RENK coupling solutions.

Technical design catalogue

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Maximum passion and reliability, precision and quality commitment in manufacturing: This makes RENK a leading specialist in pioneering solutions for controlling extreme forces troughout the drivetrain in industrial applications, power generation, demanding maritime applications and in tracked vehicles. The result is innovative products and solutions that set standards when it comes to quality, precision, and reliability and represent the cutting edge of technology on the worldwide market. Uncompromising expertise and our focus on holistic solutions ensure success in every project.

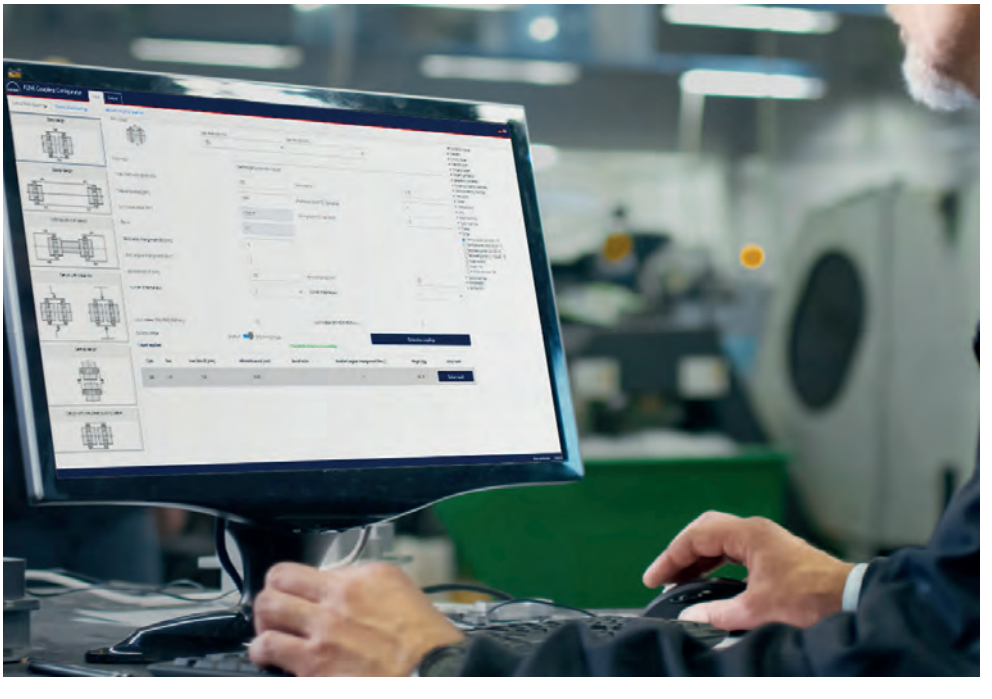
Our drive: Coupling solutions that will impress you.

Comprehensive information on our products, highly detailed and clearly presented. That is our claim for this catalogue.

The catalogue is divided into two parts: The first part contains general information on couplings and general aspects such as balancing, explosion protection and other topics. The second part contains the classic catalogue information. Here you will find RENK's different couplings and series as well as essential information on their design and other specifics that you need in order to select your coupling.

This catalogue is only available in digital format. This allows us to keep information up to date and to add to it.

RENK coupling solutions will impress you with their high power density, long service life and a large number of available combinations.



RENK coupling configurator.
The RENK coupling configurator allows you to quickly and easily find the ideal coupling to suit your needs. Based on just a few details about your application, you will receive the most important information about your coupling directly in the form of a technical data sheet and a 3D model.

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www.renk-group.com/goto/cc-c145d6


RENK

Intelligent coupling solutions for all application.

RENK offers gear unit and coupling solutions for customers all over the world. We offer a range of coupling solutions; this range is one of the most comprehensive in the world, and these couplings are used in a wide variety of industries. The large number of series and variants offers our customers the greatest possible freedom in choosing the right solution for their needs – even for highly complex applications and under extreme conditions.

RENK couplings will impress you with their high power density, long service life and a large number of available combinations.

No compromises when it comes to meeting customer requirements – this is the principle, which guides us throughout the entire life cycle of a product. RENK relies on experts with many years of experience, a high capacity for innovation and a broad level of practical knowledge. This applies to the entire process from the first consultation to product development, production and quality management. After delivery of the product, RENK Service is there for you during your assembly and throughout the product's service life.

Our claim.
Cutting-edge innovative technology from which our customers can benefit directly.

Our approach.
Intensive research and development work as the key for innovative products.

Our results.
State-of-the-art technology and directly associated customer-optimised advice.

RENK couplings at a glance.

Gear couplings – Basic series

SB, SBk, LBk

RENK has been building its range of gear couplings since they were patented in 1939. Today, this range is the most comprehensive in the world. Even when it comes to highly complex or extreme requirements: Our customers benefit from the resulting wide range of available applications

Gear couplings – High-speed series

ZTK, THB, TSB

With the gear couplings in the high-speed series, RENK is able to offer its customers extremely high-quality and powerful solutions for the transmission of high torques at the greatest speeds.

RAFLEX® flexible disk couplings – High-speed series

DTM, DTR

The high-speed series is specifically intended for high-speed applications such as turbines and compressors. Variable modifications can be made to the different designs depending on customer requirements.

HYGUARD® safety couplings

BW, BWL, HDW

HYGUARD® safety couplings are characterised by high power densities at the greatest speeds. With the right design, it is possible to use HYGUARD® safety couplings in order to reduce the size of components and thus achieve overall savings.

Diaphragm couplings – High-speed series

MCM, MCMD

Diaphragm couplings are developed individually for applications with the highest requirements. They enable the highest power to be transmitted with maximum axial displacement and at the same time impress with their low weight and the fact they are maintenance-free. The diaphragm coupling is the first choice for use in high-speed and rotor-dynamic critical applications.

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1 Technical information

1.1 Shaft-hub connection

1

RENK couplings can be designed with all common types of shaft-hub connections. Key connections to DIN 6885 are the most frequently used types of connection, followed by shrink-fit connections.

The nominal coupling torques given in the dimension tables do not always apply to the shaft-hub connection. Proof of strength must always be provided for the shaft-hub connection. To do this, check the connection using a calculation method that corresponds to the current state of the art.

When calculating the shaft-hub connection, consider not only the nominal system torque but also the additional stresses such as shock or short-circuit torques.

1.1.1 Maximum permissible bore diameter

The maximum bore diameters specified in the dimension tables in this catalogue apply exclusively to key connections with keys according to DIN 6885- 1.

A proof of strength is required for different types of key connections or other types of connections. RENK is always available to answer any questions you may have.

1.1.2 Fitted key connections

Fitted key connections with a transition fit do not have to be secured axially. Only if there is slight play in the connection must it be axially secured with a locking screw or a retaining plate. This is not included in the scope of delivery and may have to be ordered separately.

Bore	F7	H7	J7	K7	M7	P7
Shaft	s6	p6	n6	m6	k6	h6

Tab. 1: Recommended tolerances for fitted key connections

Hub keyway width tolerance	Features
P9	1 feather key, for rough and/or reversing operation
JS9	1 feather key, only slight shocks
JS9	2 feather keys, facilitates assembly/disassembly

Tab. 2: Recommended tolerances for the hub keyway width

A transition fit between the shaft and the bore prevents the hub tilting on the shaft and fretting corrosion caused by micro-movements. You can find fitting recommendations for various shaft tolerances in the Tab. 1.

For applications at high speeds, you must take into account the expansion of the hub under speed when selecting the tolerances.

A tolerance recommendation for the hub keyway width can be found in Tab. 2.

1.1.3 Pre-bored couplings

When storing replacement couplings, it is advisable to purchase pre-bored couplings. This gives you more flexibility when replacing damaged couplings. Depending on the series, you can order the couplings with pre-bored hubs or flanges.

With pre-bored couplings, note that you are responsible for the selection and design of the shaft-hub connection. Also note that the maximum allowable bore (see chapter 1.1.1) must not be exceeded by the rework.

For interference fits in gear couplings you must make allowance for expansion in the tooth tip. Depending on the oversize of the connection, the tooth tip or the centring of the flange must be reworked. In such cases, please contact RENK.

1.2 Shaft offsets

One of the primary roles of a compliant coupling is to compensate for errors in machine alignment. It is relatively impractical to align machines so precisely that in all operating states the shafts run in alignment. In the event of misalignment, a rigid connection puts a considerable strain on the bearings of the machine.

Shaft offsets are made up of errors in alignment and additional displacements that are unavoidable during operation. These include thermal expansion, shaft deflection or shifts in the foundations.

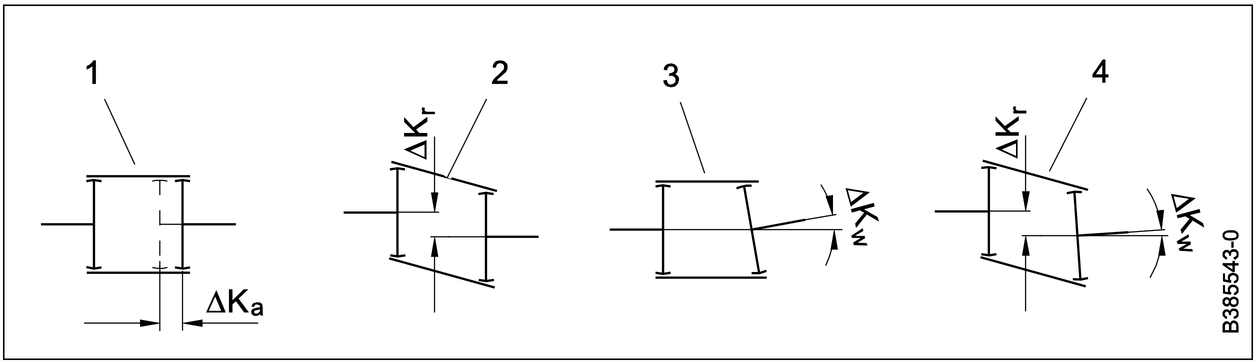


Fig. 1: Shaft displacements

Key

1 Axial offset
2 Radial offset
3 Angular offset
4 Radial and angular offset

In the case of shaft offsets, a distinction is made between axial, radial and angular offset (see Fig. 1).

Torsionally rigid and flexible couplings can compensate for axial and radial as well as angular offsets. In practice, the offsets usually occur in combination.

The gear coupling is always the first choice when high offsets have to be compensated. Due to modifications to the tooth geometry and the tooth clearance, gear couplings are suitable for angular offsets of up to 6 degrees.

Appropriately designed gear couplings can accept without problems not only large angular offsets but also large axial offsets due for example to thermal expansion.

Where a gear coupling is installed, do not align the shafts of the machines too precisely. A slight displacement improves the lubrication of the toothing and increases the service life of the gear coupling. Information on the minimum displacement can be found in the associated operating instructions.

RAFLEX® flexible disk couplings and also diaphragm couplings can usually compensate only for slight displacements. In these couplings, displacements are compensated for by elastic deformation of the flexible elements. It is advisable to align the system as precisely as possible. The known thermal expansion characteristics of the machines should be taken into account when aligning them.

HYGUARD® safety couplings cannot compensate for displacements; an additional flexible coupling must be used to achieve this.

Information on the maximum displacement capacities can be found in the corresponding chapters on the couplings. Recommendations for aligning the couplings can be found in the associated operating instructions.

1.3 Axial clearance limiter

In the drive trains of larger machines, electric motors without fixed bearings are usually used. Here, the machine or a gearbox takes over the axial guidance of the motor shaft. The guide is intended to prevent the motor shaft hitting the axial collars of the floating bearings when the motor is switched off and potentially damaging them.

When the motor is running, the motor shaft is guided at its magnetic centre by the magnetic field of the motor.

So that the machine can take over the axial guidance, the coupling must be limited in its axial displacement.

When the gear couplings are used, the axial clearance is limited by installing a **retaining ring**. This guides the outer part of the coupling in relation to the two hubs.

When RAFLEX® flexible disk couplings and diaphragm couplings are used, the guidance is provided by the flexible elements. As a rule, these elements are sufficiently stiff axially, and the non-linear stiffness prevents large displacement.

The dimension tables of the series or the dimension sheets of the respective coupling indicate the values of the axial stiffness and the axial force.

When aligning the machines, make sure that the motor shaft is positioned precisely. When the motor is running, it must run in the magnetic centre without causing axial movement of the coupling.

Couplings which have axial clearance limitation are unsuitable for the transmission of large axial forces. In these cases, special designs must be used.

1.4 Balancing

Unbalances arise because the component's centre of mass is not at the axis of rotation. This eccentricity creates a centrifugal force that can cause the system to vibrate.

The centrifugal force, also known as the unbalance force, places a load on the adjacent machine bearings and on the coupling itself. It causes increased wear as well as vibration and noise.

Unbalances can restrict the service life of the coupling and system.

Even with today's ultra-modern and highly precise manufacturing machines, it is not technically practical to produce components that have zero unbalance. Deviations in shape and position on the individual components, offsets at the assembly interfaces, distortions due to heat treatment, inhomogeneous material density and differences in the weights of the attached small parts such as nuts and bolts can be the cause of unbalances.

The requirements for the balancing quality level of the components are dependent primarily on the type of machine and system, as well as on the sensitivity of the system to any unbalances that might arise. The operating speed of the system plays a major role here. A high-speed system usually places much higher demands on the balance quality level of the components than a low-speed system.

Guide values for balancing quality levels of typical rotors can be found in DIN ISO 21940-11.

Other guidelines such as API 671, ISO 10441 and AGMA 9110 define the balancing quality only in terms of the eccentricity of the centre of gravity. This information enables a direct reference to the quality of the rotor with regard to the causes mentioned above. In order to determine the resulting balancing quality level according to DIN ISO 21940, the eccentricity must be multiplied by the corresponding speed.

When balancing the rotors or the couplings, a rigid rotor is assumed, which behaves almost identically at every speed up to the maximum operating speed. This means that balancing can be carried out even on a low-speed basis at a lower speed. The unbalance is corrected by adding or removing material in one or more compensation planes.

Balancing is performed after the last mechanical machining of the component or assembly. The key connection with a key is an exception (see chapter 1.4.2).

Both individual parts and assemblies are balanced. The assembly position of the components is permanently marked so that the balancing quality level is guaranteed even after reassembly.

Only some coupling series permit balancing of the complete coupling. Gear couplings are generally not balanced in the assembled state.

Fastening elements such as nuts or bolts are made with the same weight in sets. Therefore the connecting elements can be replaced in sets without affecting the balance quality level.

1.4.1 Components with one or two compensation planes

Disc-shaped components or assemblies are balanced in one compensation plane. The balancing process can be carried out on both a rotating and a non-rotating basis.

In the case of long rod-shaped components or assemblies, balancing takes place in two or more planes. This ensures that the torque unbalance is also reduced.

The geometry of the component is critical for the selection of the process. The length-to-diameter ratio can be used here as a rough guide. Balancing in one compensation plane is practicable for components or assemblies with a ratio of 1.0 or less. If the ratio is greater than 1.0, two or more compensation planes are used.

Balancing in one compensation plane is also known as "static" balancing, balancing with two or more compensation planes as "dynamic" balancing.

1.4.2 Convention "half feather key"

In ISO 21940- 32 it is specified that the convention "half feather key" is to be used. For coupling components, this means that balancing takes place before the keyway is made.

RENK implements this convention as standard for feather key connections with a feather key.

Any deviation from this must be specified on the order!

1.4.3 Balancing quality level

The balancing quality of the RENK couplings is indicated by the maximum eccentricity of the centre of gravity. Using the operating speed, this can then be converted into a balancing quality level according to DIN ISO 21940 and vice versa. By balancing the individual components, the overall result of the coupling can be improved to a certain extent. A further improvement can be achieved by balancing the assembled coupling. The position of the individual components or the sub-assemblies is marked captive after a total balancing. The achievable balancing quality of the entire coupling depends on the coupling type.

The standard balancing quality is achieved by the basic gear couplings and basic flexible disc couplings if all components are machined on all sides and to the usual dimensions. Couplings with longer spacers require balancing of the individual parts. To achieve AGMA class 9 and higher, it is necessary that all individual parts are balanced. Additional work is required to achieve AGMA classes 10 and 11.

RENK balancing qualities

AGMA class 8	Eccentricity: 100 µm	(standard balancing quality)
AGMA class 9	Eccentricity: 50 µm	
AGMA class 10	Eccentricity: 25 µm	
AGMA class 11	Eccentricity: 12.5 µm	

Balancing quality levels for the complete coupling according to DIN ISO 21940 are classified as follows according to RENK experience:

Standard applications with low to medium speeds	G 16
Increased requirements at medium to high speeds	G 6.3
Sensitive applications with very high speeds	G 2.5

$$G = e_{perm} \times \Omega = e_{perm} \times \frac{2\pi}{60{,}000} \times n_B \qquad e_{perm} = \frac{60{,}000}{2\pi} \times \frac{G}{n_B}$$

Legend

n_B = max. operating speed of the coupling [rpm]

e_{perm} = eccentricity of the centre of mass of the coupling [µm]

G = balancing quality level to DIN ISO 21940 [mm/s]

Example

Operating speed: $n_{B.}$ = 1,800 rpm

Required balancing quality level: G 16

Maximum permissible eccentricity of the coupling to be selected:

$$e_{perm} = \frac{60.000}{2\pi} \times \frac{16}{1{,}800} = 85\ \mu m$$

The coupling must satisfy AGMA class 9. The individual parts must therefore be balanced to the quality level G16.

1.5 Protective guards

Couplings are rotating components which, in accordance with legal regulations, must be equipped with a protective guard against unintentional contact. According to the associated operation manual, it is not permissible to operate the coupling without a protective guard.

In addition to protecting people, the protective guard also protects against components or operating materials being ejected. Likewise, the impact of tools or objects on the rotating coupling should be prevented.

The protective guard must be designed in such a way that sufficient ventilation of the coupling is guaranteed.

Gear couplings with injection lubrication must be equipped with an oil-tight protective guard that prevents the lubricating oil escaping (see chapter 4.12).

For couplings that are to be used in an explosive environment , particular care must be taken that the surface temperature and the temperature inside the protective guard are less than the specified limit temperature.

Information on the design of the protective guard is provided by the EC Machinery Directive and the associated harmonised standards such as DIN EN ISO 14120.

1.6 Explosion protection

The use of machines in explosive environments places high demands on all components used in order to avoid fires and/or explosions.

These requirements are summarised in Directive 2014/34/EU for devices, components and protective systems. The guideline regulates the testing and placing on the market of devices and components.

Contrary to the view expressed in the Machinery Directive, a coupling is classified as a device in the sense of Directive 2014/34/EU.

Conformity with the directive is confirmed by the CE mark on the product and a certificate of conformity.

The majority of the series from this catalogue are suitable for use in explosive environments. Device categories 2G and 3G are usually available. In special cases, also 2D/3D and M2.

Further information on suitability can be found in the respective chapters of the series.

The customer/operator must specify the required device category, explosion group and temperature class when ordering.

The special features that must be observed when using a coupling in an explosive environment are summarised in the **Additional instruction** to the operation manuals. These additional instructions are enclosed with every coupling for explosive environments.

Ensure compliance with these additional instructions!

We are at your disposal for further information on the subject of explosion protection.

1.7 Machinery Directive 2006/42/EC

RENK couplings are classified as **components** and therefore are not subject to the Machinery Directive 2006/42/EC.

For this reason, no declarations of incorporation are issued for RENK couplings.

1.8 Couplings to API 671 - ISO 10441

API 671 is the standard for couplings intended for use in systems in the oil and gas industry as well as in the petrochemical industry. The standard is now also used in other industrial fields.

Amongst other things, the standard specifies the standards for the design of the coupling, the radial and axial run-out, and the balancing of the coupling.

The standard is regularly revised by the American petroleum industry. The most recent valid version of the API 671 is the 5th Edition, August 2020.

	Series
Gear couplings® – High-speed series	ZTK, ZTKH, ZTF, ZTA
RAFLEX® flexible disc couplings – High-speed series	DTR, DTM, DTL

Tab. 3: API 671-compliant coupling series

In Tab. 3, the series are listed which meet the requirements of API 671 (ISO 10441) as standard.

All series not listed here can meet the requirements only with qualifications. We will be happy to send you the corresponding list of qualifications on request.

1.9 Preservation

Preservative to protect the couplings from corrosion damage is applied to them in the factory before dispatch. In addition to the standard preservation period of 6 months, there are other long-term preservation periods.

The different preservation options are listed in the Tab. 4. Please contact RENK if you have further conservation requirements.

Unless specified otherwise on the order, RENK couplings receive the standard preservation.

In order to guarantee corrosion protection, you must generally adhere to the following transport and storage conditions:

– Store dry and under a roof, where possible in the original packaging.
– Do not expose the coupling to humid, salty or acidic atmospheres, nor to atmospheres containing chemicals.
– Protect the coupling/packaging against mechanical damage.

We recommend you open the original packaging only at the start of assembly or at expiry of the specified preservation period.

1.9.1 Checking the preservation/packaging

If the standard storage period of 6 months is exceeded, you must open the packaging, inspect the coupling and, if necessary, re-apply preservative.

If the packaging for the long-term preservation has been opened, the packaging must be restored as soon as available.

– In the event of a brief opening (less than 2 hours), re-welding the protective film is sufficient.
– If the packaging is left open for a longer period of time, replace the desiccant and then weld the protective film.
– If the time the packaging was left open is unknown, inspect the coupling, then re-apply preservative and reinstate the packaging.
– Every time you open the packaging, take steps to avoid the entry of moisture.

max. duration of preservation	Description	Packaging note
6 months	Standard preservation with preservation oil	
1 year	As standard, but export packaging to the ISPM standard with PE film and desiccant	# Do not open # Long-term preservation for 1 year
3 years	As standard, but export packaging to the ISPM standard with aluminium composite film and desiccant	# Do not open # Long-term preservation for 3 years
5 years	As standard, but export packaging to the ISPM standard with aluminium composite film and desiccant Including moisture indicator in the packaging, visible from the outside	# Do not open # Long-term preservation for 5 years

Tab. 4: Preservation options

1.10 Spare parts

All spare parts must comply with the technical requirements defined by RENK. We recommend using original spare parts.

When toothed components are replaced, we generally recommend replacing both parts, i.e. the externally toothed and the internally toothed component.

When replacing components of an assembly that has been balanced together, the remaining components of the assembly should be sent in with the module, in order that the balance quality of the whole assembly can be ensured.

This is particularly recommended for high-speed couplings or where there are high demands on the balance quality.

When ordering spare parts, specify the following:

– RENK order number or serial number
– Part designation
– Part number (if known)
– Size of the part (if known)
– Required quantity

The contact address can be found on the back cover of this catalogue.

2 Selection and size determination

This chapter provides you with all the information you need to safely design the right coupling for your application.

The design philosophy is the same across all types. The application factors are the same in the names and in the numerical values. Features specific to each type of coupling are described in the corresponding chapters of this catalogue.

2

2.1 Coupling and system data

Designation	Symbol	Unit	Definition
Nominal torque of coupling	T_{KN}	Nm	Torque that can be continuously transmitted within the entire permissible speed range.
Peak coupling torque	T_{KP}	Nm	Permissible shock torque that can be withstood for a short time as pulsating or alternating stress. You can find the permissible number of load alternation cycles for pulsating or alternating stresses in the chapters on the couplings.*
Maximum coupling torque	T_{Kmax}	Nm	For very infrequent special loadings such as motor short circuits, blockages, etc., the coupling can be stressed up to the material yield point without restricting further usability. This maximum stress can be withstood with up to 1.000 load alternations over the entire service life.
Alternating coupling torque	T_{KW}	Nm	Amplitude of a periodic torque fluctuation that can be tolerated in continuous operation, such as in the case of a roller conveyor with an alternating direction of rotation.

* The load alternations are distributed at roughly even intervals over the entire service life of the coupling. It is not permissible for the high load peaks to occur at short intervals or in direct succession.

Tab. 5: Coupling parameters and symbols

Designation	Symbol	Unit	Definition
Nominal torque	T_N	Nm	Stationary nominal torque on the coupling
Peak torque	T_P	Nm	Short-term shock torques on the coupling, which can be tolerated for max. 10^5 load alternations
Maximum torque	T_{max}	Nm	Infrequent maximum torque on the coupling at max. 1.000 load alternations
Alternating torque	T_W	Nm	Amplitude of the torque fluctuation applied to the coupling

Tab. 6: System data or load on the coupling

2.2 Design factors

2.2.1 Service factor

The nominal coupling torque specified in this catalogue relates to a constant drive torque. In order to take into account the additional dynamic load, the design must make allowance for a service factor.

The service factor K_A determines from the nominal load an equivalent substitute load, which is used to determine the size of the coupling.

The service factors listed in Tab. 8have been compiled in cooperation with machine and system manufacturers. They are intended only as a general guide, as in most cases RENK does not know the details of an application.

2.2.2 Direction of rotation factor

For systems that are operated in normal operation with an alternating direction of rotation, the direction of rotation factor must be taken into account when designing the coupling. Changing directions of rotation have a fatiguing effect on the components.

The direction of rotation factor K_w is multiplied by the service factor and thus increases the substitute load when designing the coupling.

Direction of rotation factor	**K_w**
Constant direction of rotation	1.0
Alternating direction of rotation	1.3

Tab. 7: Direction of rotation factor

2.2.3 Speed factor

With gear couplings, the permissible operating speed depends on the shaft displacement that occurs continuously during operation.

The calculation of the permissible speed can be found in the respective chapter of the product family.

Excavators	
Bucket ladder excavator	1.75 – 2.0
Undercarriages (caterpillar)	1.5 – 1.8
Undercarriages (rail)	1.4 – 1.7
Suction pumps	1.5 – 1.7
Paddle wheels	1.6 – 2.0
Cutting heads	1.8 – 2.2
Slewing gears	1.3 – 1.5
Winches	1.3 – 1.6
Mining, quarrying	
Crushers	2.0 – 2.5
Rotary kilns	1.5 – 2.0
Pit ventilators	1.4 – 1.6
Vibrating machines	1.5 – 1.7
Chemical industry	
Agitators (light liquid)	1.2 – 1.4
Agitators (viscous liquid)	1.5 – 1.7
Centrifuges (light)	1.2 – 1.4
Centrifuges (heavy)	1.4 – 1.6
Conveyor systems	
Carriers	1.5 – 2.0
Link belt conveyors	1.5 – 1.7
Belt/circular conveyors	1.3 – 1.5
Chain bucket elevators	1.3 – 1.5
Passenger lifts	1.5 – 2.0
Lifts - light duty	1.25 – 1.5
Lifts - heavy duty	1.5 – 1.75
Screw conveyors	1.3 – 1.5
Steel belt conveyors	1.3 – 1.5
Blowers, fans	
Rotary piston blowers	1.3 – 1.5
Blowers (axial and radial)	1.2 – 1.3
Cooling tower fans	1.2 – 1.3
Turbo blowers	1.2 – 1.3
Generators, converters	
Frequency converters	1.5 – 1.75
Generators	1.3 – 1.5
Rubber and plastics machines	
Extruders	1.5 – 1.7
Calenders	1.5 – 1.7
Kneading machines	1.6 – 2.0
Mixers	1.6 – 2.0
Woodworking machines	
Debarking drums	1.7 – 1.9
Planing machines	1.3 – 1.5
Frames (saw frames)	1.3 – 1.5
Metallurgical industry	
Blast furnace fans	1.2 – 1.3
Converters	1.75 – 2.0
Inclined lift for blast furnaces	1.5 – 1.8
Slag crushers	1.7 – 1.9
Crane systems	
Undercarriages	1.4 – 1.6
Hoists	1.3 – 1.5
Slewing gears	1.3 – 1.5
Winches	1.2 – 1.3

Metalworking	
Sheet metal bending machines	1.5 – 1.7
Sheet metal straightening machines	1.5 – 2.0
Hammers	1.5 – 2.0
Scissors	1.5 – 1.7
Forging presses	1.6 – 2.2
Punching	1.6 – 2.0
Mills	
Hammer mills	1.8 – 2.0
Ball mills	1.8 – 2.0
Roller mills	1.8 – 2.2
Food machines	
Filling machines	1.2 – 1.3
Kneading machines	1.3 – 1.5
Packaging machines	1.2 – 1.3
Sugar cane production	1.5 – 1.7
Paper machines	
Wood grinder	1.5 – 1.75
Shredders	1.5 – 2.0
Agitators	1.5 – 1.75
Printing machines	1.3 – 1.7
Presses	
Forging presses	2.0 – 2.3
Brick presses	1.8 – 2.0
Briquette presses/eccentric presses	1.8 – 2.2
Pumps	
Centrifugal pumps (light liquid)	1.2 – 1.3
Centrifugal pumps (viscous liquid)	1.3 – 1.5
Piston pumps (U ≤ 1: 100)	1.6 – 2.0
Piston pumps (U = 1: 100 – 200)	1.5 – 1.7
Plunger pumps (submerged piston pumps)	1.6 – 2.0
Textile industry	
Rewinders,	1.5 – 1.7
Printing/dyeing machines	1.5 – 1.7
Tanning barrels	1.5 – 1.7
Calenders	1.5 – 1.7
Shredders	1.5 – 1.7
Looms	1.5 – 1.7
Compactors, compressors	
Piston compressors (U ≤ 1: 100)	1.6 – 2.0
Piston compressors (U = 1: 100 – 200)	1.4 – 1.8
Screw compressors	1.2 – 1.5
Turbo compressors	1.5 – 1.7
Rolling mills	
Tin snips	1.6 – 2.0
Sheet manipulators	1.4 – 1.8
Block and slab road	1.75 – 2.0
Block presses	1.75 – 2.0
Tape and wire reels	1.3 – 1.5
Cold rolling mills	1.75 – 2.0
Hot rolling mills	1.75 – 2.0
Roller tables (light duty)	1.3 – 1.5
Roller straightening machines	1.5 – 1.7
Machine tools	
Auxiliary drives	1.25 – 1.5
Main drives	1.5 – 1.75

Tab. 8: Service factors

2.2.4 Service factors for high-speed applications

Service factor	K_A
Minimum service factor	1.5
Flexible disk coupling/Diaphragm coupling	1.5
Gear couplings	1.75

Tab. 9: Service factors for high-speed applications

The service factors for high-speed applications are based on API 671. As a rule, high-speed applications are examined in detail in terms of rotor dynamics, so that special loads that stress the coupling are often known. Compare these special loads in terms of torque and number of load alternations directly with the permissible values of the selected coupling.

If the special load is not comparable to any of the catalogue values, please contact RENK.

2.3 Coupling design

To determine the nominal system torque T_N, the drive power and the speed applied to the coupling are required.

$$T_N = \frac{P\ [kW]}{n\ [rpm]} \cdot 9{,}550\ [Nm]$$

2.3.1 Checking the nominal torque of the coupling

When checking the nominal torque of the coupling, have regard for the design factors as specified for the Chapter 2.2.

If rules or personal experience are available as an alternative to the design factors, these can be given priority over the recommendations.

For couplings according to API 671, select the service factor according to Tab. 9.

$$T_{KN} \geq T_N \cdot K_A \cdot K_W [Nm]$$

2.3.2 Review of additional stresses

By additional stresses is meant loads on the coupling that are not covered by a service factor. Such additional loads are usually specified by torque surges as a multiple of the nominal torque and an associated number of load alternations. When selecting the coupling size, the effective direction of the torque must be taken into account, since an alternating torque causes significantly greater damage than an pulsating torque. Usual torque surges, such as when starting up a system, can be compared directly with the permissible value in the catalogue.

2

Peak coupling torque T_{KP}

Shocks that occur can be withstood to the extent of the permissible peak coupling torque of the selected coupling. Please refer to the chapters for the selected couplings for information on the permissible number of load alternation cycles for pulsating or alternating torques.

$$T_{KP} \geq T_P \ [Nm]$$

Maximum coupling torque T_{Kmax}

Very rare malfunctions due to torque surges at the value of the maximum coupling torque, due to factors such as short circuits, blockages, etc., can be tolerated for up to 1,000 load alternations during the life of the coupling.

$$T_{Kmax} \geq T_{max} \ [Nm]$$

Design to API 671

API 671 requires a minimum safety factor of 1.15 for the maximum system torque, generally based on the maximum coupling torque T_{Kmax}.

$$T_{Kmax} \geq T_{max} \cdot 1.15 \ [Nm]$$

2.3.3 Checking the speed

In all operating states, the speed of the coupling must not exceed the maximum speed n_{max} specified in the respective dimension table.

Large angular displacement values and large distances between the machine shafts can give rise to a restriction of the permissible speed.

In the respective chapters of the coupling type, you will find information on whether and to what extent the speed is restricted.

Couplings that bridge a large gap to the machine shafts must be assessed in terms of the critical bending speed. For this purpose, with a constant and simplified cross-section of a spacer made of steel, the critical natural frequency can be calculated using the following formula as a rough approximation.

$$n_K = \frac{121.86 \cdot 10^6}{{l_0}^2} \cdot \sqrt{{d_a}^2 + {d_i}^2}$$

Legend

n_k = critical bending speed [rpm]

d_a = outer pipe diameter [mm]

d_i = inner pipe diameter [mm]

l_0 = clearance between joint points [mm]

$$S_K = \frac{n_k}{n}$$

Legend

S_k = safety critical bending speed

n = operating speed [rpm]

The critical speed that is determined must be sufficiently remote from the maximum operating speed so that resonance phenomena are avoided. Due to the simplified approach, a safety factor S_K of at least 2 is required. If the safety factor is less than this, more precise calculation methods must be employed. In such cases, please contact RENK.

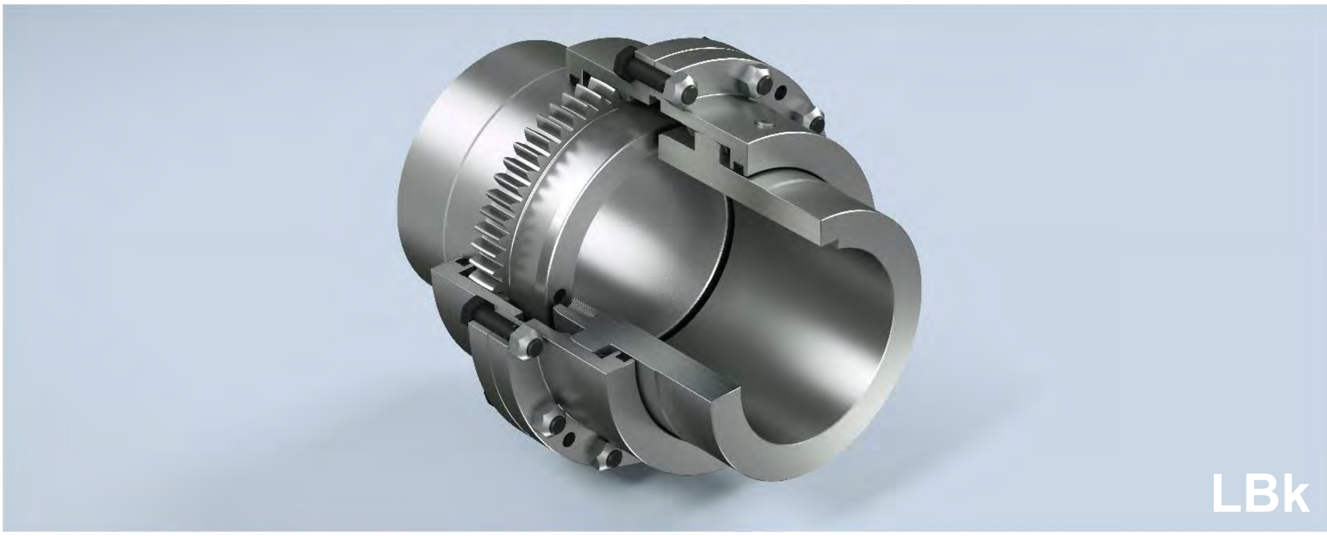
2.3.4 Operating temperature range

The information in this catalogue generally applies to an operating temperature range of –20°C to 100°C.

At lower temperatures, it is necessary to use special materials. In such cases we recommend consulting RENK.

When gear couplings are to be used outside the above range of operating temperatures, check whether the lubricant and the seals are suitable for your application.

3 Gear couplings – Basic series



3

Our extensive range of couplings with a large number of series and variants gives you every freedom in designing the shaft connection. In addition, this offers you the security of finding the optimal solution even for the most difficult drive cases.

The gear couplings in the SB, SBk and LBk series are characterised by a high power density and long service life. Depending on the series, we use reliable oil or grease lubrication. These couplings are suitable as torsionally rigid shaft connections for positive torque transmission and ensure compensation for axial, radial and angular shaft displacements. Gear couplings are real all-rounders and are used in many applications.

3.1 Application features and functional features

	Product family		
Feature	**SB**	**SBk**	**LBk**
Displacement	1.5°	0.75°	0.75°
Lubrication	Grease/oil	Grease	Grease
Tooth tip centring	●	●	●
Removable cover	●	●	
Large tooth centre distance	●	●	
Large hub bore		●	●
Compact design, low weight			●
Large lubricant space	●		
Lubrication is maintained if the seal fails	●		
Suitable for use in explosion protection areas - 2014/34/EU ATEX	●	●	●

Tab. 10: Application features and functional features of the basic series

3.2 Standard materials

The standard materials specified in the table below are used for the couplings of this series.

For special designs, materials with higher strength and also with surface hardening by gas nitriding are available.

Component	Material	Strength
Hub/flange	Quenched and tempered steel	$R_{P0.2}$ = min. 430 N/mm^2
Housing	Quenched and tempered steel	$R_{P0.2}$ = min. 325 N/mm^2
Fitted bolts		Strength class 8.8

Tab. 11: Standard material

3.3 Pre-bores

SB	SBk/LBk	Pre-bore
30 – 340	32 – 375	d_{min} – 2 mm
> 340	> 375	d_{min} – 3 mm

Tab. 12: Pre-bores for the product families SB, SBk, LBk

Couplings with pre-bored hubs or flanges are supplied with a bore that is 2 mm or 3 mm smaller than the minimum bore (d_{min}) listed in the dimension table (see Tab. 12).

Information on boring and balancing the hubs or flanges can be found in the associated operating instructions.

Pre-bored hubs or flanges are delivered in the **unbalanced** condition. After you have made the finished bore, you must balance the parts according to your specifications, if necessary.

3.4 Available from stock

The basic designs of the gear couplings are available from stock as complete items. The main components for other designs are also available from stock. Spacers or intermediate shafts are manufactured to order.

The corresponding size range is shown in the table below.

Series	Size
Basic designs	
SB	30 – 200
SBk	38 – 225
LBk	32 – 225

Tab. 13: Coupling types and sizes available from stock

3.5 Use in potentially explosive areas - ATEX

According to the current EU directive, the following maximum marking can be applied to these couplings.

The gear couplings of the basic series can be used in environments where explosion protection is required.

In accordance with Directive 2014/34/EU and DIN EN ISO 80079-36, the coupling is provided with the following marking and indicates the permissible area of use and the conditions of use.

3

Product family **SB** (type test certificate)

CE Ex **II 2G Ex h IIB T4 Gb** -20°C ≤ Ta ≤ + 60°C

Alternatively executable:

CE Ex **II 2G Ex h IIC T4 Gb** -20°C ≤ Ta ≤ + 60°C

CE Ex **II 2D Ex h IIIB T130°C Db** -20°C ≤ Ta ≤ + 60°C

Product family **SBk** and **LBk** (type test certificate)

CE Ex **II 2G Ex h IIB T3 Gb** -20°C ≤ Ta ≤ + 60°C

Alternatively executable:

CE Ex **II 2G Ex h IIC T3 Gb** -20°C ≤ Ta ≤ + 60°C

CE Ex **II 2D Ex h IIIB T130°C Db** -20°C ≤ Ta ≤ + 60°C

For underground use: M2 available on request.

3.6 Selection of the coupling size

When selecting the coupling using the dimension tables, proceed as follows:

- Select for the nominal system torque and the service factor applicable to your system (see chapter 2) the coupling size.
- Check the coupling size again based on the known additional stresses.
- Check the permissible speed of the coupling.
- Check the maximum permissible bore diameter.
- Check the shaft-hub connection (see chapter 1.1).

3.6.1 Permissible additional stresses

When specifying the coupling, you must take into account the following permissible additional stresses. You can find more detailed information on the types of additional stresses in Chapter 2.1.

Peak coupling torque

– pulsating or alternating for 100,000 load cycles

$$T_{KP} = 1.5 \cdot T_{KN}$$

Maximum coupling torque

– pulsating or alternating for 1,000 load cycles

$$T_{Kmax} = 3 \cdot T_{KN}$$

3.6.2 Permissible speed

The permissible speed is calculated using the formula:

$$n_{perm} = n_{max} \cdot f$$

Legend

n_{perm} = permissible speed [rpm]

n_{max} = max. speed (see dimension tables) [rpm]

f = speed factor

To determine the speed factor f, the angular offset ΔK_w that occurs continuously during operation is authoritative. The angular offset can be determined from the radial offset as follows:

$$\Delta K_w = arctan\left(\frac{\Delta K_r}{L_0}\right)$$

Legend

ΔK_w = angular offset [°]

ΔK_r = radial offset [mm]

L_0 = tooth centre distance (see dimension tables) [mm]

Example:

Coupling	**SB 100**
Required radial offset ΔK_r	**1.2 mm**
Distance between tooth centres L_0	**202 mm**
Angular offset ΔK_w	**0.34°**

Tab. 14 indicates a speed factor f of 0.82 for an angular offset of 0.5°. Interpolation results in a speed factor f of 0.94 for the angular offset of 0.34°.

3

SB	SBk/LBk	Speed factor f at angular displacement ΔK_W					
Size	**Size**	**0.25°**	**0.5°**	**0.75°**	**1.0°**	**1.25°**	**1.5°**
-	**32**	1	1	1	-	-	-
30	**38**	1	1	0,90	0,68	0,54	0,45
40	**48**	1	1	0,75	0,57	0,45	0,38
50	**60**	1	1	0,70	0,52	0,42	0,35
60	**70**	1	0,93	0,63	0,47	0,37	0,31
70	**80**	1	0,89	0,59	0,44	0,35	0,30
80	**90**	1	0,85	0,57	0,42	0,34	0,28
90	**100**	1	0,80	0,54	0,40	0,32	0,27
100	**110**	1	0,82	0,54	0,41	0,33	0,27
110	**125**	1	0,80	0,53	0,40	0,32	0,27
125	**140**	1	0,78	0,52	0,39	0,31	0,26
140	**160**	1	0,75	0,50	0,37	0,30	0,25
160	**180**	1	0,72	0,48	0,36	0,29	0,24
180	**200**	1	0,68	0,45	0,34	0,27	0,23
200	**225**	1	0,64	0,43	0,32	0,26	0,21
220	**250**	1	0,66	0,44	0,33	0,27	0,22
240	**265**	1	0,66	0,44	0,33	0,27	0,22
260	**280**	1	0,65	0,43	0,33	0,27	0,22
280	**315**	1	0,62	0,43	0,31	0,25	0,21
300	**335**	1	0,63	0,42	0,31	0,25	0,21
320	**355**	1	0,63	0,41	0,31	0,25	0,21
340	**375**	1	0,60	0,40	0,30	0,24	0,20

Tab. 14: Speed factor f

3.6.3 Permissible shaft offsets

The permissible **angular offset** ΔK_w for gear couplings basic series is:

Product family SB

$\Delta K_w = 1.5°$

Product family SBk and LBk

$\Delta K_w = 0.75°$

Where couplings have limited axial clearance and where the axial clearances a and b are taken from the dimension tables, the angular offset is reduced to 0.6°.

The maximum allowable static **radial offset** ΔK_r depends on the permissible angular offset and the tooth centre distance l_0.

You can determine the radial offset using the following formulas.

Product family SB

$$\Delta K_r = L_0 \cdot 0.026 \cdot f_H \text{ [mm]}$$

Legend

ΔK_r = radial offset [mm]	Speed factor
f_H = axial clearance factor	f_H = 1.0 (coupling without retaining ring)
	f_H = 0.4 (coupling with retaining ring)

Product family SBk and LBk

$$\Delta K_r = L_0 \cdot 0.013 \cdot f_H \text{ [mm]}$$

Legend

ΔK_r = radial offset [mm]	L_0 = tooth centre distance (see dimension tables) [mm]
f_H = axial clearance factor	f_H = 1.0 (coupling without retaining ring)
	f_H = 0.8 (coupling with retaining ring)

The axial clearance factor f_H is valid only for the axial clearances a and b specified in the dimension tables.

The permissible **axial offset** ΔK_a is only a few millimetres. Where axial offsets are greater, such as those due to large thermal expansions, special measures such as extended toothing may be required.

3.6.4 Selection example

Application:	Coupling between an electric motor and a centrifugal pump.
Data:	$P = 400\ kW$ $n = 1.490\ min^{-1}$ $d_1 = 100\ mm \quad (motor\ side)$ $d_2 = 60\ mm \quad (pump\ side)$ One feather key to DIN 6885-1 each Distance between the shaft ends E = 280 mm
Service factor:	Centrifugal pump (light liquids) $K_A = 1.25$
Sizing:	$T_N = \frac{P}{n} \cdot 9.550 = \frac{400}{1490} \cdot 9.550 = 2.564\ Nm$ $T_N \cdot K_A = 2.564 \cdot 1.25 = 3.205\ Nm$ According to the dimension table LBLk, this results in an LBLk 60 $T_{KN} = 3500\ Nm$
Additional stress:	Design with the service factor is sufficient, as no additional stress is known.
Bore verification:	$d_1, d_{2\ max} = 69\ mm$ $d_1, d_{2\ max} < d_1, d_2$ A redefinition is necessary.
Redefinition:	LBLk 90 with $d_1, d_{2\ max} = 110\ mm$ $d_1, d_{2\ max} \geq d_1, d_2$
Speed:	$n_{max} = 5.000\ min^{-1}$ There are no major displacements during operation. It is not necessary to take the speed factor into account.
Checking the spacer length	$E_{min} = 104\ mm$ $E \geq E_{min}$
Checking the shaft-hub connection:	Checking the load-bearing capacity of the feather key connection according to DIN 6892.

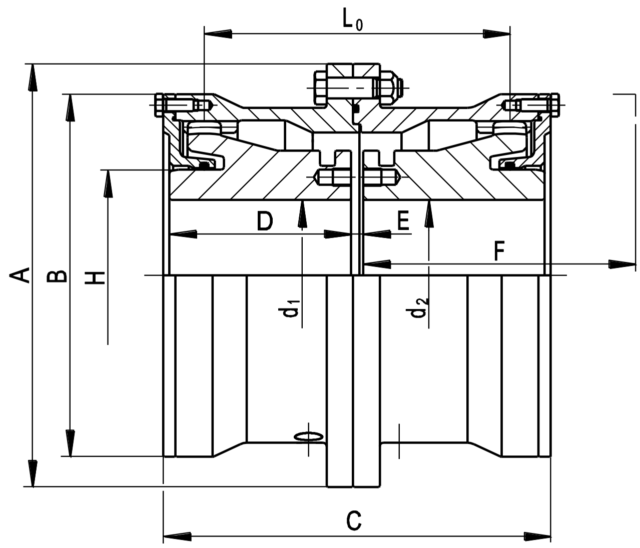
3.7 Designs and dimension tables of the product family SB

Designs	Series	Page
Basic design	SB	40
Basic design with retaining ring	SBR	41
Spacer design	SBL	42
Spacer design with retaining ring	SRL	44
Intermediate shaft design	SBG	46
Intermediate shaft design with retaining ring	SRG	48
Design with brake disc for shoe brake	SBD	50
Design with brake disc for disc brake	SBT	51
Vertical design	VSB	52
Electrically insulated design	SBi	53

Tab. 15: Designs of the product family SB

SB series

Dimension table no.: B744388-0



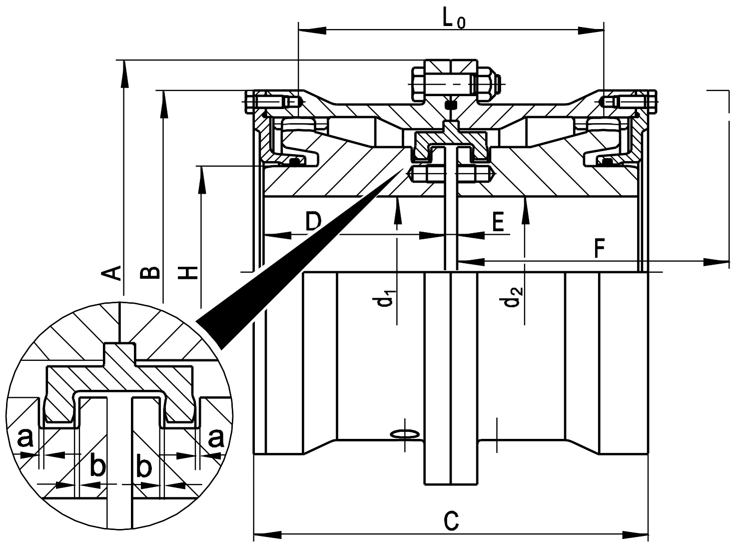
B376332-1

Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Dimensions: Bore d_1; d_2 min mm	Bore d_1; d_2 max mm	A mm	B mm	C mm	D mm	E mm	F[3] mm	H mm	L_0 mm	Max. static radial offset ΔK_r[1] mm	Mass moment of inertia[2] kgm²	Weight[2] kg
30	0.95	7500	12	34	118	92	108	50	5	75	45	77	1.95	0.006	4.4
40	2.1	6900	22	46	145	115	128	60	5	90	60	96	2.7	0.017	7.5
50	3.5	6300	22	58	165	135	148	70	5	110	75	113	3.0	0.033	11.2
60	5.9	5900	28	70	200	160	172	80	6	120	90	132	3.45	0.082	18.4
70	9	5400	28	78	220	178	192	90	6	130	100	148	3.9	0.13	26
80	13	5000	32	92	240	196	212	100	6	150	120	166	4.35	0.20	32
90	18	4700	32	100	270	225	236	110	8	170	130	184	4.8	0.38	47
100	23	4300	55	110	280	240	256	120	8	180	140	202	5.25	0.49	54
110	30.5	4000	65	120	310	265	276	130	8	190	155	218	5.7	0.82	72
125	42	3700	75	138	340	295	320	150	10	215	175	250	6.45	1.35	100
140	61	3400	85	156	390	325	350	165	10	230	200	276	7.2	2.41	142
160	90	3100	120	180	435	370	404	190	12	270	230	320	8.4	4.3	199
180	130	2900	140	200	480	415	456	220	12	300	260	366	9.6	7.5	285
200	189	2700	160	225	545	465	512	245	14	340	290	408	10.8	14.1	420
220	245	2400	160	273	580	510	556	270	16	360	355	452	12.0	19.7	514
240	330	2200	180	300	645	560	598	290	18	380	390	486	12.8	29.9	657
260	390	2100	200	319	680	595	640	310	20	400	415	524	13.5	42.3	797
280	535	2000	220	354	745	660	702	340	22	440	460	568	14.25	69	1065
300	580	1900	240	369	775	675	744	360	24	470	480	608	15.0	84	1220
320	740	1800	260	404	825	725	786	380	26	500	525	638	16.5	119	1470
340	950	1700	280	431	915	795	808	390	28	520	560	638	16.5	184	1870

[1] In relation to a permissible angular displacement of ΔK_w =1.5° for each coupling half.
[2] Values for the complete coupling for bore d_1; d_2 max.
[3] The dismounting dimension F is required for the vertical installation and removal of the machine and for changing the O-rings.

SBR series

Dimension table no.: B744389-0



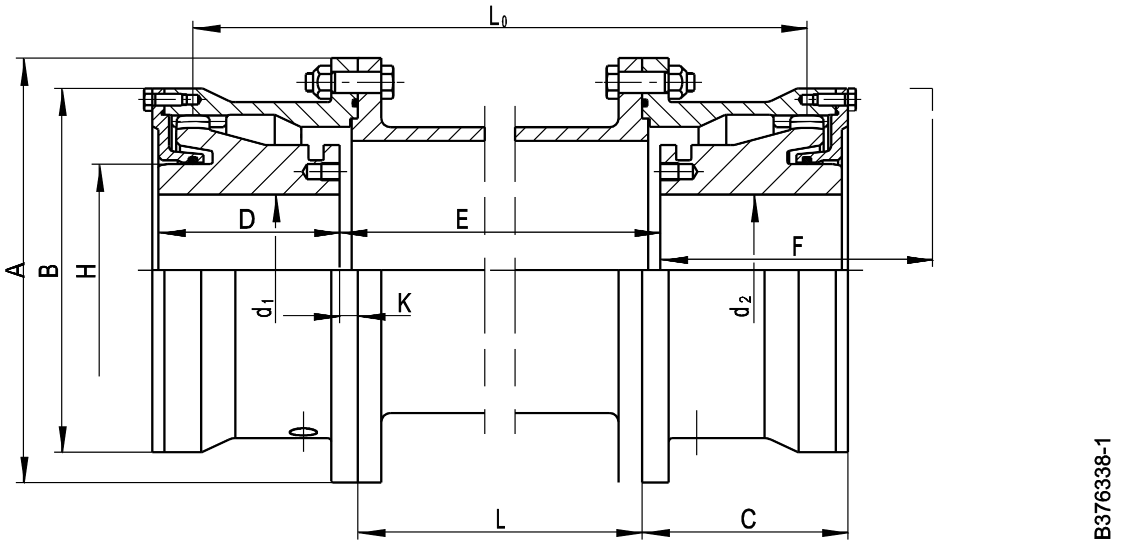
B376339-1

Size	Nominal torque T_{KN}	Speed n_{max}	Dimensions: Bore d_1; d_2 min	max	A	B	C	D	E	F[3]	H	L_0	Axial clearances a and b[1]	Mass moment of inertia[2]	Weight[2]
	kNm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kgm^2	kg
30	0.95	7500	12	34	118	92	110	50	5	75	45	77	0.5	0.006	4.7
40	2.1	6900	22	46	145	115	131	60	5	90	60	96	0.5	0.017	7.8
50	3.5	6300	22	58	165	135	151	70	5	110	75	113	0.5	0.035	12
60	5.9	5900	28	70	200	160	175	80	6	120	90	132	0.5	0.085	19.4
70	9	5400	28	78	220	178	197	90	6	130	100	148	0.5	0.14	27.3
80	13	5000	32	92	240	196	217	100	6	150	120	166	0.5	0.21	33
90	18	4700	32	100	270	225	241	110	8	170	130	184	0.5	0.4	50
100	23	4300	55	110	280	240	261	120	8	180	140	202	1	0.52	57
110	30.5	4000	65	120	310	265	282	130	8	190	155	218	1	0.83	74
125	42	3700	75	138	340	295	325	150	10	215	175	250	1	1.41	105
140	61	3400	85	156	390	325	355	165	10	230	200	276	1	2.45	148
160	90	3100	120	180	435	370	410	190	12	270	230	320	1	4.51	209
180	130	2900	140	200	480	415	462	220	12	300	260	366	1	7.8	297
200	189	2700	160	225	545	465	519	245	14	340	290	408	1	14.6	428
220	245	2400	160	273	580	510	556	270	16	360	355	452	1.5	21.7	540
240	330	2200	180	300	645	560	598	290	18	380	390	486	1.5	32.5	682
260	390	2100	200	319	680	595	640	310	20	400	415	524	1.5	44.3	832
280	535	2000	220	354	745	660	702	340	22	440	460	568	1.5	73	1130
300	580	1900	240	369	775	675	744	360	24	470	480	608	1.5	88	1275
320	740	1800	260	404	825	725	786	380	26	500	525	638	1.5	124	1535
340	950	1700	280	431	915	795	808	390	28	520	560	638	2	185	1900

[1] With these axial clearances, the permissible angular displacement ΔK_w =0.6° for each coupling half.
The axial clearances a and b can be changed if necessary.
[2] Values for the complete coupling for bore d_1; d_2 max.
[3] The dismounting dimension F is required for the vertical installation and removal of the machine, for installation of the retaining ring and for changing the O-rings.

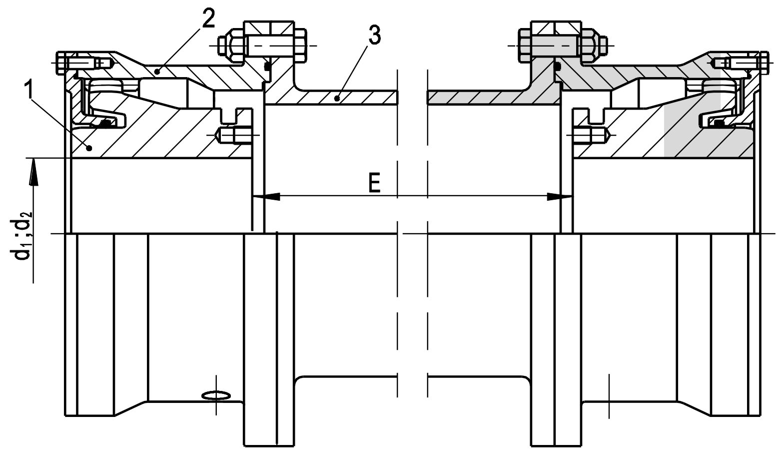
SBL series

Dimension table no.: B744390-0



Size	Nominal torque T_{KN} kNm	Speed[3] n_{max} rpm	Bore d_1; d_2 min mm	Bore d_1; d_2 max mm	A mm	B mm	C mm	D mm	F[2] mm	H mm	K mm	L mm	L_0 mm	Mass moment of inertia[1] kgm^2	Weight[1] kg
30	0.95	7500	12	34	118	92	55	50	75	45	3.5	E-7	E+72	0.007	4.5
40	2.1	6900	22	46	145	115	68.5	60	90	60	7	E-14	E+91	0.018	8
50	3.5	6300	22	58	165	135	78.5	70	110	75	7	E-14	E+108	0.035	11.8
60	5.9	5900	28	70	200	160	91.5	80	120	90	8.5	E-17	E+126	0.085	19.2
70	9	5400	28	78	220	178	102	90	130	100	9	E-18	E+142	0.138	26.4
80	13	5000	32	92	240	196	112	100	150	120	9	E-18	E+160	0.21	32.5
90	18	4700	32	100	270	225	126	110	170	130	12	E-24	E+176	0.4	50
100	23	4300	55	110	280	240	136	120	180	140	12	E-24	E+194	0.51	57
110	30.5	4000	65	120	310	265	146	130	190	155	12	E-24	E+210	0.85	75
125	42	3700	75	138	340	295	170	150	215	175	15	E-30	E+240	1.65	104
140	61	3400	85	156	390	325	185	165	230	200	15	E-30	E+266	2.45	147
160	90	3100	120	180	435	370	213	190	270	230	17	E-34	E+308	4.51	208
180	130	2900	140	200	480	415	239	220	300	260	17	E-34	E+354	7.8	295
200	189	2700	160	225	545	465	269	245	340	290	20	E-40	E+394	14.1	422
220	245	2400	160	273	580	510	294	270	360	355	24	E-48	E+436	20.4	532
240	330	2200	180	300	645	560	316	290	380	390	26	E-52	E+468	31.9	687
260	390	2100	200	319	680	595	338	310	400	415	28	E-56	E+504	43.7	832
280	535	2000	220	354	745	660	370	340	440	460	30	E-60	E+546	71	1110
300	580	1900	240	369	775	675	390	360	470	480	30	E-60	E+584	85.8	1255
320	740	1800	260	404	825	725	410	380	500	525	30	E-60	E+612	121	1515
340	950	1700	280	431	915	795	430	390	520	560	40	E-80	E+610	188	1930

[1] Values for the complete coupling, without spacer, for bore d_1; d_2 max.
[2] The dismounting dimension F is required for the vertical installation and removal of the machine and for changing the O-rings.
[3] The speed n_{max} depends on the length and weight of the spacer.



Legend

1 Hub

2 Housing

3 Spacer

Weight of the spacer

G_1 = spacer at E_{min}

G_2 = per 1 mm spacer length

G_3 = spacer at E> E_{min}

$$G_3 = G_1 + (E - E_{min}) \cdot G_2$$

Torsional stiffness of the coupling

C_1 = coupling at E_{min}

C_2 = per 1 mm spacer length

C_3 = coupling at E > E_{min}

$$C_3 = \frac{1}{\frac{1}{C_1} + \frac{E - E_{min}}{C_2}}$$

Mass moment of inertia spacer

J_1 = spacer at E_{min}

J_2 = per 1 mm spacer length

J_3 = spacer at E> E_{min}

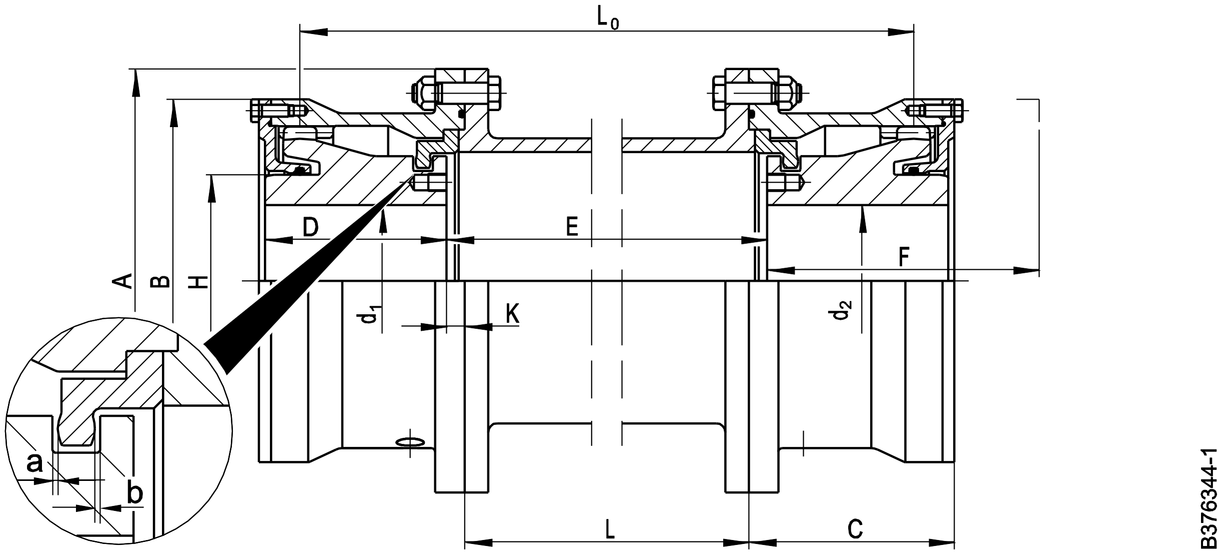
$$J_3 = J_1 + (E - E_{min}) \cdot J_2$$

Size	E_{min} mm	G_1 kg	G_2 kg/mm	C_1 MNm/rad	C_2 MNm · mm/rad	J_1 kgm²	J_2 kgm²/mm
30	82	2.17	0.011	0.38	186	0.00401	0.000011
40	94	3.20	0.014	0.92	274	0.00876	0.000020
50	94	4.40	0.018	1.72	537	0.0146	0.000041
60	117	6.70	0.022	2.94	897	0.0368	0.000072
70	118	8.20	0.029	4.07	1335	0.055	0.000113
80	118	8.70	0.030	6.49	1895	0.075	0.00017
90	144	13.0	0.034	8.49	2637	0.138	0.00023
100	144	13.5	0.040	10.68	3556	0.159	0.00032
110	179	19.2	0.041	12.49	4690	0.292	0.00043
125	185	22.8	0.048	17.66	6909	0.423	0.00064
140	205	32.0	0.053	24.76	8928	0.783	0.00088
160	239	49.0	0.070	36.70	14028	1.46	0.0014
180	239	52.0	0.080	50.58	23220	2.04	0.0023
200	280	96.0	0.120	68.69	36882	4.41	0.0036

Information based on d_1; d_2 max.
G_3 and J_3 refer exclusively to the spacer.
C_3 relates to the entire coupling.

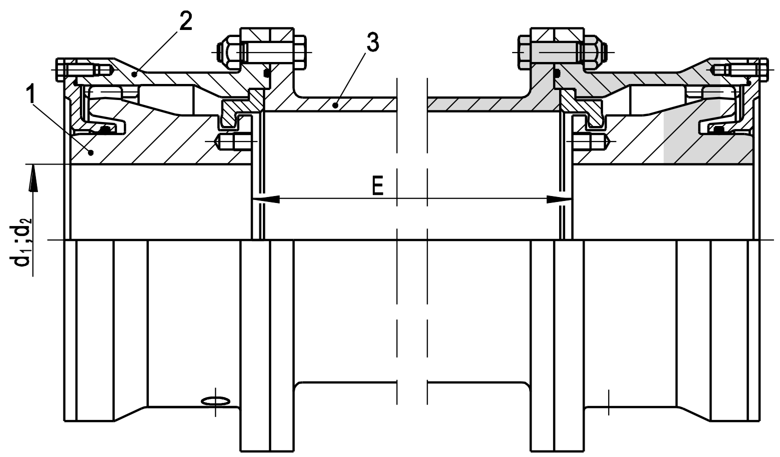
SRL series

Dimension table no.: B744391-0



Size	Nominal torque	Speed[4]	Dimensions												Axial clearances a and b[1]	Mass moment of inertia[2]	Weight[2]
			Bore d_1; d_2														
	T_{KN}	n_{max}	min	max	A	B	C	D	F[3]	H	K	L	L_0				
	kNm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		mm	kgm²	kg
30	0.95	7500	12	34	118	92	55	50	75	45	3.5	E-7	E+72		0.5	0.01	4.7
40	2.1	6900	22	46	145	115	68.5	60	90	60	7	E-14	E+91		0.5	0.02	8.3
50	3.5	6300	22	58	165	135	78.5	70	110	75	7	E-14	E+108		0.5	0.04	12.4
60	5.9	5900	28	70	200	160	91.5	80	120	90	9	E-18	E+126		0.5	0.09	20
70	9	5400	28	78	220	178	102	90	130	100	9	E-18	E+142		0.5	0.14	27.7
80	13	5000	32	92	240	196	112	100	150	120	9	E-18	E+160		0.5	0.22	34
90	18	4700	32	100	270	225	126	110	170	130	12	E-24	E+176		0.5	0.42	53
100	23	4300	55	110	280	240	136	120	180	140	12	E-24	E+194		1	0.54	60
110	30.5	4000	65	120	310	265	146	130	190	155	12	E-24	E+210		1	0.88	79
125	42	3700	75	138	340	295	170	150	215	175	15	E-30	E+240		1	1.7	108
140	61	3400	85	156	390	325	185	165	230	200	15	E-30	E+266		1	2.55	153
160	90	3100	120	180	435	370	213	190	270	230	17	E-34	E+308		1	4.71	217
180	130	2900	140	200	480	415	239	220	300	260	17	E-34	E+354		1	8.1	306
200	189	2700	160	225	545	465	269	245	340	290	20	E-40	E+394		1	14.5	443
220	245	2400	160	273	580	510	294	270	360	355	24	E-48	E+436		1.5	21.4	559
240	330	2200	180	300	645	560	316	290	380	390	26	E-52	E+468		1.5	33.5	722
260	390	2100	200	319	680	595	338	310	400	415	28	E-56	E+504		1.5	45.7	872
280	535	2000	220	354	745	660	370	340	440	460	30	E-60	E+546		1.5	75	1170
300	580	1900	240	369	775	675	390	360	470	480	30	E-60	E+584		1.5	91.4	1335
320	740	1800	260	404	825	725	410	380	500	525	30	E-60	E+612		1.5	128	1610
340	950	1700	280	431	915	795	430	390	520	560	40	E-80	E+610		2	198	2040

1) With these axial clearances, the permissible angular displacement ΔK_w =0.6° for each coupling half.
The axial clearances a and b can be changed if necessary.
2) Values for the complete coupling, without spacer, for bore d_1; d_2 max.
3) The dismounting dimension F is required for the vertical installation and removal of the machine, for installation of the retaining rings and for changing the O-rings.
4) The speed n_{max} depends on the length and weight of the spacer.



B831338-0

Legend

1 Hub

2 Sleeve

3 Spacer

Weight of the spacer

G_1 = spacer at E_{min}

G_2 = per 1 mm spacer length

G_3 = spacer at E> E_{min}

$$G_3 = G_1 + (E - E_{min}) \cdot G_2$$

Torsional stiffness of the coupling

C_1 = coupling at E_{min}

C_2 = per 1 mm spacer length

C_3 = coupling at E > E_{min}

$$C_3 = \frac{1}{\frac{1}{C_1} + \frac{E - E_{min}}{C_2}}$$

Mass moment of inertia spacer

J_1 = spacer at E_{min}

J_2 = per 1 mm spacer length

J_3 = spacer at E> E_{min}

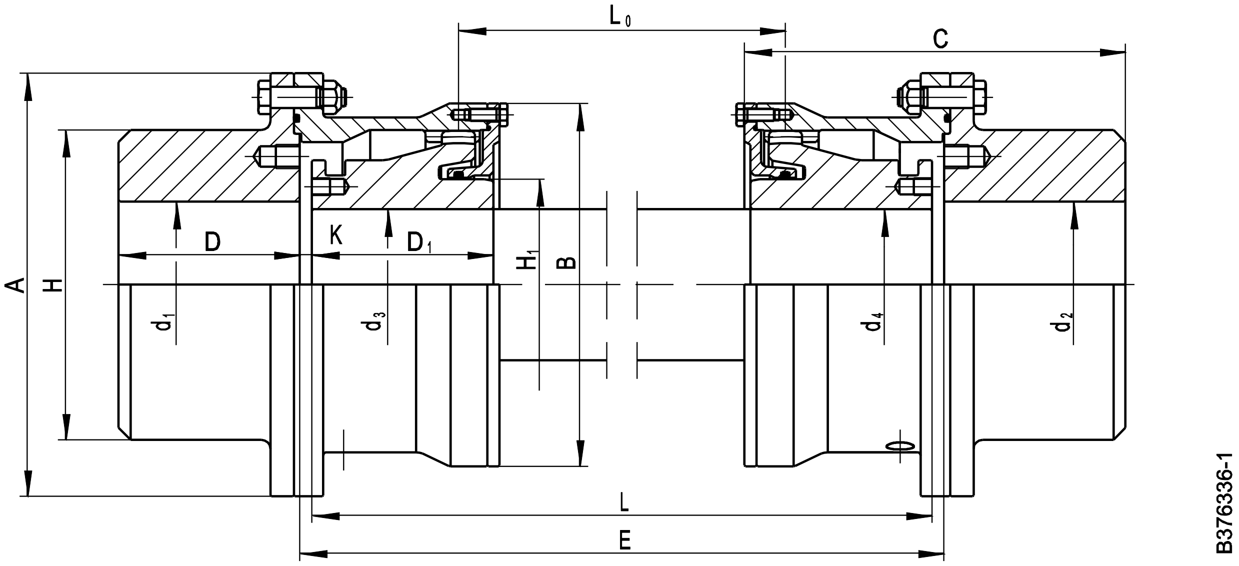
$$J_3 = J_1 + (E - E_{min}) \cdot J_2$$

Size	E_{min} mm	G_1 kg	G_2 kg/mm	C_1 MNm/rad	C_2 MNm · mm/rad	J_1 kgm²	J_2 kgm²/mm
30	82	2.17	0.011	0.38	186	0.00401	0.000011
40	94	3.20	0.014	0.92	274	0.00876	0.000020
50	94	4.40	0.018	1.72	537	0.0146	0.000041
60	117	6.70	0.022	2.94	897	0.0368	0.000072
70	118	8.20	0.029	4.07	1335	0.055	0.000113
80	118	8.70	0.030	6.49	1895	0.075	0.00017
90	144	13.0	0.034	8.49	2637	0.138	0.00023
100	144	13.5	0.040	10.68	3556	0.159	0.00032
110	179	19.2	0.041	12.49	4690	0.292	0.00043
125	185	22.8	0.048	17.66	6909	0.423	0.00064
140	205	32.0	0.053	24.76	8928	0.783	0.00088
160	239	49.0	0.070	36.70	14028	1.46	0.0014
180	239	52.0	0.080	50.58	23220	2.04	0.0023
200	280	96.0	0.120	68.69	36882	4.41	0.0036

Information based on d_1; d_2 max.
G_3 and J_3 refer exclusively to the spacer.
C_3 relates to the entire coupling.

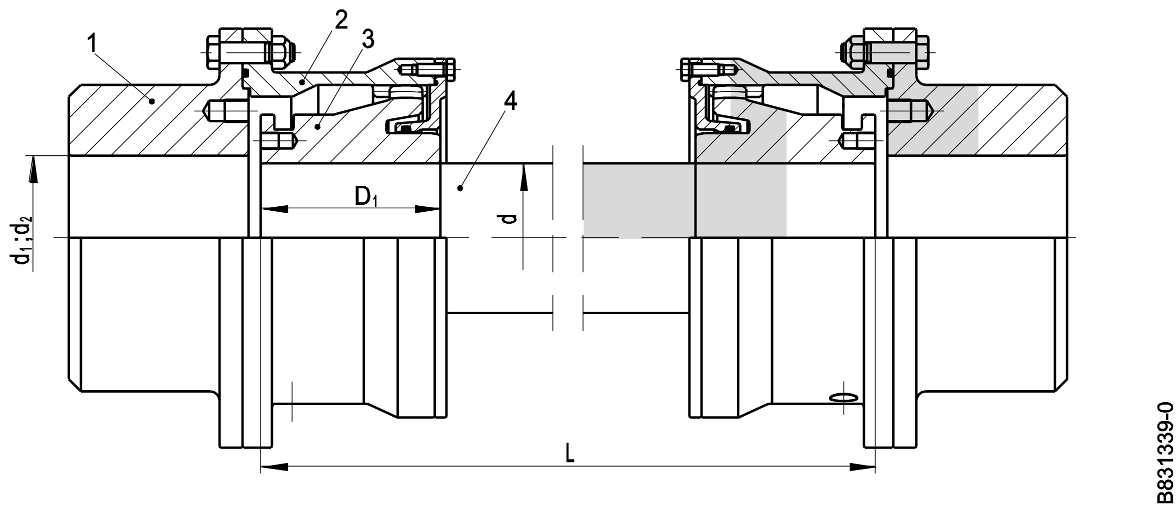
SBG series

Dimension table no.: B744392-0



Size	Nominal torque T_{KN} kNm	Speed[2] n_{max} rpm	Bore d_1; d_2 min mm	max mm	Bore d_3; d_4 min mm	max mm	A mm	B mm	C mm	D/D_1 mm	H mm	H_1 mm	K mm	L_0 mm	Mass moment of inertia[1] kgm²	Weight[1] kg
30	0.95	7500	12	61	12	34	118	92	105	50	80	45	3.5	E-79	0.01	7.7
40	2.1	6900	22	73	22	46	145	115	126.5	60	95	60	5	E-101	0.03	12.6
50	3.5	6300	22	86	22	58	165	135	146.5	70	112	75	5	E-118	0.06	19
60	5.9	5900	28	100	28	70	200	160	169	80	130	90	6	E-138	0.14	31
70	9	5400	28	115	28	78	220	178	189	90	150	100	6	E-154	0.23	45
80	13	5000	32	131	32	92	240	196	209	100	170	120	6	E-172	0.36	56
90	18	4700	32	146	32	100	270	225	232	110	190	130	8	E-192	0.67	83
100	23	4300	55	158	55	110	280	240	252	120	205	140	8	E-210	0.88	97
110	30.5	4000	65	173	65	120	310	265	272	130	225	155	8	E-226	1.45	129
125	42	3700	75	192	75	138	340	295	315	150	250	175	10	E-260	2.4	180
140	61	3400	85	219	85	156	390	325	345	165	285	200	10	E-286	4.34	252
160	90	3100	110	250	120	180	435	370	398	190	325	230	12	E-332	8.1	365
180	130	2900	134	277	140	200	480	415	454	220	360	260	12	E-378	13.8	508
200	189	2700	150	315	160	225	545	465	508	245	410	290	14	E-422	25.3	742
220	245	2400	160	346	160	273	580	510	556	270	450	355	16	E-468	36.9	934
240	330	2200	180	369	180	300	645	560	598	290	480	390	18	E-504	54.5	1175
260	390	2100	200	400	200	319	680	595	640	310	520	415	20	E-544	77	1450
280	535	2000	220	423	220	354	745	660	700	340	550	460	20	E-586	120	1885
300	580	1900	240	446	240	369	775	675	740	360	580	480	20	E-624	150	2170
320	740	1800	260	477	260	404	825	725	780	380	620	525	20	E-652	208	2620
340	950	1700	280	500	280	431	915	795	808	390	650	560	28	E-666	316	3310

[1] Values for the complete coupling, without intermediate shaft, for bore d_1; d_2 max. and d_3; d_4 max.
[2] The speed n_{max} depends on the length and weight of the intermediate shaft.
$L = E - 2 \cdot K$



Legend

1 Flange 2 Sleeve 3 Hub 4 Intermediate shaft

Weight of the intermediate shaft

G = intermediate shaft at $L_{existing}$

d = shaft diameter

Torsional stiffness of the coupling

C_1 = coupling without intermediate shaft

C_2 = intermediate shaft at $L_{existing}$

C_3 = coupling at $L_{existing}$

Inertia intermediate shaft

J = intermediate shaft at $L_{existing}$

$$G = 6.165 \cdot \frac{d^2 \cdot L}{10^6}$$

$$C_2 = 7.805 \cdot \frac{d^4}{L - 2 \cdot D_1} \qquad C_3 := \frac{1}{\frac{1}{C_1} + \frac{1}{C_2}}$$

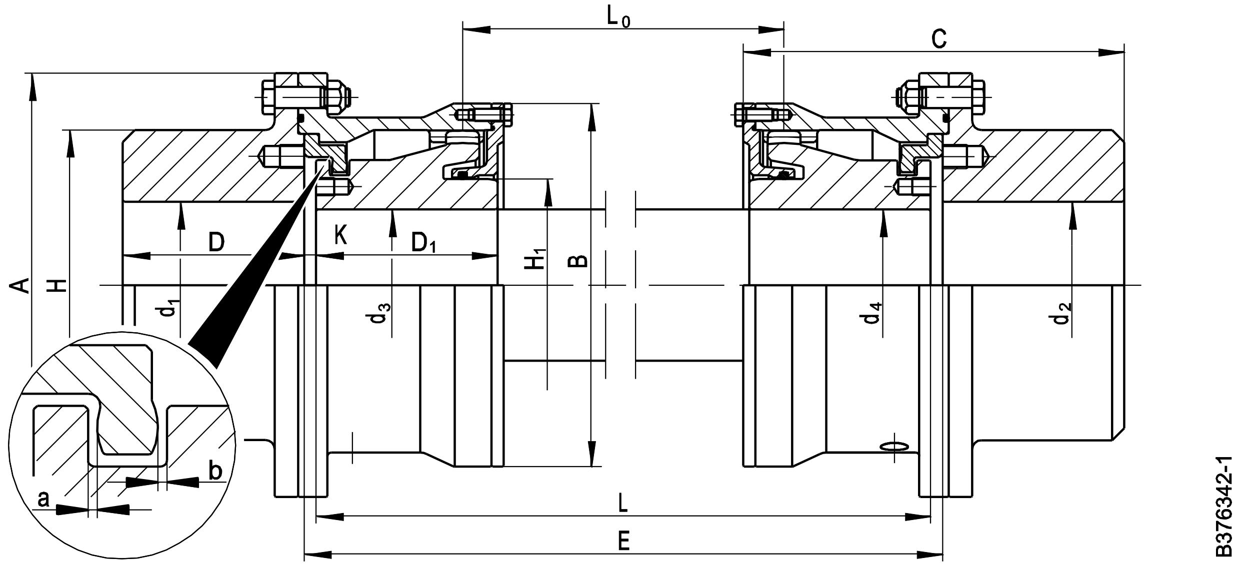
$$J = \frac{G \cdot d^2}{8 \cdot 10^6}$$

Size	C_1 [1)] MNm/rad	Size	C_1 [1)] MNm/rad	Size	C_1 [1)] MNm/rad	Size	C_1 [1)] MNm/rad
30	0.48	**90**	12.1	**160**	57.3	**260**	235.6
40	1.19	**100**	14.2	**180**	73.9	**280**	299.4
50	2.19	**110**	18.5	**200**	101.2	**300**	357.3
60	3.92	**125**	25.5	**220**	150.0	**320**	458.5
70	5.56	**140**	38.7	**240**	184.3	**340**	620.4
80	8.52						

1) Values for the complete coupling for bore d_1; d_2 max., the intermediate shaft is considered only in the range of hub lengths D_1. For the exposed part of the shaft, the data must be calculated using the above formula.

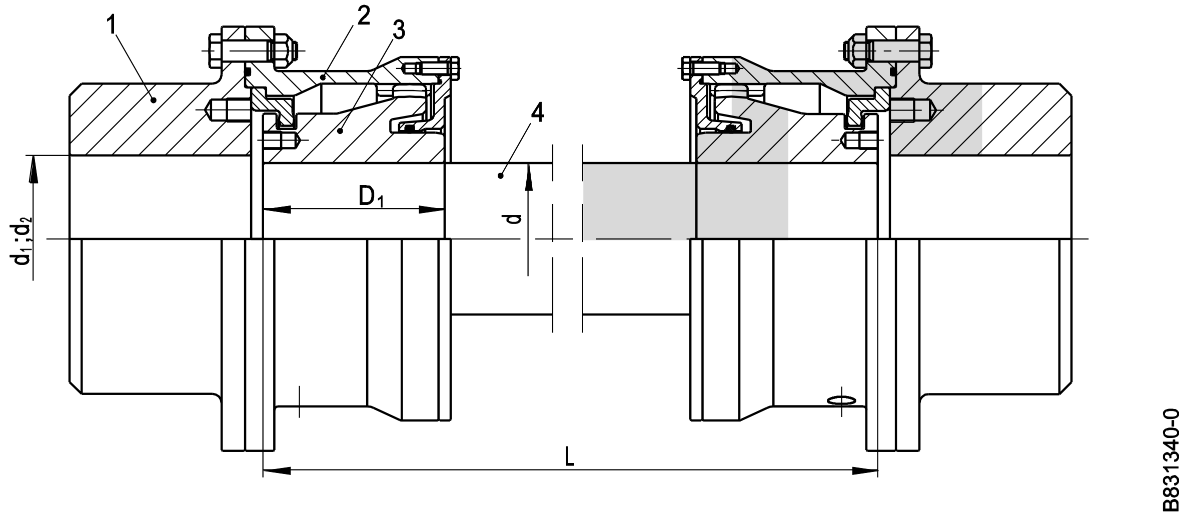
SRG series

Dimension table no.: B744393-0



Size	Nominal torque T_{KN} kNm	Speed[3] n_{max} rpm	Bore d_1; d_2 min mm	Bore d_1; d_2 max mm	Bore d_3; d_4 min mm	Bore d_3; d_4 max mm	Dimensions A mm	B mm	C mm	D/D_1 mm	H mm	H_1 mm	K mm	L_0 mm	Axial clearances a and b[1] mm	Mass moment of inertia[2] kgm²	Weight[2] kg
30	0.95	7500	12	61	12	34	118	92	105	50	80	45	3.5	E-79	0.5	0.01	8
40	2.1	6900	22	73	22	46	145	115	126.5	60	95	60	5	E-101	0.5	0.03	13
50	3.5	6300	22	86	22	58	165	135	146.5	70	112	75	5	E-118	0.5	0.06	19.8
60	5.9	5900	28	100	28	70	200	160	169	80	130	90	6	E-138	0.5	0.14	32
70	9	5400	28	115	28	78	220	178	189	90	150	100	6	E-154	0.5	0.24	46
80	13	5000	32	131	32	92	240	196	209	100	170	120	6	E-172	0.5	0.38	58
90	18	4700	32	146	32	100	270	225	232	110	190	130	8	E-192	0.5	0.69	86
100	23	4300	55	158	55	110	280	240	252	120	205	140	8	E-212	1	0.9	99
110	30.5	4000	65	173	65	120	310	265	272	130	225	155	8	E-226	1	1.49	133
125	42	3700	75	192	75	138	340	295	315	150	250	175	10	E-260	1	2.7	187
140	61	3400	85	219	85	156	390	325	345	165	285	200	10	E-286	1	4.42	259
160	90	3100	110	250	120	180	435	370	398	190	325	230	12	E-332	1	8.2	374
180	130	2900	134	277	140	200	480	415	454	220	360	260	12	E-378	1	14.1	521
200	189	2700	150	315	160	225	545	465	508	245	410	290	14	E-422	1	25.6	765
220	245	2400	160	346	160	273	580	510	556	270	450	355	16	E-468	1.5	37.9	964
240	330	2200	180	369	180	300	645	560	598	290	480	390	18	E-504	1.5	57.3	1210
260	390	2100	200	400	200	319	680	595	640	310	520	415	20	E-544	1.5	79.3	1485
280	535	2000	220	423	220	354	745	660	700	340	550	460	20	E-586	1.5	124	1950
300	580	1900	240	446	240	369	775	675	740	360	580	480	20	E-624	1.5	155	2255
320	740	1800	260	477	260	404	825	725	780	380	620	525	20	E-652	1.5	216	2710
340	950	1700	280	500	280	431	915	795	808	390	650	560	28	E-666	2	326	3420

[1] With these axial clearances, the permissible angular displacement ΔK_w =0.6° for each coupling half.
The axial clearances a and b can be changed if necessary.
[2] Values for the complete coupling, without intermediate shaft, for bore d_1; d_2 max. and d_3; d_4 max.
[3] The speed n_{max} depends on the length and weight of the intermediate shaft.
$L = E - 2 \cdot K$



3

Legend

1 Flange

2 Sleeve

3 Hub

4 Intermediate shaft

Weight of the intermediate shaft

G = intermediate shaft at $L_{existing}$

d = shaft diameter

Torsional stiffness of the coupling

C_1 = coupling without intermediate shaft

C_2 = intermediate shaft at $L_{existing}$

C_3 = coupling at $L_{existing}$

Inertia intermediate shaft

J = intermediate shaft at $L_{existing}$

$$G = 6.165 \cdot \frac{d^2 \cdot L}{10^6}$$

$$C_2 = 7.805 \cdot \frac{d^4}{L - 2 \cdot D_1} \qquad C_3 := \frac{1}{\frac{1}{C_1} + \frac{1}{C_2}}$$

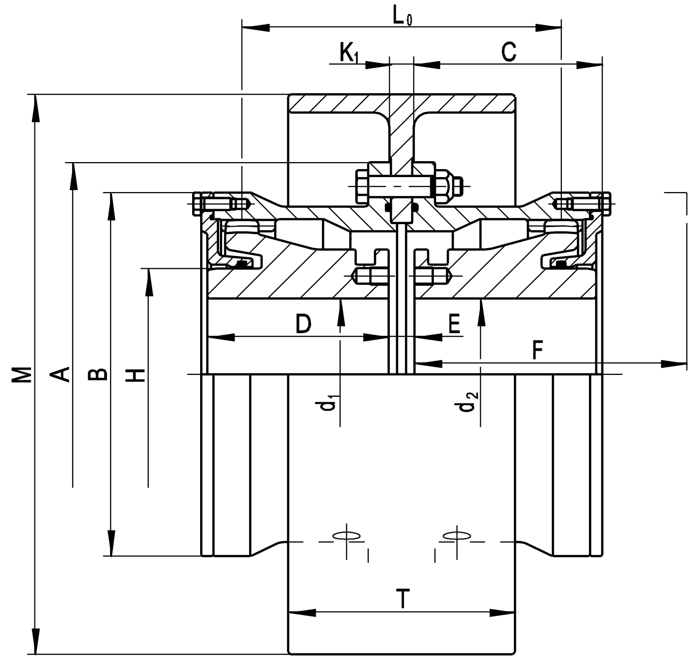
$$J = \frac{G \cdot d^2}{8 \cdot 10^6}$$

Size	C_1 [1)] MNm/rad	Size	C_1 [1)] MNm/rad	Size	C_1 [1)] MNm/rad	Size	C_1 [1)] MNm/rad
30	0.48	**90**	12.1	**160**	57.3	**260**	235.6
40	1.19	**100**	14.2	**180**	73.9	**280**	299.4
50	2.19	**110**	18.5	**200**	101.2	**300**	357.3
60	3.92	**125**	25.5	**220**	150.0	**320**	458.5
70	5.56	**140**	38.7	**240**	184.3	**340**	620.4
80	8.52						

[1)] Values for the complete coupling for bore d_1; d_2 max., the intermediate shaft is considered only in the range of hub lengths D_1.
For the exposed part of the shaft, the data must be calculated using the above formula.

SBD series

Dimension table no.: B744394-0

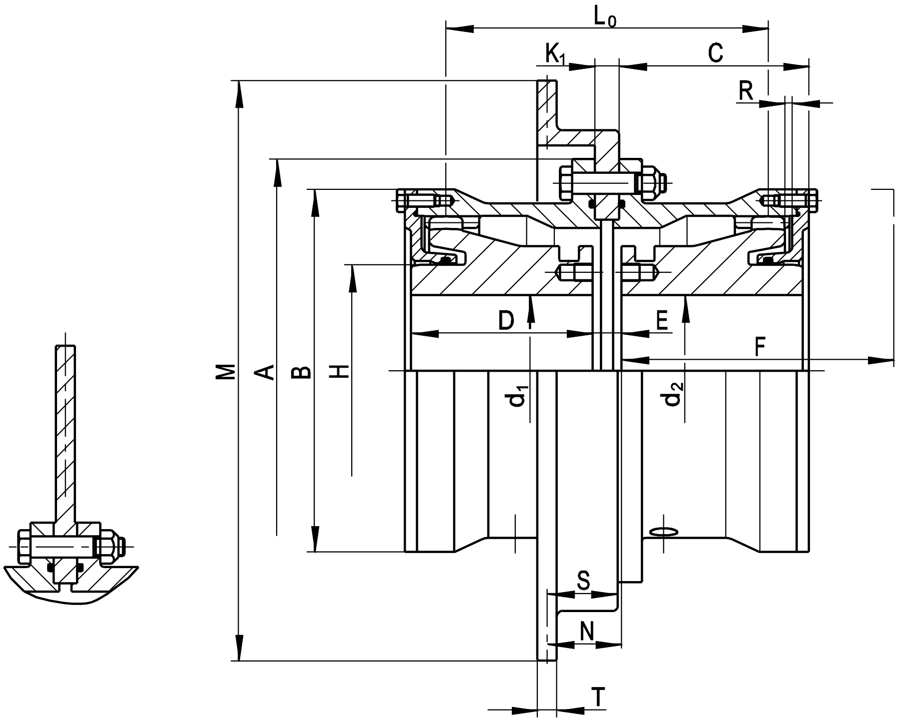


Size	Nominal torque T_{KN} kNm	Speed[4] n_{max} rpm	Bore d_1; d_2 min mm	Bore d_1; d_2 max mm	A mm	B mm	C mm	D mm	E mm	F[3] mm	H mm	L_0 mm	Max. static radial offset ΔK_r[1] mm	Mass moment of inertia[2] kgm^2	Weight[2] kg
30	0.95	7500	12	34	118	92	53	50	K_1+3	75	45	K_1+75	1.95	0.007	4.4
40	2.1	6900	22	46	145	115	62.5	60	K_1+2	90	60	K_1+93	2.70	0.016	7.4
50	3.5	6300	22	58	165	135	72.5	70	K_1+2	110	75	K_1+110	3.00	0.029	11.1
60	5.9	5900	28	70	200	160	84.5	80	K_1+3	120	90	K_1+129	3.45	0.075	18.3
70	9	5400	28	78	220	178	93.5	90	K_1+1	130	100	K_1+143	3.90	0.13	25.4
80	13	5000	32	92	240	196	103.5	100	K_1+1	150	120	K_1+161	4.35	0.19	31.4
90	18	4700	32	100	270	225	115.5	110	K_1+3	170	130	K_1+179	4.80	0.37	46
100	23	4300	55	110	280	240	125.5	120	K_1+3	180	140	K_1+197	5.25	0.47	54
110	30.5	4000	65	120	310	265	135	130	K_1+2	190	155	K_1+212	5.70	0.81	72
125	42	3700	75	138	340	295	157.5	150	K_1+5	215	175	K_1+245	6.45	1.31	100
140	61	3400	85	156	390	325	172.5	165	K_1+5	230	200	K_1+271	7.20	2.35	140
160	90	3100	120	180	435	370	199	190	K_1+6	270	230	K_1+314	8.40	4.2	198
180	130	2900	140	200	480	415	225	220	K_1+6	300	260	K_1+360	9.60	7.4	283
200	189	2700	160	225	545	465	252.5	245	K_1+7	340	290	K_1+401	10.80	14	417

1) In relation to a permissible angular displacement of ΔK_w =1.5° for each coupling half.
These values do not apply to the braking equipment.
2) Values for the complete coupling, without brake disc, for bore d_1; d_2 max.
3) The dismounting dimension F is required for changing the O-rings.
4) The speed n_{max} depends on the permissible circumferential speed of the brake disc.
Observe the brake manufacturer's specifications!
K_1, M, T see Page 84

SBT series

Dimension table no.: B744395-0



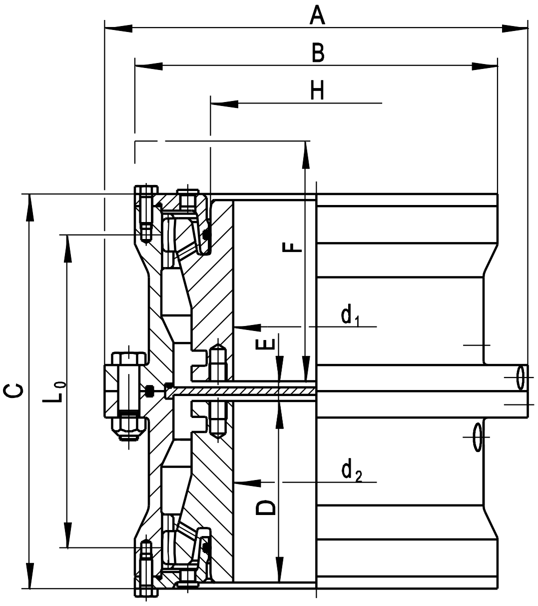
B376340-1

Size	Nominal torque T_{KN} kNm	Speed[5] n_{max} rpm	Bore d_1; d_2 min mm	Bore d_1; d_2 max mm	A mm	B mm	C mm	D mm	E mm	F[3] mm	H mm	N mm	R[4] mm	L_0 mm	Max. static radial offset ΔK_r[1] mm	Mass moment of inertia[2] kgm^2	Weight[2] kg
30	0.95	7500	12	34	118	92	53	50	K_1+3	75	45	36.15	2	K_1+75	1.95	0.007	4.4
40	2.1	6900	22	46	145	115	62.5	60	K_1+3	90	60	36.15	2	K_1+94	2.70	0.016	7.4
50	3.5	6300	22	58	165	135	72.5	70	K_1+4	110	75	49.65	2	K_1+112	3.00	0.029	11.1
60	5.9	5900	28	70	200	160	84.5	80	K_1+5	120	90	50.15	2	K_1+131	3.45	0.075	18.3
70	9	5400	28	78	220	178	93.5	90	K_1+5	130	100	50.15	2	K_1+147	3.90	0.13	25.4
80	13	5000	32	92	240	196	103.5	100	K_1+5	150	120	50.15	2	K_1+165	4.35	0.19	31.4
90	18	4700	32	100	270	225	115.5	110	K_1+5	170	130	50.15	3	K_1+181	4.80	0.37	46
100	23	4300	55	110	280	240	125.5	120	K_1+7	180	140	51.15	3	K_1+201	5.25	0.47	54
110	30.5	4000	65	120	310	265	135	130	K_1+6	190	155	50.65	3	K_1+216	5.70	0.81	72
125	42	3700	75	138	340	295	157.5	150	K_1+11	215	175	53.15	3	K_1+251	6.45	1.31	100
140	61	3400	85	156	390	325	172.5	165	K_1+11	230	200	53.15	3	K_1+277	7.20	2.35	140
160	90	3100	120	180	435	370	199	190	K_1+14	270	230	54.65	3	K_1+322	8.40	4.2	198
180	130	2900	140	200	480	415	225	220	K_1+16	300	260	55.65	3	K_1+370	9.60	7.4	283
200	189	2700	160	225	545	465	252.5	245	K_1+19	340	290	57.15	4	K_1+413	10.80	14	417

[1] In relation to a permissible angular displacement of ΔK_w =1.5° for each coupling half.
These values do not apply to the braking equipment.
[2] Values for the complete coupling, without brake disc, for bore d_1; d_2 max.
[3] The dismounting dimension F is required for changing the O-rings.
[4] Check the clearance R with the axial clearance for the brake clamps.
[5] The speed n_{max} depends on the permissible circumferential speed of the brake disc.
Observe the brake manufacturer's specifications!
K_1, M, S, T see Page 85

VSB series

Dimension table no.: B744396-0



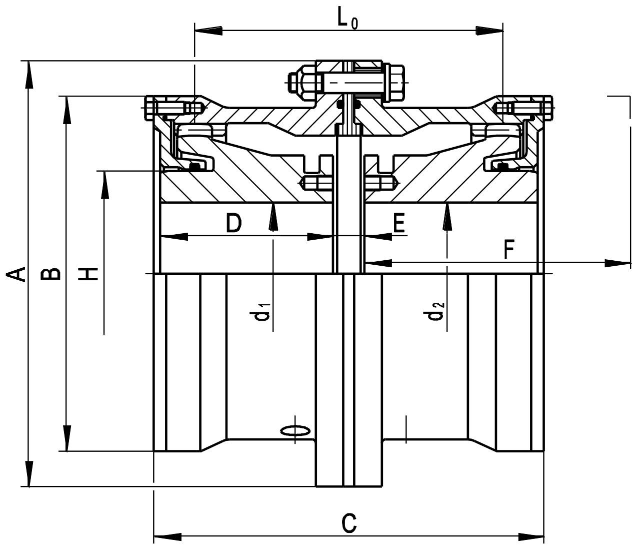
B376345-1

Size	Nominal torque T_{KN} kNm	Speed n_{min} rpm	Speed n_{max} rpm	Dimensions: Bore d_1; d_2 min mm	Bore d_1; d_2 max mm	A mm	B mm	C mm	D mm	E mm	F[3] mm	H mm	L_0 mm	Max. static radial offset ΔK_r[1] mm	Mass moment of inertia[2] kgm²	Weight[2] kg
30	0.95	1300	7500	12	34	118	92	110	50	7	75	45	79	1.95	0.007	4.6
40	2.1	1300	6900	22	46	145	115	131	60	8	90	60	99	2.70	0.018	7.9
50	3.5	1300	6300	22	58	165	135	151	70	8	110	75	116	3.00	0.035	11.8
60	5.9	900	5900	28	70	200	160	175	80	9	120	90	135	3.45	0.084	19.1
70	9	900	5400	28	78	220	178	197	90	11	130	100	153	3.90	0.14	27
80	13	900	5000	32	92	240	196	217	100	11	150	120	171	4.35	0.21	34
90	18	650	4700	32	100	270	225	241	110	13	170	130	189	4.80	0.40	49
100	23	650	4300	55	110	280	240	261	120	13	180	140	207	5.25	0.57	56
110	30.5	650	4000	65	120	310	265	282	130	14	190	155	224	5.70	0.85	75
125	42	650	3700	75	138	340	295	325	150	15	215	175	255	6.45	1.4	104
140	61	500	3400	85	156	390	325	355	165	15	230	200	281	7.20	2.5	147
160	90	500	3100	120	180	435	370	410	190	18	270	230	326	8.40	4.41	204
180	130	500	2900	140	200	480	415	462	220	18	300	260	372	9.60	7.62	292
200	189	500	2700	160	225	545	465	519	245	21	340	290	415	10.80	14.3	430

[1] In relation to a permissible angular displacement of ΔK_w =1.5° for each coupling half.
[2] Values for the complete coupling for bore d_1; d_2 max.
[3] The dismounting dimension F is required for changing the O-rings.

SBi series

Dimension table no.: B744397-0



Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Dimensions: Bore d_1; d_2 min mm	Bore d_1; d_2 max mm	A mm	B mm	C mm	D mm	E mm	F[3] mm	H mm	L_0 mm	Max. static radial offset ΔK_r[1] mm	Mass moment of inertia[2] kgm^2	Weight[2] kg
40	2.1	6900	22	46	145	115	135	60	9	90	60	100	2.70	0.017	8
50	3.5	6300	22	58	165	135	155	70	9	110	75	117	3.00	0.033	11.8
60	5.9	5900	28	70	200	160	180	80	11	120	90	137	3.45	0.082	19.2
70	9	5400	28	78	220	178	203	90	12	130	100	154	3.90	0.133	26.4
80	13	5000	32	92	240	196	223	100	12	150	120	172	4.35	0.2	32.5
90	18	4700	32	100	270	225	248	110	15	170	130	191	4.80	0.38	50
100	23	4300	55	110	280	240	268	120	15	180	140	209	5.25	0.49	57
110	30.5	4000	65	120	310	265	289	130	15	190	155	225	5.70	0.82	75
125	42	3700	75	138	340	295	333	150	18	215	175	258	6.45	1.35	104
140	61	3400	85	156	390	325	363	165	18	230	200	284	7.20	2.41	147
160	90	3100	120	180	435	370	418	190	20	270	230	328	8.40	4.3	208
180	130	2900	140	200	480	415	470	220	20	300	260	374	9.60	7.5	295
200	189	2700	160	225	545	465	527	245	22	340	290	416	10.80	14.1	422

[1] In relation to a permissible angular displacement of ΔK_w =1.5° for each coupling half.
[2] Values for the complete coupling for bore d_1; d_2 max.
[3] The dismounting dimension F is required for the vertical installation and removal of the machine and for changing the O-rings.

3

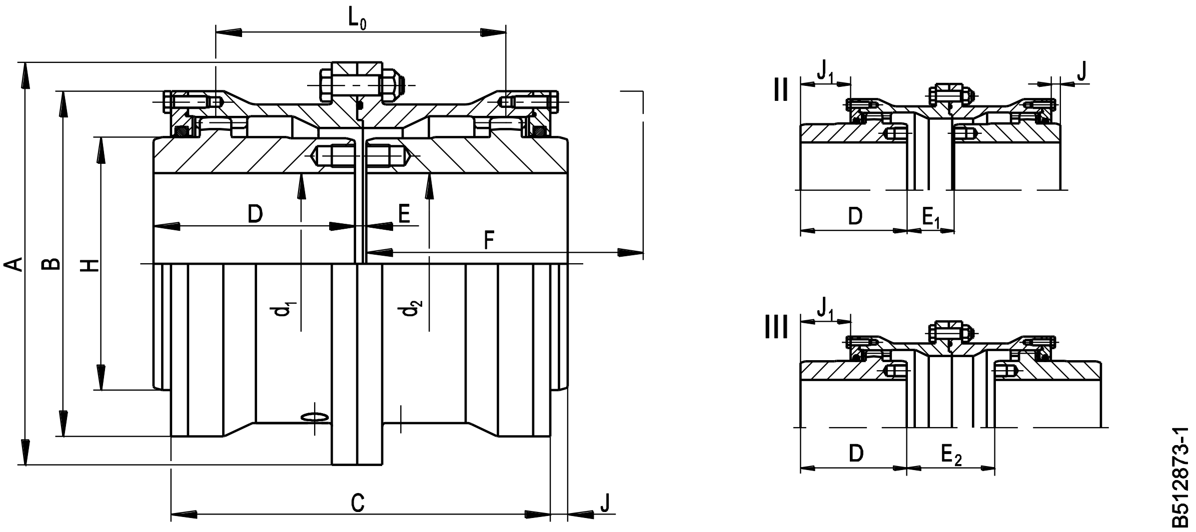
3.8 Designs and dimension tables of the product family SBk

Designs	Series	Page
Basic design	SBk	56
Basic design with retaining ring	SBRk	57
Spacer design	SBLk	58
Spacer design with retaining ring	SRLk	60
Intermediate shaft design	SBGk	62
Intermediate shaft design with retaining ring	SRGk	64
Design with brake disc for shoe brake	SBkD	66
Design with brake disc for disc brake	SBkT	67
Electrically insulated design	SBki	68

Tab. 16: Designs of the product family SBk

SBk series

Dimension table no.: B759800-0

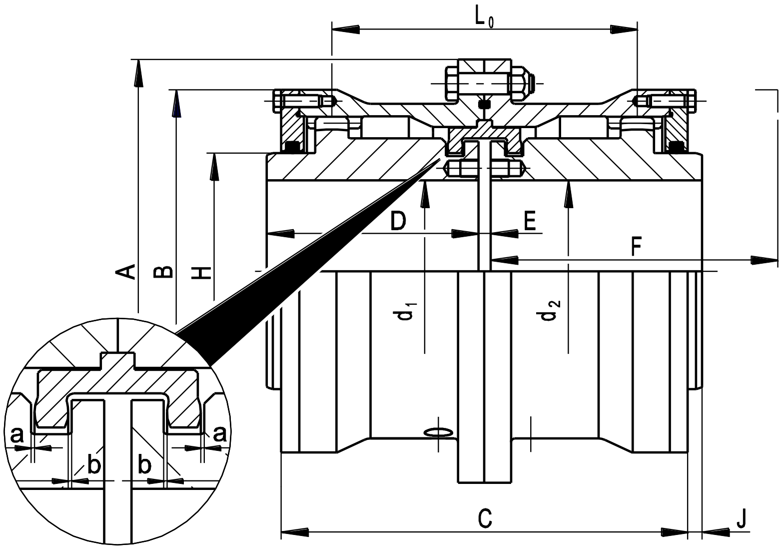


Size	Nominal torque P_{KN} kNm	Speed n_{max} rpm	Bore d_1; d_2 min mm	Bore d_1; d_2 max mm	A mm	B mm	C mm	D mm	E mm	E_1 mm	E_2 mm	F[3] mm	H mm	J mm	J_1 mm	L_0 mm	Max. static radial offset ΔK_r[1] mm	Mass moment of inertia[2] kgm²	Weight[2] kg
38	0.95	7500	12	46	118	92	115	60	5	17	29	90	60	5	17	77	1.01	0.007	4.6
48	2.1	6900	22	59	145	115	135	70	5	26	47	100	77	5	26	96	1.26	0.018	8.1
60	3.5	6300	22	69	165	135	155	80	6	33	60	110	90	5.5	32.5	113	1.50	0.036	11.9
70	5.9	5900	28	85	200	160	178	90	6	42	78	120	112.5	4	40	132	1.73	0.087	20
80	9	5400	28	98	220	178	198	100	6	48	90	130	128	4	46	148	1.95	0.146	27
90	13	5000	32	110	240	196	218	110	8	56	104	140	145	5	53	166	2.25	0.22	33
100	18	4700	32	123	270	225	244	125	8	59	110	150	160.5	7	58	184	2.40	0.42	50
110	23	4300	55	135	280	240	264	140	8	62	116	170	176	12	66	202	2.70	0.55	59
125	30.5	4000	65	150	310	265	284	150	10	68	126	180	200.5	13	71	218	2.85	0.91	78
140	42	3700	75	170	340	295	330	170	10	80	150	200	224.5	10	80	250	3.30	1.58	111
160	61	3400	85	195	390	325	360	190	12	84	156	230	256.5	16	88	274	3.60	2.78	154
180	90	3100	120	220	435	370	416	220	12	100	188	260	288.5	18	106	320	4.20	4.96	218
200	130	2900	140	245	480	415	476	250	14	116	218	300	320.5	19	121	366	4.80	8.4	305
225	189	2700	160	275	545	465	532	280	16	128	240	330	362	22	134	408	5.40	15.6	445
250	245	2400	160	305	580	510	556	300	20	152	284	350	400	32	164	452	6.00	21.8	550
265	330	2200	180	335	645	560	600	330	20	154	288	380	440	40	174	484	6.30	34	735
280	390	2100	200	350	680	595	640	330	20	194	368	380	460	20	194	524	6.75	45.5	850
315	535	2000	220	390	745	660	702	360	20	206	392	420	510	19	205	566	6.75	71	1060
335	580	1900	240	410	775	675	744	380	20	221	422	440	535	18	219	601	7.50	88	1275
355	740	1800	260	440	825	725	786	400	25	234	443	460	580	19.5	228.5	634	8.25	127	1530
375	950	1700	280	470	915	795	808	420	25	221	417	480	620	28.5	224.5	641	8.25	192	1920

1) In relation to a permissible angular displacement of ΔK_w =0.75° for each coupling half.
2) Values for the complete coupling for bore d_1; d_2 max.
3) The dismounting dimension F is required for the vertical installation and removal of the machine and for changing the O-rings.

SBRk series

Dimension table no.: B759801-0



B512874-1

Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Bore d_1; d_2 min mm	Bore max mm	A mm	B mm	C mm	D mm	E mm	F[3] mm	H mm	J mm	L_0 mm	Axial clearances a and b[1] mm	Mass moment of inertia[2] kgm²	Weight[2] kg
38	0.95	7500	12	40	118	92	117	60	5	90	52	4	77	0.5	0.008	5.1
48	2.1	6900	22	54	145	115	138	70	5	100	71	3.5	96	0.5	0.022	9
60	3.5	6300	22	63	165	135	158	80	6	110	83	4	113	0.5	0.041	12.8
70	5.9	5900	28	78	200	160	181	90	6	120	103	2.5	132	0.5	0.1	22
80	9	5400	28	85	220	178	203	100	6	130	116	1.5	148	0.5	0.16	29
90	13	5000	32	100	240	196	223	110	8	140	133	2.5	166	0.5	0.25	37
100	18	4700	32	108	270	225	249	125	8	150	142	4.5	184	0.5	0.49	55
110	23	4300	55	120	280	240	269	140	8	170	156	9.5	202	1	0.65	65
125	30.5	4000	65	135	310	265	290	150	10	180	177	10	218	1	1.1	86
140	42	3700	75	150	340	295	335	170	10	200	200	7.5	250	1	1.83	119
160	61	3400	85	175	390	325	365	190	12	230	230	13.5	274	1	3.12	167
180	90	3100	120	200	435	370	422	220	12	260	261	15	320	1	5.75	243
200	130	2900	140	225	480	415	482	250	14	300	296	16	366	1	9.6	337
225	189	2700	160	260	545	465	539	280	16	330	338	18.5	408	1	17.8	475

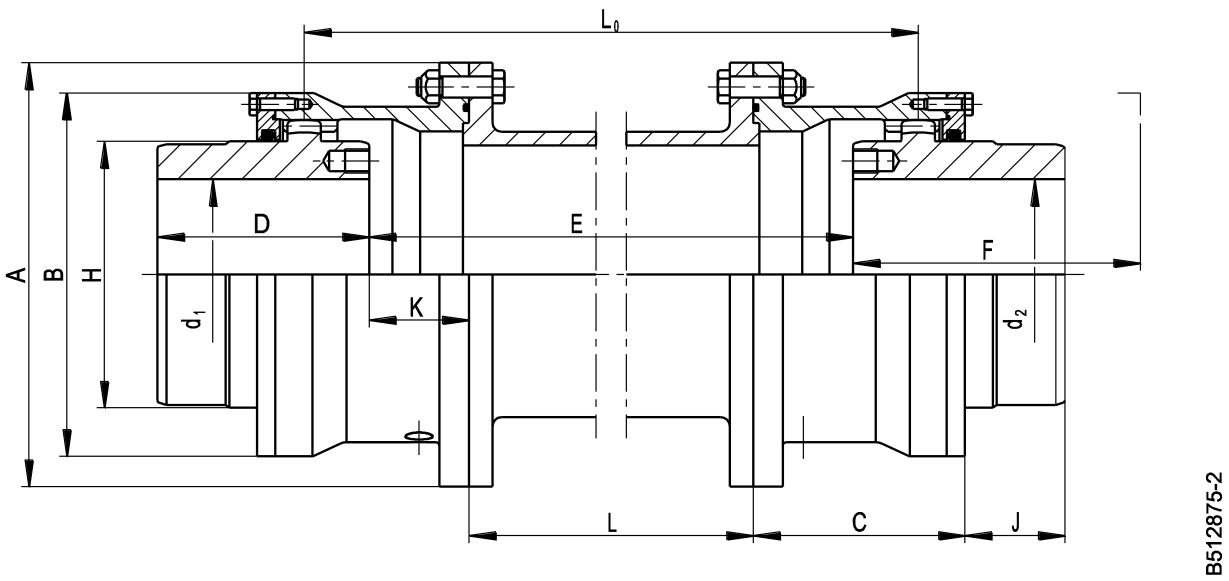
1) With these axial clearances, the permissible angular displacement ΔK_w =0.6° for each coupling half. The axial clearances a and b can be changed if necessary.

2) Values for the complete coupling for bore d_1; d_2 max.

3) The dismounting dimension F is required for the vertical installation and removal of the machine, for installation of the retaining ring and for changing the O-rings.

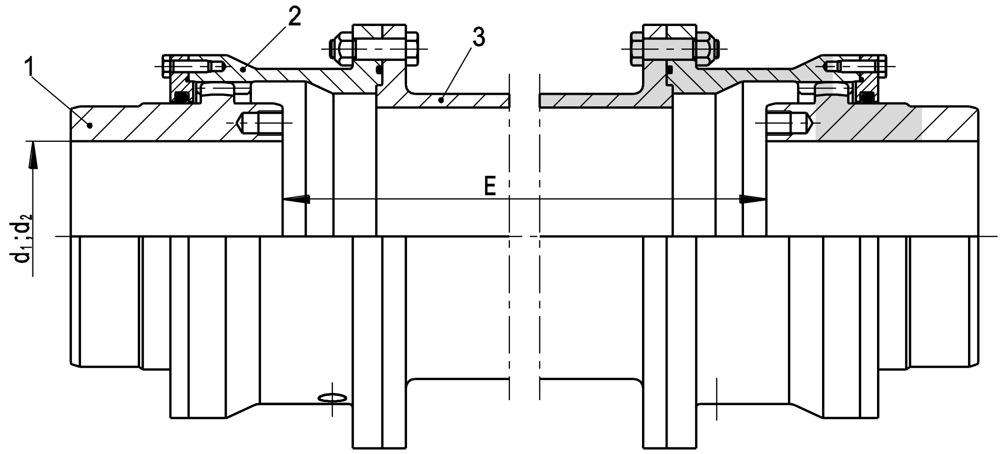
SBLk series

Dimension table no.: B759802-0



Size	Nominal torque T_{KN} kNm	Speed[3] n_{max} rpm	Bore d_1; d_2 min mm	max mm	A mm	B mm	C mm	D mm	F[2] mm	H mm	J mm	K mm	L mm	L_0 mm	Mass moment of inertia[1] kgm²	Weight[1] kg
38	0.95	7500	12	46	118	92	58.5	60	90	60	17	15.5	E-31	E+48	0.01	4.7
48	2.1	6900	22	59	145	115	72	70	100	77	26	28	E-56	E+49	0.02	8.6
60	3.5	6300	22	69	165	135	82	80	110	90	32.5	34.5	E-69	E+53	0.04	12.6
70	5.9	5900	28	85	200	160	94.5	90	120	112.5	40	44.5	E-89	E+54	0.09	21
80	9	5400	28	98	220	178	105	100	130	128.5	46	51	E-102	E+58	0.15	28
90	13	5000	32	110	240	196	115	110	140	145	53	58	E-116	E+62	0.23	35
100	18	4700	32	123	270	225	130	125	150	160.5	58	63	E-126	E+74	0.44	52
110	23	4300	55	135	280	240	140	140	170	176	66	66	E-132	E+86	0.57	62
125	30.5	4000	65	150	310	265	150	150	180	200.5	71	71	E-142	E+92	0.94	82
140	42	3700	75	170	340	295	175	170	200	224.5	80	85	E-170	E+100	1.86	115
160	61	3400	85	195	390	325	190	190	230	256.5	88	88	E-176	E+118	2.84	160
180	90	3100	120	220	435	370	219	220	260	288.5	106	105	E-210	E+132	5.18	228
200	130	2900	140	245	480	415	249	250	300	320.5	121	120	E-240	E+148	8.77	316
225	189	2700	160	275	545	465	279	280	330	362	134	133	E-266	E+168	15.6	449
250	245	2400	160	305	580	510	282	300	350	400	164	146	E-292	E+168	22.3	564
265	330	2200	180	335	645	560	304	330	380	440	174	148	E-296	E+196	34.2	757
280	390	2100	200	350	680	595	324	330	380	460	194	188	E-376	E+156	46.5	873
315	535	2000	220	390	745	660	356	360	420	510	205	201	E-402	E+174	73	1090
335	580	1900	240	410	775	675	377	380	440	535	219	216	E-432	E+179	114	1315
355	740	1800	260	440	825	725	398	400	460	580	228.5	226.5	E-453	E+191	129	1571
375	950	1700	280	470	915	795	410	420	480	620	224.5	214.5	E-429	E+224	195	1970

1) Values for the complete coupling, without spacer, for bore d_1; d_2 max.
2) The dismounting dimension F is required for changing the O-rings.
3) The speed n_{max} depends on the length and weight of the spacer.
A different hub layout is possible, see SBk series.



Legend

1 Hub   2 Sleeve   3 Spacer

Weight of the spacer

G_1 = spacer at E_{min}

G_2 = per 1 mm spacer length

G_3 = spacer at E> E_{min}

$$G_3 = G_1 + (E - E_{min}) \cdot G_2$$

Torsional stiffness of the coupling

C_1 = coupling at E_{min}

C_2 = per 1 mm spacer length

C_3 = coupling at E > E_{min}

$$C_3 = \frac{1}{\frac{1}{C_1} + \frac{E - E_{min}}{C_2}}$$

Mass moment of inertia spacer

J_1 = spacer at E_{min}

J_2 = per 1 mm spacer length

J_3 = spacer at E> E_{min}

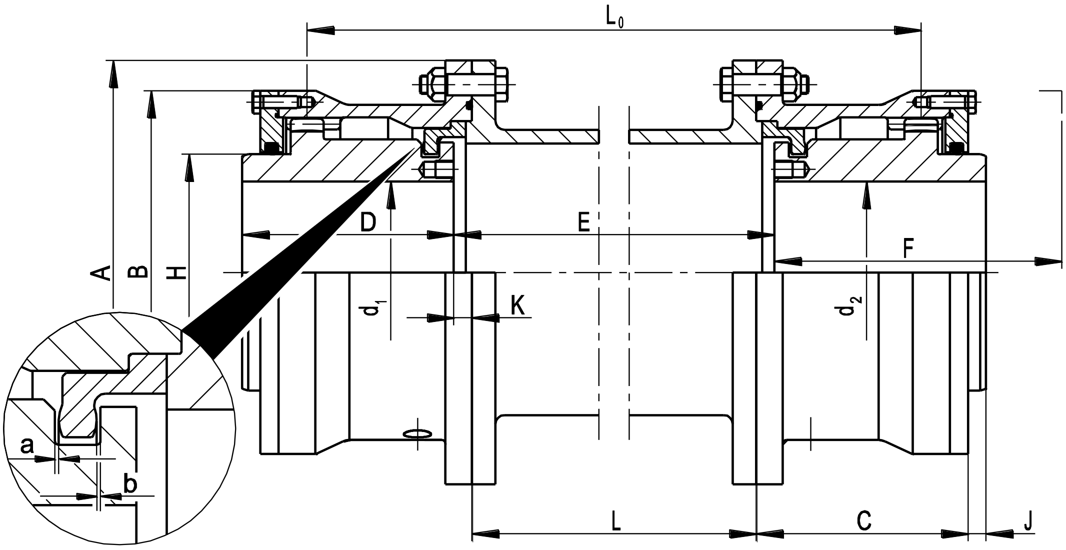
$$J_3 = J_1 + (E - E_{min}) \cdot J_2$$

Size	E_{min} mm	G_1 kg	G_2 kg/mm	C_1 MNm/rad	C_2 MNm · mm/rad	J_1 kgm²	J_2 kgm²/mm
38	106	2.17	0.011	0.83	186	0.00401	0.000011
48	136	3.20	0.014	1.51	274	0.00876	0.000020
60	149	4.40	0.018	2.53	537	0.0146	0.000041
70	189	6.70	0.022	4.42	897	0.0368	0.000072
80	202	8.20	0.029	6.48	1335	0.055	0.000113
90	216	8.70	0.030	8.76	1895	0.075	0.00017
100	246	13.0	0.034	11.66	2637	0.138	0.00023
110	252	13.5	0.040	14.41	3556	0.159	0.00032
125	297	19.2	0.041	17.25	4690	0.292	0.00043
140	325	22.8	0.048	24.27	6909	0.423	0.00064
160	351	32.0	0.053	32.35	8928	0.783	0.00088
180	415	49.0	0.070	42.79	14028	1.46	0.0014
200	445	52.0	0.080	62.94	23220	2.04	0.0023
225	506	96.0	0.120	84.69	36882	4.41	0.036

Information based on d_1; d_2 max.
G_3 and J_3 refer exclusively to the spacer.
C_3 relates to the entire coupling.

SRLk series

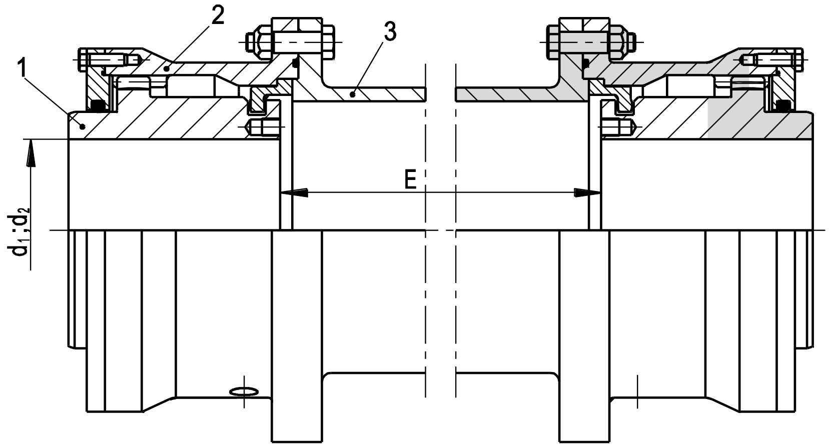
Dimension table no.: B759803-0



B512876-1

Size	Nominal torque T_{KN} kNm	Speed[4] n_{max} rpm	Dimensions: Bore d_1; d_2 min mm	Bore d_1; d_2 max mm	A mm	B mm	C mm	D mm	F[3] mm	H mm	J mm	K mm	L mm	L_0 mm	Axial clearances a and b[1] mm	Mass moment of inertia[2] kgm^2	Weight[2] kg
38	0.95	7500	12	40	118	92	58.5	60	90	52	5	3.5	E-7	E+72	0.5	0.01	5.3
48	2.1	6900	22	54	145	115	72	70	100	71	5	7	E-14	E+91	0.5	0.02	10
60	3.5	6300	22	63	165	135	82	80	110	83	5	7	E-14	E+107	0.5	0.05	15
70	5.9	5900	28	78	200	160	94.5	90	120	103	4	8.5	E-17	E+126	0.5	0.1	24
80	9	5400	28	85	220	178	105	100	130	116	4	9	E-18	E+142	0.5	0.16	31
90	13	5000	32	100	240	196	115	110	140	133	4	9	E-18	E+158	0.5	0.25	42
100	18	4700	32	108	270	225	130	125	150	142	7	12	E-24	E+176	0.5	0.5	60
110	23	4300	55	120	280	240	140	140	170	156	12	12	E-24	E+194	1	0.64	72
125	30.5	4000	65	135	310	265	150	150	180	177	12	12	E-24	E+208	1	1	96
140	42	3700	75	150	340	295	175	170	200	200	10	15	E-30	E+240	1	1.93	136
160	61	3400	85	175	390	325	190	190	230	230	15	15	E-30	E+262	1	3.14	182
180	90	3100	120	200	435	370	219	220	260	261	18	17	E-34	E+308	1	5.75	268
200	130	2900	140	225	480	415	249	250	300	296	18	17	E-34	E+352	1	9.85	365
225	189	2700	160	260	545	465	279	280	330	338	21	20	E-40	E+392	1	18.4	553

[1] With these axial clearances, the permissible angular displacement ΔK_w =0.6° for each coupling half.
The axial clearances a and b can be changed if necessary.
[2] Values for the complete coupling, without spacer, for bore d_1; d_2 max.
[3] The dismounting dimension F is required for the vertical installation and removal of the machine, for installation of the retaining rings and for changing the O-rings.
[4] The speed n_{max} depends on the length and weight of the spacer.



Legend

1 Flange 2 Sleeve 3 Spacer

Weight of the spacer

G_1 = spacer at E_{min}

G_2 = per 1 mm spacer length

G_3 = spacer at E> E_{min}

$$G_3 = G_1 + (E - E_{min}) \cdot G_2$$

Torsional stiffness of the coupling

C_1 = coupling at E_{min}

C_2 = per 1 mm spacer length

C_3 = coupling at E > E_{min}

$$C_3 = \frac{1}{\frac{1}{C_1} + \frac{E - E_{min}}{C_2}}$$

Mass moment of inertia spacer

J_1 = spacer at E_{min}

J_2 = per 1 mm spacer length

J_3 = spacer at E> E_{min}

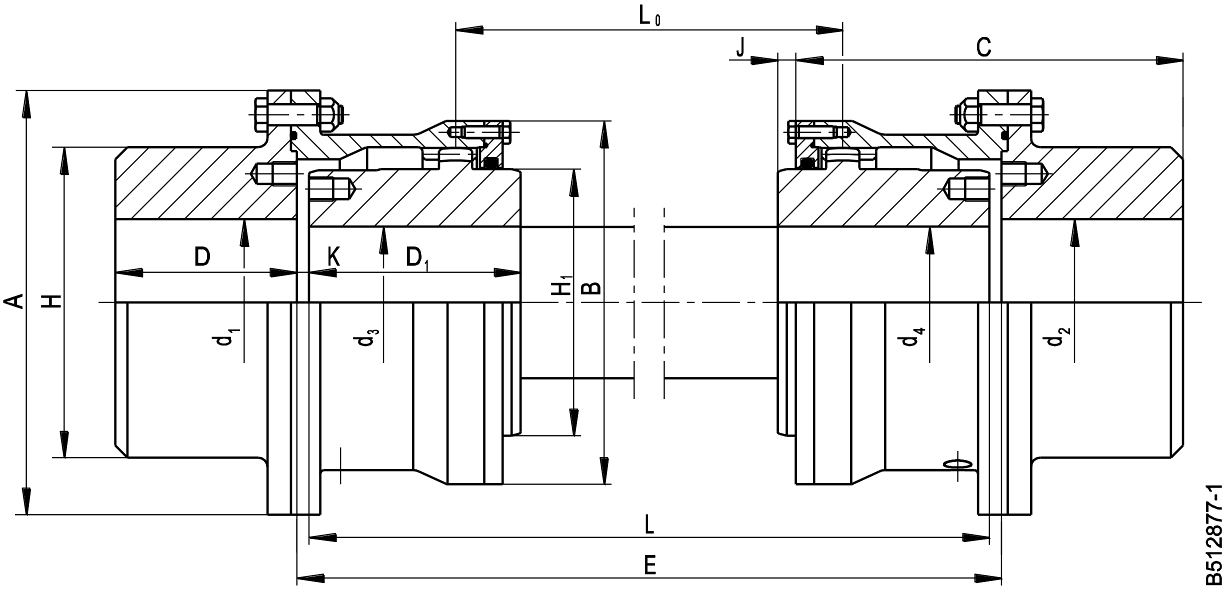
$$J_3 = J_1 + (E - E_{min}) \cdot J_2$$

Size	E_{min} mm	G_1 kg	G_2 kg/mm	C_1 MNm/rad	C_2 MNm · mm/rad	J_1 kgm²	J_2 kgm²/mm
38	82	2.17	0.011	0.57	186	0.00401	0.000011
48	94	3.20	0.014	1.35	274	0.00876	0.000020
60	94	4.40	0.018	2.22	537	0.0146	0.000041
70	117	6.70	0.022	3.96	897	0.0368	0.000072
80	118	8.20	0.029	5.74	1335	0.055	0.000113
90	118	8.70	0.030	7.95	1895	0.075	0.00017
100	144	13.0	0.034	10.23	2637	0.138	0.00023
110	144	13.5	0.040	12.58	3556	0.159	0.00032
125	179	19.2	0.041	15.29	4690	0.292	0.00043
140	185	22.8	0.048	21.45	6909	0.423	0.00064
160	205	32.0	0.053	29.22	8928	0.783	0.00088
180	239	49.0	0.070	39.14	14028	1.46	0.0014
200	239	52.0	0.080	58.83	23220	2.04	0.0023
225	280	96.0	0.120	79.13	36882	4.41	0.0036

Information based on d_1; d_2 max.
G_3 and J_3 refer exclusively to the spacer.
C_3 relates to the entire coupling.

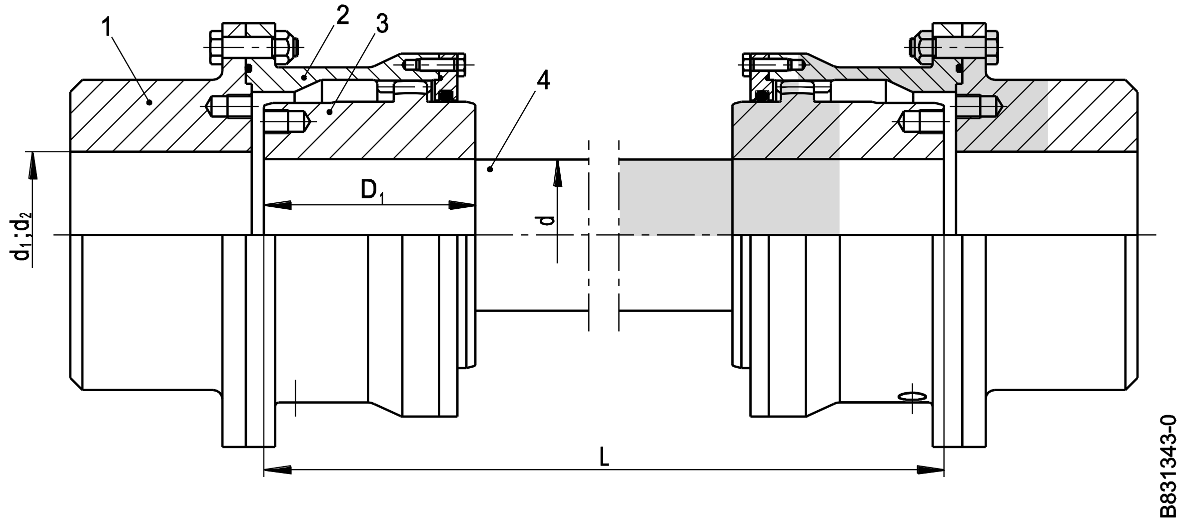
SBGk series

Dimension table no.: B759804-0



Size	Nominal torque	Speed[2)]	Dimensions													Mass moment of inertia[1)]	Weight[1)]
			Bore														
			d_1-d_4	d_1; d_2	d_3; d_4												
	T_{KN}	n_{max}	min	max	max	A	B	C	D	D_1	H	H_1	J	K	L_0		
	kNm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kgm^2	kg
38	0.95	7500	12	61	46	118	92	108.5	50	60	80	60	5	3.5	E-79	0.01	8.3
48	2.1	6900	22	73	59	145	115	130	60	70	95	77	5	5	E-101	0.03	13.5
60	3.5	6300	22	86	69	165	135	150	70	80	112	90	5	5	E-117	0.06	20
70	5.9	5900	28	100	85	200	160	172	80	90	130	112.5	4	6	E-138	0.14	33
80	9	5400	28	115	98	220	178	192	90	100	150	128	4	6	E-154	0.24	46
90	13	5000	32	131	110	240	196	212	100	110	170	145	4	6	E-170	0.38	58
100	18	4700	32	146	123	270	225	236	110	125	190	160.5	7	8	E-192	0.68	86
110	23	4300	55	158	135	280	240	256	120	140	205	176	12	8	E-210	0.95	102
125	30.5	4000	65	173	150	310	265	276	130	150	225	200.5	12	8	E-224	1.54	135
140	42	3700	75	192	170	340	295	320	150	170	250	224.5	10	10	E-260	2.86	189
160	61	3400	85	219	195	390	325	350	165	190	285	256.5	15	10	E-282	4.6	255
180	90	3100	120	250	220	435	370	404	190	220	325	288.5	18	12	E-332	8.54	380
200	130	2900	140	277	245	480	415	464	220	250	360	320.5	18	12	E-376	15.1	526
225	189	2700	160	315	275	545	465	518	245	280	410	362	21	14	E-420	26.7	763
250	245	2400	160	346	305	580	510	574	300	300	450	400	164	138	E-708	40	995
265	330	2200	180	369	335	645	560	626	330	330	520	440	174	140	E-744	57	1244
280	390	2100	200	400	350	680	595	646	330	330	520	460	194	180	E-864	77	1408
315	535	2000	220	423	390	745	660	706	360	360	550	510	205	191	E-928	122	1846
335	580	1900	240	446	410	775	675	747	380	380	580	535	219	206	E-993	155	2214
355	740	1800	260	477	440	825	725	788	400	400	620	580	228.5	216.5	E-1042	209	2612
375	950	1700	280	500	470	915	795	818	420	420	650	620	224.5	202.5	E-1021	320	3565

[1)] Values for the complete coupling, without intermediate shaft, for bore d_1; d_2 max. and d_3; d_4 max.
[2)] The speed n_{max} depends on the length and weight of the intermediate shaft.
$L = E - 2 \cdot K$



Legend

1 Flange | 2 Sleeve | 3 Hub | 4 Intermediate shaft

Weight of the intermediate shaft

G = intermediate shaft at $L_{existing}$

d = shaft diameter

Torsional stiffness of the coupling

C_1 = coupling without intermediate shaft

C_2 = intermediate shaft at $L_{existing}$

C_3 = coupling at $L_{existing}$

Inertia intermediate shaft

J = intermediate shaft at $L_{existing}$

$$G = 6.165 \cdot \frac{d^2 \cdot L}{10^6}$$

$$C_2 = 7.805 \cdot \frac{d^4}{L - 2 \cdot D_1} \qquad C_3 := \frac{1}{\frac{1}{C_1} + \frac{1}{C_2}}$$

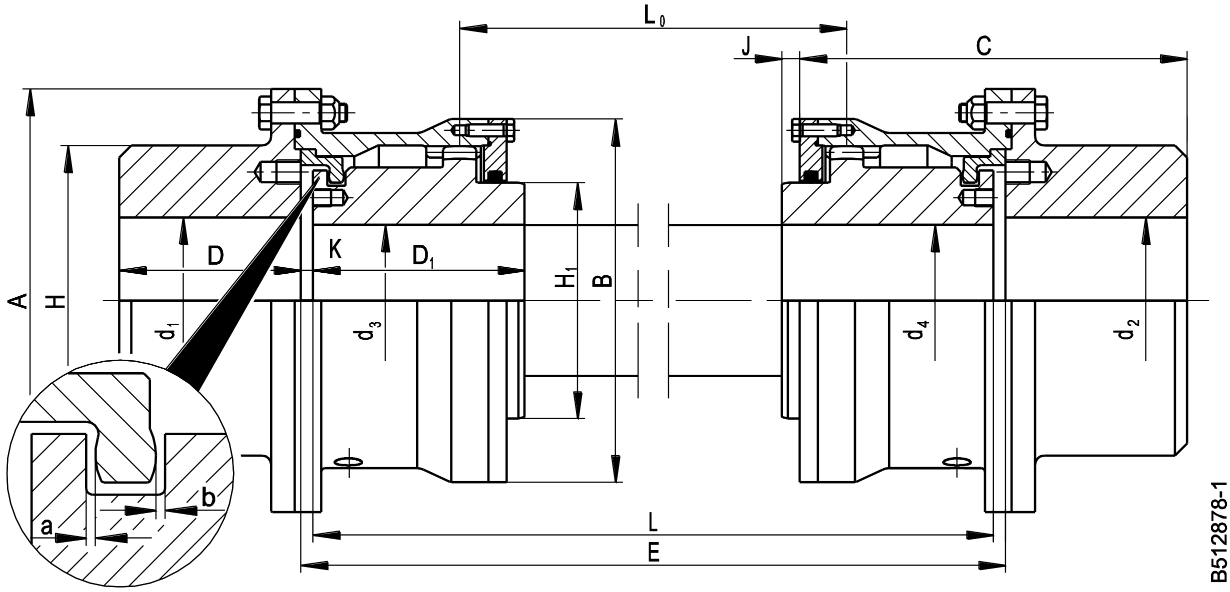
$$J = \frac{G \cdot d^2}{8 \cdot 10^6}$$

Size	C_1 [1)] MNm/rad	Size	C_1 [1)] MNm/rad	Size	C_1 [1)] MNm/rad	Size	C_1 [1)] MNm/rad
38	1.02	**100**	17.5	**180**	72.8	**280**	275.1
48	2.08	**110**	20.0	**200**	96.8	**315**	347.9
60	3.40	**125**	27.1	**225**	131.9	**335**	415.6
70	6.30	**140**	36.7	**250**	180.7	**355**	528.1
80	9.15	**160**	54.9	**265**	218.2	**375**	705.6
90	12.0						

1) Values for the complete coupling for bore d_1; d_2 max., the intermediate shaft is considered only in the range of hub lengths D_1. For the exposed part of the shaft, the data must be calculated using the above formula.

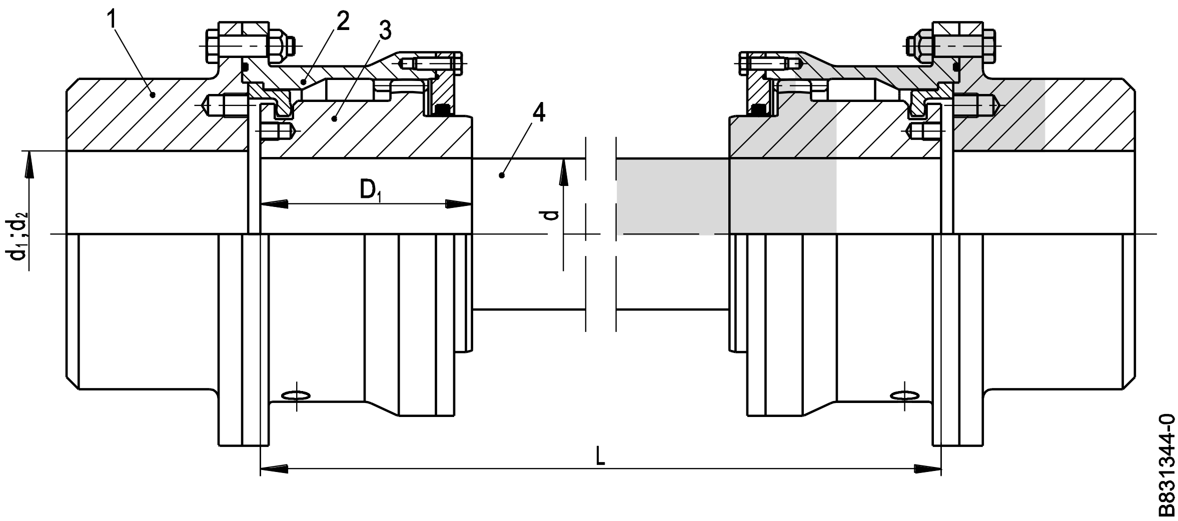
SRGk series

Dimension table no.: B759805-0



Size	Nominal torque T_{KN}	Speed[3)] n_{max}	Bore d1-d4 min	Bore d1; d2 max	Bore d3; d4 max	A	B	C	D	D1	H	H1	J	K	L0	Axial clearances a and b[1)]	Mass moment of inertia[2)]	Weight[2)]
	kNm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kgm^2	kg
38	0.95	7500	12	61	40	118	92	108.5	50	60	80	52	5	3.5	E-79	0.5	0.013	8.5
48	2.1	6900	22	73	54	145	115	130	60	70	95	71	5	5	E-101	0.5	0.031	14.1
60	3.5	6300	22	86	63	165	135	150	70	80	112	83	5	5	E-117	0.5	0.062	20.5
70	5.9	5900	28	100	78	200	160	172	80	90	130	103	4	6	E-138	0.5	0.15	33.5
80	9	5400	28	115	85	220	178	192	90	100	150	116	4	6	E-154	0.5	0.25	48
90	13	5000	32	131	100	240	196	212	100	110	170	133	4	6	E-170	0.5	0.4	60
100	18	4700	32	146	108	270	225	236	110	125	190	142	7	8	E-192	0.5	0.72	90
110	23	4300	55	158	120	280	240	256	120	140	205	156	12	8	E-210	1	1	106
125	30.5	4000	65	173	135	310	265	276	130	150	225	177	12	8	E-224	1	1.6	142
140	42	3700	75	192	150	340	295	320	150	170	250	200	10	10	E-260	1	2.95	195
160	61	3400	85	219	175	390	325	350	165	190	285	230	15	10	E-282	1	4.7	264
180	90	3100	120	250	200	435	370	404	190	220	325	261	18	12	E-332	1	9	400
200	130	2900	140	277	225	480	415	464	220	250	360	296	18	12	E-376	1	15.6	552
225	189	2700	160	315	260	545	465	518	245	280	410	338	21	14	E-420	1	28.2	790

1) With these axial clearances, the permissible angular displacement ΔK_w =0.6° for each coupling half.
The axial clearances a and b can be changed if necessary.
2) Values for the complete coupling, without intermediate shaft, for bore d_1; d_2 max. and d_3; d_4 max.
3) The speed n_{max} depends on the length and weight of the intermediate shaft.
L = E – 2 · K



Legend

1 Flange 2 Sleeve 3 Hub 4 Intermediate shaft

Weight of the intermediate shaft

G = intermediate shaft at $L_{existing}$

d = shaft diameter

Torsional stiffness of the coupling

C_1 = coupling without intermediate shaft

C_2 = intermediate shaft at $L_{existing}$

C_3 = coupling at $L_{existing}$

Inertia intermediate shaft

J = intermediate shaft at $L_{existing}$

$$G = 6.165 \cdot \frac{d^2 \cdot L}{10^6}$$

$$C_2 = 7.805 \cdot \frac{d^4}{L - 2 \cdot D_1} \qquad C_3 := \frac{1}{\frac{1}{C_1} + \frac{1}{C_2}}$$

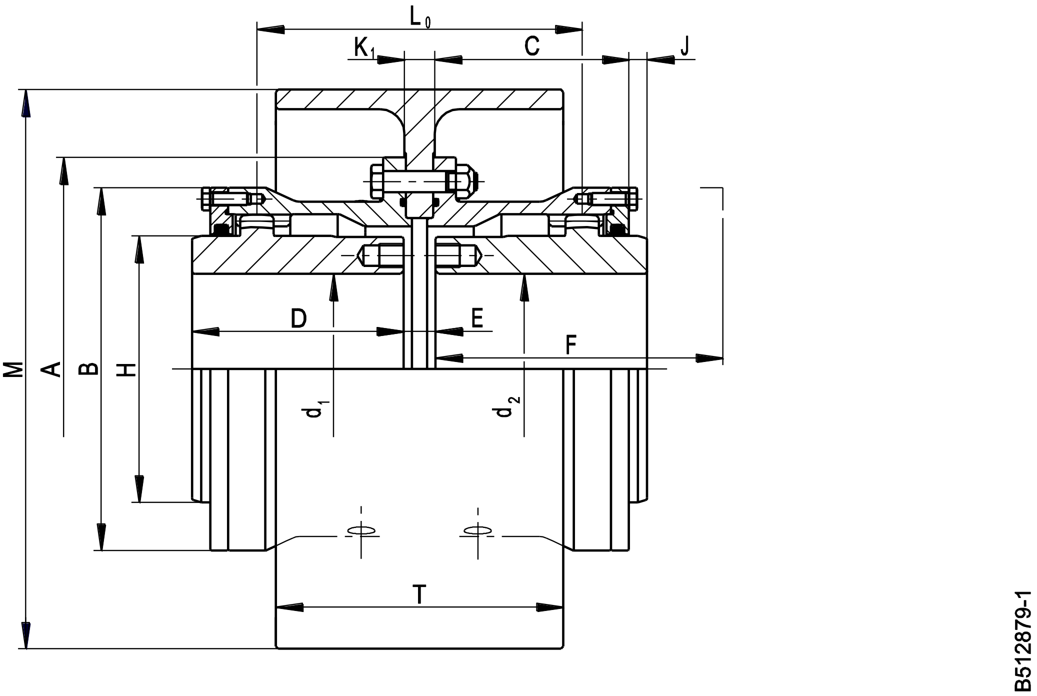
$$J = \frac{G \cdot d^2}{8 \cdot 10^6}$$

Size	C_1 [1)] MNm/rad	Size	C_1 [1)] MNm/rad	Size	C_1 [1)] MNm/rad	Size	C_1 [1)] MNm/rad
38	1.02	**100**	17.5	**180**	72.8	**280**	275.1
48	2.08	**110**	20.0	**200**	96.8	**315**	347.9
60	3.40	**125**	27.1	**225**	131.9	**335**	415.6
70	6.30	**140**	36.7	**250**	180.7	**355**	528.1
80	9.15	**160**	54.9	**265**	218.2	**375**	705.6
90	12.0						

[1)] Values for the complete coupling for bore d_1; d_2 max., the intermediate shaft is considered only in the range of hub lengths D_1.
For the exposed part of the shaft, the data must be calculated using the above formula.

SBkD series

Dimension table no.: B759806-0

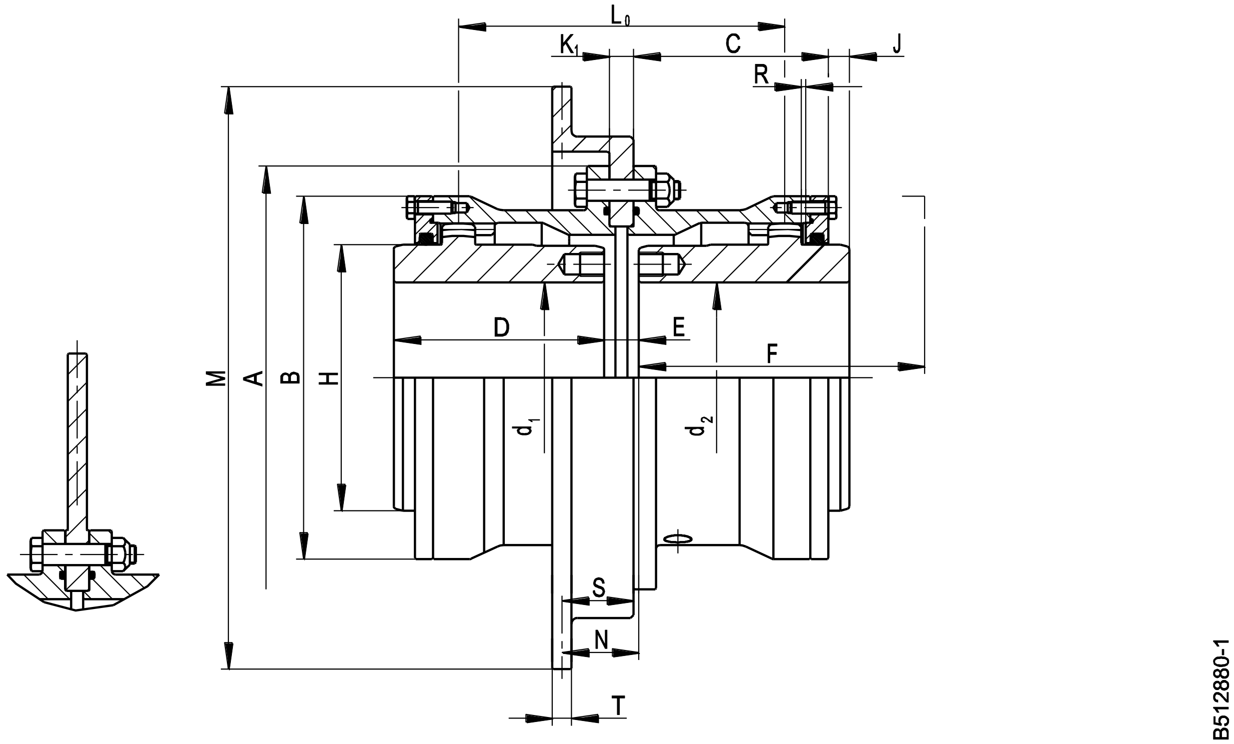


Size	Nominal torque T_{KN}	Speed[4] n_{max}	Dimensions											Max. static radial offset ΔK_r[1]	Mass moment of inertia[2]	Weight[2]
			Bore d_1; d_2													
			min	max	A	B	C	D	E	F[3]	H	J	L_0			
	kNm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kgm²	kg
38	0.95	7500	12	46	118	92	56.5	60	K_1+3	90	60	5	K_1+75	1.01	0.007	4.2
48	2.1	6900	22	59	145	115	66	70	K_1+2	100	77	5	K_1+93	1.26	0.017	7.8
60	3.5	6300	22	69	165	135	76	80	K_1+3	110	90	5.5	K_1+110	1.50	0.035	11.7
70	5.9	5900	28	85	200	160	87.5	90	K_1+3	120	112.5	4	K_1+129	1.73	0.085	19.8
80	9	5400	28	98	220	178	96.5	100	K_1+1	130	128	4	K_1+143	1.95	0.13	26.5
90	13	5000	32	110	240	196	106.5	110	K_1+3	140	145	5	K_1+161	2.25	0.21	32.5
100	18	4700	32	123	270	225	119.5	125	K_{11}+3	150	160.5	7	K_1+179	2.40	0.4	46
110	23	4300	55	135	280	240	129.5	140	K_1+3	170	176	12	K_1+197	2.70	0.53	57
125	30.5	4000	65	150	310	265	139	150	K_1+4	180	200.5	13	K_1+212	2.85	0.84	59
140	42	3700	75	170	340	295	162.5	170	K_1+5	200	224.5	10	K_1+245	3.30	1.5	111
160	61	3400	85	195	390	325	177.5	190	K_1+7	230	256.5	16	K_1+269	3.60	2.6	153
180	90	3100	120	220	435	370	205	220	K_1+6	260	288.5	18	K_1+314	4.20	4.7	217
200	130	2900	140	245	480	415	235	250	K_1+8	300	320.5	19	K_1+360	4.80	8.1	303
225	189	2700	160	275	545	465	262.5	280	K_1+9	330	362	22	K_1+401	5.40	15.2	442

1) In relation to a permissible angular displacement of ΔK_w =0.75° for each coupling half.
These values do not apply to the braking equipment.
2) Values for the complete coupling, without brake disc, for bore d_1; d_2 max.
3) The dismounting dimension F is required for changing the O-rings.
4) The speed n_{max} depends on the permissible circumferential speed of the brake disc.
Observe the brake manufacturer's specifications!
K_1, M, T see Page 84

SBkT series

Dimension table no.: B759807-0

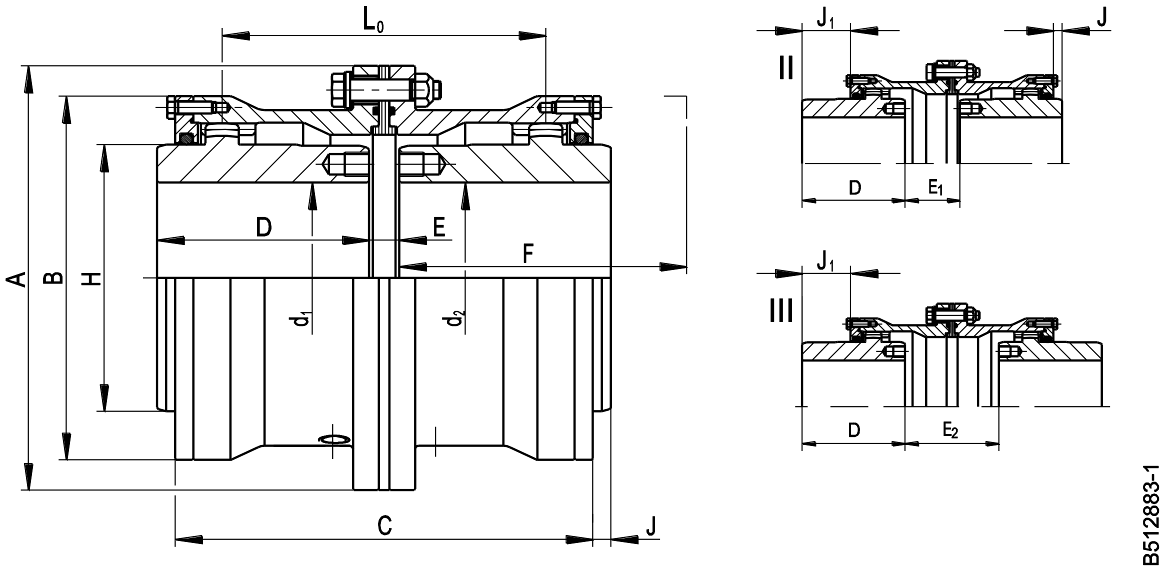


Size	Nominal torque T_{KN}	Speed[5] n_{max}	Bore d_1; d_2 min	Bore d_1; d_2 max	A	B	C	D	E	F[3]	H	J	N	R[4]	L_0	Max. static radial offset ΔK_r[1]	Mass moment of inertia[2]	Weight[2]
	kNm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kgm^2	kg
38	0.95	7500	12	46	118	92	56.5	60	K_1+3	90	60	5	36.15	2	K_1+75	1.01	0.007	4.2
48	2.1	6900	22	59	145	115	66	70	K_1+3	100	77	5.5	36.15	2	K_1+94	1.26	0.017	7.8
60	3.5	6300	22	69	165	135	76	80	K_1+5	110	90	6.5	50.15	2	K_1+112	1.50	0.035	11.7
70	5.9	5900	28	85	200	160	87.5	90	K_1+5	120	112.5	5	50.15	2	K_1+131	1.73	0.085	19.8
80	9	5400	28	98	220	178	96.5	100	K_1+5	130	128	6	50.15	2	K_1+147	1.95	0.13	26.5
90	13	5000	32	110	240	196	106.5	110	K_1+7	140	145	7	51.15	2	K_1+165	2.25	0.21	32.5
100	18	4700	32	123	270	225	119.5	125	K_1+5	150	160.5	8	50.15	3	K_1+181	2.40	0.4	46
110	23	4300	55	135	280	240	129.5	140	K_1+7	170	176	14	51.15	3	K_1+201	2.70	0.53	57
125	30.5	4000	65	150	310	265	139	150	K_1+8	180	200.5	15	51.65	3	K_1+216	2.85	0.84	59
140	42	3700	75	170	340	295	162.5	170	K_1+11	200	224.5	13	53.15	3	K_1+251	3.30	1.5	111
160	61	3400	85	195	390	325	177.5	190	K_1+15	230	256.5	20	55.15	3	K_1+277	3.60	2.6	153
180	90	3100	120	220	435	370	205	220	K_1+14	260	288.5	22	54.65	3	K_1+322	4.20	4.7	217
200	130	2900	140	245	480	415	235	250	K_1+18	300	320.5	24	56.65	3	K_1+370	4.80	8.1	303
225	189	2700	160	275	545	465	262.5	280	K_1+21	330	362	28	58.15	4	K_1+413	5.40	15.2	442

[1] In relation to a permissible angular displacement of ΔK_w =0.75° for each coupling half.
These values do not apply to the braking equipment.
[2] Values for the complete coupling, without brake disc, for bore d_1; d_2 max.
[3] The dismounting dimension F is required for changing the O-rings.
[4] Check the clearance R with the axial clearance for the brake clamps.
[5] The speed n_{max} depends on the permissible circumferential speed of the brake disc.
Observe the brake manufacturer's specifications!
K_1, M, S, T see Page 85

SBki series

Dimension table no.: B790865-0



Size	Nominal torque T_{kN} kNm	Speed n_{max} rpm	Bore d_1; d_2 min mm	Bore d_1; d_2 max mm	Dimensions A mm	B mm	C mm	D mm	E mm	E_1 mm	E_2 mm	F[3] mm	H mm	J mm	J_1 mm	L_0[4] mm	Max. static radial offset ΔK_r[1] mm	Mass moment of inertia[2] kgm²	Weight[2] kg
38	0.95	7500	12	46	118	92	121	60	9	21	33	90	60	8	20	81	1.01	0.007	4.7
48	2.1	6900	22	59	145	115	142	70	9	30	51	100	77	8.5	29.5	100	1.26	0.018	8.6
60	3.5	6300	22	69	165	135	162	80	10	37	64	110	90	9	36	117	1.50	0.036	12.5
70	5.9	5900	28	85	200	160	186	90	11	47	83	120	112.5	8	44	137	1.73	0.087	20.8
80	9	5400	28	98	220	178	209	100	12	54	96	130	128	9.5	51.5	154	1.95	0.146	27.4
90	13	5000	32	110	240	196	229	110	14	62	110	140	145	10.5	58.5	172	2.25	0.22	33.5
100	18	4700	32	123	270	225	256	125	15	66	117	150	160.5	13	64	191	2.40	0.42	53
110	23	4300	55	135	280	240	276	140	15	69	123	170	176	18	72	209	2.70	0.55	62
125	30.5	4000	65	150	310	265	297	150	17	75	133	180	200.5	19.5	77.5	225	2.85	0.91	81
140	42	3700	75	170	340	295	343	170	18	88	158	200	224.5	16.5	86.5	258	3.30	1.58	115
160	61	3400	85	195	390	325	373	190	20	92	164	230	256.5	22.5	94.5	282	3.60	2.78	159
180	90	3100	120	220	435	370	430	220	20	108	196	260	288.5	25	113	328	4.20	4.96	227
200	130	2900	140	245	480	415	490	250	22	124	226	300	320.5	26	128	374	4.80	8.4	315
225	189	2700	160	275	545	465	547	280	24	136	248	330	362	29.5	141.5	416	5.40	15.6	447

1) In relation to a permissible angular displacement of ΔK_w =0.75° for each coupling half.
2) Values for the complete coupling for bore d_1; d_2 max.
3) The dismounting dimension F is required for the vertical installation and removal of the machine and for changing the O-rings.
4) L_0 is applicable to E

3.9 Designs and dimension tables of the product family LBk

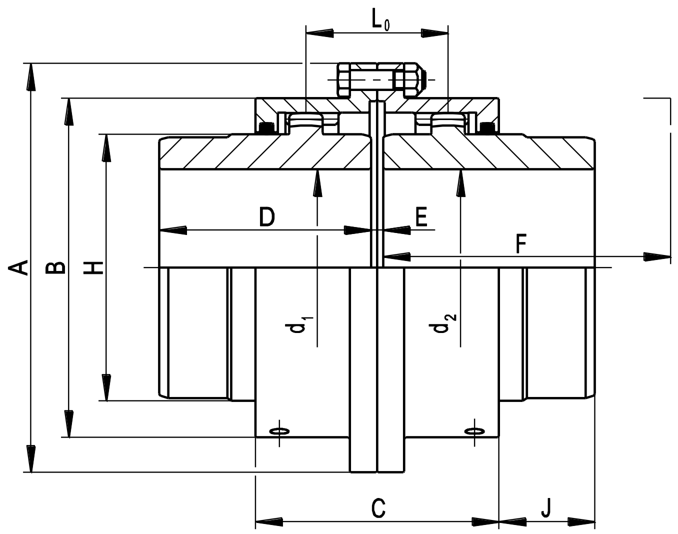
Designs	Series	Page
Basic design	LBk	70
Basic design with retaining ring	LBRkn	71
Spacer design	LBLk	72
Spacer design with retaining ring	LRLkn	74
Intermediate shaft design	LBGk	76
Intermediate shaft design with retaining ring	LRGkn	78
Design with brake disc for shoe brake	LBkD	80
Design with brake disc for disc brake	LBkT	81
Vertical design	VLBk	82
Electrically insulated design	LBki	83

Tab. 17: Designs of the product family LBk

3

LBk series

Dimension table no.: B759808-0



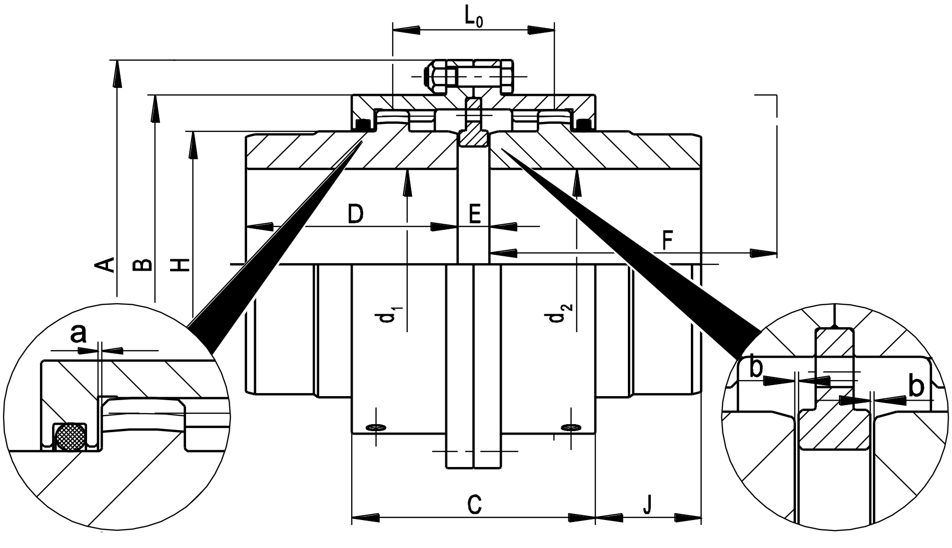
B570276-0

Size	Nominal torque	Speed	Dimensions											Max. static radial offset ΔK_r[1)]	Mass moment of inertia[2)]	Weight[2)]
			Bore d_1; d_2													
	T_{KN}	n_{max}	min	max	A	B	C	D	E	F[3)]	H	J	L_0			
	kNm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kgm²	kg
32	0.48	8500	12	37	105	74	90	50	4	80	48	7	44	0.57	0.0034	2.9
38	0.95	7500	12	46	115	88	101	60	5	90	60	12	53	0.69	0.0059	4.3
48	2.1	6900	22	59	145	108	102	70	5	100	77	21.5	54	0.71	0.015	7
60	3.5	6300	22	69	165	125	107	80	6	110	90	29.5	59	0.77	0.026	9.3
70	5.9	5900	28	85	195	146	112	90	6	120	112.5	37	60	0.78	0.059	14.7
80	9	5400	28	98	215	168	119	100	6	130	128	43.5	64	0.84	0.097	20
90	13	5000	32	110	230	185	127	110	8	140	145	50.5	70	0.92	0.14	25.4
100	18	4700	32	123	265	210	148	125	8	150	160.5	55	82	1.08	0.28	38
110	23	4300	55	135	270	224	161	140	8	170	176	63.5	94	1.23	0.36	45.6
125	30.5	4000	65	150	305	245	175	150	10	180	200.5	67.5	102	1.34	0.64	62
140	42	3700	75	170	330	270	197	170	10	200	224.5	76.5	110	1.44	1.03	82
160	61	3400	85	195	375	305	221	190	12	230	256.5	85.5	130	1.70	1.5	120
180	90	3100	120	220	425	348	250	220	12	260	288.5	101	144	1.89	3.6	177
200	130	2900	140	245	470	392	272	250	14	300	320.5	121	162	2.12	6.2	245
225	189	2700	160	275	535	437	315	280	16	330	362	130.5	184	2.42	11.2	347

1) In relation to a permissible angular displacement of ΔK_w =0.75° for each coupling half.
2) Values for the complete coupling for bore d_1; d_2 max.
3) The dismounting dimension F is required for changing the O-rings.

LBRkn series

Dimension table no.: B759809-0

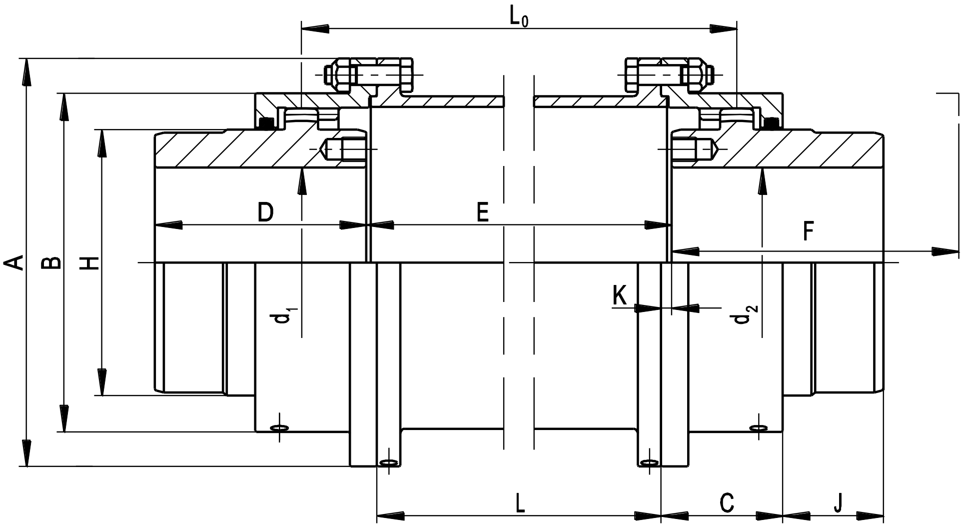


Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Dimensions: Bore d_1; d_2 min mm	Bore d_1; d_2 max mm	A mm	B mm	C mm	D mm	E mm	F[3] mm	H mm	J mm	L_0 mm	Axial clearances a and b[1] mm	Mass moment of inertia[2] kgm²	Weight[2] kg
32	0.48	8500	12	37	105	74	90	50	13	80	48	11.5	53	0.50	0.004	3.1
38	0.95	7500	12	46	115	88	101	60	14	90	60	16.5	62	0.50	0.006	4.5
48	2.1	6900	22	59	145	108	102	70	14	100	77	26	63	0.50	0.016	7.3
60	3.5	6300	22	69	165	125	107	80	17	110	90	35	70	0.50	0.027	9.8
70	5.9	5900	28	85	195	146	112	90	17	120	112	42.5	71	0.50	0.062	15.4
80	9	5400	28	98	215	168	119	100	18	130	128	49.5	76	0.50	0.102	21
90	13	5000	32	110	230	185	127	110	20	140	145	56.5	82	0.50	0.15	26.5
100	18	4700	32	123	265	210	148	125	21	150	160	61.5	95	0.50	0.29	39.8
110	23	4300	55	135	270	224	161	140	21	170	176	70	107	1.00	0.38	47.5
125	30.5	4000	65	150	305	245	175	150	25	180	200	75	117	1.00	0.66	64.4
140	42	3700	75	170	330	270	197	170	27	200	224	85	127	1.00	1.07	85
160	61	3400	85	195	375	305	221	190	29	230	256	94	147	1.00	1.57	124
180	90	3100	120	220	425	348	250	220	34	260	288	112	166	1.00	3.72	183
200	130	2900	140	245	470	392	272	250	36	300	320	132	184	1.00	6.39	252
225	189	2700	160	275	535	437	315	280	39	330	362	142	207	1.00	11.5	357

[1] With these axial clearances, the permissible angular displacement ΔK_w =0.6° for each coupling half.
The axial clearances a and b can be changed if necessary.
[2] Values for the complete coupling for bore d_1; d_2 max.
[3] The dismounting dimension F is required for changing the O-rings.

LBLk series

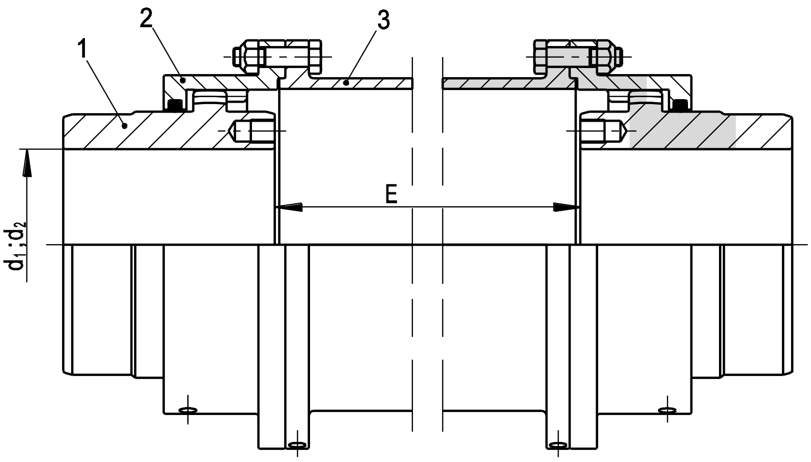
Dimension table no.: B759810-0



B570286-0

Size	Nominal torque T_{KN} kNm	Speed[3] n_{max} rpm	Dimensions: Bore d_1; d_2 min mm	max mm	A mm	B mm	C mm	D mm	F[2] mm	H mm	J mm	K mm	L mm	L_0 mm	Mass moment of inertia[1] kgm²	Weight[1] kg
32	0.48	8500	12	37	105	74	45	50	80	48	9.5	4.5	E-9	E+40	0.0034	2.9
38	0.95	7500	12	46	115	88	50.5	60	90	60	14.5	5	E-10	E+48	0.0059	4.3
48	2.1	6900	22	59	145	108	51	70	100	77	24	5	E-10	E+49	0.015	7
60	3.5	6300	22	69	165	125	53.5	80	110	90	32	5.5	E-11	E+53	0.026	9.3
70	5.9	5900	28	85	195	146	56	90	120	112.5	40	6	E-12	E+54	0.059	14.7
80	9	5400	28	98	215	168	59.5	100	130	128.5	46.5	6	E-12	E+58	0.097	20
90	13	5000	32	110	230	185	63.5	110	140	145	53.5	7	E-14	E+62	0.14	25.4
100	18	4700	32	123	265	210	74	125	150	160.5	58	7	E-14	E+74	0.28	38
110	23	4300	55	135	270	224	80.5	140	170	176	66.5	7	E-14	E+86	0.36	45.6
125	30.5	4000	65	150	305	245	87.5	150	180	200.5	70.5	8	E-16	E+92	0.64	62
140	42	3700	75	170	330	270	98.5	170	200	224.5	80.5	9	E-18	E+100	1.03	82
160	61	3400	85	195	375	305	110.5	190	230	256.5	89.5	10	E-20	E+118	1.5	93
180	90	3100	120	220	425	348	125	220	260	288.5	107	12	E-24	E+132	3.6	177
200	130	2900	140	245	470	392	136	250	300	320.5	126	12	E-24	E+148	6.2	245
225	189	2700	160	275	535	437	157.5	280	330	362	136.5	14	E-28	E+168	11.2	347

[1] Values for the complete coupling, without spacer, for bore d_1; d_2 max.
[2] The dismounting dimension F is required for changing the O-rings.
[3] The speed n_{max} depends on the length and weight of the spacer.



Legend

1 Hub

2 Sleeve

3 Spacer

Weight of the spacer

G_1 = spacer at E_{min}

G_2 = per 1 mm spacer length

G_3 = spacer at E> E_{min}

$$G_3 = G_1 + (E - E_{min}) \cdot G_2$$

Torsional stiffness of the coupling

C_1 = coupling at E_{min}

C_2 = per 1 mm spacer length

C_3 = coupling at E > E_{min}

$$C_3 = \frac{1}{\frac{1}{C_1} + \frac{E - E_{min}}{C_2}}$$

Mass moment of inertia spacer

J_1 = spacer at E_{min}

J_2 = per 1 mm spacer length

J_3 = spacer at E> E_{min}

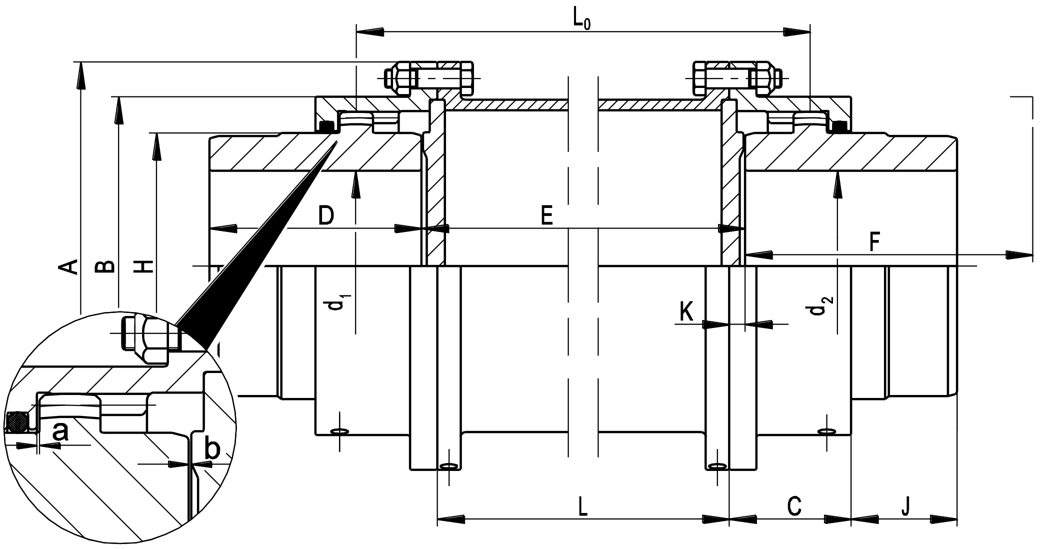
$$J_3 = J_1 + (E - E_{min}) \cdot J_2$$

Size	E_{min} mm	G_1 kg	G_2 kg/mm	C_1 MNm/rad	C_2 MNm · mm/rad	J_1 kgm²	J_2 kgm²/mm
32	79	1.81	0.011	0.46	90.5	0.0025	0.000010
38	80	2.16	0.011	0.73	113.2	0.0036	0.000011
48	85	2.36	0.014	1.45	202.4	0.0087	0.00002
60	86	4.20	0.018	2.48	410.2	0.015	0.00004
70	102	6.70	0.022	4.47	724.0	0.034	0.00007
80	102	7.40	0.029	6.83	1140.5	0.05	0.00011
90	104	8.90	0.030	9.95	1724	0.065	0.00017
100	119	13.3	0.034	12.77	2325	0.128	0.00023
110	119	14.1	0.040	15.95	3257	0.14	0.00032
125	146	20.6	0.040	20.93	4308	0.28	0.00043
140	148	23.7	0.048	28.85	6463	0.38	0.00064
160	165	33.2	0.053	39.28	8928	0.69	0.00088
180	194	50	0.070	55.51	14075	1.34	0.0014
200	194	59	0.079	80.85	23218	1.96	0.0023
225	228	98	0.120	111.9	36882	4.1	0.0036

Information based on d_1; d_2 max.
G_3 and J_3 refer exclusively to the spacer.
C_3 relates to the entire coupling.

LRLkn series

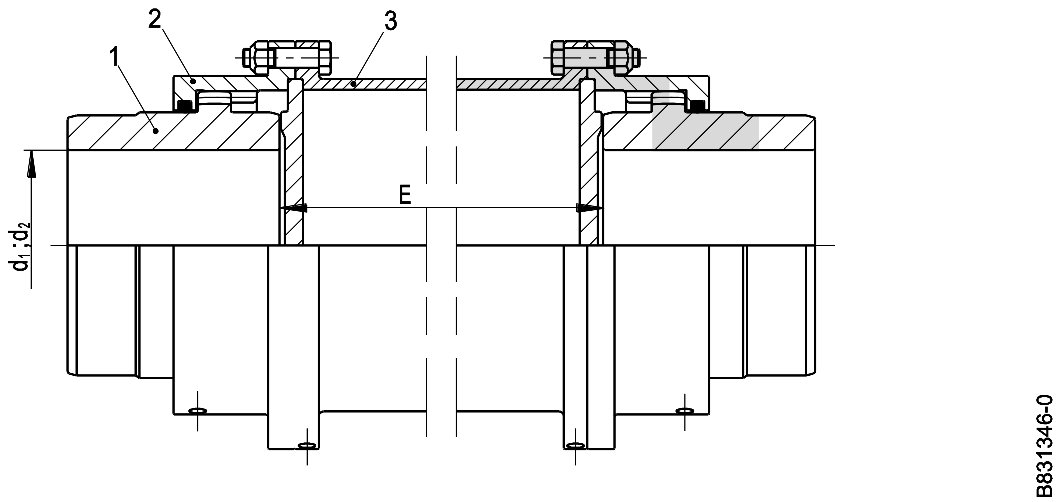
Dimension table no.: B759811-0



B570293-0

Size	Nominal torque	Speed[4]	Dimensions													Axial clearances a and b[1]	Mass moment of inertia[2]	Weight[2]
			Bore d_1; d_2															
	T_{KN}	n_{max}	min	max	A	B	C	D	F[3]	H	J	K	L	L_0				
	kNm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kgm²	kg
32	0.48	8500	12	37	105	74	45	50	80	48	11.5	6.5	E-13	E+40	0.5	0.004	3.3
38	0.95	7500	12	46	115	88	50.5	60	90	60	16.5	7	E-14	E+48	0.5	0.006	4.8
48	2.1	6900	22	59	145	108	51	70	100	77	26	7	E-14	E+49	0.5	0.02	7.9
60	3.5	6300	22	69	165	125	53.5	80	110	90	35	8.5	E-17	E+53	0.5	0.03	10.7
70	5.9	5900	28	85	195	146	56	90	120	112	42.5	8.5	E-17	E+54	0.5	0.07	17.2
80	9	5400	28	98	215	168	59.5	100	130	128	49.5	9	E-18	E+58	0.5	0.11	23.2
90	13	5000	32	110	230	185	63.5	110	140	145	56.5	10	E-20	E+62	0.5	0.16	29.5
100	18	4700	32	123	265	210	74	125	150	160	61.5	10.5	E-21	E+74	0.5	0.31	44
110	23	4300	55	135	270	224	80.5	140	170	176	70	10.5	E-21	E+86	1	0.4	53
125	30.5	4000	65	150	305	245	87.5	150	180	200	75	12.5	E-25	E+92	1	0.69	72
140	42	3700	75	170	330	270	98.5	170	200	224	85	14	E-28	E+100	1	1.13	95
160	61	3400	85	195	375	305	110.5	190	230	256	94	15	E-30	E+118	1	1.68	110
180	90	3100	120	220	425	348	125	220	260	288	112	17	E-34	E+132	1	3.93	201
200	130	2900	140	245	470	392	136	250	300	320	132	18	E-36	E+148	1	6.7	278
225	189	2700	160	275	535	437	157.5	280	330	362	142	19.5	E-39	E+168	1	12.2	392

[1] With these axial clearances, the permissible angular displacement ΔK_w =0.6° for each coupling half.
The axial clearances a and b can be changed if necessary.
[2] Values for the complete coupling, without spacer, for bore d_1; d_2 max.
[3] The dismounting dimension F is required for changing the O-rings.
[4] The speed n_{max} depends on the length and weight of the spacer.



Legend

1 Hub

2 Sleeve

3 Spacer

Weight of the spacer

G_1 = spacer at E_{min}

G_2 = per 1 mm spacer length

G_3 = spacer at E> E_{min}

$$G_3 = G_1 + (E - E_{min}) \cdot G_2$$

Torsional stiffness of the coupling

C_1 = coupling at E_{min}

C_2 = per 1 mm spacer length

C_3 = coupling at E > E_{min}

$$C_3 = \frac{1}{\frac{1}{C_1} + \frac{E - E_{min}}{C_2}}$$

Mass moment of inertia spacer

J_1 = spacer at E_{min}

J_2 = per 1 mm spacer length

J_3 = spacer at E> E_{min}

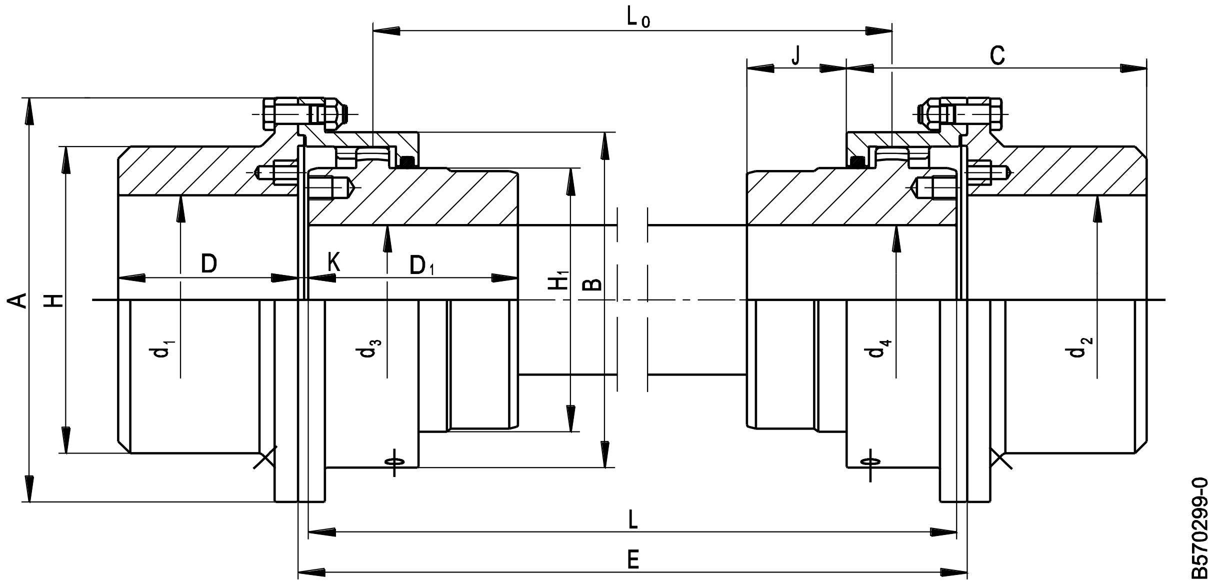
$$J_3 = J_1 + (E - E_{min}) \cdot J_2$$

Size	E_{min} mm	G_1 kg	G_2 kg/mm	C_1 MNm/rad	C_2 MNm · mm/rad	J_1 kgm²	J_2 kgm²/mm
32	79	1.81	0.011	0.46	90.5	0.0025	0.000010
38	80	2.16	0.011	0.73	113.2	0.0036	0.000011
48	85	2.36	0.014	1.45	202.4	0.0087	0.00002
60	86	4.20	0.018	2.48	410.2	0.015	0.00004
70	102	6.70	0.022	4.47	724.0	0.034	0.00007
80	102	7.40	0.029	6.83	1140.5	0.05	0.00011
90	104	8.90	0.030	9.95	1724	0.065	0.00017
100	119	13.3	0.034	12.77	2325	0.128	0.00023
110	119	14.1	0.040	15.95	3257	0.14	0.00032
125	146	20.6	0.040	20.93	4308	0.28	0.00043
140	148	23.7	0.048	28.85	6463	0.38	0.00064
160	165	33.2	0.053	39.28	8928	0.69	0.00088
180	194	50	0.070	55.51	14075	1.34	0.0014
200	194	59	0.079	80.85	23218	1.96	0.0023
225	228	98	0.120	111.9	36882	4.1	0.0036

Information based on d_1; d_2 max.
G_3 and J_3 refer exclusively to the spacer.
C_3 relates to the entire coupling.

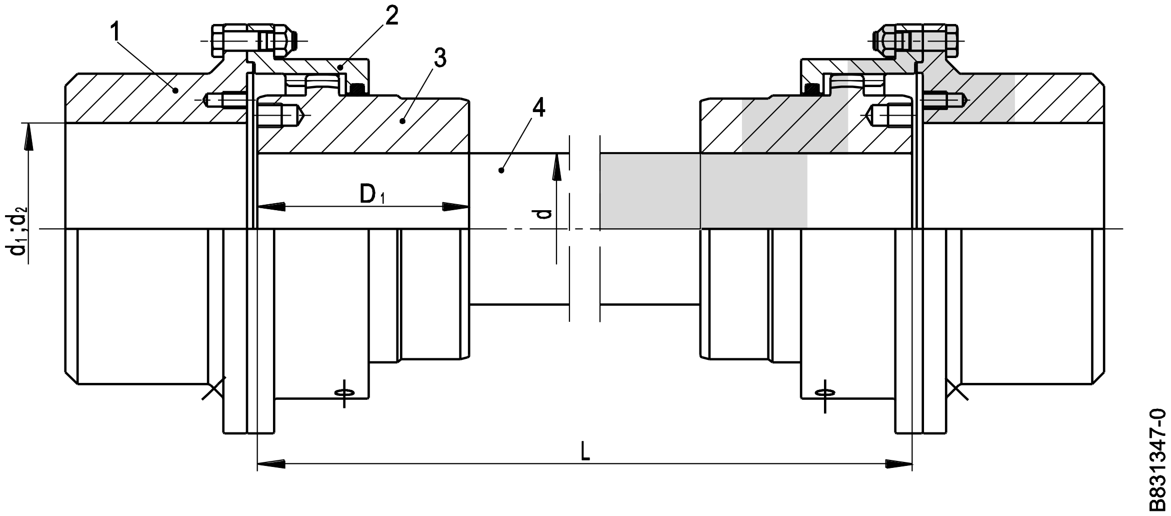
LBGk series

Dimension table no.: B759812-0



Size	Nominal torque T_{KN} kNm	Speed[2] n_{max} rpm	Dimensions: Bore d_1-d_4 min mm	Bore d_1; d_2 max mm	Bore d_3; d_4 max mm	A mm	B mm	C mm	D mm	D_1 mm	H mm	H_1 mm	J mm	K mm	L_0 mm	Mass moment of inertia[1] kgm²	Weight[1] kg
32	0.48	8500	12	50	37	105	74	85	40	50	65	48	9.5	4.5	E-40	0.01	5.2
38	0.95	7500	12	62	46	115	88	100.5	50	60	80	60	14.5	5	E-48	0.01	7.4
48	2.1	6900	22	73	59	145	108	111	60	70	95	77	24	5	E-49	0.03	12.4
60	3.5	6300	22	86	69	165	125	123.5	70	80	112	90	32	5.5	E-53	0.05	17.5
70	5.9	5900	28	100	85	195	146	136	80	90	130	112.5	40	6	E-54	0.11	27
80	9	5400	28	115	98	215	168	149.5	90	100	150	128	46.5	6	E-58	0.19	38
90	13	5000	32	131	110	230	185	163.5	100	110	170	145	53.5	7	E-62	0.28	49
100	18	4700	32	146	123	265	210	184	110	125	190	160.5	58	7	E-74	0.54	71
110	23	4300	55	158	135	270	224	200.5	120	140	205	176	66.5	7	E-86	0.7	85
125	30.5	4000	65	173	150	305	245	217.5	130	150	225	200.5	70.5	8	E-92	1.22	115
140	42	3700	75	192	170	330	270	248.5	150	170	250	224.5	80.5	9	E-100	2	156
160	61	3400	85	219	195	375	305	275.5	165	190	285	256.5	89.5	10	E-118	3.3	197
180	90	3100	120	250	220	425	348	315	190	220	325	288.5	107	12	E-132	7	330
200	130	2900	140	277	245	470	392	356	220	250	360	320.5	126	12	E-148	11.9	457
225	189	2700	160	315	275	535	437	402.5	245	280	410	362	136.5	14	E-168	22.2	665

[1] Values for the complete coupling, without intermediate shaft, for bore d_1; d_2 max. and d_3; d_4 max.
[2] The speed n_{max} depends on the length and weight of the intermediate shaft.
$L = E - 2 \cdot K$



3

Legend

1 Flange
2 Sleeve
3 Hub
4 Intermediate shaft

Weight of the intermediate shaft

G = intermediate shaft at $L_{existing}$

d = shaft diameter

Torsional stiffness of the coupling

C_1 = coupling without intermediate shaft

C_2 = intermediate shaft at $L_{existing}$

C_3 = coupling at $L_{existing}$

Inertia intermediate shaft

J = intermediate shaft at $L_{existing}$

$$G = 6.165 \cdot \frac{d^2 \cdot L}{10^6}$$

$$C_2 = 7.805 \cdot \frac{d^4}{L - 2 \cdot D_1} \qquad C_3 := \frac{1}{\frac{1}{C_1} + \frac{1}{C_2}}$$

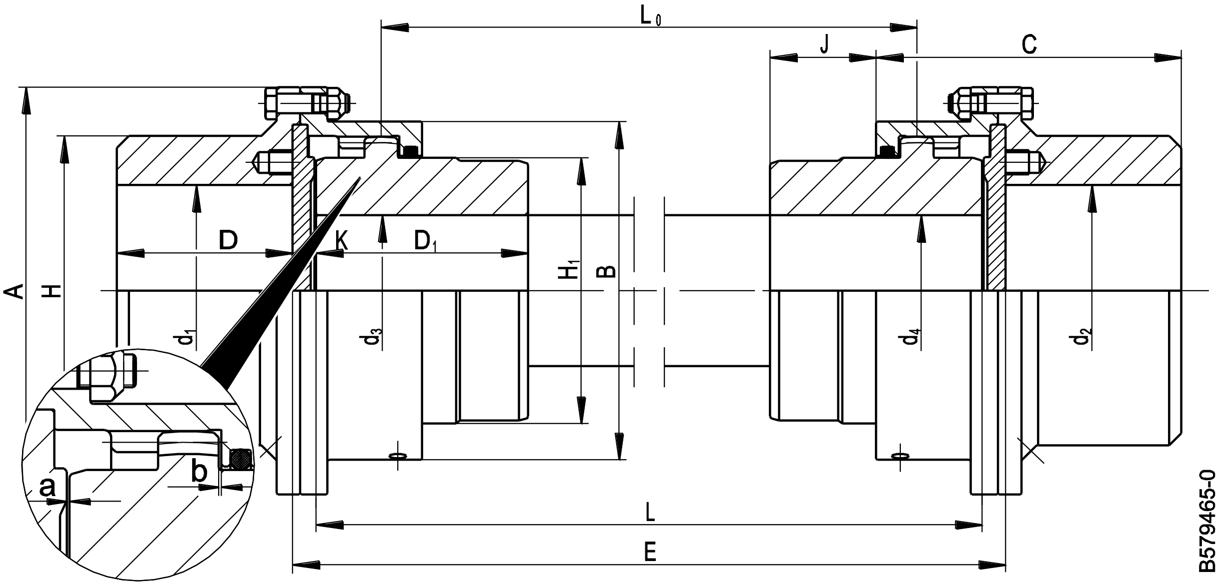
$$J = \frac{G \cdot d^2}{8 \cdot 10^6}$$

Size	C_1 [1)] MNm/rad	Size	C_1 [1)] MNm/rad	Size	C_1 [1)] MNm/rad
32	0.69	**80**	12.1	**140**	52.6
38	1.25	**90**	16.9	**160**	76.6
48	2.64	**100**	23.5	**180**	112.1
60	4.16	**110**	27.3	**200**	147.9
70	7.98	**125**	40.5	**225**	206.6

[1)] Values for the complete coupling for bore d_1; d_2 max., the intermediate shaft is considered only in the range of hub lengths D_1. For the exposed part of the shaft, the data must be calculated using the above formula.

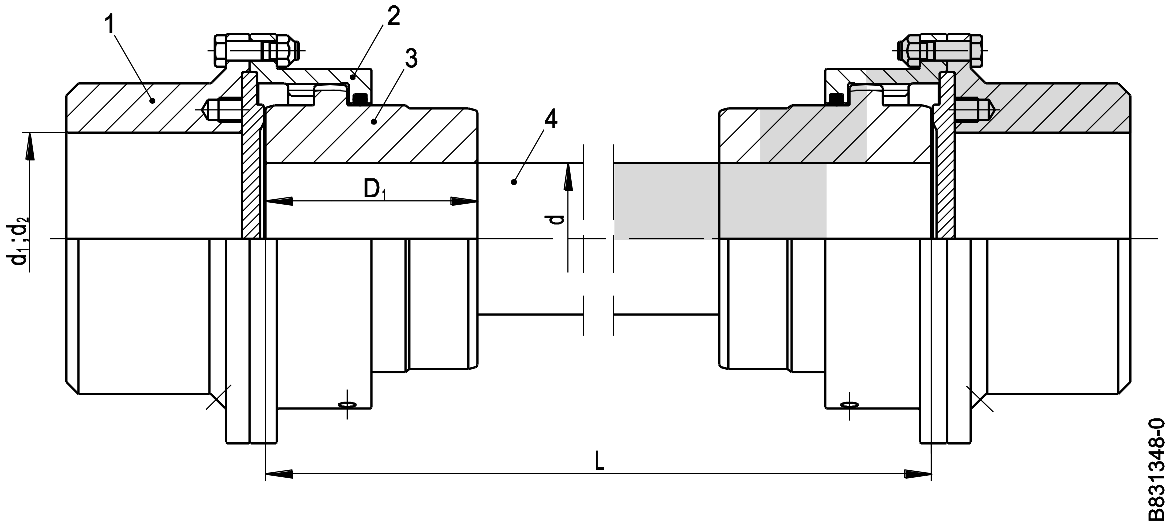
LRGkn series

Dimension table no.: B792095-0



Size	Nominal torque T_{KN} kNm	Speed[3] n_{max} rpm	Bore d_1-d_4 min mm	Bore d_1; d_2 max mm	Bore d_3; d_4 max mm	A mm	B mm	C mm	D mm	D_1 mm	H mm	H_1 mm	J mm	K mm	L_0 mm	Axial clearances a and b[1] mm	Mass moment of inertia[2] kgm²	Weight[2] kg
32	0.48	8500	12	50	37	105	74	87.5	40	50	65	48	11.5	9	E-58	0.5	0.01	5.2
38	0.95	7500	12	62	46	115	88	103	50	60	80	60	16.5	9.5	E-67	0.5	0.01	7.4
48	2.1	6900	22	73	59	145	108	114	60	70	95	77	26	10	E-69	0.5	0.03	12.4
60	3.5	6300	22	86	69	165	125	126.5	70	80	112	90	35	11.5	E-76	0.5	0.05	17.5
70	5.9	5900	28	100	85	195	146	140	80	90	130	112.5	42.5	12.5	E-79	0.5	0.11	27
80	9	5400	28	115	98	215	168	153.5	90	100	150	128	49.5	13	E-84	0.5	0.19	38
90	13	5000	32	131	110	230	185	167.5	100	110	170	145	56.5	14	E-90	0.5	0.28	49
100	18	4700	32	146	123	265	210	189	110	125	190	160.5	61.5	15.5	E-105	0.5	0.54	71
110	23	4300	55	158	135	270	224	205.5	120	140	205	176	70	15.5	E-117	1	0.7	85
125	30.5	4000	65	173	150	305	245	222.5	130	150	225	200.5	75	17.5	E-127	1	1.22	115
140	42	3700	75	192	170	330	270	254.5	150	170	250	224.5	85	19.5	E-139	1	2	156
160	61	3400	85	219	195	375	305	281.5	165	190	285	256.5	94	20.5	E-159	1	3.3	197
180	90	3100	120	250	220	425	348	321	190	220	325	288.5	112	23	E-178	1	7	330
200	130	2900	140	277	245	470	392	362	220	250	360	320.5	132	24	E-196	1	11.9	457
225	189	2700	160	315	275	535	437	409.5	245	280	410	362	142	26.5	E-221	1	22.2	665

[1] With these axial clearances, the permissible angular displacement ΔK_w =0.6° for each coupling half.
The axial clearances a and b can be changed if necessary.
[2] Values for the complete coupling, without intermediate shaft, for bore d_1; d_2 max. and d_3; d_4 max.
[3] The speed n_{max} depends on the length and weight of the intermediate shaft.
$L = E - 2 \cdot K$



Legend

1 Flange 2 Sleeve 3 Hub 4 Intermediate shaft

Weight of the intermediate shaft

G = intermediate shaft at $L_{existing}$

d = shaft diameter

Torsional stiffness of the coupling

C_1 = coupling without intermediate shaft

C_2 = intermediate shaft at $L_{existing}$

C_3 = coupling at $L_{existing}$

Inertia intermediate shaft

J = intermediate shaft at $L_{existing}$

$$G = 6.165 \cdot \frac{d^2 \cdot L}{10^6}$$

$$C_2 = 7.805 \cdot \frac{d^4}{L - 2 \cdot D_1} \qquad C_3 := \frac{1}{\frac{1}{C_1} + \frac{1}{C_2}}$$

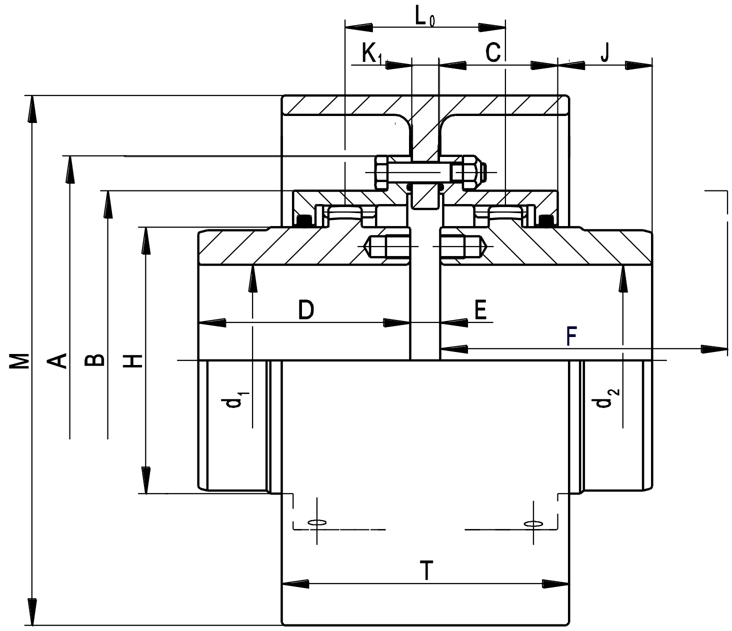
$$J = \frac{G \cdot d^2}{8 \cdot 10^6}$$

Size	C_1[1) MNm/rad	Size	C_1[1) MNm/rad	Size	C_1[1) MNm/rad
32	0.69	**80**	12.1	**140**	52.6
38	1.25	**90**	16.9	**160**	76.6
48	2.64	**100**	23.5	**180**	112.1
60	4.16	**110**	27.3	**200**	147.9
70	7.98	**125**	40.5	**225**	206.6

1) Values for the complete coupling for bore d_1; d_2 max., the intermediate shaft is considered only in the range of hub lengths D_1. For the exposed part of the shaft, the data must be calculated using the above formula.

LBkD series

Dimension table no.: B759813-0



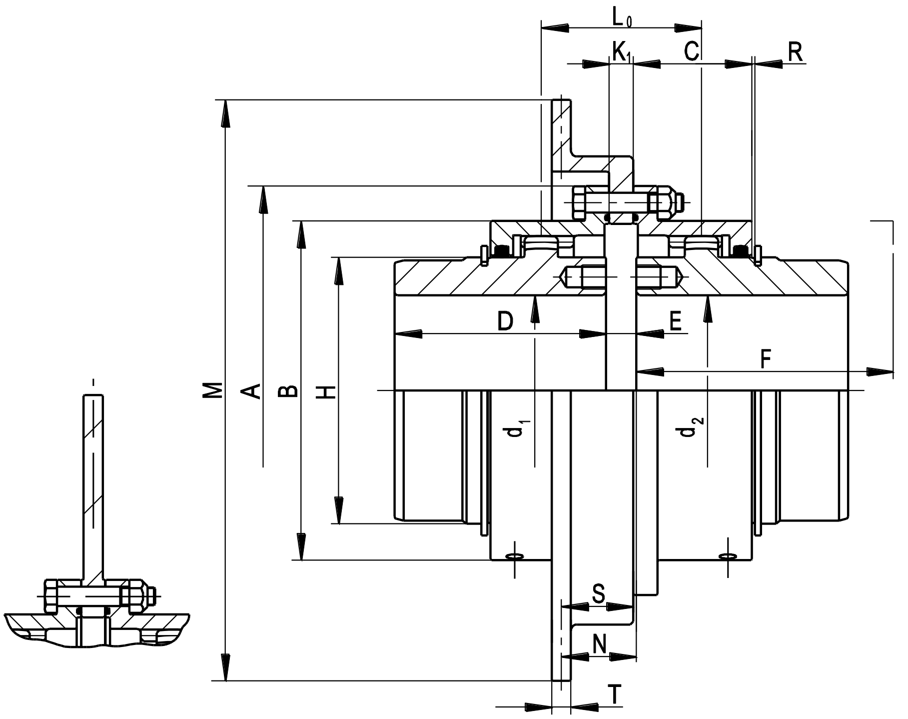
B570312-0

Size	Nominal torque T_{KN} kNm	Speed[4] n_{max} rpm	Bore d_1; d_2 min mm	Bore d_1; d_2 max mm	A mm	B mm	C mm	D mm	E mm	F[3] mm	G mm	J mm	L_0 mm	Max. static radial offset ΔK_r[1] mm	Mass moment of inertia[2] kgm²	Weight[2] kg
32	0.48	8500	12	37	105	74	44.5	50	K_1+2	80	48	7	K_1+42	0.57	0.003	2.9
38	0.95	7500	12	46	115	87	50	60	K_1+3	90	60	12	K_1+51	0.69	0.006	4.3
48	2.1	6900	22	59	145	108	50	70	K_1+3	100	77	21.5	K_1+52	0.71	0.015	7
60	3.5	6300	22	69	165	125	52.5	80	K_1+4	110	90	29.5	K_1+57	0.77	0.026	9.3
70	5.9	5900	28	85	195	146	54.5	90	K_1+3	120	112	37	K_1+57	0.78	0.059	14.7
80	9	5400	28	98	215	168	58	100	K_1+3	130	128	43.5	K_1+61	0.84	0.097	20
90	13	5000	32	110	230	185	62	110	K_1+5	140	145	50.5	K_1+67	0.92	0.14	25.4
100	18	4700	32	123	265	210	72	125	K_1+4	150	160	55	K_1+78	1.08	0.28	38
110	23	4300	55	135	270	224	78.5	140	K_1+4	170	176	63.5	K_1+90	1.23	0.36	45.6
125	30.5	4000	65	150	305	245	85.5	150	K_1+6	180	200	67.5	K_1+98	1.34	0.64	62
140	42	3700	75	170	330	270	96.5	170	K_1+6	200	224	76.5	K_1+106	1.44	1.03	82
160	61	3400	85	195	375	305	108	190	K_1+7	230	256	85.5	K_1+125	1.70	1.5	93
180	90	3100	120	220	425	348	122	220	K_1+6	260	288	101	K_1+138	1.89	3.6	177
200	130	2900	140	245	470	392	133	250	K_1+8	300	320	121	K_1+156	2.12	6.2	245
225	189	2700	160	275	535	437	154.5	280	K_1+10	330	362	130.5	K_1+178	2.42	11.2	347

[1] In relation to a permissible angular displacement of $\Delta K_{w\,perm.}$ =0.75° for each coupling half.
These values do not apply to the braking equipment.
[2] Values for the complete coupling, without brake disc, for bore d_1; d_2 max.
[3] The dismounting dimension F is required for changing the O-rings.
[4] The speed n_{max} depends on the permissible circumferential speed of the brake disc.
Observe the brake manufacturer's specifications!
K_1, M, T see Page 84

LBkT series

Dimension table no.: B759814-0



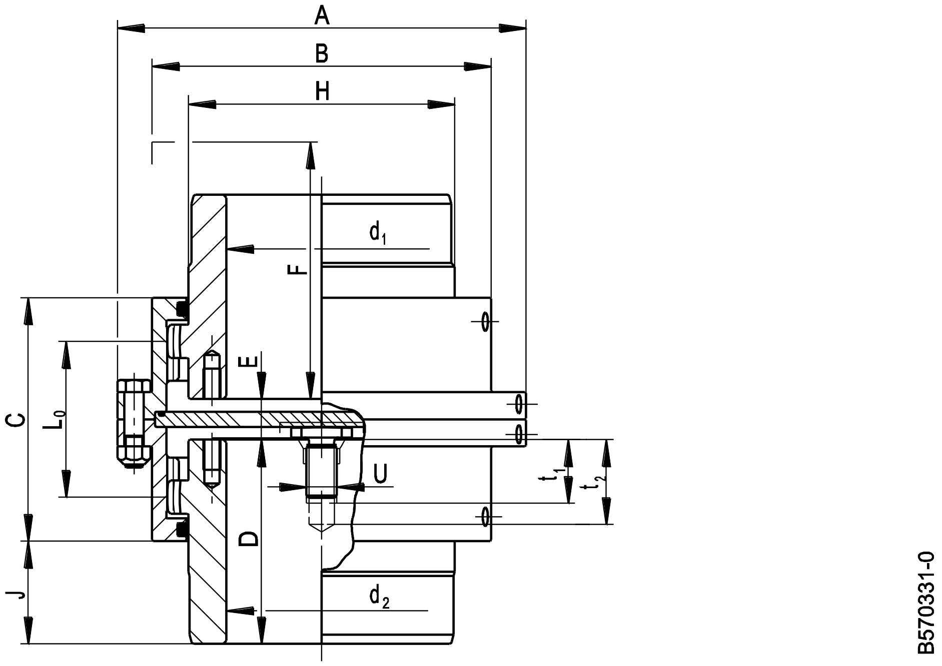
B570318-0

Size	Nominal torque T_{KN}	Speed[5] n_{max}	Bore d_1; d_2 min	Bore d_1; d_2 max	A	B	C	D	E	F[3]	H	N	R[4]	L_0	Max. static radial offset ΔK_r[1]	Mass moment of inertia[2]	Weight[2]
	kNm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kgm^2	kg
32	0.48	8500	12	37	105	74	44.5	50	K_1+2	80	48	35.65	1.5	K_1+42	0.57	0.003	2.9
38	0.95	7500	12	46	115	87	50	60	K_1+3	90	60	36.15	1.5	K_1+51	0.69	0.006	4.3
48	2.1	6900	22	59	145	108	50	70	K_1+3	100	77	36.15	2	K_1+52	0.71	0.015	7
60	3.5	6300	22	69	165	125	52.5	80	K_1+4	110	90	49.65	2	K_1+57	0.77	0.026	9.3
70	5.9	5900	28	85	195	146	54.5	90	K_1+3	120	112	49.15	2	K_1+57	0.78	0.059	14.7
80	9	5400	28	98	215	168	58	100	K_1+3	130	128	49.15	2	K_1+61	0.84	0.097	20
90	13	5000	32	110	230	185	62	110	K_1+5	140	145	50.15	2	K_1+67	0.92	0.14	25.4
100	18	4700	32	123	265	210	72	125	K_1+4	150	160	49.65	3	K_1+78	1.08	0.28	38
110	23	4300	55	135	270	224	78.5	140	K_1+4	170	176	49.65	3	K_1+90	1.23	0.36	45.6
125	30.5	4000	65	150	305	245	85.5	150	K_1+6	180	200	50.65	3	K_1+98	1.34	0.64	62
140	42	3700	75	170	330	270	96.5	170	K_1+6	200	224	50.65	3	K_1+106	1.44	1.03	82
160	61	3400	85	195	375	305	108	190	K_1+7	230	256	51.15	3	K_1+125	1.70	1.5	93
180	90	3100	120	220	425	348	122	220	K_1+6	260	288	50.65	3	K_1+138	1.89	3.6	177
200	130	2900	140	245	470	392	133	250	K_1+8	300	320	51.65	3	K_1+156	2.12	6.2	245
225	189	2700	160	275	535	437	154.5	280	K_1+10	330	362	52.65	3	K_1+178	2.42	11.2	347

[1] In relation to a permissible angular displacement of ΔK_w =0.75° for each coupling half.
These values do not apply to the braking equipment.
[2] Values for the complete coupling, without brake disc, for bore d_1; d_2 max.
[3] The dismounting dimension F is required for changing the O-rings.
[4] Check the clearance R with the axial clearance for the brake clamps.
[5] The speed n_{max} depends on the permissible circumferential speed of the brake disc.
Observe the brake manufacturer's specifications!
K_1, M, S, T see Page 85

VLBk series

Dimension table no.: B759815-0

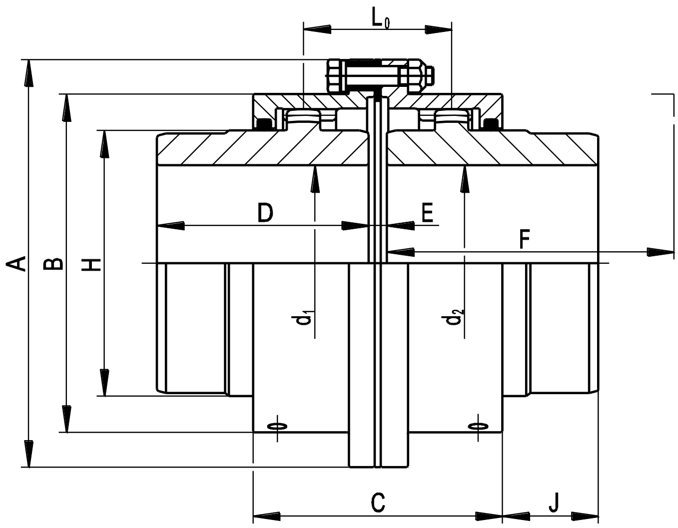


Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Dimensions: Bore d_1; d_2 min mm	max mm	A mm	B mm	C mm	D mm	E mm	F[3] mm	H mm	J mm	L_0 mm	Max. static radial offset ΔK_r[1] mm	Mass moment of inertia[2] kgm^2	Weight[2] kg
32	0.48	8500	12	37	105	74	90	45	16	75	48	8	56	0.57	0.004	3
38	0.95	7500	12	46	115	87	101	55	17	85	60	13	65	0.69	0.006	4.5
48	2.1	6900	22	59	145	108	102	65	17	95	77	22.5	66	0.71	0.016	7.6
60	3.5	6300	22	69	165	125	107	75	18	105	90	30.5	71	0.77	0.025	10
70	5.9	5900	28	85	195	146	112	85	21	115	112	39.5	75	0.78	0.062	16
80	9	5400	28	98	215	168	119	95	22	125	128	46.5	80	0.84	0.103	21.5
90	13	5000	32	110	230	185	127	105	24	135	145	53.5	86	0.92	0.15	26.5
100	18	4700	32	123	265	210	148	120	26	155	160	59	100	1.08	0.303	41
110	23	4300	55	135	270	224	161	135	27	170	176	68	113	1.23	0.39	48.5
125	30.5	4000	65	150	305	245	175	145	27	180	200	71	119	1.34	0.675	65
140	42	3700	75	170	330	270	197	165	29	200	224	81	129	1.44	1.1	87.5
160	61	3400	85	195	375	305	221	185	30	225	256	89.5	148	1.70	1.97	126
180	90	3100	120	220	425	348	250	215	32	255	288	106	164	1.89	3.74	185
200	130	2900	140	245	470	392	272	245	34	290	320	126	182	2.12	6.39	255
225	189	2700	160	275	535	437	315	275	37	330	362	136	205	2.42	11.62	363

[1] In relation to a permissible angular displacement of ΔK_w =0.75° for each coupling half.
[2] Values for the complete coupling for bore d_1; d_2 max.
[3] The dismounting dimension F is required for changing the O-rings.
U, t_1, t_2 to DIN 332

LBki series

Dimension table no.: B790865-0



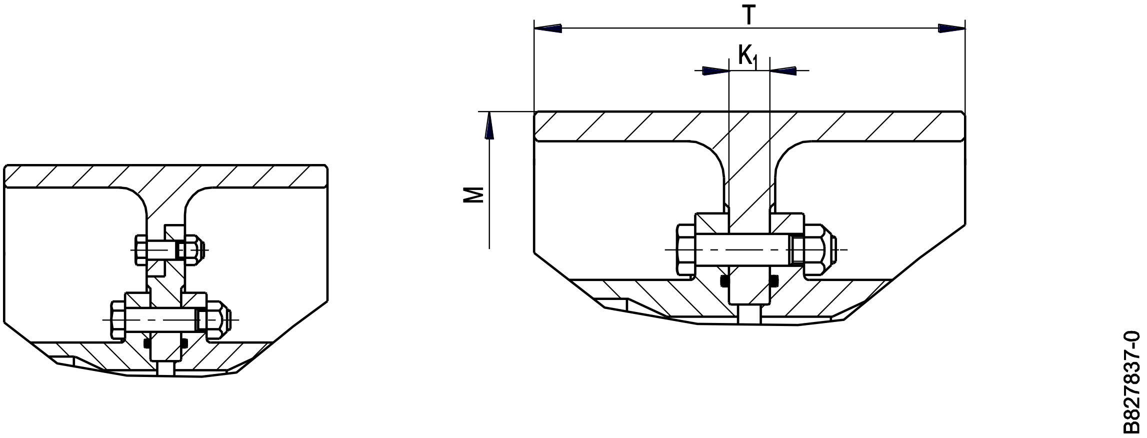
B570343-0

Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Dimensions: Bore d_1; d_2 min mm	Bore max mm	A mm	B mm	C mm	D mm	E mm	F[3] mm	H mm	J mm	L_0 mm	Max. static radial offset ΔK_r[1] mm	Mass moment of inertia[2] kgm^2	Weight[2] kg
32	0.48	8500	12	37	105	74	93	50	7	80	48	7	47	0.57	0.0034	2.9
38	0.95	7500	12	46	115	88	104	60	8	90	60	12	56	0.69	0.0059	4.3
48	2.1	6900	22	59	145	108	105	70	8	100	77	21.5	57	0.71	0.015	7
60	3.5	6300	22	69	165	125	110	80	9	110	90	29.5	62	0.77	0.026	9.3
70	5.9	5900	28	85	195	146	115	90	9	120	112.5	37	63	0.78	0.059	14.7
80	9	5400	28	98	215	168	122	100	9	130	128	43.5	67	0.84	0.097	20
90	13	5000	32	110	230	185	130	110	11	140	145	50.5	73	0.92	0.14	25.4
100	18	4700	32	123	265	210	152	125	12	150	160.5	55	86	1.08	0.28	38
110	23	4300	55	135	270	224	165	140	12	170	176	63.5	98	1.23	0.36	45.6
125	30.5	4000	65	150	305	245	179	150	14	180	200.5	67.5	106	1.34	0.64	62
140	42	3700	75	170	330	270	201	170	14	200	224.5	76.5	114	1.44	1.03	82
160	61	3400	85	195	375	305	226	190	17	230	256.5	85.5	135	1.70	1.5	120
180	90	3100	120	220	425	348	255	220	17	260	288.5	101	149	1.89	3.6	177
200	130	2900	140	245	470	392	277	250	19	300	320.5	121	167	2.12	6.2	245
225	189	2700	160	275	535	437	320	280	21	330	362	130.5	189	2.42	11.2	347

[1] In relation to a permissible angular displacement of ΔK_w =0.75° for each coupling half.
[2] Values for the complete coupling for bore d_1; d_2 max.
[3] The dismounting dimension F is required for changing the O-rings.

3

3.10 Brake disc assignment and dimensions for shoe brakes



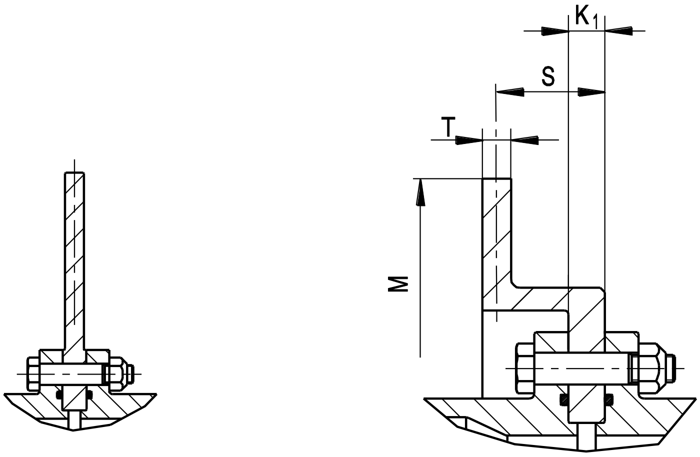
Recommended brake disc assignment				
Size			M	
SBD	SBkD LBkD	mm	mm	mm
	32	200		
30	38	200	250	
40	48	200	250	315
50	60	200	250	315
60	70	250	315	400
70	80	250	315	400
80	90	315	400	
90	100	315	400	500
100	110	315	400	500
110	125	400	500	630
125	140	400	500	630
140	160	500	630	710
160	180	500	630	710
180	200	630	710	
200	225	630	710	

Brake disc data				
M	T	K_1	Mass moment of inertia[1)]	Weight[1)]
mm	mm	mm	kgm^2	kg
200	75	8	0.033	4.22
250	95	9	0.09	7.25
315	118	11	0.28	13.5
400	150	14	0.9	28
500	190	18	2.35	45
630	236	22	7.5	94
710	265	22	12.5	123

1) Weights and mass moments of inertia relating to the largest coupling size assigned.

Split brake discs enable machines to be installed and removed vertically.

3.11 Brake disc assignment and dimensions for disc brakes



Recommended brake disc assignment					
Size		M			
SBT	SBkT LBkT	mm	mm	mm	mm
	32	300			
30	**38**	300			
40	**48**	300			
50	**60**	350			
60	**70**	400	460	515	
70	**80**	400	460	515	
80	**90**	460	515	610	
90	**100**	460	515	610	710
100	**110**	515	610	710	
110	**125**	515	610	710	810
125	**140**	610	710	810	
140	**160**	610	710	810	915
160	**180**	710	810	915	
180	**200**	710	810	915	
200	**225**	810	915		

Brake disc data						
Nominal dimension M mm	Actual dimension M mm	T mm	K_1 mm	S mm	Mass moment of inertia[1)] kgm^2	Weight[1)] kg
300	300	12.7	8	34.65	0.099	6.7
350	356	12.7	10	47.65	0.19	10.0
400	406	12.7	13	47.65	0.30	12.0
460	457	12.7	16	47.65	0.48	16.0
515	514	12.7	16	47.65	0.57	20
610	610	12.7	16	47.65	1.5	26
710	711	12.7	18	47.65	2.9	39
810	812	12.7	23	47.65	5.8	61
915	915	12.7	23	47.65	10	92

[1)] Weights and mass moments of inertia relating to the largest coupling size assigned.

Optionally, the couplings are also available with straight brake discs and/or with a thickness of 1 inch (25.4 mm).

3.12 Lubricants

Due to their special seal, the couplings of the product family SB are suitable for both oil and grease lubrication. One advantage of oil lubrication is that the lubricant filling can be changed more quickly and easily.

The product families SBk and LBk are designed only for grease lubrication. With these couplings, when changing the lubricant, it is necessary to remove the coupling.

The service life of the coupling is very much dependent on compliance with the maintenance intervals. The lubricity of the lubricants decreases significantly over the operating time. An aged, contaminated lubricant can lead to premature failure of the gears and thus to an unplanned failure of the entire coupling. Regularly changing the lubricant in accordance with the instructions in the operating instructions can reduce this risk.

Lubricant	Maintenance interval	
	Oil lubrication	Grease lubrication
Mineral	8000 h or 2 years	8000 h or 2 years
Synthetic	16000 h or 3 years	16000 h or 3 years
RENK Longlife Grease	-	25000 h or 5 years

Tab. 18: Lubricants and maintenance intervals

The maintenance interval depends on the selected lubricant. Synthetic lubricants generally allow longer change intervals. When RENK Longlife Grease (see chapter 3.17.2) is used, the change intervals can be extended to a maximum of five years. The change intervals for the various lubricants are listed in the Tab. 18.

Recommendations for the selection of lubricants are included in the operation manual and can also be requested directly from RENK. The lubricant recommendation contains only a small selection of approved lubricants from the well-known lubricant manufacturers.

We will be happy to help you choose a suitable lubricant. For this, we need information about the application and the technical data sheet of the intended lubricant. Please send this information to the address on the back of this catalogue.

3.12.1 Quantities of lubricant

In the following tables, you will find the required quantities of lubricant for the various coupling series. If no values are given in the tables for the desired size, you can ask us about them. Also note the footnotes in the tables.

With gear couplings with spacer, depending on the size and design, an additional amount of lubricant must be taken into account. The length of the spacer is the primary determinant of this.

Where spacer lengths are greater than 400 mm, the ends of the spacers are closed with bottoms. In such cases, no additional amount of lubricant is required. Here it is sufficient to fill the coupling with the "amount of lubricant without spacer".

The values given in the following tables "per 10 mm spacer" must be multiplied according to the spacer length and added to the values for the coupling.

3.12.2 Lubricant quantities for the product family SB

Size	Total quantity of lubricant											
	SB		SBR		SBG		SRG		SBD		SBi	
	kg	litres	kg	litres	kg	litres	kg	litres	kg	litres	kg	litres
30	0.09	0.03	0.08	0.08	0.09	0.04	0.09	0.09	0.09	0.03	0.09	0.04
40	0.09	0.04	0.16	0.16	0.10	0.06	0.17	0.17	0.09	0.04	0.10	0.06
50	0.17	0.07	0.26	0.26	0.18	0.09	0.27	0.27	0.17	0.07	0.18	0.09
60	0.25	0.11	0.43	0.43	0.26	0.13	0.45	0.45	0.25	0.11	0.26	0.13
70	0.35	0.15	0.57	0.57	0.36	0.16	0.59	0.59	0.35	0.15	0.36	0.16
80	0.40	0.20	0.74	0.74	0.41	0.21	0.77	0.77	0.40	0.20	0.41	0.21
90	0.60	0.30	1.2	1.2	0.62	0.32	1.3	1.3	0.60	0.30	0.62	0.32
100	0.75	0.35	1.4	1.4	0.77	0.37	1.5	1.5	0.75	0.35	0.77	0.37
110	1.0	0.45	1.8	1.8	1.1	0.53	1.9	1.9	1.0	0.50	1.1	0.53
125	1.3	0.65	2.4	2.4	1.4	0.68	2.5	2.5	1.3	0.65	1.4	0.68
140	1.6	0.85	3.1	3.1	1.7	0.9	3.2	3.2	1.6	0.85	1.7	0.9
160	2.6	1.4	4.5	4.5	2.7	1.5	4.7	4.7	2.6	1.4	2.7	1.5
180	3.3	1.8	7.0	7.0	3.4	1.9	7.2	7.2	3.3	1.8	3.4	1.9
200	4.8	2.5	10.7	10.7	4.9	2.6	11.0	11.0	4.8	2.5	4.9	2.6
220	5.0	2.5	11.5	11.5	5.2	2.8	11.8	11.8	-	-	5.2	2.8
240	7.0	3.5	12.5	12.5	7.3	3.5	12.8	12.8	-	-	7.3	3.5
260	8.0	4.0	14.0	14.0	8.3	4.0	14.4	14.4	-	-	8.3	4.0
280	10.0	6.0	17.0	17.0	10.5	6.0	17.5	17.5	-	-	10.5	6.0
300	11.0	8.0	20.0	20.0	11.5	8.0	21.5	21.5	-	-	11.5	8.0
320	13.0	9.0	24.0	24.0	13.5	9.0	22.0	22.0	-	-	13.5	9.0
340	20.0	11.0	28.0	28.0	21.0	11.0	29.0	29.0	-	-	21.0	11.0
360	26.0	12.0	-	-	27.0	12.0	-	-	-	-	-	-
380	29.0	13.0	-	-	30.0	13.0	-	-	-	-	-	-
400	32.0	15.0	-	-	33.0	15.0	-	-	-	-	-	-

Tab. 19: Lubricant quantities for the product family SB

Size	Lubricant quantity without spacer				Lubricant quantity per 10 mm spacer length			
	SBL		SRL		SBL		SRL	
	kg	litres	kg	litres	kg	litres	kg	litres
30	0.09	0.04	0.09	0.09	0.002	0.0016	0.0058	0.0054
40	0.10	0.06	0.17	0.17	0.0019	0.0015	0.0056	0.0052
50	0.18	0.09	0.27	0.27	0.0037	0.0027	0.014	0.013
60	0.26	0.13	0.45	0.45	0.0053	0.0033	0.025	0.023
70	0.36	0.16	0.59	0.59	0.0058	0.0038	0.015	0.014
80	0.41	0.21	0.77	0.77	0.0095	0.0065	0.045	0.042
90	0.62	0.32	1.3	1.3	0.012	0.0075	0.056	0.052
100	0.77	0.37	1.5	1.5	0.014	0.0097	0.058	0.054
110	1.1	0.53	1.9	1.9	0.029	0.018	0.11	0.099
125	1.4	0.68	2.5	2.5	0.032	0.022	0.13	0.12
140	1.7	0.9	3.2	3.2	0.036	0.026	0.14	0.13
160	2.7	1.5	4.7	4.7	0.032	0.022	0.12	0.11
180	3.4	1.9	7.2	7.2	0.069	0.049	0.28	0.26
200	4.9	2.6	11.0	11.0	0.035	0.025	0.11	0.1
220	5.2	2.8	11.8	11.8	-	-	-	-
240	7.3	3.5	12.8	12.8	-	-	-	-
260	8.3	4.0	14.4	14.4	-	-	-	-
280	10.5	6.0	17.5	17.5	-	-	-	-
300	11.5	8.0	21.5	21.5	-	-	-	-
320	13.5	9.0	22.0	22.0	-	-	-	-
340	21.0	11.0	29.0	29.0	-	-	-	-

Tab. 20: Lubricant quantities for the product family SB with spacer

Size	Grease quantity		Oil quantity					
				Low speed			High speed	
	upper half	lower half	n_{max}	upper half	lower half	n_{max}	upper half	lower half
	kg	kg	rpm	litres	litres	rpm	litres	litres
30	0.07	0.016	1300	0.07	0.016	7500	0.04	0.016
40	0.095	0.025	1300	0.095	0.025	6900	0.05	0.025
50	0.17	0.07	1300	0.17	0.07	6300	0.06	0.07
60	0.29	0.11	900	0.29	0.11	5900	0.13	0.11
70	0.36	0.15	900	0.36	0.15	5400	0.16	0.15
80	0.50	0.21	900	0.50	0.21	5000	0.22	0.21
90	0.78	0.31	650	0.78	0.31	4700	0.35	0.31
100	0.98	0.43	650	0.98	0.43	4300	0.40	0.43
110	1.3	0.57	650	1.3	0.57	4000	0.54	0.57
125	1.6	0.70	650	1.6	0.70	3700	0.68	0.70
140	2.1	0.93	500	2.1	0.93	3400	0.90	0.93
160	3.1	1.3	500	3.1	1.3	3100	1.3	1.3
180	4.5	1.5	500	4.5	1.5	2900	2.0	1.5
200	6.8	2.3	500	6.8	2.3	2700	2.8	2.3

Tab. 21: Lubricant quantities for the VSB series for vertical design

3.12.3 Lubricant quantities for the product family SBk

Size	Total quantity of lubricant									
							without spacer		per 10 mm spacer length	
	SBk	SBRk	SBGk	SRGk	SBkD, SBkT	SBki	SBLk	SRLk	SBLk	SRLk
	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg
38	0.09	0.07	0.09	0.08	0.11	0.09	0.09	0.08	0.002	0.0017
48	0.09	0.14	0.09	0.15	0.12	0.10	0.09	0.15	0.0019	1)
60	0.17	0.21	0.17	0.22	0.20	0.18	0.17	0.22	0.0037	0.01
70	0.25	0.28	0.25	0.30	0.28	0.26	0.25	0.30	0.0053	0.012
80	0.35	0.44	0.35	0.46	0.45	0.36	0.35	0.46	0.0058	0.006
90	0.40	0.60	0.40	0.63	0.65	0.41	0.40	0.63	0.0095	0.022
100	0.60	0.90	0.60	1.0	0.80	0.62	0.60	1.0	0.012	0.031
110	0.75	1.0	0.75	1.1	0.95	0.77	0.75	1.1	0.014	0.037
125	1.0	1.1	1.0	1.2	1.3	1.1	1.0	1.2	0.029	0.059
140	1.3	1.4	1.3	1.5	1.6	1.4	1.3	1.5	0.032	0.071
160	1.6	1.7	1.6	1.8	2.0	1.7	1.6	1.8	0.036	0.078
180	2.6	2.8	2.6	3.0	3.4	2.7	2.6	3.0	0.032	0.048
200	3.3	4.6	3.3	4.8	4.4	3.4	3.3	4.8	0.069	0.17
225	4.8	7.1	4.8	7.4	6.6	4.9	4.8	7.4	0.035	1)
250	5.0	-	5.0	-	-	5.2	5.0	-	-	-
265	7.0	-	7.0	-	-	7.3	7.0	-	-	-
280	8.0	-	8.0	-	-	8.3	8.0	-	-	-
315	10.0	-	10.0	-	-	10.5	10.0	-	-	-
335	11.0	-	11.0	-	-	11.5	11.0	-	-	-
355	13.0	-	13.0	-	-	13.5	13.0	-	-	-
375	20.0	-	20.0	-	-	21.0	20.0	-	-	-

1) These coupling sizes do not require any additional quantity of grease for the spacer.

Tab. 22: Lubricant quantities for the product family SBk

3

3.12.4 Lubricant quantities for the product family LBk

Size	Total quantity of lubricant								
						without spacer		per 10 mm spacer length	
	LBk, LBRkn	LBGk, LRGkn	LBkD, LBkT	VLBk each half	LBki	LBLk	LRLkn	LBLk	LRLkn[2)]
	kg	kg	kg	kg	kg	kg	kg	kg	kg
32	0.03	0.03	0.03	0.028	0.035	0.03	0.03	0.010	-
38	0.04	0.04	0.04	0.052	0.045	0.04	0.04	0.015	-
48	0.06	0.06	0.06	0.069	0.07	0.06	0.06	0.020	-
60	0.10	0.10	0.10	0.11	0.11	0.10	0.10	0.026	-
70	0.15	0.15	0.15	0.14	0.16	0.15	0.15	0.031	-
80	0.22	0.22	0.22	0.21	0.23	0.22	0.22	0.047	-
90	0.29	0.29	0.29	0.27	0.30	0.29	0.29	0.050	-
100	0.44	0.44	0.44	0.40	0.46	0.44	0.44	0.070	-
110	0.55	0.55	0.55	0.52	0.57	0.55	0.55	0.075	-
125	0.79	0.79	0.79	0.58	0.85	0.79	0.79	0.090	-
140	0.90	0.90	0.90	0.69	1.00	0.90	0.90	0.1	-
160	1.23	1.23	1.23	0.94	1.33	1.23	1.23	1)	-
180	1.90	1.90	1.90	1.50	2.00	1.90	1.90	-	-
200	2.40	2.40	2.40	2.30	2.50	2.40	2.40	-	-
225	3.70	3.70	3.70	3.10	3.80	3.70	3.70	-	-

1) These coupling sizes do not require any additional quantity of grease for the spacer.
2) The design of couplings of the LRLkn series does not require any additional quantity of grease for the spacer. However, this applies only to the coupling sizes up to 225 listed in the catalogue. For larger couplings, ask RENK for details.

Tab. 23: Lubricant quantities for the product family LBk

3.13 Torsional stiffness for series with a fixed tooth centre distance

The values listed in the following tables for the torsional stiffness C_T for the various series always apply to the complete coupling in its basic design version. The calculations are based on the hub bores with the largest diameter (d_1; $d_{2\ max}$).

The calculation scheme is shown in the following figures.

The formulas for calculating the torsional stiffness for couplings with a spacer or intermediate shaft can be found in the respective dimension tables.

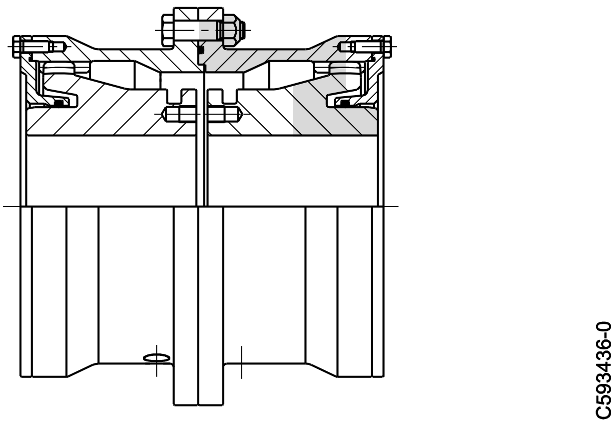


Fig. 2: Calculation scheme for product family SB

Size	Torsional stiffness C_T			
	SB MNm/rad	SBR MNm/rad	SBD, SBT MNm/rad	VSB MNm/rad
30	0.44	0.44	0.44	0.44
40	1.44	1.44	1.15	1.44
50	2.15	2.15	2.15	2.15
60	3.97	3.97	4.00	3.97
70	5.45	5.45	5.49	5.45
80	9.00	9.00	9.10	9.00
90	12.42	12.42	12.49	12.42
100	14.26	14.26	14.30	14.26
110	18.77	18.77	18.90	18.77
125	26.10	26.10	26.21	26.10
140	40.36	40.36	38.8	40.36
160	64.39	64.39	64.7	64.39
180	79.11	79.11	79.4	79.11
200	108.12	108.12	108.7	108.12
220	169.8	172.46		
240	214.7	219.00		
260	265.7	280.94		
280	349.7	354.35	Values on request	
300	399.9	416.72		
320	527.3	553.10		
340	729.6	719.82		

Tab. 24: Torsional spring stiffness for the product family SB

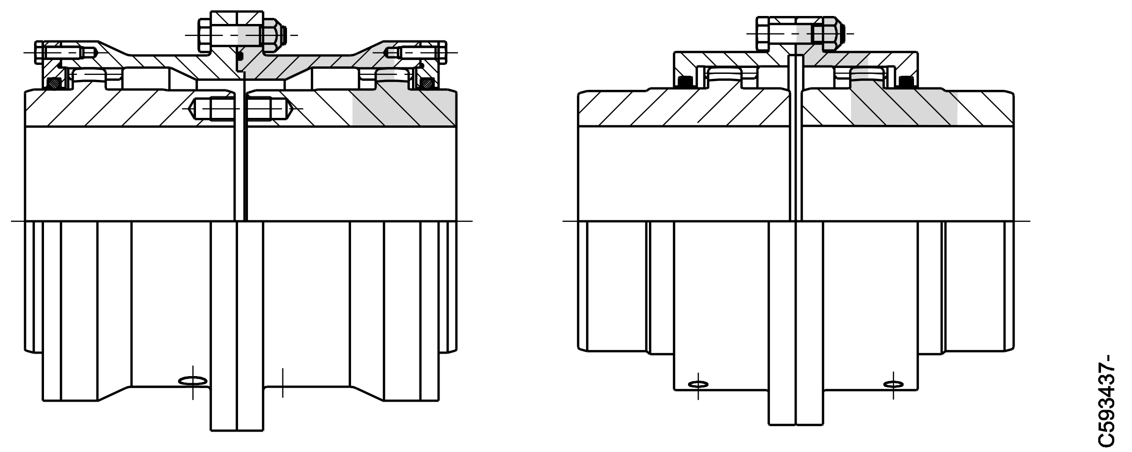


Fig. 3: Calculation scheme for the product families SBk and LBk

Size	Torsional stiffness C_T						
	SBk MNm/rad	SBRk MNm/rad	SBkD/SBkT MNm/rad	LBk MNm/rad	LBRkn MNm/rad	LBkD/LBkT MNm/rad	VLBk MNm/rad
32	-	-	-	0.66	0.73	0.66	0.73
38	1.1	0.68	1.1	1.25	1.36	1.24	1.36
48	2.4	1.94	2.3	2.89	3.10	2.87	3.10
60	3.5	3.0	3.5	4.33	4.44	4.3	4.44
70	7.0	6.2	7.1	9.27	9.18	9.2	9.18
80	10.2	8.9	10.3	13.9	13.5	13.7	13.5
90	13.4	12.1	13.6	20.1	19.2	19.9	19.2
100	19.5	16.5	19.7	27.3	26.2	27.0	26.2
110	22.3	18.8	22.5	31.8	30.4	31.4	30.4
125	30.4	25.7	30.7	48.6	45.8	48.0	45.8
140	41.1	35.1	41.4	62.9	60.4	60.9	60.4
160	61.8	53.2	62.2	91.2	87.3	89.9	87.3
180	81.1	71.6	81.6	133.5	125.6	132.0	125.6
200	109.1	100.0	109.7	180.0	171.0	177.6	171.0
225	145.1	135.0	146.2	241.6	231.1	239.0	231.1
250	204.3	Values on request					
265	257.4						
280	323.8						
315	419.3						
335	491.6						
355	656.4						
375	875.4						

Tab. 25: Torsional spring stiffness for the product families SBk and LBk

3.14 Puller threads

Puller threads make it easier to dismantle the hubs or flanges from the machine shafts. For the smaller sizes, geometrical considerations render the use of puller threads impractical.

Puller threads are used for the product families SB, SBk and LBk if the following conditions are met:

For **press-fit connections** the rule is:

– From size 70 according to the following table.

For **fitted key connections** the rule is:

– From size 70 to 100 only if specified in the order.

– From size 110 generally according to the following table.

Puller thread for product family SB			
Size	Thread diameter	Hole spacing mm	Quantity
70	M8	94	2
80	M8	107	2
90	M10	115	2
100	M12	130	2
110	M12	140	2
125	M12	162	2
140	M16	190	2
160	M20	215	2
180	M24	240	2
200	M24	270	2
220	M24	290	2
240	M24	320	2
260	M30	340	2
280	M30	380	2
300	M36	395	2
320	M36	430	2
340	M42	460	2

Puller thread for product family SBk/LBk			
Size	Thread diameter	Hole spacing mm	Quantity
70	M8	95	2
80	M12	110	2
90	M12	125	2
100	M12	140	2
110	M16	150	2
125	M16	170	2
140	M20	190	2
160	M20	220	2
180	M24	245	2
200	M24	270	2
225	M24	305	2
250	M30	340	2
265	M30	370	2
280	M36	390	2
315	M36	440	2
335	M36	460	2
355	M42	500	2
375	M42	530	2

Tab. 26: Puller threads for the product families SB, SBk and LBk

3.15 Keyway sealing

Where the shaft-hub connection uses a feather key, the keyways must be sealed on the inside to prevent oil or grease escaping.

Sealing with an oil-resistant or grease-resistant sealant is a simple way of sealing.

In the case of a non-continuous feather key, sealing can be achieved by means of a milled or a circumferential annular groove. The keyway in the hub is not continuous and a cylindrical sealing face remains between the hub and the shaft.

Where a continuous feather key is fitted, the seal can be achieved using a screwed-on cover.

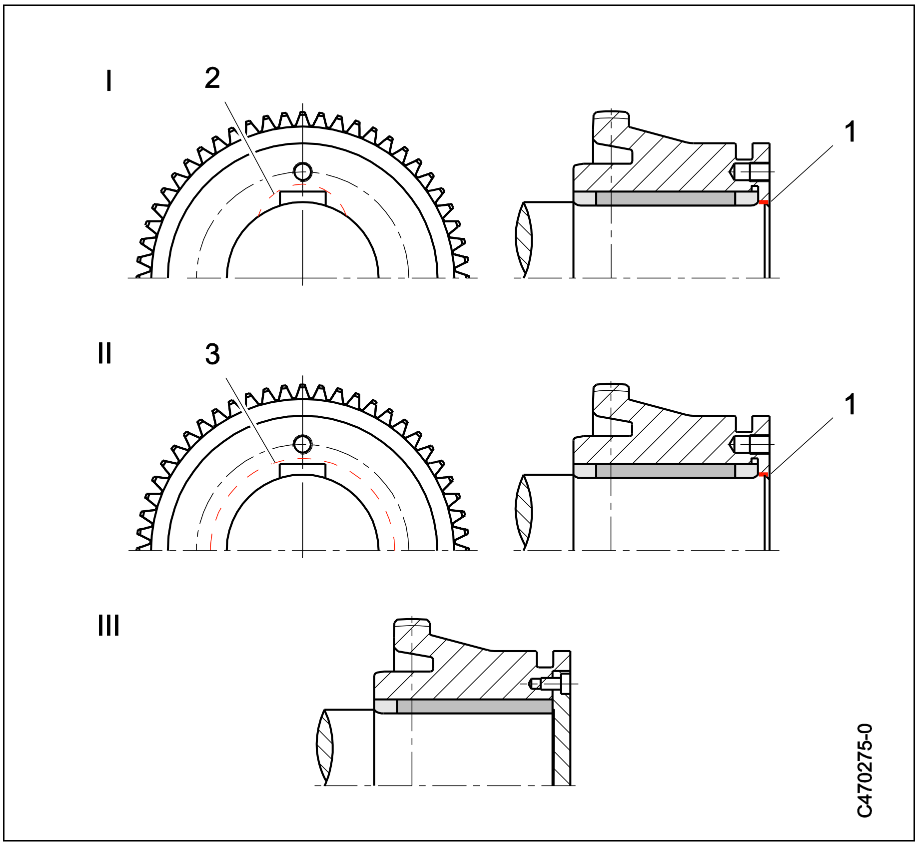


Fig. 4: Keyway sealing

Legend

1 Sealing face

2 Milled groove

3 Ring groove

3.16 Backlash control

The backlash control device for gear couplings enables quick and easy checking of the coupling teeth without dismantling the coupling. The backlash between the internal and external teeth is measured directly at the meshing point. A comparison of the measured values with the given data shows changes. This enables the current state of the coupling to be assessed. Regular controls enable the optimal procurement of spare parts and also offer the security of constant operational readiness.

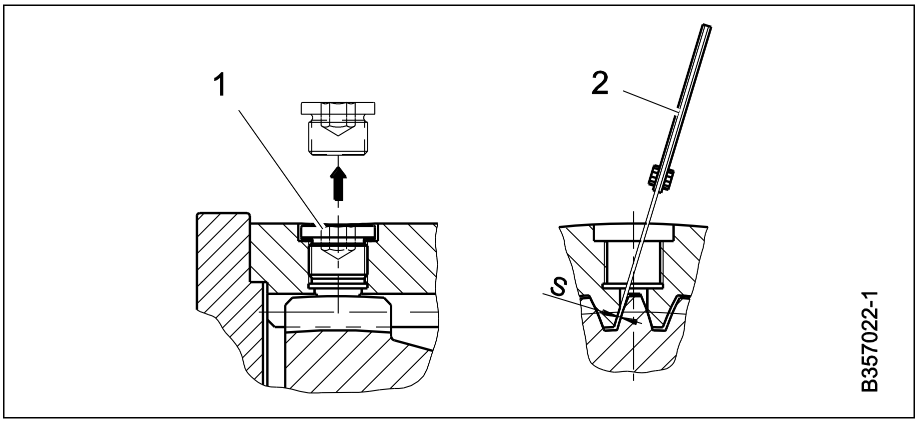


Fig. 5: Measure the backlash

Legend

1 Screw plug

2 Feeler gauge

S Backlash

Couplings with backlash control devices are equipped with at least one inspection opening in both housings. During operation, the opening is closed by a screw plug (**1**). It is located above the tooth centre of the gears. Depending on the design, several of these inspection openings can be arranged around the coupling circumference.

To measure the backlash (**S**), proceed as follows:

- Unscrew the screw plug (**1**) from the housing above the teeth.
- Move the housing axially to the centre above the two hubs so that the inspection opening is centrally above the hub teeth (see **1**). This ensures that the backlash can be measured correctly.
- Turn the machine shaft until the tooth flanks come into contact.
- Measure the clearance between the flanks using a feeler gauge (**2**) in the middle of the toothing.

If the shafts cannot be turned and the tooth flanks do not come into contact on one side, measure the backlash on both flanks and sum the results to yield the total backlash.

- After completing the measurement, screw the screw plug back in and tighten it.

3.17 Accessories

3.17.1 Distance plates

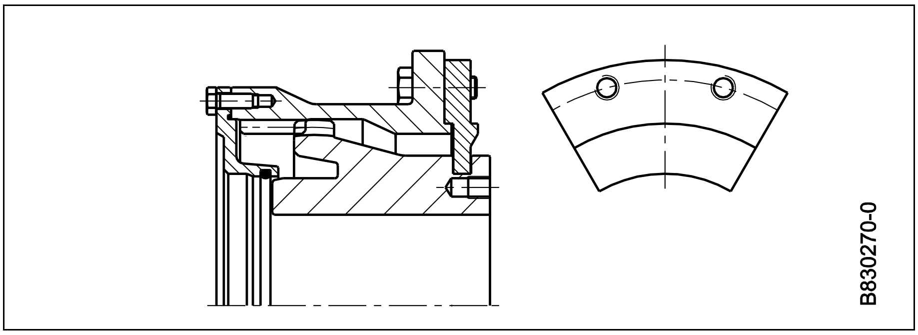


Fig. 6: Product family SB

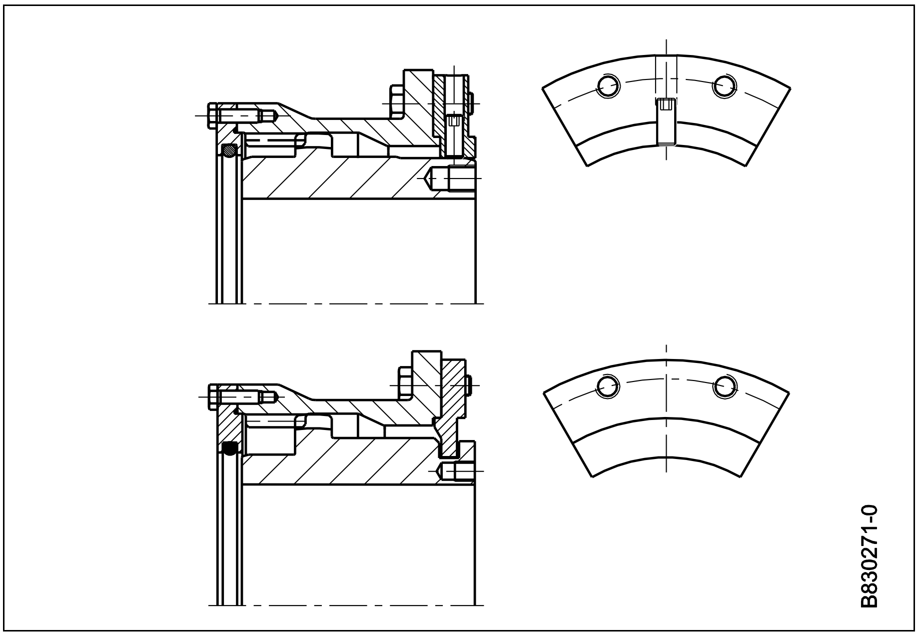


Fig. 7: Product family SBk: Standard (above), retaining ring version (below)

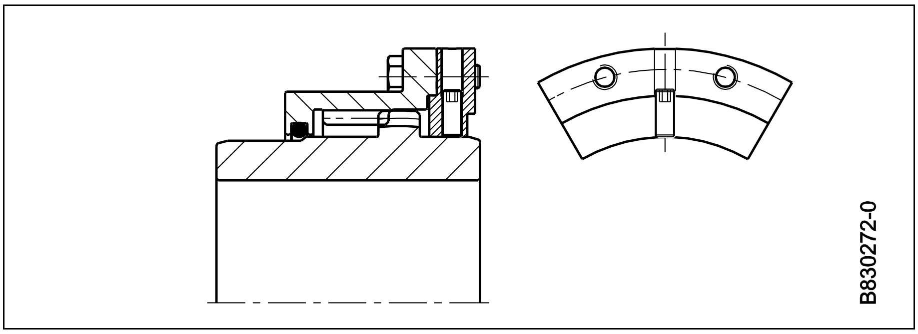


Fig. 8: Product family LBk

When the coupling is open, distance plates take over the radial and axial guidance of the coupling housing . This allows the drive machine to be brought up to speed without the machine coupled to it.

This is necessary, for example, when testing electric motors. Distance plates are intended only for short-term use and are not suitable for continuous operation.

Two plate segments are screwed to the housing, each with two fastening screws. For certain coupling series, the plate segment must also be clamped radially to the hub.

The dismounting dimension F (see dimension tables) is required for installing and removing the distance plates.

3.17.2 RENK Longlife Grease

RENK Longlife Grease is a grease specially tailored to the requirements of gear couplings; it is based on a mineral oil and a lithium polymer thickener. The high-quality additive package guarantees full lubricity even over long periods. The high-pressure additives of RENK Longlife Grease make it the ideal lubricant for couplings that are subject to high loads, even in the event of impact loads. The thixotropic structure ensures high drip resistance at standstill, even under unfavourable installation conditions.

RENK Longlife Grease corresponds to NLGI class 1. It is fully water-resistant and behaves completely neutrally compared to the installed seals.

RENK Longlife Grease extends the maintenance intervals of RENK gear couplings to 25.000 operating hours or max. 5 years. This period corresponds to the intervals of the major overhaul in power plants and the regulations of the API.

RENK Longlife Grease is available in practical, easy-to-use cartridges, or also in larger containers if required.

Container sizes			
0.28 kg	Cartridge	4.5 kg	Can
1.0 kg	Can	18 kg	Hobbock

Tab. 27: Container sizes of RENK Longlife Grease

Store the product in a cool, dry place, if possible in the closed original container.

For more information, please refer to the product information.

The product information and the safety data sheet can be downloaded from our website or requested from the contact address on the back of the catalogue.

4 Gear couplings – High-speed series

RENK offers you gear couplings of the high-speed series: the ideal product for medium, high and very high speeds.

In our high-speed range, you will find three different product families for a wide variety of applications and with different quality features. You obtain the optimal coupling for every application.

4.1 Application features and functional features

	Product family		
Features	**ZT**	**TF**	**TSB**
Displacement	0.167°	0.4°	0.4°
High and very high speeds	●		
High speeds	●	●	
Medium speeds	●	●	●
Toothing	nitrided, ground	nitrided	naturally hard
Toothing concentricity to DIN 3962	4-5	6-7	7-8
Tooth tip centring	●	●	●
Single tooth injection lubrication	●	●	●
High concentricity and balance quality	●	●	
High overload protection	●	●	●
Design to API 671	●		
Suitable for use in explosion protection areas - 2014/34/EU ATEX	●	●	●

Tab. 28: Application features and functional features of the Turbo series

4.2 Series change in the product family ZT

Series	old	new
Spacer	ZTNH	ZTKH
	ZTKH	
Flange and hub sleeve	ZTF	ZTF
	ZTFK	
Flange and hub sleeve with retaining ring	ZTFR	ZTFR
	ZTFKR	
Hub sleeve	ZTA	ZTA
	ZTAK	
One-piece sleeve	ZTN	ZTK
	ZTK	

Tab. 29: Series comparison old – new

In the previous catalogues, a distinction was made for the ZT series designation between cylindrical bore and tapered bore, for example **ZTNH** and **ZTKH**. This distinction is not made in this catalogue. The Tab. 29 shows the current series designations.

4.3 Standard materials

The standard materials specified in the table below are used for the couplings of this series.

For special versions of the TSB, materials with higher strength are also available and, in addition, surface hardening by gas nitriding.

Component	Material	Strength
Product family **ZT**		
Hub/flange	Quenched and tempered steel	$R_{P0.2}$ = min. 700 N/mm^2
Housing	Quenched and tempered steel	$R_{P0.2}$ = min. 700 N/mm^2
Fitted bolts		Strength class 10.9
Product family **TF**		
Hub/flange	Quenched and tempered steel	$R_{P0.2}$ = min. 460 N/mm^2
Housing	Quenched and tempered steel	$R_{P0.2}$ = min. 390 N/mm^2
Fitted bolts		Strength class 8.8
Product family **TSB**		
Hub/flange	Quenched and tempered steel	$R_{P0.2}$ = min. 430 N/mm^2
Housing	Quenched and tempered steel	$R_{P0.2}$ = min. 325 N/mm^2
Fitted bolts		Strength class 8.8

Tab. 30: Standard material

4.4 Use in potentially explosive areas - ATEX

According to the current EU directive, the following maximum marking can be applied to these couplings.

Product family **ZT, TF** and **TSB**

II 2G Ex h IIC T4 Gb -20 C ≤ T_a ≤ +60°C

II 2G Ex h IIC T3 Gb -20°C ≤ T_a ≤ + 60°C *

II 2D Ex h IIIB T130°C Db -20°C ≤ T_a ≤ + 60°C

II 2D Ex h IIIB T195°C Db -20°C ≤ T_a ≤ + 60°C *

* Temperature monitoring is required for peripheral speeds > 100 m/s and > 150 m/s.

4.5 Single-tooth injection lubrication

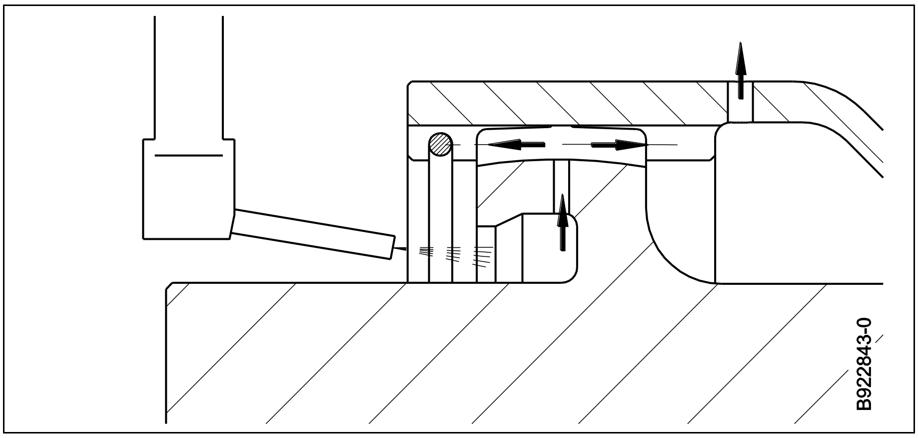


Fig. 9: Principle of single-tooth injection lubrication

The gear couplings of the high-speed series are supplied with lubricating oil via single-tooth injection lubrication. The lubricating oil is injected into a pocket below the hub spline (see Fig. 9). Bores in each tooth root bring the oil directly into the tooth area. The single-tooth injection lubrication with continuous lubricant supply means a high degree of operational safety with minimal maintenance. The deposition of centrifuged oil components is reliably prevented by the structural design of the coupling parts.

The coupling must be equipped with an oil-tight protective guard (coupling guard). This protective guard prevents hot lubricating oil escaping. For logical reasons, the injection nozzles are integrated into the protective guard. When positioning, make sure that the injection nozzles inject as close as possible to the toothing and in the correct position and direction. You can find more detailed information on aligning the injection nozzles in the respective operation manual.

The oil supply can take place in connection with the central lubrication system of the overall system or, if necessary, via an independent unit. Use mineral lubricants, for example gear oils or turbine oils of viscosity class ISO VG 32 to 68.

4.6 Selection of the coupling size

When selecting the coupling using the dimension tables, proceed as follows:

- Select for the nominal system torque and the service factor applicable to your system (see chapter 2.2.4) the coupling size.
- Check the coupling size again based on the known additional stresses.
- Check the permissible speed of the coupling.
- Check the maximum permissible bore diameter.
- Check the shaft-hub connection (see chapter 1.1).

4.6.1 Permissible additional stresses

When specifying the coupling, you must take into account the following permissible additional stresses. You can find more detailed information on the types of additional stresses in (see chapter 2.1).

Peak coupling torque

– pulsating or alternating for 100,000 load cycles

$$T_{KP} = 1.5 \cdot T_{KN}$$

Maximum coupling torque

– pulsating or alternating for 1,000 load cycles

$$T_{Kmax} = 3 \cdot T_{KN}$$

4

4.6.2 Permissible speed

The permissible speed is calculated using the formula:

$$n_{perm} = n_{max} \cdot f$$

Legend

n_{perm} = permissible speed [rpm]

n_{max} = max. speed (see dimension tables) [rpm]

f = speed factor

To determine the speed factor f, the angular offset ΔK_w that occurs continuously during operation is authoritative. The angular offset can be determined from the radial offset as follows:

$$\Delta K_w = arctan\left(\frac{\Delta K_r}{L_0}\right)$$

Legend

ΔK_w = angular offset [°]

ΔK_r = radial offset [mm]

L_0 = tooth centre distance (see dimension tables) [mm]

Example:

Coupling	**THB 100**
Required radial offset ΔK_r	**0.3 mm**
Distance between tooth centres L_0	**63 mm**
Angular offset ΔK_w	**0.27°**

Tab. 31 indicates a speed factor f of 0.75 for an angular offset of 0.27°.

	Speed factor f at angular displacement ΔK_w											
Product family	**0.033°**	**0.067°**	**0.1°**	**0.133°**	**0.167°**	**0.2°**	**0.233°**	**0.267°**	**0.3°**	**0.33°**	**0.367°**	**0.4°**
ZT	1	1	1	1	0,8	-						
TF	1	1	1	1	1	0,90	0,80	0,75	0,67	0,60	0,55	0,50
TSB (≤ size 160)	1	1	1	1	1	1	1	0,94	0,83	0,75	0,68	0,63
TSB (> size 160)	1	1	1	1	1	1	0,90	0,79	0,70	0,63	0,57	0,52

Tab. 31: Speed factor f

4.6.3 Permissible shaft offsets

The permissible **angular offset** ΔK_w of the gear couplings high-speed series is:

Product family ZT

$\Delta K_w = 0.167°$

Product family TF and TSB

$\Delta K_w = 0.4°$

The maximum allowable static **radial offset** ΔK_r depends on the permissible angular offset and the tooth centre distance l_0.

You can determine the radial offset using the following formulas.

Product family ZT

$\Delta K_r = L_0 \bullet 0.0029$ [mm]

Legend

ΔK_r = radial offset [mm]
L_0 = tooth centre distance (see dimension tables) [mm]

The axial clearances a and b of the ZTFR series are available on request.

Product family TF and TSB

$\Delta K_r = L_0 \cdot 0.0070 \quad f_H$ [mm]

Legend

ΔK_r = radial offset [mm]
f_H = axial clearance factor
L_0 = tooth centre distance (see dimension tables) [mm]
f_H = 1.0 (coupling without retaining ring)
f_H = 0.8 (coupling with retaining ring)

The axial clearance factor f_H is only valid for the product family TSB and for the axial clearances a and b specified in the dimension tables.

Axial clearances a and b of the TFR series are available on request.

The permissible **axial offset** ΔK_a is only a few millimetres. In the case of larger axial offsets such as large thermal expansions, special measures may be required, such as extended teeth.

4.6.4 Selection example

Application:	Coupling between turbine and gearbox.
Data:	$P = 13{,}000\ kW$
	$n = 10{,}700\ min^{-1}$
	$d_1, d_2 = 130\ mm$
	Conical press fits
	Distance between the shaft ends: E = 300 mm
Service factor:	Design to API 671
	$K_A = 1.75$
Sizing:	$T_N = \frac{P}{n} \cdot 9{,}550 = \frac{13000}{10700} \cdot 9{,}550 = 11{,}603\ Nm$
	$T_N \cdot K_A = 11{,}603 \cdot 1.75 = 20{,}305\ Nm$
	According to the ZTKH dimension table, this results in a ZTKH 115
	$T_{KN} = 31{,}000\ Nm$
	$T_{Kmax} = 3 \cdot T_{KN} = 93{,}000\ Nm$
Additional stress:	Short circuit torque 6 x T_N
	$T_{max} = 6 \cdot T_N \cdot 1.15 = 80{,}061\ Nm$
	$T_{Kmax} \geq T_{max}$
Bore verification:	$d_1, d_{2\,max} = 115\ mm$
	$d_1, d_{2\,max} \leq d_1, d_2$
	A redefinition is necessary.
Redefinition:	ZTKH 130:
	$d_1, d_{2\,max} = 130\ mm$
	$d_1, d_{2\,max} \geq d_1, d_2$
Speed:	$n_{max} = 13{,}500\ min^{-1}$
	There are no major displacements during operation. It is not necessary to take the speed factor into account.
Checking the spacer length	$E_{min} = 111\ mm$
	$E \geq E_{min}$
Checking the shaft-hub connection:	Checking the load-bearing capacity of the press fit connection according to DIN 7190.

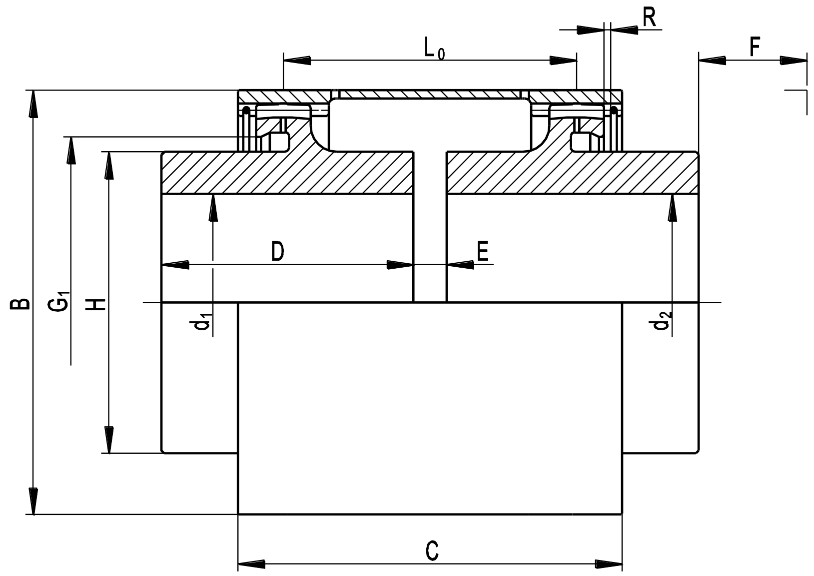
4.7 Designs and dimension tables of the product family ZT

Designs	Series	Page
Basic design	ZTK	110
Spacer design	ZTKH	112
Design with flange and hub sleeve	ZTF	114
Design with flange and hub sleeve with retaining ring	ZTFR	114
Design with hub sleeve	ZTA	116

Tab. 32: Designs of the product family ZT

ZTK series

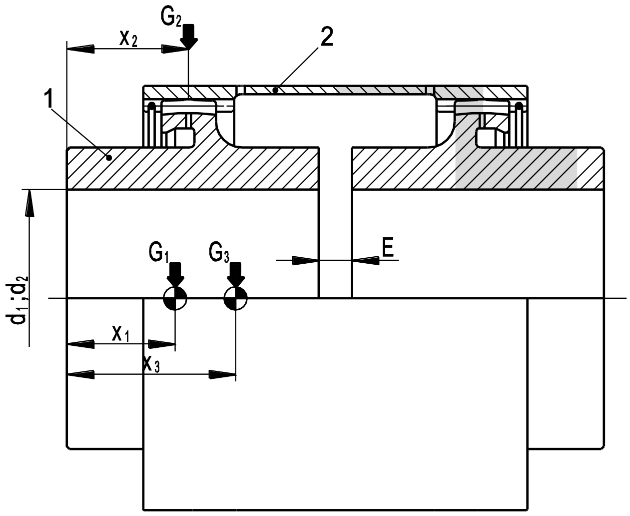
Dimension table no.: B791310-0



B812645-0

Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Bore d_1; d_2 min mm	Bore d_1; d_2 max mm	Dimensions B mm	C_{min} mm	D mm	F mm	G_1 mm	H mm	L_0 mm	R mm	Oil injection nozzles per half quantity x size mm	Total oil requirement per minute at 1.5 bar pressure litres
35	1.1	40000	18	35	82	77	45	30	60	50	E+49	1.5	1 x Ø2	4.5
40	1.4	37500	20	40	88	87	50	40	66	56	E+58	1.5	1 x Ø2	4.5
45	1.9	32000	35	45	104	128	55	68	74	64	E+93	2.5	1 x Ø2	4.5
55	3.1	28000	40	55	120	138	65	68	87	77	E+101	2.5	1 x Ø2	4.5
63	4.9	25000	45	63	135	149	75	69	101	88	E+110	2.5	1 x Ø2.5	7
73	7.6	22000	50	73	155	157	90	62	118	102	E+113	3	1 x Ø2.5	7
85	12	20000	55	85	174	165	105	55	133	119	E+119	3	1 x Ø3	10
100	19	18000	65	100	198	188	120	63	156	140	E+138	3	1 x Ø3	10
115	31	16000	75	115	224	208	135	63	178	160	E+144	4	1 x Ø3.5	13
130	42	13500	85	130	256	244	155	79	200	182	E+174	4	1 x Ø3.5	13
150	67	11500	100	150	288	268	180	78	230	210	E+191	4	2 x Ø3	20
175	100	10000	115	175	330	314	210	89	265	245	E+222	5	2 x Ø3	20
205	150	9000	135	205	390	354	245	94	315	290	E+256	5	2 x Ø3.5	26

The dismantling dimension F is required for vertical installation and removal of the machines.
For technical reasons, pressurised oil assemblies require the supply of pressurised oil through the shaft.



B830845-0

Legend

1 Hub

2 Sleeve

Weight

G_1 = for E_{min}

G_2 = per 1 mm sleeve length

G_3 = half coupling if $E > E_{min}$

Centre of gravity

X_1 = for E_{min}

X_2 = for G_2

X_3 = half coupling if $E > E_{min}$

Torsional stiffness

C_1 = for E_{min}

C_2 = per 1 mm sleeve length

C_3 = half coupling if $E > E_{min}$

Mass moment of inertia

J_1 = for E_{min}

J_2 = per 1 mm sleeve length

J_3 = half coupling if $E > E_{min}$

$$G_3 = G_1 + \frac{(E - E_{min}) * G_2}{2}$$

$$X_3 = \frac{X_1 * G_1 + X_2 * \frac{(E - E_{min}) * G_2}{2}}{G_3}$$

$$C_3 = \frac{1}{\frac{1}{C_1} + \frac{E - E_{min}}{C_2}}$$

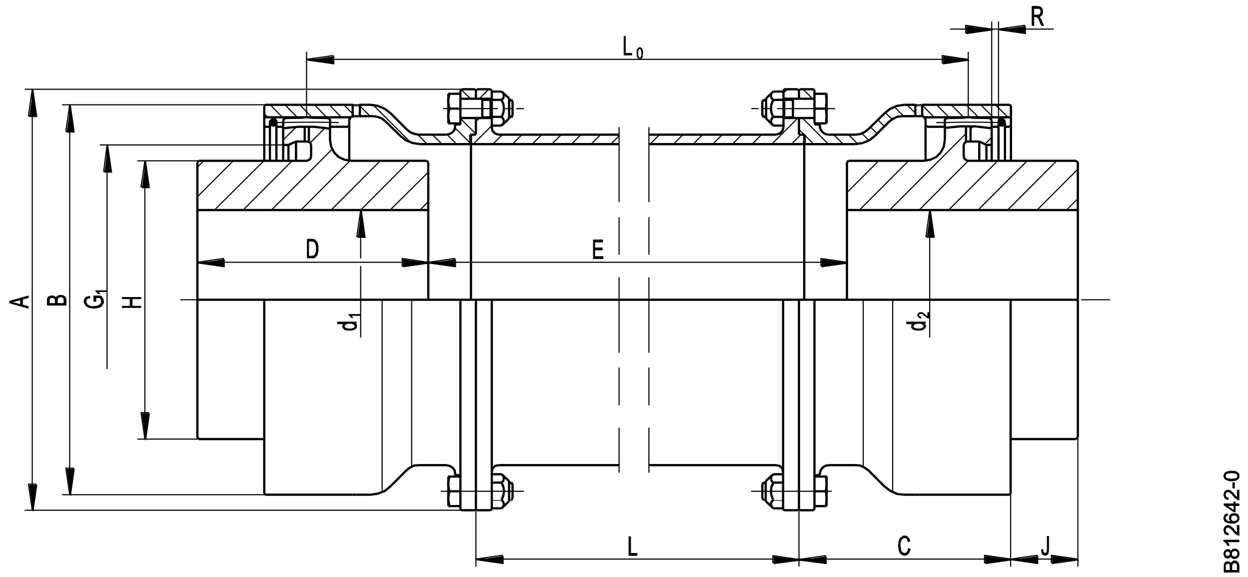
$$J_3 = J_1 + (E - E_{min}) * J_2$$

Size	E_{min} mm	X_1 mm	X_2 mm	G_1 kg	G_2 kg/mm	C_1 MNm/rad	C_2 MNm · mm/rad	J_1 kgm²	J_2 kgm²/mm
35	5	21.6	20.5	0.75	0.0058	0.61	92	0.0015	0.0000091
40	5	23.1	21.0	0.96	0.0063	0.78	115	0.0024	0.000011
45	10	17.0	8.5	1.60	0.0075	1.3	193	0.0050	0.000019
55	10	23.4	14.5	2.39	0.0087	1.7	300	0.010	0.000030
63	10	29.1	20.0	3.38	0.0114	2.5	497	0.017	0.000049
73	10	39.1	33.5	5.00	0.0131	3.4	760	0.033	0.000075
85	10	49.2	45.5	7.40	0.0147	4.7	1083	0.060	0.00011
100	10	57.0	51.0	10.96	0.0191	7.2	1823	0.12	0.00018
115	15	66.2	63.0	16.18	0.0244	10.2	2971	0.22	0.00029
130	15	74.1	68.0	24.78	0.0310	14.9	4936	0.46	0.00049
150	15	87.6	84.5	37.00	0.0417	21.7	8401	0.83	0.00083
175	20	101.9	99.0	57.30	0.0558	32.2	14728	1.8	0.0015
205	20	121.2	117.0	92.50	0.0661	52.1	24552	3.9	0.0024

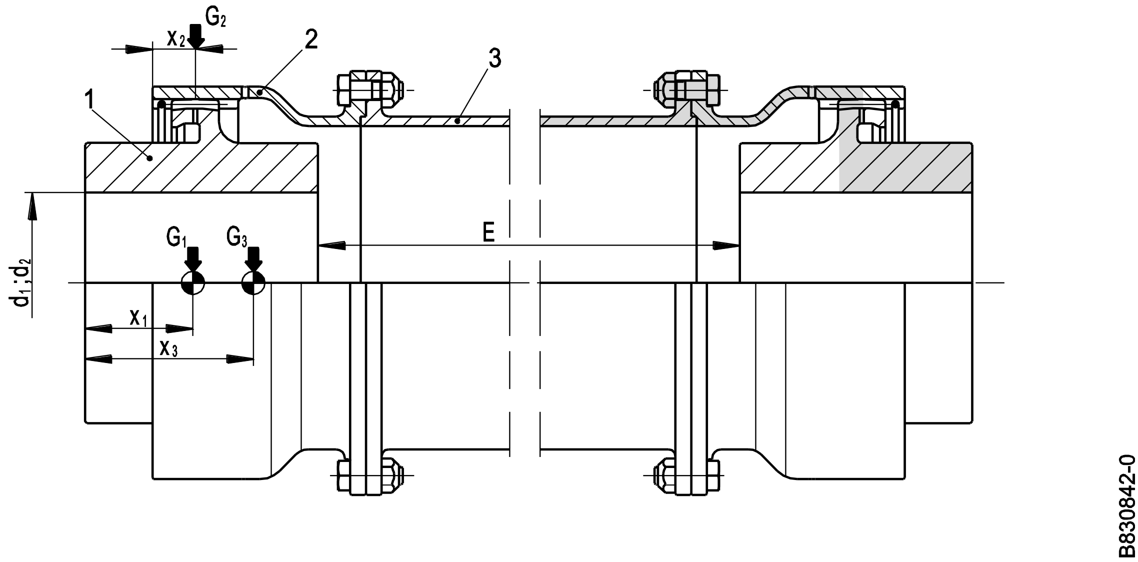
Information based on d_1; d_2 max.

ZTKH series

Dimension table no.: B791311-0



Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Dimensions: Bore d_1; d_2 min mm	Bore d_1; d_2 max mm	A mm	B mm	C mm	D mm	G_1 mm	H mm	J mm	L mm	L_0 mm	R mm	Oil injection nozzles per half quantity x size mm	Total oil requirement per minute at 1.5 bar pressure litres
35	1.1	40000	18	35	117	82	49	45	60	50	9	E-26	E+49	1.5	1 x Ø2	4.5
40	1.4	37500	20	40	127	88	54	50	66	56	9	E-26	E+58	1.5	1 x Ø2	4.5
45	1.9	32000	35	45	123	104	85	55	74	64	-4	E-52	E+93	2.5	1 x Ø2	4.5
55	3.1	28000	40	55	133	120	88	65	87	77	1	E-48	E+101	2.5	1 x Ø2	4.5
63	4.9	25000	45	63	148	135	95	75	101	88	5.5	E-51	E+110	2.5	1 x Ø2.5	7
73	7.6	22000	50	73	168	155	100	90	118	102	16.5	E-53	E+113	3	1 x Ø2.5	7
85	12	20000	55	85	188	174	102	105	133	119	27.5	E-49	E+119	3	1 x Ø3	10
100	19	18000	65	100	217	198	112	120	156	140	31	E-46	E+138	3	1 x Ø3	10
115	31	16000	75	115	242	224	122	135	178	160	38.5	E-51	E+144	4	1 x Ø3.5	13
130	42	13500	85	130	276	256	140	155	200	182	40.5	E-51	E+174	4	1 x Ø3.5	13
150	67	11500	100	150	306	288	155	180	230	210	53.5	E-57	E+191	4	2 x Ø3	20
175	100	10000	115	175	354	330	180	210	265	245	63	E-66	E+222	5	2 x Ø3	20
205	150	9000	135	205	394	390	195	245	315	290	78	E-56	E+256	5	2 x Ø3.5	26
240	235	8000	160	240	465	465	227	285	379	340	88	E-60	E+308	5	2 x Ø3.5	26
260	300	7000	175	260	510	510	237.5	320	410	370	107.5	E-50	E+328	6	2 x Ø4	36
280	375	6500	185	280	560	560	255	340	455	400	110	E-50	E+358	6	2 x Ø4	36
For technical reasons, pressurised oil assemblies require the supply of pressurised oil through the shaft.																



4

Legend

1 Hub

2 Housing

3 Spacer

Weight

G_1 = half coupling for E_{min}

G_2 = per 1 mm spacer length

G_3 = half coupling if $E > E_{min}$

Centre of gravity

X_1 = half coupling for E_{min}

X_2 = for G_2

X_3 = half coupling if $E > E_{min}$

Torsional stiffness

C_1 = coupling for E_{min}

C_2 = per 1 mm spacer length

C_3 = coupling if $E > E_{min}$

Mass moment of inertia

J_1 = coupling for E_{min}

J_2 = per 1 mm spacer length

J_3 = coupling if $E > E_{min}$

$$G_3 = G_1 + \frac{(E - E_{min}) * G_2}{2}$$

$$X_3 = \frac{X_1 * G_1 + X_2 * \frac{(E - E_{min}) * G_2}{2}}{G_3}$$

$$C_3 = \frac{1}{\frac{1}{C_1} + \frac{E - E_{min}}{C_2}}$$

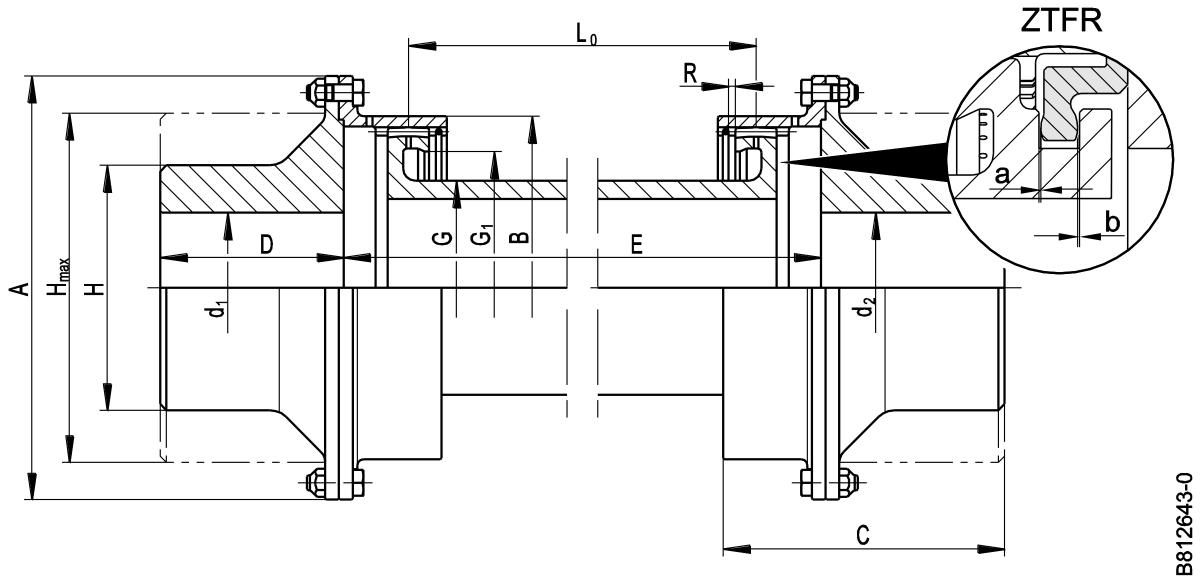
$$J_3 = J_1 + (E - E_{min}) * J_2$$

Size	E_{min} mm	X_1 mm	X_2 mm	G_1 kg	G_2 kg/mm	C_1 MNm/rad	C_2 MNm · mm/rad	J_1 kgm²	J_2 kgm²/mm
35	76	20.04	20.5	1.48	0.0058	0.429	92	0.0044	0.0000091
40	76	20.83	21.0	1.85	0.0063	0.540	115	0.0062	0.000011
45	102	11.91	8.5	2.66	0.0058	0.484	89	0.0099	0.000088
55	98	18.31	14.5	3.49	0.0065	0.739	128	0.017	0.000013
63	101	24.22	20.0	4.53	0.0075	1.08	199	0.027	0.000020
73	103	34.34	33.5	6.13	0.009	1.74	340	0.048	0.000034
85	99	44.90	45.5	8.91	0.012	3.02	619	0.085	0.000061
100	101	51.90	51.0	13.45	0.018	4.88	1162	0.17	0.00011
115	106	61.76	63.0	19.1	0.025	8.20	2158	0.30	0.00021
130	111	67.88	68.0	28.65	0.031	11.5	3421	0.60	0.00034
150	117	80.47	84.5	40.95	0.041	18.0	5894	1.1	0.00058
175	141	93.43	99.0	64.25	0.054	26.2	10056	2.3	0.00099
205	131	110.73	117.0	97.9	0.073	43.6	17765	4.6	0.0018
240	135	127.69	131.0	172.2	0.094	66.3	34269	10.0	0.0034
260	140	144.59	156.0	206.05	0.11	85.6	47187	16.3	0.0047
280	140	152.96	161.0	229.1	0.13	112.7	66981	24.1	0.0066

Information based on d_1; d_2 max.

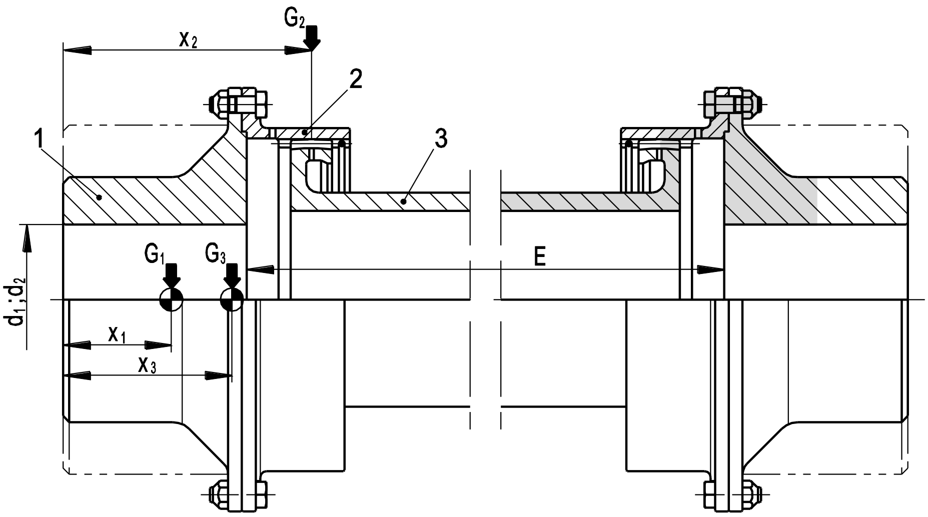
ZTF and ZTFR series

Dimension table no.: B791312-0



Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Bore d_1; d_2 min mm	Bore d_1; d_2 nominal mm	Bore d_1; d_2 max mm	A mm	B mm	C mm	D mm	G mm	G_1 mm	$H_{nominal}$ mm	H_{max} mm	L_0 mm	R mm	Oil injection nozzles per half quantity x size mm	Total oil requirement per minute at litres
35	1.1	40000	18	35	55	117	82	73	45	50	60	60	78	E-33	1.5	1 x Ø2	4.5
40	1.4	37500	20	40	60	127	88	79	50	56	66	66	84	E-34	1.5	1 x Ø2	4.5
45	1.9	32000	35	45	71	143	104	91	55	55	73	74	100	E-47	2.5	1 x Ø2	4.5
55	3.1	28000	40	55	80	157	120	104	65	70	87	87	115	E-51	2.5	1 x Ø2	4.5
63	4.9	25000	45	63	90	172	135	117	75	80	101	101	130	E-55	2.5	1 x Ø2.5	7
73	7.6	22000	50	73	110	197	155	139	90	90	118	118	155	E-64	3	1 x Ø2.5	7
85	12	20000	55	85	120	212	174	156	105	100	133	133	170	E-66	3	1 x Ø3	10
100	19	18000	65	100	130	247	198	176	120	120	156	156	185	E-72	3	1 x Ø3	10
115	31	16000	75	115	155	277	224	199	135	140	178	178	220	E-79	4	1 x Ø3.5	13
130	42	13500	85	130	170	310	256	229	155	165	200	200	240	E-93	4	1 x Ø3.5	13
150	67	11500	100	150	200	345	288	263	180	190	230	230	280	E-104	4	2 x Ø3	20
175	100	10000	115	175	220	398	330	305	210	215	265	265	310	E-118	5	2 x Ø3	20
205	150	9000	135	205	270	465	390	348	245	255	315	315	380	E-128	5	2 x Ø3.5	26
240	235	8000	160	240	310	560	465	400	285	312	379	360	435	E-142	6	2 x Ø3.5	26
260	300	7000	175	260	340	605	510	446	320	342	410	390	480	E-155	6	2 x Ø4	36
280	375	6500	185	280	370	690	560	480	340	367	455	420	520	E-178	6	2 x Ø4	36

For technical reasons, pressurised oil assemblies require the supply of pressurised oil through the shaft.
The ZTFR series is equipped with two Z-shaped retaining rings to limit axial clearance.
Axial clearances a and b on request.



B830843-0

Legend

1 Flange

2 Housing

3 Hub sleeve

Weight

G_1 = for E_{min}

G_2 = per 1 mm sleeve length

G_3 = half coupling if $E > E_{min}$

Centre of gravity

X_1 = for E_{min}

X_2 = for G_2

X_3 = half coupling if $E > E_{min}$

Torsional stiffness

C_1 = for E_{min}

C_2 = per 1 mm sleeve length

C_3 = half coupling if $E > E_{min}$

Mass moment of inertia

J_1 = for E_{min}

J_2 = per 1 mm sleeve length

J_3 = half coupling if $E > E_{min}$

$$G_3 = G_1 + \frac{(E - E_{min}) * G_2}{2}$$

$$X_3 = \frac{X_1 * G_1 + X_2 * \frac{(E - E_{min}) * G_2}{2}}{G_3}$$

$$C_3 = \frac{1}{\frac{1}{C_1} + \frac{E - E_{min}}{C_2}}$$

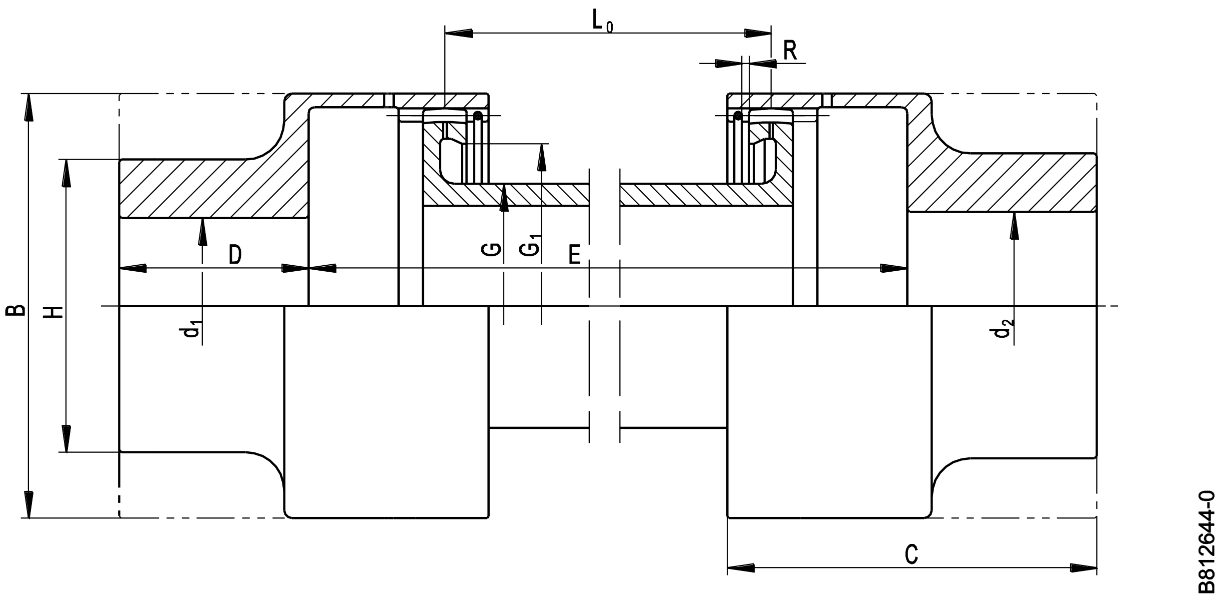
$$J_3 = J_1 + (E - E_{min}) * J_2$$

Size	E_{min} mm	X_1 mm	X_2 mm	G_1 kg	G_2 kg/mm	C_1 MNm/rad	C_2 MNm · mm/rad	J_1 kgm²	J_2 kgm²/mm
35	100	41.3	61.5	1.76	0.0040	0.22	22	0.0050	0.0000022
40	100	44.3	67	2.12	0.0045	0.28	32	0.0071	0.0000031
45	112	53.2	78.5	3.14	0.0050	0.36	33	0.013	0.0000033
55	125	61.5	90.5	4.19	0.0065	0.58	72	0.022	0.0000071
63	140	69.5	102.5	5.46	0.0084	0.85	121	0.034	0.000012
73	160	82.2	122	8.35	0.0124	1.3	223	0.067	0.000022
85	180	92.8	138	11.65	0.0202	2.1	427	0.11	0.000042
100	200	103.4	156	16.5	0.0259	3.7	806	0.20	0.000080
115	225	119.0	174.5	24.85	0.0379	5.7	1584	0.38	0.00016
130	280	136.7	201.5	36.85	0.0435	7.9	2610	0.73	0.00026
150	315	155.0	232	53.8	0.0588	12.5	4660	1.3	0.00046
175	355	179.8	269	82.4	0.0808	19.6	8110	2.8	0.00080
205	400	203.2	309	131	0.0970	30.4	14037	6.0	0.00140
240	405	222.5	356	231	0.1262	72.5	27443	14.8	0.00271
260	420	249.1	397.5	310	0.1392	96.1	36759	24.2	0.00363
280	450	266.7	429	383	0.1702	123	51452	35.1	0.00508

Information based on d_1; d_2 nominal and $H_{nominal}$.

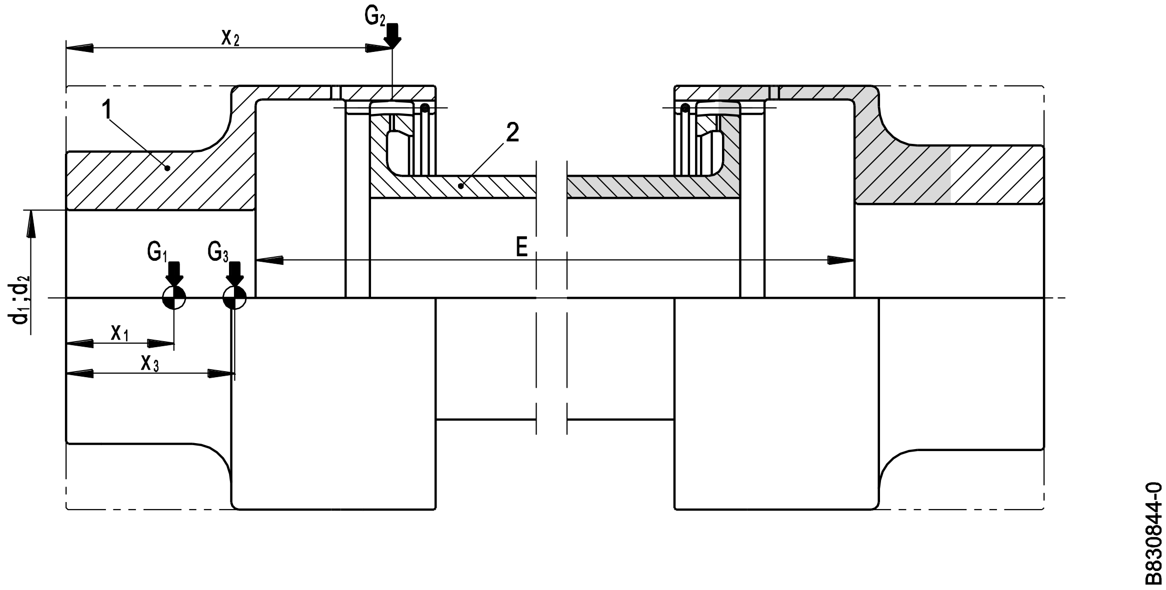
ZTA series

Dimension table no.: B791313-0



Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Bore d_1; d_2 min mm	Bore nominal mm	Bore max mm	B mm	C mm	D mm	G mm	G_1 mm	$H_{nominal}$ mm	L_0 mm	R mm	Oil injection nozzles per half quantity x size mm	Total oil requirement per minute at 1.5 bar pressure litres
35	1.1	40000	18	35	55	82	105	45	50	60	50	E-96.8	1.5	1 x Ø2	4.5
40	1.4	37500	20	40	60	88	111	50	56	66	56	E-97.8	1.5	1 x Ø2	4.5
45	1.9	32000	35	45	71	104	117	55	55	73	65	E-99	2.5	1 x Ø2	4.5
55	3.1	28000	40	55	80	120	129	65	70	87	77	E-101	2.5	1 x Ø2	4.5
63	4.9	25000	45	63	90	135	142	75	80	101	88	E-105	2.5	1 x Ø2.5	7
73	7.6	22000	50	73	110	155	161	90	90	118	102	E-108	3	1 x Ø2.5	7
85	12	20000	55	85	120	174	179	105	100	133	120	E-112	3	1 x Ø3	10
100	19	18000	65	100	130	198	198	120	120	156	140	E-116	3	1 x Ø3	10
115	31	16000	75	115	155	224	221	135	140	178	160	E-123	4	1 x Ø3.5	13
130	42	13500	85	130	170	256	247	155	165	200	182	E-133	4	1 x Ø3.5	13
150	67	11500	100	150	200	288	289	180	190	230	210	E-156	4	2 x Ø3	20
175	100	10000	115	175	220	330	332	210	215	265	245	E-178	5	2 x Ø3	20
205	150	9000	135	205	270	390	379	245	255	315	290	E-198	5	2 x Ø3.5	26

For technical reasons, pressurised oil assemblies require the supply of pressurised oil through the shaft.
The ZTAF series has a split hub sleeve for easy decoupling of the machine and for simplified assembly, also for systems that have already been aligned.
The ZTAH series has a split hub sleeve and a spacer for bridging large shaft distances
.



Legend

1 Housing

2 Hub sleeve

Weight

G_1 = for E_{min}

G_2 = per 1 mm sleeve length

G_3 = half coupling if $E > E_{min}$

Centre of gravity

X_1 = for E_{min}

X_2 = for G_2

X_3 = half coupling if $E > E_{min}$

Torsional stiffness

C_1 = for E_{min}

C_2 = per 1 mm sleeve length

C_3 = half coupling if $E > E_{min}$

Mass moment of inertia

J_1 = for E_{min}

J_2 = per 1 mm sleeve length

J_3 = half coupling if $E > E_{min}$

$$G_3 = G_1 + \frac{(E - E_{min}) * G_2}{2}$$

$$C_3 = \frac{1}{\frac{1}{C_1} + \frac{E - E_{min}}{C_2}}$$

$$X_3 = \frac{X_1 * G_1 + X_2 * \frac{(E - E_{min}) * G_2}{2}}{G_3}$$

$$J_3 = J_1 + (E - E_{min}) * J_2$$

Size	E_{min} mm	X_1 mm	X_2 mm	G_1 kg	G_2 kg/mm	C_1 MNm/rad	C_2 MNm · mm/rad	J_1 kgm²	J_2 kgm²/mm
35	228	64.3	93.5	1.31	0.0040	0.11	22	0.0025	0.0000022
40	228	66.9	99	1.55	0.0045	0.16	32	0.0034	0.0000031
45	230	69.0	104.5	2.49	0.0050	0.19	33	0.0073	0.0000033
55	233	75.8	115.5	3.5	0.0065	0.37	72	0.014	0.0000071
63	252	84.0	127.5	4.56	0.0084	0.56	121	0.023	0.000012
73	259	93.7	144	6.98	0.0124	0.87	223	0.045	0.000022
85	278	104.9	161	10.88	0.0202	1.54	427	0.086	0.000042
100	314	116.4	178	14.78	0.0259	2.3	806	0.15	0.000080
115	356	131.2	196.5	23.2	0.0379	3.7	1584	0.30	0.00016
130	394	145.5	219.5	33.85	0.0435	5.7	2610	0.58	0.00026
150	439	167.1	258	49.5	0.0588	8.6	4660	1.1	0.00046
175	506	191.8	296	77.1	0.0808	13.2	8110	2.2	0.0008
205	604	216.3	340	122.4	0.0970	19.9	14037	4.9	0.0014

Information based on d_1; d_2 nominal and $H_{nominal}$.

4.8 Designs and dimension tables for the product family TF

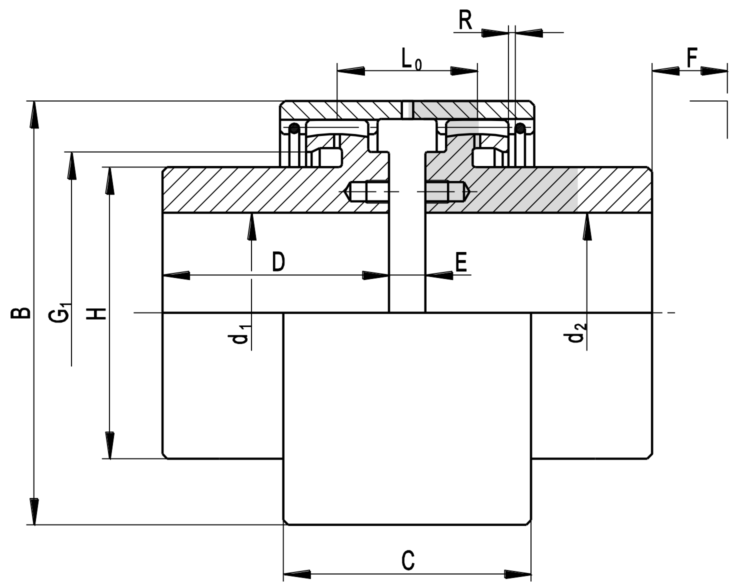
Designs	Series	Page
Basic design	THB	121
Design with flange and hub sleeve	TF	122
Design with flange and hub sleeve with retaining ring	TFR	122
Design with hub sleeve	TFH	124

Tab. 33: Designs of the product family TF

4

THB series

Dimension table no.: B791314-0



B815575-0

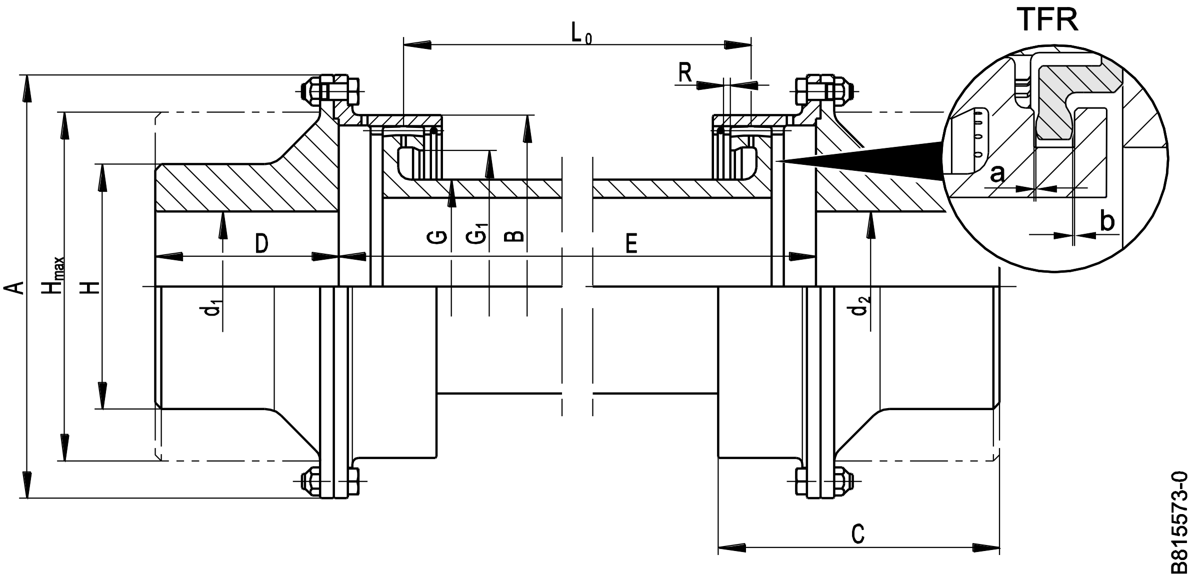
Size	Torsional stiffness[1)] C_T MNm/rad	Mass moment of inertia[1)] J kgm²	Weight[1)] G kg
30	0.69	0.00175	2.0
40	1.73	0.008	3.6
50	3.23	0.0125	6.0
60	5.91	0.0275	9.4
70	8.92	0.050	13.4
80	12.84	0.083	18.2
90	21.25	0.160	27.5
100	27.08	0.225	33
110	35.58	0.35	42
125	47.38	0.60	60
140	69.94	1.15	84
160	101.88	2.08	125
180	143.83	3.83	185
200	222.40	7.38	280

Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Dimensions: Bore d_1; d_2 min mm	Bore max mm	B mm	C mm	D mm	E mm	F mm	G_1 mm	H mm	L_0 mm	R mm	Oil injection nozzles per half quantity x size mm	Total oil requirement per minute at 1.5 bar pressure litres
30	0.85	25000	12	30	85	59	50	5	10	55	45	30	1.5	1 x Ø2	4.5
40	1.6	22500	22	42	105	65	60	5	10	72	62	30	1.5	1 x Ø2	4.5
50	2.8	20000	22	55	125	70	70	5	70	88	77	31	1.5	1 x Ø2	4.5
60	5.4	18000	28	65	148	80	80	6	80	105	92	41	1.5	1 x Ø2.5	7
70	8.6	16000	28	75	168	95	90	6	10	120	105	49	2	1 x Ø2.5	7
80	12	14000	32	85	185	100	100	6	10	135	120	51	2	1 x Ø3	10
90	17	12500	32	100	210	110	110	8	10	155	140	58	2	1 x Ø3	10
100	22	11200	55	110	224	120	120	8	10	170	154	63	2	1 x Ø3.5	13
110	31	10000	65	120	245	130	130	8	10	185	168	70	2.5	1 x Ø3.5	13
125	43	9000	75	130	275	150	150	10	10	205	186	84	3	1 x Ø3.5	13
140	61	8000	85	150	305	165	165	10	10	235	210	94	3	2 x Ø3	20
160	96	7100	120	170	348	190	190	12	10	265	240	110	4	2 x Ø3	20
180	140	6300	140	190	392	220	220	12	10	300	270	126	4	2 x Ø3.5	26
200	200	5600	160	210	445	245	245	14	15	340	310	141	4	2 x Ø3.5	26

[1)] Values for the complete coupling for bore d_1; d_2 max.

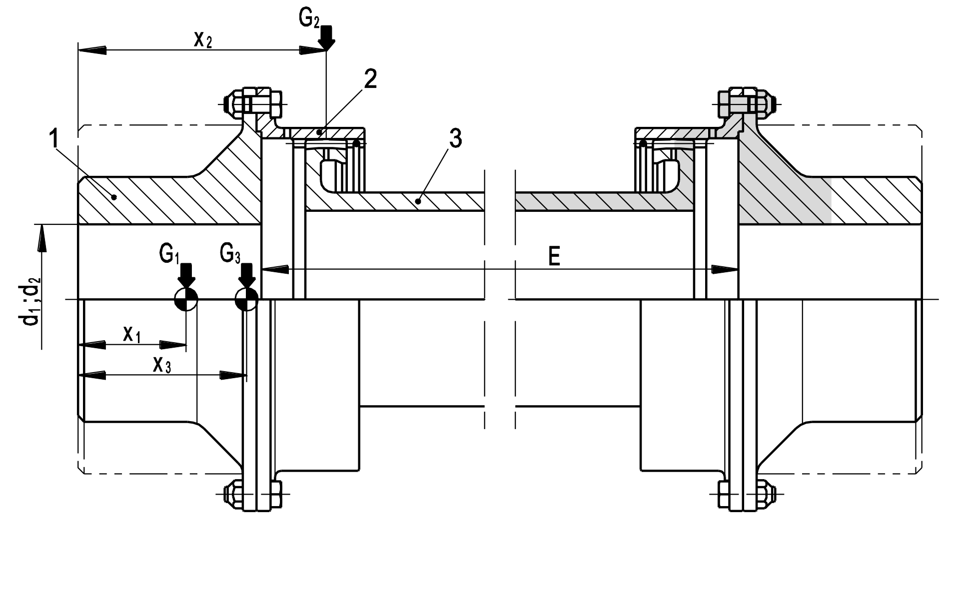
TF and TFR series

Dimension table no.: B791315-0



Size	Nominal torque T_{KN}	Speed n_{max}	Dimensions: Bore d_1; d_2 min	Bore d_1; d_2 nominal	Bore d_1; d_2 max	A	B	C	D	G	G_1	$H_{nominal}$	H_{max}	L_0	R	Oil injection nozzles per half quantity x size	Total oil requirement per minute at
	kNm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	litres
30	0.85	25000	12	50	55	120	85	79	50	46	53	80	85	E-28.8	1.5	1 x Ø2	4.5
40	1.6	22500	22	55	65	145	105	95	60	60	72	90	105	E-34.8	1.5	1 x Ø2	4.5
50	2.8	20000	22	60	75	165	125	107	70	70	88	100	125	E-36.8	1.5	1 x Ø2	4.5
60	5.4	18000	28	70	90	200	145	122	80	86	105	112	148	E-44.8	1.5	1 x Ø2.5	7
70	8.6	16000	28	80	100	215	168	138	90	100	120	125	168	E-49.8	2	1 x Ø2.5	7
80	12	14000	32	90	115	235	185	151	100	115	135	140	185	E-52.8	2	1 x Ø3	10
90	17	12500	32	100	125	270	210	167	110	130	155	160	210	E-61.8	2	1 x Ø3	10
100	22	11200	55	110	140	275	224	177	120	145	170	180	224	E-57.8	2	1 x Ø3.5	13
110	31	10000	65	125	160	305	245	190	130	158	185	200	245	E-59.8	2.5	1 x Ø3.5	13
125	43	9000	75	140	180	335	268	220	150	185	205	225	272	E-73.8	3	1 x Ø3.5	13
140	61	8000	85	160	200	380	305	241	165	200	235	250	305	E-80.8	3	2 x Ø3	20
160	96	7100	120	180	225	430	347	279	190	225	265	280	348	E-95.8	4	2 x Ø3	20
180	140	6300	140	200	250	470	392	318	220	250	300	315	392	E-97.8	4	2 x Ø3.5	26
200	200	5600	160	220	280	545	437	357	245	280	340	350	445	E-111.8	4	2 x Ø3.5	26

The TFR series is equipped with two Z-shaped retaining rings to limit axial clearance.
Axial clearances on request.



4

Legend

1 Flange

2 Housing

3 Hub sleeve

Weight

G_1 = for E_{min}

G_2 = per 1 mm sleeve length

G_3 = half coupling if $E > E_{min}$

Centre of gravity

X_1 = for E_{min}

X_2 = for G_2

X_3 = half coupling if $E > E_{min}$

Torsional stiffness

C_1 = for E_{min}

C_2 = per 1 mm sleeve length

C_3 = half coupling if $E > E_{min}$

Mass moment of inertia

J_1 = for E_{min}

J_2 = per 1 mm sleeve length

J_3 = half coupling if $E > E_{min}$

$$G_3 = G_1 + \frac{(E - E_{min}) * G_2}{2}$$

$$C_3 = \frac{1}{\frac{1}{C_1} + \frac{E - E_{min}}{C_2}}$$

$$X_3 = \frac{X_1 * G_1 + X_2 * \frac{(E - E_{min}) * G_2}{2}}{G_3}$$

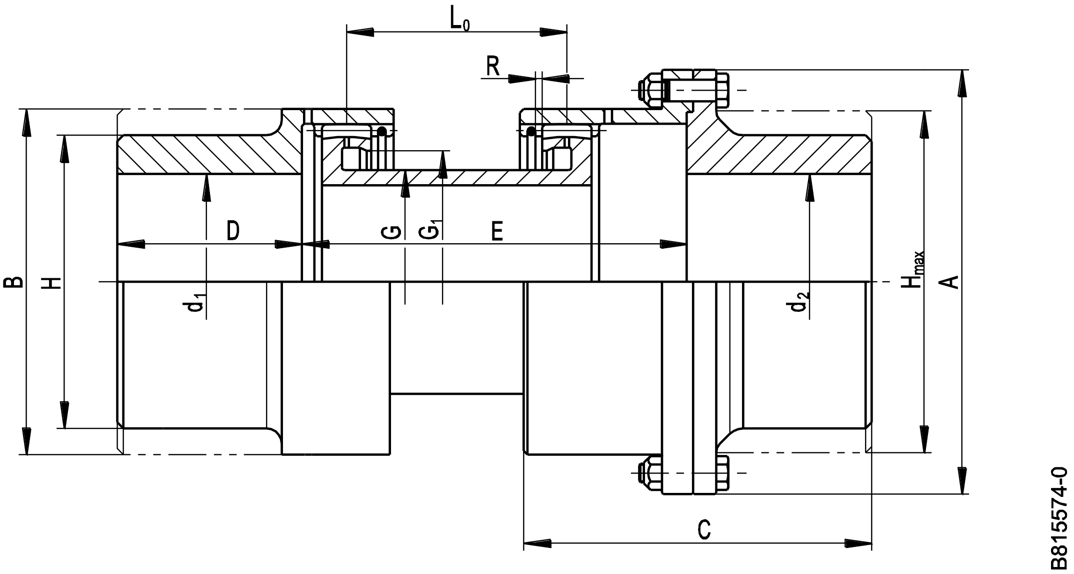
$$J_3 = J_1 + (E - E_{min}) * J_2$$

Size	E_{min} mm	X_1 mm	X_2 mm	G_1 kg	G_2 kg/mm	C_1 MNm/rad	C_2 MNm · mm/rad	J_1 kgm²	J_2 kgm²/mm
30	100	44.6	65	3.245	0.005	0.28	23.2	0.0108	0.0000023
40	112	52.9	76	5.15	0.009	0.68	66.2	0.024	0.0000065
50	125	61.8	88	7.8	0.01	0.94	99	0.045	0.0000098
60	140	75.5	100.5	11.85	0.015	1.92	239	0.108	0.000024
70	160	80.6	112.5	16.1	0.022	3.06	460.9	0.150	0.000046
80	180	88.7	124	20.85	0.026	4.37	729	0.235	0.000072
90	200	98.0	139.5	30.7	0.036	7.14	1280	0.393	0.00013
100	225	100.4	148.5	36.1	0.033	7.49	1544	0.525	0.00015
110	250	110.4	161	45.8	0.041	9.95	2270	0.975	0.00022
125	280	125.2	186	62.2	0.053	15.34	4025	1.59	0.00040
140	315	139.9	204	87.5	0.068	20.34	5966	2.83	0.00059
160	355	161.9	235.5	132	0.078	27.01	8714	5.43	0.00086
180	400	178.1	268	185.5	0.092	34.97	12854	8.75	0.00130
200	450	201.2	301	272	0.13	54.53	22068	16.6	0.00220

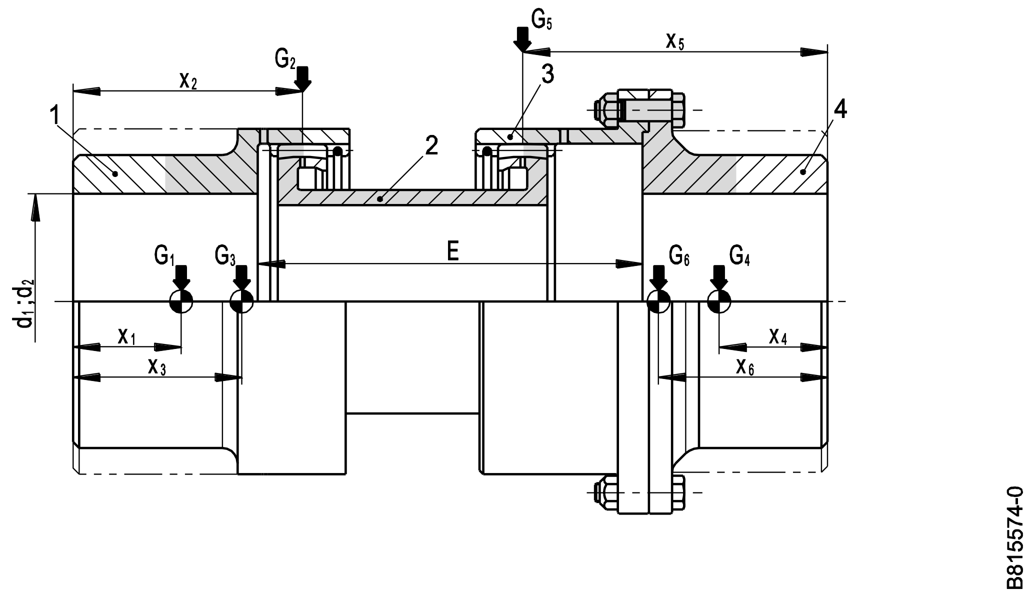
Information based on d_1; d_2 nominal and $H_{nominal}$.

TFH series

Dimension table no.: B791316-0



Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Dimensions: Bore d_1; d_2 min mm	Bore nominal mm	Bore max mm	A mm	B mm	C mm	D mm	G mm	G_1 mm	H_{max} mm	$H_{nominal}$ mm	L_0 mm	R mm	Oil injection nozzles per half quantity x size mm	Total oil requirement per minute at 1.5 bar pressure litres
30	0.85	25000	12	50	55	120	85	79	50	46	53	85	80	E-54.3	1.5	1 x Ø2	4.5
40	1.6	22500	22	55	65	145	105	95	60	60	72	105	90	E-66.3	1.5	1 x Ø2	4.5
50	2.8	20000	22	60	75	165	125	107	70	70	88	125	100	E-70.3	1.5	1 x Ø2	4.5
60	5.4	18000	28	70	90	200	145	122	80	86	105	148	112	E-82.3	1.5	1 x Ø2.5	7
70	8.6	16000	28	80	100	215	168	138	90	100	120	168	125	E-93.8	2	1 x Ø2.5	7
80	12	14000	32	90	115	235	185	151	100	115	135	185	140	E-99.8	2	1 x Ø3	10
90	17	12500	32	100	125	270	210	167	110	130	155	210	160	E-112.8	2	1 x Ø3	10
100	22	11200	55	110	140	275	224	177	120	145	170	224	180	E-108.8	2	1 x Ø3.5	13
110	31	10000	65	125	160	305	245	190	130	158	185	245	200	E-114.3	2.5	1 x Ø3.5	13
125	43	9000	75	140	180	335	268	220	150	185	205	272	225	E-136.8	3	1 x Ø3.5	13
140	61	8000	85	160	200	380	305	241	165	200	235	305	250	E-149.8	3	2 x Ø3	20
160	96	7100	120	180	225	430	347	279	190	225	265	348	280	E-176.8	4	2 x Ø3	20
180	140	6300	140	200	250	470	392	318	220	250	300	392	315	E-186.8	4	2 x Ø3.5	26
200	200	5600	160	220	280	545	437	357	245	280	340	445	350	E-213.8	4	2 x Ø3.5	26



Legend

1 Housing

2 Hub sleeve

3 Housing

4 Flange

Weight

$G_{1.4}$ = half coupling at E_{min}

$G_{2.5}$ = per 1 mm sleeve length

$G_{3.6}$ = half coupling at E> E_{min}

Centre of mass

$X_{1.4}$ = half coupling at E_{min}

$X_{2.5}$ = for G_3

$X_{3.6}$ = half coupling at E > E_{min}

Torsional stiffness

C_1 = coupling at E_{min}

C_2 = per 1 mm sleeve length

C_3 = coupling at E > E_{min}

Mass moment of inertia

J_1 = coupling at E_{min}

J_2 = per 1 mm sleeve length

J_3 = coupling at E > E_{min}

$$G_{3.6} = G_{1.4} + \frac{(E - E_{min}) \cdot G_{2.5}}{2}$$

$$C_3 = \frac{1}{\frac{1}{C_1} + \frac{E - E_{min}}{C_2}}$$

$$X_{3.6} = \frac{X_{1.4} \cdot G_{1.4} + X_{2.5} \cdot \frac{(E - E_{min}) \cdot G_{2.5}}{2}}{G_{3.6}}$$

$$J_3 = J_1 + (E - E_{min}) \cdot J_2$$

Size	E_{min}	X_1	X_4	X_2	X_5	G_1	G_4	$G_{2.5}$	C_1	C_2	J_1	J_3
	mm	mm	mm	mm	mm	kg	kg	kg/mm	MNm/rad	MNm · mm/rad	kgm²	kgm²/mm
30	100	36	65	46.7	89.0	2.1	3.4	0.005	0.36	23.2	0.0075	0.0000023
40	112	43.5	76	55.6	106.0	3.4	5.5	0.009	0.87	66.2	0.018	0.0000065
50	125	50.7	88	64.0	120.0	5.5	8.0	0.01	1.24	99	0.035	0.0000098
60	140	59.8	100.5	74.2	136.5	8.0	13.1	0.015	2.55	239	0.080	0.000024
70	160	67.6	112.5	83.3	154.5	11.7	16.1	0.022	3.91	460.9	0.125	0.000046
80	180	72.4	124	89.0	169.0	15.7	20.9	0.026	5.21	729	0.200	0.000072
90	200	79.7	139.5	98.0	188.5	22.5	31.6	0.036	8.46	1280	0.360	0.00013
100	225	81.8	148.5	99.8	197.5	27.9	35.7	0.033	8.73	1544	0.475	0.00015
110	250	87.3	161	107.9	213.0	35.8	48.1	0.041	11.47	2270	0.825	0.00022
125	280	100	186	122.8	246.0	49.9	64.9	0.053	17.04	4025	1.38	0.00040
140	315	109.5	204	130.3	270.0	68	92.0	0.068	23.18	5966	2.40	0.00059
160	355	128.4	235.5	158.3	312.5	102	134.0	0.078	31.55	8714	4.65	0.00086
180	400	146.2	268	177.0	354.0	148.5	185.5	0.092	40.80	12854	7.88	0.0013
200	450	166.1	301	196.7	399.0	214.5	269.5	0.13	61.36	22068	15.63	0.0022
Information based on d_1; d_2 nominal and $H_{nominal}$												

4.9 Designs and dimension tables of the product family TSB

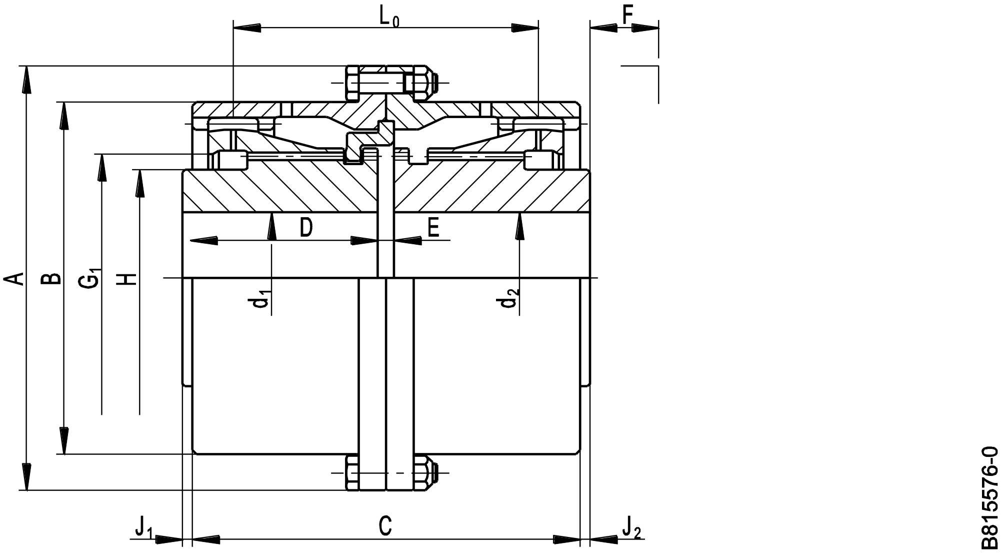
Designs	Series	Page
Basic design	TSB	128
Basic design with retaining ring	TSR	129
Spacer design	TSBL	130
Spacer design with retaining ring	TRL	132
Intermediate shaft design with retaining ring	TRG	134

Tab. 34: Designs of the product family TSB

4

TSB series

Dimension table no.: B791317-0



Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Dimensions: Bore d_1; d_2 min mm	Bore d_1; d_2 max mm	A mm	B mm	C mm	D mm	E mm	F[1)] mm	G_1 mm	H mm	J_1 mm	J_2 mm	L_0 mm	Oil injection nozzles per half quantity x size mm	Total oil requirement per minute at 1.5 bar pressure litres
30	0.69	14000	12	30	115	85	100	50	5	20	54	44	-	6	75	1 x Ø2	4.5
40	1.2	12500	22	40	145	105	121	60	5	20	71	58	1.5	2.5	92	1 x Ø2	4.5
50	2.4	11200	22	50	165	125	141	70	5	20	86	73	1.5	2.5	109	1 x Ø2	4.5
60	4.2	10000	28	60	195	145	164	80	6	25	103	88	0.5	1.5	128	1 x Ø2	4.5
70	6.9	9000	28	70	215	168	184	90	6	25	116	98	-	2	144	1 x Ø2	4.5
80	9.6	8000	32	80	230	185	204	100	6	25	136	118	-	2	161	1 x Ø2	4.5
90	14	7100	32	90	265	210	229	110	8	30	146	128	-	0.5	178	1 x Ø2	4.5
100	20	6300	55	100	270	224	247	120	8	30	158	138	-	1.5	192	1 x Ø2.5	7
110	22	6000	65	110	305	245	266	130	8	30	177	153	-	2	207	1 x Ø2.5	7
125	39	5600	75	125	330	268	306	150	10	35	198	173	1	3	238	1 x Ø2.5	7
140	55	5000	85	140	375	305	340	165	10	35	224	198	-	1	263	2 x Ø2	9
160	77	4750	120	160	425	347	388	190	12	40	260	228	2	2	306	2 x Ø2	9
180	110	4500	140	180	470	392	438	220	12	40	290	258	7	7	350	2 x Ø2.5	14
200	160	4250	160	200	535	437	492	245	14	45	330	288	6	6	391	2 x Ø2.5	14
220	220	4000	180	220	580	495	500	270	16	20	365	330	28	28	413	2 x Ø2.5	14
240	280	3750	200	240	645	535	540	290	18	30	415	355	29	29	446	2 x Ø3	20
260	340	3550	220	260	680	580	580	310	20	30	425	385	30	30	481	2 x Ø3	20
280	430	3350	240	280	745	630	640	340	22	30	460	415	31	31	534	2 x Ø4	36
300	540	3150	260	300	775	660	680	360	24	35	490	445	32	32	569	2 x Ø4	36
320	690	3000	280	320	825	710	720	380	26	40	530	480	33	33	604	3 x Ø4	54

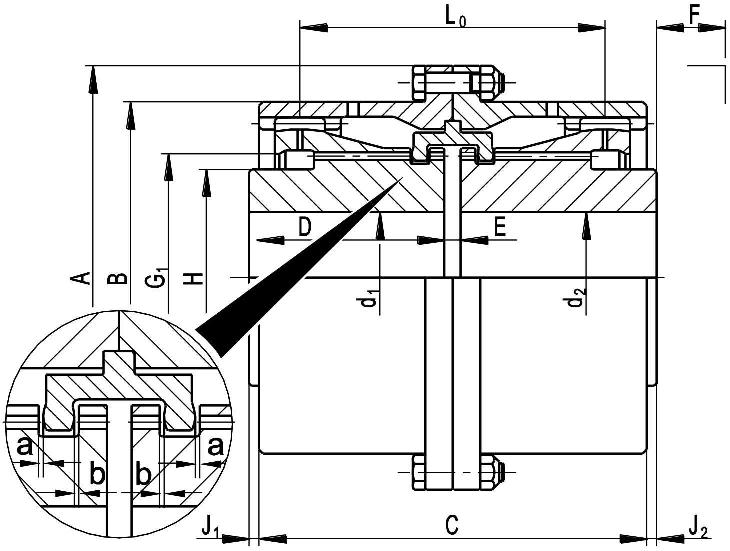
1) The dismounting dimension F is required for the vertical installation and removal of the machine, for installation of the retaining ring and for alignment.

For the weight, mass moment of inertia, torsional stiffness and centre of gravity, see Page 136

4

TSR series

Dimension table no.: B791318-0



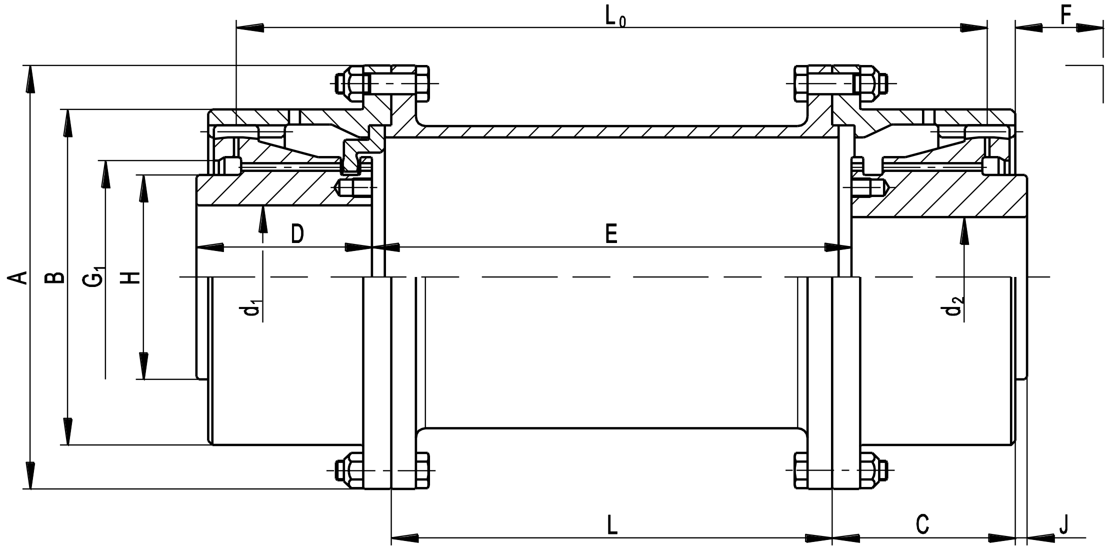
B815577-0

Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Bore d_1; d_2 min mm	max mm	A mm	B mm	C mm	D mm	E mm	F[1] mm	G_1 mm	H mm	J mm	L_0 mm	Axial clearances a and b[2] mm	Oil injection nozzles per half quantity x size mm	Total oil requirement per minute at 1.5 bar pressure litres
30	0.69	14000	12	30	115	85	100	50	5	20	54	44	2.5	E+70	0.5	1 x Ø2	4.5
40	1.2	12500	22	40	145	105	121	60	5	20	71	58	2	E+87	0.5	1 x Ø2	4.5
50	2.4	11200	22	50	165	125	141	70	5	20	86	73	2	E+104	0.5	1 x Ø2	4.5
60	4.2	10000	28	60	195	145	164	80	6	25	103	88	1	E+122	0.5	1 x Ø2	4.5
70	6.9	9000	28	70	215	168	184	90	6	25	116	98	1	E+138	0.5	1 x Ø2	4.5
80	9.6	8000	32	80	230	185	204	100	6	25	136	118	1	E+155	0.5	1 x Ø2	4.5
90	14	7100	32	90	265	210	229	110	8	30	146	128	-	E+170	0.5	1 x Ø2	4.5
100	20	6300	55	100	270	224	247	120	8	30	158	138	0.5	E+184	1.0	1 x Ø2.5	7
110	22	6000	65	110	305	245	266	130	8	30	177	153	1	E+199	1.0	1 x Ø2.5	7
125	39	5600	75	125	330	268	306	150	10	35	198	173	2	E+228	1.0	1 x Ø2.5	7
140	55	5000	85	140	375	305	340	165	10	35	224	198	-	E+253	1.0	2 x Ø2	9
160	77	4750	120	160	425	347	388	190	12	40	260	228	2	E+294	1.0	2 x Ø2	9
180	110	4500	140	180	470	392	438	220	12	40	290	258	7	E+338	1.0	2 x Ø2.5	14
200	160	4250	160	200	535	437	492	245	14	45	330	288	6	E+377	1.0	2 x Ø2.5	14
220	220	4000	180	220	580	495	500	270	16	20	365	330	28	E+397	1.5	2 x Ø2.5	14
240	280	3750	200	240	645	535	540	290	18	30	415	355	29	E+428	1.5	2 x Ø3	20
260	340	3550	220	260	680	580	580	310	20	30	425	385	30	E+461	1.5	2 x Ø3	20
280	430	3350	240	280	745	630	640	340	22	30	460	415	31	E+512	1.5	2 x Ø4	36
300	540	3150	260	300	775	660	680	360	24	35	490	445	32	E+545	1.5	2 x Ø4	36
320	690	3000	280	320	825	710	720	380	26	40	530	480	33	E+578	1.5	3 x Ø4	54

1) The dismounting dimension F is required for the vertical installation and removal of the machine, for installation of the retaining ring and for alignment.
2) The axial clearances a and b can be changed if necessary.
For weight, inertia, torsional spring stiffness and centre of gravity, see Page 136

TSBL series

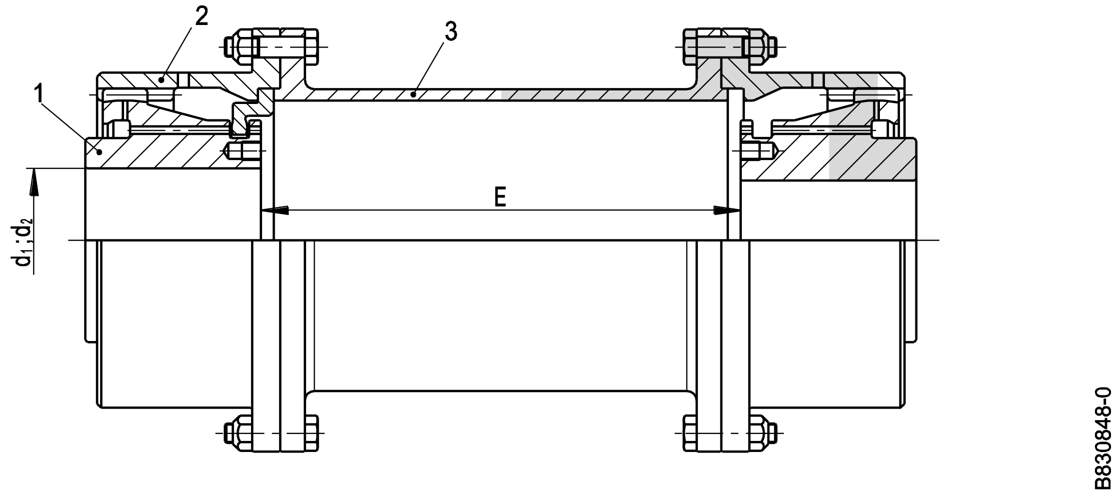
Dimension table no.: B791319-0



B815578-0

Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Bore d_1; d_2 min mm	Bore d_1; d_2 max mm	A mm	B mm	C mm	D mm	F[1] mm	G_1 mm	H mm	J mm	L mm	L_0 mm	Oil injection nozzles per half quantity x size mm	Total oil requirement per minute at 1.5 bar pressure litres
30	0.69	14000	12	30	115	85	50	50	20	54	44	3.5	E-7	E+70	1 x Ø2	4.5
40	1.2	12500	22	40	145	105	60.5	60	25	71	58	7	E-14	E+87	1 x Ø2	4.5
50	2.4	11200	22	50	165	125	70.5	70	25	86	73	7	E-14	E+104	1 x Ø2	4.5
60	4.2	10000	28	60	195	145	82	80	30	103	88	8.5	E-17	E+122	1 x Ø2	4.5
70	6.9	9000	28	70	215	168	92	90	30	116	98	9	E-18	E+138	1 x Ø2	4.5
80	9.6	8000	32	80	230	185	102	100	35	136	118	9	E-18	E+155	1 x Ø2	4.5
90	14	7100	32	90	265	210	114.5	110	40	146	128	12	E-24	E+170	1 x Ø2	4.5
100	20	6300	55	100	270	224	123.5	120	45	158	138	12	E-24	E+184	1 x Ø2.5	7
110	22	6000	65	110	305	245	133	130	50	177	153	12	E-24	E+199	1 x Ø2.5	7
125	39	5600	75	125	330	268	153	150	45	198	173	15	E-30	E+228	1 x Ø2.5	7
140	55	5000	85	140	375	305	170	165	50	224	198	15	E-30	E+253	2 x Ø2	9
160	77	4750	120	160	425	347	194	190	55	260	228	17	E-34	E+294	2 x Ø2	9
180	110	4500	140	180	470	392	219	220	55	290	258	17	E-34	E+338	2 x Ø2.5	14
200	160	4250	160	200	535	437	246	245	65	330	288	20	E-40	E+377	2 x Ø2.5	14
220	220	4000	180	220	580	495	265	270	40	365	330	23	E-46	E+397	2 x Ø2.5	14
240	280	3750	200	240	645	535	287	290	45	415	355	26	E-52	E+428	2 x Ø3	20
260	340	3550	220	260	680	580	308	310	45	425	385	28	E-56	E+461	2 x Ø3	20
280	430	3350	240	280	745	630	341	340	50	460	415	32	E-64	E+512	2 x Ø4	36
300	540	3150	260	300	775	660	362	360	55	490	445	34	E-68	E+545	2 x Ø4	36
320	690	3000	280	320	825	710	383	380	60	530	480	36	E-72	E+578	3 x Ø4	54

[1] The dismounting dimension F is required for the vertical installation and removal of the machine and for installation of the retaining ring.
[2] The speed n_{max} depends on the length and weight of the spacer.



Legend

1 Hub
2 Sleeve
3 Spacer

Weight of the coupling

G_1 = coupling at E_{min}

G_2 = per 1 mm spacer length

G_3 = coupling at E > E_{min}

$$G_3 = G_1 + (E - E_{min}) \cdot G_2$$

Torsional stiffness of the coupling

C_1 = coupling at E_{min}

C_2 = per 1 mm spacer length

C_3 = coupling at E > E_{min}

$$C_3 = \frac{1}{\frac{1}{C_1} + \frac{E - E_{min}}{C_2}}$$

Mass moment of inertia of the coupling

J_1 = coupling at E_{min}

J_2 = per 1 mm spacer length

J_3 = coupling at E > E_{min}

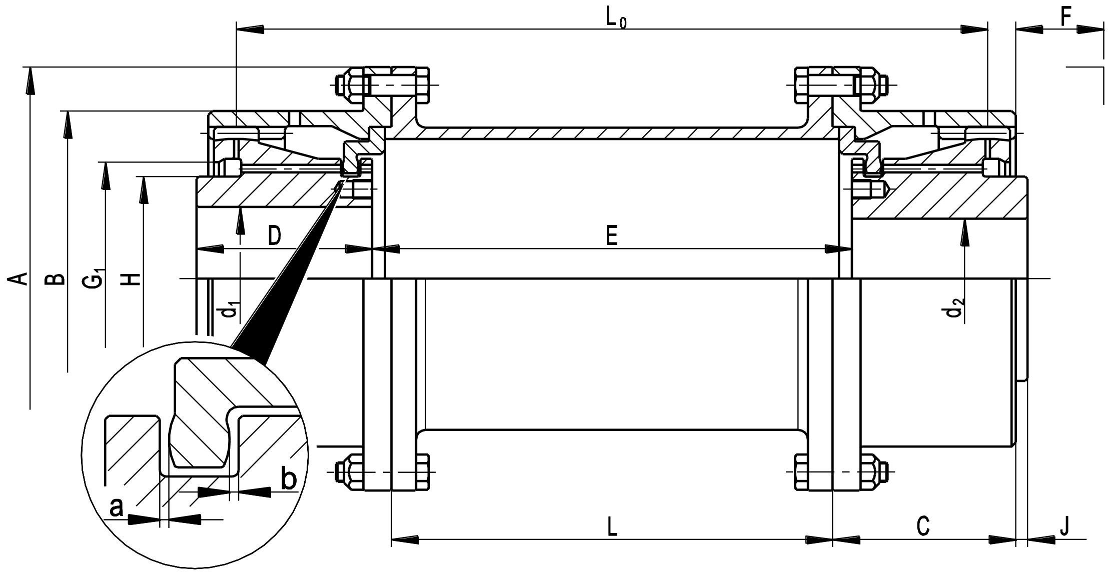
$$J_3 = J_1 + (E - E_{min}) \cdot J_2$$

Size	E_{min} mm	G_1 kg	G_2 kg/mm	C_1 MNm/rad	C_2 MNm · mm/rad	J_1 kgm²	J_2 kgm²/mm
30	82	5.8	0.012	0.44	186	0.0091	0.000018
40	89	9.6	0.013	1.03	274	0.0228	0.000027
50	89	13.8	0.018	2.07	537	0.0427	0.000053
60	107	21.6	0.022	3.36	898	0.0929	0.000089
70	108	29.3	0.025	4.93	1335	0.154	0.00013
80	108	36.5	0.028	7.48	1895	0.222	0.00019
90	129	54	0.031	9.89	2638	0.438	0.00026
100	129	62	0.036	11.84	3557	0.538	0.00035
110	159	86	0.040	14.94	4690	0.943	0.00046
125	165	108	0.047	19.30	6909	1.401	0.00068
140	175	159	0.053	27.83	8928	2.635	0.00088
160	214	238	0.070	39.57	14088	5.064	0.0014
180	214	324	0.079	59.05	23218	8.414	0.0023
200	250	477	0.120	78.11	36882	15.569	0.0036

Information based on d_1; d_2 max.

TRL series

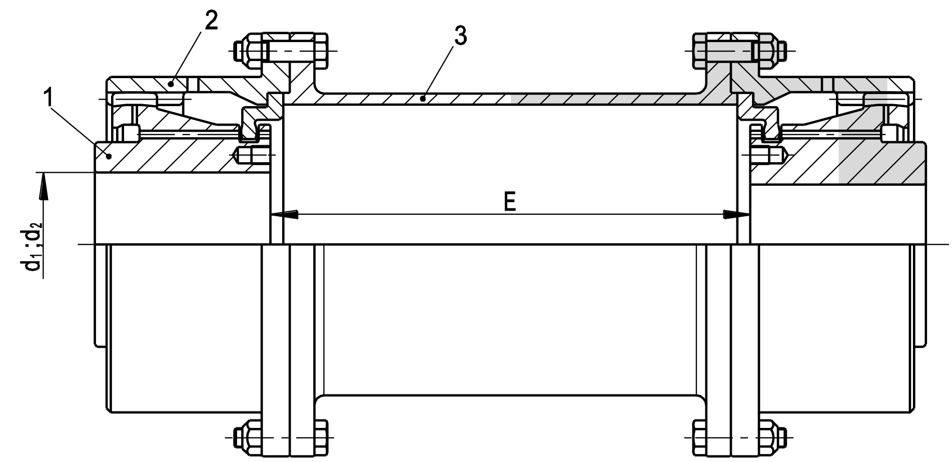
Dimension table no.: B791320-0



B815579-0

Size	Nominal torque T_{KN}	Speed n_{max}	Dimensions: Bore d_1; d_2 min	max	A	B	C	D	F[2]	G_1	H	J	L	L_0	Axial clearances a and b[1]	Oil injection nozzles per half quantity x size	Total oil requirement per minute at 1.5 bar pressure
	kNm	rpm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	litres
30	0.69	14000	12	30	115	85	50	50	20	54	44	3.5	E-7	E+70	0.5	1 x Ø2	4.5
40	1.2	12500	22	40	145	105	60.5	60	25	71	58	6.5	E-14	E+87	0.5	1 x Ø2	4.5
50	2.4	11200	22	50	165	125	70.5	70	25	86	73	6.5	E-14	E+104	0.5	1 x Ø2	4.5
60	4.2	10000	28	60	195	145	82	80	30	103	88	6.5	E-17	E+122	0.5	1 x Ø2	4.5
70	6.9	9000	28	70	215	168	92	90	30	116	98	7	E-18	E+138	0.5	1 x Ø2	4.5
80	9.6	8000	32	80	230	185	102	100	35	136	118	7	E-18	E+155	0.5	1 x Ø2	4.5
90	14	7100	32	90	265	210	114.5	110	40	146	128	7.5	E-24	E+170	0.5	1 x Ø2	4.5
100	20	6300	55	100	270	224	123.5	120	45	158	138	8.5	E-24	E+184	1.0	1 x Ø2.5	7
110	22	6000	65	110	305	245	133	130	50	177	153	9	E-24	E+199	1.0	1 x Ø2.5	7
125	39	5600	75	125	330	268	153	150	45	198	173	12	E-30	E+228	1.0	1 x Ø2.5	7
140	55	5000	85	140	375	305	170	165	50	224	198	10	E-30	E+253	1.0	2 x Ø2	9
160	77	4750	120	160	425	347	194	190	55	260	228	13	E-34	E+294	1.0	2 x Ø2	9
180	110	4500	140	180	470	392	219	220	55	290	258	18	E-34	E+338	1.0	2 x Ø2.5	14
200	160	4250	160	200	535	437	246	245	65	330	288	19	E-40	E+377	1.0	2 x Ø2.5	14
220	220	4000	180	220	580	495	265	270	40	365	330	28	E-46	E+397	1.5	2 x Ø2.5	14
240	280	3750	200	240	645	535	287	290	45	415	355	29	E-52	E+428	1.5	2 x Ø3	20
260	340	3550	220	260	680	580	308	310	45	425	385	30	E-56	E+461	1.5	2 x Ø3	20
280	430	3350	240	280	745	630	341	340	50	460	415	31	E-64	E+512	1.5	2 x Ø4	36
300	540	3150	260	300	775	660	362	360	55	490	445	32	E-68	E+545	1.5	2 x Ø4	36
320	690	3000	280	320	825	710	383	380	60	530	480	33	E-72	E+578	1.5	3 x Ø4	54

[1] The axial clearances a and b can be changed if necessary.
[2] The dismounting dimension F is required for the vertical installation and removal of the machine and for installation of the retaining rings.



B830849-0

Legend

1 Hub   2 Sleeve   3 Spacer

Weight of the coupling

G_1 = coupling at E_{min}

G_2 = per 1 mm spacer length

G_3 = coupling at E > E_{min}

$$G_3 = G_1 + (E - E_{min}) \cdot G_2$$

Torsional stiffness of the coupling

C_1 = coupling at E_{min}

C_2 = per 1 mm spacer length

C_3 = coupling at E > E_{min}

$$C_3 = \frac{1}{\frac{1}{C_1} + \frac{E - E_{min}}{C_2}}$$

Mass moment of inertia of the coupling

J_1 = coupling at E_{min}

J_2 = per 1 mm spacer length

J_3 = coupling at E > E_{min}

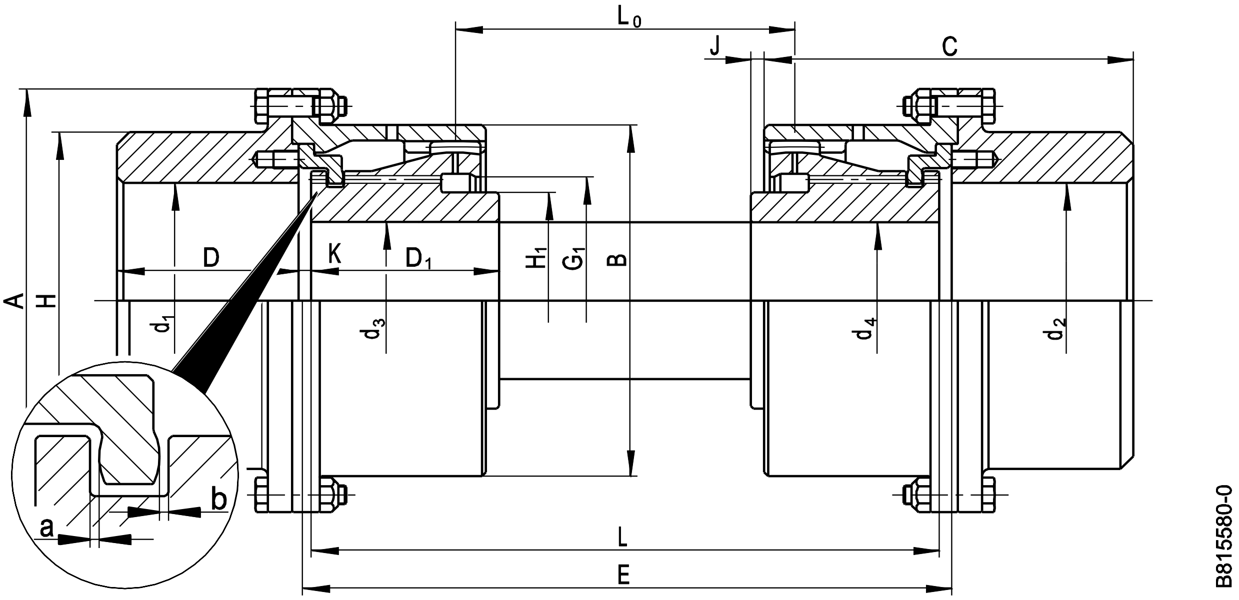
$$J_3 = J_1 + (E - E_{min}) \cdot J_2$$

Size	E_{min} mm	G_1 kg	G_2 kg/mm	C_1 MNm/rad	C_2 MNm · mm/rad	J_1 kgm²	J_2 kgm²/mm
30	82	4.1	0.012	0.44	186	0.0057	0.000018
40	89	7.1	0.013	1.03	274	0.0147	0.000027
50	89	10.7	0.018	2.07	537	0.0292	0.000053
60	107	16.8	0.022	3.36	898	0.0630	0.000059
70	108	24	0.025	4.93	1335	0.111	0.00013
80	108	30.5	0.028	7.48	1895	0.169	0.00019
90	129	45	0.031	9.89	2638	0.332	0.00026
100	129	53	0.036	11.84	3557	0.427	0.00035
110	159	72	0.04	14.94	4690	0.710	0.00046
125	165	92	0.047	19.30	6909	1.09	0.00068
140	185	136	0.053	27.83	8928	2.04	0.00088
160	214	200	0.07	39.57	14088	3.88	0.0014
180	214	284	0.079	59.05	23218	6.79	0.0023
200	250	400	0.12	78.11	36882	11.94	0.0036

Information based on d_1; d_2 max.

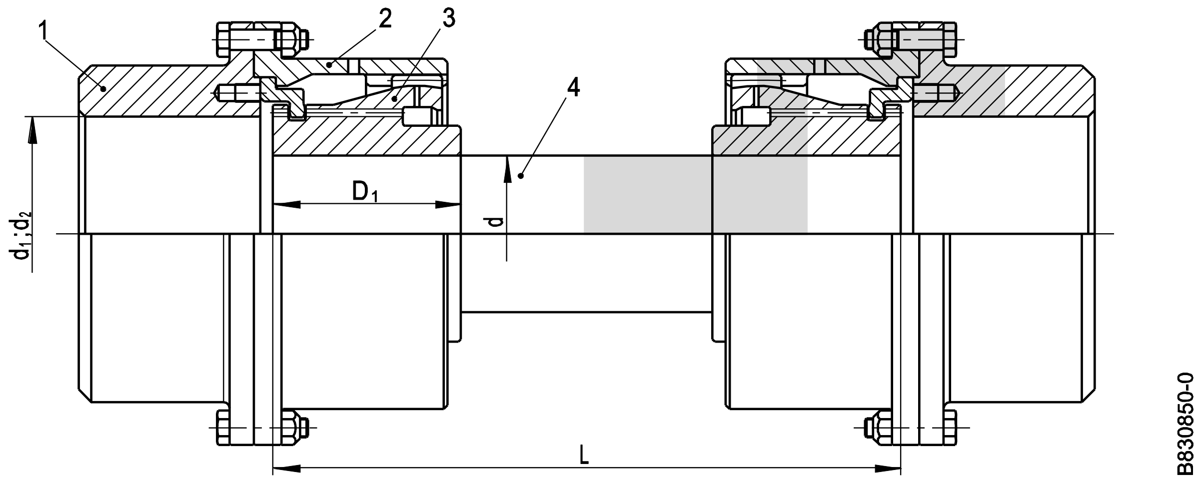
TRG series

Dimension table no.: B791321-0



Size	Nominal torque T_{KN} kNm	Speed[2] n_{max} rpm	Bore d_1; d_2 min mm	Bore d_1; d_2 max mm	Dimensions A mm	B mm	C mm	D/D_1 mm	G_1 mm	H mm	H_1 mm	J mm	K mm	L_0 mm	Axial clearances a and b[1] mm	Oil injection nozzles per half quantity x size mm	Total oil requirement per minute at 1.5 bar pressure litres
30	0.69	14000	12	30	115	85	100	50	54	80	44	3.5	3.5	E-77	0.5	1 x Ø2	4.5
40	1.2	12500	22	40	145	105	118.5	60	71	95	58	6.5	5	E-97	0.5	1 x Ø2	4.5
50	2.4	11200	22	50	165	125	138.5	70	86	112	73	6.5	5	E-114	0.5	1 x Ø2	4.5
60	4.2	10000	28	60	195	145	159.5	80	103	130	88	6.5	6	E-134	0.5	1 x Ø2	4.5
70	6.9	9000	28	70	215	168	179	90	116	150	98	7	6	E-150	0.5	1 x Ø2	4.5
80	9.6	8000	32	80	230	185	199	100	136	170	118	7	6	E-167	0.5	1 x Ø2	4.5
90	14	7100	32	90	265	210	220.5	110	146	190	128	7.5	8	E-186	0.5	1 x Ø2	4.5
100	20	6300	55	100	270	224	239.5	120	158	205	138	8.5	8	E-200	1.0	1 x Ø2.5	7
110	22	6000	65	110	305	245	259	130	177	225	153	9	8	E-215	1.0	1 x Ø2.5	7
125	39	5600	75	125	330	268	298	150	198	250	173	12	10	E-248	1.0	1 x Ø2.5	7
140	55	5000	85	140	375	305	330	165	224	285	198	10	10	E-273	1.0	2 x Ø2	9
160	77	4750	120	160	425	347	379	190	260	325	228	13	12	E-318	1.0	2 x Ø2	9
180	110	4500	140	180	470	392	434	220	290	360	258	18	12	E-362	1.0	2 x Ø2.5	14
200	160	4250	160	200	535	437	485	245	330	410	288	19	14	E-405	1.0	2 x Ø2.5	14
220	220	4000	180	220	580	495	528	270	365	450	330	28	16	E-429	1.5	2 x Ø2.5	14
240	280	3750	200	240	645	535	569	290	415	480	355	29	18	E-464	1.5	2 x Ø3	20
260	340	3550	220	260	680	580	610	310	425	520	385	30	20	E-501	1.5	2 x Ø3	20
280	430	3350	240	280	745	630	671	340	460	550	415	31	22	E-556	1.5	2 x Ø4	36
300	540	3150	260	300	775	660	712	360	490	580	445	32	24	E-593	1.5	2 x Ø4	36
320	690	3000	280	320	825	710	753	380	530	620	480	33	26	E-630	1.5	3 x Ø4	54

[1] The axial clearances a and b can be changed if necessary.
[2] The speed n_{max} depends on the length and weight of the intermediate shaft.
$L = E - 2 \cdot K$



Legend

1 Flange

2 Sleeve

3 Hub

4 Intermediate shaft

Weight

G = intermediate shaft at $L_{existing}$

G_1 = coupling without intermediate shaft

d = shaft diameter

Torsional spring stiffness

C_1 = coupling without intermediate shaft

C_2 = intermediate shaft at $L_{existing}$

C_3 = coupling at $L_{existing}$

Mass moment of inertia

J = intermediate shaft at $L_{existing}$

J_1 = coupling without intermediate shaft

$$G = 6.165 \cdot \frac{d^2 \cdot L}{10^6}$$

$$C_2 = 7.805 \cdot \frac{d^4}{L - 2 \cdot D_1} \qquad C_3 := \frac{1}{\frac{1}{C_1} + \frac{1}{C_2}}$$

$$J = \frac{G \cdot d^2}{8 \cdot 10^6}$$

Size	G_1 kg	C_1 MNm/rad	J_1 kgm²
30	7.9	0.10	0.011
40	13.4	0.26	0.027
50	20.4	0.54	0.053
60	37.8	0.96	0.115
70	47	1.53	0.206
80	62	2.31	0.32
90	89	3.37	0.61
100	107	4.43	0.79
110	144	6.05	1.32
125	196	8.26	2.11
140	280	12.24	3.89
160	413	18.21	7.43
180	583	25.19	12.8
200	836	34.01	23.4

1) Values for the complete coupling for bore d_1; d_2 max, the intermediate shaft is considered only in the range of hub lengths D_1. For the exposed part of the shaft, the data must be calculated using the above formula.

4.10 Technical data of the series with fixed tooth centre distance

The values of the various series listed in the following table always apply to the complete coupling in its basic version. The calculation is based on the hub bores with the largest diameter (d_1; $d_{2\ max}$).

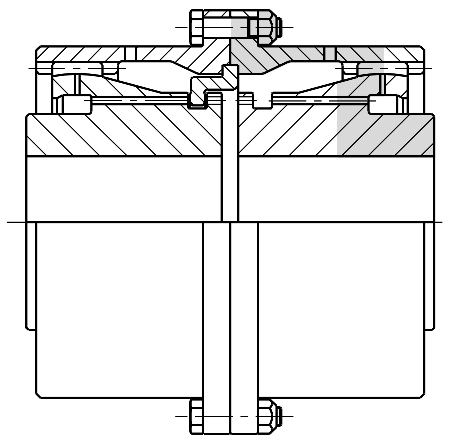


Fig. 10: Calculation scheme for the product family TSB

Size	TSB			TSR		
	Torsional stiffness	Mass moment of inertia[2)]	Weight	Torsional stiffness	Mass moment of inertia[2)]	Weight
	MNm/rad	kgm^2	kg	MNm/rad	MNm/rad	MNm/rad
30	0.50	0.0055	4	0.50	0.0056	4.1
40	1.29	0.0145	6.9	1.29	0.0147	7.0
50	2.62	0.0288	10.5	2.62	0.0291	10.6
60	4.39	0.0618	16.3	4.39	0.063	16.5
70	6.50	0.112	23	6.50	0.111	23.5
80	9.96	0.163	29.7	9.96	0.168	30.3
90	13.87	0.326	44	13.87	0.333	45
100	15.71	0.418	51.5	15.71	0.425	53
110	21.77	0.69	69	21.77	0.71	71
125	26.67	1.06	90	26.67	1.08	92
140	43.21	2.0	132	43.21	2.05	135
160	62.73	3.8	195	62.73	3.88	198
180	89.02	6.65	276	89.02	6.78	281
200	115.28	11.75	389	115.28	11.93	394
220	164.85	19.65	540	164.85	20.13	550
240	198.71	29.74	690	198.71	30.38	703
260	261.05	42.17	848	261.05	43.25	865
280	291.69	62.71	1080	291.69	64.0	1100
300	393.66	86.16	1275	393.66	84.13	1305
320	509.68	115.96	1565	509.68	118.5	1595

Tab. 35: Weight, mass moment of inertia and torsional stiffness

4.11 Accessories

4.11.1 Distance plates

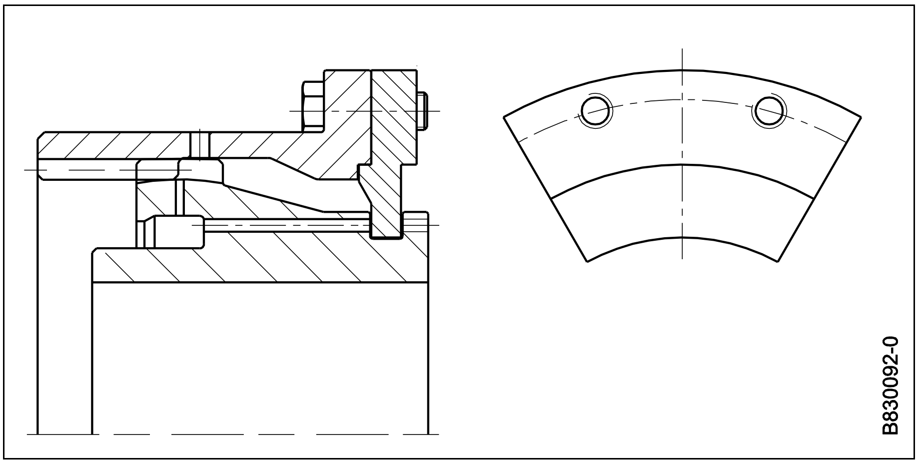


Fig. 11: TSB series

When the coupling is open, distance plates take over the radial and axial guidance of the coupling housing . This allows the drive machine to be brought up to speed without the machine coupled to it.

This is necessary, for example, when testing the emergency shutdown of turbines or when testing electric motors. distance plates are intended only for short-term use and are not suitable for continuous operation.

2 plate segments are screwed to the housing each with 2 fastening screws. For certain coupling series, the plate segment must also be clamped radially to the hub.

The dismounting dimension F (see dimension tables) is required for installing and removing the spacer plates.

4.12 Coupling guard

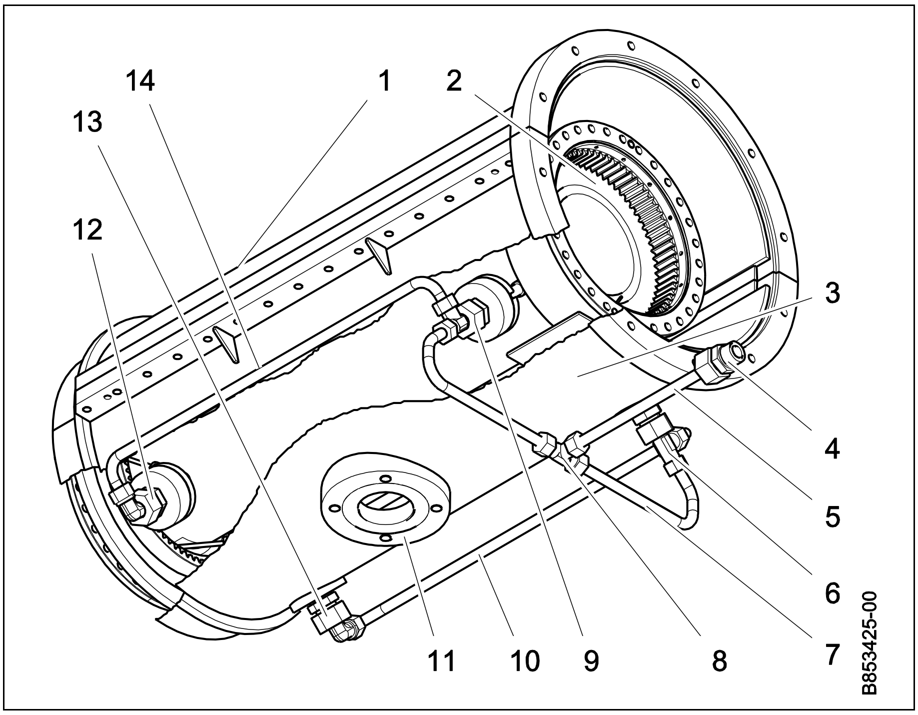


Abb. 12: Example of coupling guard with pipe line

Legende

1 Coupling guard -upper part	8 Distributor
2 Coupling	9 Oil injection II
3 Coupling guard lower part	10 Pipe line
4 Oil supply connection	11 Oil return
5 Pipe line	12 Oil injection I
6 Oil injection II	13 Oil injection I
7 Pipe line	14 Pipe line

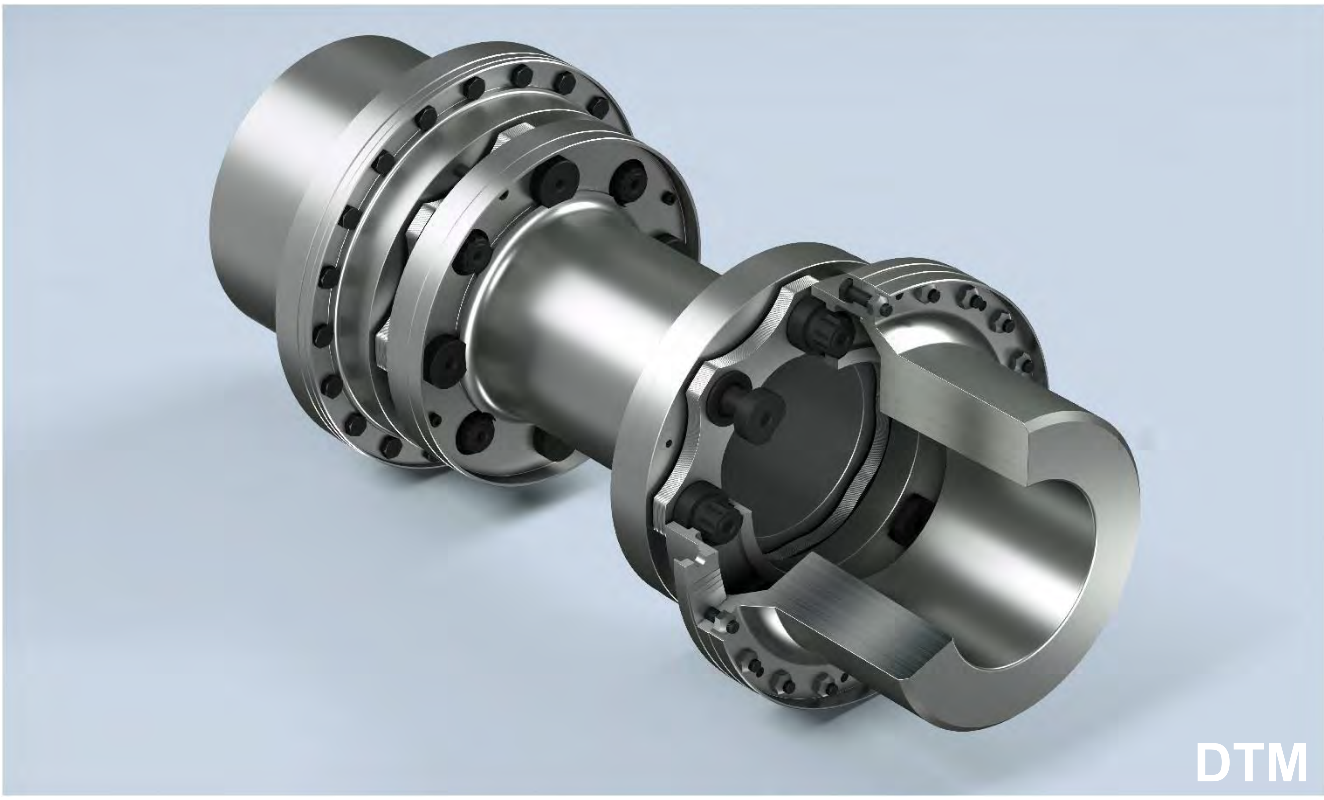
The gear couplings of the high-speed series must be provided with an oil-tight coupling guard (protective guard) on site. This coupling guard prevents reaching in or pulling in as well as the escape of hot oil.

When designing/executing the coupling guard, observe the local safety regulations.

On request, RENK can help with the creation of the coupling guard. We can send you further information on the design of the coupling guard on request. Further information on the design of the coupling guard can be found in the associated operation manual.

If required, an adapted coupling gaurd can be supplied for your application.

5 RAFLEX® flexible disk couplings – High-speed series



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5.1 Structure of the coupling

5.1.1 Disk pack design

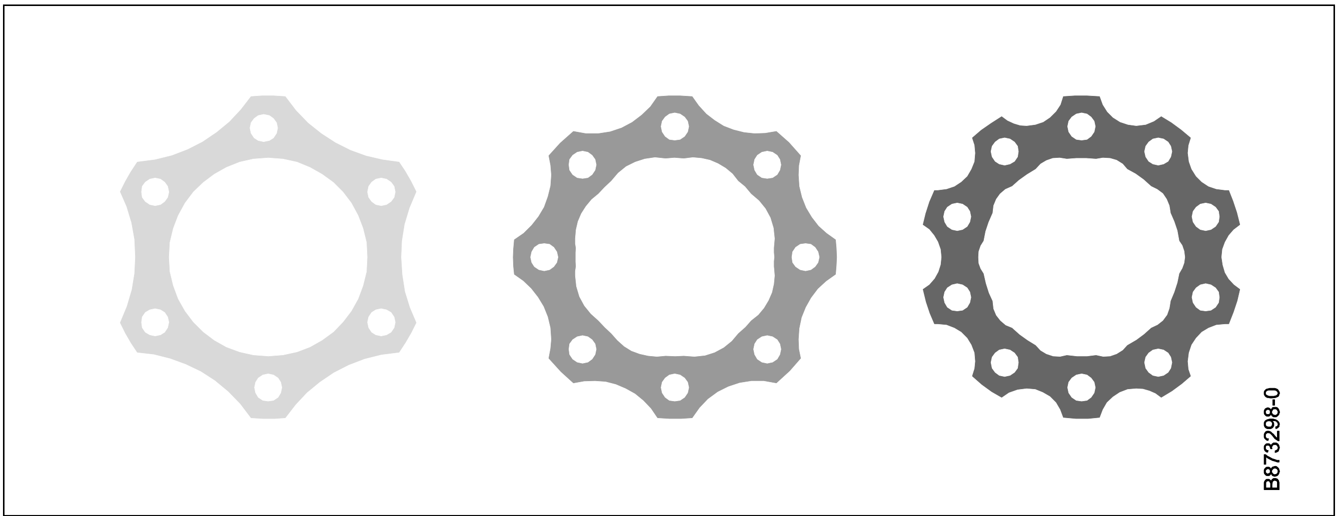


Fig. 13: Disk pack design: 3-bolt, 4-bolt and 5-bolt design

RAFLEX® flexible disk couplings are available in standard designs in 3-bolt, 4-bolt and 5-bolt design. The number of bolts always refers to one connection side.

Thanks to the various disk variants, the optimal coupling can be selected for every application. The number of bolts determines the torque that can be transmitted and the ability of the coupling to accommodate displacement.

The **3-bolt design** permits high axial and angular displacements. This version is particularly suitable for systems in which a high shaft offset is to be expected, for example due to thermal expansion.

The **4-bolt design** offers a balanced ratio of displacement capacity and high torque and is therefore suitable for many applications.

The **5-bolt design** is designed for very high torques but still permits good displacement capability. Typical applications are systems with high peak or short-circuit torques.

As a special version, the couplings can also be designed specifically for the requirements of the system, so that torque and displacement can be optimally transmitted.
In these cases, contact RENK.

In the size designation of the coupling, the last digit indicates the number of bolts. Thus size 224 is a 4-bolt design.

5.2 Application features and functional features

Features	Product family		
	DTR	DTM	DTL
Displacement	0.2° / 0.25° / 0.3°		
High speeds	●	●	
Medium speeds	●	●	●
Variant	Reduced moment	Marine	Marine
Easy assembly due to pre-assembled assembly	●	●	●
Weight optimised	●		
High concentricity and balance quality	●	●	
Low restoring forces	●	●	●
Design to API 671	●	●	●
Suitable for use in explosion protection areas - 2014/34/EU ATEX	●	●	●

Tab. 36: Application features and functional features RAFLEX® high-speed series

5.3 Standard materials

Component	Material	Strength
Flange	Quenched and tempered steel	$R_{P0.2}$ = min. 460 N/mm²
Flange DTR	Quenched and tempered steel	$R_{P0.2}$ = min. 700 N/mm²
Sleeves	Quenched and tempered steel	$R_{P0.2}$ = min. 700 N/mm²
Fitted bolts		Strength class 10.9

Tab. 37: Standard material

5.4 Use in potentially explosive areas - ATEX

According to the current EU directive, the following maximum marking can be applied to these couplings.

CE Ex **II 2G Ex h IIC T4 Gb** -20°C ≤ T_a ≤ + 60°C

CE Ex **II 2G Ex h IIC T3 Gb** -20°C ≤ T_a ≤ + 60°C *

CE Ex **II 2D Ex h IIIB T130°C Db** -20°C ≤ T_a ≤ + 60°C

CE Ex **II 2D Ex h IIIB T195°C Db** -20°C ≤ T_a ≤ + 60°C *

* For peripheral speeds > 100 m/s. Temperature monitoring is required from 150 m/s.

5.5 Selection of the coupling size

When selecting the coupling using the dimension tables, proceed as follows:

- Select for the nominal system torque and the service factor applicable to your system (see chapter 2) the coupling size.
- Check the coupling size again based on the known additional stresses.
- Check the permissible speed of the coupling.
- Check the maximum permissible bore diameter.
- Check the shaft-hub connection (see chapter 1.1).

5.5.1 Permissible additional stresses

When specifying the coupling, you must take into account the following permissible additional stresses. You can find more detailed information on the types of additional stresses in (see chapter 2.1).

Peak coupling torque

– pulsating for 100,000 load cycles:

$$T_{KP} = 1.1 \cdot T_{KN}$$

– alternating for 100,000 load cycles:

$$T_{KP} = 0.76 \cdot T_{KN}$$

Maximum coupling torque

– pulsating or alternating for 1,000 load cycles

$$T_{Kmax} = 1.9 \cdot T_{KN}$$

5.5.2 Permissible shaft offsets

The permissible **angular offset** ΔK_w of the RAFLEX® flexible disk coupling high-speed series is:

3-bolt design	$\Delta K_w = 0.3°$
4-bolt design	$\Delta K_w = 0.25°$
5-bolt design	$\Delta K_w = 0.2°$

The maximum allowable **radial offset** ΔK_r depends on the permissible angular offset and the tooth centre distance l_0.

5

You can determine the radial offset using the following formulas.

For 3-bolt design:

$\Delta K_r = L_0 \cdot 0.012$ [mm]

For 4-bolt design:

$\Delta K_r = L_0 \cdot 0.0044$ [mm]

For 5-bolt design:

$\Delta K_r = L_0 \cdot 0.0035$ [mm]

Legend

ΔK_r = radial offset [mm]

L_0 = tooth centre distance (see dimension tables) [mm]

The permissible **axial offset** ΔK_a and the restoring force are specified in Tab. 39.

5.5.3 Selection example

Application:	Coupling between turbine and gearbox.
Data:	$P = 13{,}000\ kW$
	$n = 10{,}700\ min^{-1}$
	$d_1, d_2 = 130\ mm$
	Conical press fits
	Distance between the shaft ends: E = 300 mm
Service factor:	Design to API 671
	$K_A = 1.5$
Sizing:	$T_N = \frac{P}{n} \cdot 9{,}550 = \frac{13{,}000}{10{,}700} \cdot 9{,}550 = 11{,}603\ Nm$
	$T_N \cdot K_A = 11{,}603 \cdot 1.5 = 17{,}404\ Nm$
	According to the DTR dimension table, this results in a DTR 223
	$T_{KN} = 19{,}000\ Nm$
	$T_{Kmax} = 1.9 \cdot T_{KN} = 36{,}100\ Nm$
Additional stress:	Short-circuit torque 6 x T_N
	$T_{max} = 6 \cdot T_N \cdot 1.15 = 80{,}061\ Nm$
	Redefinition required.
Redefinition:	DTR 293
	$T_{KN} = 44{,}000\ Nm$
	$T_{Kmax} = 1.9 \cdot T_{KN} = 83{,}600\ Nm$
Bore verification:	$d_1, d_{2\,max} = 122\ mm$
	$d_1, d_{2\,max} < d_1, d_2$
	Redefinition required.
Redefinition:	DTR 323
	$d_1, d_{2\,max} = 137\ mm$
	$d_1, d_{2\,max} \geq d_1, d_2$
Speed:	$n_{max} = 11{,}600\ min^{-1}$
Checking the spacer length	$E_{min} = 208\ mm \qquad E \geq E_{min}$
Checking the shaft-hub connection:	Checking the load-bearing capacity of the press fit connection according to DIN 7190.

5

5.6 Designs and dimension tables of the product family DT

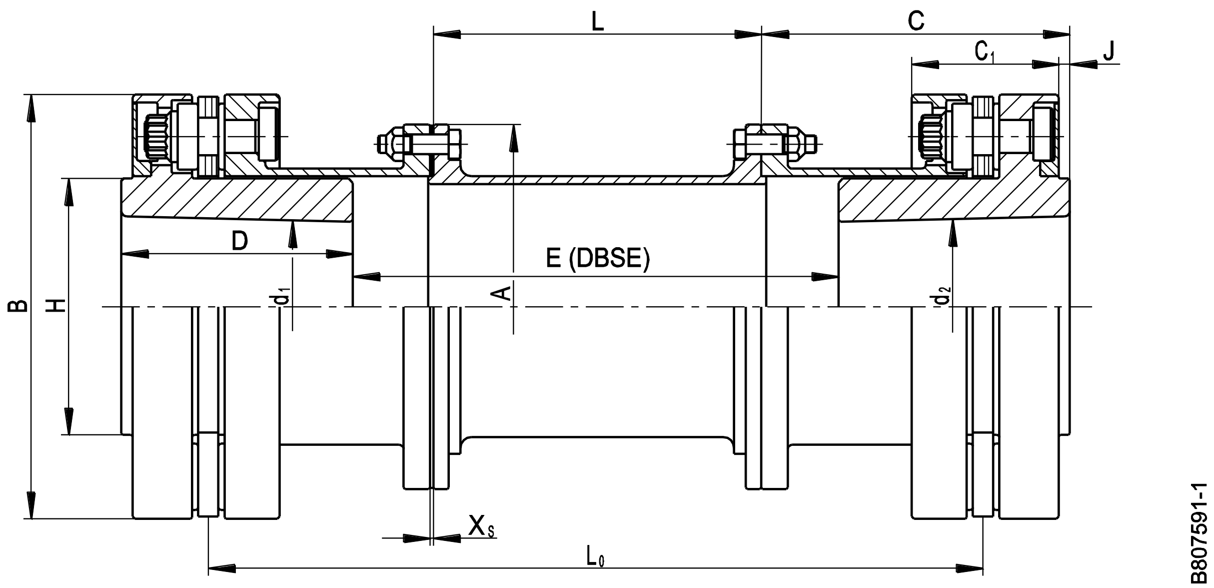
Versions	Series	Page
Reduced moment design	DTR	148
Marine design	DTM	150
Marine design, medium speed	DTL	152

Tab. 38: Designs of the product family DT

5

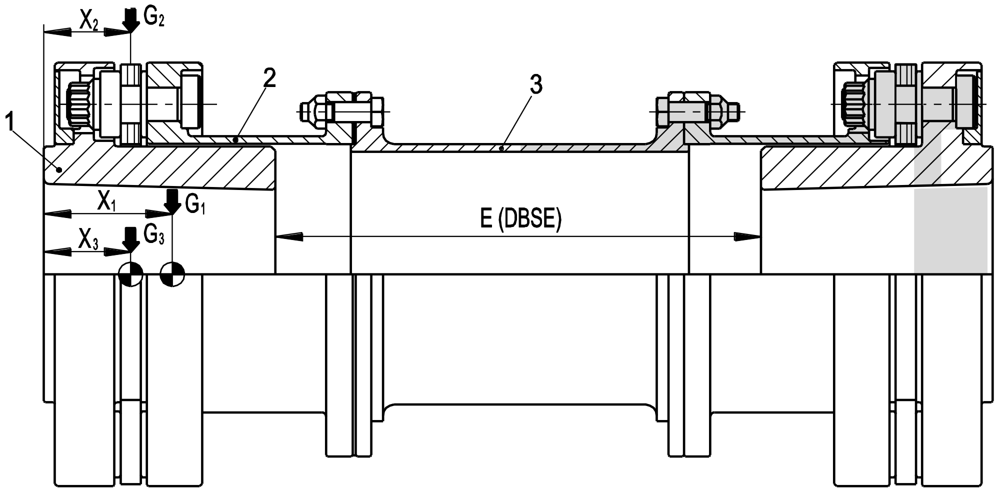
DTR series

Dimension table no.: B494728-3



Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Dimensions d_1; d_2 max mm	A mm	B mm	C mm	C_1 mm	D mm	E_{min} mm	H mm	J mm	L mm	L_0 mm	X_S mm
103	1.95	36000	40	88	104	84	40.4	50	111	56	5	E - 69	E + 49.5	1.00
133	3.95	26800	55	112	136	100	47.6	70	103	78	5	E - 61	E + 80.5	1.25
163 **164**	6.50 8.80	22800	68	130	161	120	55.8	90	103	96	5	E - 61	E + 112.5	1.25
193 **194**	11.5 15.3	19200	82	165	192	140	66.8	105	133.5	116	5	E - 71.5	E + 131.0	1.50
223 **224**	19 25	16500	96	188	223	160	80.0	120	143.5	135	5	E - 81.5	E + 147.0	1.50
253 **254**	30 40	14500	110	215	255	185	92.8	135	177.5	154	5	E - 101.5	E + 164.0	1.50
293 **294**	44 59	12800	122	240	290	205	104.8	155	178	172	5	E - 102	E + 192.0	1.75
323 **324**	59 78	11600	137	267	318	230	116.4	175	208	192	5	E - 112	E + 219.5	1.75
354 **355**	108 135	10600	152	293	350	255	130.4	190	228	214	5	E - 132	E + 235.5	1.75
384 **385**	140 175	9700	165	326	381	280	142.6	210	264	231	5	E - 142	E + 263.5	2.00
424 **425**	185 231	8900	178	349	416	305	155.4	220	294	250	5	E - 172	E + 269.5	2.00
464 **465**	260 330	8000	190	373	460	345	180.4	235	344	266	5	E - 222	E + 275.0	2.25
514 **515**	360 450	7200	216	429	512	375	193.8	270	358	303	5	E - 212	E + 330.5	2.25
584 **585**	520 650	6400	237	469	579	425	220.4	300	398	333	5	E - 252	E + 364.0	2.25
665	930	5600	282	534	660	485	248.4	350	436.5	395	5	E - 272.5	E + 435.5	2.50

Dimension E including one shim package (X_S).



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Legend

1 Flange

2 Sleeve

3 Spacer

Weight

G_1 = half coupling for E_{min}

G_2 = per 1 mm spacer length

G_3 = half coupling if $E > E_{min}$

Centre of gravity

X_1 = half coupling for E_{min}

X_2 = for G_2

X_3 = half coupling if $E > E_{min}$

Torsional stiffness

C_1 = coupling for E_{min}

C_2 = per 1 mm spacer length

C_3 = coupling if $E > E_{min}$

Mass moment of inertia

J_1 = coupling for E_{min}

J_2 = per 1 mm spacer length

J_3 = coupling if $E > E_{min}$

$$G_3 = G_1 + \frac{(E - E_{min}) * G_2}{2}$$

$$X_3 = \frac{X_1 * G_1 + X_2 * \frac{(E - E_{min}) * G_2}{2}}{G_3}$$

$$C_3 = \frac{1}{\frac{1}{C_1} + \frac{E - E_{min}}{C_2}}$$

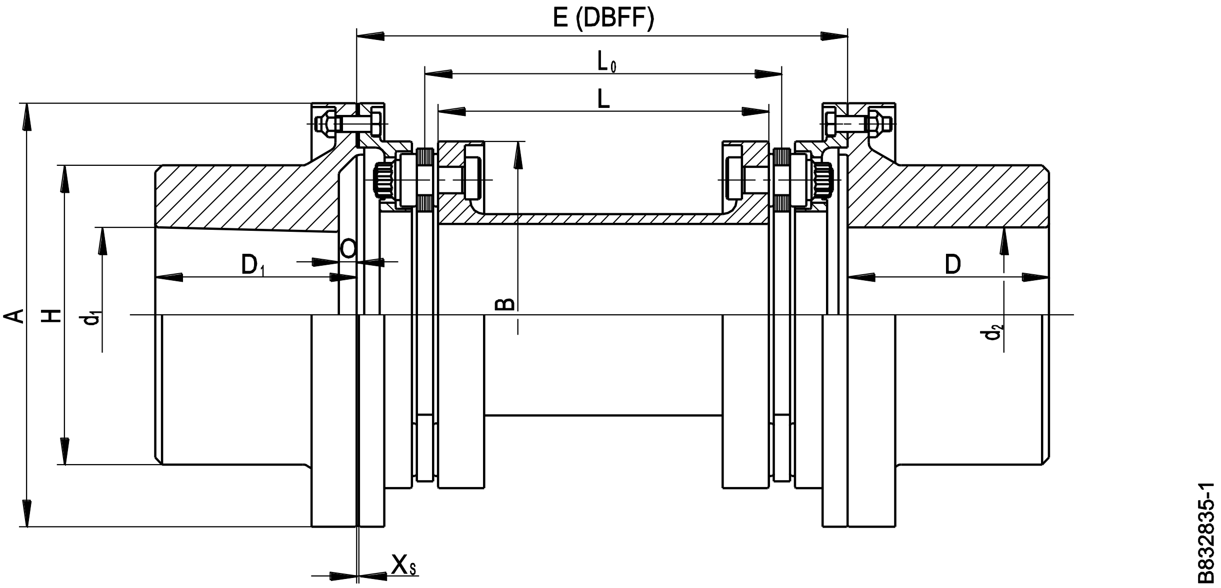
$$J_3 = J_1 + (E - E_{min}) * J_2$$

Size	E_{min} mm	X_1 mm	X_2 mm	G_1 kg	G_2 kg/mm	C_1 MNm/rad	C_2 MNm · mm/rad	J_1 kgm²	J_2 kgm²/mm
103	111	23.1	25.2	2.30	0.0034	0.072	25	0.006	0.00000250
133	103	28.9	29.8	4.66	0.0057	0.167	86	0.021	0.00000846
163 / 164	103	34.9	33.9	7.59	0.0070	0.289 / 0.386	162	0.049	0.0000159
193 / 194	133.5	40.9	39.4	13.8	0.0099	0.499 / 0.678	330	0.126	0.0000324
223 / 224	143.5	46.9	46.5	20.7	0.013	0.808 / 1.07	592	0.263	0.0000581
253 / 254	177.5	53.0	52.9	31.1	0.017	1.21 / 1.64	984	0.525	0.0000966
293 / 294	178	59.6	58.9	44.9	0.023	1.77 / 2.34	1685	0.958	0.000165
323 / 324	208	66.7	65.2	61.7	0.030	2.40 / 3.21	2739	1.59	0.000269
354 / 355	228	73.7	72.2	84.1	0.044	4.79 / 5.91	4849	2.66	0.000476
384 / 385	264	80.4	78.3	112	0.053	6.16 / 7.56	6857	4.20	0.000673
424 / 425	294	85.9	85.2	142	0.063	7.80 / 9.56	9543	6.31	0.000936
464 / 465	344	94.4	97.7	193	0.082	11.0 / 13.4	15066	10.45	0.001478
514 / 515	358	105	105	268	0.11	14.4 / 17.4	23527	17.99	0.002309
584 / 585	398	116	118	381	0.15	22.3 / 24.2	38890	32.4	0.003816
665	436.5	134	132	564	0.18	38.2	66189	63.7	0.006495

Information based on d_1; d_2 max.
Calculation of the torsional stiffness according to API/AGMA 9004.

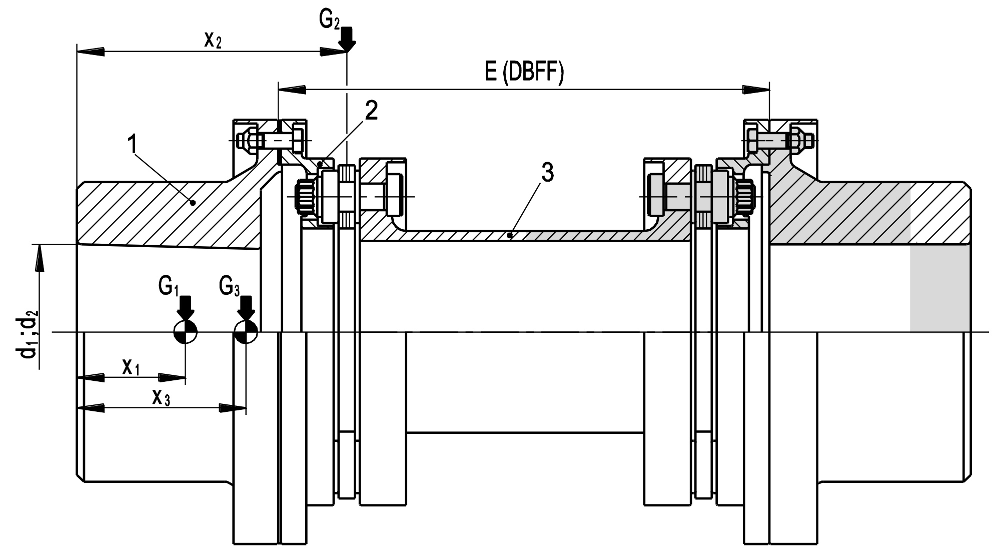
DTM series

Dimension table no.: B494729-1



Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Dimensions d_1; d_2 max mm	A mm	B mm	D_1 mm	D mm	E_{min} mm	H mm	L mm	L_0 mm	O mm	X_S mm
103	1.95	27800	70	137	106	60	50	121	98	E - 61	E - 52.5	10	1.00
133	3.95	22000	95	173	142	80	70	146	133	E - 71	E - 61.5	10	1.25
163 **164**	6.50 8.80	19100	112	199	167	100	90	166	158	E - 81	E - 69	10	1.25
193 **194**	11.5 15.3	15700	134	242	198	115	105	196.5	188	E - 91.5	E - 76.5	10	1.50
223 **224**	19 25	13800	157	275	231	140	120	231.5	220	E - 111.5	E - 94.5	20	1.50
253 **254**	30 40	12000	179	318	263	155	135	276.5	251	E - 131.5	E - 111.5	20	1.50
293 **294**	44 59	10800	202	353	298	175	155	317	284	E - 152	E - 130	20	1.75
323 **324**	59 78	9800	223	389	328	205	175	342	313	E - 162	E - 137.5	30	1.75
354 **355**	108 135	9000	244	421	360	220	190	382	342	E - 182	E - 153.5	30	1.75
384 **385**	140 175	8100	265	466	391	240	210	412	371	E - 192	E - 161.5	30	2.00
424 **425**	185 231	7500	290	503	427	260	220	452	406	E - 212	E - 179.5	40	2.00
464 **465**	260 330	6900	320	552	476	275	235	522	448	E - 242	E - 204.5	40	2.25
514 **515**	360 450	6100	356	621	525	320	270	552	499	E - 252	E - 212	50	2.25
584 **585**	520 650	5500	400	688	592	350	300	627	561	E - 282	E - 237.5	50	2.25
665	930	4800	460	781	675	400	350	714.5	644	E - 319.5	E - 269	50	2.50

Dimension E including one shim package (X_S).



B832836-1

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Legend

1 Flange

2 Sleeve

3 Spacer

Weight

G_1 = half coupling for E_{min}

G_2 = per 1 mm spacer length

G_3 = half coupling if $E > E_{min}$

Centre of gravity

X_1 = half coupling for E_{min}

X_2 = for G_2

X_3 = half coupling if $E > E_{min}$

Torsional stiffness

C_1 = coupling for E_{min}

C_2 = per 1 mm spacer length

C_3 = coupling if $E > E_{min}$

Mass moment of inertia

J_1 = coupling for E_{min}

J_2 = per 1 mm spacer length

J_3 = coupling if $E > E_{min}$

$$G_3 = G_1 + \frac{(E - E_{min}) * G_2}{2}$$

$$C_3 = \frac{1}{\frac{1}{C_1} + \frac{E - E_{min}}{C_2}}$$

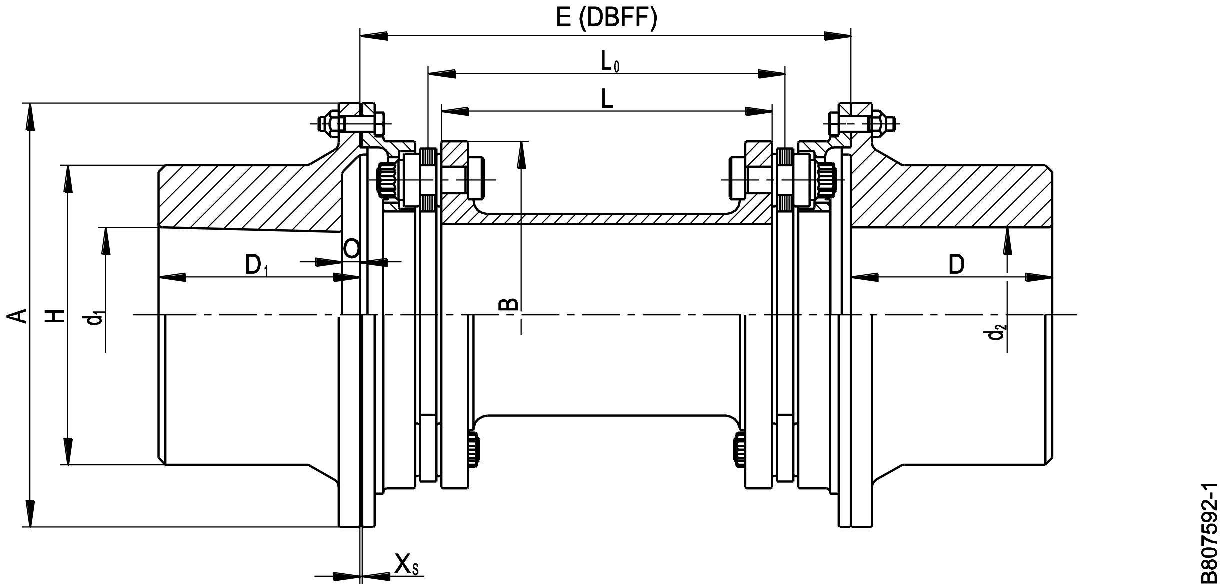
$$X_3 = \frac{X_1 * G_1 + X_2 * \frac{(E - E_{min}) * G_2}{2}}{G_3}$$

$$J_3 = J_1 + (E - E_{min}) * J_2$$

Size	E_{min} mm	X_1 mm	X_2 mm	G_1 kg	G_2 kg/mm	C_1 MNm/rad	C_2 MNm · mm/rad	J_1 kgm²	J_2 kgm²/mm
103	121	48.3	75.8	3.76	0.0060	0.118	37	0.017	0.00000366
133	146	62.5	110.2	7.79	0.0091	0.248	128	0.058	0.0000126
163 / 164	166	75.9	124.1	12.8	0.011	0.446 / 0.726	237	0.128	0.0000233
193 / 194	196.5	88.5	142.6	21.8	0.015	0.761 / 1.27	455	0.317	0.0000446
223 / 224	231.5	103	166.5	33.3	0.019	1.24 / 1.99	811	0.643	0.0000796
253 / 254	276.5	118	190.1	50.2	0.027	1.85 / 3.10	1426	1.27	0.000140
293 / 294	317	135	219.1	72.1	0.035	2.72 / 4.36	2427	2.28	0.000238
323 / 324	342	150	242.8	98.8	0.043	3.67 / 6.00	3698	3.84	0.000363
354 / 355	382	166	265.8	130	0.063	8.79 / 13.5	6841	5.98	0.000671
384 / 385	412	183	289.7	172	0.079	11.5 / 17.6	9943	9.50	0.000976
424 / 425	452	195	308.8	217	0.091	14.4 / 21.9	13102	14.1	0.001286
464 / 465	522	216	336.3	295	0.11	20.0 / 29.9	19302	23.1	0.001894
514 / 515	552	240	375.1	410	0.15	27.5 / 41.7	31687	40.0	0.003109
584 / 585	627	269	417.8	578	0.19	48.8 / 59.0	50252	70.3	0.004931
665	714.5	310	483.3	870	0.25	93	88499	138	0.008684
Information based on d_1; d_2 max. Calculation of the torsional stiffness according to API/AGMA 9004.									

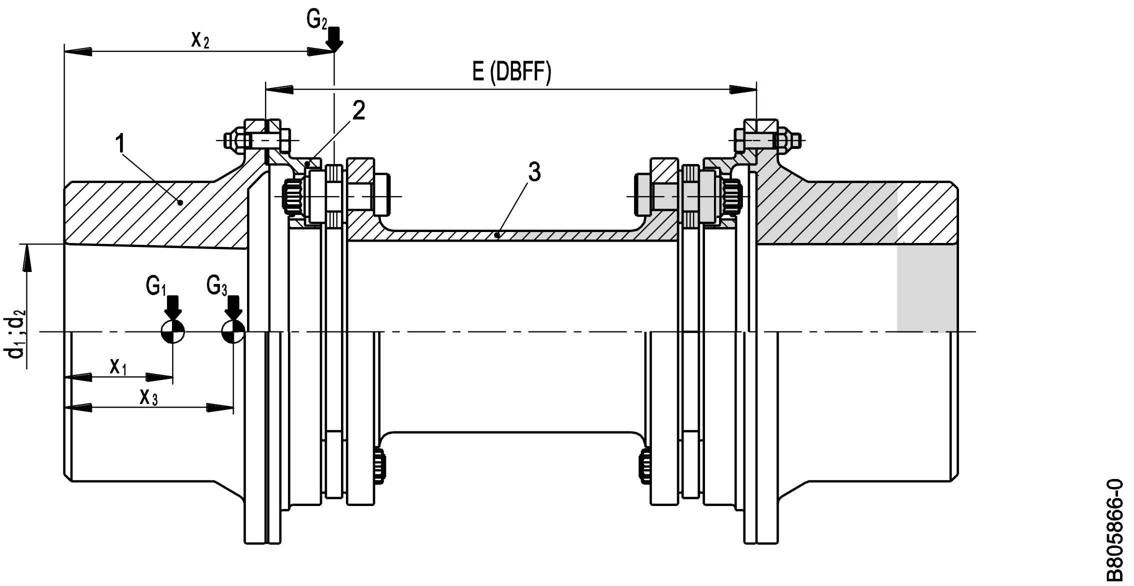
DTL series

Dimension table no.: B494730-3



Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Dimensions d_1; d_2 max mm	A mm	B mm	D_1 mm	D mm	E_{min} mm	H mm	L mm	L_0 mm	O mm	X_S mm
103	1.95	7400	70	137	106	60	50	121	98	E - 61	E - 52.5	10	1.00
133	3.95	6500	95	173	142	80	70	146	133	E - 71	E - 61.5	10	1.25
163 **164**	6.50 8.80	5900	112	199	167	100	90	166	158	E - 81	E - 69	10	1.25
193 **194**	11.5 15.3	5300	134	242	198	115	105	196.5	188	E - 91.5	E - 76.5	10	1.50
223 **224**	19 25	4900	157	275	231	140	120	231.5	220	E - 111.5	E - 94.5	20	1.50
253 **254**	30 40	4500	179	318	263	155	135	276.5	251	E - 131.5	E - 111.5	20	1.50
293 **294**	44 59	4200	202	353	298	175	155	317	284	E - 152	E - 130	20	1.75
323 **324**	59 78	3900	223	389	328	205	175	342	313	E - 162	E - 137.5	30	1.75
354 **355**	108 135	3700	244	421	360	220	190	382	342	E - 182	E - 153.5	30	1.75
384 **385**	140 175	3500	265	466	391	240	210	412	371	E - 192	E - 161.5	30	2.00
424 **425**	185 231	3300	290	503	427	260	220	452	406	E - 212	E - 179.5	40	2.00
464 **465**	260 330	3100	320	552	476	275	235	522	448	E - 242	E - 204.5	40	2.25
514 **515**	360 450	2900	356	621	525	320	270	552	499	E - 252	E - 212	50	2.25
584 **585**	520 650	2700	400	688	592	350	300	627	561	E - 282	E - 237.5	50	2.25
665	930	2500	460	781	675	400	350	714.5	644	E - 319.5	E - 269	50	2.50

Dimension E including one shim package (X_S).



Legend

1 Flange

2 Sleeve

3 Spacer

Weight

G_1 = half coupling for E_{min}

G_2 = per 1 mm spacer length

G_3 = half coupling if $E > E_{min}$

Centre of gravity

X_1 = half coupling for E_{min}

X_2 = for G_2

X_3 = half coupling if $E > E_{min}$

Torsional stiffness

C_1 = coupling for E_{min}

C_2 = per 1 mm spacer length

C_3 = coupling if $E > E_{min}$

Mass moment of inertia

J_1 = coupling for E_{min}

J_2 = per 1 mm spacer length

J_3 = coupling if $E > E_{min}$

$$G_3 = G_1 + \frac{(E - E_{min}) * G_2}{2}$$

$$X_3 = \frac{X_1 * G_1 + X_2 * \frac{(E - E_{min}) * G_2}{2}}{G_3}$$

$$C_3 = \frac{1}{\frac{1}{C_1} + \frac{E - E_{min}}{C_2}}$$

$$J_3 = J_1 + (E - E_{min}) * J_2$$

Size	E_{min} mm	X_1 mm	X_2 mm	G_1 kg	G_2 kg/mm	C_1 MNm/rad	C_2 MNm · mm/rad	J_1 kgm²	J_2 kgm²/mm
103	121	48.1	75.8	3.65	0.0060	0.118	37	0.016	0.00000366
133	146	62.2	110.2	7.60	0.0091	0.248	128	0.056	0.0000126
163 / 164	166	75.5	124.1	12.6	0.011	0.446 / 0.726	237	0.125	0.0000233
193 / 194	196.5	88.1	142.6	21.4	0.015	0.761 / 1.270	455	0.309	0.0000446
223 / 224	231.5	102	166.5	32.8	0.019	1.24 / 1.99	811	0.628	0.0000796
253 / 254	276.5	117	190.1	49.5	0.027	1.85 / 3.10	1426	1.24	0.000140
293 / 294	317	134	219.1	71.2	0.035	2.72 / 4.36	2427	2.24	0.000238
323 / 324	342	149	242.8	98.0	0.043	3.67 / 6.00	3698	3.76	0.000363
354 / 355	382	166	265.8	129	0.063	8.79 / 13.5	6841	5.88	0.000671
384 / 385	412	182	289.7	171	0.079	11.5 / 17.6	9943	9.34	0.000976
424 / 425	452	194	308.8	215	0.091	14.4 / 21.9	13102	13.9	0.0001286
464 / 465	522	215	336.3	292	0.11	20.0 / 29.9	19302	22.7	0.0001894
514 / 515	552	239	375.1	407	0.15	27.5 / 41.7	31687	39.4	0.0003109
584 / 585	627	268	417.8	573	0.19	48.8 / 59.0	50252	69.4	0.0004931
665	714.5	310	483.3	864	0.25	93	88499	137	0.0008684

Information based on d_1; d_2 max.
Calculation of the torsional stiffness according to API/AGMA 9004.

5.7 Displacement data, forces and natural frequencies

Size	Axial offset values				m_{Sch}			Angular offset values	
	ΔK_a	$F_{a100\%}$	$C_{a0\%}$	$C_{a100\%}$	DTR	DTM	DTL	ΔK_w	C_w
	mm	N	N/mm	N/mm	kg	kg	kg	Degree	Nm/degree
103	2	2410	1470	4070	2.79	3.18	3.08	0.3	70
133	3	2770	770	3650	4.91	6.03	5.82	0.3	92
163	3.7	3270	590	3810	7.32	9.05	8.81	0.3	130
193	4.4	4100	530	4300	13.7	15.6	15.1	0.3	190
223	5.3	4280	420	4820	20.4	24.3	23.8	0.3	281
253	5.8	6940	440	5970	31.6	38.0	37.3	0.3	440
293	6.8	8420	350	6350	44.7	54.2	53.3	0.3	520
323	7.6	9510	295	6600	61.8	73.3	72.1	0.3	720
164	2.3	6340	3120	9680	7.65	9.02	8.78	0.25	400
194	2.8	7770	2750	10660	14.3	15.5	15.1	0.25	465
224	3.4	9050	2140	11200	21.2	24.2	23.7	0.25	750
254	3.6	11660	2400	14160	33.2	38.0	37.3	0.25	1190
294	4.3	13100	1810	14020	46.7	54.0	53.1	0.25	1240
324	4.9	14650	1470	14440	64.6	73.2	72.0	0.25	1720
354	5.2	17490	1540	16670	87.4	97.5	96.0	0.25	2370
384	5.5	20780	1570	19080	121	131	128	0.25	3130
424	6	23790	1420	20440	153	168	166	0.25	3880
464	6.6	31200	1470	24790	216	241	238	0.25	5650
514	7.4	33500	1200	24000	294	323	319	0.25	6230
584	8	76900	1600	50300	424	464	458	0.25	17500
355	3.4	36000	7330	42800	90.9	97.1	95.6	0.2	7460
385	3.6	44080	7820	50770	125	130	128	0.2	10140
425	3.8	44240	7000	49500	159	167	165	0.2	11400
465	4.1	54380	7510	57810	226	239	237	0.2	15840
515	4.6	58200	6090	55300	305	322	318	0.2	15120
585	5	70340	6090	63590	443	462	456	0.2	26430
665	6	145000	18400	91400	617	678	671	0.2	59000

Tab. 39: axial and angular offset data

Legend

$C_{a0\%}$ = local axial stiffness at 0% axial offset

$C_{a100\%}$ = local axial stiffness at 100% axial offset

C_w = angular stiffness

$F_{a100\%}$ = axial restoring force at 100% axial offset

ΔK_a = permissible axial offset for the complete coupling

ΔK_w = permissible angular offset for a disc pack

m_{Sch} = oscillating mass at E_{min}

5.7.1 Axial and angular offset

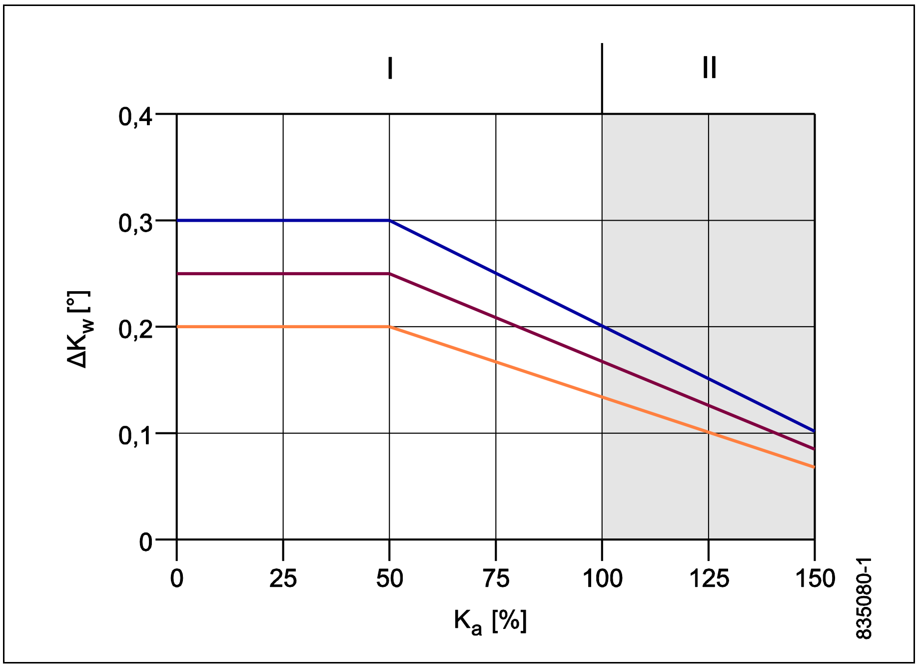


Fig. 14: Angular offset over axial offset

Legend

I = continuous operation	II = short-term operation
ΔK_w = angular offset	ΔK_a = axial offset
— = 3-bolt design	— = 4-bolt design
— = 5-bolt design	

The maximum values specified in the Tab. 39 for the axial offset and the angular offset must not be present at the same time. In the case of large axial offsets, the permissible angular offsets are reduced as shown in Fig. 14.

Please note that the angular offset in the disk pack consists of the gap and the radial offset. See also Chapter 1.2.

The axial offsets specified in range II are permitted for only a short time, for example at assembly or disassembly.

When specifying the coupling, take account of any expected axial offsets. Pre-tensioning the coupling when it is cold can reduce the amount of stresses in the disks during continuous operation. This leads to an increased service life of the coupling.

5.7.2 Restoring forces and stiffnesses

The restoring forces and stiffnesses listed in the Tab. 39 can influence each other. This can lead to deviations in the values. The axial force shows progressive behaviour. The exact values can be found on the dimensional drawing or can be requested from RENK.

5.7.3 Axial natural frequency

The axial natural frequency can be calculated using the following formula.

Using the values $C_{a0\%}$ and $C_{a100\%}$ taken from the Tab. 39, you can calculate the critical speeds at minimum and maximum axial displacement.

$$n_e = 427\sqrt{\frac{C_a}{m_{sch}}}$$

Legend

n_e	critical speed [rpm]	C_a local axial stiffness [N/mm]
m_{Sch}	oscillating mass [kg]	

The progressive course of the stiffness of the disk packs ensures that the axial natural frequency does not have to be considered in normal use. Axial oscillations applied from the outside are dampened by the disk pack and the entire system is detuned.

In the event of strong axial excitation, the difference between that frequency and the axial natural frequency should be at least 10% from one times the operating speed or from two times the operating speed.

5.7.4 Transport screw connection

The transport screw connection serves to protect the disk pack during transport and assembly. It locks the disk packs in place and thus prevents overloads due to deformation.

Furthermore, the transport screw connection enables low-speed balancing of the assemblies.

The transport screw connection should be removed only at the final assembly of the coupling. Keep the transport screw connection for later use.

Operation of the coupling with the transport screw connection is not permitted!

5.7.5 Freewheel adapter and torque simulator

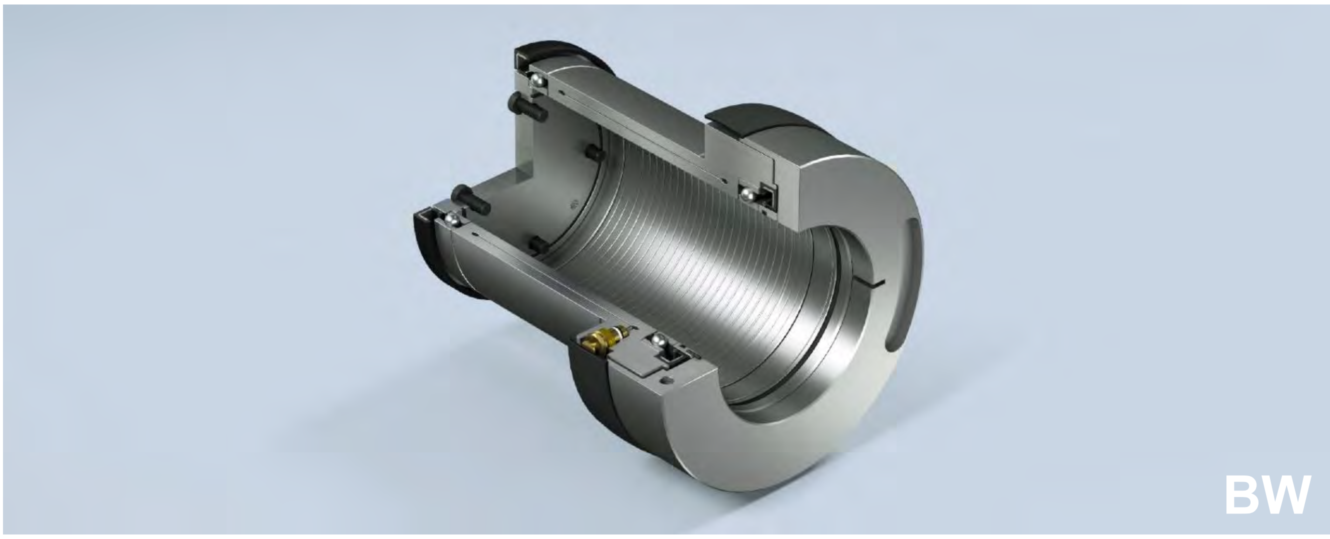
A high-speed balancing or an operation of the uncoupled coupling over 1800 rpm is not permitted with the transport screw connection.

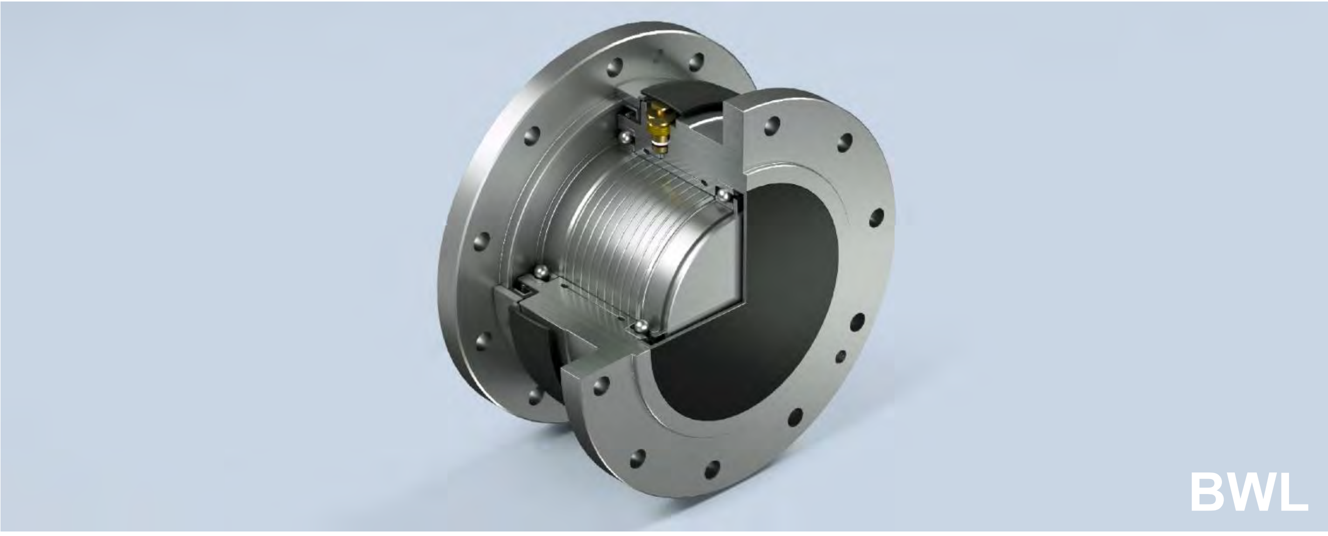
A special freewheel adapter is required for this, which braces the components against one another so that an unintentional deflection of the components is prevented.

A torque simulator can be provided if desired. This simulates the weight of half the coupling on the machine shaft during factory test runs of the machine.

In both cases, please contact RENK.

6 HYGUARD® safety couplings





6

Overload protection is becoming increasingly important in modern drive trains. Systems in use today are continuously being optimised in terms of power density. The loads in the drive trains are increasing significantly. In addition, the risk of unexpected overloading has not diminished despite the enormous further development in the fields of calculation and simulation.

High availability is extremely important for systems in use today. Every standstill or failure of the system results in high costs and lost sales. Safety couplings offer the best available protection for your systems. The costs of the safety couplings are negligible compared to those of a protracted system failure.

HYGUARD® safety couplings have proven themselves over the past decades as a reliable safety element in a wide variety of drive trains.

6.1 How the coupling works

The HYGUARD® safety coupling is a torque limiting coupling with hydrostatic torque adjustment. The torque of the drive machine is transmitted exclusively by friction between the hydraulically loaded surfaces of the shaft and hub. As long as the set torque is not exceeded, the coupling operates without slippage.

The advantages of these coupling over other safety couplings are: the release accuracy is not subject to ageing, and the coupling is ready for use again in a short time. The stock of spare parts is limited to a minimum:

- Universally usable shear tubes

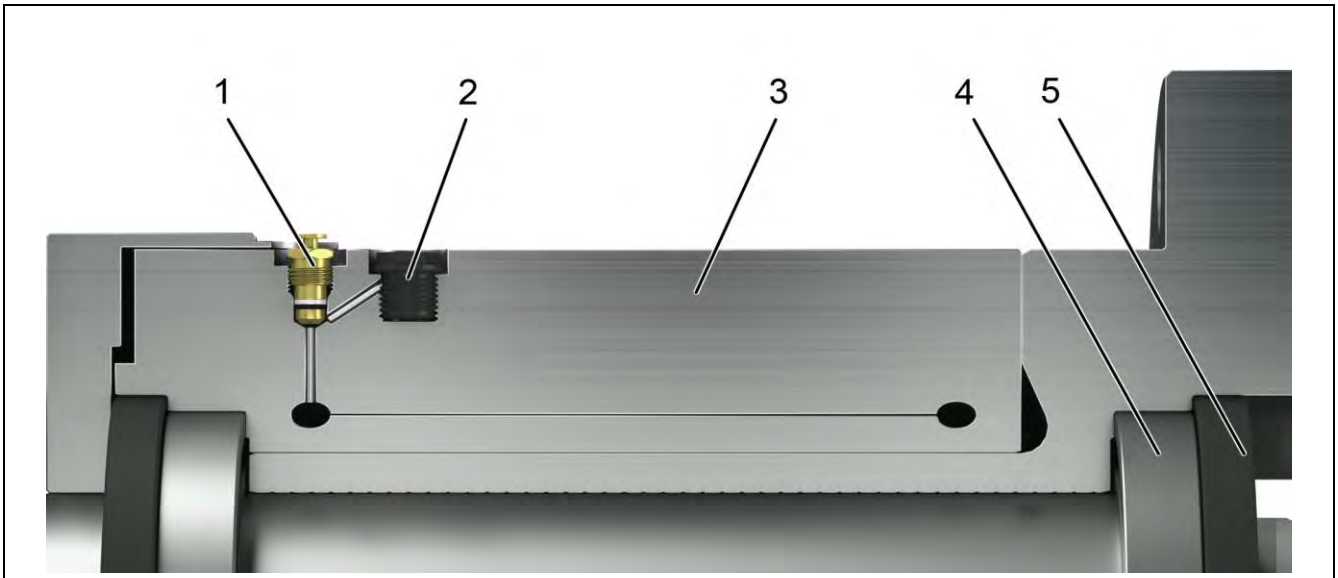


Fig. 15: Working principle

Legend

1 Shear tube
2 Injector connection
3 Clamping element
4 Roller bearing
5 Shaft seal

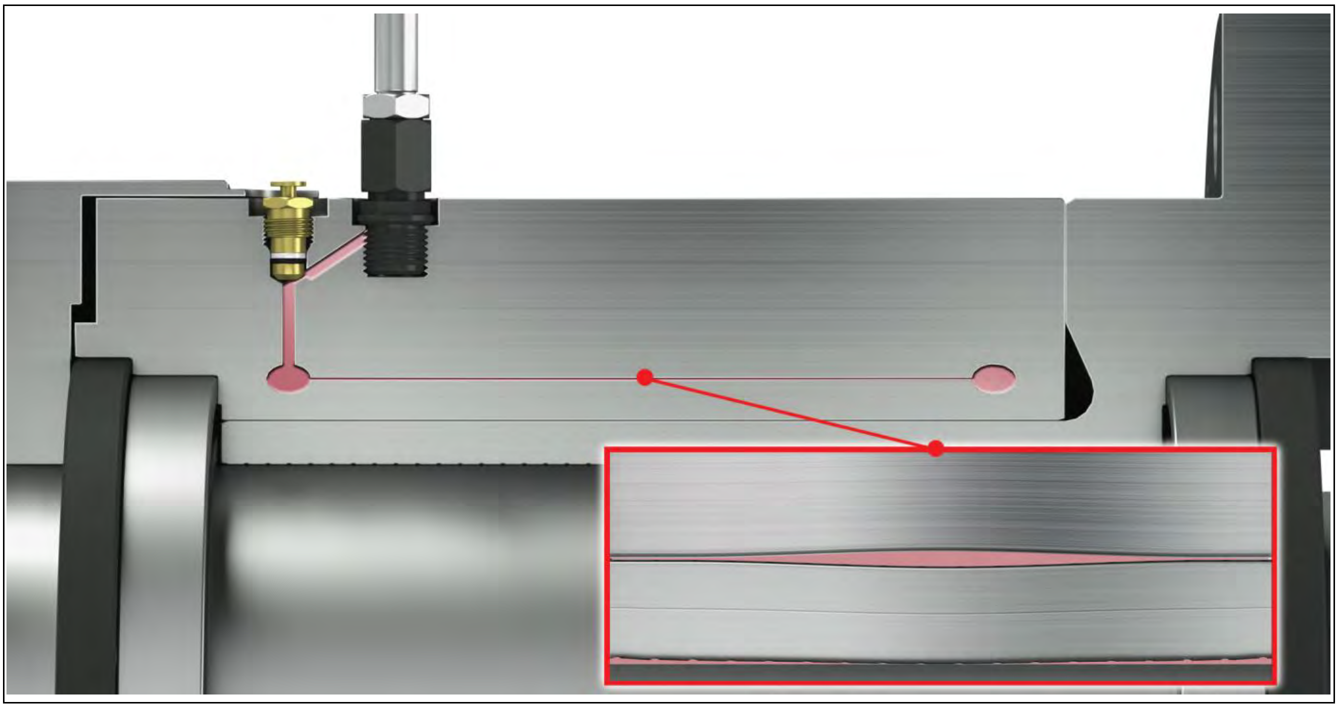


Fig. 16: Activating the coupling

The main element of the coupling, the clamping element, basically consists of two nested bushes, which are closed pressure-tight at both ends.

When the coupling is triggered, the roller bearing or, in the case of the B series, the plain bearing, ensures safe operation until the drive train comes to a standstill.

For activation, a hand lever pump is used to fill the coupling with hydraulic oil via the injector connection and thereby pressurise it. This causes expansion of the annular piston. The annular piston is closed pressure-tight via the shear tube. Installed between the shaft and the hub, this system behaves like a shrink fit. The torque is transmitted exclusively via frictional engagement.

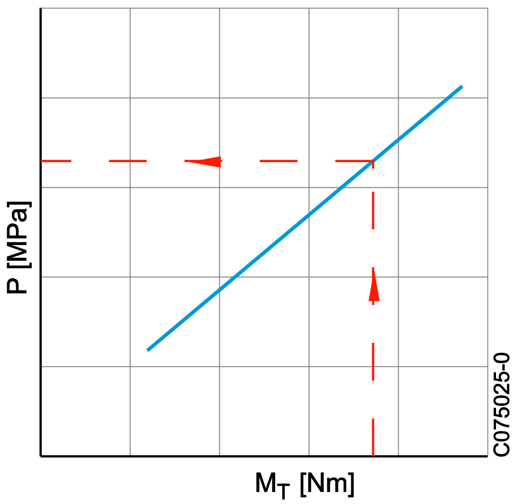


Fig. 17: Calibration diagram

An individual calibration diagram is enclosed with each coupling. The release torque M_T can be adjusted by varying the hydraulic pressure P.

In this way, the release torque can be adapted to the requirements of the line without replacing components.

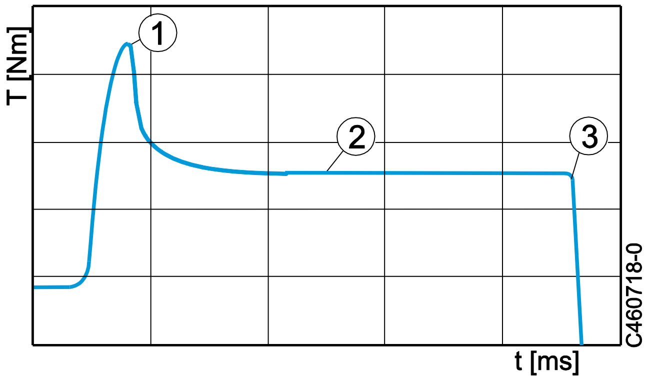


Fig. 18: Triggering sequence

In the event of a malfunction, the torque in the drive train increases until it reaches the triggering torque (**1**). At the slipping torque (**2**) the coupling slips on the shaft and there is relative movement between the clamping element and the shear ring fixed on the shaft. The shear ring shears the head off the shear tube, and within a few milliseconds the pressure in the annular piston drops (**3**). The coupling rotates on the roller bearings without transmitting torque.

This process takes place within a few milliseconds.

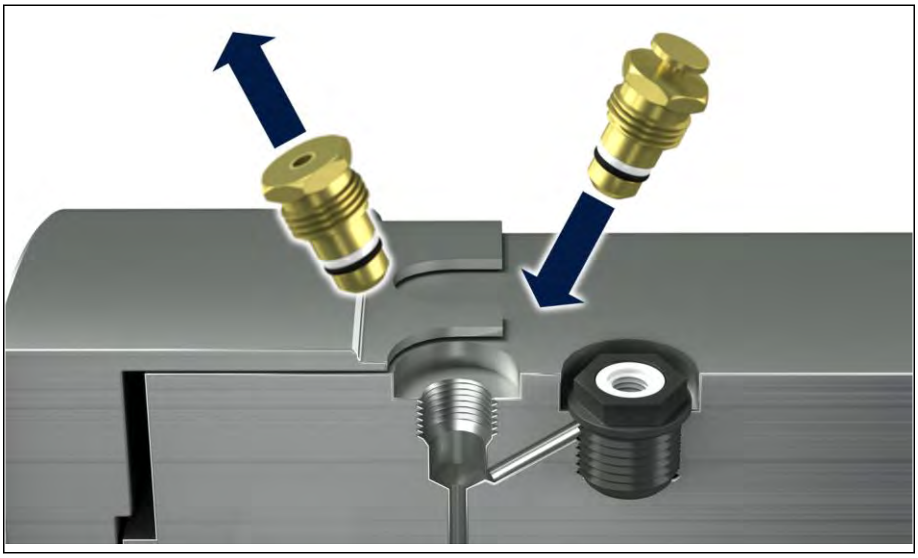


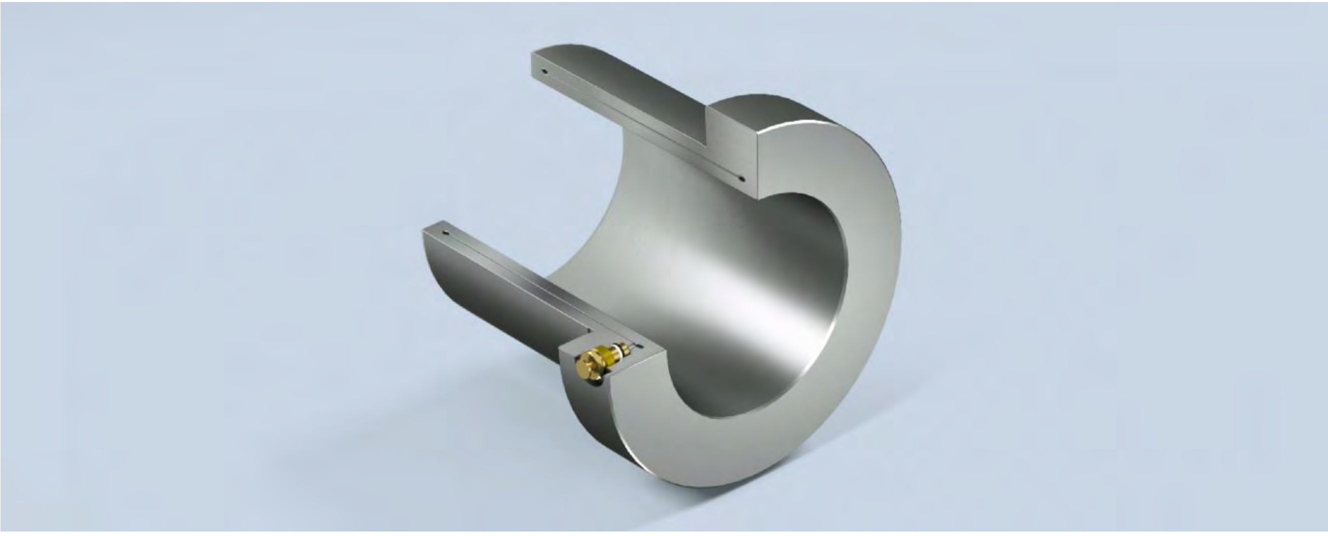
Fig. 19: Reactivation

The recommissioning of the system takes only a little time.

You dismantle the destroyed shear tube, insert a new shear tube and activate the coupling by applying pressure again.

The system can then be put back into operation immediately.

6.2 TORLOC® clamping element



The TORLOC® clamping element uses the same principle as the HYGUARD® safety coupling, but without using the safety function. The clamping element is used to fix wheels, hubs or other components on axles and shafts, and is always used when quick assembly and disassembly is required.

One application example is test stands, another application is the use as a clamping coupling with fine adjustment options.

6.3 Designs and dimension tables for HYGUARD® safety couplings

Designs	Series	Page
Basic series for low speeds	B	164
Series with roller bearings for higher speeds	BW	165
Series for grooved shafts and higher speeds	BWN	166
Coupling unit in flange version	BWL	167
Flanged series	HW	168
Flanged series for higher torques	HEW	169
Series for rolling mill drives	HDW	170
Clamping element	SP	171

Tab. 40: Designs of the HYGUARD® safety couplings and clamping elements

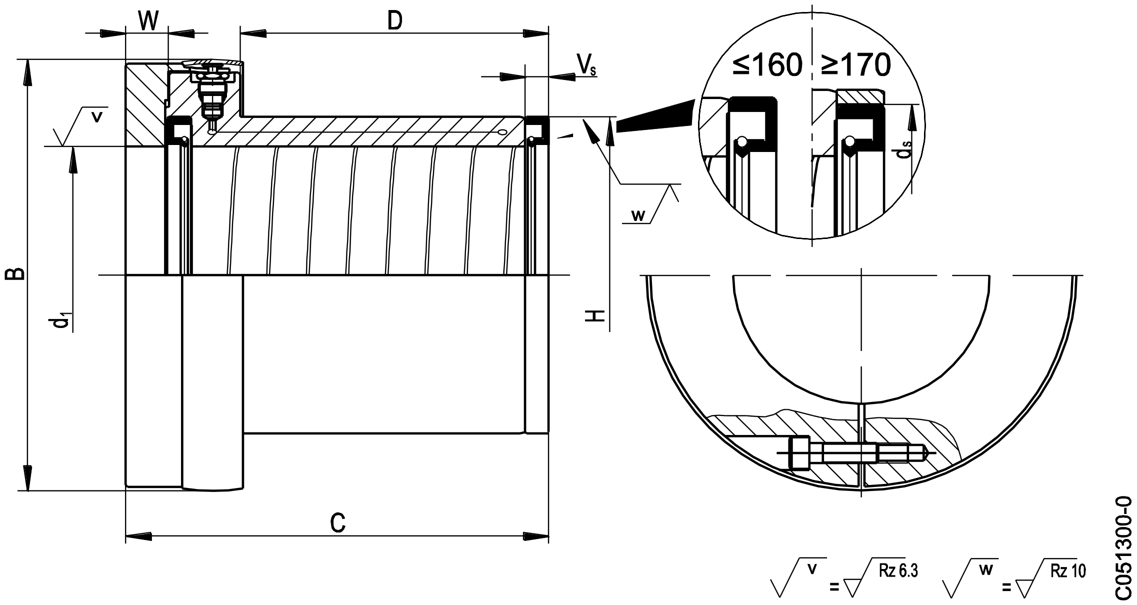
Tolerance information

The tolerances given in the dimension tables below generally refer to the shafts or other connecting parts (e.g. hubs).

6

B series

Dimension table no.: B919048

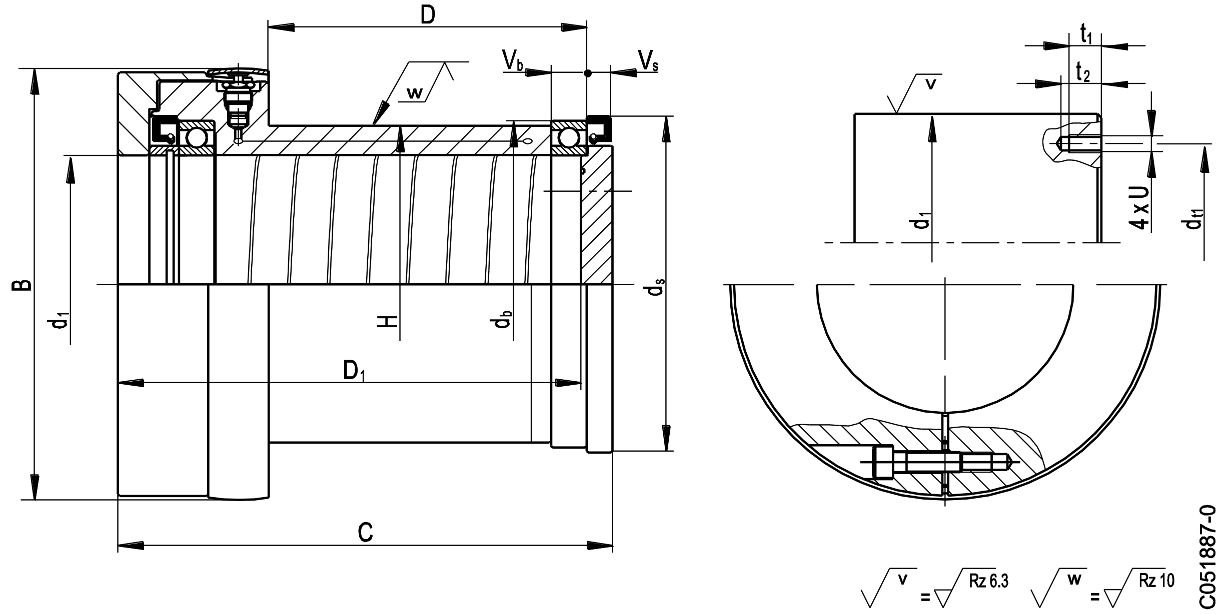


Size	Nominal torque T_{KN} kNm	Speed[1] n_{max} rpm	d_1 h6 mm	d_s[2] mm	B mm	C mm	D mm	H K6 mm	V_s mm	W mm	Mass moment of inertia kgm^2	Weight kg
30	0.30 - 0.60	955	30	-	98	82	40	40	4	12	0.0020	1.9
35	0.45 - 0.90	818	35	-	104	87	45	45	4	12	0.0025	2.1
40	0.65 - 1.3	716	40	-	109	94	52	52	5	12	0.003	2.5
45	0.85 - 1.7	636	45	-	116	102	60	58	7	12	0.004	2.8
50	1.1 - 2.2	572	50	-	122	109	65	65	8	14	0.006	3.4
60	1.8 - 3.6	477	60	-	133	117	73	75	8	14	0.009	4.0
70	3.0 - 6.0	409	70	-	148	130	82	90	8	18	0.016	5.7
80	3.9 - 7.8	358	80	-	157	146	98	100	8	18	0.021	6.5
90	5.0 - 10	318	90	-	168	158	110	110	8	18	0.028	7.5
100	7.5 - 15	286	100	-	183	180	120	125	12	22	0.051	11
110	10 - 20	260	110	-	201	176	121	140	12	20	0.072	13
120	13 - 25	238	120	-	209	205	145	150	12	22	0.097	16
130	17 - 33	220	130	-	218	214	156	160	12	20	0.12	17
140	20 - 40	204	140	-	228	225	165	170	13	22	0.14	19
150	23 - 46	190	150	-	238	235	175	180	13	22	0.17	21
160	36 - 71	179	160	-	246	260	195	200	15	20	0.26	28
170	39 - 78	168	170	200	256	256	191	210	15	20	0.29	28
180	49 - 98	159	180	210	274	256	191	225	15	20	0.37	32
190	63 - 126	150	190	220	286	302	236	240	15	17	0.54	43
200	70 - 140	143	200	230	296	302	236	250	15	17	0.61	45
220	85 - 170	130	220	250	314	302	236	270	15	17	0.76	49

[1] The peripheral speed on the sliding surface must not exceed 1.5 m/s. Higher speeds on request.
[2] The dimension d_s only applies to sizes ≥ 170, since there is a difference between the outer diameter H of the clamping element and the outer diameter of the radial shaft seal.

BW series

Dimension table no.: B919049

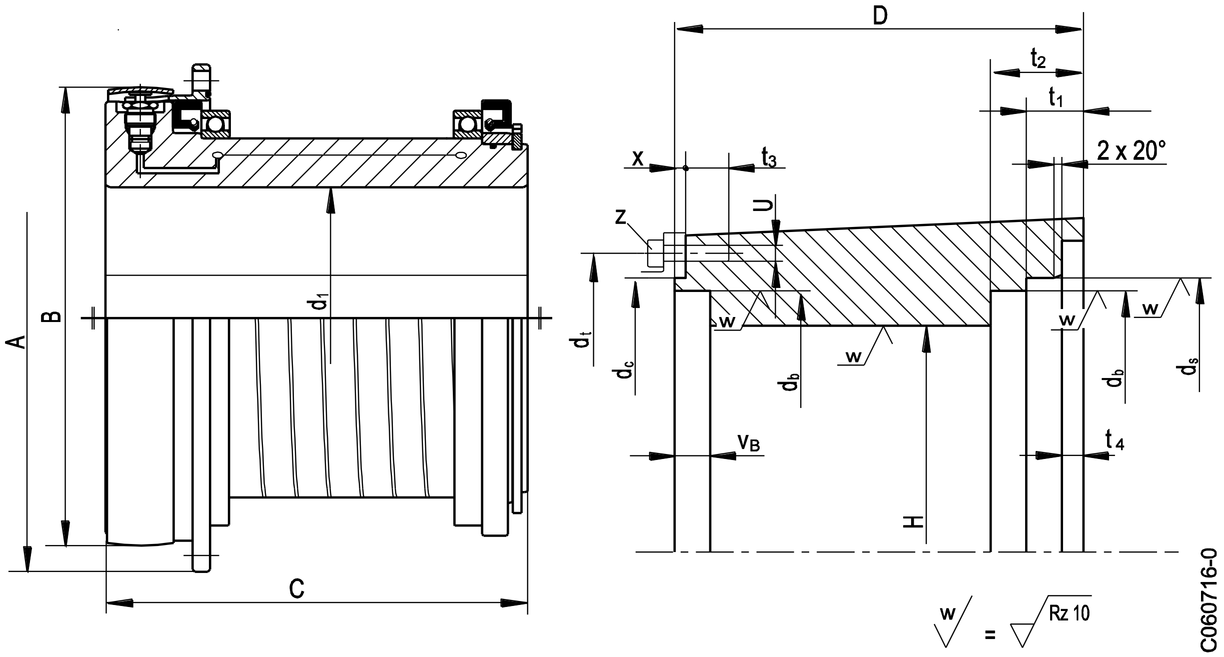


Size	Nominal-torque T_{KN} kNm	Speed[1] n_{max} rpm	d_1 h6 mm	d_b mm	d_s mm	d_{t1} mm	t_1 mm	B mm	C mm	D mm	D_1 mm	H K6 mm	U mm	V_b mm	Vs mm	Mass moment of inertia kgm²	Weight kg
60	1.8 - 3.6	7500	60	78	90	40	13	136	136,5	75	128	75	M6	10	7	0.012	5.3
70	3.0 - 6.0	6700	70	90	100	50	13	148	150	84	140,5	90	M6	10	7	0.019	7.0
80	3.9 - 7.8	6000	80	100	110	50	13	157	166	100	156,5	100	M6	10	8	0.025	8.0
90	5.0 - 10	5300	90	115	125	65	18	168	184	111	170	110	M8	13	12	0.035	9.7
100	7.5 - 15	4800	100	125	140	70	18	183	206	121	191	125	M8	13	12	0.061	13.9
110	10 - 20	4300	110	140	150	80	18	201	208	125	193	140	M8	16	12	0.091	17.2
120	13 - 25	3800	120	150	160	90	18	209	237	148	221	150	M8	16	13	0.118	20.3
130	17 - 33	3600	130	165	170	100	18	218	250	161	234	160	M8	18	13	0.144	22.2
140	20 - 40	3400	140	175	180	105	23	228	261	170	245	170	M10	18	13	0.179	24.7
150	23 - 46	3000	150	190	190	115	23	238	275	182	259	180	M10	20	13	0.221	27.6
160	36 - 71	2800	160	200	200	120	23	253	300	202	284	200	M10	20	13	0.342	37.4
170	39 - 78	2600	170	215	215	130	23	258	300	198	282	210	M10	22	15	0.379	38.6
180	49 - 98	2400	180	225	225	135	23	273	300	197	281	225	M10	22	16	0.493	44.5
190	63 - 126	2200	190	240	250	145	23	286	350	245	332	240	M10	24	15	0.698	56
200	70 - 140	2200	200	250	250	150	23	296	350	245	332	250	M10	24	15	0.819	61
220	85 - 170	1900	220	270	270	175	23	320	350	245	332	270	M10	24	15	1.09	68

[1] Higher speeds on request.

BWN series

Dimension table no.: B919051

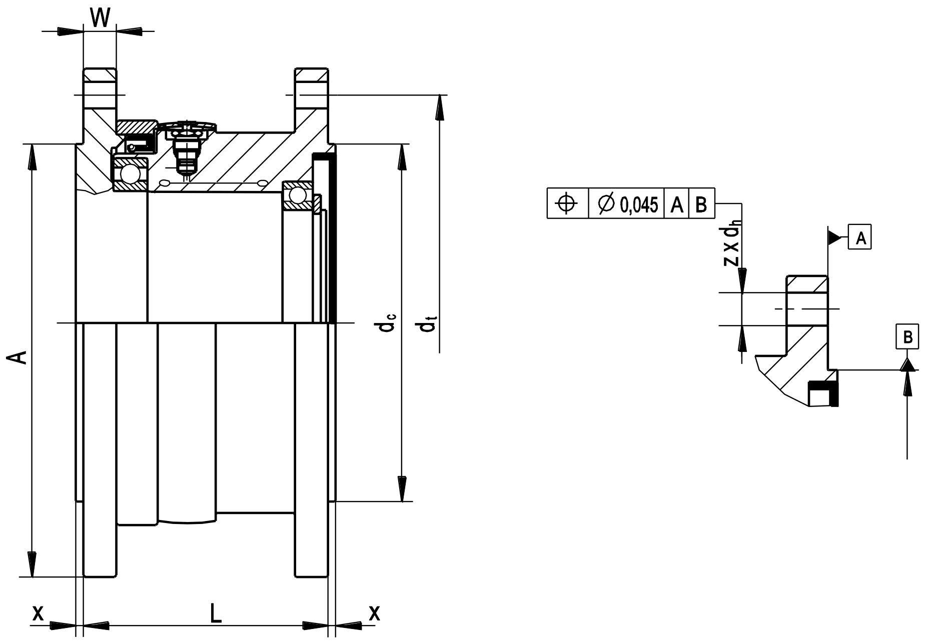


Size	Nominal torque T_{KN} kNm	Speed[1)] n_{max} rpm	d_1[3)] mm	d_b K6 mm	d_c h7 mm	d_s H8 mm	d_t mm	t_1 +0.2 mm	t_2 +0.2 mm	t_3 mm	t_4 mm	x ±0.1 mm	z -	A mm	B mm	C mm	D -0.2 mm	H H6 mm	U mm	V_b +0.2 mm	Mass moment of inertia[2)] kgm²	Weight[2)] kg
65	3 - 6	4500	65	115	125	125	148	18	31	20	5	4	4	159	137	136	93	90	M6	13	0.018	6.8
76	5 - 10	3400	76	133.35	140	140	166	20	33	15	7	4	4	177	159	146	103	107.95	M6	12.7	0.030	9.3
86	7 - 14	3400	86	146.05	150	150	174	20	33	15	7	4	4	185	168	160	117	120.65	M6	12.7	0.041	11.1
92	9 - 17	2800	92	152.4	160	160	181	21	34	15	7	4	4	192	179	172	128	127	M6	12.7	0.053	12.8
100	10 - 20	2600	100	165.1	170	170	193	21	34	15	7	4	4	204	183	176	132	139.7	M6	12.7	0.071	15.1
110	13 - 26	2600	110	177.8	185	185	206	18	31	21	7	4	4	221	201	175	134	152.4	M8	12.7	0.093	16.9
120	17 - 34	2400	120	190.5	200	200	218	21	34	21	7	4	4	233	209	194	150	165.1	M8	12.7	0.128	20.4
130	23 - 46	2200	130	203.2	210	210	229	21	34	21	7	4	4	243	224	219	175	177.8	M8	12.7	0.177	25.2
150	35 - 70	1700	150	228.6	240	240	262	22	35	14	9	4	4	277	253	253	210	203.2	M8	12.7	0.339	36.7
165	50 - 100	1500	168	254	270	270	295	25	38	14	9	4	4	310	284	281	235	228.6	M8	12.7	0.589	51
195	70 - 140	1500	193	279.4	290	290	318	26	39	14	9	4	4	333	304	303	256	254	M8	12.7	0.861	61
210	90 - 180	1400	208	304.8	320	320	342	25	38	14	9	4	4	357	330	311	265	279.4	M8	12.7	1.283	77

1) Higher speeds on request.
2) Values for the complete coupling for bore d_1 max.
3) Max. bore diameter with parallel key connection according to DIN 6885-1.
You will receive a detailed drawing of the connection geometry of the opposite part (hub) on request or after placing an order.

BWL series

Dimension table no.: B919052



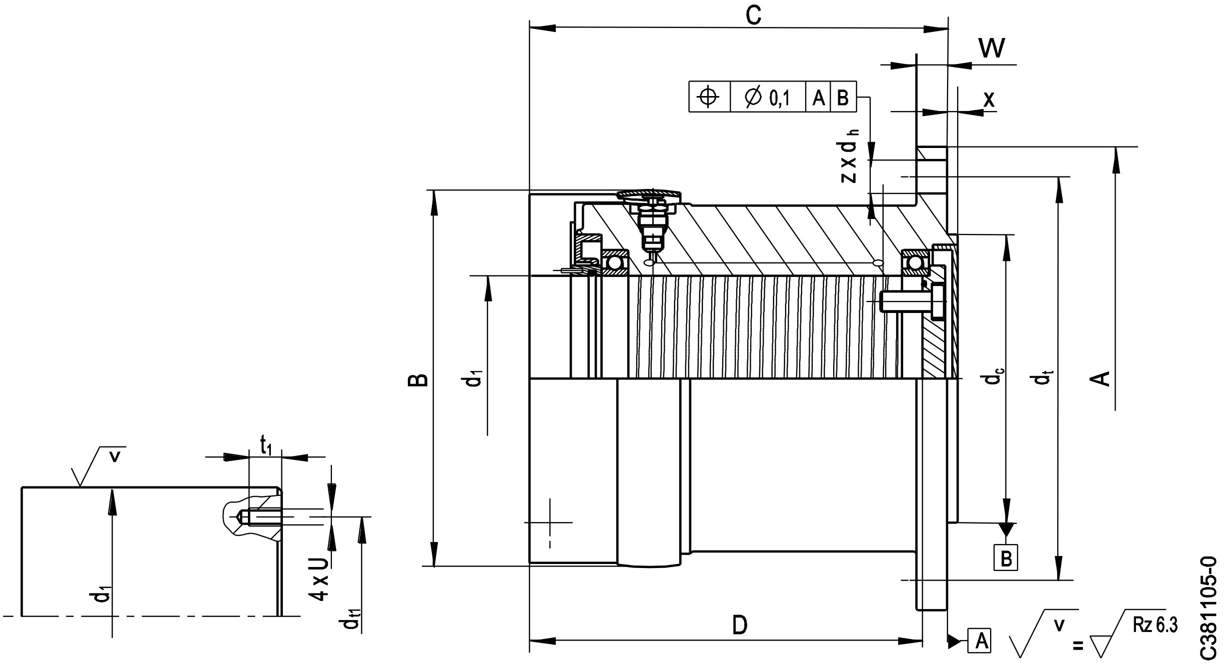
C055629-0

Size	Nominal torque T_{KN} kNm	Speed[1)] n_{max} rpm	Dimensions								Mass moment of inertia kgm^2	Weight kg
			d_c H6 mm	d_h D7 mm	d_t mm	x mm	z -	A mm	L mm	W mm		
30	0.40 - 0.80	6700	80	8	102	2	6	118	80	12	0.007	5.1
40	0.71 - 1.42	6000	95	9	126	2	6	145	90	12.5	0.016	8.0
50	1.40 - 2.80	5300	110	9	145	2	8	165	110	12.5	0.031	12.5
60	2.50 - 5.00	4300	135	11	175	2.5	8	200	105	15	0.064	17.3
70	4.00 - 8.00	3800	150	11	192	3	10	220	110	15	0.103	22.8
80	5.60 - 11.2	3600	170	11	210	3	12	240	120	15	0.150	28.6
90	8.00 - 16.0	3000	190	14	242	4	10	270	130	17.5	0.266	39.9
100	11.2 - 22.4	2800	200	14	248	4	12	280	140	17.5	0.364	49.1
110	14.0 - 28.0	2600	220	17	274	4	12	310	150	23	0.579	63
125	22.4 - 44.8	2200	250	17	302	5	16	340	160	23	0.918	83
140	31.5 - 63.0	1900	280	20	342	5	14	390	170	26	1.55	110
160	45.0 - 90.0	1800	320	24	386	5	14	435	180	29	2.73	152
180	63.0 - 126	1700	360	24	430	5	16	480	195	29	4.18	196
200	90.0 - 180	1500	410	28	486	6	16	545	210	34	7.99	283
220	125 - 250	1500	450	28	525	8	18	580	230	36	11.5	359

[1)] Higher speeds on request.

HW series

Dimension table no.: B919053-1

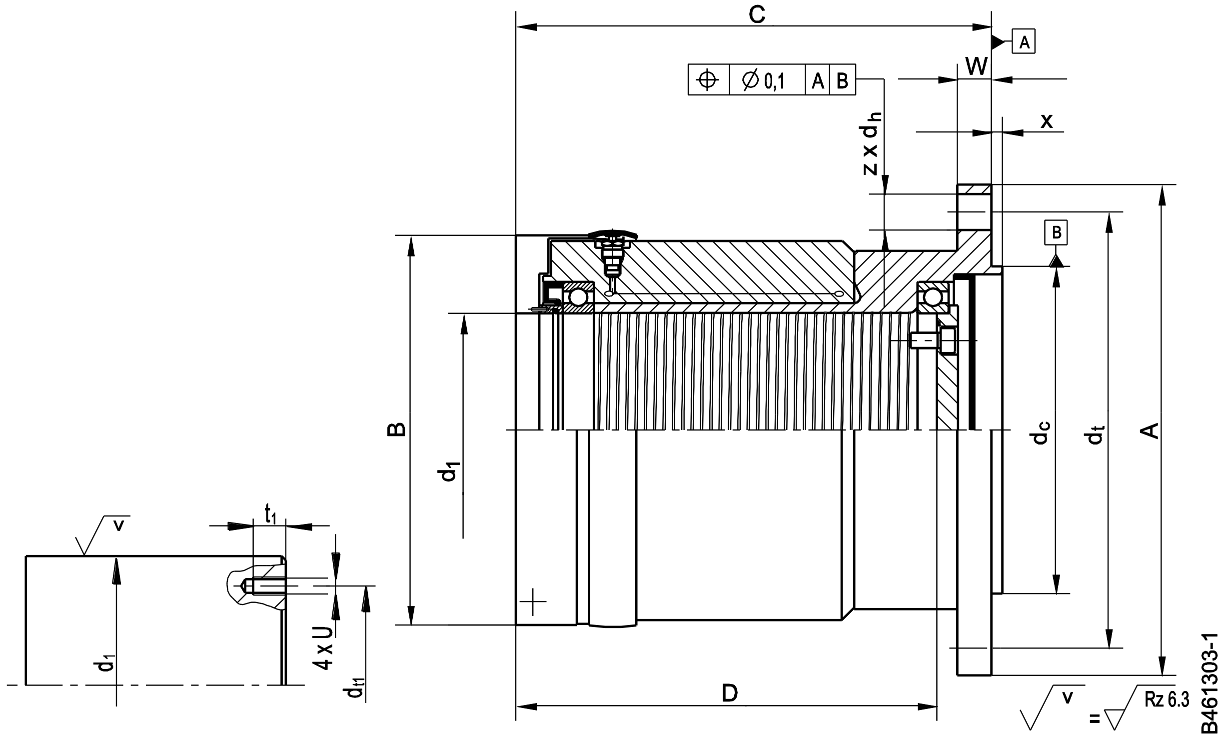


Size	Nominal torque T_{KN} kNm	Speed[1)] n_{max} rpm	d_1 h6 mm	d_c H7 mm	d_h C12 mm	d_t mm	d_{t1} mm	t_1 mm	x mm	z -	A mm	B mm	C mm	D mm	U mm	W mm	Mass moment of inertia kgm^2	Weight kg	Standard Cardan shaft size
60	1.8 - 3.6	7500	60	90	12	130	40	21	2.3	8	150	136	136	128	M6	12	0.023	9.5	150
			60	110	14	155.5	40	21	2.5	8	180	136	136	128	M6	14	0.031	11.1	180
70	3 - 6	6700	70	90	12	130	50	21	2.3	8	150	148	150	140	M6	12	0.034	11.7	150
			70	110	14	155.5	50	21	2.5	8	180	148	150	140	M6	12	0.043	13.5	180
80	3.9 - 7.8	6000	80	110	14	155.5	50	20	2.5	8	180	157	166	156	M6	12	0.055	15.5	180
			80	140	16	196	50	20	4	8	225	157	166	156	M6	15	0.074	17.8	225
90	5 - 10	5300	90	110	14	155.5	65	21	2.5	8	180	168	184	171	M8	12	0.074	18.2	180
			90	140	16	196	65	21	4	8	225	168	184	171	M8	15	0.093	20.4	225
100	7.5 - 15	4800	100	140	16	196	75	25	4	8	225	183	203	191	M10	15	0.13	25.6	225
			100	140	18	218	75	25	5	8	250	183	203	191	M10	18	0.16	27.2	250
			100	175	20	245	75	25	6	8	285	183	203	191	M10	20	0.19	29.9	285

1) Higher speeds on request.
Cardan shaft size corresponds to flange diameter A.
Different flange connections are also available on request.

HEW series

Dimension table no.: B919054-1

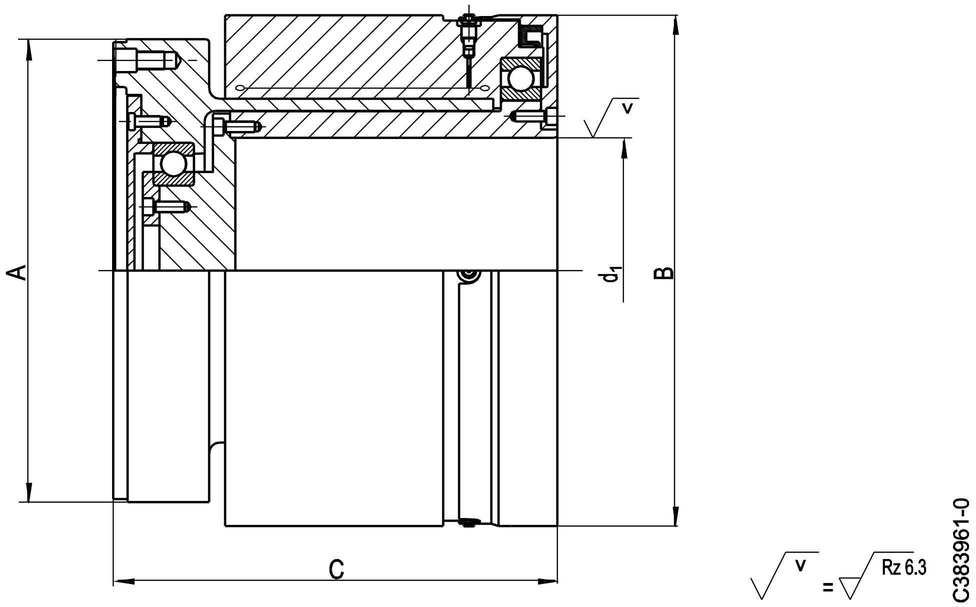


Size	Nominal torque T_{KN} kNm	Speed[1] n_{max} rpm	d_1 h6 mm	d_c H7 mm	d_h C12 mm	d_t mm	d_{t1} ±0.2 mm	t_1 mm	x mm	z -	A mm	B mm	C mm	D mm	U mm	W mm	Mass moment of inertia kgm²	Weight kg	Standard Cardan shaft size
100	7.5 - 15	4800	100	140	18	218	70	18	5	8	250	187	209	200	M8	18	0.19	31.4	250
			100	175	20	245	70	18	6	8	285	187	209	200	M8	20	0.23	34.4	285
110	10 - 20	4300	110	140	18	218	80	18	5	8	250	200	208	198	M8	18	0.22	33.4	250
			110	175	20	245	80	18	6	8	285	200	208	198	M8	20	0.27	36.9	285
120	13 - 26	3800	120	140	18	218	60	23	5	8	250	215	237	220	M10	18	0.30	41.0	250
			120	175	20	245	60	23	6	8	285	215	237	220	M10	20	0.36	45.3	285
			120	175	22	280	60	23	6	8	315	215	237	220	M10	22	0.42	48.1	315
130	17 - 33	3600	130	175	20	245	100	18	6	8	285	237	250	234	M8	20	0.53	58	285
			130	175	22	280	100	18	6	8	315	237	250	234	M8	22	0.60	62	315
			130	220	22	310	100	18	7	10	350	237	250	234	M8	25	0.70	67	350
140	20 - 40	3400	140	190	20	245	110	23	6	8	285	235	261	243	M10	20	0.46	48.7	285
			140	175	22	280	110	23	6	8	315	235	261	243	M10	22	0.61	59	315
			140	220	22	310	110	23	7	10	350	235	261	243	M10	25	0.64	58	350
150	25 - 50	3000	150	210•	22	280	115	23	6	8	315	250	305	270	M10	22	0.69	64	315
			150	220	22	310	115	23	7	10	350	250	305	270	M10	25	0.80	68	350
160	35 - 71	2800	160	220	22	310	120	23	7	10	350	280	355	320	M10	25	1.46	110	350
			160	250	24	345	120	23	7	10	390	280	355	320	M10	32	1.66	116	390
180	49 - 98	2400	180	280	27	385	135	23	7	10	435	310	300	281	M10	28	2.21	125	435

[1] Higher speeds on request. • not to the Cardan shaft standard
Cardan shaft size corresponds to flange diameter A.
On request, also available with different flange connections and also in a cross wedge version.

HDW series

Dimension table no.: B919055

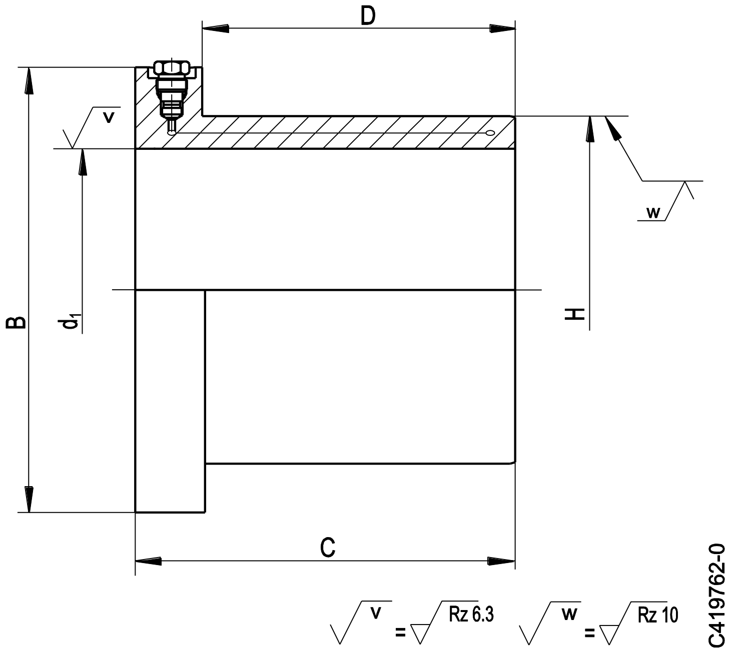


Size	Nominal torque T_{KN} kNm			Dimensions d_1 mm	A mm	B mm	C mm	Weight kg
240	200	-	400	240	315	520	500	400
320	350	-	750	320	390	600	600	800
400	700	-	1400	400	550	750	750	1500
480	1000	-	2000	480	700	900	950	2200
570	1700	-	3500	570	800	1070	1150	3500
640	2500	-	5000	640	880	1200	1200	5000
720	3500	-	7000	720	1020	1350	1350	7000
800	5000	-	10000	800	1220	1500	1500	10000

The coupling sizes listed are design examples.
The coupling is adapted to the special requirements.

SP series

Dimension table no.: B919057



Sizing

$T_S \leq T_{KN} \cdot f$

$F_a \leq F_{KA} \cdot f$

$T_{S.}$ = existing starting torque or shock torque [Nm]
T_{KN} = permissible torque [Nm]
f = axial force factor
$F_{A.}$ = existing axial force [N]
F_{KA} = permissible axial force [N]

Axial force

F_{KA} using the example of the SP 30:

	≤ 4.500 N	f = 1
> 4.500 N	≤ 9.000 N	f = 0.9
> 9.000 N	≤13.500 N	f = 0.8

Size	Nominal torque[1)] T_{KN} Nm	Axial force F_{KA} [2)] f = 1 N	f = 0.9 N	f = 0.8 N	Dimensions d_1 h6 mm	B mm	C mm	D mm	H H7 mm	Mass moment of inertia kgm^2	Weight kg
30	390	4500	9000	13500	30	85	66	36	40	0.0012	1.33
35	610	6000	12000	18000	35	91	71	41	45	0.0016	1.50
40	900	7800	15600	23400	40	96	77	47	52	0.0021	1.72
45	1370	10500	21000	31500	45	103	83	53	58	0.0028	2.03
50	1620	11200	22400	33600	50	109	87	57	65	0.0036	2.35
60	2900	16900	33800	50700	60	120	95	65	75	0.0054	2.81
70	4000	20000	40000	60000	70	135	104	74	90	0.0095	3.92
80	6700	29000	58000	87000	80	144	120	90	100	0.0131	4.65
90	9800	38000	76000	114000	90	155	132	102	110	0.0182	5.47
100	11900	41000	82000	123000	100	170	146	108	125	0.0335	8.18
110	13600	43000	86000	129000	110	188	144	109	140	0.0497	10.0
120	20500	59000	118000	177000	120	196	171	133	150	0.0678	12.2
130	26800	70000	140000	210000	130	205	182	144	160	0.0844	13.6
140	33800	83000	166000	249000	140	215	190	152	170	0.1042	15.0
150	41000	95000	190000	385000	150	225	200	162	180	0.1281	16.5
160	47500	100000	200000	300000	160	233	225	180	200	0.2105	24.0
170	53000	108000	216000	324000	170	243	221	176	210	0.2425	24.9
180	57000	111000	220000	333000	180	261	221	176	225	0.3298	29.7
190	81000	148000	296000	444000	190	273	270	222	240	0.4906	40.0
200	92000	160000	320000	480000	200	283	270	222	250	0.5598	41.9
220	113000	178000	256000	534000	220	301	270	222	270	0.7096	45.1

[1)] max. permissible torque. The starting torque and shock torque must not exceed this value.
[2)] Please contact us for larger axial forces.

6.4 Accessories

6.4.1 Service Box

Fig. 20: Service Box R 120

In addition to a hand pump, various (standard) tools are required to assemble and operate the coupling. RENK offers two different service boxes that contain all the necessary tools and a hand pump.

For the standard versions listed in this catalogue, the service box with the hand pump R 120 (see Fig. 20) is sufficient.

The service box with the hand pump R 120 vT and a larger tank is available for couplings larger than the catalogue sizes or for couplings of the HDW series. The larger tank volume permits larger couplings to be pressurised more quickly.

For coupling sizes beyond this, the use of a motorised high-pressure pump is recommended.

For applications that require a higher pressure setting accuracy, we can offer digital precision pressure gauges.

For more information, please contact RENK.

6.4.2 Lubrication oil and pressure oil

For standard applications, we recommend our HyLub 13 for both lubrication and pressurisation.

You can order the HyLub 13 from RENK in 1-litre bottles. The service box contains one or two bottles of HyLub13.

Special oils can be used for special applications. The required lubricating oil and pressure oil is specified on the order-related dimension sheet.

6.4.3 Shear tubes

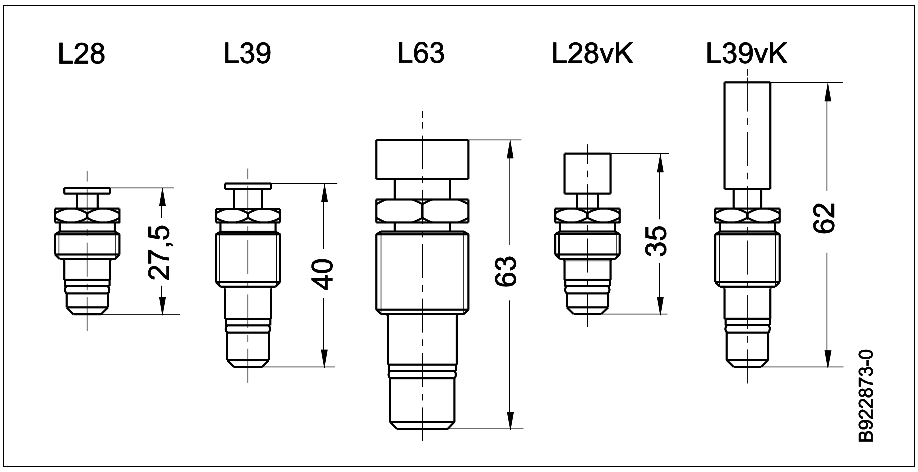


Fig. 21: Shear tubes for HYGUARD® safety couplings

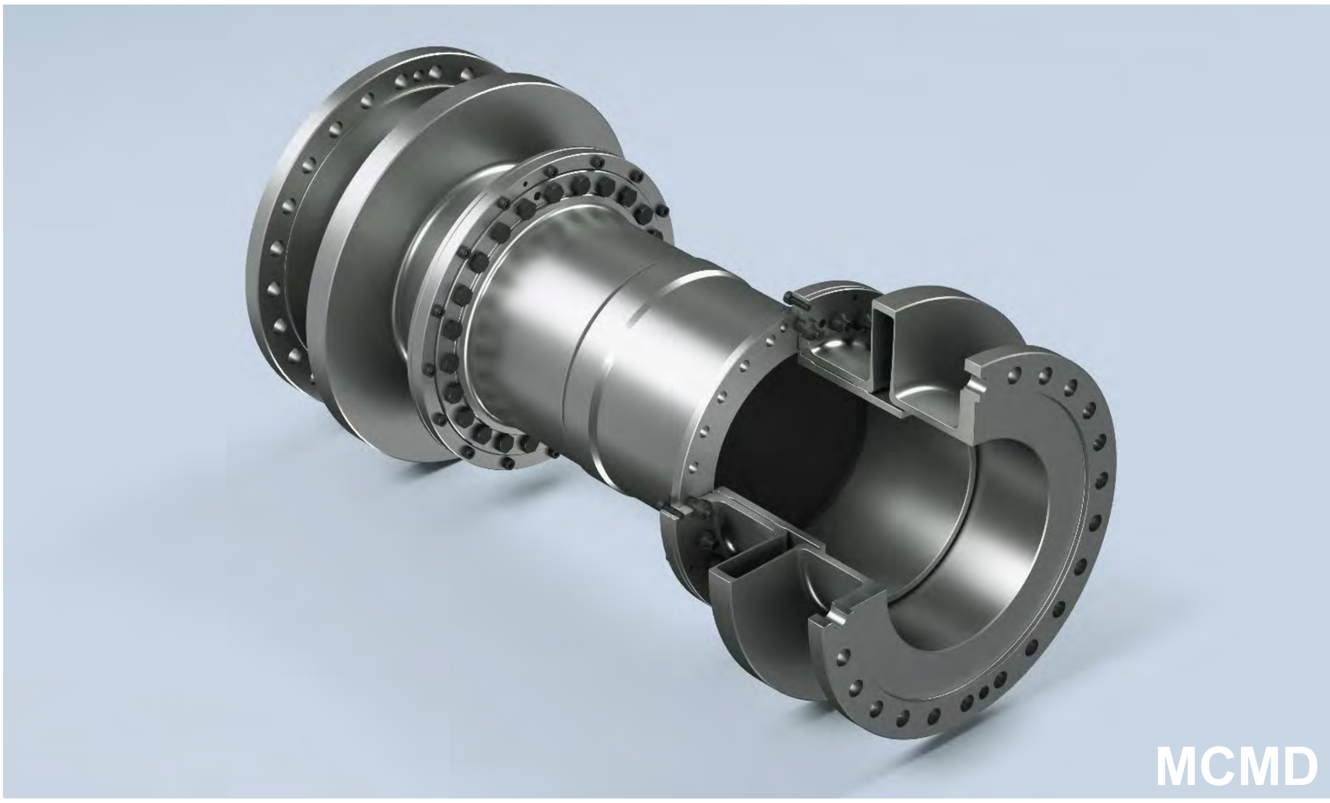
Different shear tubes are used depending on the size and application of the coupling. The Fig. 21 shows the available versions. The table below shows the number of shear tubes for the different types and sizes. Deviations from this are permissible in special cases.

TORLOC® clamping elements are equipped with screw plugs instead of shear tubes.

	Size		Shear tube	
Type	**from**	**to**	**Quantity**	**Size**
B	30	220	1	L28
BW	60	140	1	L28
BW	150	220	2	L28
BWN	65	110	1	L28
BWN	120	210	2	L28
BWL	30	100	1	L28
BWL	110	140	2	L28
BWL	160	220	4	L39
HW	60	100	1	L28
HEW	100	140	1	L28
HEW	150	160	2	L28
HDW	On request			

Tab. 41: Size and quantity of shear tubes

7 Diaphragm couplings – High-speed series



7

A diaphragm contour developed individually for the application ensures the operation of the system and enables high displacements even under maximum load. Long service life and freedom from maintenance ensure high availability. RENK diaphragm couplings offer impressive and consistently high manufacturing quality for individual customer solutions.

7.1 How the coupling works

A profiled single-disk diaphragm transmits very high torques at very high speeds safely, reliably and always without problems. Due to the low weight of the diaphragm and the extremely high balancing quality that can be achieved, this coupling is an ideal addition to high-speed gear units in the power range up to 150 MW and a continuous torque of up to 3.500.000 Nm. The individually shaped diaphragm contour ensures the flexibility of the coupling in order to compensate for axial, radial and angular displacements, even under load, without generating large restoring forces.

Where the demands on the displacement capability are particularly high, the coupling can be designed as a double diaphragm arrangement (MCMD series). The double diaphragm coupling provides additional flexibility in terms of displacement with the same performance capacity and coupling size.

The basic version of the diaphragm coupling consists of only a few components. This makes assembly and handling much easier for the operator. In addition, the coupling offers impressive maintenance-free operation; there is no need for a lubricant supply.

The manufacturing process of our diaphragm couplings is the basis for their outstanding availability. Every single component is characterised by very high demands on concentricity and axial run-out accuracy. The balance quality is constant at the highest level. A final overall balancing enables the system to run with little vibration.

Each diaphragm coupling is designed for the specified application using the most modern calculation methods (including FEM). This is how tailor-made solutions are created for the maximum success of every system.

7.2 Designs of the product family MC

Designs	Series
Marine design	MCM
Marine design as a double diaphragm design	MCMD
Reduced moment design	MCR

Tab. 42: Designs of the product family MC

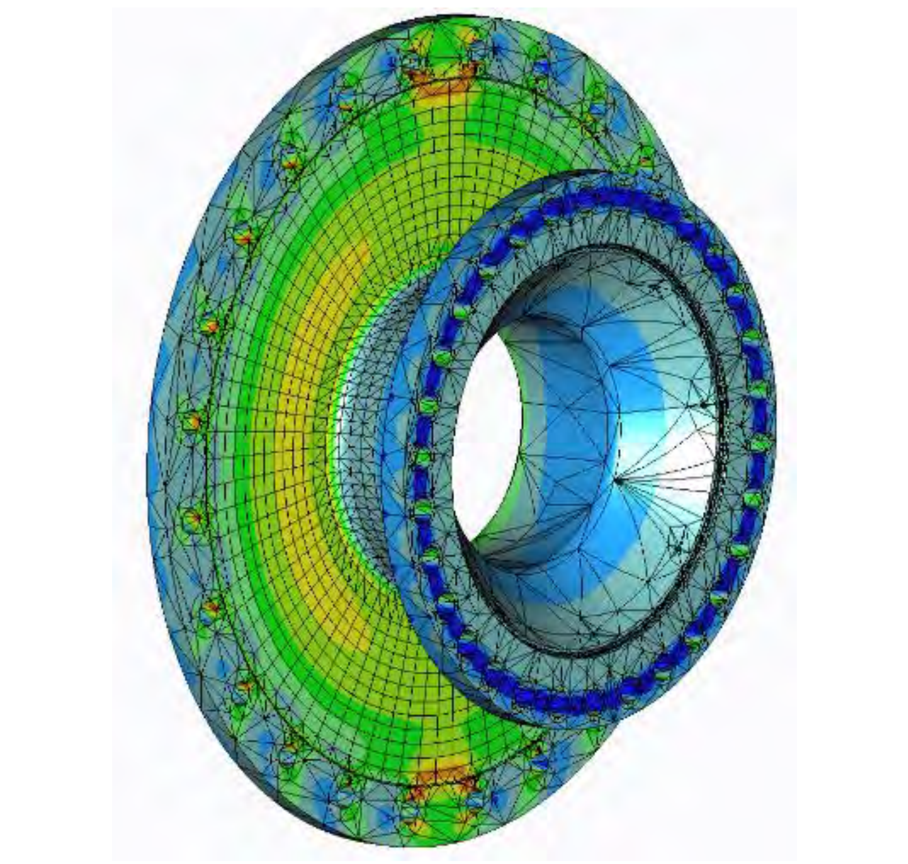


Fig. 22: Optimisation of a single-disk diaphragm using FE methods

7.3 Customer-specific design of the diaphragm coupling

Diaphragm couplings from RENK are individually adapted to the needs of the respective application. This ensures that the best possible coupling solution can be selected for each application, thus maximising the service life of the driving and driven machines.

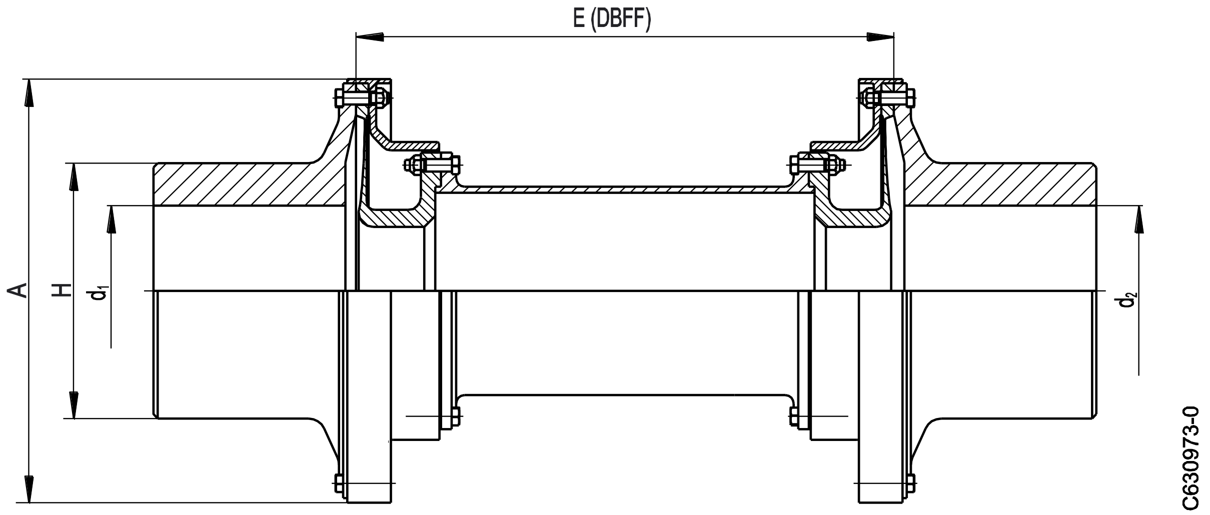
In the course of the technical clarification, a coupling design is developed together with the customer, which is tailored to the most varied of requirements. Diaphragm couplings can be highly flexible and very light, but other applications require more rigid and robust variants.

The dimension table for the MCM series already provides you with some information for an initial pre-selection of the coupling.

For enquiries about diaphragm couplings, please contact RENK with your requirements catalogue. The contact address can be found on the back cover of this catalogue.

MCM series

Dimension table no.: C630983-0



Size	Nominal torque T_{KN} kNm	Speed n_{max} rpm	Dimensions d_1; d_2 max mm	 A mm	 E_{min} mm	 H mm	Permissible displacement $\Delta K_{A\,max}$ mm	 $\Delta K_{W\,max}$ Degree
164 **165**	7.80 9.75	19100	114	199	202	160	1.4 1.1	0.25 0.20
184 **185**	11.1 13.8	16200	129	235	242	180	1.6 1.3	0.25 0.20
204 **205**	15.4 19.0	14900	143	255	262	200	1.8 1.5	0.25 0.20
224 **225**	20.5 25.3	13800	157	275	282	220	2.0 1.6	0.25 0.20
254 **255**	29.9 37.2	12000	179	318	316	250	2.2 1.8	0.25 0.20
283 **284** **285**	31.8 42.4 52.3	11100	200	344	346	280	3.2 2.5 2.0	0.33 0.25 0.20
323 **324** **325**	49.0 63.0 78.0	9800	229	389	406	320	3.6 2.9 2.3	0.33 0.25 0.20
353 **354** **355**	64.0 83.0 102	9000	250	421	426	350	3.7 3.1 2.5	0.33 0.25 0.20
403 **404** **405**	92 123 153	7800	286	486	492	400	4.8 3.6 2.8	0.33 0.25 0.20
453 **454** **455**	132 175 222	7100	321	533	522	450	5.4 4.1 3.2	0.33 0.25 0.20
504 **505**	240 300	6200	357	611	606	500	4.5 3.6	0.25 0.20
564 **565**	340 430	5600	400	671	646	560	5.0 4.0	0.25 0.20
634 **635**	470 614	5000	450	751	744	630	5.8 4.5	0.25 0.20

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