pensation capacity is verified. The operating speed of 1,460 1/min corresponds to a peripheral speed of 12.7 m/s. Therefore, no balancing will be necessary.

| | | |
|---|---|---------------------|
| Misalignment values in state of operation | $\Delta K_{AB} = 0.5 \text{ mm}$ $\Delta K_{WB} = 0.5^\circ$ $\Delta K_{rB} = 0.7 \text{ mm}$ | |
| Verification of the misalignment values | $0.5 \text{ mm} / 2.4 \text{ mm} + 0.5^\circ / 2^\circ + 0.7 \text{ mm} / 1.4 \text{ mm} = 0.95 \leq 1$ | acc. to Equation 5) |

Verification of the dimensioning result

| | Machine Data | Coupling Data |
|--------------------------|--------------------------------|------------------|
| Nominal torque | 1,663 Nm (incl. safety factor) | 2,400 Nm |
| Maximum torque | 2,376 Nm (incl. safety factor) | 4,200 Nm |
| Speed | 1,460 1/min | max. 5,250 1/min |
| Shaft diameter, motor | 80 mm | max. 85 mm |
| Shaft diameter, agitator | 85 mm | max. 85 mm |

Example 2

A RINGFEDER® Steel Disc Coupling is intended to be used for the drive of a kneading machine. The gear unit provides a nominal torque of 12,000 Nm at a speed of 120 1/min. The input shaft has a diameter of 150 mm and the output shaft has a diameter of 135 mm. The shaft tolerance is g6 each. The distance between the shaft ends amounts to 300 mm. The maximum torque of the machine is 30,000 Nm. Further requirements are reversing operation and an ambient temperature of 110 °C. Shrink discs are to be used for the shaft-hub connection on both sides.



| | | |
|--|---|---------------------|
| Operating speed $n_N =$ | 120 1/min | |
| Nominal torque of machine $T_N =$ | 12,000 Nm | |
| Ambient temperature $\vartheta =$ | 110 °C | acc. to Table 1) |
| → Temperature factor $S_\vartheta =$ | 1 | acc. to Table 1) |
| → Load factor $S_L =$ | for reversing operation = 2.5 | acc. to Table 2) |
| Required nominal torque of coupling $T_{KN} =$ | $T_N \cdot S_\vartheta \cdot S_L = 12.000 \text{ Nm} \cdot 1 \cdot 2,5 = 30.000 \text{ Nm}$ | acc. to Equation 2) |

| | | |
|--------------------------------------|---|---------------------|
| For reversing torque S_Z | 1.5 | |
| Ambient temperature $\vartheta =$ | 110 °C | acc. to Table 1) |
| → Temperature factor $S_\vartheta =$ | 1 | acc. to Table 1) |
| Max. torque of machine $T_{max} =$ | 30,000 Nm | |
| Max. torque $T_{Kmax} =$ | $30.000 \text{ Nm} \cdot 1 \cdot 1,5 = 45.000 \text{ Nm}$ | acc. to Equation 3) |

On account of the required shrink disc connection and use of a spacer to bridge the shaft distance, the steel disc coupling type TND XDX

size 254 with HD disc pack is selected. To match the shaft distance of 300 mm, a spacer length of 300 mm (E = 300 mm) is chosen.

| Coupling Selection: TND XDX, Size 254, Spacer Length E = 300 mm | |
|---|---------------------|
| $T_{KN} \text{ drive} = 30,000 \text{ Nm} \leq 36,000 \text{ Nm} = T_{KN} \text{ coupling}$ | |
| $T_{Kmax} 45,000 \leq 1.75 \cdot 36,000 = 63,000 \text{ Nm}$ | acc. to equation 3) |
| $n_N 120 \text{ 1/min} \leq 2,100 \text{ 1/min}$ | |

The shafts will be aligned according to the below mentioned misalignment values which are assumed to occur during operation.

On this basis, the utilization of the maximum possible misalignment compensation capacity is verified.

| | | |
|---|---|---------------------|
| Misalignment values in state of operation | $\Delta K_{AB} = 0.3 \text{ mm}$ $\Delta K_{WB} = 0.3^\circ$ $\Delta K_{rB} = 1.0 \text{ mm}$ | |
| Verification of the misalignment values | $0.3 \text{ mm} / 2.2 \text{ mm} + 0.3^\circ / 1^\circ + 1 \text{ mm} / 2.2 \text{ mm} = 0.89 \leq 1$ | acc. to equation 5) |

The sizes of the RINGFEDER® RfN 4061 Shrink Discs that match the respective coupling hubs are listed in the Tech Paper for the coupling type TND XDX. In this example, the size 200 x 350

is selected for the input shaft (diameter 150 mm), and the size 185 x 330 mm for the output shaft (diameter 135 mm).

| | |
|---|-----------|
| Transmissible torque T RfN 4061 185 x 330 with d = 135 mm | 52,500 Nm |
| Transmissible torque T RfN 4061 200 x 350 with d = 150 mm | 75,000 Nm |

Verification of the dimensioning result

| | Machine Data | Coupling Data |
|--|--------------|------------------|
| Nominal torque | 12,000 Nm | 36,000 Nm |
| Maximum torque | 30,000 Nm | 63,000 Nm |
| Speed | 120 1/min | max. 2,100 1/min |
| Shaft diameter, motor | 150 mm | max. 160 mm |
| Shaft diameter, kneader | 135 mm | max. 160 mm |
| Shrink disc connection, motor | 45,000 Nm | 75,000 Nm |
| Shrink disc connection, kneader | 45,000 Nm | 52,000 Nm |

In this case, the maximum torque T_{kmax} of the complete system is limited by the lower torque that can be transmitted by the shaft-hub-connection, and therefore is set to 52,500 Nm.



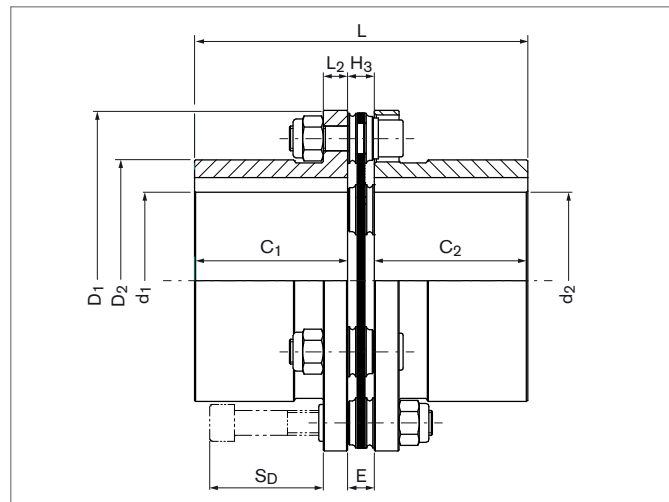
TND HSH

Further information on
RINGFEDER® TND HSH
on www.ringfeder.com

Standard Hubs, Single-Jointed, without Spacer

The type **RINGFEDER® TND HSH** is a torsionally stiff, backlash-free steel disc coupling consisting of two standard hubs H and one disc pack S alternately connected to the hubs by high-strength screws.

Depending on the coupling size, two different disc packs are available: The type HD (High Deflection) as well as the type HT (High Torque). The single-jointed design with single disc pack compensates for angular and axial shaft misalignments.



Characteristics

- Completely backlash- and maintenance-free
- Highly effective compensation of angular and axial shaft misalignment
- Torsionally rigid with high torsional stiffness
- Low restoring forces in case of shaft misalignment due to optimum disc pack design
- Quick and easy realization of a double-cardanic setup by means of two couplings and one spacer
- Bore diameter $d_{1/2}$ up to 215 mm
- Transmissible torque T_{KN} up to 130,000 Nm / T_{kmax} up to 220,000 Nm
- Rotational speeds n_{max} up to 12,200 1/min
- Efficient realization of customer-specific solutions at short delivery times thanks to modular design



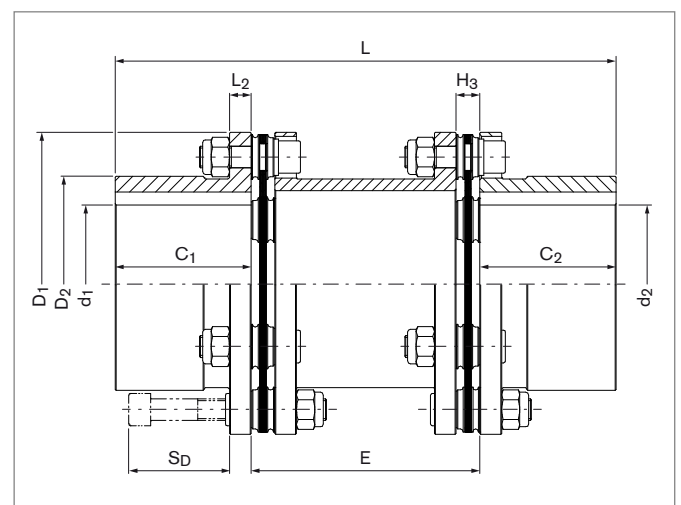
TND HDH

Further information on
RINGFEDER® TND HDH
on www.ringfeder.com

Standard Hubs, Double-Jointed, with Spacer

The type RINGFEDER® TND HDH is a torsionally stiff, backlash-free steel disc coupling consisting of two standard hubs H as well as a spacer D in standardized or individually customized length. Using high-strength screws, one disc pack each is connected to the spacer and one hub, thus achieving the function of a double-cardanic system.

Depending on the coupling size, two different disc packs are available: The type HD (High Deflection) as well as the type HT (High Torque). The double-jointed design with two disc packs compensates for radial (adjustable via the spacer length), angular and axial shaft misalignments.



Characteristics

- Completely backlash- and maintenance-free
- Highly effective compensation of angular, axial and radial shaft misalignment
- Torsionally rigid with high torsional stiffness
- Low restoring forces in case of shaft misalignment due to optimum disc pack design
- Bridging of large shaft distances by means of spacers in various standard and freely customizable special lengths
- Bore diameter $d_{1/2}$ up to 215 mm
- Transmissible torque T_{KN} up to 130,000 Nm / T_{kmax} up to 220,000 Nm
- Rotational speeds depending on spacer length n_{max} up to 12,200 1/min
- Efficient realization of customer-specific solutions at short delivery times thanks to modular design



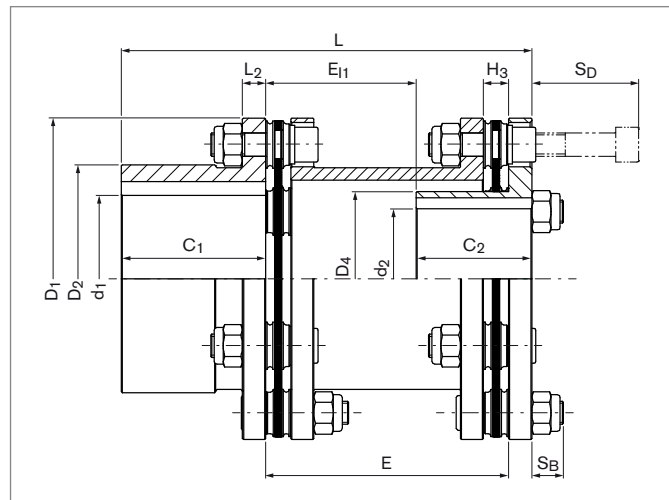
TND HDV

Further information on
RINGFEDER® TND HDV
on www.ringfeder.com

Combination of Standard Hub and Inverted Hub, Double-Jointed, with Spacer

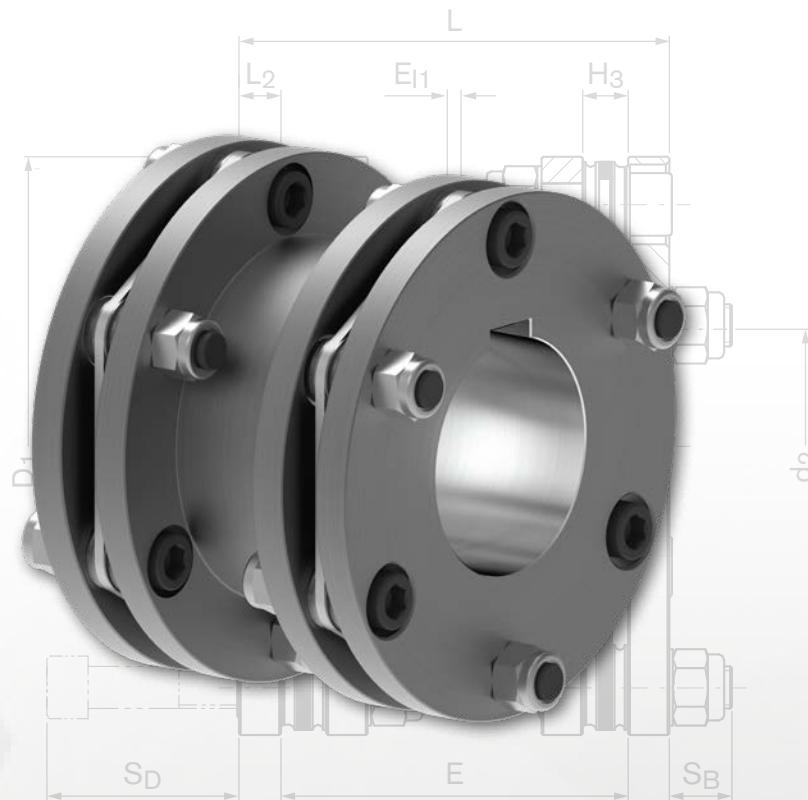
The type **RINGFEDER® TND HDV** is a torsionally stiff, backlash-free steel disc coupling consisting of a standard hub H and an inverted hub V, connected by a spacer D in standardized or individually customized length. Using high-strength screws, one disc pack each is connected to the spacer and one hub, thus achieving the function of a double-cardanic system.

Depending on the coupling size, two different disc packs are available: The type HD (High Deflection) as well as the type HT (High Torque). The double-jointed design with two disc packs compensates for radial (adjustable via the spacer length), angular and axial shaft misalignments.



Characteristics

- Completely backlash- and maintenance-free
- Highly effective compensation of angular, axial and radial shaft misalignment
- Torsionally rigid with high torsional stiffness
- Low restoring forces in case of shaft misalignment due to optimum disc pack design
- Bridging of large shaft distances by means of spacers in various standard and freely customizable special lengths
- Bore diameter in standard hub H d_1 up to 175 mm, in inverted hub V d_2 up to 120 mm
- Transmissible torque T_{KN} up to 44,000 Nm / T_{kmax} up to 77,000 Nm
- Rotational speeds depending on spacer length n_{max} up to 12,200 1/min
- Efficient realization of customer-specific solutions at short delivery times thanks to modular design



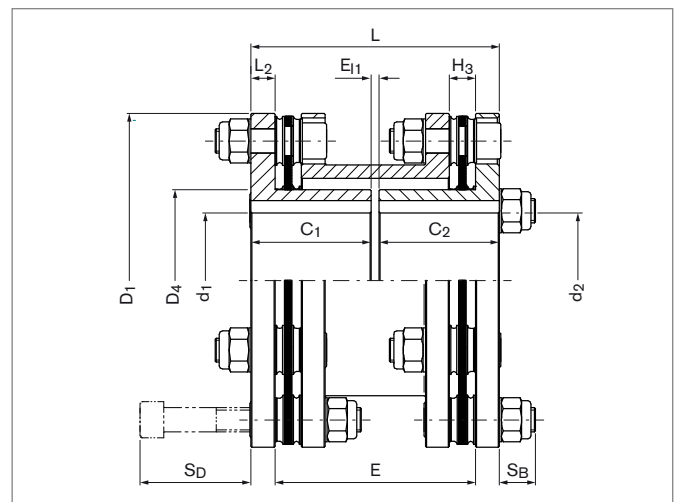
TND VDV

Further information on
RINGFEDER® TND VDV
on www.ringfeder.com

Inverted Hubs, Double-Jointed, with Spacer

The type RINGFEDER® TND VDV is a torsionally stiff, backlash-free steel disc coupling consisting of two inverted hubs V, connected by a spacer D in standardized length. Using high-strength screws, one disc pack each is connected to the spacer and one hub, thus achieving the function of a double-cardanic system.

Depending on the coupling size, two different disc packs are available: The type HD (High Deflection) as well as the type HT (High Torque). The double-jointed design with two disc packs compensates for radial (adjustable via the spacer length), angular and axial shaft misalignments. By utilizing the standard spacers, the largest possible disc pack distance and thus the largest possible radial misalignment is realized at minimum distance of the shafts to be connected.



Characteristics

- Completely backlash- and maintenance-free
- Highly effective compensation of angular, axial and radial shaft misalignment
- Torsionally rigid with high torsional stiffness
- Low restoring forces in case of shaft misalignment due to optimum disc pack design
- Bridging of large shaft distances by means of spacers in various standard lengths
- Maximum radial misalignment at minimum shaft distance
- Bore diameter $d_{1/2}$ up to 120 mm
- Transmissible torque T_{KN} up to 44,000 Nm / T_{kmax} up to 77,000 Nm
- Rotational speeds depending on spacer length n_{max} up to 12,200 1/min
- Efficient realization of customer-specific solutions at short delivery times thanks to modular design



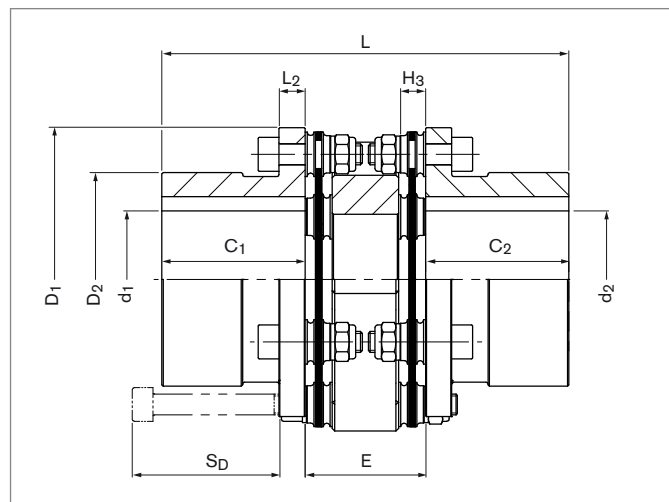
TND OCO

Further information on
RINGFEDER® TND OCO
on www.ringfeder.com

Standard Hubs with Open Flange, Double-Jointed, with Compact-Spacer

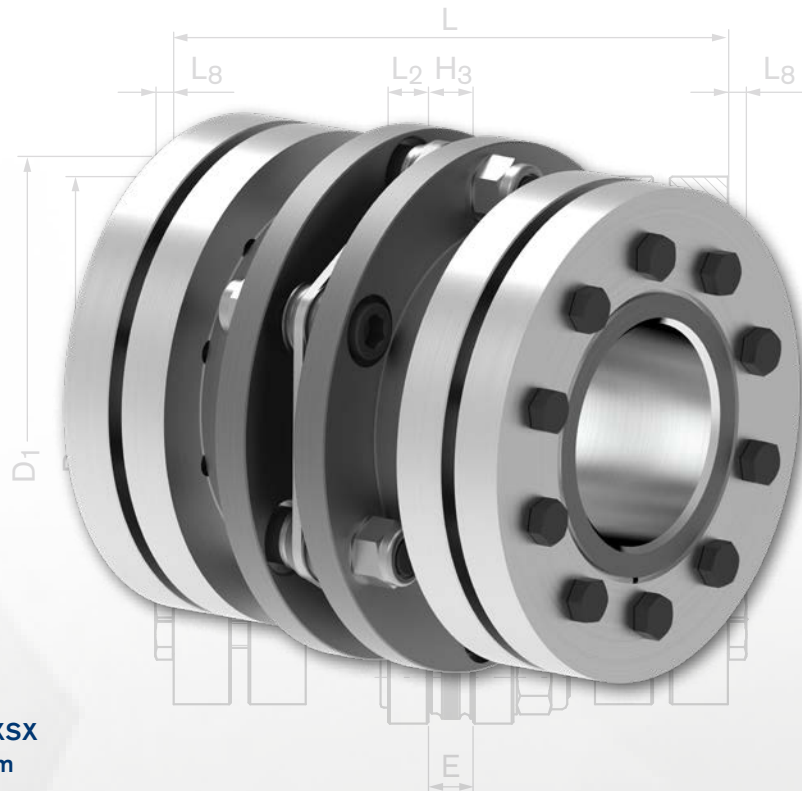
The type **RINGFEDER® TND OCO** is a torsionally stiff, backlash-free steel disc coupling consisting of two standard hubs with open flange O and a compact-spacer C that can be installed and removed radially. Using high-strength screws, one disc pack each is connected to the spacer and one hub, thus achieving the function of a double-cardanic system.

Depending on the coupling size, two different disc packs are available: The type HD (High Deflection) as well as the type HT (High Torque). The double-jointed design with two disc packs compensates for angular, axial and radial shaft misalignments with minimum axial space requirement.



Characteristics

- Completely backlash- and maintenance-free
- Highly effective compensation of angular, axial and radial shaft misalignment
- Torsionally rigid with high torsional stiffness
- Low restoring forces in case of shaft misalignment due to optimum disc pack design
- Minimum shaft distance for standard hubs
- Radially install- and removeable compact-spacer
- Bore diameter $d_{1/2}$ up to 65 mm
- Transmissible torque T_{KN} up to 1,750 Nm / T_{kmax} up to 3,000 Nm
- Rotational speeds depending on spacer length n_{max} up to 8,400 1/min
- Efficient realization of customer-specific solutions at short delivery times thanks to modular design



TND XSX

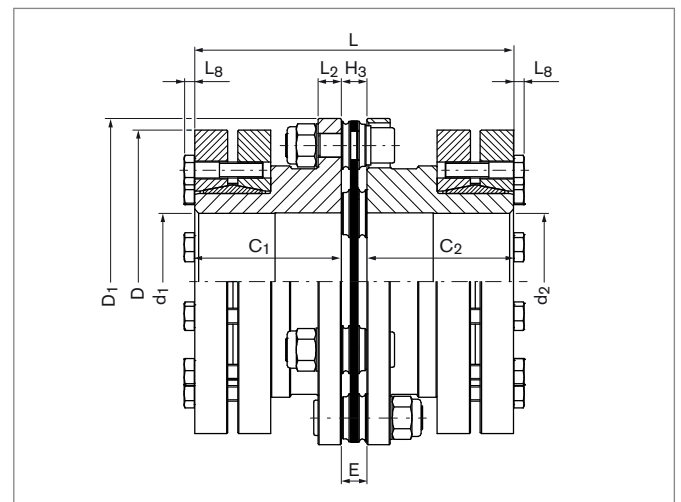
Further information on
RINGFEDER® TND XSX
on www.ringfeder.com

Hubs with RINGFEDER® Shrink Discs, Single-Jointed, without Spacer

The type RINGFEDER® TND XSX is a torsionally stiff, backlash-free steel disc coupling consisting of two hubs X prepared to be equipped with shrink discs of the series RINGFEDER® RfN 4061 and one disc pack S alternately connected to the hubs by high-strength screws.

Depending on the coupling size, two different disc packs are available: The type HD (High Deflection) as well as the type HT (High Torque). The single-jointed design with single disc pack compensates for angular and axial shaft misalignments.

A permanently backlash-free fixation of the coupling hubs on the shafts to be connected is realized by means of high-quality RINGFEDER® Shrink Discs.



Characteristics

- Completely backlash- and maintenance-free
- Highly effective compensation of angular and axial shaft misalignment
- Torsionally rigid with high torsional stiffness
- Low restoring forces in case of shaft misalignment due to optimum disc pack design
- Quick and easy realization of a double-cardanic setup by means of two couplings and one spacer
- Simplified shrink disc selection thanks to RINGFEDER® Shrink Discs specifically assigned per coupling size
- Bore diameter $d_{1/2}$ up to 160 mm
- Transmissible torque T_{KN} up to 44,000 Nm / T_{kmax} up to 77,000 Nm
- Rotational speeds n_{max} up to 3,600 1/min
- Efficient realization of customer-specific solutions at short delivery times thanks to modular design



TND XDX

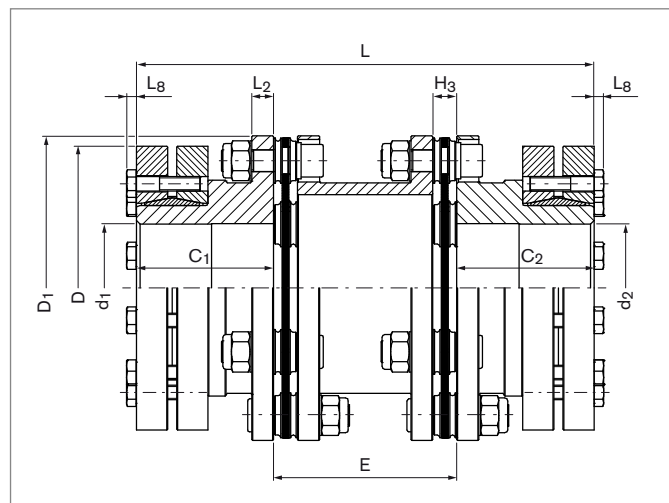
Further information on
RINGFEDER® TND XDX
on www.ringfeder.com

Hubs with RINGFEDER® Shrink Discs, Double-Jointed, with Spacer

The type RINGFEDER® TND XDX is a torsionally stiff, backlash-free steel disc coupling consisting of two hubs X prepared to be equipped with shrink discs of the series RINGFEDER® RfN 4061 and a spacer D in standardized or individually customized length. Using high-strength screws, one disc pack each is connected to the spacer and one hub, thus achieving the function of a double-cardanic system.

Depending on the coupling size, two different disc packs are available: The type HD (High Deflection) as well as the type HT (High Torque). The double-jointed design with two disc packs compensates for radial (adjustable via the spacer length), angular and axial shaft misalignments.

A permanently backlash-free fixation of the coupling hubs on the shafts to be connected is realized by means of high-quality RINGFEDER® Shrink Discs.



Characteristics

- Completely backlash- and maintenance-free
- Highly effective compensation of angular, axial and radial shaft misalignment
- Torsionally rigid with high torsional stiffness
- Low restoring forces in case of shaft misalignment due to optimum disc pack design
- Bridging of large shaft distances by means of spacers in various standard and freely customizable special lengths
- Simplified shrink disc selection thanks to RINGFEDER® Shrink Discs specifically assigned per coupling size
- Bore diameter $d_{1/2}$ up to 160 mm
- Transmissible torque T_{KN} up to 44,000 Nm / T_{kmax} up to 77,000 Nm
- Rotational speeds depending on spacer length n_{max} up to 3,600 1/min
- Efficient realization of customer-specific solutions at short delivery times thanks to modular design



TND QCQ

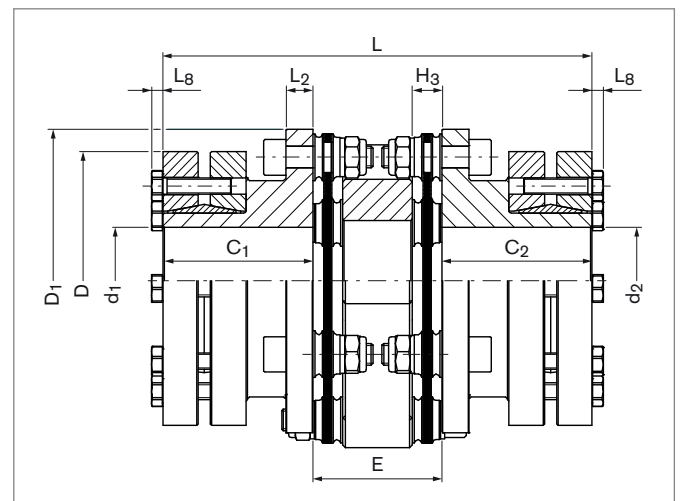
Further information on
RINGFEDER® TND QCQ
on www.ringfeder.com

Hubs with Open Flange and RINGFEDER® Shrink Discs, Double-Jointed, with Compact-Spacer

The type RINGFEDER® TND QCQ is a torsionally stiff, backlash-free steel disc coupling consisting of two hubs with open flange Q prepared to be equipped with shrink discs of the series RINGFEDER® RfN 4061 and a compact-spacer C that can be installed and removed radially. Using high-strength screws, one disc pack each is connected to the spacer and one hub, thus achieving the function of a double-cardanic system.

Depending on the coupling size, two different disc packs are available: The type HD (High Deflection) as well as the type HT (High Torque). The double-jointed design with two disc packs compensates for angular, axial and radial shaft misalignments with minimum axial space requirement.

A permanently backlash-free fixation of the coupling hubs on the shafts to be connected is realized by means of high-quality RINGFEDER® Shrink Discs.



Characteristics

- Completely backlash- and maintenance-free
- Highly effective compensation of angular, axial and radial shaft misalignment
- Torsionally rigid with high torsional stiffness
- Low restoring forces in case of shaft misalignment due to optimum disc pack design
- Minimum shaft distance for standard hubs
- Radially install- and removeable compact-spacer
- Simplified shrink disc selection thanks to RINGFEDER® Shrink Discs specifically assigned per coupling size
- Bore diameter $d_{1/2}$ up to 70 mm
- Transmissible torque T_{KN} up to 1,750 Nm / T_{kmax} up to 3,000 Nm
- Rotational speeds depending on spacer length n_{max} up to 3,600 1/min
- Efficient realization of customer-specific solutions at short delivery times thanks to modular design

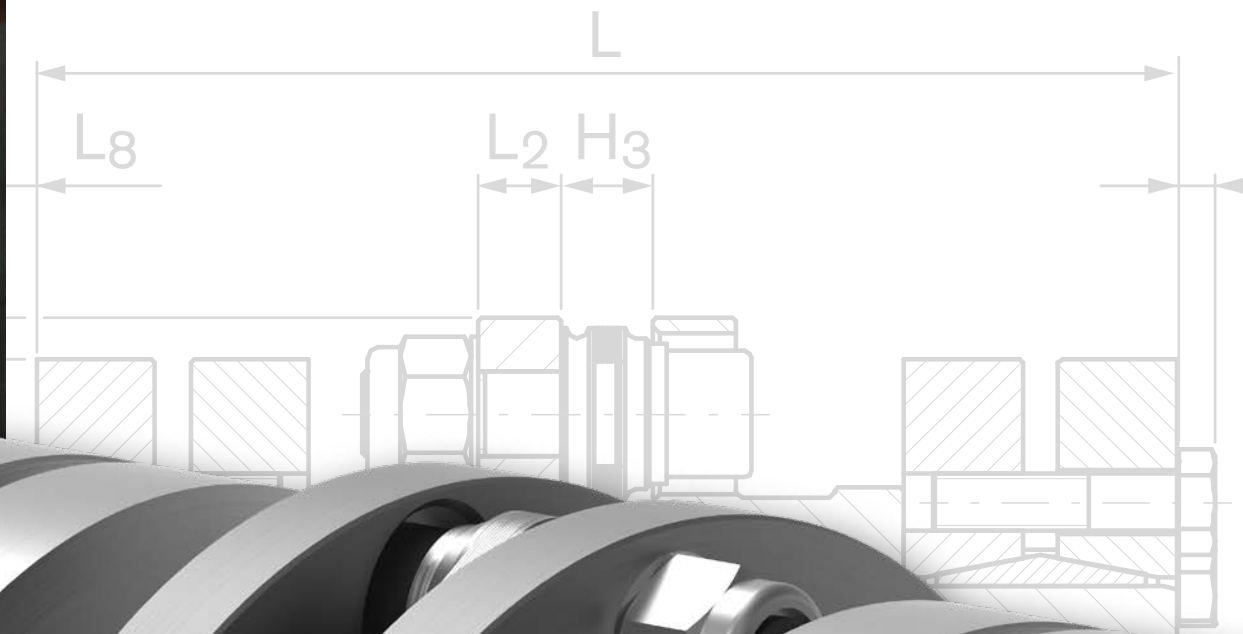


Steel Disc Couplings

RINGFEDER® TND

Tables & Values

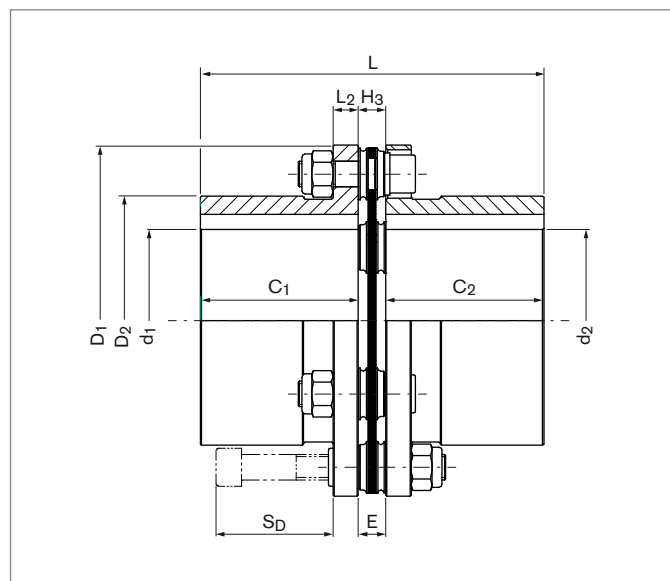
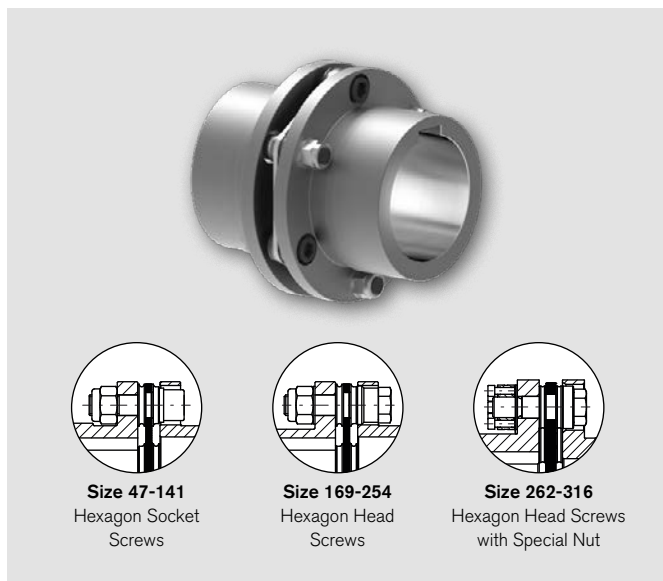
For the correct selection of a suitable coupling type and size, it is essential to observe the explanations in the chapter "Coupling Dimensioning".



Steel Disc Couplings

RINGFEDER® TND HSH

Standard Hubs, Single-Jointed, without Spacer,
Shaft-Hub Connection by Keyway



| Size | T _{KNHD} ¹⁾ | T _{KNHT} ¹⁾ | n _{max} | d _{pre} ³⁾ | d _{1k} ; d _{2k} max ⁴⁾ | C ₁ / C ₂ | E | H ₃ | D ₁ | D ₂ | L ₂ | L | S _D | n _{Sc} |
|------------|---------------------------------|---------------------------------|------------------|--------------------------------|--|---------------------------------|------|----------------|----------------|----------------|----------------|-------|----------------|-----------------|
| HSH | Nm | Nm | 1/min | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | Quantity |
| 47 | 170 | 230 | 12200 | 10 | 32 | 39,5 | 7,5 | 7,5 | 70,5 | 47 | 5 | 86,5 | 24 | 6 |
| 63 | 320 | 420 | 9900 | 14 | 42 | 45 | 9 | 9 | 88 | 62,5 | 8 | 99 | 32 | 6 |
| 82 | 750 | 1050 | 7500 | 15 | 55 | 55 | 10,5 | 10,5 | 116 | 82 | 10 | 120,5 | 40 | 6 |
| 98 | 1350 | 1750 | 6200 | 19 | 65 | 60 | 12 | 12 | 140,5 | 98 | 11 | 132 | 47 | 6 |
| 118 | 2400 | 3000 | 5250 | 25 | 85 | 75 | 13 | 13 | 166,5 | 118 | 12 | 163 | 55 | 6 |
| 141 | 4000 | 5200 | 4400 | 30 | 95 | 90 | 15 | 15 | 198,5 | 141 | 14 | 195 | 64 | 6 |
| 169 | 6500 | 8500 | 3650 | 39 | 115 | 125 | 21 | 21 | 238 | 169 | 16 | 271 | 81 | 6 |
| 205 | 21000 | 26000 | 2950 | 59 | 140 | 160 | 28 | 28 | 295 | 205 | 22 | 348 | 112 | 8 |
| 254 | 36000 | 44000 | 2500 | 79 | 175 | 200 | 32,5 | 32,5 | 345 | 254 | 26 | 432,5 | 133 | 8 |
| 262 | 74000 | --- | 2050 | 90 | 180 | 210 | 34 | 34 | 420 | 262 | 32 | 454 | 137 | 8 |
| 316 | 130000 | --- | 1700 | 100 | 215 | 240 | 47 | 47 | 510 | 316 | 38 | 527 | 172 | 8 |

To continue see next page

Steel Disc Couplings RINGFEDER® TND HSH

| Size | G _{WSB} ⁶⁾ | J _{SB} ⁶⁾ | C _{TdynHD} | C _{TdynHT} | Max. Permissible Misalignment ⁷⁾ | | | | | |
|------|--------------------------------|-----------------------------------|------------------------|------------------------|---|--------------------|--------------------|--------------------|--------------------|--------------------|
| | | | | | axial | | angular | | radial | |
| HSH | kg | 10 ⁻³ kgm ² | 10 ⁶ Nm/rad | 10 ⁶ Nm/rad | ΔK _a HD | ΔK _a HT | ΔK _w HD | ΔK _w HT | ΔK _r HD | ΔK _r HT |
| | | | | | mm | mm | Degrees | Degrees | mm | mm |
| 47 | 1,3 | 0,5 | 0,173 | 0,184 | 0,5 | 0,3 | 1 | 0,7 | --- | --- |
| 63 | 2,6 | 1,6 | 0,281 | 0,312 | 0,5 | 0,4 | 1 | 0,7 | --- | --- |
| 82 | 5,6 | 5,9 | 0,637 | 0,743 | 0,7 | 0,4 | 1 | 0,7 | --- | --- |
| 98 | 8,8 | 14 | 1,173 | 1,251 | 1 | 0,6 | 1 | 0,7 | --- | --- |
| 118 | 15,4 | 35 | 2 | 2,082 | 1,2 | 0,8 | 1 | 0,7 | --- | --- |
| 141 | 25,9 | 84 | 2,992 | 3,142 | 1,4 | 0,8 | 1 | 0,7 | --- | --- |
| 169 | 50 | 230 | 5,269 | 6,586 | 1,5 | 1,2 | 1 | 0,7 | --- | --- |
| 205 | 97,8 | 700 | 21,848 | 22,285 | 1,1 | 0,6 | 0,5 | 0,4 | --- | --- |
| 254 | 171,2 | 1750 | 37,204 | 37,868 | 1,1 | 0,8 | 0,5 | 0,4 | --- | --- |
| 262 | 223,2 | 3260 | 46,192 | --- | 1,6 | --- | 0,5 | --- | --- | --- |
| 316 | 384,4 | 8650 | 87,706 | --- | 1,8 | --- | 0,5 | --- | --- | --- |

1) When selecting the size, it is essential to observe the instructions on coupling dimensioning in the document "Product Paper & Tech Paper RINGFEDER® Steel Disc Couplings". Short-term peak torque T_{Kmax} is limited to 1.75 multiples of T_{KN}.

3) Pre-bore has free tolerance.

4) Maximum finished bore with keyways according to DIN 6885-1.

6) Weight and mass moments of inertia for pre-bored hubs.

7) The maximum misalignment values must not apply simultaneously. The instructions on coupling dimensioning in the document "Product Paper & Tech Paper RINGFEDER® Steel Disc Couplings" are to be observed.

Explanations

| | | |
|---|---|---|
| T_{KNHD} = Nom. transmissible torque with disc pack HD | D₁ = Max. outer diameter | ΔK_aHD = Max. permissible axial misalignment with disc pack HD |
| T_{KNHT} = Nom. transmissible torque with disc pack HT | D₂ = Outer diameter hub | ΔK_aHT = Max. permissible axial misalignment with disc pack HT |
| n_{max} = Max. rotational speed | L₂ = Hub flange thickness | ΔK_wHD = Max. permissible angular misalignment with disc pack HD |
| d_{pre} = Diameter pre-bore | L = Total length | ΔK_wHT = Max. permissible angular misalignment with disc pack HT |
| d_{1kmax} = Max. bore diameter d ₁ with keyway acc. to DIN 6885-1 | S_D = Disassembly space | ΔK_rHD = Max. permissible radial misalignment with disc pack HD |
| d_{2kmax} = Max. bore diameter d ₂ with keyway acc. to DIN 6885-1 | n_{sc} = Quantity of screws | ΔK_rHT = Max. permissible radial misalignment with disc pack HT |
| C₁ = Guided length in hub bore | G_{WSB} = Weight at smallest bore diameter | |
| C₂ = Guided length in hub bore | J_{SB} = Moment of inertia at smallest bore diameter. | |
| E = Distance between hubs | C_{TdynHD} = Dynamic torsional stiffness with disc pack HD | |
| H₃ = Width of the disc pack | C_{TdynHT} = Dynamic torsional stiffness with disc pack HT | |

Ordering example

| Type | Size | Disc pack | Bore diameter d ₁ | Bore diameter d ₂ |
|---------|------|-----------|------------------------------|------------------------------|
| TND HSH | 118 | HD | 60 | 80 |

Technical Information

- Without further specifications, we deliver as standard: Bore tolerance H7; Keyway acc. to DIN 6885-1; Keyway width tolerance P9; Set screw per hub.
- From a peripheral speed of 30 m/s, separate balancing of the individual coupling parts is recommended.
- Without further instructions on balancing, the coupling parts are balanced individually according to DIN 21940-11 in quality G 6,3 at 1,500 1/min. The hubs are balanced half key (before grooving).

Further information on RINGFEDER® TND HSH on www.ringfeder.com

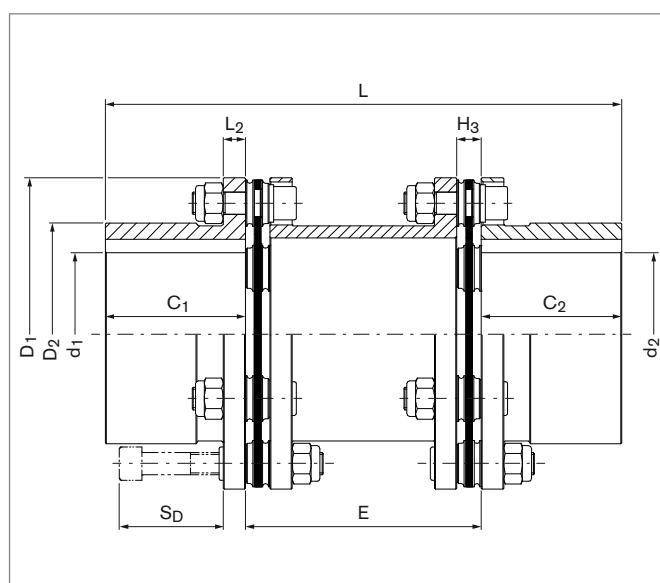
Disclaimer of liability

All technical details and notes are non-binding and cannot be used as a basis for legal claims. The user is obligated to determine whether the represented products meet his requirements. We reserve the right to carry out modifications at any time in the interests of technical progress.

Steel Disc Couplings

RINGFEDER® TND HDH

Standard Hubs, Double-Jointed, with Spacer,
Shaft-Hub Connection by Keyway



| Size | T _{KNHD} ¹⁾ | T _{KNHT} ¹⁾ | n _{max} ²⁾ | d _{pre} ³⁾ | d _{1k;d_{2k}} ⁴⁾ | C ₁ / C ₂ | E ⁵⁾ | H ₃ | D ₁ | D ₂ | L ₂ | L | S _D | n _{Sc} |
|------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|--|---------------------------------|-----------------|----------------|----------------|----------------|----------------|-----|----------------|-----------------|
| HDH | Nm | Nm | 1/min | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | Quantity |
| 47 | 170 | 230 | 12200 | 10 | 32 | 39,5 | 60 | 7,5 | 70,5 | 47 | 5 | 139 | 24 | 6 |
| | | | | | | | 100 | | | | | 179 | | |
| | | | | | | | 140 | | | | | 219 | | |
| 63 | 320 | 420 | 9900 | 14 | 42 | 45 | 70 | 9 | 88 | 62,5 | 8 | 160 | 32 | 6 |
| | | | | | | | 80 | | | | | 170 | | |
| | | | | | | | 100 | | | | | 190 | | |
| | | | | | | | 140 | | | | | 230 | | |
| 82 | 750 | 1050 | 7500 | 15 | 55 | 55 | 100 | 10,5 | 116 | 82 | 10 | 210 | 40 | 6 |
| | | | | | | | 140 | | | | | 250 | | |
| | | | | | | | 180 | | | | | 290 | | |
| 98 | 1350 | 1750 | 6200 | 19 | 65 | 60 | 100 | 12 | 140,5 | 98 | 11 | 220 | 47 | 6 |
| | | | | | | | 140 | | | | | 260 | | |
| | | | | | | | 180 | | | | | 300 | | |
| 118 | 2400 | 3000 | 5250 | 25 | 85 | 75 | 100 | 13 | 166,5 | 118 | 12 | 250 | 55 | 6 |
| | | | | | | | 140 | | | | | 290 | | |
| | | | | | | | 180 | | | | | 330 | | |
| 141 | 4000 | 5200 | 4400 | 30 | 95 | 90 | 140 | 15 | 198,5 | 141 | 14 | 320 | 64 | 6 |
| | | | | | | | 180 | | | | | 360 | | |
| | | | | | | | 140 | | | | | 390 | | |
| 169 | 6500 | 8500 | 3650 | 39 | 115 | 125 | 180 | 21 | 238 | 169 | 16 | 430 | 81 | 6 |
| | | | | | | | 180 | | | | | 430 | | |
| | | | | | | | 250 | | | | | 500 | | |

To continue see next page

Steel Disc Couplings RINGFEDER® TND HDH

| Size | T _{KNHD} ¹⁾ | T _{KNHT} ¹⁾ | n _{max} ²⁾ | d _{pre} ³⁾ | d _{1k;d2k} max ⁴⁾ | C ₁ / C ₂ | E ⁵⁾ | H ₃ | D ₁ | D ₂ | L ₂ | L | S _D | n _{sc} |
|------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|--|---------------------------------|-------------------|----------------|----------------|----------------|----------------|-------------------|----------------|-----------------|
| HDH | Nm | Nm | 1/min | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | Quantity |
| 205 | 21000 | 26000 | 2950 | 59 | 140 | 160 | 200 250 | 28 | 295 | 205 | 22 | 520 570 | 112 | 8 |
| 254 | 36000 | 44000 | 2500 | 79 | 175 | 200 | 224 250 300 | 32,2 | 345 | 254 | 26 | 624 650 700 | 133 | 8 |
| 262 | 74000 | --- | 2050 | 90 | 180 | 210 | 280 | 34 | 420 | 262 | 32 | 700 | 137 | 8 |
| 316 | 130000 | --- | 1700 | 100 | 215 | 240 | 350 | 47 | 510 | 316 | 38 | 830 | 172 | 8 |

| Size | E ⁵⁾ | G _{WSB} ⁶⁾ | J _{SB} ⁶⁾ | C _{TdynHD} | C _{TdynHT} | Max. Permissible Misalignment ⁷⁾ | | | | | |
|--------------|-----------------|--------------------------------|-----------------------------------|------------------------|------------------------|---|-----------------------------|-------------------------------|-------------------------------|------------------------------|------------------------------|
| | | | | | | axial ΔK _a HD | axial ΔK _a HT | angular ΔK _w HD | angular ΔK _w HT | radial ΔK _r HD | radial ΔK _r HT |
| HDH | mm | kg | 10 ⁻⁹ kgm ² | 10 ⁶ Nm/rad | 10 ⁶ Nm/rad | mm | mm | Degrees | Degrees | mm | mm |
| 47 | 60 | 1,7 | 0,76 | 0,071 | 0,075 | 1,0 | 0,6 | 2 | 1,4 | 0,8 | 0,6 |
| | 100 | 1,8 | 0,76 | 0,059 | 0,062 | | | | | | |
| | 140 | 1,9 | 0,76 | 0,071 | 0,075 | | | | | | |
| | Δ per 100 mm | 0,31 | 0,14 | 0,14 | | | | | | | |
| 63 | 70 | 3,3 | 2,5 | 0,126 | 0,139 | 1,0 | 0,8 | 2 | 1,4 | 1 | 0,7 |
| | 80 | 3,3 | 2,6 | 0,123 | 0,134 | | | | | | |
| | 100 | 3,5 | 2,7 | 0,116 | 0,127 | | | | | | |
| | 140 | 3,7 | 2,8 | 0,105 | 0,114 | | | | | | |
| Δ per 100 mm | 0,55 | 0,44 | 0,44 | | | | | | | | |
| 82 | 100 | 7,1 | 9,1 | 0,271 | 0,308 | 1,4 | 0,8 | 2 | 1,4 | 1,4 | 1,1 |
| | 140 | 7,4 | 9,5 | 0,246 | 0,277 | | | | | | |
| | 180 | 7,7 | 9,9 | 0,226 | 0,251 | | | | | | |
| | Δ per 100 mm | 0,74 | 0,10 | 1,06 | | | | | | | |
| 98 | 100 | 11,1 | 21 | 0,513 | 0,543 | 2,0 | 1,2 | 2 | 1,4 | 1,5 | 1 |
| | 140 | 11,5 | 22 | 0,469 | 0,494 | | | | | | |
| | 180 | 12 | 23 | 0,433 | 0,454 | | | | | | |
| | Δ per 100 mm | 1,09 | 1,04 | 2,18 | | | | | | | |
| 118 | 100 | 18,9 | 52 | 0,914 | 0,948 | 2,4 | 1,6 | 2 | 1,4 | 1,4 | 1 |
| | 140 | 19,6 | 54 | 0,855 | 0,884 | | | | | | |
| | 180 | 20,3 | 56 | 0,803 | 0,829 | | | | | | |
| | Δ per 100 mm | 1,74 | 5,14 | 5,24 | | | | | | | |
| 141 | 140 | 31,7 | 120 | 1,306 | 1,362 | 2,8 | 1,6 | 2 | 1,4 | 2 | 1,5 |
| | 180 | 32,5 | 130 | 1,229 | 1,279 | | | | | | |
| | Δ per 100 mm | 1,92 | 8,14 | 8,3 | | | | | | | |
| | 140 | 60,2 | 340 | 2,467 | 3,035 | | | | | | |
| 169 | 180 | 61,8 | 350 | 2,375 | 2,898 | 3 | 2,4 | 2 | 1,4 | 2,6 | 1,9 |
| | 250 | 64,5 | 360 | 2,231 | 2,686 | | | | | | |
| | Δ per 100 mm | 3,92 | 24,88 | 25,36 | | | | | | | |
| | 200 | 119,6 | 1070 | 8,995 | 9,142 | | | | | | |
| 205 | 250 | 122,4 | 1100 | 8,265 | 8,389 | 2,2 | 1,2 | 1 | 0,8 | 1,4 | 1,2 |
| | Δ per 100 mm | 5,56 | 49,36 | 50,3 | | | | | | | |

To continue see next page

Steel Disc Couplings RINGFEDER® TND HDH

| Size | E ⁵⁾ | G _{WSB} ⁶⁾ | J _{SB} ⁶⁾ | C _{TdynHD} | C _{TdynHT} | Max. Permissible Misalignment ⁷⁾ | | | | | |
|------|-----------------|--------------------------------|-----------------------------------|------------------------|------------------------|---|--------------------|--------------------|--------------------|--------------------|--------------------|
| | | | | | | axial | | angular | | radial | |
| HDH | mm | kg | 10 ⁻³ kgm ² | 10 ⁶ Nm/rad | 10 ⁶ Nm/rad | ΔK _a HD | ΔK _a HT | ΔK _w HD | ΔK _w HT | ΔK _r HD | ΔK _r HT |
| 254 | 224 | 207,5 | 2620 | 14,975 | 15,19 | 2,2 | 1,6 | 1 | 0,8 | 1,6 | 1,3 |
| | 250 | 209,5 | 2640 | 14,302 | 14,497 | | | | | | |
| | 300 | 213,3 | 2680 | 13,163 | 13,328 | | | | | | |
| | Δ per 100 mm | 7,58 | 80,10 | 81,63 | | | | | | | |
| 262 | 280 | 261,9 | 5350 | 18,116 | --- | 3,2 | --- | 1 | --- | 2,5 | --- |
| | Δ per 100 mm | 8,75 | 121,28 | 122,81 | | | | | | | |
| 316 | 350 | 450,1 | 14430 | 36,134 | --- | 3,8 | --- | 1 | --- | 3 | --- |
| | Δ per 100 mm | 11,05 | 221,59 | 224,4 | | | | | | | |

- When selecting the size, it is essential to observe the instructions on coupling dimensioning in the document "Product Paper & Tech Paper RINGFEDER® Steel Disc Couplings". Short-term peak torque T_{kmax} is limited to 1.75 multiples of T_{KN}.
- For longer spacers, check bending critical rotational speed.
- Pre-bore has free tolerance.
- Maximum finished bore with keyways according to DIN 6885-1.
- Longer spacers on request. The figures given at "Δ per 100 mm" for G_{WSB}, J_{SB}, C_{TdynHD} and C_{TdynHT} are approximate values.
- Weight and mass moments of inertia for pre-bored hubs.
- The maximum misalignment values must not apply simultaneously. The instructions on coupling dimensioning in the document "Product Paper & Tech Paper RINGFEDER® Steel Disc Couplings" are to be observed.

Explanations

| | | |
|---|---|---|
| T_{KNHD} = Nom. transmissible torque with disc pack HD | D₁ = Max. outer diameter | ΔK_aHD = Max. permissible axial misalignment with disc pack HD |
| T_{KNHT} = Nom. transmissible torque with disc pack HT | D₂ = Outer diameter hub | ΔK_aHT = Max. permissible axial misalignment with disc pack HT |
| n_{max} = Max. rotational speed | L₂ = Hub flange thickness | ΔK_wHD = Max. permissible angular misalignment with disc pack HD |
| d_{pre} = Diameter pre-bore | L = Total length | ΔK_wHT = Max. permissible angular misalignment with disc pack HT |
| d_{1kmax} = Max. bore diameter d ₁ with keyway acc. to DIN 6885-1 | S_D = Disassembly space | ΔK_rHD = Max. permissible radial misalignment with disc pack HD |
| d_{2kmax} = Max. bore diameter d ₂ with keyway acc. to DIN 6885-1 | n_{sc} = Quantity of screws | ΔK_rHT = Max. permissible radial misalignment with disc pack HT |
| C₁ = Guided length in hub bore | G_{WSB} = Weight at smallest bore diameter | |
| C₂ = Guided length in hub bore | J_{SB} = Moment of inertia at smallest bore diameter. | |
| E = Distance between hubs | C_{TdynHD} = Dynamic torsional stiffness with disc pack HD | |
| H₃ = Width of the disc pack | C_{TdynHT} = Dynamic torsional stiffness with disc pack HT | |

Ordering example

| Type | Size | Disc pack | Distance between hubs E | Bore diameter d ₁ | Bore diameter d ₂ |
|---------|------|-----------|-------------------------|------------------------------|------------------------------|
| TND HDH | 118 | HT | 140 | 60 | 80 |

Further information on RINGFEDER® TND HDH on www.ringfeder.com

Technical Information

- Without further specifications, we deliver as standard: Bore tolerance H7; Keyway acc. to DIN 6885-1; Keyway width tolerance P9; Set screw per hub.
- From a peripheral speed of 30 m/s, separate balancing of the individual coupling parts is recommended.
- Without further instructions on balancing, the coupling parts are balanced individually according to DIN 21940-11 in quality G 6,3 at 1,500 1/min. The hubs are balanced half key (before grooving), the spacer without screwed-on disc packs.

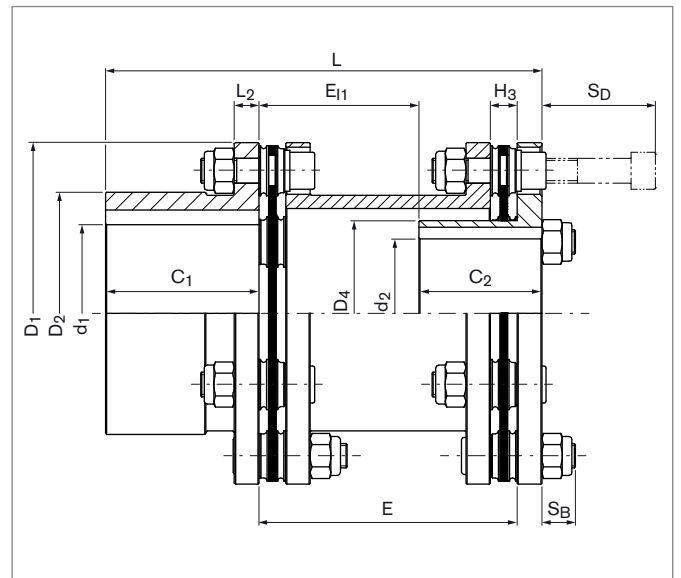
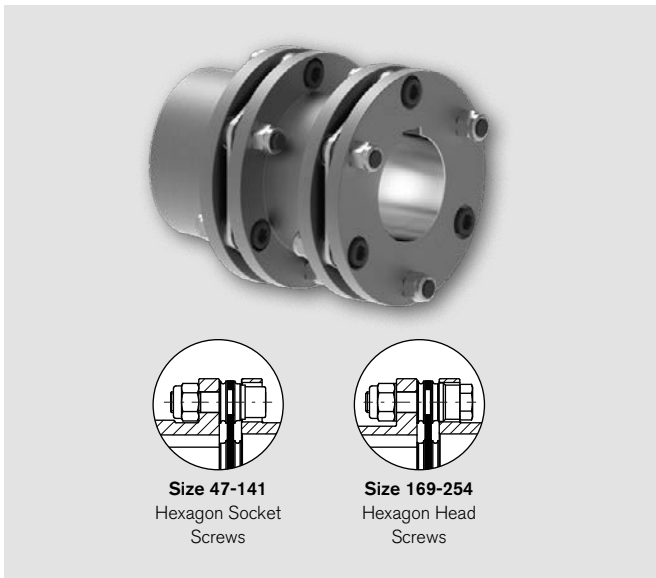
Disclaimer of liability

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Steel Disc Couplings

RINGFEDER® TND HDV

Combination of Standard Hub and Inverted Hub, Double-Jointed, with Spacer, Shaft-Hub Connection by Keyway



| Size | T _{KNHD} ¹⁾ | T _{KNHT} ¹⁾ | n _{max} ²⁾ | d _{pre} ³⁾ | d _{1kmax} ⁴⁾ | d _{2kmax} ⁴⁾ | C ₁ /C ₂ | E ₁ | E ⁵⁾ | H ₃ | D ₁ | D ₂ | D ₄ | L ₂ | L | S _B | S _D | n _{Sc} |
|------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|----------------------------------|----------------------------------|--------------------------------|----------------|-----------------|----------------|----------------|----------------|----------------|----------------|-----|----------------|----------------|-----------------|
| HDV | Nm | Nm | 1/min | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | Quantity |
| 47 | 170 | 230 | 12200 | 10 | 32 | 25 | 39,5 | 25,5 | 60 | 7,5 | 70,5 | 47 | 37 | 5 | 105 | 7 | 24 | 6 |
| | | | | | | | | 65,5 | 100 | | | | | | 145 | | | |
| | | | | | | | | 105,5 | 140 | | | | | | 185 | | | |
| 63 | 320 | 420 | 9900 | 14 | 42 | 32 | 45 | 33 | 70 | 9 | 88 | 62,5 | 48 | 8 | 123 | 9 | 32 | 6 |
| | | | | | | | | 43 | 80 | | | | | | 133 | | | |
| | | | | | | | | 63 | 100 | | | | | | 153 | | | |
| | | | | | | | | 103 | 140 | | | | | | 193 | | | |
| 82 | 750 | 1050 | 7500 | 15 | 55 | 44 | 55 | 55 | 100 | 10,5 | 116 | 82 | 64 | 10 | 165 | 11 | 40 | 6 |
| | | | | | | | | 95 | 140 | | | | | | 205 | | | |
| | | | | | | | | 135 | 180 | | | | | | 245 | | | |
| 98 | 1350 | 1750 | 6200 | 19 | 65 | 50 | 60 | 51 | 100 | 12 | 140,5 | 98 | 77 | 11 | 171 | 15 | 47 | 6 |
| | | | | | | | | 91 | 140 | | | | | | 211 | | | |
| | | | | | | | | 131 | 180 | | | | | | 251 | | | |
| 118 | 2400 | 3000 | 5250 | 25 | 85 | 60 | 75 | 37 | 100 | 13 | 166,5 | 118 | 90,5 | 12 | 187 | 17 | 55 | 6 |
| | | | | | | | | 77 | 140 | | | | | | 227 | | | |
| | | | | | | | | 117 | 180 | | | | | | 267 | | | |
| 141 | 4000 | 5200 | 4400 | 30 | 95 | 75 | 90 | 64 | 140 | 15 | 198,5 | 141 | 114 | 14 | 244 | 18 | 64 | 6 |
| | | | | | | | | 104 | 180 | | | | | | 284 | | | |
| | | | | | | | | 31 | 140 | | | | | | 281 | | | |
| 169 | 6500 | 8500 | 3650 | 39 | 115 | 90 | 125 | 71 | 180 | 21 | 238 | 169 | 135 | 16 | 321 | 24 | 81 | 6 |
| | | | | | | | | 141 | 250 | | | | | | 391 | | | |

To continue see next page

Steel Disc Couplings RINGFEDER® TND HDV

| Size | T _{KNHD} ¹⁾ | T _{KNHT} ¹⁾ | n _{max} ²⁾ | d _{pre} ³⁾ | d _{1kmax} ⁴⁾ | d _{2kmax} ⁴⁾ | C _{1/C2} | E _{I1} | E ⁵⁾ | H ₃ | D ₁ | D ₂ | D ₄ | L ₂ | L | S _B | S _D | n _{Sc} |
|------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|----------------------------------|----------------------------------|-------------------|-----------------|-------------------|----------------|----------------|----------------|----------------|----------------|-------------------|----------------|----------------|-----------------|
| HDV | Nm | Nm | 1/min | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | Quantity |
| 205 | 21000 | 26000 | 2950 | 59 | 140 | 115 | 160 | 62 112 | 200 250 | 28 | 295 | 205 | 170 | 22 | 382 432 | 27 | 112 | 8 |
| 254 | 36000 | 44000 | 2500 | 79 | 175 | 120 | 200 | 50 76 126 | 224 250 300 | 32,5 | 345 | 254 | 180 | 26 | 450 476 526 | 29 | 133 | 8 |

| Size | E ⁵⁾ | G _{WSB} ⁶⁾ | J _{SB} ⁶⁾ | C _{TdynHD} | C _{TdynHT} | Max. Permissible Misalignment ⁷⁾ | | | | | |
|------|-----------------|--------------------------------|-----------------------------------|------------------------|------------------------|---|--------------------|--------------------|--------------------|--------------------|--------------------|
| | | | | | | axial | | angular | | radial | |
| HDV | mm | kg | 10 ⁻³ kgm ² | 10 ⁶ Nm/rad | 10 ⁶ Nm/rad | ΔK _a HD | ΔK _a HT | ΔK _w HD | ΔK _w HT | ΔK _r HD | ΔK _r HT |
| | | | | | | mm | mm | Degrees | Degrees | mm | mm |
| 47 | 60 | 1,4 | 0,69 | 0,071 | 0,075 | | | | | 0,8 | 0,6 |
| | 100 | 1,6 | 0,75 | 0,059 | 0,062 | 1,0 | 0,6 | 2 | 1,4 | 1,5 | 1,1 |
| | 140 | 1,7 | 0,8 | 0,051 | 0,053 | | | | | 2,2 | 1,5 |
| 63 | 70 | 2,9 | 2,33 | 0,123 | 0,134 | | | | | 1 | 0,7 |
| | 80 | 2,9 | 2,37 | 0,123 | 0,134 | | | | | 1,1 | 0,8 |
| | 100 | 3 | 2,46 | 0,116 | 0,127 | 1,0 | 0,8 | 2 | 1,4 | 1,5 | 1,1 |
| | 140 | 3,2 | 2,63 | 0,105 | 0,114 | | | | | 2,1 | 1,6 |
| 82 | 100 | 5,4 | 8,83 | 0,271 | 0,308 | | | | | 1,4 | 1,1 |
| | 140 | 6,7 | 9,23 | 0,246 | 0,277 | 1,4 | 0,8 | 2 | 1,4 | 2,1 | 1,5 |
| | 180 | 7 | 9,65 | 0,226 | 0,251 | | | | | 2,8 | 2,1 |
| 98 | 100 | 9,9 | 20,35 | 0,513 | 0,543 | | | | | 1,5 | 1 |
| | 140 | 10,4 | 21,21 | 0,469 | 0,494 | 2,0 | 1,2 | 2 | 1,4 | 2,1 | 1,5 |
| | 180 | 10,8 | 22,07 | 0,433 | 0,454 | | | | | 2,8 | 2 |
| 118 | 100 | 16 | 46,28 | 0,914 | 0,948 | | | | | 1,4 | 1 |
| | 140 | 16,7 | 48,34 | 0,855 | 0,884 | 2,4 | 1,6 | 2 | 1,4 | 2,1 | 1,5 |
| | 180 | 17,3 | 50,39 | 0,803 | 0,829 | | | | | 2,8 | 2 |
| 141 | 140 | 26,4 | 98,01 | 1,306 | 1,362 | 2,8 | 1,6 | 2 | 1,4 | 2 | 1,5 |
| | 180 | 28,5 | 105,33 | 1,229 | 1,279 | | | | | 2,7 | 2 |
| 169 | 140 | 50,7 | 289,79 | 2,467 | 3,035 | | | | | 2 | 1,4 |
| | 180 | 52,3 | 299,74 | 2,375 | 2,898 | 3 | 2,4 | 2 | 1,4 | 2,6 | 1,9 |
| | 250 | 55 | 317,15 | 2,231 | 2,686 | | | | | 3,8 | 2,7 |
| 205 | 200 | 105 | 951,03 | 8,995 | 9,142 | 2,2 | 1,2 | 1 | 0,8 | 1,4 | 1,2 |
| | 250 | 107,8 | 975,71 | 8,265 | 8,389 | | | | | 1,8 | 1,5 |
| 254 | 224 | 169,2 | 2131,73 | 14,975 | 15,19 | 2,2 | 1,6 | 1 | 0,8 | 1,6 | 1,3 |
| | 250 | 171,2 | 2152,56 | 14,302 | 14,497 | | | | | 1,8 | 1,5 |
| | 300 | 175 | 2192,61 | 13,163 | 13,328 | | | | | 2,2 | 1,8 |

- 1) When selecting the size, it is essential to observe the instructions on coupling dimensioning in the document "Product Paper & Tech Paper RINGFEDER® Steel Disc Couplings". Short-term peak torque T_{kmax} is limited to 1.75 multiples of T_{KN}.
- 2) For longer spacers, check bending critical rotational speed.
- 3) Pre-bore has free tolerance.
- 4) Maximum finished bore with keyways according to DIN 6885-1.

- 5) Longer spacers on request.
- 6) Weight and mass moments of inertia for pre-bored hubs.
- 7) The maximum misalignment values must not apply simultaneously. The instructions on coupling dimensioning in the document "Product Paper & Tech Paper RINGFEDER® Steel Disc Couplings" are to be observed.

To continue see next page

Steel Disc Couplings RINGFEDER® TND HDV

Explanations

| | | |
|---|---|---|
| T_{KNHD} = Nom. transmissible torque with disc pack HD | H₃ = Width of the disc pack | C_{TdynHD} = Dynamic torsional stiffness with disc pack HD |
| T_{KNHT} = Nom. transmissible torque with disc pack HT | D₁ = Max. outer diameter | C_{TdynHT} = Dynamic torsional stiffness with disc pack HT |
| n_{max} = Max. rotational speed | D₂ = Outer diameter hub | ΔK_{aHD} = Max. permissible axial misalignment with disc pack HD |
| d_{pre} = Diameter pre-bore | D₄ = Outer diameter of the inverted hub | ΔK_{aHT} = Max. permissible axial misalignment with disc pack HT |
| d_{1kmax} = Max. bore diameter d ₁ with keyway acc. to DIN 6885-1 | L₂ = Hub flange thickness | ΔK_{wHD} = Max. permissible angular misalignment with disc pack HD |
| d_{2kmax} = Max. bore diameter d ₂ with keyway acc. to DIN 6885-1 | L = Total length | ΔK_{wHT} = Max. permissible angular misalignment with disc pack HT |
| C₁ = Guided length in hub bore | S_B = Protruding of the screw | ΔK_{rHD} = Max. permissible radial misalignment with disc pack HD |
| C₂ = Guided length in hub bore | S_D = Disassembly space | ΔK_{rHT} = Max. permissible radial misalignment with disc pack HT |
| E₁₁ = Distance between hubs | n_{sc} = Quantity of screws | |
| E = Distance between hubs | G_{WSB} = Weight at smallest bore diameter | |
| | J_{SB} = Moment of inertia at smallest bore diameter | |

Ordering example

| Type | Size | Disc pack | Distance between hubs E | Bore diameter d ₁ | Bore diameter d ₂ |
|---------|------|-----------|-------------------------|------------------------------|------------------------------|
| TND HDV | 118 | HD | 140 | 85 | 60 |

Further information on
RINGFEDER® TND HDV
 on www.ringfeder.com

Technical Information

- Without further specifications, we deliver as standard: Bore tolerance H7; Keyway acc. to DIN 6885-1; Keyway width tolerance P9; Set screw per hub.
- From a peripheral speed of 30 m/s, separate balancing of the individual coupling parts is recommended.
- Without further instructions on balancing, the coupling parts are balanced individually according to DIN 21940-11 in quality G 6,3 at 1,500 1/min. The hubs are balanced half key (before grooving), the spacer without screwed-on disc packs.

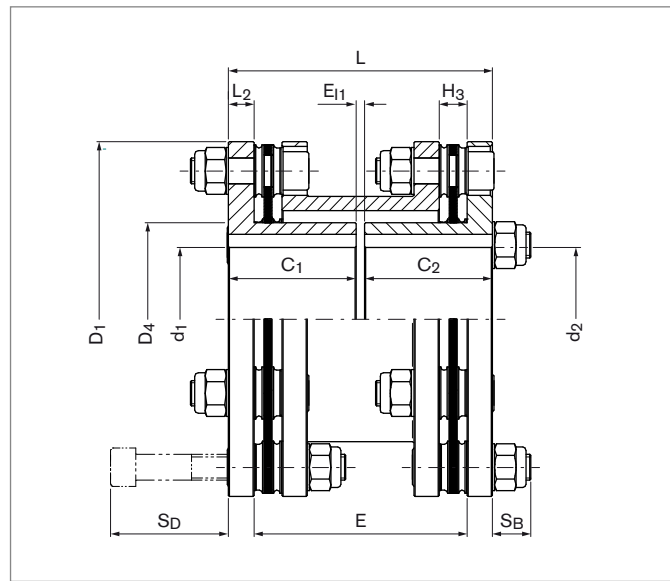
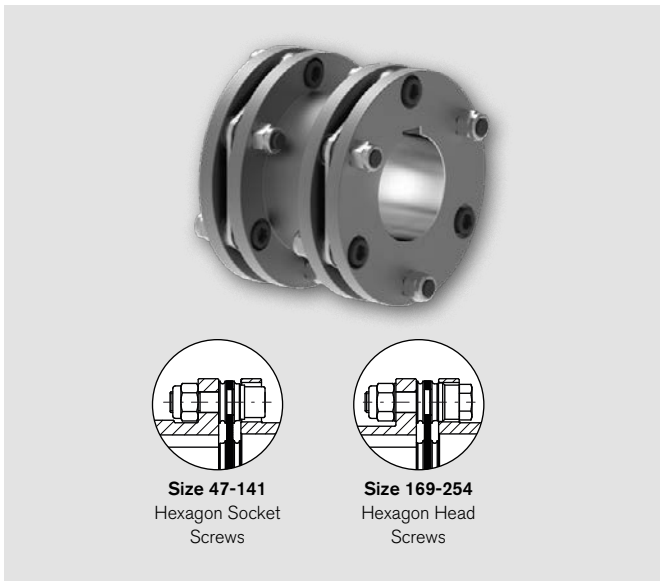
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Steel Disc Couplings

RINGFEDER® TND VDV

Inverted Hubs, Double-Jointed, with Spacer,
Shaft-Hub Connection by Keyway



| Size | T _{KNHD} ¹⁾ | T _{KNHT} ¹⁾ | n _{max} ²⁾ | d _{pre} ³⁾ | d _{1k} ; d _{2k} max ⁴⁾ | C ₁ / C ₂ | E ₁₁ | E ⁵⁾ | H ₃ | D ₁ | D ₄ | L ₂ | L | S _B | S _D | n _{Sc} |
|------------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|--|---------------------------------|-----------------|-----------------|----------------|----------------|----------------|----------------|------------|----------------|----------------|-----------------|
| VDV | Nm | Nm | 1/min | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | Quantity |
| 47 | 170 | 230 | 12200 | 10 | 25 | 33 39,5 | 4 31 | 60 100 | 7,5 | 70,5 | 37 | 5 | 70 110 | 7 | 24 | 6 |
| 63 | 320 | 420 | 9900 | 14 | 32 | 41 45 | 4 6 | 70 80 | 9 | 88 | 48 | 8 | 86 96 | 9 | 32 | 6 |
| 82 | 750 | 1050 | 7500 | 15 | 44 | 55 55 | 10 50 | 100 140 | 10,5 | 116 | 64 | 10 | 120 160 | 11 | 40 | 6 |
| 98 | 1350 | 1750 | 6200 | 19 | 50 | 59 60 | 4 42 | 100 140 | 12 | 140,5 | 77 | 11 | 122 162 | 15 | 47 | 6 |
| 118 | 2400 | 3000 | 5250 | 25 | 60 | 60 75 | 4 14 | 100 140 | 13 | 166,5 | 90,5 | 12 | 124 164 | 17 | 55 | 6 |
| 141 | 4000 | 5200 | 4400 | 30 | 75 | 81 90 | 6 28 | 140 180 | 15 | 198,5 | 114 | 14 | 168 208 | 18 | 64 | 6 |
| 169 | 6500 | 8500 | 3650 | 39 | 90 | 103 125 | 6 32 | 180 250 | 21 | 238 | 135 | 16 | 212 282 | 24 | 81 | 6 |
| 205 | 21000 | 26000 | 2950 | 59 | 115 | 142 | 10 | 250 | 28 | 295 | 170 | 22 | 294 | 27 | 112 | 8 |
| 254 | 36000 | 44000 | 2500 | 79 | 120 | 146 171 | 10 10 | 250 300 | 32,5 | 345 | 180 | 26 | 302 352 | 29 | 133 | 8 |

To continue see next page

Steel Disc Couplings RINGFEDER® TND VDV

| Size | | | | | | Max. Permissible Misalignment ⁷⁾ | | | | | |
|------|-----------------|--------------------------------|-----------------------------------|------------------------|------------------------|---|--------------------|--------------------|--------------------|--------------------|--------------------|
| | E ⁵⁾ | G _{WSB} ⁶⁾ | J _{SB} ⁶⁾ | C _{Tdyn} HD | C _{Tdyn} HT | axial | | angular | | radial | |
| VDV | mm | kg | 10 ⁻³ kgm ² | 10 ⁶ Nm/rad | 10 ⁶ Nm/rad | ΔK _s HD | ΔK _s HT | ΔK _w HD | ΔK _w HT | ΔK _r HD | ΔK _r HT |
| | | | | | | mm | mm | Degrees | Degrees | mm | mm |
| 47 | 60 | 1,2 | 0,6 | 0,071 | 0,075 | 1 | 0,6 | 2 | 1,4 | 0,8 | 0,6 |
| | 100 | 1,4 | 0,66 | 0,059 | 0,062 | | | | | 1,5 | 1,1 |
| 63 | 70 | 2,4 | 2,04 | 0,126 | 0,139 | 1 | 0,8 | 2 | 1,4 | 1 | 0,7 |
| | 80 | 2,5 | 2,08 | 0,126 | 0,139 | | | | | 1,1 | 0,8 |
| 82 | 100 | 5,7 | 7,90 | 0,271 | 0,308 | 1,4 | 0,8 | 2 | 1,4 | 1,4 | 1,1 |
| | 140 | 6 | 8,32 | 0,246 | 0,277 | | | | | 2,1 | 1,5 |
| 98 | 100 | 8,8 | 18,36 | 0,513 | 0,543 | 2 | 1,2 | 2 | 1,4 | 1,5 | 1 |
| | 140 | 9,2 | 19,22 | 0,469 | 0,494 | | | | | 2,1 | 1,5 |
| 118 | 100 | 13,1 | 39,38 | 0,914 | 0,948 | 2,4 | 1,6 | 2 | 1,4 | 1,4 | 1 |
| | 140 | 13,8 | 41,44 | 0,855 | 0,884 | | | | | 2,1 | 1,5 |
| 141 | 140 | 22,6 | 100,41 | 1,306 | 1,362 | 2,8 | 1,6 | 2 | 1,4 | 2 | 1,5 |
| | 180 | 24,7 | 105,33 | 1,229 | 1,279 | | | | | 2,7 | 2 |
| 169 | 180 | 43,5 | 256,20 | 2,375 | 2,898 | 3 | 2,4 | 2 | 1,4 | 2,6 | 1,9 |
| | 250 | 46,2 | 273,61 | 2,231 | 2,686 | | | | | 3,8 | 2,7 |
| 205 | 250 | 93,4 | 862,77 | 8,265 | 8,389 | 2,2 | 1,2 | 1 | 0,8 | 1,8 | 1,5 |
| 254 | 250 | 132,8 | 1734,93 | 14,302 | 14,497 | 2,2 | 1,6 | 1 | 0,8 | 1,8 | 1,5 |
| | 300 | 136,6 | 1774,98 | 13,163 | 13,328 | | | | | 2,2 | 1,8 |

- 1) When selecting the size, it is essential to observe the instructions on coupling dimensioning in the document "Product Paper & Tech Paper RINGFEDER® Steel Disc Couplings". Short-term peak torque T_{kmax} is limited to 1.75 multiples of T_{KN}.
- 2) For longer spacers, check bending critical rotational speed.
- 3) Pre-bore has free tolerance.
- 4) Maximum finished bore with keyways according to DIN 6885-1.

- 5) Longer spacers on request.
- 6) Weight and mass moments of inertia for pre-bored hubs.
- 7) The maximum misalignment values must not apply simultaneously. The instructions on coupling dimensioning in the document "Product Paper & Tech Paper RINGFEDER® Steel Disc Couplings" are to be observed.

To continue see next page

Steel Disc Couplings RINGFEDER® TND VDV

Explanations

| | | |
|---|---|---|
| T_{KNHD} = Nom. transmissible torque with disc pack HD | H₃ = Width of the disc pack | C_{TdynHT} = Dynamic torsional stiffness with disc pack HT |
| T_{KNHT} = Nom. transmissible torque with disc pack HT | D₁ = Max. outer diameter | ΔK_{aHD} = Max. permissible axial misalignment with disc pack HD |
| n_{max} = Max. rotational speed | D₄ = Outer diameter of the inverted hub | ΔK_{aHT} = Max. permissible axial misalignment with disc pack HT |
| d_{pre} = Diameter pre-bore | L₂ = Hub flange thickness | ΔK_{wHD} = Max. permissible angular misalignment with disc pack HD |
| d_{1kmax} = Max. bore diameter d ₁ with keyway acc. to DIN 6885-1 | L = Total length | ΔK_{wHT} = Max. permissible angular misalignment with disc pack HT |
| d_{2kmax} = Max. bore diameter d ₂ with keyway acc. to DIN 6885-1 | S_B = Protruding of the screw | ΔK_{rHD} = Max. permissible radial misalignment with disc pack HD |
| C₁ = Guided length in hub bore | S_D = Disassembly space | ΔK_{rHT} = Max. permissible radial misalignment with disc pack HT |
| C₂ = Guided length in hub bore | n_{Sc} = Quantity of screws | |
| E₁ = Distance between hubs | G_{WSB} = Weight at smallest bore diameter | |
| E = Distance between hubs | J_{SB} = Moment of inertia at smallest bore diameter | |
| | C_{TdynHD} = Dynamic torsional stiffness with disc pack HD | |

Ordering example

| Type | Size | Disc pack | Distance between hubs E | Bore diameter d ₁ | Bore diameter d ₂ |
|---------|------|-----------|-------------------------|------------------------------|------------------------------|
| TND VDV | 118 | HD | 140 | 60 | 60 |

Further information on RINGFEDER® TND VDV on www.ringfeder.com

Technical Information

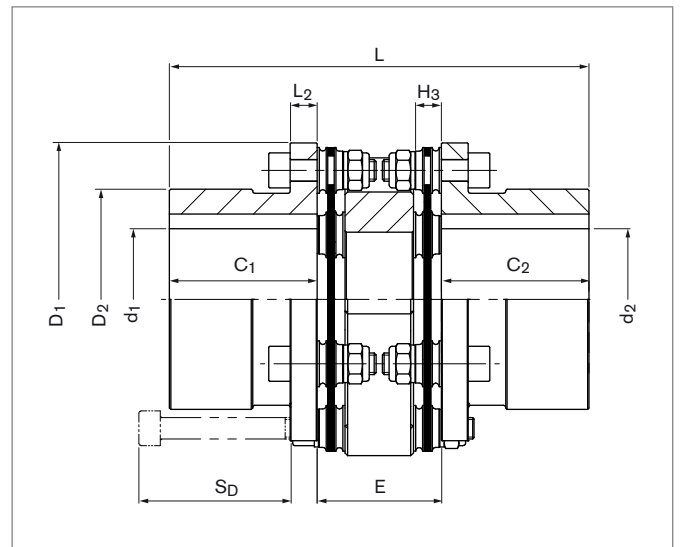
- Without further specifications, we deliver as standard: Bore tolerance H7; Keyway acc. to DIN 6885-1; Keyway width tolerance P9.
- From a peripheral speed of 30 m/s, separate balancing of the individual coupling parts is recommended.
- Without further instructions on balancing, the coupling parts are balanced individually according to DIN 21940-11 in quality G 6,3 at 1,500 1/min. The hubs are balanced half key (before grooving), the spacer without screwed-on disc packs.

Disclaimer of liability

All technical details and notes are non-binding and cannot be used as a basis for legal claims. The user is obligated to determine whether the represented products meet his requirements. We reserve the right to carry out modifications at any time in the interests of technical progress.

Steel Disc Couplings RINGFEDER® TND OCO

Standard Hubs with Open Flange, Double-Jointed,
with Compact-Spacer, Shaft-Hub Connection by Keyway



| Size | T _{KNHD} ¹⁾ | T _{KNHT} ¹⁾ | n _{max} | d _{pre} ³⁾ | d _{1k} ; d _{2k} max ⁴⁾ | C ₁ / C ₂ | E | H ₃ | D ₁ | D ₂ | L ₂ | L | S _D | n _{Sc} |
|------------|---------------------------------|---------------------------------|------------------|--------------------------------|--|---------------------------------|------|----------------|----------------|----------------|----------------|-------|----------------|-----------------|
| OCO | Nm | Nm | 1/min | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | Quantity |
| 47 | 170 | 230 | 8400 | 10 | 32 | 39,5 | 31,2 | 7,5 | 70,5 | 47 | 5 | 110 | 24 | 6 |
| 63 | 320 | 420 | 6800 | 14 | 42 | 45 | 38 | 9 | 88 | 62,5 | 8 | 128 | 32 | 6 |
| 82 | 750 | 1050 | 5400 | 15 | 55 | 55 | 46,5 | 10,5 | 116 | 82 | 10 | 156,5 | 40 | 6 |
| 98 | 1350 | 1750 | 4600 | 19 | 65 | 60 | 55 | 12 | 140,5 | 98 | 11 | 175 | 47 | 6 |

| Size | G _{WSB} ⁶⁾ | J _{SB} ⁶⁾ | C _{TdynHD} | C _{TdynHT} | Max. Permissible Misalignment ⁷⁾ | | | | | |
|------|--------------------------------|-----------------------------------|------------------------|------------------------|---|-------------------|-------------------|-------------------|-------------------|-------------------|
| | | | | | axial | | angular | | radial | |
| OCO | kg | 10 ⁻³ kgm ² | 10 ⁶ Nm/rad | 10 ⁶ Nm/rad | ΔK _{aHD} | ΔK _{aHT} | ΔK _{wHD} | ΔK _{wHT} | ΔK _{rHD} | ΔK _{rHT} |
| 47 | 1,6 | 0,71 | 0,084 | 0,089 | mm | mm | Degrees | Degrees | mm | mm |
| 63 | 3,1 | 2,2 | 0,136 | 0,151 | 0,9 | 0,5 | 2 | 1,4 | 0,3 | 0,2 |
| 82 | 6,7 | 8 | 0,309 | 0,360 | 0,8 | 0,7 | 2 | 1,4 | 0,4 | 0,3 |
| 98 | 10,3 | 18 | 0,569 | 0,607 | 1,4 | 0,6 | 2 | 1,4 | 0,5 | 0,4 |
| | | | | | 2 | 1 | 2 | 1,4 | 0,7 | 0,5 |

1) When selecting the size, it is essential to observe the instructions on coupling dimensioning in the document "Product Paper & Tech Paper RINGFEDER® Steel Disc Couplings". Short-term peak torque T_{kmax} is limited to 1.75 multiples of T_{KN}.

3) Pre-bore has free tolerance.

4) Maximum finished bore with keyways according to DIN 6885-1.

6) Weight and mass moments of inertia for pre-bored hubs.

7) The maximum misalignment values must not apply simultaneously. The instructions on coupling dimensioning in the document "Product Paper & Tech Paper RINGFEDER® Steel Disc Couplings" are to be observed.

To continue see next page

Steel Disc Couplings RINGFEDER® TND OCO

Explanations

| | | |
|---|---|---|
| T_{KNHD} = Nom. transmissible torque with disc pack HD | H₃ = Width of the disc pack | C_{TdynHT} = Dynamic torsional stiffness with disc pack HT |
| T_{KNHT} = Nom. transmissible torque with disc pack HT | D₁ = Max. outer diameter | ΔK_{aHD} = Max. permissible axial misalignment with disc pack HD |
| n_{max} = Max. rotational speed | D₂ = Outer diameter hub | ΔK_{aHT} = Max. permissible axial misalignment with disc pack HT |
| d_{pre} = Diameter pre-bore | L₂ = Hub flange thickness | ΔK_{wHD} = Max. permissible angular misalignment with disc pack HD |
| d_{1kmax} = Max. bore diameter d ₁ with keyway acc. to DIN 6885-1 | L = Total length | ΔK_{wHT} = Max. permissible angular misalignment with disc pack HT |
| d_{2kmax} = Max. bore diameter d ₂ with keyway acc. to DIN 6885-1 | S_D = Disassembly space | ΔK_{rHD} = Max. permissible radial misalignment with disc pack HD |
| C₁ = Guided length in hub bore | n_{Sc} = Quantity of screws | ΔK_{rHT} = Max. permissible radial misalignment with disc pack HT |
| C₂ = Guided length in hub bore | G_{WSB} = Weight at smallest bore diameter | |
| E = Distance between hubs | J_{SB} = Moment of inertia at smallest bore diameter. | |
| | C_{TdynHD} = Dynamic torsional stiffness with disc pack HD | |

Ordering example

| Type | Size | Disc pack | Bore diameter d ₁ | Bore diameter d ₂ |
|---------|------|-----------|------------------------------|------------------------------|
| TND OCO | 98 | HD | 50 | 60 |

Further information on RINGFEDER® TND OCO on www.ringfeder.com

Technical Information

- Without further specifications, we deliver as standard: Bore tolerance H7; Keyway acc. to DIN 6885-1; Keyway width tolerance P9; Set screw per hub.
- From a peripheral speed of 30 m/s, separate balancing of the individual coupling parts is recommended.
- Without further instructions on balancing, the coupling parts are balanced individually according to DIN 21940-11 in quality G 6,3 at 1,500 1/min. The hubs are balanced half key (before grooving), the spacer without screwed-on disc packs.

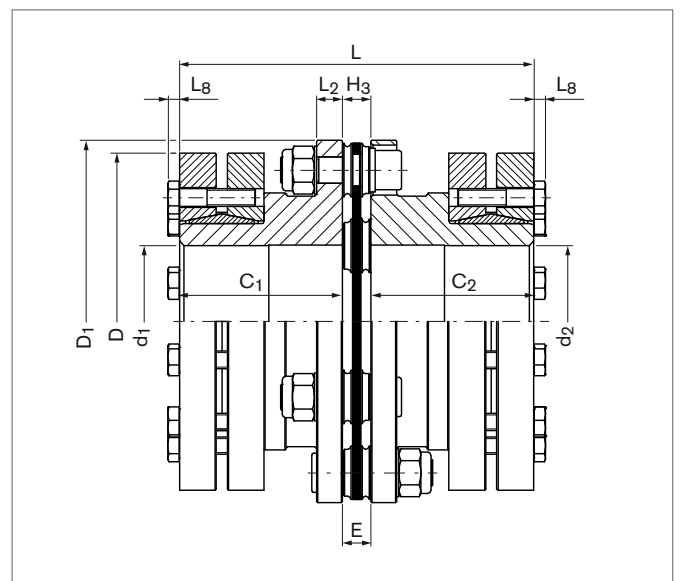
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Steel Disc Couplings

RINGFEDER® TND XSX

Hubs with RINGFEDER® Shrink Discs, Single-Jointed, without Spacer, Shaft-Hub Connection by Shrink Disc



| Size | T _{KNHD} ¹⁾ | T _{KNHT} ¹⁾ | n _{max} | d ₁ ;d ₂ ³⁾ min | d ₁ ;d ₂ ³⁾ max | C ₁ / C ₂ | E | H ₃ | D ₁ | L ₂ | L | n _{Sc} |
|------------|---------------------------------|---------------------------------|------------------|---|---|---------------------------------|------|----------------|----------------|----------------|-------|-----------------|
| XSX | Nm | Nm | 1/min | mm | mm | mm | mm | mm | mm | mm | mm | Quantity |
| 82 | 750 | 1050 | 3600 | 38 | 60 | 55 | 10,5 | 10,5 | 116 | 10 | 120,5 | 6 |
| 98 | 1350 | 1750 | 3600 | 50 | 70 | 60 | 12 | 12 | 140,5 | 11 | 132 | 6 |
| 118 | 2400 | 3000 | 3600 | 50 | 75 | 75 | 13 | 13 | 166,5 | 12 | 163 | 6 |
| 141 | 4000 | 5200 | 3400 | 65 | 95 | 90 | 15 | 15 | 198,5 | 14 | 195 | 6 |
| 169 | 6500 | 8500 | 3000 | 65 | 105 | 125 | 21 | 21 | 238 | 16 | 271 | 6 |
| 205 | 21000 | 26000 | 2500 | 95 | 145 | 160 | 28 | 28 | 295 | 22 | 348 | 8 |
| 254 | 36000 | 44000 | 2100 | 95 | 160 | 200 | 32,5 | 32,5 | 345 | 26 | 432,5 | 8 |

| Size | G _{Wsp} | C _{TdynHD} | C _{TdynHT} | Max. Permissible Misalignment ⁷⁾ | | | | | |
|------|------------------|------------------------|------------------------|---|-------------------|-------------------|-------------------|-------------------|-------------------|
| | | | | axial | | angular | | radial | |
| | kg | 10 ⁶ Nm/rad | 10 ⁶ Nm/rad | ΔK _{aHD} | ΔK _{aHT} | ΔK _{wHD} | ΔK _{wHT} | ΔK _{rHD} | ΔK _{rHT} |
| XSX | | | | mm | mm | Degrees | Degrees | mm | mm |
| 82 | 0,5 | 0,637 | 0,743 | 0,7 | 0,4 | 1 | 0,7 | --- | --- |
| 98 | 0,85 | 1,173 | 1,251 | 1 | 0,6 | 1 | 0,7 | --- | --- |
| 118 | 1,36 | 2 | 2,082 | 1,2 | 0,8 | 1 | 0,7 | --- | --- |
| 141 | 2,096 | 2,992 | 3,142 | 1,4 | 0,8 | 1 | 0,7 | --- | --- |
| 169 | 4,032 | 5,269 | 6,586 | 1,5 | 1,2 | 1 | 0,7 | --- | --- |
| 205 | 10,903 | 21,848 | 22,285 | 1,1 | 0,6 | 0,5 | 0,4 | --- | --- |
| 254 | 18,135 | 37,204 | 37,868 | 1,1 | 0,8 | 0,5 | 0,4 | --- | --- |

1) When selecting the coupling size, it is essential to observe the instructions on coupling dimensioning in the document "Product Paper & Tech Paper RINGFEDER® Steel Disc Couplings". Short-term peak torque T_{kmax} is limited to 1.75 multiples of T_{KN} or by the transmissible torque T of the shrink disc.

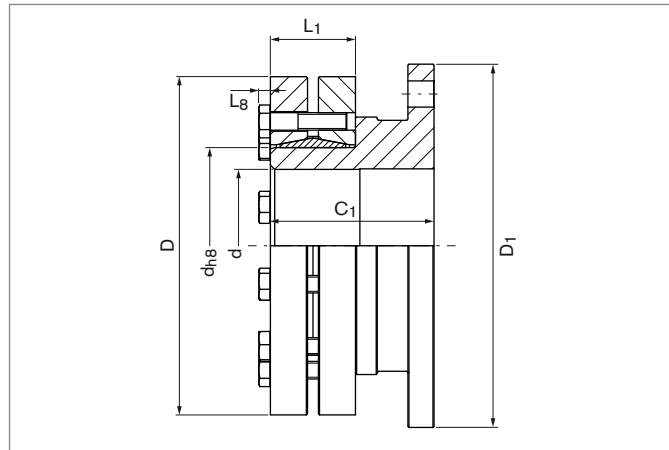
7) The maximum misalignment values must not apply simultaneously. The instructions on coupling dimensioning in the document "Product Paper & Tech Paper RINGFEDER® Steel Disc Couplings" are to be observed.

3) Bore tolerance H6 up to diameter 80 mm; Bore tolerance H7 from diameter 80 mm.

To continue see next page

Steel Disc Couplings RINGFEDER® TND XSX

Shaft-Hub Connection by Shrink Discs RINGFEDER® RfN 4061



| Shrink Discs RINGFEDER® RfN 4061 | | | | | | Sizing RINGFEDER® TND XSX | | | | | | | |
|----------------------------------|---|-----|----------------|----------------|-----|---------------------------|------|----------------|---------------------------------|---------------------------------|---------------------------------|------------------|-----------------------------|
| d _{h8} | x | D | L ₁ | L ₈ | d | T | Size | D ₁ | C ₁ / C ₂ | T _{KNHD} ¹⁾ | T _{KNHT} ¹⁾ | n _{max} | G _{W_{HS}} |
| mm | | mm | mm | mm | mm | Nm | XSX | mm | mm | Nm | Nm | 1/min | kg |
| 50 | x | 90 | 27,5 | 4 | 38 | 1350 | 82 | 116 | 55 | 750 | 1050 | 3600 | 2,3 |
| | | | | | 40 | 1500 | | | | | | | |
| | | | | | 42 | 1700 | | | | | | | |
| 55 | x | 100 | 30,5 | 4 | 42 | 1300 | 82 | 116 | 55 | 750 | 1050 | 3600 | 2,4 |
| | | | | | 45 | 1550 | | | | | | | |
| | | | | | 48 | 1800 | | | | | | | |
| 68 | x | 115 | 30,5 | 4 | 48 | 1700 | 82 | 116 | 55 | 750 | 1050 | 3600 | 2,8 |
| | | | | | 55 | 2250 | | | | | | | |
| | | | | | 60 | 2850 | | | | | | | |
| 75 | x | 138 | 32,5 | 5,3 | 55 | 2650 | 98 | 140,5 | 60 | 1350 | 1750 | 3600 | 4,4 |
| | | | | | 60 | 3300 | | | | | | | |
| | | | | | 65 | 4050 | | | | | | | |
| 80 | x | 145 | 32,5 | 5,3 | 60 | 3200 | 98 | 140,5 | 60 | 1350 | 1750 | 3600 | 4,6 |
| | | | | | 65 | 3900 | | | | | | | |
| | | | | | 70 | 4600 | | | | | | | |
| 90 | x | 155 | 39 | 5,5 | 65 | 4800 | 118 | 166,5 | 75 | 2400 | 3000 | 3600 | 7,2 |
| | | | | | 70 | 6050 | | | | | | | |
| | | | | | 75 | 7300 | | | | | | | |
| 115 | x | 185 | 56 | 6,4 | 75 | 9100 | 141 | 198,5 | 90 | 4000 | 5200 | 3400 | 12,6 |
| | | | | | 90 | 12100 | | | | | | | |
| | | | | | 95 | 14050 | | | | | | | |
| 140 | x | 230 | 60,5 | 7,5 | 95 | 15100 | 169 | 238 | 125 | 6500 | 8500 | 3000 | 24,4 |
| | | | | | 100 | 17550 | | | | | | | |
| | | | | | 105 | 20000 | | | | | | | |
| 165 | x | 290 | 71 | 10 | 105 | 25000 | 205 | 295 | 160 | 21000 | 26000 | 2500 | 48,8 |
| | | | | | 120 | 35500 | | | | | | | |
| | | | | | 125 | 39400 | | | | | | | |
| 185 | x | 330 | 86,4 | 10 | 125 | 43500 | 205 | 295 | 160 | 21000 | 26000 | 2500 | 60,4 |
| | | | | | 140 | 57350 | | | | | | | |
| | | | | | 145 | 62400 | | | | | | | |
| 200 | x | 350 | 86 | 10 | 145 | 69000 | 254 | 345 | 200 | 36000 | 44000 | 2100 | 77,7 |
| | | | | | 155 | 81000 | | | | | | | |
| | | | | | 160 | 87200 | | | | | | | |

The transmissible torque of the coupling is dependent on the selected disc pack as well as the type of the shaft-hub connection. The lower torque limits the transmissibility and must be taken as a basis for the selection of the coupling.

To continue see next page

Steel Disc Couplings RINGFEDER® TND XSX

Explanations

| | | |
|---|--|---|
| T_{KNHD} = Nom. transmissible torque with disc pack HD | L₂ = Hub flange thickness | ΔK_{wHT} = Max. permissible angular misalignment with disc pack HT |
| T_{KNHT} = Nom. transmissible torque with disc pack HT | L = Total length | ΔK_{r,HD} = Max. permissible radial misalignment with disc pack HD |
| n_{max} = Max. rotational speed | n_{Sc} = Quantity of screws | ΔK_{r,HT} = Max. permissible radial misalignment with disc pack HT |
| d_{1min} = Min. bore diameter d ₁ | GW_{sp} = Weight of spacer | |
| d_{2min} = Min. bore diameter d ₂ | GW_{hs} = Weight of hub including shrink disc | |
| d_{1max} = Max. bore diameter d ₁ | C_{TdynHD} = Dynamic torsional stiffness with disc pack HD | |
| d_{2max} = Max. bore diameter d ₂ | C_{TdynHT} = Dynamic torsional stiffness with disc pack HT | |
| C₁ = Guided length in hub bore | ΔK_{a,HD} = Max. permissible axial misalignment with disc pack HD | Shrink Disc Selection |
| C₂ = Guided length in hub bore | ΔK_{a,HT} = Max. permissible axial misalignment with disc pack HT | d_{h8} = Inner diameter |
| E = Distance between hubs | ΔK_{w,HD} = Max. permissible angular misalignment with disc pack HD | D = Outer diameter |
| H₃ = Width of the disc pack | | L₁ = Min. installation length (without screws) |
| D₁ = Max. outer diameter | | L₈ = Overhang length |
| | | d = Solid shaft diameter |
| | | T = Transmissible torque |

Ordering example

| Type | Size | Disc pack | Bore diameter d ₁ | Shrink Disc RfN 4061 for bore diameter d ₁ | Bore diameter d ₂ | Shrink Disc RfN 4061 for bore diameter d ₂ |
|---------|------|-----------|------------------------------|---|------------------------------|---|
| TND XSX | 98 | HD | 50 | 68 x 115 | 60 | 68 x 115 |

Further information on RINGFEDER® TND XSX on www.ringfeder.com

Technical Information

- The specified values for transmissible torques are valid as follows: Shaft tolerance h6 for shaft diameters up to 50 mm; Shaft tolerance g6 for shaft diameters from 50 mm; Surface quality R_a ≤ 3.2 μm.
- From a peripheral speed of 30 m/s, separate balancing of the individual coupling parts is recommended.
- Without further instructions on balancing, the coupling parts are balanced individually according to DIN 21940-11 in quality G 6,3 at 1,500 1/min. The hubs are balanced without screwed-on disc pack.

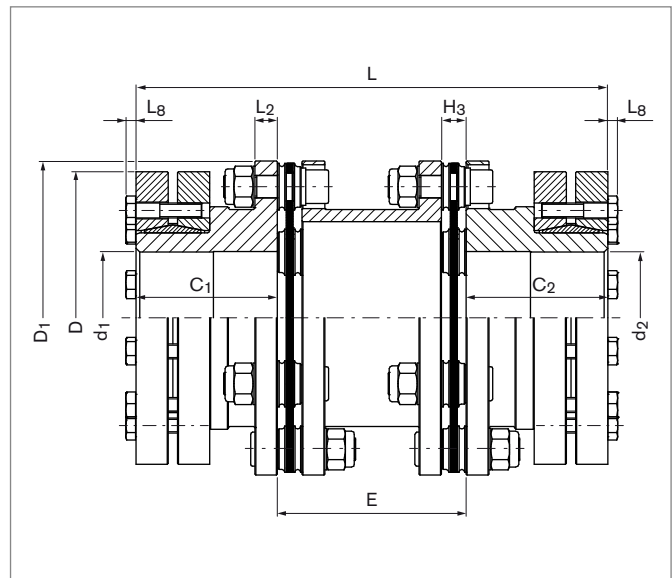
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Steel Disc Couplings

RINGFEDER® TND XDX

Hubs with RINGFEDER® Shrink Discs, Double-Jointed, with Spacer, Shaft-Hub Connection by Shrink Disc



| Size | T _{KNHD} ¹⁾ | T _{KNHT} ¹⁾ | n _{max} ²⁾ | d ₁ ;d ₂ ³⁾ min | d ₁ ;d ₂ ³⁾ max | C ₁ / C ₂ | E ⁵⁾ | H ₃ | D ₁ | L ₂ | L | n _{Sc} | L ₈ |
|------|---------------------------------|---------------------------------|--------------------------------|---|---|---------------------------------|-----------------|----------------|----------------|----------------|-----|-----------------|----------------|
| XDX | Nm | Nm | 1/min | mm | mm | mm | mm | mm | mm | mm | mm | Quantity | mm |
| 82 | 750 | 1050 | 3600 | 38 | 60 | 55 | 100 | 10,5 | 116 | 10 | 210 | 6 | 4 |
| | | | | | | | 140 | | | | 250 | | |
| | | | | | | | 180 | | | | 290 | | |
| 98 | 1350 | 1750 | 3600 | 50 | 70 | 60 | 100 | 12 | 140,5 | 11 | 220 | 6 | 5,3 |
| | | | | | | | 140 | | | | 260 | | |
| | | | | | | | 180 | | | | 300 | | |
| 118 | 2400 | 3000 | 3600 | 50 | 75 | 75 | 100 | 13 | 166,5 | 12 | 250 | 6 | 5,3 |
| | | | | | | | 140 | | | | 290 | | |
| | | | | | | | 180 | | | | 330 | | |
| 141 | 4000 | 5200 | 3400 | 65 | 95 | 90 | 140 | 15 | 198,5 | 14 | 320 | 6 | 7,5 |
| | | | | | | | 180 | | | | 360 | | |
| | | | | | | | 390 | | | | | | |
| 169 | 6500 | 8500 | 3000 | 65 | 105 | 125 | 140 | 21 | 238 | 16 | 430 | 6 | 10 |
| | | | | | | | 180 | | | | 500 | | |
| | | | | | | | 250 | | | | | | |
| 205 | 21000 | 26000 | 2500 | 95 | 145 | 160 | 200 | 28 | 295 | 22 | 520 | 8 | 10 |
| | | | | | | | 250 | | | | 570 | | |
| | | | | | | | 224 | | | | 624 | | |
| 254 | 36000 | 44000 | 2100 | 94 | 160 | 200 | 250 | 32,5 | 345 | 26 | 650 | 8 | 10 |
| | | | | | | | 250 | | | | 700 | | |
| | | | | | | | 300 | | | | | | |

To continue see next page

Steel Disc Couplings RINGFEDER® TND XDX

| Size | E ⁵⁾ | G _{wsp} | C _{Tdyn} | | Max. Permissible Misalignment ⁷⁾ | | | | | | |
|------|-----------------|------------------|------------------------|------------------------|---|--------------------|--------------------|--------------------|--------------------|--------------------|-----|
| | | | HD | HT | axial | | angular | | radial | | |
| XDX | mm | kg | 10 ⁶ Nm/rad | 10 ⁶ Nm/rad | ΔK _a HD | ΔK _a HT | ΔK _w HD | ΔK _w HT | ΔK _r HD | ΔK _r HT | |
| | | | | | mm | mm | Degrees | Degrees | mm | mm | |
| 82 | 100 | 1,991 | 0,271 | 0,308 | 1,4 | 0,8 | 2 | 1,4 | 1,4 | 1,1 | |
| | 140 | 2,289 | 0,246 | 0,277 | | | | | | | 2,1 |
| | 180 | 2,586 | 0,226 | 0,251 | | | | | | | 2,8 |
| | Δ per 100 mm | 0,74 | 1,06 | | | | | | | | |
| 98 | 100 | 3,188 | 0,513 | 0,543 | 2 | 1,2 | 2 | 1,4 | 2,1 | 1,5 | |
| | 140 | 3,627 | 0,469 | 0,494 | | | | | | | 2,8 |
| | 180 | 4,066 | 0,433 | 0,454 | | | | | | | |
| | Δ per 100 mm | 1,09 | 2,18 | | | | | | | | |
| 118 | 100 | 4,874 | 0,914 | 0,948 | 2,4 | 1,6 | 2 | 1,4 | 2,1 | 1,5 | |
| | 140 | 5,574 | 0,855 | 0,884 | | | | | | | 2,8 |
| | 180 | 6,275 | 0,803 | 0,829 | | | | | | | |
| | Δ per 100 mm | 1,74 | 5,24 | | | | | | | | |
| 141 | 140 | 7,944 | 1,306 | 1,362 | 2,8 | 1,6 | 2 | 1,4 | 2,7 | 2 | |
| | 180 | 8,718 | 1,229 | 1,279 | | | | | | | |
| | Δ per 100 mm | 1,92 | 8,3 | | | | | | | | |
| 169 | 140 | 14,179 | 2,467 | 3,035 | 3 | 2,4 | 2 | 1,4 | 2,6 | 1,9 | |
| | 180 | 15,757 | 2,375 | 2,898 | | | | | | | 3,8 |
| | 250 | 18,520 | 2,231 | 2,686 | | | | | | | |
| | Δ per 100 mm | 3,92 | 25,36 | | | | | | | | |
| 205 | 200 | 32,689 | 8,995 | 9,142 | 2,2 | 1,2 | 1 | 0,8 | 1,8 | 1,5 | |
| | 250 | 35,489 | 8,265 | 8,389 | | | | | | | |
| | Δ per 100 mm | 5,56 | 50,3 | | | | | | | | |
| 254 | 224 | 54,420 | 14,975 | 15,19 | 2,2 | 1,6 | 1 | 0,8 | 1,8 | 1,3 | |
| | 250 | 56,404 | 14,302 | 14,497 | | | | | | | |
| | 300 | 60,22 | 13,163 | 13,328 | | | | | | | |
| | Δ per 100 mm | 7,58 | 81,63 | | | | | | | | |

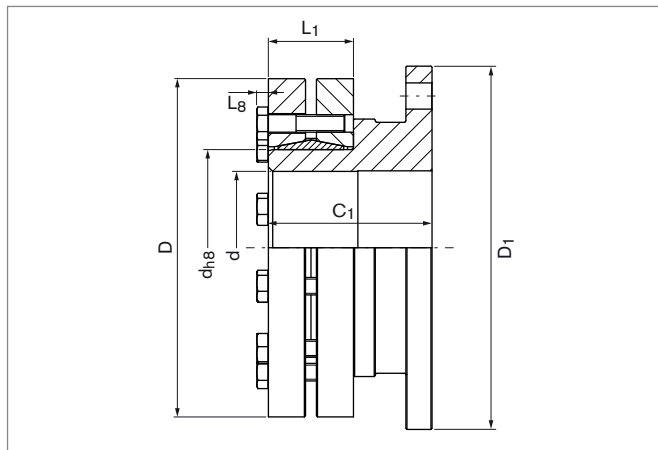
1) When selecting the coupling size, it is essential to observe the instructions on coupling dimensioning in the document "Product Paper & Tech Paper RINGFEDER® Steel Disc Couplings". Short-term peak torque T_{kmax} is limited to 1.75 multiples of T_{KN} or by the transmissible torque T of the shrink disc.
 2) For longer spacers, check bending critical rotational speed.
 3) Bore tolerance H6 up to diameter 80 mm; Bore tolerance H7 from diameter 80 mm.

5) Longer spacers on request. The figures given at "Δ per 100 mm" for G_{wsp}, C_{Tdyn}HD and C_{Tdyn}HT are approximate values.
 7) The maximum misalignment values must not apply simultaneously. The instructions on coupling dimensioning in the document "Product Paper & Tech Paper RINGFEDER® Steel Disc Couplings" are to be observed.

To continue see next page

Steel Disc Couplings RINGFEDER® TND XDX

Shaft-Hub Connection by Shrink Discs RINGFEDER® RfN 4061



| Shrink Discs RINGFEDER® RfN 4061 | | | | | | Sizing RINGFEDER® TND XDX | | | | | | | |
|----------------------------------|---|-----|------|-----|-----|---------------------------|------|-------|---------|----------------------|----------------------|------------------|------------------|
| dh8 | x | D | L1 | L8 | d | T | Size | D1 | C1 / C2 | T _{KNHD} 1) | T _{KNHT} 1) | n _{max} | GW _{HS} |
| mm | | mm | mm | mm | mm | Nm | XDX | mm | mm | Nm | Nm | 1/min | kg |
| 50 | x | 90 | 27,5 | 4 | 38 | 1350 | 82 | 116 | 55 | 750 | 1050 | 3600 | 2,3 |
| | | | | | 40 | 1500 | | | | | | | |
| | | | | | 42 | 1700 | | | | | | | |
| 55 | x | 100 | 30,5 | 4 | 42 | 1300 | 82 | 116 | 55 | 750 | 1050 | 3600 | 2,4 |
| | | | | | 45 | 1550 | | | | | | | |
| | | | | | 48 | 1800 | | | | | | | |
| 68 | x | 115 | 30,5 | 4 | 48 | 1700 | 82 | 116 | 55 | 750 | 1050 | 3600 | 2,8 |
| | | | | | 55 | 2250 | | | | | | | |
| | | | | | 60 | 2850 | | | | | | | |
| 75 | x | 138 | 32,5 | 5,3 | 55 | 2650 | 98 | 140,5 | 60 | 1350 | 1750 | 3600 | 3,6 |
| | | | | | 60 | 4050 | | | | | | | |
| | | | | | 65 | 4600 | | | | | | | |
| 80 | x | 145 | 32,5 | 5,3 | 60 | 3200 | 98 | 140,5 | 60 | 1350 | 1750 | 3600 | 4,6 |
| | | | | | 65 | 3900 | | | | | | | |
| | | | | | 70 | 4600 | | | | | | | |
| 90 | x | 155 | 39 | 5,5 | 65 | 4800 | 118 | 166,5 | 75 | 2400 | 3000 | 3600 | 7,2 |
| | | | | | 70 | 6050 | | | | | | | |
| | | | | | 75 | 7300 | | | | | | | |
| 115 | x | 185 | 56 | 6,4 | 75 | 9100 | 141 | 198,5 | 90 | 4000 | 5200 | 3400 | 12,6 |
| | | | | | 90 | 12100 | | | | | | | |
| | | | | | 95 | 14050 | | | | | | | |
| 140 | x | 230 | 60,5 | 7,5 | 95 | 15100 | 169 | 238 | 125 | 6500 | 8500 | 3000 | 24,4 |
| | | | | | 100 | 17550 | | | | | | | |
| | | | | | 105 | 20000 | | | | | | | |
| 165 | x | 290 | 71 | 10 | 105 | 25000 | 205 | 295 | 160 | 21000 | 26000 | 2500 | 48,8 |
| | | | | | 120 | 35500 | | | | | | | |
| | | | | | 125 | 39400 | | | | | | | |
| 185 | x | 330 | 86,4 | 10 | 125 | 43500 | 205 | 295 | 160 | 21000 | 26000 | 2500 | 60,4 |
| | | | | | 140 | 57350 | | | | | | | |
| | | | | | 145 | 62400 | | | | | | | |
| 200 | x | 350 | 86 | 10 | 145 | 69000 | 254 | 345 | 200 | 36000 | 44000 | 2100 | 77,7 |
| | | | | | 155 | 81000 | | | | | | | |
| | | | | | 160 | 87200 | | | | | | | |

The transmissible torque of the coupling is dependent on the selected disc pack as well as the type of the shaft-hub connection. The lower torque limits the transmissibility and must be taken as a basis for the selection of the coupling.

To continue see next page

Steel Disc Couplings RINGFEDER® TND XDX

Explanations

| | | |
|--|--|--|
| T_{KNHD} = Nom. transmissible torque with disc pack HD | L_2 = Hub flange thickness | ΔK_{wHT} = Max. permissible angular misalignment with disc pack HT |
| T_{KNHT} = Nom. transmissible torque with disc pack HT | L = Total length | $\Delta K_r, HD$ = Max. permissible radial misalignment with disc pack HD |
| n_{max} = Max. rotational speed | n_{Sc} = Quantity of screws | $\Delta K_r, HT$ = Max. permissible radial misalignment with disc pack HT |
| d_{1min} = Min. bore diameter d_1 | L_8 = Overhang length | |
| d_{2min} = Min. bore diameter d_2 | GW_{sp} = Weight of spacer | |
| d_{1max} = Max. bore diameter d_1 | GW_{hs} = Weight of hub including shrink disc | |
| d_{2max} = Max. bore diameter d_2 | C_{TdynHD} = Dynamic torsional stiffness with disc pack HD | Shrink Disc Selection |
| C_1 = Guided length in hub bore | C_{TdynHT} = Dynamic torsional stiffness with disc pack HT | d_{h8} = Inner diameter |
| C_2 = Guided length in hub bore | $\Delta K_a, HD$ = Max. permissible axial misalignment with disc pack HD | D = Outer diameter |
| E = Distance between hubs | $\Delta K_a, HT$ = Max. permissible axial misalignment with disc pack HT | L_1 = Min. installation length (without screws) |
| H_3 = Width of the disc pack | $\Delta K_w, HD$ = Max. permissible angular misalignment with disc pack HD | L_8 = Overhang length |
| D_1 = Max. outer diameter | | d = Solid shaft diameter |
| | | T = Transmissible torque |

Ordering example

| Type | Size | Disc pack | Distance between hubs E | Bore diameter d_1 | Shrink Disc RfN 4061 for bore diameter d_1 | Bore diameter d_2 | Shrink Disc RfN 4061 for bore diameter d_2 |
|---------|------|-----------|-------------------------|---------------------|--|---------------------|--|
| TND XDX | 98 | HD | 100 | 50 | 68 x 115 | 60 | 68 x 115 |

Further information on RINGFEDER® TND XDX on www.ringfeder.com

Technical Information

- The specified values for transmissible torques are valid as follows: Shaft tolerance h6 for shaft diameters up to 50 mm; Shaft tolerance g6 for shaft diameters from 50 mm; Surface quality $R_a \leq 3.2 \mu m$.
- From a peripheral speed of 30 m/s, separate balancing of the individual coupling parts is recommended.
- Without further instructions on balancing, the coupling parts are balanced individually according to DIN 21940-11 in quality G 6,3 at 1,500 1/min. The hubs and the spacer are balanced without screwed-on disc packs.

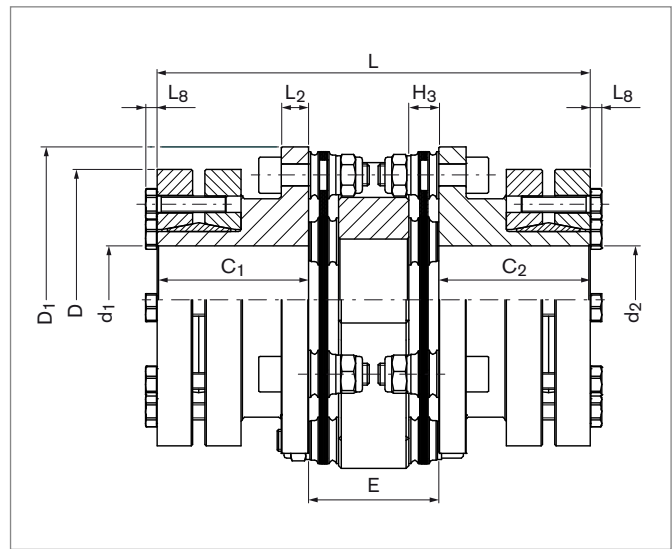
Disclaimer of liability

All technical details and notes are non-binding and cannot be used as a basis for legal claims. The user is obligated to determine whether the represented products meet his requirements. We reserve the right to carry out modifications at any time in the interests of technical progress.

Steel Disc Couplings

RINGFEDER® TND QCQ

Hubs with Open Flange and RINGFEDER® Shrink Discs, Double-Jointed, with Compact-Spacer, Shaft-Hub Connection by Shrink Disc



| Size | $T_{KNHD}^{1)}$ | $T_{KNHT}^{1)}$ | n_{max} | $d_1; d_2^{3)}$ min | $d_1; d_2^{3)}$ max | C_1 / C_2 | E | H_3 | D_1 | L_2 | L | n_{Sc} | L_8 |
|------------|-----------------|-----------------|-----------|------------------------|------------------------|-------------|------|-------|-------|-------|-------|----------|-------|
| QCQ | Nm | Nm | 1/min | mm | mm | mm | mm | mm | mm | mm | mm | Quantity | mm |
| 82 | 750 | 1050 | 3600 | 38 | 65 | 55 | 46,5 | 10,5 | 116 | 10 | 156,5 | 6 | 5,3 |
| 98 | 1350 | 1750 | 3600 | 50 | 70 | 60 | 55 | 12 | 140,5 | 11 | 175 | 6 | 5,3 |

| Size | G_{Wsp} | C_{TdynHD} | C_{TdynHT} | Max. Permissible Misalignment ⁷⁾ | | | | | |
|------------|-----------|---------------|---------------|---|----------------|----------------|----------------|----------------|----------------|
| | | | | axial | | angular | | radial | |
| | kg | 10^6 Nm/rad | 10^6 Nm/rad | ΔK_aHD | ΔK_aHT | ΔK_wHD | ΔK_wHT | ΔK_rHD | ΔK_rHT |
| QCQ | | | | mm | mm | Degrees | Degrees | mm | mm |
| 82 | 1,8 | 0,309 | 0,360 | 1,4 | 0,6 | 2 | 1,4 | 0,5 | 0,4 |
| 98 | 2,9 | 0,569 | 0,607 | 2 | 1 | 2 | 1,4 | 0,7 | 0,5 |

1) When selecting the coupling size, it is essential to observe the instructions on coupling dimensioning in the document "Product Paper & Tech Paper RINGFEDER® Steel Disc Couplings". Short-term peak torque T_{kmax} is limited to 1.75 multiples of T_{KN} or by the transmissible torque T of the shrink disc.

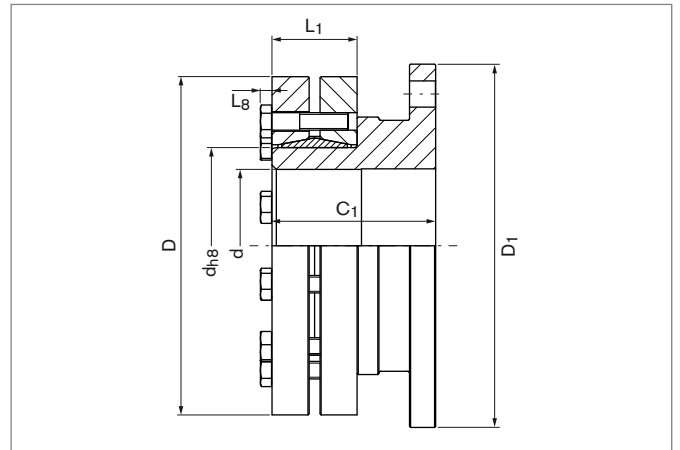
3) Bore tolerance H6 up to diameter 80 mm; Bore tolerance H7 from diameter 80 mm.

7) The maximum misalignment values must not apply simultaneously. The instructions on coupling dimensioning in the document "Product Paper & Tech Paper RINGFEDER® Steel Disc Couplings" are to be observed.

To continue see next page

Steel Disc Couplings RINGFEDER® TND QCQ

Shaft-Hub Connection by Shrink Discs RINGFEDER® RfN 4061



| Shrink Discs RINGFEDER® RfN 4061 | | | | | | Sizing RINGFEDER® TND QCQ | | | | | | | |
|----------------------------------|---|-----|------|-----|----|---------------------------|------|-------|---------|---------------------------------|---------------------------------|------------------|------------------|
| dh8 | x | D | L1 | L8 | d | T | Size | D1 | C1 / C2 | T _{KNHD} ¹⁾ | T _{KNHT} ¹⁾ | n _{max} | G _{whs} |
| mm | | mm | mm | mm | mm | Nm | QCQ | mm | mm | Nm | Nm | 1/min | kg |
| 50 | x | 90 | 27,5 | 4 | 38 | 1350 | 82 | 116 | 55 | 750 | 1050 | 3600 | 2,2 |
| | | | | | 40 | 1500 | | | | | | | |
| | | | | | 42 | 1700 | | | | | | | |
| 55 | x | 100 | 30,5 | 4 | 42 | 1300 | 82 | 116 | 55 | 750 | 1050 | 3600 | 2,3 |
| | | | | | 45 | 1550 | | | | | | | |
| | | | | | 48 | 1800 | | | | | | | |
| 68 | x | 115 | 30,5 | 4 | 48 | 1700 | 82 | 116 | 55 | 750 | 1050 | 3600 | 2,7 |
| | | | | | 55 | 2250 | | | | | | | |
| | | | | | 60 | 2850 | | | | | | | |
| 75 | x | 138 | 32,5 | 5,3 | 55 | 2650 | 98 | 140,5 | 60 | 1350 | 1750 | 3600 | 4,2 |
| | | | | | 60 | 3300 | | | | | | | |
| | | | | | 65 | 4050 | | | | | | | |
| 80 | x | 145 | 32,5 | 5,3 | 60 | 3200 | 98 | 140,5 | 60 | 1350 | 1750 | 3600 | 4,4 |
| | | | | | 65 | 3900 | | | | | | | |
| | | | | | 70 | 4600 | | | | | | | |

The transmissible torque of the coupling is dependent on the selected disc pack as well as the type of the shaft-hub connection. The lower torque limits the transmissibility and must be taken as a basis for the selection of the coupling.

To continue see next page

Steel Disc Couplings RINGFEDER® TND QCQ

Explanations

| | | |
|---|---|---|
| T_{KNHD} = Nom. transmissible torque with disc pack HD | L₂ = Hub flange thickness | ΔK_{wHT} = Max. permissible angular misalignment with disc pack HT |
| T_{KNHT} = Nom. transmissible torque with disc pack HT | L = Total length | ΔK_{rHD} = Max. permissible radial misalignment with disc pack HD |
| n_{max} = Max. rotational speed | n_{Sc} = Quantity of screws | ΔK_{rHT} = Max. permissible radial misalignment with disc pack HT |
| d_{1min} = Min. bore diameter d ₁ | L_g = Overhang length | |
| d_{2min} = Min. bore diameter d ₂ | G_{wsp} = Weight of spacer | |
| d_{1max} = Max. bore diameter d ₁ | G_{whs} = Weight of hub including shrink disc | |
| d_{2max} = Max. bore diameter d ₂ | C_{TdynHD} = Dynamic torsional stiffness with disc pack HD | Shrink Disc Selection |
| C₁ = Guided length in hub bore | C_{TdynHT} = Dynamic torsional stiffness with disc pack HT | d_{hb} = Inner diameter |
| C₂ = Guided length in hub bore | ΔK_{aHD} = Max. permissible axial misalignment with disc pack HD | D = Outer diameter |
| E = Distance between hubs | ΔK_{aHT} = Max. permissible axial misalignment with disc pack HT | L₁ = Min. installation length (without screws) |
| H₃ = Width of the disc pack | ΔK_{wHD} = Max. permissible angular misalignment with disc pack HD | L_g = Overhang length |
| D₁ = Max. outer diameter | | d = Solid shaft diameter |
| | | T = Transmissible torque |

Ordering example

| Type | Size | Disc pack | Bore diameter d ₁ | Shrink Disc RfN 4061 for bore diameter d ₁ | Bore diameter d ₂ | Shrink Disc RfN 4061 for bore diameter d ₂ |
|---------|------|-----------|------------------------------|---|------------------------------|---|
| TND QCQ | 98 | HD | 50 | 68 x 115 | 60 | 68 x 115 |

Further information on RINGFEDER® TND QCQ on www.ringfeder.com

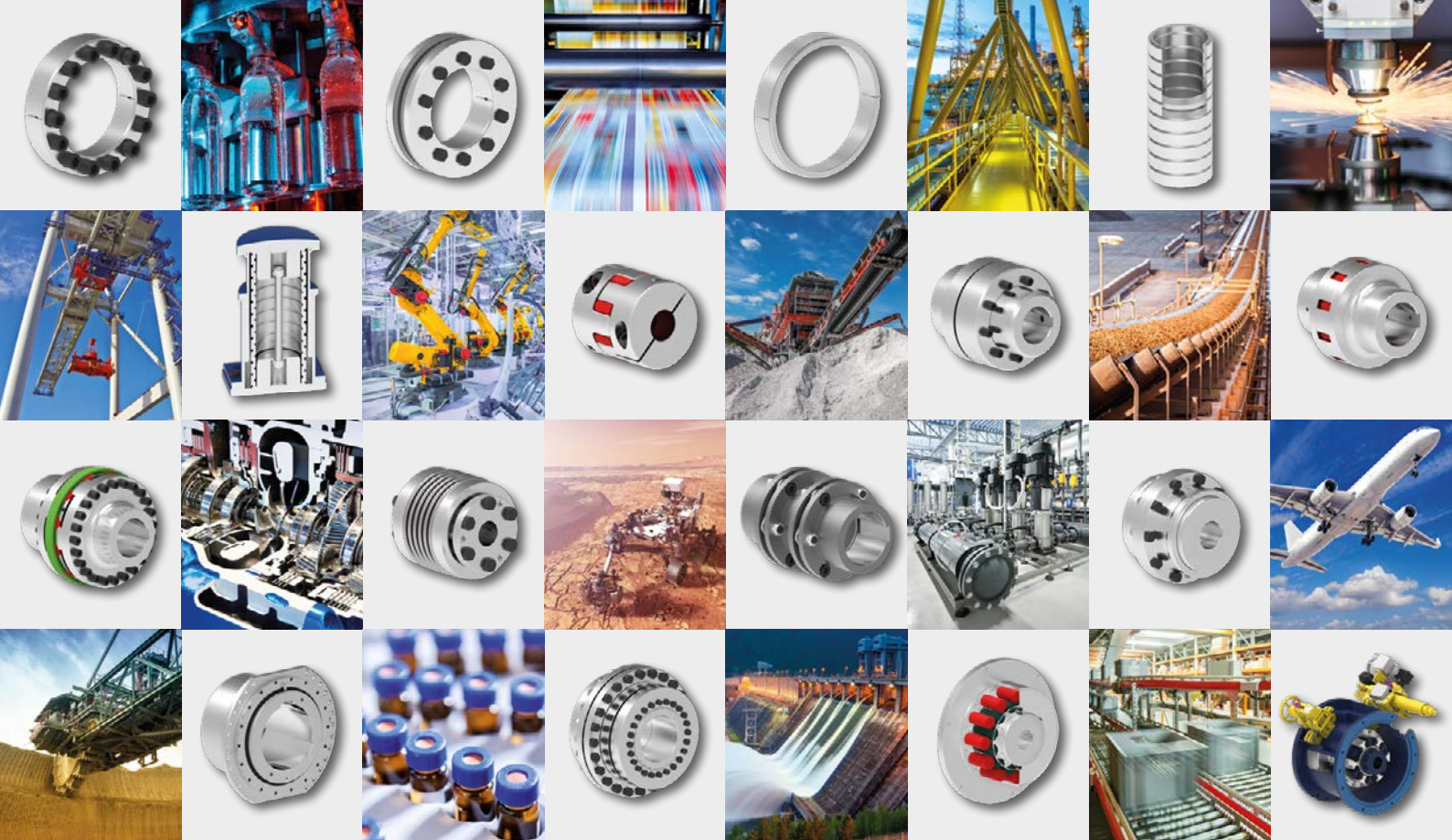
Technical Information

- The specified values for transmissible torques are valid as follows: Shaft tolerance h6 for shaft diameters up to 50 mm; Shaft tolerance g6 for shaft diameters from 50 mm; Surface quality R_a ≤ 3.2 μm.
- From a peripheral speed of 30 m/s, separate balancing of the individual coupling parts is recommended.
- Without further instructions on balancing, the coupling parts are balanced individually according to DIN 21940-11 in quality G 6,3 at 1,500 1/min. The hubs and the spacer are balanced without screwed-on disc packs.

Disclaimer of liability

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