RINGSPANN®
Power Transmission

Cardan Shafts

Edition 2026/2027

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Overview of RINGSPANN Cardan Shafts

Cardan shafts, also known as drive shafts or universal joints, are torsionally rigid couplings. They are an indispensable component in many areas of mechanical and vehicle engineering, used to connect prime movers and driven machines.

RINGSPANN has more than 60 years of experience in the development, production and worldwide distribution of cardan shafts.

Our product range comprises three standard designs of cardan shaft, each with five types of flange yokes. In addition, we offer four special designs of cardan shaft as well as customer-specific designs.

Thanks to our comprehensive application and manufacturing expertise, as well as high quality standards, we deliver solutions designed for reliability, durability and precision.

A global network of subsidiaries and sales partners ensures that you can count on personal local service wherever you are. Assembly and production facilities in various countries ensure fast and reliable delivery

Standard Designs of Cardan Shafts

Cardan Shaft CSL
with length compensation

Cardan Shaft CSS
short with length compensation

Cardan Shaft CSF
without length compensation

Special Designs of Cardan Shafts

Cardan Shafts CSZ
with intermediate bearings

Cardan Shafts CSM
in modular design

Double-Flanged Joint CSD

Double-Flanged Joint CSH
with H-type yoke

Types of Flange Yokes

Flange yoke B
with frictional connection

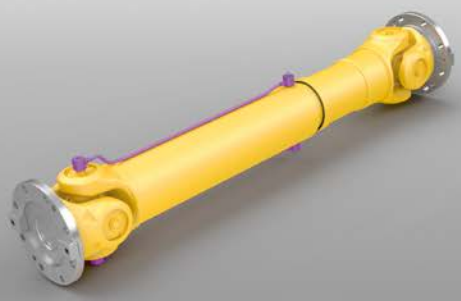
Flange yoke S
with clamping sleeves

Flange yoke K
with face key

Flange yoke T
with jaw teeth

Flange yoke H
with Hirth serration

Customized Designs



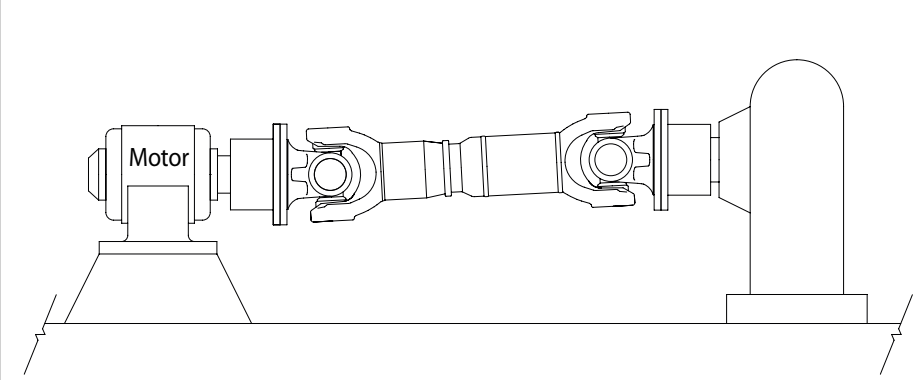
Example: Cardan shaft with external lubrication

Basic Functions of Cardan Shafts

Cardan shafts perform several basic functions within the driveline. They are not only couplings for torque transmission, but also enable the flexible compensation of movements and positional changes between the input and output sides.

Torque and Speed Transmission

Cardan shafts ensure reliable power transmission from the driving machine to the driven machine, even under changing loads and dynamic operating conditions.



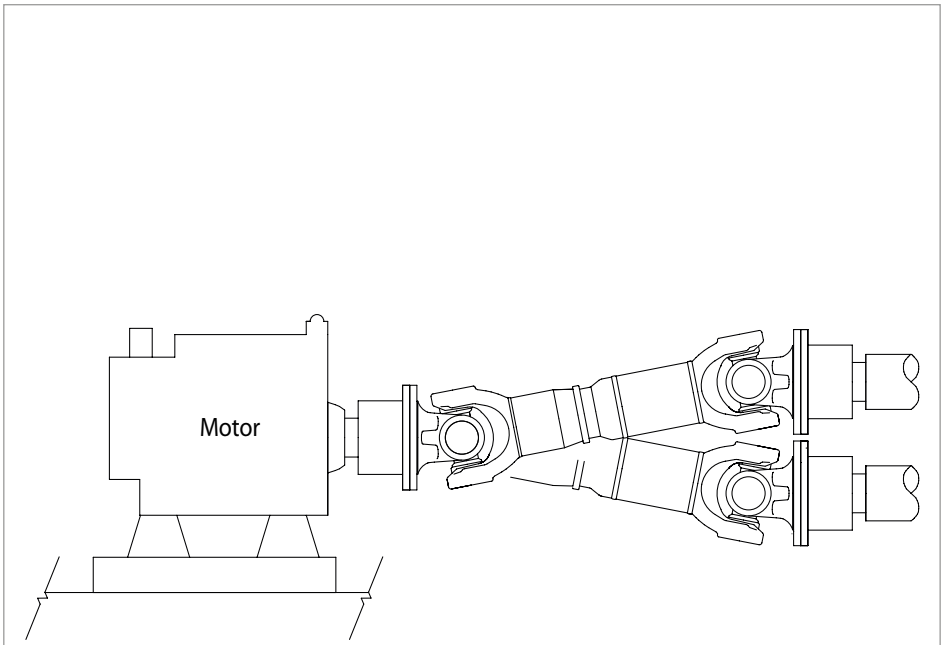
4-1

Compensation of Length Changes

Thanks to their telescopic design, cardan shafts compensate for changes in the distance between the input and output sides. This is particularly relevant for machines that move vertically or horizontally during operation.

Compensation for Angular Misalignment

Cardan shafts compensate for angular misalignment. This allows for flexible machine layouts without complex foundation work.



4-2

Your Benefits at a Glance

- Reliable torque transmission
- Flexibility through compensation of length changes and misalignments
- Easy integration into a wide range of drivelines

Application Areas of Cardan Shafts

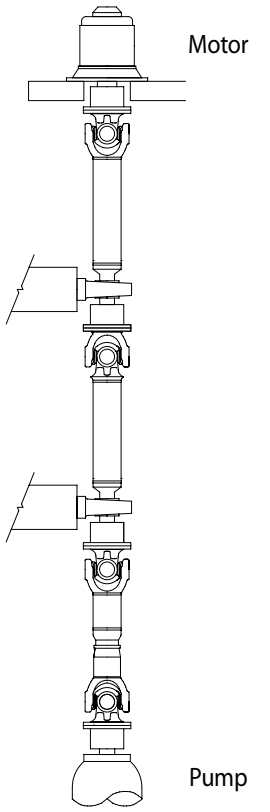
RINGSPANN Cardan Shafts are used in a wide range of machines and systems. The main applications are:

- Rolling mill drives (e.g. hot and cold rolling stands, transport lines)
- Paper machines (e.g. wet and dry sections)
- Pump drives (e.g. wastewater and service water pumps)
- Test benches (e.g. for engines, gearboxes, other drive components)
- Heavy machinery construction (e.g. presses, crushers, shredders)
- General machinery and plant engineering (e.g. conveyor systems, mixers, mine fans)
- Rail vehicles and ships (main and auxiliary drives)

Application Example: Pumps

RINGSPANN Cardan Shafts have been used in pump drives for decades – from water and wastewater pumps to process pumps in industrial plants.

- **Function:** Bridging large vertical distances between motor and pump.
- **Features:** Driveline consisting of cardan shafts with intermediate bearings and cardan shafts with length compensation.
- **Benefits:** Smooth running, long service life and reliable continuous operation even under demanding conditions.

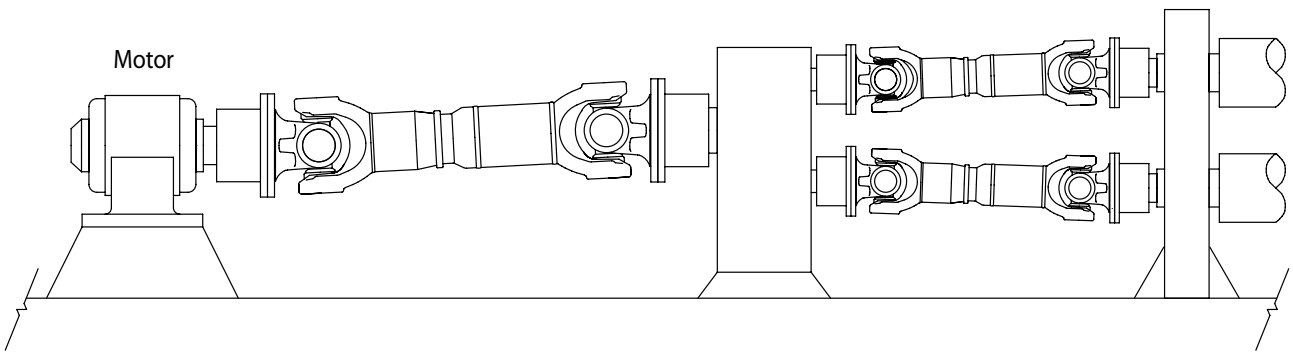


5-1

Application Example: Rolling Mills

In rolling mills, RINGSPANN Cardan Shafts ensure reliable torque transmission between the main drive and the rolling stands.

- **Function:** Transmission of very high torques in a compact design, even under highly fluctuating loads caused by varying material thicknesses and widths as well as roll separating forces.
- **Features:** Robust design, high wear resistance and optimized lubrication for continuous operation in demanding environments.
- **Benefits:** Reliable function even under shock and vibration loads, increased machine availability and reduced downtime costs.



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Design of Cardan Shafts

RINGSPANN Cardan Shafts consist of precisely matched components that ensure high reliability and a long service life:

1 Journal Cross

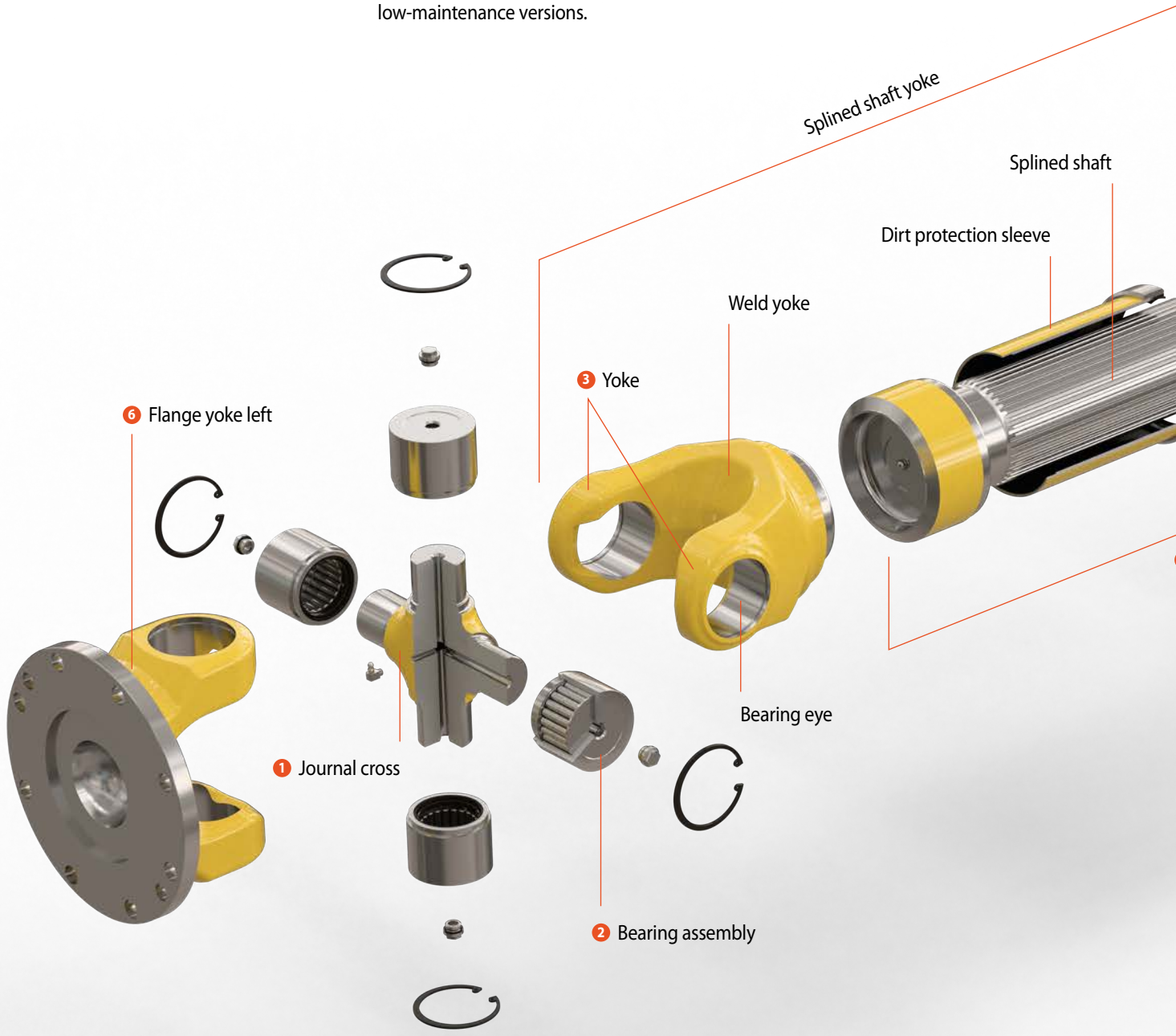
- Drop-forged from high-quality case-hardened steel for high loads and wear resistance.
- Journals with low surface roughness, high roundness accuracy and a case-hardened surface for an above-average bearing service life.

2 Bearing Assembly

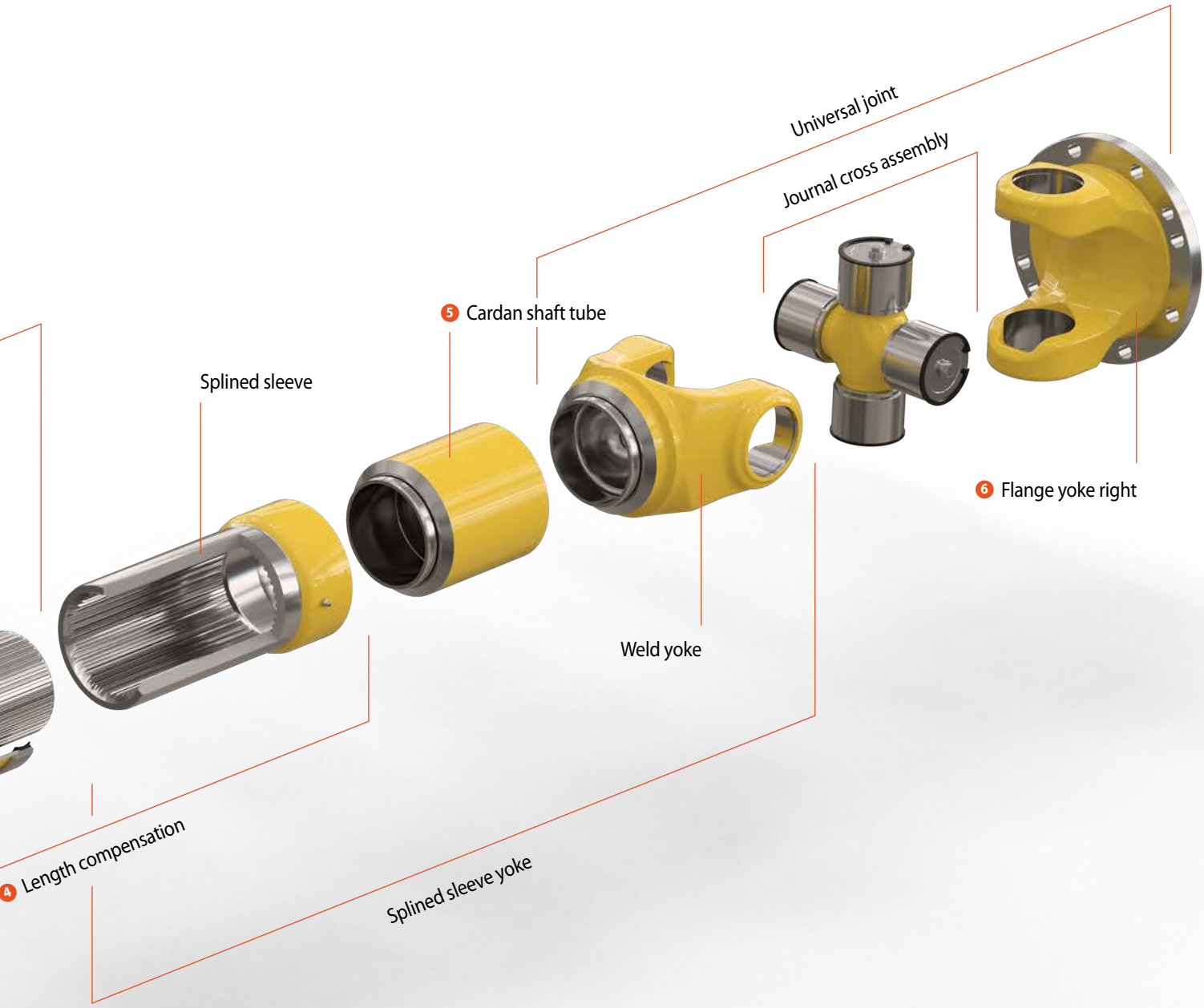
- Durable and highly load-bearing, developed in collaboration with leading European roller bearing manufacturers.
- RINGSPANN developed sealing system, designed to meet the specific requirements and characteristics of rolling bearings in cardan shaft.
- Available in either maintenance-free or low-maintenance versions.

3 Yoke

- With closed bearing eyes to ensure even load distribution and to prevent harmful stress peaks and notch effects.



Picture: Cardan Shaft CSL with length compensation



4 Length Compensation consisting of Splined Shaft and Splined Sleeve

- Made from high-quality quenched and tempered steels or ductile cast iron: high strength, torsionally rigid, and bending-resistant.
- Splines of the splined shaft manufactured either by hobbing or cold rolling.
- Splined sleeves with polymer coating to reduce friction and thus axial forces.

5 Cardan Shaft Tube

- Made from high-quality structural steel, seamless drawn or precision-welded.
- Uniform wall thickness and minimal geometric deviations for smooth and trouble-free operation.
- Maximum machining lengths up to 6000 mm or 236.22 in.

6 Flange Yoke

- Made from high-quality quenched and tempered steels or ductile cast iron.
- High-strength, torsionally rigid, and with high bending stiffness to ensure a long service life of the joint bearing.
- Available in five standard versions. Special versions available on request.

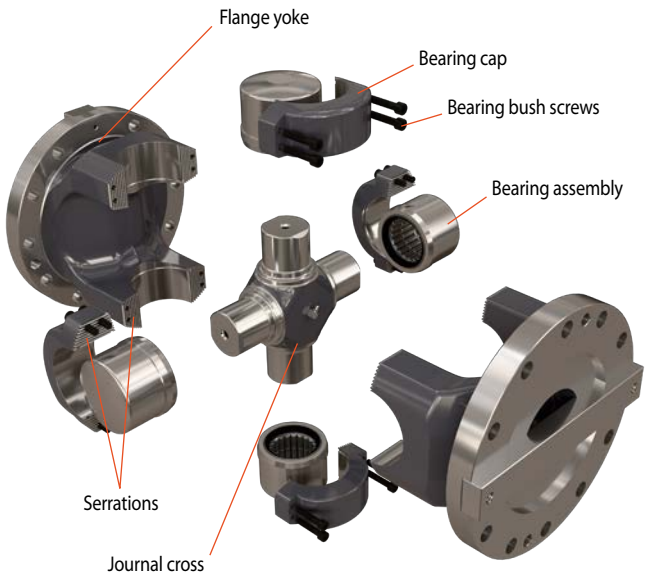
Comparison between Closed Bearing Eye and Split Bearing Eye

RINGSPANN Cardan Shafts are equipped with yokes featuring closed bearing eyes. Compared to cardan shafts with split bearing eyes, this design offers significant advantages in terms of service life, maintenance intervals and operational reliability:

Closed Bearing Eye

8-1

Split Bearing Eye



8-2

One-piece yoke with a seamless bearing bore provides high rigidity and improved bearing support.	The bearing bore is weakened by the split line in the main load zone, resulting in lower rigidity and reduced bearing support.
Only minimal deformation of the yoke and journal cross under load, resulting in improved load distribution.	Increased deformation of the yoke and journal cross under load, resulting in reduced load distribution.
No bolted connections at the bearing bore are required, which would weaken the yoke.	Bolted connections at the bearing bore require space and thus further weaken the yoke.
No bolted connections or serrations at the bearing bore that require maintenance.	Bolted connections and serrations at the bearing bore require additional maintenance.
The seamless bearing bore provides no entry point for corrosion.	The split line at the bearing bore is susceptible to corrosion.
Replacement of the journal cross assembly by a specialist workshop.	The journal cross assembly can be replaced on site; however, necessary subsequent tasks such as straightening or balancing can only be carried out by a specialist workshop.

Your Benefits at a Glance

- Long service life, even under varying loads
- Reliable operation under shock and vibration loads
- Lower maintenance costs
- Higher machine availability

Precision Length Compensation and Long-Life Bearing Assemblies

RINGSPANN Cardan Shafts feature sophisticated design details in every functional area. Length compensation, spline connection and bearing assemblies are carefully matched to ensure maximum operational reliability and an extended service life – even under varying loads and demanding operating conditions.

Precision Length Compensation

RINGSPANN length compensation systems consist of splined shafts and splined sleeves manufactured with involute splines according to DIN 5480.

Up to cardan shaft size 3070, the splines on the splined shafts are produced either by cold rolling or hobbing, while from size 3075 onwards they are manufactured exclusively by hobbing. Both manufacturing methods are characterized by low roundness and lead deviations.

Up to cardan shaft size 3070, the splined sleeves are supplied with a polymer coating as standard. This reduces friction and axial forces that arise when the splined sleeve and splined shaft are slid into one another. This offers the best possible protection, particularly for the axial bearings in the customer's connecting assemblies. From cardan shaft size 3075 upwards, the splined sleeves are supplied gas-nitrided to withstand high loads.

Splined shafts and splined sleeves are matched to each other to further reduce the design-specified clearance.

All this results in precise and long-lasting length compensation, even under varying loads.

Hobbed splined shaft with splined sleeve in extra-long design.

Detail view of a cold-rolled splined shafts

Cold-rolled splines are characterized by high dimensional accuracy and excellent surface quality. During the rolling process, the material's grain structure remains uninterrupted, resulting in high strength and wear resistance. The result is uniform torque transmission at low contact pressures, with the very low surface roughness ensuring that the splined sleeve and splined shaft slide easily against one another.

Long-Life Bearing Assemblies

Durable and heavy-duty bearing assembly are used for the bearing support. These bearing assemblies were developed in collaboration with leading European roller bearing manufacturers. An optimized roller geometry ensures even load distribution and low friction.

The high-quality sealing system of the bearing assemblies is developed in-house and takes into account the requirements and specific characteristics of cardan shaft rolling bearings. It ensures reliable lubrication and provides long-lasting protection against the ingress of contaminants and lubricant loss.

Rolling bearing with a combined radial-axial sealing system

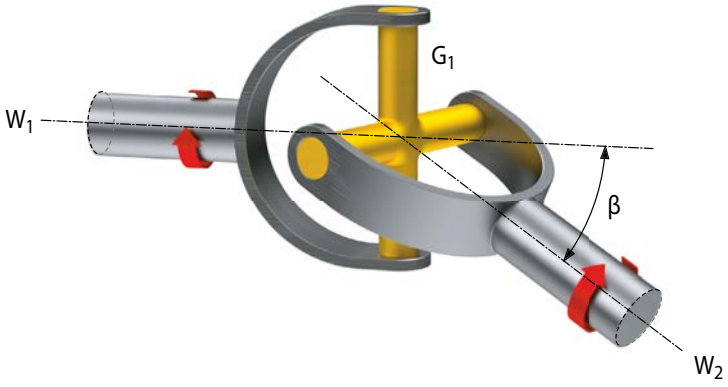
Your Benefits at a Glance

- Precise length compensation during axial movements
- Low axial forces during length compensation protect customer's axial bearings
- Long service life thanks to high-quality splines in the length compensation mechanism
- Robust and long-life bearing assemblies for harsh operating conditions
- Low wear and long maintenance intervals

Operating Angle

Operating Angle of a Universal Joint

The operating angle ß of a universal joint G_1 is the angle formed between the center line of the input shaft W_1 and the center line of the output shaft W_2.

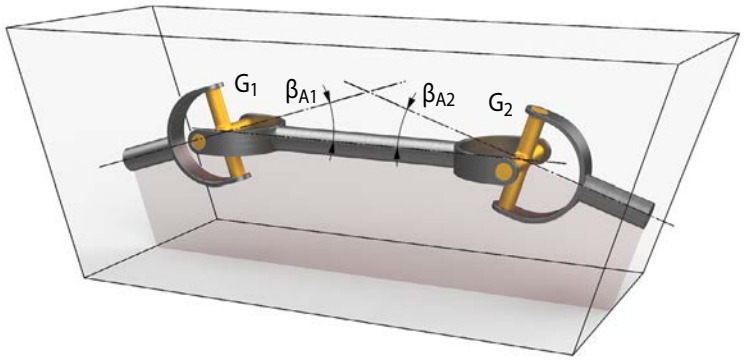


10-1

Operating Angles for Cardan Shafts

Cardan shafts have two universal joints, G_1 and G_2. The maximum operating angles $ß_{A1}$ and $ß_{A2}$ occurring at these universal joints during operation must be less than the maximum permissible operating angle ß for the selected cardan shaft size.

The maximum permissible operating angles β for each cardan shaft size are listed on pages 30, 32 and 34. In all cases, an operating angle $ß_A$ of at least 2° should be maintained.



10-2

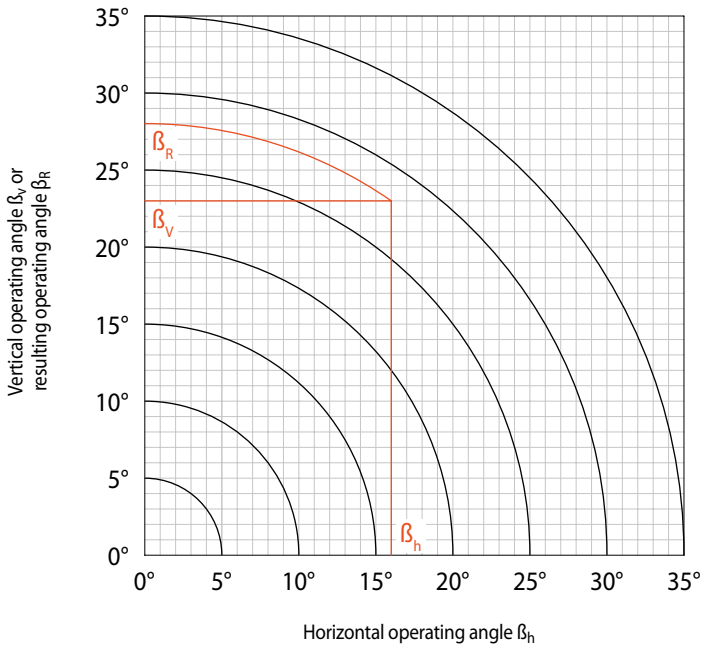
Resulting Operating Angle

In applications involving three-dimensional deflection of universal joints, the resulting operating angle $β_R$ is the relevant parameter. It can be determined graphically from the horizontal operating angle $ß_h$ and the vertical operating angle $ß_v$ using the adjacent diagram as follows:

- Plot the horizontal operating angle $ß_h$ on the horizontal axis and draw a vertical line from that point.
- Plot the vertical operating angle $ß_v$ on the vertical axis and draw a horizontal line from that point.
- Draw a radius from the origin of the diagram through the point where the vertical and horizontal lines drawn earlier intersect.
- Read the resulting operating angle $β_R$ at the point where the radius intersects the vertical axis.

Alternatively, the resulting operating angle $β_R$ can be calculated using the equation shown below:

$$β_R = \arctan\left(\sqrt{\tan^2 ß_h + \tan^2 ß_v}\right)$$



10-3

Short Designation Key

Example for Short Designation: CSL - 3053 - 2505 - B S 250 - K 225 - mm

	Code
Cardan Shaft Design	
• Cardan Shaft CSL with length compensation	CSL
• Cardan Shaft CSS short with length compensation	CSS
• Cardan Shaft CSF without length compensation	CSF
• Cardan Shaft CSZ with intermediate bearings	CSZ
• Cardan Shaft CSM in modular design	CSM
• Double-Flanged Joint CSD	CSD
• Double-Flanged Joint CSH with H-type yoke	CSH
Cardan Shaft Size	
• e.g. 3053	
Compressed Length LZ or Fixed Length LF	
• e.g. 2 505 mm	2505
• e.g. 98.62 in	98.62
Flange Yoke Version, Left	
Type	
• B with frictional connection	B
• S with clamping sleeves	S
• K with face key	K
• T with jaw teeth	T
• H with Hirth serration	H
Option	
Implementation of optional joint-side bolt insertion	
• Yes	S
• No	*leave blank*
Flange Yoke Diameter, Left	
• e.g. 250 mm	250
• e.g. 9.84 in	9.84
Flange Yoke Version, Right	
Type	
• B with frictional connection	B
• S with clamping sleeves	S
• K with face key	K
• T with jaw teeth	T
• H with Hirth serration	H
Option	
Implementation of optional joint-side bolt insertion	
• Yes	S
• No	*leave blank*
Flange Yoke Diameter, Right	
• e.g. 225 mm	225
• e.g. 8.86 in	8.86
Unit of Length	
• metric in mm	mm
• inches in in	in

Non-Uniform Rotational Motion of a Single Universal Joint

Non-Uniform Rotational Motion of a Single Universal Joint

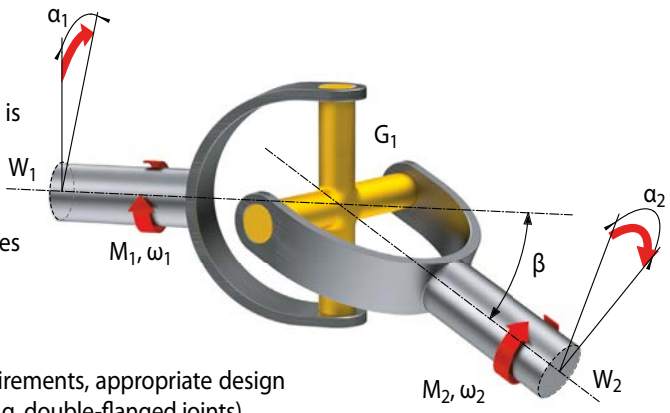
When the input shaft W_1 of a universal joint rotates uniformly (angular velocity ω_1 = const.), the rotation of the output shaft W_2 is not uniform (angular velocity $\omega_2 \neq$ const.). Similarly, when a constant torque M_1 is applied to the input shaft, the torque M_2 on the output shaft is non-uniform. This characteristic behaviour of a universal joint is also referred to as cardan error and must be taken into account when selecting and designing cardan shafts.

Instructions for use:

The use of a single universal joint is suitable when:

- the non-uniformity of the rotational motion is acceptable,
- the non-uniformity of the torques is acceptable, and
- the operating angle is small (typically $\beta < 3°$).

For applications with higher requirements, appropriate design measures should be considered (e.g. double-flanged joints).



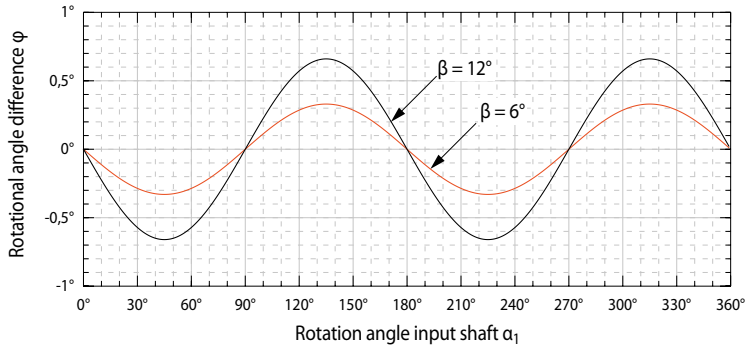
12-1

Rotational Angle Difference of a Single Universal Joint

For of a single universal joint, we define the difference between the angle of rotation of the input shaft α_1 and the angle of rotation of the output shaft α_2 as the rotational angle difference $\varphi = (\alpha_1 - \alpha_2)$.

At a constant angular velocity ω_1 of the input shaft, the rotational angle difference φ follows a sinusoidal curve, with the amplitude of the sine curves increasing as the operating angle β increases.

During one complete revolution of the input shaft, the rotational angle difference φ reaches maxima at rotation angles α1 of 135° and 315°, and minima at rotation angles α1 of 45° and 225°. At rotation angles α1 of 90°, 180°, 270° and 360°, the rotation angles α_1 and α_2 are equal, resulting in a rotation angle difference $\varphi = 0$. The following applies to the rotation angle difference:



12-2

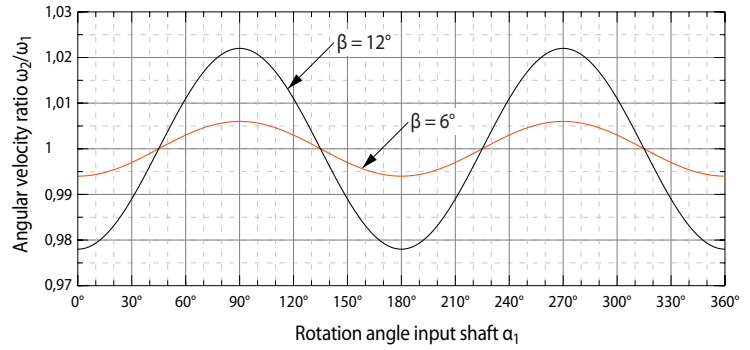
$$\varphi = \arctan\left(\frac{\tan \alpha^1 \cdot (\cos \beta - 1)}{1 + \cos \beta \cdot \tan^2 \alpha_1}\right)$$

Angular Velocity Ratio of a Single Universal Joint

For a single universal joint, the ratio between the angular velocity ω_2 of the output shaft and the angular velocity ω_1 of the input shaft is referred to as the angular velocity ratio ω_2/ω_1.

At a constant angular velocity ω_1 of the input shaft, the angular velocity ω_2 of the output shaft, and therefore also the angular velocity ratio ω_2/ω_1, follows a sinusoidal curve. The amplitude of the sinusoidal curve increases with increasing operating angle β.

During one complete revolution of the input shaft, the angular velocity ratio ω_2/ω_1 reaches maxima at angles of rotation α_1 of 90° and 270°, and minima at angles of rotation α_1 of 180° and 360°. At angles of rotation α_1 of 45°, 135°, 225° and 315°, the angular velocities ω_2 and ω_1 are equal, resulting in an angular velocity ratio $\omega_2/\omega_1 = 1$. The following applies to the angular velocity ratio:



12-3

$$\frac{\omega_2}{\omega_1} = \frac{\cos \beta}{1 - \sin^2 \beta \cdot \sin^2 \alpha_1}$$

Torque Ratio of a Single Universal Joint

For of a single universal joint, the ratio between the torque of the input shaft M_1 and the torque of the output shaft M_2 is referred to as the torque ratio M_1/M_2. The torque ratio M_1/M_2 corresponds to the angular velocity ratio ω_2/ω_1.

$$\frac{M_1}{M_2} = \frac{\omega_2}{\omega_1}$$

At a constant angular velocity ω_1 of the input shaft and a constant torque M_1 of the input shaft, the torque M_2 of the output shaft decreases as the angular velocity ω_2 of the output shaft increases, and vice versa.

Double Universal Joint Arrangements for Compensating Non-Uniform Rotational Motion

The non-uniform rotational motion of a single universal joint can be compensated by combining two universal joints into a cardan shaft. This requires both universal joints to operate at identical operating angles in a Z-arrangement, W-arrangement or 3D-Z-arrangement.

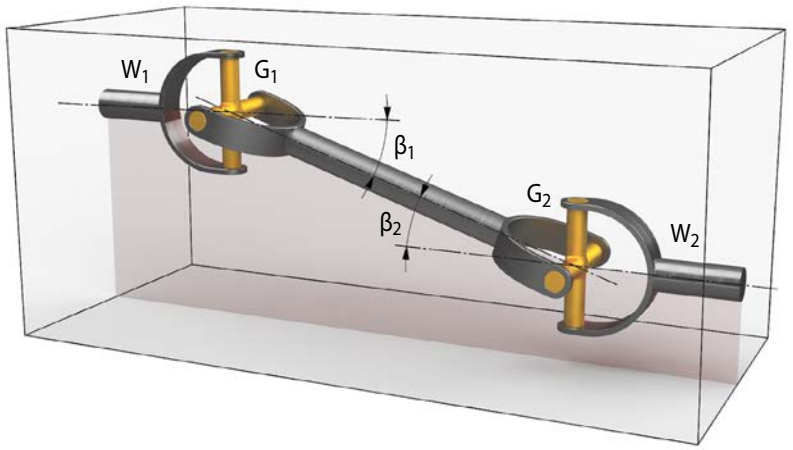
In these arrangements, the non-uniform motion introduced by the first universal joint is compensated by the second universal joint. As a result, uniform rotational motion and uniform torque transmission are achieved between the input and output shaft.

Z-Arrangement

The following conditions must be met:

- The centerlines of the input shaft W_1 and output shaft W_2 of the cardan shaft must be parallel and lie in the same plane.
- The operating angle β_1 at universal joint G_1 must be equal to the operating angle β_2 at universal joint G_2.

  $\beta_1 = \beta_2$



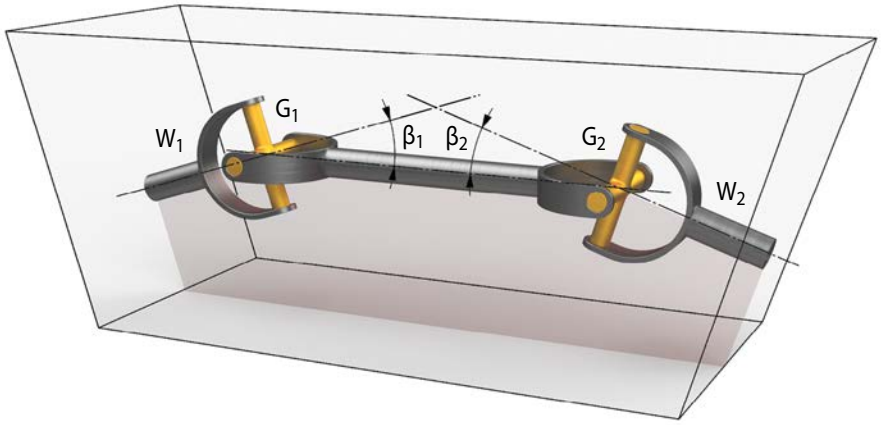
13-1

W-Arrangement

The following conditions must be met:

- The centerlines of the input shaft W_1 and output shaft W_2 of the cardan shaft must intersect in a common plane.
- The operating angle β_1 at universal joint G_1 must be equal to the operating angle β_2 at universal joint G_2.

  $\beta_1 = \beta_2$



13-2

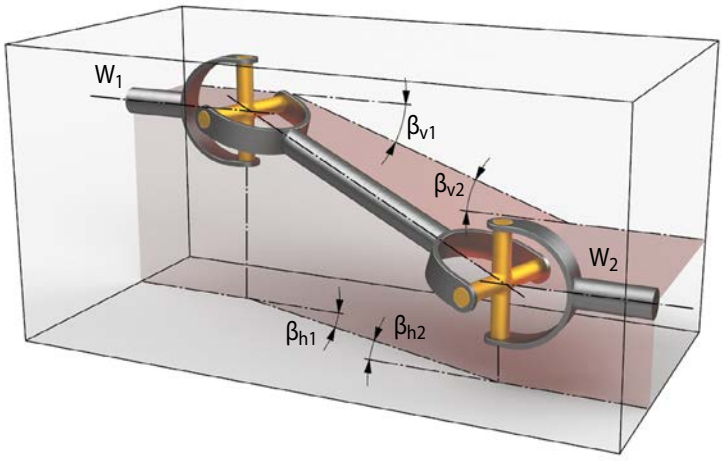
3D-Z-Arrangement

The following conditions must be met:

- The centerlines of the input shaft W_1 and output shaft W_2 of the cardan shaft must lie in parallel planes.
- The vertical operating angle $ß_{v1}$ at universal joint G_1 must be equal to the vertical operating angle $ß_{v2}$ at universal joint G_2.

  $\beta_{v1} = \beta_{v2}$
- The horizontal operating angle $ß_{h1}$ at universal joint G_1 must be equal to the horizontal operating angle $ß_2$ at universal joint G_2.

  $\beta_{h1} = \beta_{h2}$



13-3

7 Steps to Selecting a Cardan Shaft

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<table>
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<tr><td>• CSL with length compensation
• CSS short with length compens.
• CSF without length compens.</td><td>CSL</td></tr>
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</td></tr>
<tr><td>2. Selection of Cardan Shaft Size</td><td>Page 18 - 21</td><td>
<table>
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<tr><td>• 2065 • 8050 • 3070
• 3052 • 3062 • 3075
• 3053 • 3065 • 3078</td><td>3053</td></tr>
</table>
</td></tr>
<tr><td>3. Determination of the Compressed Length or Fixed Length</td><td>Page 24</td><td>
<table>
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<tr><td>• 760 - 6 500 mm
• 29.92 - 255.91 in</td><td>2 505 mm</td></tr>
</table>
or
<table>
<tr><th>Fixed Length</th><th>e.g.</th></tr>
<tr><td>• 485 - 6 500 mm
• 19.09 - 255.91 in</td><td>2 505 mm</td></tr>
</table>
</td></tr>
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<tr><td><u>Type</u>
• B with frictional connection
• S with clamping sleeves
• K with face key
• T with jaw teeth
• H with Hirth serration</td><td>B</td></tr>
<tr><td><u>Option</u>
Implementation of optional joint-side bolt insertion:
• Yes = S
• No = leave blank</td><td>S</td></tr>
<tr><th>Flange Yoke Diameter, Left</th><th>e.g.</th></tr>
<tr><td>• 180 - 480 mm
• 7.09 - 18.90 in</td><td>250 mm</td></tr>
</table>
<table>
<tr><th>Flange Yoke Version, Right</th><th>e.g.</th></tr>
<tr><td><u>Type</u>
• B with frictional connection
• S with clamping sleeves
• K with face key
• T with jaw teeth
• H with Hirth serration</td><td>K</td></tr>
<tr><td><u>Option</u>
Implementation of optional joint-side bolt insertion:
• Yes = S
• No = leave blank</td><td></td></tr>
<tr><th>Flange Yoke Diameter, Right</th><th>e.g.</th></tr>
<tr><td>• 180 - 480 mm
• 7.09 - 18.90 in</td><td>225 mm</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Step</th><th>Details</th><th>Order Information</th></tr>
<tr><td>5. Selection of Balancing Quality</td><td>Page 26</td><td>
<table>
<tr><th>Balancing Quality</th><th>e.g.</th></tr>
<tr><td>• Unbalanced
• G25
• G16 (standard)
• G6.3</td><td>G16</td></tr>
<tr><th>Max. Application Speed</th><th>e.g.</th></tr>
<tr><td></td><td>900 min^{-1}</td></tr>
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<tr><td>6. Selection of Paint Finish</td><td>Page 27</td><td>
<table>
<tr><th>Paint Finish Variant</th><th>e.g.</th></tr>
<tr><td>• Primer in deep black, matt (standard)
• Standard paint finish
• Reinforced paint finish
• Unpainted</td><td>Standard paint finish</td></tr>
<tr><th>RAL Color</th><th>e.g.</th></tr>
<tr><td>• RAL 9005 (standard)
• RAL 1003 • RAL 5015
• RAL 1005 • RAL 5018
• RAL 1021 • RAL 6011
• RAL 2008 • RAL 6019
• RAL 3013 • RAL 7011
• RAL 3020 • RAL 7021</td><td>RAL 1003</td></tr>
</table>
</td></tr>
<tr><td>7. Selection of Lubrication</td><td>Page 28</td><td>
<table>
<tr><th>Lubrication Type</th><th>e.g.</th></tr>
<tr><td>• Central lubrication (standard)
• Bearing assembly lubrication (optional)
• Lifetime lubrication (please consult us)</td><td>Central lubrication</td></tr>
<tr><th>Grease Type</th><th>e.g.</th></tr>
<tr><td>• Standard grease -40° to +120° C
• Low-temperature grease < -40° C (please consult us)
• High-temperature grease > +120° C (please consult us)</td><td>Standard grease</td></tr>
</table>
</td></tr>
</table>

1. Selection of Cardan Shaft Design – Standard Designs

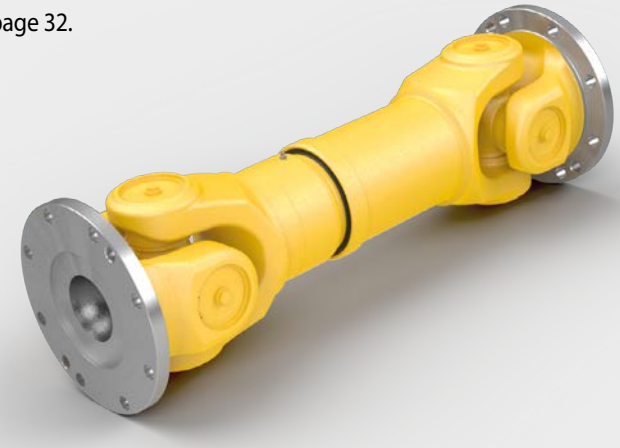
Cardan Shafts CSL with Length Compensation

See page 30.

Nominal Torques	29 000 - 290 000 Nm 257 000 - 2 567 000 lb•ft
Flange Yoke Diameter	180 - 480 mm 7.09 - 18.90 in
Rotational Diameter	198 - 390 mm 7.80 - 15.35 in
Max. Operating Angle	15° - 24° (size-dependent)
Sliding Length	110 - 200 mm 4.33 - 7.87 in
Max. Compressed Length	4 500 mm / 177.17 in * 6 500 mm / 255.91 in ** * balanced; ** unbalanced

Cardan Shafts CSS short with Length Compensation

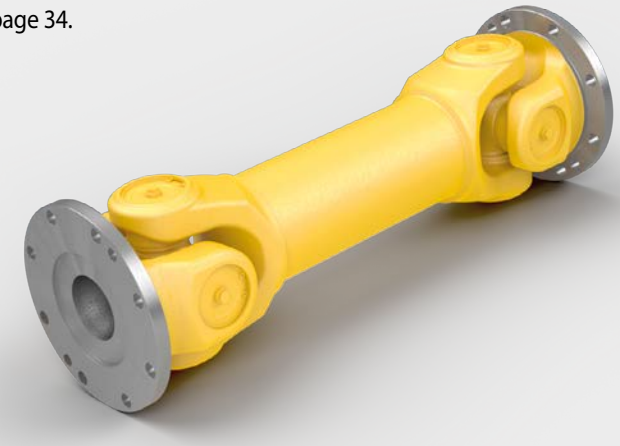
See page 32.



Nominal Torques	29 000 - 290 000 Nm 257 000 - 2 567 000 lb•ft
Flange Yoke Diameter	180 - 480 mm 7.09 - 18.90 in
Rotational Diameter	198 - 390 mm 7.80 - 15.35 in
Max. Operating Angle	15° - 24° (size-dependent)
Sliding Length	25 - 200 mm 0.98 - 7.87 in
Compressed Length	600 - 1 420 mm 23.62 in - 55.91 in

Cardan Shafts CSF without Length Compensation

See page 34.



Nominal Torques	29 000 - 290 000 Nm 257 000 - 2 567 000 lb•ft
Flange Yoke Diameter	180 - 480 mm 7.09 - 18.90 in
Rotational Diameter	198 - 390 mm 7.80 - 15.35 in
Max. Operating Angle	15° - 24° (size-dependent)
Min. Fixed Length	485 mm 19.09 in
Max. Fixed Length	4 500 mm / 177.17 in * 6 500 mm / 255.91 in ** * balanced; ** unbalanced

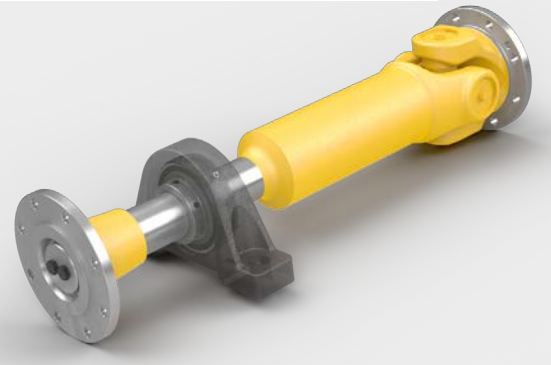
Order Information

When placing an order, please specify the required cardan shaft design:

Cardan Shaft Design	e.g.
• CSL with length compensation • CSS short with length compens. • CSF without length compens.	CSL

1. Selection of Cardan Shaft Design – Special Designs

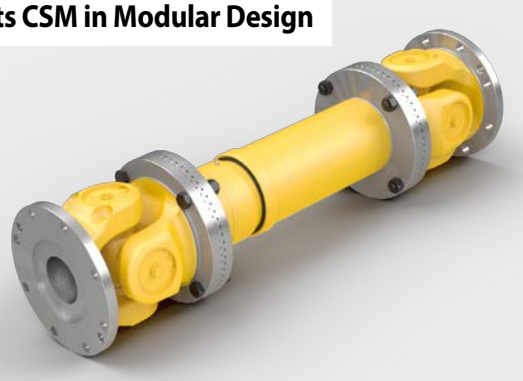
Cardan Shafts CSZ with Intermediate Bearings



Cardan Shafts CSZ with intermediate bearings are used when, for technical reasons, the required installation length cannot be achieved with a single cardan shaft. An additional radial bearing is required for operation. Typical applications include pump drives for wastewater or service water.

For further information, please contact us.

Cardan Shafts CSM in Modular Design



Cardan Shafts CSM in modular design allow individual components to be replaced quickly during conversion or maintenance work. This significantly reduces service and downtime. The two universal joints of the cardan shaft may be of different sizes.

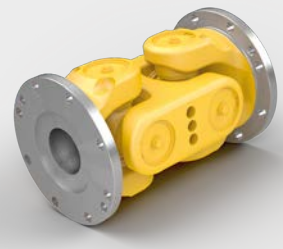
For further information, please contact us.

Double-Flanged Joint CSD

Double-Flanged Joints CSD consist exclusively of flange yokes and are therefore particularly suitable for applications with short installation lengths. Due to their compact design, no integrated length compensation is provided. The use of flange yokes with short length and the absence of length compensation give Double-Flanged Joints CSD high torsional stiffness.

For further information, please contact us.

Double-Flanged Joint CSH with H-Type Yoke



Double-Flanged Joints CSH are similar in design to Double-Flanged Joints CSD. However, Double-Flanged Joints CSH use a so-called H-type yoke as the center section, which results in slightly different performance characteristics: shorter installation lengths are possible, but the torsional stiffness is lower.

For further information, please contact us.

2. Selection of Cardan Shaft Size

Procedure

When selecting the appropriate cardan shaft size, the following criteria should be taken into consideration:

A. Application Torque at the Cardan Shaft

B. Service Life of the Rolling Bearings in the Universal Joints

C. Fatigue Strength of the Cardan Shaft

D. Maximum Permissible Application Speed of the Cardan Shaft

Order Information

When placing an order, please specify the required cardan shaft size.

Cardan Shaft Size			e.g.
• 2065	• 8050	• 3070	3053
• 3052	• 3062	• 3075	
• 3053	• 3065	• 3078	

A. Application Torque at the Cardan Shaft

The application torque is a key value in the selection of the appropriate cardan shaft size. It is determined using the following parameters and calculation formulas:

Parameters	Symbol	Unit	Remarks	Example
Nominal Drive Power	P_A	kW HP	Application-specific value. To be specified by the customer.	P = 1 000 kW
Motor Speed	n_M	min^{-1}	Application-specific value. To be specified by the customer.	n = 1 420 min^{-1}
Gear Ratio	i	–	Application-specific value. To be specified by the customer. (If no gearbox is used, i = 1.)	i = 2
Application Speed at the Cardan Shaft	n_A	min^{-1}	The application speed is the speed at the input shaft of the cardan shaft. The following equation applies: $n_A = n / i$	n_A = 1 420 min^{-1} / 2 = 710 min^{-1}
Application Torque at the Cardan Shaft *	M_A	Nm lb•ft	The application torque is the torque at the input shaft of the cardan shaft. The following equation applies: $M_A\,(Nm) = \frac{P\,(kW) \cdot 9550}{n_A\,(min^{-1})}$ or $M_A\,(lb \cdot ft) = \frac{P\,(HP) \cdot 5252}{n_A\,(min^{-1})}$	$M_A = \frac{1000\ kW \cdot 9550}{710\ min^{-1}}$ = 13 451 Nm ≈ 13 450 Nm

* **IMPORTANT**: For frequency-controlled electric motors, the torque effectively acting in the application must be used.

B. Service Life of the Rolling Bearings in the Universal Joints

The service life of the rolling bearings in the universal joints depends on the cardan shaft size. For a given application torque, the service life of the rolling bearings increases with increasing cardan shaft size. For a selected cardan shaft size, it must be ensured that the rated bearing life L_h of the rolling bearings exceeds the service life $L_{h,req}$ required for the application. The evaluation is based on the following parameters and calculation formulas:

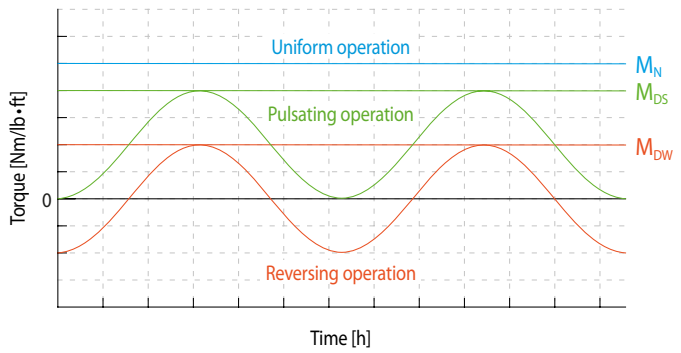
Parameters	Symbol	Unit	Remarks	Example
Required Service Life of the Rolling Bearings	$L_{h,req}$	h	Application-specific value. To be specified by the customer.	$L_{h,req}$ = 10 000 h
Cardan Shaft Size	–	–	Available cardan shaft sizes are listed on pages 30, 32 and 34.	Selected cardan shaft size: 3065
Dynamic Load Rating	CR	Nm lb•ft	• The dynamic load rating CR is used to determine the rated bearing life L_{10}. The rated bearing life L_{10} corresponds to the life that 90% of a sufficiently large group of identical rolling bearings are expected to attain or exceed. The value is determined in accordance with DIN ISO 281 ("Rolling Bearings – Dynamic Load Ratings and Rating Life"). • Dynamic load ratings are listed on pages 30, 32 and 34.	Dynamic load rating CR for cardan shaft size 3065: CR = 19 700 Nm
Maximum Operating Angle of the Application	$ß_A$	°	• Application-specific value. To be specified by the customer. • The maximum permissible operating angles ß are listed on pages 30, 32 and 34. • The operating angle of the application $ß_A$ must be smaller than the maximum permissible operating angle ß of the selected cardan shaft size: $ß_A < ß$ • In all cases, an operating angle of at least 2° should be aimed for. • In applications involving three-dimensional deflection, the resulting operating angle $ß_R$ is the relevant parameter (see page 10).	$ß_A$ = 4° Maximum permissible operating angles for cardan shaft size 3065: ß = 18° The following applies: $ß_A = 4° < ß = 18°$ The condition is fulfilled.
Rated Bearing Life	L_h	h	Calculation formula for L_h according to DIN ISO 281 in an application-specific form adapted for cardan shafts: $L_h = \frac{1{,}5 \cdot 10^7}{n_A \cdot \beta \cdot K_B} \cdot \left(\frac{CR}{M_A}\right)^{\frac{10}{3}}$ with Driving Machine / Operating Factor K_B: Electric motor 1; Diesel engine 1,2 Note: The calculated rated bearing life L_h is a statistical value and is frequently exceeded in practical use.	Input Values n_A = 710 min^{-1} CR = 19 700 Nm $ß_A$ = 4° M_A = 13 450 Nm K_B = 1 Calculation $L_h = \frac{1{,}5 \cdot 10^7}{710 \cdot 4 \cdot 1} \cdot \left(\frac{19\,700}{13\,450}\right)^{\frac{10}{3}}$ = 18 847 h Condition check The following applies: L_h = 18 847 h > $L_{h,req}$ = 10 000 h The condition is fulfilled.
Rated Bearing Life under a Duty Cycle	$L_{h,Z}$	h	• In applications where torque, speed and operating angle vary predictably during a typical operating cycle, the rated bearing life can be determined on the basis of a duty cycle. • For this purpose, the duty cycle is divided into individual load stages. Each load stage is defined by a fixed combination of torque, speed and operating angle and represents a specific proportion of the duty cycle duration. • The rated bearing life $L_{h,Z}$ is determined according to Miner's rule using the following equation: $L_{h,Z} = \left(\sum_{i=1}^{n} \frac{f_i}{L_{h,i}}\right)^{-1}$ with • $L_{h,i}$ = Rated bearing life of the load stage i • f_i = Time proportion of load stage i, where $\sum fi = 1$ • n = Number of load stages	Input Values n = 2 f_1 = 40% $L_{h,1}$ = 7 000 h f_2 = 60% $L_{h,2}$ = 16 000 h Calculation $L_{h,Z} = \frac{1}{\frac{40\,\%}{7000\,h} + \frac{60\,\%}{16000\,h}}$ = 10 566 h Condition check The following applies: $L_{h,Z}$ = 10 566 h > $L_{h,req}$ = 10 000 h The condition is fulfilled.

2. Selection of Cardan Shaft Size

C. Fatigue Strength of the Cardan Shaft

The fatigue strength of cardan shaft plays a particularly important role in applications pronounced dynamic loads, frequent load reversals or shock loads. It must be ensured that the cardan shaft's limit torque - defined as the maximum permissible torque - exceeds the maximum torque occurring in the application. The evaluation is based on the following operating conditions, parameters and calculation formulas:

Operating Condition	Applicable Limit Torque
Uniform Operation The torque remains essentially constant, with no significant fluctuations.	M_N = Nominal torque
Pulsating Operation The torque fluctuates unidirectionally between a minimum and a maximum value.	M_{DS} = Pulsating fatigue torque The following applies: $M_{DS} \approx 0{,}93 \cdot M_N$
Reversing Operation The torque changes direction periodically.	M_{DW} = Reversing fatigue torque The following applies: $M_{DW} \approx 0{,}62 \cdot M_N$



20-1

Parameters	Symbol	Unit	Remarks	Example
Application Factor	K_A	–	The value for the application factor K_A must be determined based on the intensity and frequency of shock loads occurring in the application. The table below serves as a guideline.	Moderate, infrequent shocks: K_A = 1,4

Intensity of Occurring Shocks	Frequency of Occurring Shocks	Application Factor K_A	Examples of Typical Machines
light	infrequent	1,1	Electric machines, grinding machines, steam and water turbines, rotary compressors
	frequent to regular	1,6	
moderate	infrequent	1,3	Internal combustion engines, planing and turning machines, reciprocating compressors
	frequent to regular	2,0	
moderately severe	infrequent	1,4	Plastics presses, bending and straightening machines, rolling mill gearboxes
	frequent to regular	2,1	
severe	infrequent	1,8	Screw presses, hydraulic forging presses, press brakes, section shears, gang saws
	frequent to regular	2,7	
very severe	infrequent	2,5	Stone crushers, hammers, cold rolling mill shears, rolling stands, crushers
	frequent to regular	3,8	

Application Torque	M_A	Nm	For the calculation, please refer to the section "A. Application Torque at the Cardan Shaft".	M_A = 13450 Nm
Selection Torque	M_S	Nm	Calculation formula: $M_S = M_A \cdot K_A$	M_S = 13450 Nm • 1,4 = 18830 Nm
Cardan Shaft Size	–	–	Available cardan shaft sizes are listed on pages 30, 32 and 34.	Selected cardan shaft size: 3065
Limit Torque	–	–	The following conditions must be fulfilled by the selected cardan shaft size: • For uniform operation: $M_N \geq M_S$ • For pulsating operation: $M_{DS} \geq M_S$ • For reversing operation: $M_{DW} \geq M_S$ Limit torques M_N, M_{DS} and M_{DW} for the various cardan shaft sizes are listed on pages 30, 32 and 34.	Pulsating operation Pulsating fatigue torque for cardan shaft size 3065: M_{DS} = 96000 Nm The following applies: M_{DS} = 96000 Nm > M_S = 18830 Nm The condition is fulfilled.

D. Maximum Permissible Application Speed of the Cardan Shaft

Limit Speed

The limit speed n_G of a cardan shaft, also referred to as the bending critical speed, depends on the size and the operating length of the cardan shaft. The larger the cardan shaft size and the operating length, the lower the limit speed n_G.

The limit speed n_G is calculated as follows:

$$n_G = 1{,}22 \cdot 10^8 \cdot \frac{1}{(LB - 2 \times E)^2} \cdot \sqrt{d_a^2 + d_i^2}$$

The adjacent diagram illustrates the relationship between the limit speed n_G and the distance between bearing centers for the various cardan shaft sizes.

Cardan Shaft Size	E		d_a		d_i	
	mm	in	mm	in	mm	in
2065	110	4.33	140	5.51	130	5.11
3052	125	4.92	144	5.67	130	5.11
3053	125	14.92	160	6.30	140	5.52
8050	125	4.92	160	6.30	140	5.52
3062	130	5.12	165	6.50	140	5.52
3065	140	5.51	177	6.97	142	5.59
3070	180	7.09	177	6.97	142	5.59
3075	290	11.42	220	8.66	190	7.48
3078	215	8.46	280	11.02	230	9.06

Formula Symbols:

d_a = Tube outside diameter [mm/in]

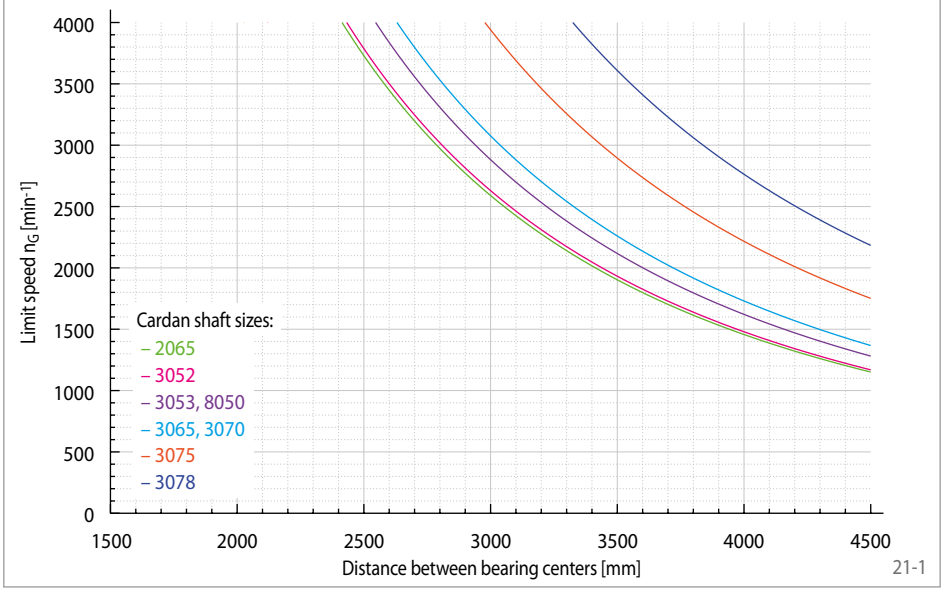
d_i = Tube inside diameter [mm/in]

E = Bearing center distance [mm/in]

LB = Operating length [mm/in]

LB - 2E = Distance between bearing centers [mm/in]

n_G = Limit speed [min^{-1}]



Application-Specific Limit Speed

The application-specific limit speed n_S takes into account not only the limit speed n_G but also the cardan shaft design and its balancing quality. It must be ensured that the application-specific limit speed n_S is greater than the maximum application speed n_A at the input shaft end of the cardan shaft.

$n_S > n_A$

The application-specific limit speed n_S is determined by multiplying the limit speed n_G by the relevant factors taken from the adjacent tables.

$n_S = n_G \cdot B_C \cdot B_D$

Cardan Shaft Design	Operating Factor B_C
Cardan Shaft CSL with length compensation	0,7
Cardan Shaft CSS short with length com.	0,9
Cardan Shaft CSF without length com.	1,0

Balancing Quality of Cardan Shaft	Balancing Quality Factor B_D
G25	0,80
G16	0,85
G6,3	1,00

Important

For applications with an operating angle greater than 10° and an application speed n_A greater than 1 000 min^{-1}, it must be verified that the center section of the cardan shaft is not subjected to impermissible vibration loads. If your application falls within this range, please contact us.

Example

Input Values

- Selected cardan shaft size: 3065
- Operating length LB: 3 300 mm
- Bearing center distance E: 140 mm
- Tube outside diameter d_a: 177 mm
- Tube inside diameter d_i: 142 mm
- Max. application speed n_A: 1 700 min^{-1}
- Operating factor B_C for cardan shaft CSL: 0,7
- Balancing quality factor B_D for balancing quality G16: 0,85

Calculation of Limit Speed

$$n_G = 1{,}22 \cdot 10^8 \cdot \frac{1}{(3\,300 - 2 \times 140)^2} \cdot \sqrt{177^2 + 142^2} = 3\,035 \text{ min}^{-1}$$

Calculation of Application-Specific Limit Speed

$n_S = 3\,035 \text{ min}^{-1} \cdot 0{,}7 \cdot 0{,}85 = 1\,806 \text{ min}^{-1}$

Condition check

The following applies: $n_S = 1\,806 > n_A = 1\,700$ → The condition is fulfilled.

3. Determination of the Compressed Length or Fixed Length

Determination of the Compressed Length

For cardan shafts with length compensation, the compressed length LZ is determined using the following parameters and calculation formulas:

Order Information

When placing an order, please specify the compressed length.

Compressed Length	e.g.
• 760 - 6 500 mm • 29.92 - 255.91 in	2 505 mm

Parameters	Symbol	Unit	Remarks	Example
Operating Length	LB	mm in	The operating length LB indicates the length of the cardan shaft that typically occurs encountered during operation or when stationary. Application-specific value. To be specified by the customer.	LB = 2 550 mm
Sliding Length	LV	mm in	The sliding length LV depends on the cardan shaft size and represents the change in length of the cardan shaft in the extended condition. The sliding lengths LV for the individual cardan shaft sizes are listed in the data tables on pages 31 and 33.	Sliding length LV of the cardan shaft size 3065: LV = 140 mm
Compressed Length	LZ	mm in	We recommend calculating the compressed length LZ using the following formula: LZ = LB - 1/3 LV (In the USA, it is common practice to calculate the compressed length LZ using the following formula: LZ = LB - 1/2 LV.) The value of LZ shall be rounded in increments of 5 millimeters or 1/5 inch. In general, the following applies: • The compressed length LZ must be less than the minimum operating length LB_{min} of the cardan shafts: $LZ < LB_{min}$ • The compressed length LZ plus its sliding length LV must be greater than the maximum operating length LB_{max}: $LZ + LV > LB_{max}$ • When a cardan shaft is operated at its optimum operating length LB_{opt}, the length compensation has the greatest possible spline overlap between the splined shaft and the splined sleeve, resulting in a particularly long service life of the length compensation. The optimum operating length LB_{opt} of a cardan shaft is composed of the compressed length LZ and one third of the sliding length LV: $LB_{opt} = LZ + 1/3 \cdot LV$	LZ = LB - 1/3 x LV = 2 550 mm – 1/3 x 140 mm = 2 550 mm – 46,67 mm ≈ 2 505 mm

Determination of the Fixed Length

For cardan shafts without length compensation, the fixed length LF is determined using the following parameter and calculation formula:

Order Information

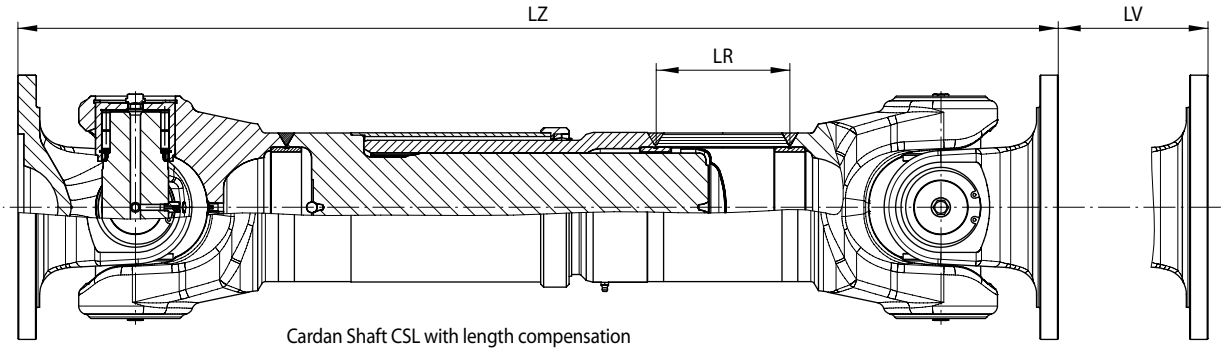
When placing an order, please specify the fixed length.

Fixed Length	e.g.
• 485 - 6 500 mm • 19.09 - 255.91 in	2 505 mm

Parameters	Symbol	Unit	Remarks	Example
Fixed Length	LF	mm in	For cardan shafts without length compensation, the fixed length LF is equal to the operating length LB: LF = LB	Fixed length LF at 2 505 mm operating length LB: LF = 2 505 mm

Compressed Length for Cardan Shafts with Length Compensation

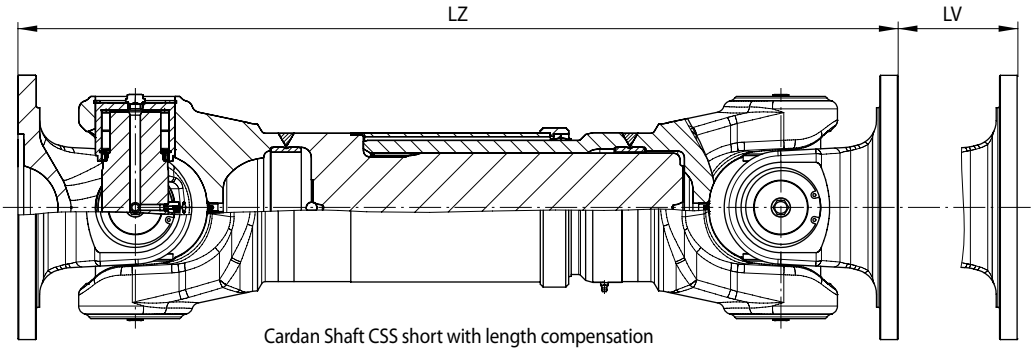
For cardan shafts with length compensation, the compressed length is designated as LZ, while the change in length in the extended condition is designated as the sliding length LV.



Cardan Shaft CSL with length compensation

23-1

For a given size of a Cardan Shaft CSL with length compensation, the compressed length LZ varies depending on the length of the installed tube LR. The longer the installed tube, the greater the compressed length LZ of the cardan shaft, and vice versa.

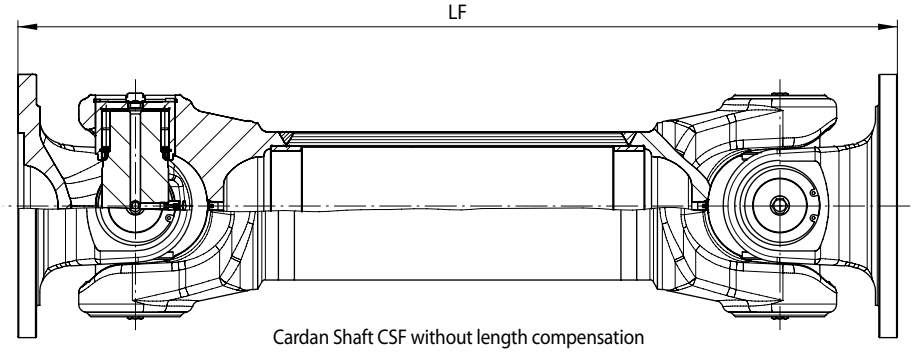


Cardan Shaft CSS short with length compensation

23-2

For a given size of a Cardan Shaft CSS short with length compensation, both the compressed length LZ and the sliding length LV vary depending on the length of the installed components. The longer the installed components, the greater the compressed length LZ and the sliding length LV of a cardan shaft, and vice versa; Cardan Shafts CSS are designed without a tube.

Fixed Length for Cardan Shafts without Length Compensation



Cardan Shaft CSF without length compensation

23-3

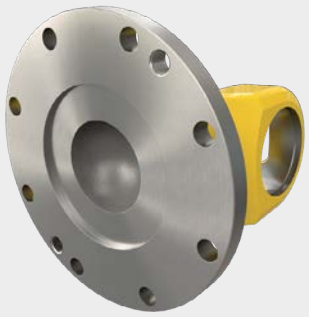
Cardan Shafts CSF without length compensation have a fixed length LF.

4. Selection of Flange Yokes

Flange Yoke B with Frictional Connection

Flange Yokes B with frictional connection is the most commonly used flange yoke design for our cardan shafts. Their simple and robust design makes them the preferred choice for most applications.

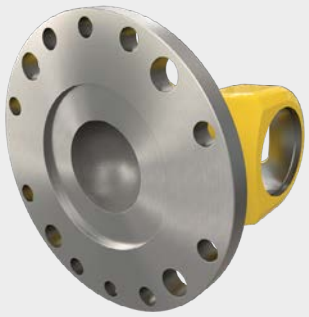
See page 36.



Flange Yoke S with Clamping Sleeves

Flange Yokes S with clamping sleeves have the same design as Flange Yokes B with frictional connection, although the Flange Yokes S have four additional bores for clamping sleeves.

See page 37.



Flange Yoke K with Face Key

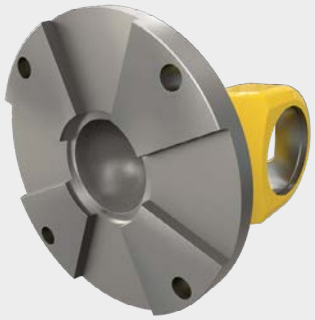
Flange Yokes K with face key are an enhanced version of Flange Yokes B with frictional connection. This design enables the reliable transfer of higher torques and peak loads.

See page 38.

Flange Yoke T with Jaw Teeth

Flange Yokes T with jaw teeth provide a positive-locking, self-centering connection with high torque transmission capability. The interlocking jaws ensure a reliable and connection that is easy to assemble.

See page 39.



Flange Yoke H with Hirth Serration

Flange Yokes H with Hirth serration are particularly suitable for applications with the highest torque requirements. In addition to their high load-carrying capacity, these connections offer easy assembly and disassembly.

See page 40.

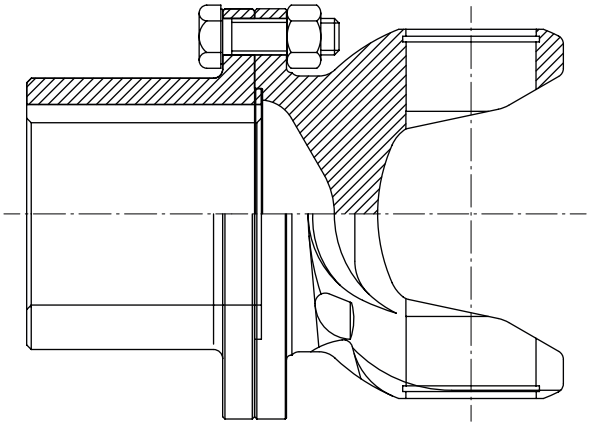
Bolt Insertion

All our flange yokes are supplied as standard with **equipment-side bolt insertion**, where the bolt nut rests on the flange yoke plate.

Depending on the design and size, an additional **joint-side bolt insertion** may be available, where the bolt head rests on the flange yoke plate. Depending on the design, this option is

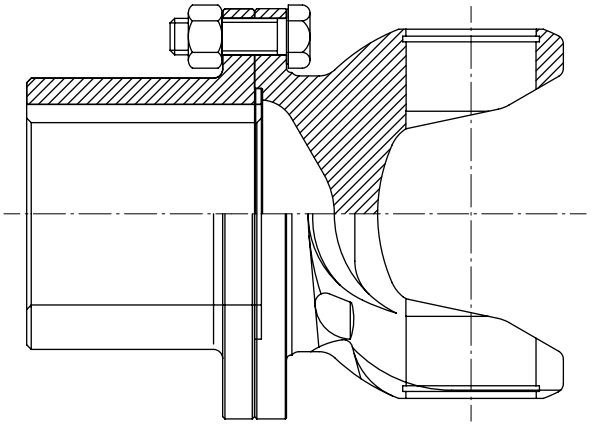
- available as standard,
- optionally available by additional machining, or
- not possible due to design constraints.

Detailed information on joint-side bolt insertion for the individual flange yokes are listed in the data tables on pages 36 to 40.



Equipment-side bolt insertion

25-1



Joint-side bolt insertion

25-2

Order Information

When placing an order, please specify the required types and flange diameters for the left-hand and right-hand flange yokes.

If optional joint-side bolt insertion is to be implemented, please also specify this information.

Flange yokes can also be ordered individually. Please refer to the ordering examples on pages 36 to 40.

Flange Yoke Version, Left	e.g.
Type • B with frictional connection • S with clamping sleeves • K with face key • T with jaw teeth • H with Hirth serration	B
Option Implementation of optional joint-side bolt insertion: • Yes = S • No = *leave blank*	S
Flange Yoke Diameter, Left	**e.g.**
• 180 - 480 mm • 7.09 - 18.90 in	250 mm

Flange Yoke Version, Right	e.g.
Type • B with frictional connection • S with clamping sleeves • K with face key • T with jaw teeth • H with Hirth serration	K
Option Implementation of optional joint-side bolt insertion: • Yes = S • No = *leave blank*	
Flange Yoke Diameter, Right	**e.g.**
• 180 - 480 mm • 7.09 - 18.90 in	225 mm

5. Selection of Balancing Quality

Professional dynamic balancing of cardan shafts minimizes unbalance, vibration and consequential damage to the cardan shafts and other drive components.

RINGSPANN balances cardan shafts on modern balancing machines in accordance with the DIN ISO 21940-11 standard ("Mechanical vibrations – Rotor balancing – Part 11: Procedures and tolerances for rotors with rigid behavior") Our maximum balancing speed is 3 800 min^{-1}, subject to machine limitations.

Advantages of balancing cardan shafts:

- Reduced vibration: protection of bearings and gearbox components
- Increased operational reliability: fewer failures caused by unbalance-induced damage
- Longer service life: reduced wear thanks to smooth running

The table below shows typical balancing qualities of cardan shafts at different application speeds n_A at the input shafts of the cardan shafts. The specified typical balancing qualities are intended as a guide only.

Application Speed [min^{-1}]	Typical Application Areas	Typical Balancing Quality	Remarks
up to 300	Very slow-running shafts (hydraulic drives, conveying equipment)	Unbalanced	Vibration effects negligible
> 300 – 800	Moderate speeds in plant engineering or vehicle construction	According to customer requirements, often G25	Balancing only advisable where proneness to vibration exists
> 800 – 1 500	Standard industrial cardan shafts, general mechanical engineering	G16	Economical standard at RINGSPANN
> 1 500 – 3 000	High-speed cardan shafts, test stands	G16 – G6.3	Depending on size, bearings arrangement and running smoothness
> 3 000 – 6 000	Precision or special applications	G6.3	Requires complex, precise manufacturing and test-stand balancing

Order Information

When placing an order, please specify the required balancing quality and the maximum application speed:

Balancing Quality	e.g.
• Unbalanced • G25 • G16 (standard) • G6.3	G16
Max. Application Speed	e.g.
	900 min^{-1}

6. Selection of Paint Finish

The following paint finishes are regularly available:

Paint Finish Variant	Total Coating Thickness	Suitable for Corrosivity Category *	Application Areas
Primer in deep black, matt (standard)	40 – 80 µm	C1 – C2	Heated or dry indoor areas with low corrosive exposure, e.g. machine rooms, machine halls, storage areas
Standard paint finish	120 – 160 µm	C3 – C4	Industrial and outdoor areas with moderate corrosive exposure, moderate humidity or changing ambient conditions
Reinforced paint finish	180 – 240 µm	C4 – C5	Outdoor installations and industrial atmospheres with high humidity or increased corrosive exposure; e.g. port and mining areas, depending on the specific environmental condition
Unpainted	-	CO	Only for dry indoor areas without corrosion protection requirements, e.g. test stands or machine halls with controlled environment

* Classification based on DIN EN ISO 12944. Actual suitability depends on environmental conditions, protection duration and exposure.

For the standard paint finish and the reinforced paint finish, 13 different RAL colors are regularly available:

RAL Code	Color Name	Color Samples
RAL 9005	Deep black, matt (standard)	
RAL 1003	Signal yellow	
RAL 1005	Honey yellow	
RAL 1021	Colza yellow	
RAL 2008	Bright red orange	
RAL 3013	Tomato red	
RAL 3020	Traffic red	
RAL 5015	Sky blue	
RAL 5018	Turquoise blue	
RAL 6011	Reseda green	
RAL 6019	Pastel green	
RAL 7011	Iron gray	
RAL 7021	Black gray	

Order Information

When placing an order, please specify the required paint finish variant and the RAL color. Further paint finish variants or colors are available on request.

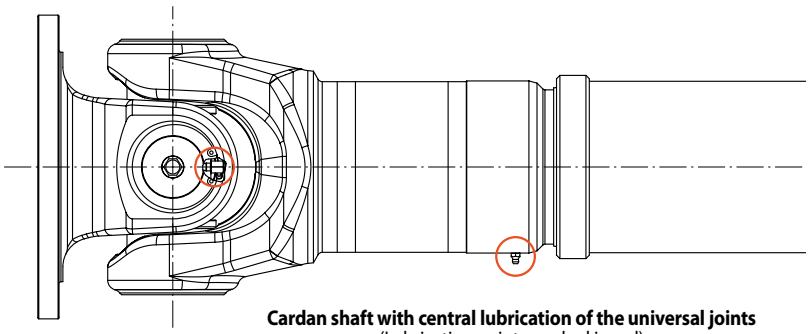
Paint Finish Variant	e.g.
• Primer in deep black, matt (standard) • Standard paint finish • Reinforced paint finish • Unpainted	Standard paint finish
RAL Color	**e.g.**
• RAL 9005 (standard) • RAL 1003 • RAL 5015 • RAL 1005 • RAL 5018 • RAL 1021 • RAL 6011 • RAL 2008 • RAL 6019 • RAL 3013 • RAL 7011 • RAL 3020 • RAL 7021	RAL 1003

7. Selection of Lubrication

Lubrication Types

Central Lubrication

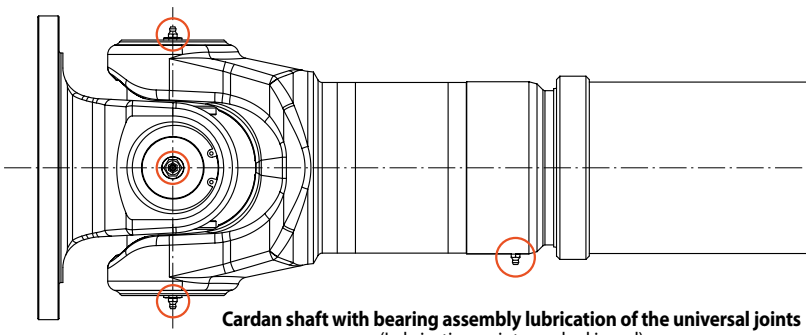
As standard, we supply low-maintenance, relubricatable cardan shafts with central lubrication of the universal joints.



Cardan shaft with central lubrication of the universal joints
(Lubrication points marked in red) 28-1

Bearing Assembly Lubrication

Optionally, we supply cardan shafts with bearing assembly lubrication of the universal joints for applications with restricted installation space or increased requirements regarding lubrication quality.



Cardan shaft with bearing assembly lubrication of the universal joints
(Lubrication points marked in red) 28-2

Lifetime Lubrication

For applications with defined requirements, we optionally offer maintenance-free, lifetime-lubricated cardan shafts. In this case, the universal joints and length compensation are not relubricatable. Such defined requirements may include, for example, limited accessibility of the cardan shaft, particularly high operational reliability, extended maintenance intervals or a hermetically sealed installation space. Please consult us in such cases.

Relubrication Intervals

Unless otherwise specified in individual cases, the following relubrication intervals must be observed for universal joints and length compensation:

Installation Location	Relubrication Interval for Universal Joints	Relubrication Interval for Length Compensation
Industrial application	every 6 months	every 6 months
Commercial vehicles for road use	every 50 000 km or 12 months	predominantly maintenance-free
Commercial vehicles for construction use	every 12 500 km or 250 hours	predominantly maintenance-free

Grease Types

The universal joints and the length compensation of our cardan shafts are generally lubricated with grease.

For lubrication, a lithium-soap grease of NLGI grade 2 without MoS_2 additives must be used. We recommend the following greases for relubrication:

Supplier	Grease Type
Fuchs	Renolit LX PEP2
Fuchs	Renolit MP
Shell	Gadus S3V220C
Mobil	XHP 462
Mystik	JT-6 HT

Standard Greases

Our standard greases are suitable for operating temperatures from -40°C to +120°C.

Low- and High-Temperature Greases

For operating temperatures below -40°C, we offer special low-temperature greases, and for operating temperatures above +120°C, special high-temperature greases. Please consult us in such cases.

Order Information

When placing an order, please specify the required lubrication type and grease type.

Lubrication Type	e.g.
• Central lubrication (standard) • Bearing assembly lubrication (optional) • Lifetime lubrication (please consult us)	Central lubrication
Grease Type	**e.g.**
• Standard grease -40° to +120° C • Low-temperature grease < -40° C (please consult us) • High-temperature grease > +120° C (please consult us)	Standard grease

Cardan Shaft CSL
with Length Compensation

RINGSPANN®

Features

Nominal Torques	29 000 - 290 000 Nm 257 000 - 2 567 000 lb•ft
Flange Yoke Diameter	180 - 480 mm 7.09 - 18.90 in
Rotation Diameter	198 - 390 mm 7.80 - 15.35 in
Max. Operating Angle	15° - 24° (size-dependent)
Sliding Length	110 - 200 mm 4.33 - 7.87 in
Max. Compressed Length	4 500 mm / 177.17 in * 6 500 mm / 255.91 in ** * balanced; ** unbalanced

Order Information

Cardan Shaft Design	e.g.
• CSL with length compensation • CSS short with length compens. • CSF without length compens.	CSL

Cardan Shaft Size			e.g.
• 2065	• 8050	• 3070	3053
• 3052	• 3062	• 3075	
• 3053	• 3065	• 3078	

Compressed Length	e.g.
• 760 - 6 500 mm • 29.92 - 255.91 in	2505

Flange Yoke Version, Left	e.g.
Type • B with frictional connection • S with clamping sleeves • K with face key • T with jaw teeth • H with Hirth serration	B
Option Implementation of optional joint-side bolt insertion: • Yes = S • No = *leave blank*	S
Flange Yoke Diameter, Left	**e.g.**
• 180 - 480 mm • 7.09 - 18.90 in	250

Flange Yoke Version, Right	e.g.
Type • B with frictional connection • S with clamping sleeves • K with face key • T with jaw teeth • H with Hirth serration	K
Option Implementation of optional joint-side bolt insertion: • Yes = S • No = *leave blank*	
Flange Yoke Diameter, Right	**e.g.**
• 180 - 480 mm • 7.09 - 18.90 in	225

Unit of Length	e.g.
• mm • in	mm

Short Designation
CSL-3053-2505-BS250-K225-mm

Further Order Information

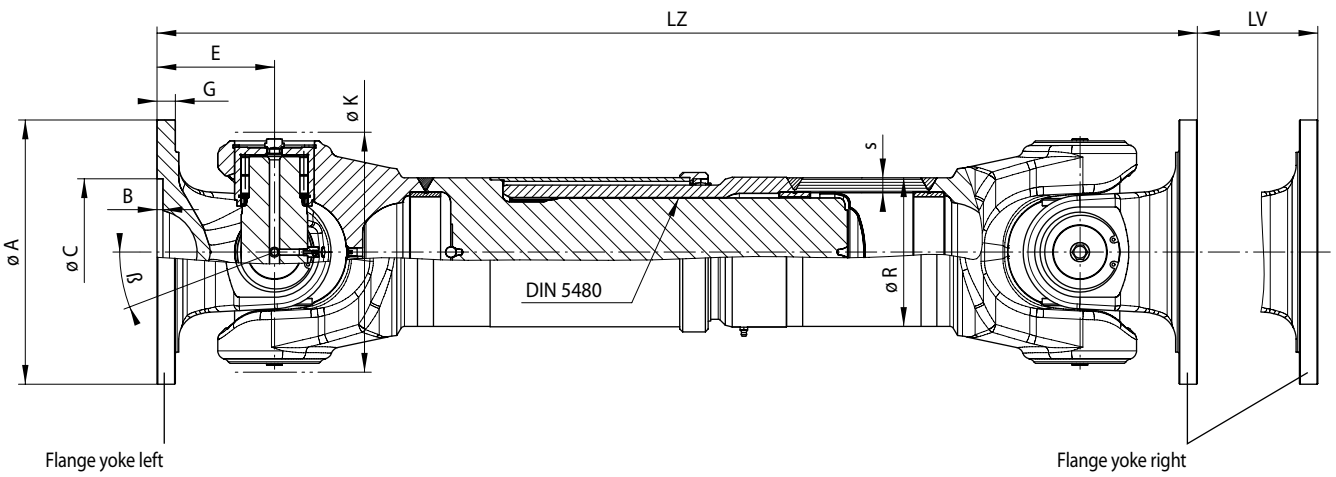
Balancing Quality	e.g.
• Unbalanced • G25 • G16 (standard) • G6.3	G16
Max. Application Speed	**e.g.**
	900 min^{-1}

Paint Finish Variant	e.g.
• Primer in deep black, matt (standard) • Standard paint finish • Reinforced paint finish • Unpainted	Standard paint finish
RAL Color	**e.g.**
See page 27	RAL 1003

Lubrication Type	e.g.
• Central lubrication (standard) • Bearing assembly lubrication (optional) • Lifetime lubrication (please consult us)	Central lubrication
Grease Type	**e.g.**
• Standard grease -40° to +120° C • Low-temperature grease < -40° C (please consult us) • High-temperature grease > +120° C (please consult us)	Standard grease

Cardan Shaft CSL
with Length Compensation

RINGSPANN®



Note: The drawing shows an example of a flange yoke B with frictional connection.

31-1

Cardan Shaft Size (old series)	Nominal Torque M_N		Pulsating Fatigue Torque M_{DS}		Reversing Fatigue Torque M_{DW}		Dynamic Load Rating CR	
	Nm	lb•ft	Nm	lb•ft	Nm	lb•ft	Nm	lb•ft
2065 (100)	29000	257000	24000	212000	16000	142000	6340	56110
3052 (104)	42000	372000	40500	358000	27000	239000	9240	81780
3053 (106)	42000	372000	40500	358000	27000	239000	9240	81780
8050 (109)	61000	540000	55500	491000	37000	327000	11310	100100
3062 (115)	62000	549000	58500	518000	39000	345000	13390	118510
3065 (124)	104000	920000	96000	850000	64000	566000	19700	174360
3070 (135)	120000	1062000	110000	982000	74000	655000	28640	253490
3075 (145)	140000	1239000	135000	1195000	90000	797000	39660	351020
3078 (160)	290000	2567000	277500	2456000	185000	1637000	55410	490420

Cardan Shaft Size (old series)	Minimum Compressed Length LZ min.		Sliding Length LV		Bearing Center Distance E		Profile DIN 5480-1	Cardan Shaft Tube R x s		Max. Operating Angle β
	mm	in	mm	in	mm	in	mm	mm	in	
2065 (100)	760	29.92	110	4.33	110	4.33	90 x 2,5	140 x 5	5.51 x 0.20	24°
3052 (104)	900	35.43	140	5.51	125	4.92	90 x 2,5	144 x 7	5.67 x 0.28	18°
3053 (106)	855	33.66	140	5.51	125	14.92	120 x 2,5	160 x 10	6.30 x 0.39	18°
8050 (109)	855	33.66	140	5.51	125	4.92	120 x 2,5	160 x 10	6.30 x 0.39	18°
3062 (115)	935	36.81	140	5.51	130	5.12	120 x 2,5	165 x 12,5	6.50 x 0.49	18°
3065 (124)	1140	44.88	140	5.51	140	5.51	130 x 3,0	177 x 17,5	6.97 x 0.69	22°
3070 (135)	1235	48.62	140	5.51	180	7.09	130 x 3,0	177 x 17,5	6.97 x 0.69	15°
3075 (145)	1720	67.72	170	6.69	290	11.42	150 x 3,0	220 x 15	8.66 x 0.59	20°
3078 (160)	1425	56.10	200	7.87	215	8.46	200 x 3,0	280 x 25	11.02 x 0.98	18°

Compressed lengths LZ are available in increments of 5 mm or 1/5 in. For unbalanced cardan shafts, LZ is theoretically unlimited upwards. For balanced cardan shafts, LZ is limited to a maximum of 4500 mm or 177.17 in. Larger values for LZ are available on request.

Cardan Shaft Size (old series)	Rotational Diameter K		Flange Yoke Diameter * A		Centering Depth * B		Centering Diameter * C		Flange Thickness * G	
	mm	in	mm	in	mm	in	mm	in	mm	in
2065 (100)	198	7.80	225	8.86	5	0.20	140	5.51	16	0.63
3052 (104)	225	8.86	250	9.84	6	0.24	140	5.51	18	0.71
3053 (106)	225	8.86	250	9.84	6	0.24	140	5.51	18	0.71
8050 (109)	225	8.86	250	9.84	6	0.24	140	5.51	18	0.71
3062 (115)	250	9.84	285	11.22	7	0.28	175	6.89	20	0.79
3065 (124)	286	11.26	315	12.40	7	0.28	175	6.89	22	0.87
3070 (135)	315	12.40	350	13.78	8	0.31	220	8.66	25	0.98
3075 (145)	355	13.98	390	15.35	8	0.31	250	9.84	28	1.10
3078 (160)	390	15.35	435	17.13	10	0.39	280	11.02	40	1.57

* Example dimensions for Flange Yoke B with frictional connection, while all available flange diameters and corresponding dimensions are listed on page 36.
Dimensions for the positive-locking Flange Yokes S, K, T and H can be found on pages 37 to 40.

Cardan Shaft CSS
short with Length Compensation

RINGSPANN®

Features

Nominal Torques	29 000 - 290 000 Nm 257 000 - 2 567 000 lb•ft
Flange Yoke Diameter	180 - 480 mm 7.09 - 18.90 in
Rotation Diameter	198 - 390 mm 7.80 - 15.35 in
Max. Operating Angle	15° - 24° (size-dependent)
Sliding Length	25 - 200 mm 0.98 - 7.87 in
Compressed Length	600 - 1 420 mm 23.62 - 55.91 in

Order Information

Cardan Shaft Design	e.g.
• CSL with length compensation • CSS short with length compens. • CSF without length compens.	CSS

Cardan Shaft Size	e.g.
• 2065 • 8050 • 3070 • 3052 • 3062 • 3075 • 3053 • 3065 • 3078	3053

Compressed Length	e.g.
• 600 - 1 420 mm • 23.62 - 55.91 in	750

Flange Yoke Version, Left	e.g.
Type • B with frictional connection • S with clamping sleeves • K with face key • T with jaw teeth • H with Hirth serration	B
Option Implementation of optional joint-side bolt insertion: • Yes = S • No = *leave blank*	S
Flange Yoke Diameter, Left	**e.g.**
• 180 - 480 mm • 7.09 - 18.90 in	250

Flange Yoke Version, Right	e.g.
Type • B with frictional connection • S with clamping sleeves • K with face key • T with jaw teeth • H with Hirth serration	K
Option Implementation of optional joint-side bolt insertion: • Yes = S • No = *leave blank*	
Flange Yoke Diameter, Right	**e.g.**
• 180 - 480 mm • 7.09 - 18.90 in	225

Unit of Length	e.g.
• mm • in	mm

Short Designation
CSS-3053-750-BS250-K225-mm

Further Order Information

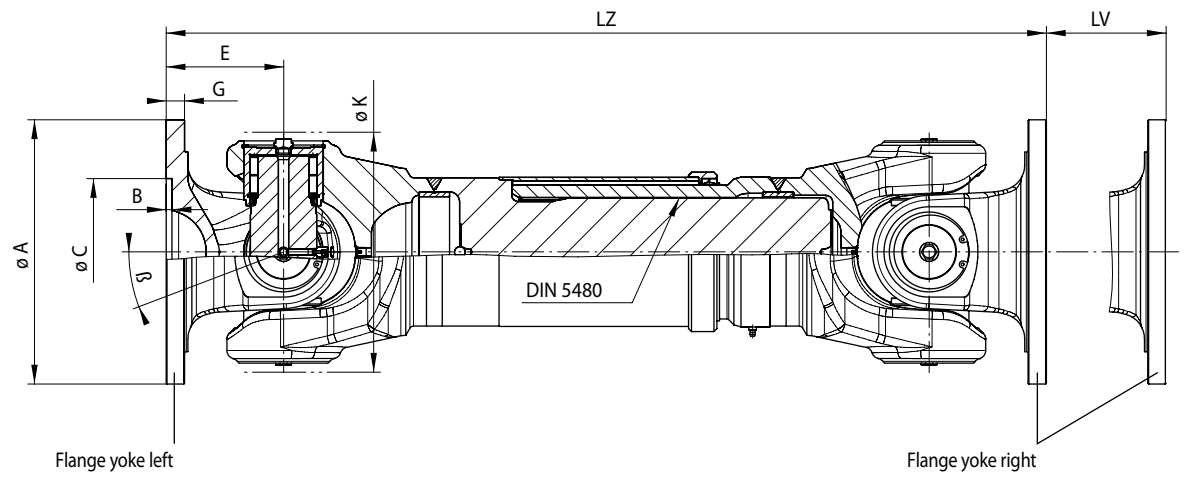
Balancing Quality	e.g.
• Unbalanced • G25 • G16 (standard) • G6.3	G16
Max. Application Speed	**e.g.**
	900 min^{-1}

Paint Finish Variant	e.g.
• Primer in deep black, matt (standard) • Standard paint finish • Reinforced paint finish • Unpainted	Standard paint finish
RAL Color	**e.g.**
See page 27	RAL 1003

Lubrication Type	e.g.
• Central lubrication (standard) • Bearing assembly lubrication (optional) • Lifetime lubrication (please consult us)	Central lubrication
Grease Type	**e.g.**
• Standard grease -40° to +120° C • Low-temperature grease < -40° C (please consult us) • High-temperature grease > +120° C (please consult us)	Standard grease

Cardan Shaft CSS
short with Length Compensation

RINGSPANN®



Note: The drawing shows an example of a flange yoke B with frictional connection.

33-1

Cardan Shaft Size (old series)	Nominal Torque M_N		Pulsating Fatigue Torque M_{DS}		Reversing Fatigue Torque M_{DW}		Dynamic Load Rating CR	
	Nm	lb•ft	Nm	lb•ft	Nm	lb•ft	Nm	lb•ft
2065 (100)	29000	257000	24000	212000	16000	142000	6340	56110
3052 (104)	42000	372000	40500	358000	27000	239000	9240	81780
3053 (106)	42000	372000	40500	358000	27000	239000	9240	81780
8050 (109)	61000	540000	55500	491000	37000	327000	11310	100100
3062 (115)	62000	549000	58500	518000	39000	345000	13390	118510
3065 (124)	104000	920000	96000	850000	64000	566000	19700	174360
3070 (135)	120000	1062000	110000	982000	74000	655000	28640	253490
3075 (145)	140000	1239000	135000	1195000	90000	797000	39660	351020
3078 (160)	290000	2567000	277500	2456000	185000	1637000	55410	490420

Cardan Shaft Size (old series)	Compressed Length LZ				Sliding Length LV				Bearing Center Distance E		Profile DIN 5480-1	Max. Operating Angle β
	min.		max.		at LZ min.		at LZ max.					
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	
2065 (100)	600	23.62	755	29.72	25	0.98	110	4.33	110	4.33	90 x 2,5	24°
3052 (104)	650	25.59	895	35.24	30	1.18	140	5.51	125	4.92	90 x 2,5	18°
3053 (106)	650	25.59	850	33.46	50	1.97	105	4.13	125	14.92	120 x 2,5	18°
8050 (109)	650	25.98	850	33.46	50	1.97	105	4.13	125	4.92	120 x 2,5	18°
3062 (115)	800	31.50	930	36.61	45	1.77	110	4.33	130	5.12	120 x 2,5	18°
3065 (124)	880	34.65	1115	43.90	95	3.74	140	5.51	140	5.51	130 x 3,0	22°
3070 (135)	980	38.58	1230	48.43	90	3.54	140	5.51	180	7.09	130 x 3,0	15°
3075 (145)	1400	55.12	1715	67.52	90	3.54	170	6.69	290	11.42	150 x 3,0	20°
3078 (160)	1200	47.24	1420	55.91	100	3.94	200	7.87	215	8.46	200 x 3,0	18°

Compressed lengths LZ are available in increments of 5 mm or 1/5 inch.

Cardan Shaft Size (old series)	Rotational Diameter K		Flange Yoke Diameter * A		Centering Depth * B		Centering Diameter * C		Flange Thickness * G	
	mm	in	mm	in	mm	in	mm	in	mm	in
2065 (100)	198	7.80	225	8.86	5	0.20	140	5.51	16	0.63
3052 (104)	225	8.86	250	9.84	6	0.24	140	5.51	18	0.71
3053 (106)	225	8.86	250	9.84	6	0.24	140	5.51	18	0.71
8050 (109)	225	8.86	250	9.84	6	0.24	140	5.51	18	0.71
3062 (115)	250	9.84	285	11.22	7	0.28	175	6.89	20	0.79
3065 (124)	286	11.26	315	12.40	7	0.28	175	6.89	22	0.87
3070 (135)	315	12.40	350	13.78	8	0.31	220	8.66	25	0.98
3075 (145)	355	13.98	390	15.35	8	0.31	250	9.84	28	1.10
3078 (160)	390	15.35	435	17.13	10	0.39	280	11.02	40	1.57

* Example dimensions for Flange Yoke B with frictional connection, while all available flange diameters and corresponding dimensions are listed on page 36.
Dimensions for the positive-locking Flange Yokes S, K, T and H can be found on pages 37 to 40.

Cardan Shaft CSF
without Length Compensation

RINGSPANN®

Features

Nominal Torques	29 000 - 290 000 Nm 257 000 - 2 567 000 lb•ft
Flange Yoke Diameter	180 - 480 mm 7.09 - 18.90 in
Rotation Diameter	198 - 390 mm 7.80 - 15.35 in
Max. Operating Angle	15° - 24° (size-dependent)
Min. Fixed Length	485 mm 19.09 in
Max. Fixed Length	4 500 mm / 177.17 in * 6 500 mm / 255.91 in ** * balanced; ** unbalanced

Order Information

Cardan Shaft Design	e.g.
• CSL with length compensation • CSS short with length compens. • CSF without length compens.	CSF

Cardan Shaft Size	e.g.
• 2065 • 8050 • 3070 • 3052 • 3062 • 3075 • 3053 • 3065 • 3078	3053

Fixed Length	e.g.
• 485 - 6 500 mm • 19.09 - 255.91 in	2 600

Flange Yoke Version, Left	e.g.
Type • B with frictional connection • S with clamping sleeves • K with face key • T with jaw teeth • H with Hirth serration	B
Option Implementation of optional joint-side bolt insertion: • Yes = S • No = *leave blank*	S
Flange Yoke Diameter, Left	**e.g.**
• 180 - 480 mm • 7.09 - 18.90 in	250

Flange Yoke Version, Right	e.g.
Type • B with frictional connection • S with clamping sleeves • K with face key • T with jaw teeth • H with Hirth serration	K
Option Implementation of optional joint-side bolt insertion: • Yes = S • No = *leave blank*	
Flange Yoke Diameter, Right	**e.g.**
• 180 - 480 mm • 7.09 - 18.90 in	225

Unit of Length	e.g.
• mm • in	mm

Short Designation
CSF-3053-2600-BS250-K225-mm

Further Order Information

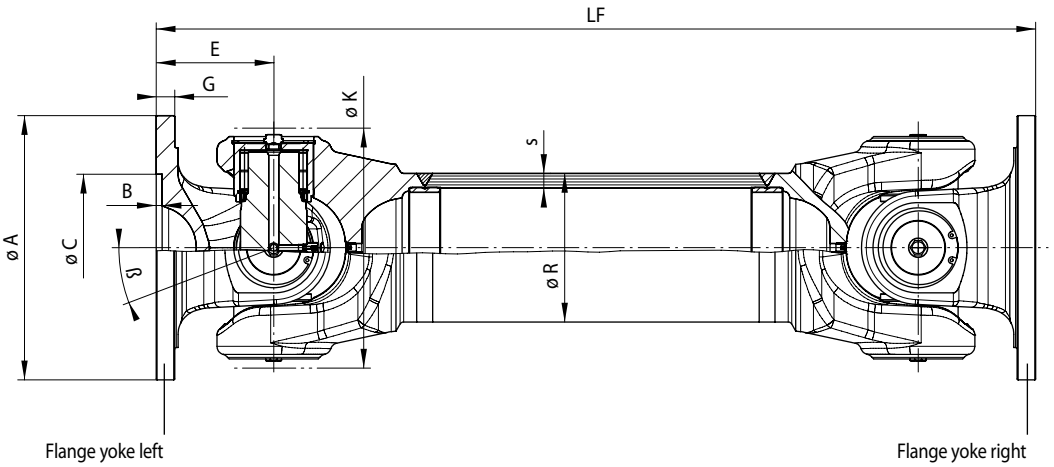
Balancing Quality	e.g.
• Unbalanced • G25 • G16 (standard) • G6.3	G16
Max. Application Speed	**e.g.**
	900 min^{-1}

Paint Finish Variant	e.g.
• Primer in deep black, matt (standard) • Standard paint finish • Reinforced paint finish • Unpainted	Standard paint finish
RAL Color	**e.g.**
See page 27	RAL 1003

Lubrication Type	e.g.
• Central lubrication (standard) • Bearing assembly lubrication (optional) • Lifetime lubrication (please consult us)	Central lubrication
Grease Type	**e.g.**
• Standard grease -40° to +120° C • Low-temperature grease < -40° C (please consult us) • High-temperature grease > +120° C (please consult us)	Standard grease

Cardan Shaft CSF
without Length Compensation

RINGSPANN®



Note: The drawing shows an example of a flange yoke B with frictional connection.

35-1

Cardan Shaft Size (old series)	Nominal Torque M_N		Pulsating Fatigue Torque M_{DS}		Reversing Fatigue Torque M_{DW}		Dynamic Load Rating CR	
	Nm	lb•ft	Nm	lb•ft	Nm	lb•ft	Nm	lb•ft
2065 (100)	29000	257000	24000	212000	16000	142000	6340	56110
3052 (104)	42000	372000	40500	358000	27000	239000	9240	81780
3053 (106)	42000	372000	40500	358000	27000	239000	9240	81780
8050 (109)	61000	540000	55500	491000	37000	327000	11310	100100
3062 (115)	62000	549000	58500	518000	39000	345000	13390	118510
3065 (124)	104000	920000	96000	850000	64000	566000	19700	174360
3070 (135)	120000	1062000	110000	982000	74000	655000	28640	253490
3075 (145)	140000	1239000	135000	1195000	90000	797000	39660	351020
3078 (160)	290000	2567000	277500	2456000	185000	1637000	55410	490420

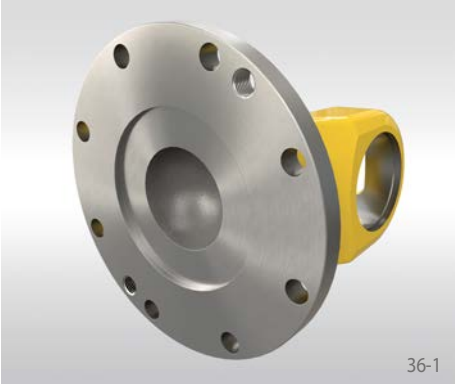
Cardan Shaft Size (old series)	Minimum Fixed Length LF min.		Bearing Center Distance E		Cardan Shaft Tube R x s		Max. Operating Angle β
	mm	in	mm	in	mm	in	
2065 (100)	485	19.09	110	4.33	140 x 5	5.51 x 0.20	24°
3052 (104)	570	22.44	125	4.92	144 x 7	5.67 x 0.28	18°
3053 (106)	545	21.46	125	14.92	160 x 10	6.30 x 0.39	18°
8050 (109)	545	21.46	125	4.92	160 x 10	6.30 x 0.39	18°
3062 (115)	625	24.61	130	5.12	165 x 12,5	6.50 x 0.49	18°
3065 (124)	680	26.77	140	5.51	177 x 17,5	6.97 x 0.69	22°
3070 (135)	835	32.87	180	7.09	177 x 17,5	6.97 x 0.69	15°
3075 (145)	1155	45.47	290	11.42	220 x 15	8.66 x 0.59	20°
3078 (160)	920	36.22	215	8.46	280 x 25	11.02 x 0.98	18°

Fixed lengths LF are available in increments of 5 mm or 1/5 in. For unbalanced cardan shafts, LF is theoretically unlimited upwards. For balanced cardan shafts, LF is limited to a maximum of 4500 mm or 177.17 in. Larger values for LF are available on request.

Cardan Shaft Size (old series)	Rotational Diameter K		Flange Yoke Diameter * A		Centering Depth * B		Centering Diameter * C		Flange Thickness * G	
	mm	in	mm	in	mm	in	mm	in	mm	in
2065 (100)	198	7.80	225	8.86	5	0.20	140	5.51	16	0.63
3052 (104)	225	8.86	250	9.84	6	0.24	140	5.51	18	0.71
3053 (106)	225	8.86	250	9.84	6	0.24	140	5.51	18	0.71
8050 (109)	225	8.86	250	9.84	6	0.24	140	5.51	18	0.71
3062 (115)	250	9.84	285	11.22	7	0.28	175	6.89	20	0.79
3065 (124)	286	11.26	315	12.40	7	0.28	175	6.89	22	0.87
3070 (135)	315	12.40	350	13.78	8	0.31	220	8.66	25	0.98
3075 (145)	355	13.98	390	15.35	8	0.31	250	9.84	28	1.10
3078 (160)	390	15.35	435	17.13	10	0.39	280	11.02	40	1.57

* Example dimensions for Flange Yoke B with frictional connection, while all available flange diameters and corresponding dimensions are listed on page 36.
Dimensions for the positive-locking Flange Yokes S, K, T and H can be found on pages 37 to 40.

Flange Yoke B with Frictional Connection



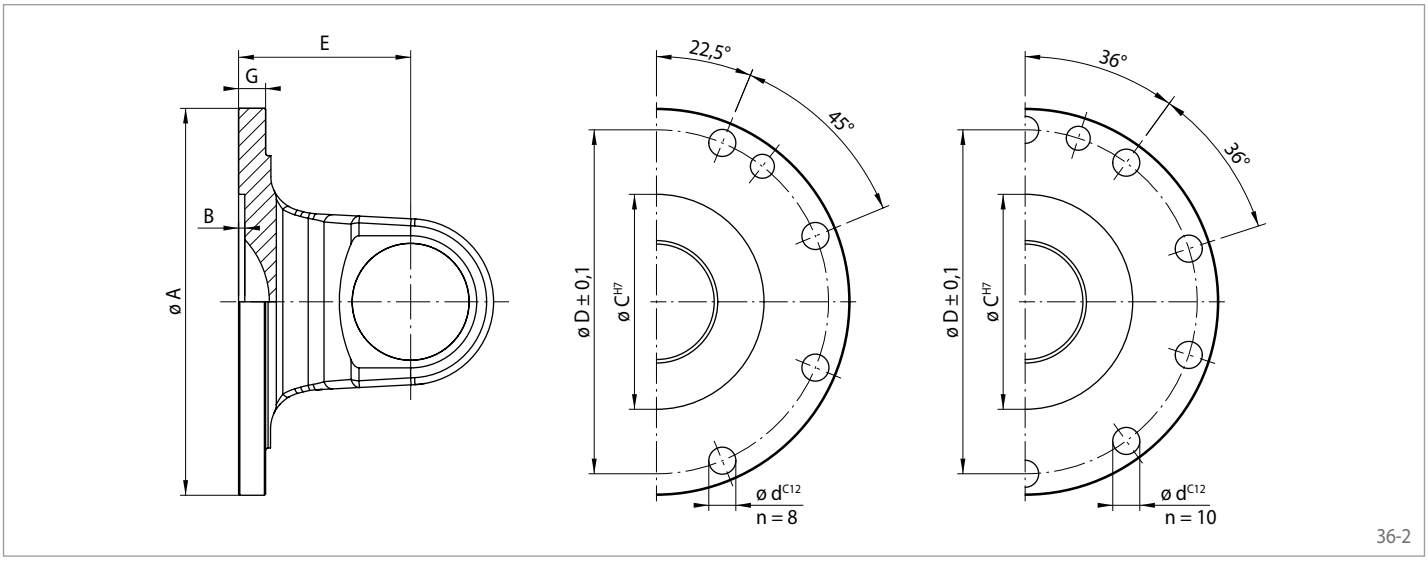
Features

Flange Yokes B with frictional connection is the most commonly used flange yoke design for our cardan shafts. Their simple and robust design makes them the preferred choice for most applications.

Order Example

Flange Yoke	B
Option [1]	S
Cardan Shaft Size	3053
Flange Yoke Diameter	250
Unit of Length	mm
Short Designation	BS-3053-250-mm

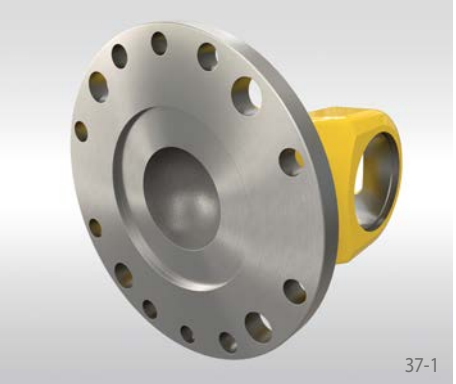
[1] Implementation of optional joint-side bolt insertion: Yes = S or No = *leave blank*



Cardan Shaft Size	Rotation Diameter K		Flange Yoke Diameter A		Centering Depth B		Centering Diameter C		Bolt Circle Diameter D		Bearing Center Distance E		Flange Thickness G		Bore Diameter d		No. of Bores	JBI *
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	n	
2065	198	7.80	180	7.09	3,5	0.14	110	0.14	155.5	6.12	110	4.33	15	0.59	16	0.63	10	n
			225	8.86	5	0.20	140	0.20	196	7.72	110	4.33	16	0.63	16	0.63	8	o
			250	9.84	5	0.20	140	0.20	218	8.58	110	4.33	18	0.71	18	0.71	8	s
3052	225	8.86	225	8.86	5	0.20	140	0.20	196	7.72	125	4.92	16	0.63	16	0.63	8	o
			250	9.84	6	0.24	140	0.24	218	8.58	125	4.92	18	0.71	18	0.71	8	s
			285	11.22	7	0.28	175	0.28	245	9.65	125	4.92	20	0.79	20	0.79	8	o
3053	225	8.86	225	8.86	5	0.20	140	0.20	196	7.72	125	4.92	16	0.63	16	0.63	8	o
			250	9.84	6	0.24	140	0.24	218	8.58	125	4.92	18	0.71	18	0.71	8	s
			285	11.22	7	0.28	175	0.28	245	9.65	125	4.92	20	0.79	20	0.79	8	o
8050	225	8.86	225	8.86	5	0.20	140	0.20	196	7.72	125	4.92	16	0.63	16	0.63	8	o
			250	9.84	6	0.24	140	0.24	218	8.58	125	4.92	18	0.71	18	0.71	8	s
			285	11.22	7	0.28	175	0.28	245	9.65	125	4.92	20	0.79	20	0.79	8	o
3062	250	9.84	250	9.84	6	0.24	140	0.24	218	8.58	130	5.12	20	0.79	18	0.71	8	o
			285	11.22	7	0.28	175	0.28	245	9.65	130	5.12	20	0.79	20	0.79	8	o
			315	12.40	7	0.28	175	0.28	280	11.02	130	5.12	22	0.87	22	0.87	8	s
3065	286	11.26	285	11.22	7	0.28	175	0.28	245	9.65	140	5.51	22	0.87	20	0.79	8	o
			315	12.40	7	0.28	175	0.28	280	11.02	140	5.51	22	0.87	22	0.87	8	o
			350	13.78	8	0.31	220	0.31	310	12.20	150	5.91	25	0.98	22	0.87	10	s
3070	315	12.40	315	12.40	7	0.28	175	0.28	280	11.02	180	7.09	22	0.87	22	0.87	8	o
			350	13.78	8	0.31	220	0.31	310	12.20	180	7.09	25	0.98	22	0.87	10	o
3075	355	13.98	350	13.78	8	0.31	220	0.31	310	12.20	290	11.42	25	0.98	22	0.87	10	s
			390	15.35	8	0.31	250	0.31	345	13.58	290	11.42	28	1.10	24	0.94	10	s
			435	17.13	10	0.39	280	0.39	385	15.16	290	11.42	32	1.26	27	1.06	10	s
3078	390	15.35	390	15.35	8	0.31	250	0.31	345	13.58	215	8.46	32	1.26	24	0.94	10	o
			435	17.13	10	0.39	280	0.39	385	15.16	215	8.46	40	1.57	27	1.06	10	o

* JBI = Joint-side bolt insertion: s = available as standard, o = optionally available, n = not possible

Flange Yoke S with Clamping Sleeves



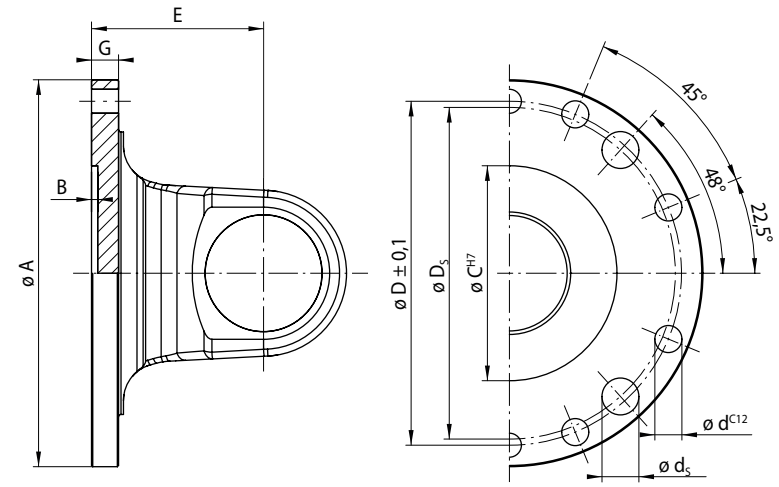
Features

Flange Yokes S with clamping sleeves have the same design as Flange Yokes B with frictional connection, although the Flange Yokes S have four additional bores for clamping sleeves.

Order Example

Flange Yoke	S
Option [1]	
Cardan Shaft Size	3053
Flange Yoke Diameter	9.84
Unit of Length	in
Short Designation	S-3053-9.84-in

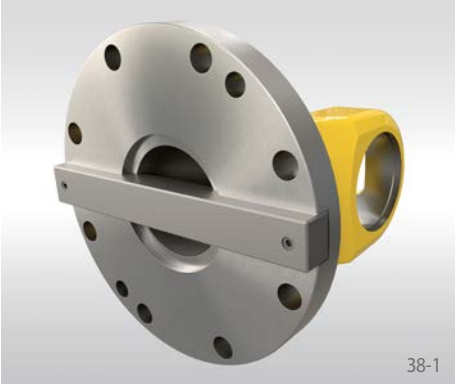
[1] Implementation of optional joint-side bolt insertion: Yes = S or No = *leave blank*



Cardan Shaft Size	Rotation Diameter K		Flange Yoke Diameter A		Centering Depth B		Centering Diameter C		Bolt Circle Diameter D		Bearing Center Distance E		Flange Thickness G		Bore Diameter d		No. of Bores	Bolt Circle Diameter D_S		Bore Diameter d_S		No. of Bores	JBI *
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	n	mm	inch	mm	inch	n_S	
2065	198	7.80	225	8.86	5	0.20	140	5.51	196	7.72	110	4.33	16	0.63	16	0.63	8	192	7.56	21	0.83	4	o
			250	9.84	5	0.20	140	5.51	218	8.58	110	4.33	18	0.71	18	0.71	8	214	8.43	25	0.98	4	s
3052	225	8.86	250	9.84	6	0.24	140	5.51	218	8.58	125	4.92	18	0.71	18	0.71	8	214	8.43	25	0.98	4	s
3053	225	8.86	250	9.84	6	0.24	140	5.51	218	8.58	125	4.92	18	0.71	18	0.71	8	214	8.43	25	0.98	4	s
8050	225	8.86	250	9.84	6	0.24	140	5.51	218	8.58	125	4.92	18	0.71	18	0.71	8	214	8.43	25	0.98	4	s
3062	250	9.84	285	11.22	7	0.28	175	6.89	245	9.65	130	5.12	20	0.79	20	0.79	8	240	9.45	28	1.10	4	o
3065	286	11.26	315	12.40	7	0.28	175	6.89	280	11.02	140	5.51	22	0.87	22	0.87	8	270	10.63	30	1.18	4	o
3070	315	12.40	350	13.78	8	0.31	220	8.66	310	12.20	180	7.09	25	0.98	22	0.87	10	300	11.81	32	1.26	4	o
3075	355	13.98	390	15.35	8	0.31	250	9.84	345	13.58	290	11.42	28	1.10	24	0.94	10	340	13.39	32	1.26	4	s
3078	390	15.35	435	17.13	10	0.39	280	11.02	385	15.16	215	8.46	40	1.57	27	1.06	10	378	14.88	35	1.38	4	o

* JBI = Joint-side bolt insertion: s = available as standard, o = optionally available, n = not possible

Flange Yoke K with Face Key



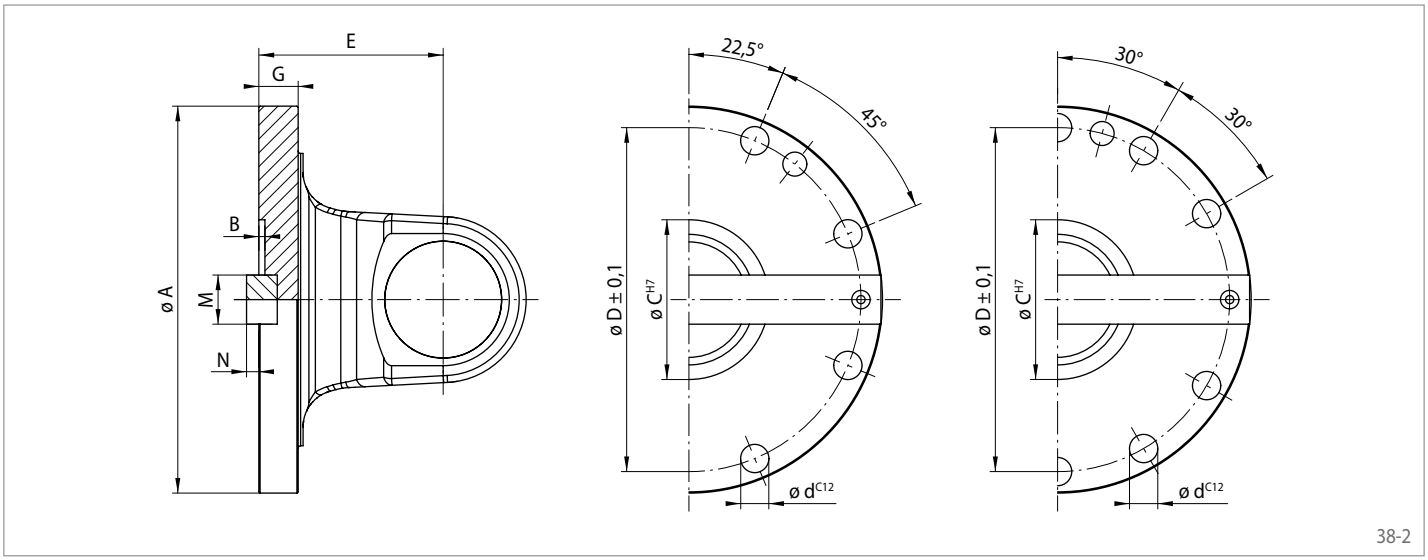
Features

Flange Yokes K with face key are an enhanced version of Flange Yokes B with frictional connection. This design enables the reliable transfer of higher torques and peak loads.

Order Example

Flange Yoke	K
Option [1]	S
Cardan Shaft Size	3053
Flange Yoke Diameter	250
Unit of Length	mm
Short Designation	KS-3053-250-mm

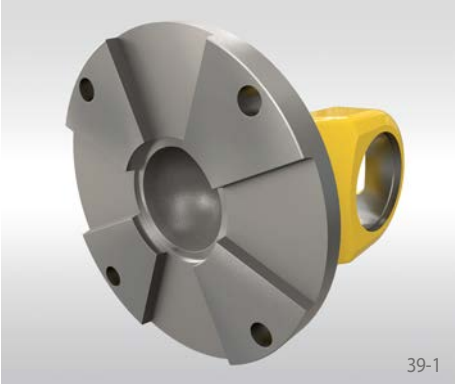
[1] Implementation of optional joint-side bolt insertion: Yes = S or No = *leave blank*



Cardan Shaft Size	Rotation Diameter K		Flange Yoke Diameter A		Centering Depth B		Centering Diameter C		Bolt Circle Diameter D		Bearing Center Distance E		Flange Thickness G		Bore Diameter d		No. of Bores	Face Key Width M		Face Key Overlap N		JBI *
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	n	mm	inch	mm	inch	
2065	198	7.80	180	7.09	5	0.20	90	3.54	155,5	6.12	110	4.33	15	0.59	17	0.67	8	9	0.35	7,0	0.28	n
			225	8.86	5	0.20	140	5.51	196	7.72	110	4.33	18	0.71	17	0.67	10	12	0.47	9,0	0.35	o
3052	225	8.86	225	8.86	5	0.20	105	4.13	196	7.72	125	4.92	20	0.79	17	0.67	8	32	1.26	9,0	0.35	o
			250	9.84	6	0.24	140	5.51	218	8.58	125	4.92	20	0.79	19	0.75	8	40	1.57	12,0	0.47	s
			285	11.22	7	0.28	125	4.92	245	9.65	125	4.92	22	0.87	21	0.83	8	40	1.57	15,0	0.59	o
3053	225	8.86	225	8.86	5	0.20	105	4.13	196	7.72	125	4.92	20	0.79	17	0.67	8	32	1.26	9,0	0.35	o
			250	9.84	6	0.24	140	5.51	218	8.58	125	4.92	20	0.79	19	0.75	8	40	1.57	12,0	0.47	s
			285	11.22	7	0.28	125	4.92	245	9.65	125	4.92	22	0.87	21	0.83	8	40	1.57	15,0	0.59	o
8050	225	8.86	225	8.86	5	0.20	105	4.13	196	7.72	125	4.92	20	0.79	17	0.67	8	32	1.26	9,0	0.35	o
			250	9.84	6	0.24	140	5.51	218	8.58	125	4.92	20	0.79	19	0.75	8	40	1.57	12,0	0.47	s
			285	11.22	7	0.28	125	4.92	245	9.65	125	4.92	22	0.87	21	0.83	8	40	1.57	15,0	0.59	o
3062	250	9.84	250	9.84	6	0.24	105	4.13	218	8.58	130	5.12	25	0.98	19	0.75	8	40	1.57	12,5	0.49	n
			285	11.22	7	0.28	125	4.92	245	9.65	130	5.12	27	1.06	21	0.83	8	40	1.57	15,0	0.59	n
			285	11.22	7	0.28	175	6.89	245	9.65	130	5.12	27	1.06	21	0.83	8	40	1.57	15,0	0.59	n
			315	12.40	7	0.28	130	5.12	280	11.02	130	5.12	27	1.06	23	0.91	10	40	1.57	15,0	0.59	n
3065	286	11.26	285	11.22	7	0.28	125	4.92	245	9.65	150	5.91	32	1.26	21	0.83	8	40	1.57	15,0	0.59	n
			315	12.40	8	0.31	130	5.12	280	11.02	150	5.91	32	1.26	23	0.91	10	40	1.57	15,0	0.59	n
			350	13.78	8	0.31	155	6.10	310	12.20	150	5.91	32	1.26	23	0.91	10	50	1.97	16,0	0.63	n
3070	315	12.40	315	12.40	8	0.31	130	5.12	280	11.02	180	7.09	32	1.26	23	0.91	10	40	1.57	15,0	0.59	n
			350	13.78	6	0.24	220	8.66	310	12.20	180	7.09	35	1.38	23	0.91	10	50	1.97	16,0	0.63	n
3075	355	13.98	350	13.78	8	0.31	155	6.10	310	12.20	290	11.42	35	1.38	23	0.91	10	50	1.97	16,0	0.63	o
			390	15.35	8	0.31	170	6.69	345	13.58	290	11.42	40	1.57	25	0.98	10	70	2.76	18,0	0.71	o
			435	17.13	10	0.39	190	7.48	385	15.16	290	11.42	42	1.65	28	1.10	10	80	3.15	20,0	0.79	o
3078	390	15.35	390	15.35	8	0.31	170	6.69	345	13.58	215	8.46	40	1.57	25	0.98	10	70	2.76	18,0	0.71	n
			435	17.13	10	0.39	190	7.48	385	15.16	215	8.46	42	1.65	28	1.10	16	80	3.15	20,0	0.79	o
			480	18.90	12	0.47	205	8.07	425	16.73	215	8.46	47	1.85	31	1.22	16	90	3.54	22,5	0.89	o

* JBI = Joint-side bolt insertion: s = available as standard, o = optionally available, n = not possible

Flange Yoke T with Jaw Teeth

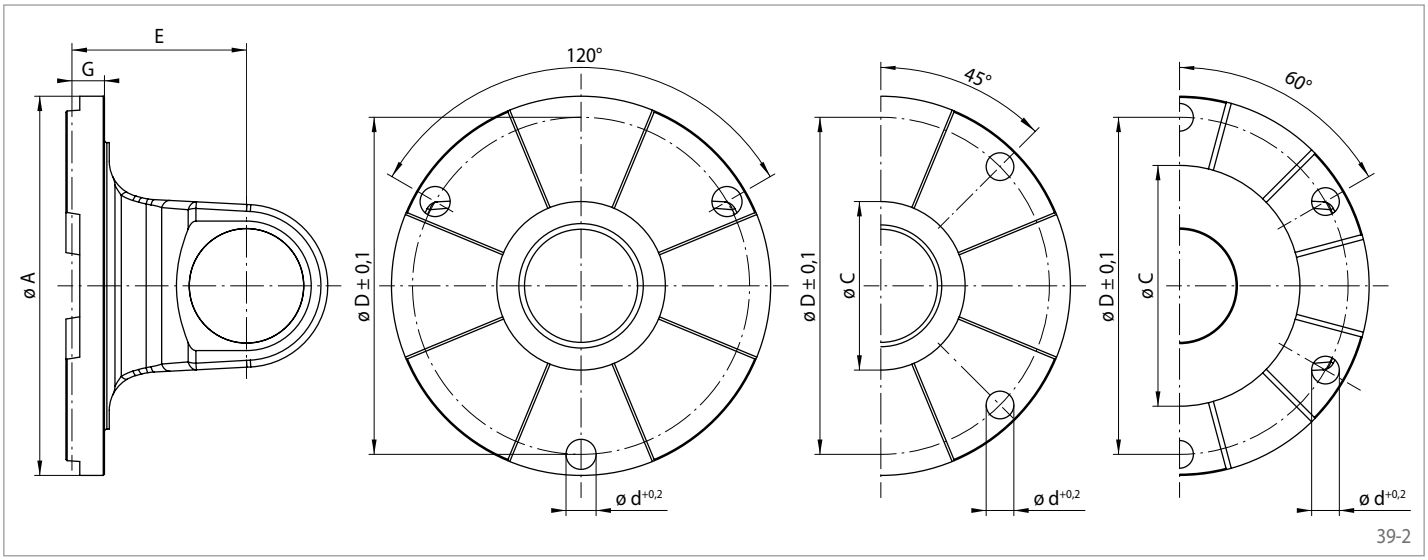


Features

Flange Yokes T with jaw teeth provide a positive-locking, self-centering connection with high torque transmission capability. The interlocking jaws ensure a reliable and connection that is easy to assemble.

Order Example

Flange Yoke	T
Cardan Shaft Size	3053
Flange Yoke Diameter	9.84
Unit of Length	in
Short Designation	T-3053-9.84-in



Cardan Shaft Size	Rotation Diameter K		Flange Yoke Diameter A		Centering Diameter C		Bolt Circle Diameter D		Bearing Center Distance E		Flange Thickness G		Bore Diameter d		No. of Bores	No. of Segments	JBI *
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	n	z	
3052	225	8.86	225	8.86	140	5.51	196	7.72	110	4.33	18	0.71	17	0.67	3	4	n
			250	9.84	140	5.51	218	8.58	110	4.33	18	0.71	19	0.75	3	4	n
3053	225	8.86	225	8.86	140	5.51	196	7.72	125	4.92	18	0.71	17	0.67	3	4	n
			250	9.84	140	5.51	218	8.58	125	4.92	18	0.71	19	0.75	3	4	n
8050	225	8.86	225	8.86	140	5.51	196	7.72	125	4.92	18	0.71	17	0.67	3	4	n
			250	9.84	140	5.51	218	8.58	125	4.92	18	0.71	19	0.75	3	4	n
3062	250	9.84	250	9.84	140	5.51	218	8.58	130	5.12	22	0.87	21	0.83	3	4	n
			285	11.22	182	7.17	245	9.65	130	5.12	19	0.75	21	0.83	3	4	n
3065	286	11.26	285	11.22	182	7.17	245	9.65	150	5.91	27	1.06	21	0.83	4	4	n
			315	12.40	140	5.51	280	11.02	150	5.91	32	1.26	23	0.91	4	4	n
			350	13.78	220	8.66	310	12.20	150	5.91	33	1.30	23	0.91	6	6	n
3070	315	12.40	315	12.40	140	5.51	280	11.02	180	7.09	30	1.18	23	0.91	4	4	n
			350	13.78	220	8.66	310	12.20	180	7.09	28	1.10	23	0.91	6	6	n
3075	355	13.98	390	15.35	190	7.48	345	13.58	290	11.42	40	1.57	25	0.98	6	6	n

* JBI = Joint-side bolt insertion: s = available as standard, o = optionally available, n = not possible

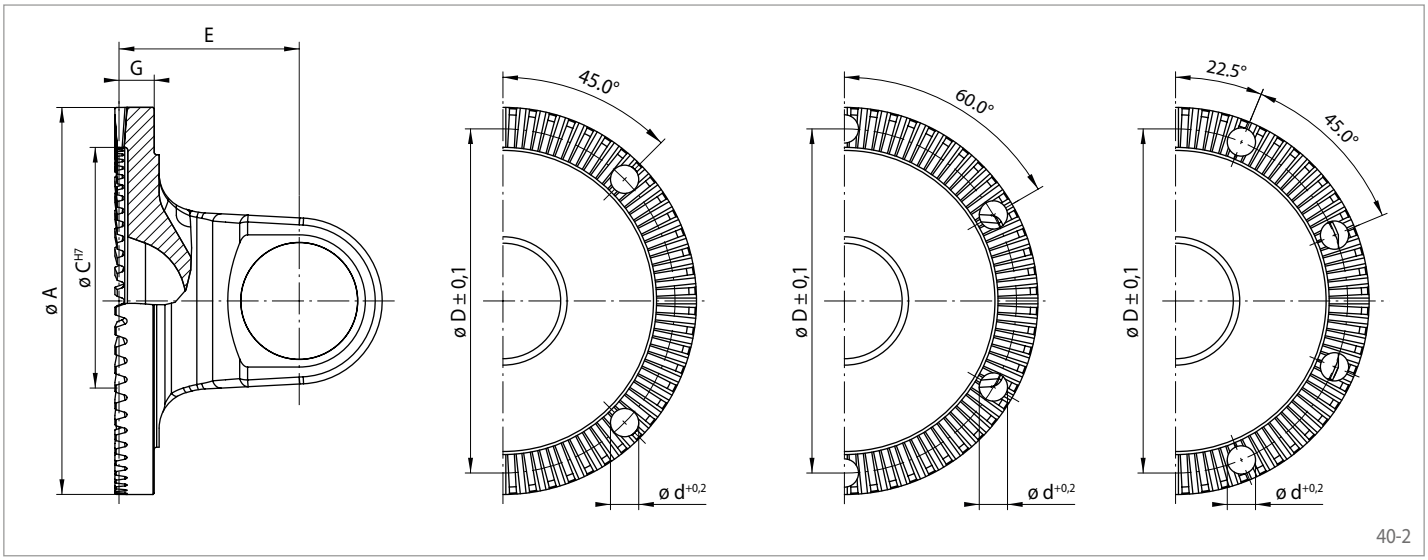
Flange Yoke H with Hirth Serration

Features

Flange Yokes H with Hirth serration are particularly suitable for applications with the highest torque requirements. In addition to their high load-carrying capacity, these connections offer easy assembly and disassembly.

Order Example

Flange Yoke	H
Cardan Shaft Size	3053
Flange Yoke Diameter	250
Unit of Length	mm
Short Designation	HS-3053-250-mm



Cardan Shaft Size	Rotation Diameter K		Flange Yoke Diameter A		Centering Diameter C		Bolt Circle Diameter D		Bearing Center Distance E		Flange Thickness G		Bore Diameter d		No. of Bores	No. of Teeth	JBI *
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	n	z	
3052	225	8.86	225	8.86	180	7.09	196	7.72	110	4.33	17,5	0.69	17	0.67	4	48	n
			250	9.84	194	7.64	218	8.58	110	4.33	17,0	0.67	19	0.75	4	48	n
3053	225	8.86	225	8.86	180	7.09	196	7.72	125	4.92	17,5	0.69	17	0.67	4	48	n
			250	9.84	194	7.64	218	8.58	125	4.92	17,0	0.67	19	0.75	4	48	n
8050	225	8.86	225	8.86	180	7.09	196	7.72	125	4.92	17,5	0.69	17	0.67	4	48	n
			250	9.84	194	7.64	218	8.58	125	4.92	17,0	0.67	19	0.75	4	48	n
3062	250	9.84	250	9.84	194	7.64	218	8.58	130	5.12	21,0	0.83	19	0.75	4	48	n
			285	11.22	225	8.86	245	9.65	130	5.12	23,6	0.93	21	0.83	4	60	n
			315	12.40	250	9.84	280	11.02	130	5.12	23,6	0.93	23	0.91	4	60	n
3065	286	11.26	285	11.22	215	8.46	245	9.65	150	5.91	29,8	1.17	21	0.83	4	60	n
			315	12.40	250	9.84	280	11.02	150	5.91	28,6	1.13	23	0.91	4	60	n
			350	13.78	280	11.02	310	12.20	150	5.91	30,0	1.18	23	0.91	6	72	n
3070	315	12.40	315	12.40	250	9.84	280	11.02	180	7.09	26,6	1.05	23	0.91	4	60	n
			350	13.78	280	11.02	310	12.20	180	7.09	26,6	1.05	25	0.98	6	72	n
3075	355	13.98	350	13.78	280	11.02	310	12.20	290	11.42	37,0	1.46	23	0.91	6	72	n
			390	15.35	315	12.40	345	13.58	290	11.42	37,0	1.46	25	0.98	6	72	n
3078	390	15.35	390	15.35	315	12.40	345	13.58	215	8.46	37,0	1.46	25	0.98	6	72	n

* JBI = Joint-side bolt insertion: s = available as standard, o = optionally available, n = not possible

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