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Fax: +1-269/6372254
info@elbeusa.com

G. Elbe & Sohn GmbH & Co. KG
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D-74321 Bietigheim-Bissingen
Phone: +49 (0)7142/353-0
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info@elbe.elbe-group.de

Complete range

Cardan and double joints

Pin and block cardan shafts

Rigid shafts

Drive and driven flanges

Ball and socket cardan shafts

Single pieces and repair of universal joint shafts

Complete range

The Original since 1919

■ INFORMATION & CONTACT ■
www.elbe-group.com

ELSO Elbe GmbH & Co. KG
- Ball and socket/ Pin and block cardan shafts
- Drive and driven flanges
- Cardan shafts

Elbe & Sohn, Inc.
- Cardan and double joints
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- Rigid shafts

G. Elbe & Sohn GmbH & Co. KG
- Cardan and double joint shafts for series and original equipment manufacturing
- Rigid shafts

ELSO Elbe GmbH & Co. KG
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- Cardan and double joint shafts for series and original equipment manufacturing
- Rigid shafts

8 good reasons for the products of the Elbe Group

- the biggest variety of products
- the decades of long experience
- the consulting know-how
- the very high product quality
- the individual technical solutions
- the balanced concept on production locations
- the advantages of a system supplier
- the humans who adopt their task

Issue 2020

Content

ORIGINAL®
elbe
GELENKE

System Partners for Power Transmission

ORIGINAL®
elbe
GELENKE
elso®

The Companies of the Elbe Group

Elbe Bietigheim-Bissingen and Elso Hofheim i. Ufr. (left to right)

Global System Partners

Gottlob Elbe founded his company in 1919 in the Swabian town of Bissingen. With five employees he began to manufacture swivel plates and machined components for clients operating in the mechanical engineering and vehicle manufacturing sectors. He had high expectations for both himself and his small company. His aim was to achieve superior quality and fulfill his customers' most difficult requirements without fail, turning even the trickiest power train solutions into a reality.

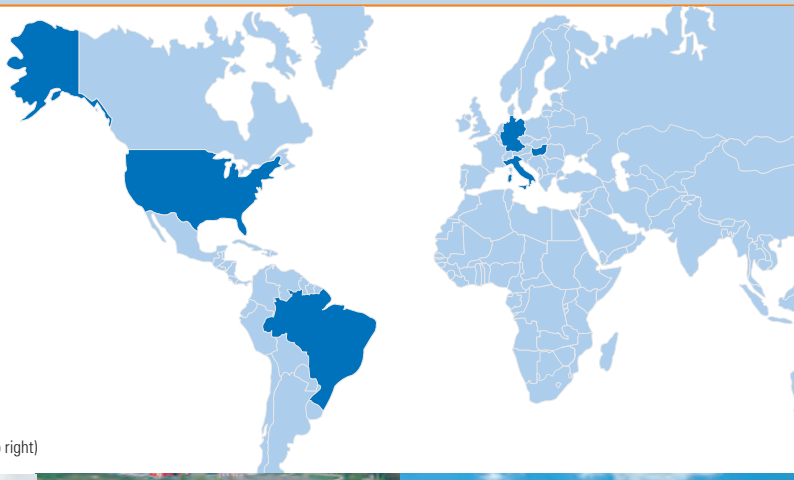
Gottlob Elbe was the first to lay down the values which remain fundamental to the company today – customer focus, technical excellence and the willingness to grow in line with consumer demands. Today these values continue to guarantee long-term, successful and cooperative business relations.

The company's history is also proof that Elbe has repeatedly risen to new market challenges and has taken a courageous but rewarding path to achieve continuous growth – by its own means and with the incentive of providing solutions for the future requirements of its customers even today.

The experience, reliability and service offered by the Elbe Group are now highly valued by customers all over the world. Even though the corporate group employs more than 1,100 staff and Elbe's steady growth continues as it provides the global market with drive shafts and drive and driven flanges, it has retained its character as a family business.

But that's not all to remain unchanged – our company continues to focus on the future. The use of the most up-to-date machinery and technology and our employees' motivation provide a sound basis for manufacturing innovative products with the utmost quality standards. Your belief in our products and achievements is not taken for granted. We continue to earn it every day. For Elbe, quality is more than a promise. It's a way of life. Every working day, in every aspect of our company.

Elbe quality management has been continually developed over many decades. Elbe now fulfills the highest quality standards and is certified in accordance with IATF 16949:2016.



Elbe North Italy, Elbe USA,
Elbe Southern Italy, Elso Hungary, Elbe Brazil (left to right)

More than 300 people are employed at the Elbe head office in Bietigheim-Bissingen. A few more work in the subsidiary in Hofheim in Unterfranken, founded in 1973. In 1993 and 1994 Elbe set up two plants in Italy and one in the USA. Elso Hungaria was established in 1999, Elbe Brazil in 2007.

In all its international activities the Elbe Group remains dedicated to Germany as its main manufacturing location – with Headquarters in Bietigheim-Bissingen.

ORIGINAL elbe GELENKE elso

The Companies of the Elbe Group

0.100

0.200

0.300

0.400

0.500

A variety of products for

Elbe drive trains are an essential component in many wells and are often used in irrigation projects in desert regions in the third world – sustainable development for the benefit of the population.

Product variety is our strength. In every situation where there is a need for reliability and longevity, Elbe provides drive shafts and components to ensure that machines and vehicles in daily use are able to stand the test of time.


0.600


0.700


0.800

0.900


Flanges

your drive train solutions

If, when you think of Elbe power train solutions, you first think of automobiles and commercial vehicles, you're quite right. However, their scope goes far beyond the automotive industry alone. Elbe power train solutions are now involved in many areas of everyday life.

What would mornings be without your daily newspaper? Rotary printing presses require highly complex power train solutions, the kind that Elbe provides. What about the oats you have for breakfast? By the time they reach your home they've already encountered Elbe power transmission technology several times – during harvesting in the combine harvester, for loading the sacks using the harbor crane or telescopic handler, in the mill and in the packaging machine. Last but not least, when you throw the empty cereal box into the recycling, Elbe technology once again comes into play soon afterwards – our drive shafts are used in the refuse collection vehicle to transmit engine power to the lifting arm to empty the recycling container. The next Original Elbe drive shaft is found in the waste paper sorting plant and after that there's another in the wheel loader which takes the waste paper to the press. A final drive shaft is found in the crushing mill in the paper factory – and from there it's back to the rotary printing press for your daily newspaper…

An example made up purely out of thin air? Unlikely. All over the world reputable manufacturers in vehicle, mechanical and plant engineering choose Original Elbe drive shafts. More than 750,000 units are assembled every year and provide locomotive technology in numerous fields of application worldwide.

At Elbe a unique variety of drive train solutions is available in a product range which is unrivalled across the globe. All drive train solutions – whether in small or large production runs or even produced individually – have Elbe manufacturing quality. During our development process, the design of the drive shafts is precisely tailored to your needs and the intended usage. And you can expect this service to continue in the future – Elbe doesn't leave anything to chance and, if requested, will supply Original Elbe drive shafts in the same design as your first order years, or even decades, later.

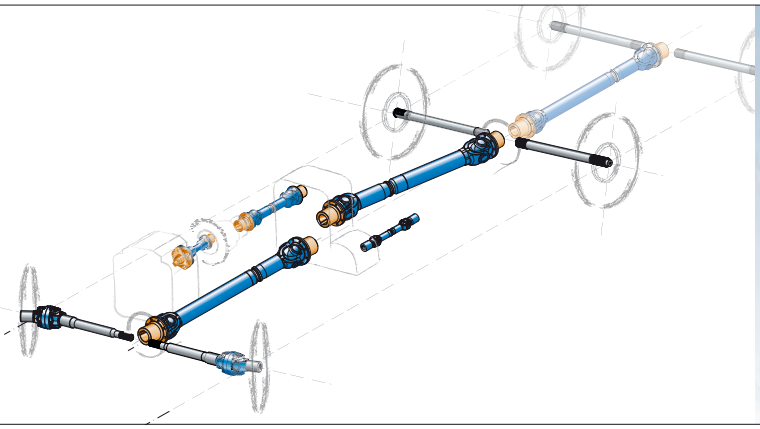
On road, off road, by air or by rail, Original Elbe drive shafts are found in many modes of transport. Whether in cars and motorbikes for optimum driving enjoyment on mountain roads, or in industrial machines generating huge forces.

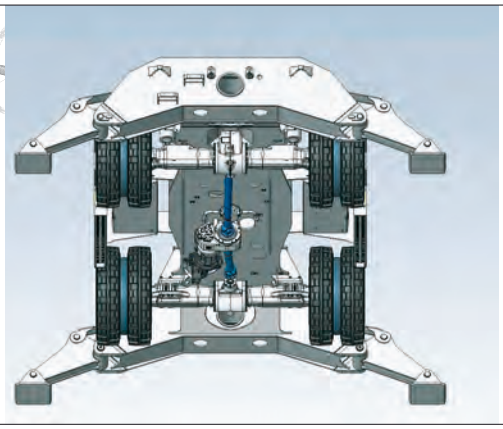
Continuous rigorous use in agriculture, reliable drive systems for vehicle manufacture, high torque systems for heavy construction machinery – the application fields for Elbe technology can be very different. However, the demands on the drive units are the same – quality and reliability. Which is why our power trains are the preferred choice for quality brands.

Many of our products are developed on the basis of individual customer requests. This is why development of Elbe products closely follows the market and its requirements. Every commission is important. However, as in Gottlob Elbe's era, technically demanding jobs often spur us on to high achievements.

More than hundred years' experience in a highly competitive market segment undergoing dynamic technological changes is irreplaceable. This experience has taught us to always consider our Original Elbe drive components as part of a whole – your vehicle. This is why our thinking goes far beyond the power train itself. The connections in our power transmission systems correspond with all current European and global standards. We are also happy to develop customized solutions for you on request.

Reliability through quality,





whichever route you take

When precision is key for machine and installation power transmission, Elbe power trains are always first choice.

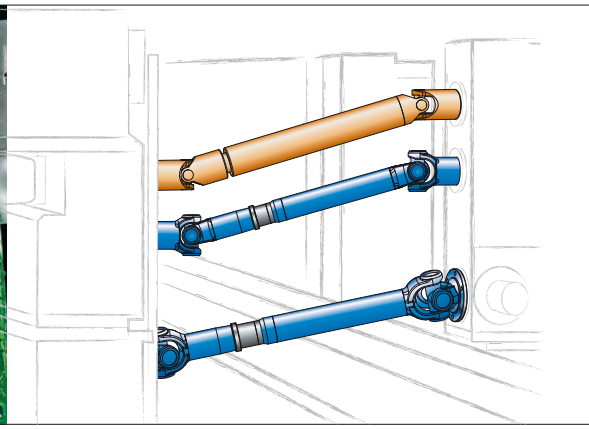
Automobile and vehicle manufacturers incorporate Elbe drive train components into their vehicles. But what is more, they use our products in the most important place of all – their manufacturing systems. Elbe drive train components are used, for example, in conveyor belts and paint finishing systems in the automobile industry. Our technology also drives printing presses and bottling plants in the food industry and is used in woodworking machines in the furniture industry. And when celebrities dazzle their fans at concerts, our power train components are toiling away, hidden in the stage technology, still and quiet.

All these different uses have a common element, a focus on precision and reliability. It's important to achieve the highest productivity through precision. And it's important to avoid any kind of malfunction. After all, there's a lot to risk if anything goes wrong.

We are very aware of this responsibility, which is why we provide our customers with outstanding product quality and versatile advice. Our technicians both in and out of the office speak the language of our customers and work together with them to develop customized solutions for their particular problem. These solutions also incorporate a precise analysis of the design of a driveshaft, with consideration of the type of application and required service life. A benefit which pays off.

Machines and installations:

Elbe components are used in many critical manufacturing installations and function reliably day-in, day-out.



productivity through precision

We believe that service involves much more than just dealing with repairs. Of course, if repairs are required, our Drive Shaft Service places utmost priority on providing you with an ideal technical and economically-viable solution in the shortest possible time. However, so that it doesn't even get to this stage, our service begins even earlier – by providing expert advice, direct from drive train specialists.

Long before you decide to make a purchase, our on and off-site staff will provide you with in-depth advice. We support you in the selection and design of drive shafts and work with you to develop the best technical and most cost-effective solution. The speed of our service represents a further bonus. Whether we're dealing with prototypes, individual productions or small or large series runs, we provide a quick response and thereby reduce your processing times. Likewise, as far as service is concerned, we believe it's important to offer you the appropriate logistical solution, fully integrated into your production planning systems on request. We supply your mass production system with parts when required, or use a courier service in the case of repairs, whatever suits you best.

Nevertheless, even the best-designed vehicles and machines experience wear and tear. To reduce downtime, we repair drive shafts as quickly as possible. Our service includes the skilled modification of drive shafts. The Drive Shaft Service is certified in accordance with IATF 16949:2016. This means you're always in good hands.

In addition, good service doesn't necessarily come at a high price. Like our product range, our service is designed in accordance with a sophisticated modular strategy, which saves on costs.

Drive Shaft Service: direc

With Elbe and Elso Drive Shaft Service, you are in the hands of a skilled and reliable partner offering Original Elbe quality.

elbe ORIGINAL® GELENKE elso®

The Companies of the Elbe Group

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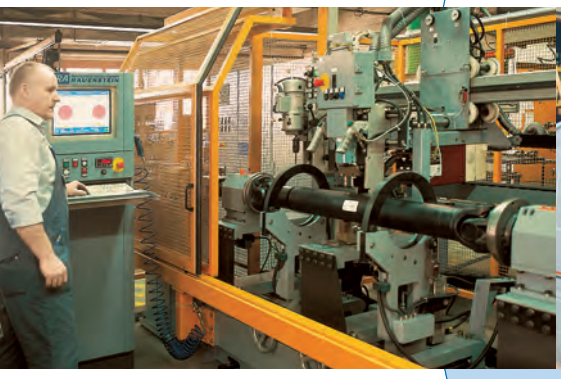
t from the manufacturer



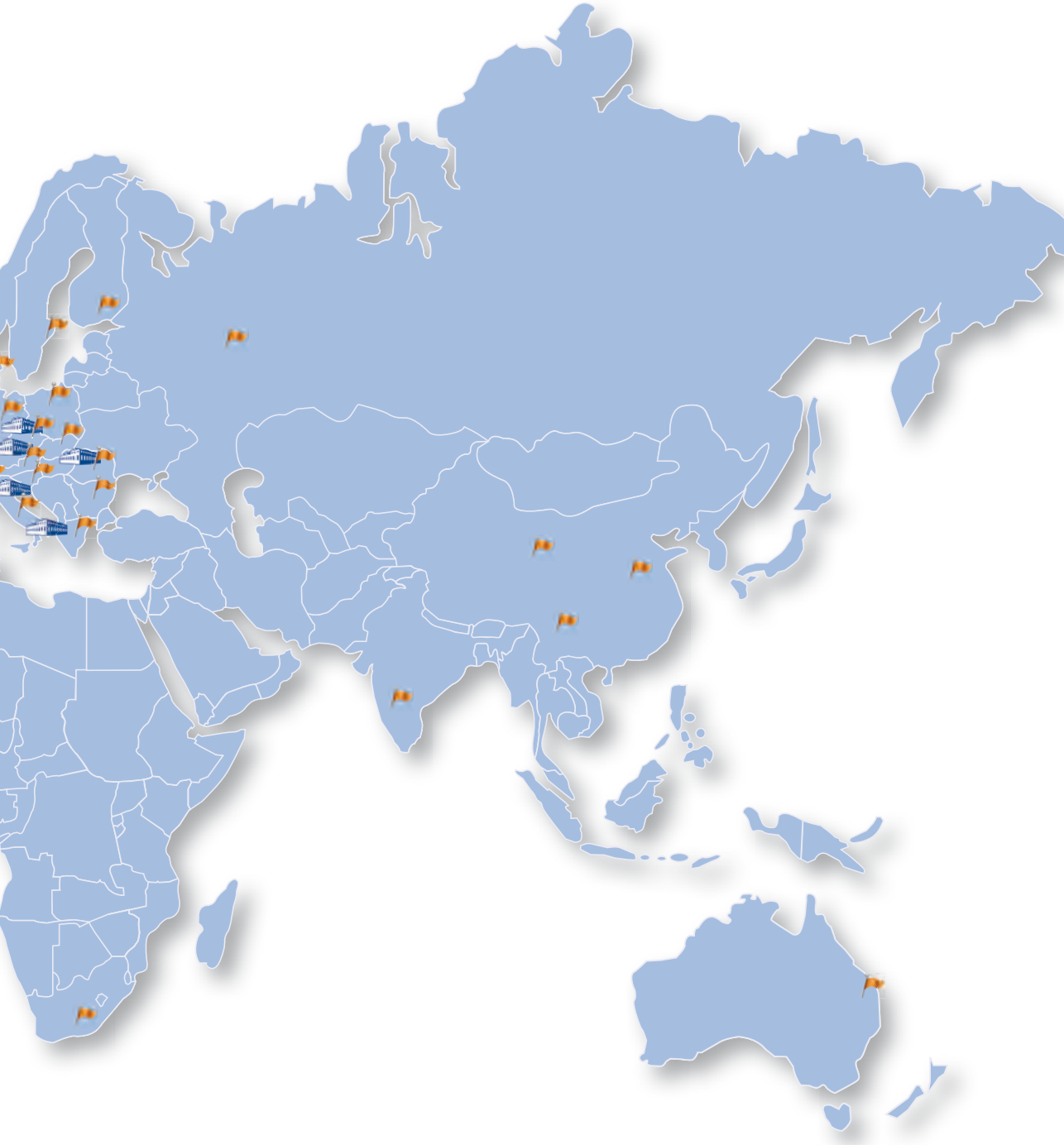
In good hands. Elso Drive Shaft Service is certified in accordance with IATF 16949:2016.

Sales Area Representative

Contact data of the Elbe Group partners can be found on our Internet site: www.elbe-group.com

Plants

Sales distributors



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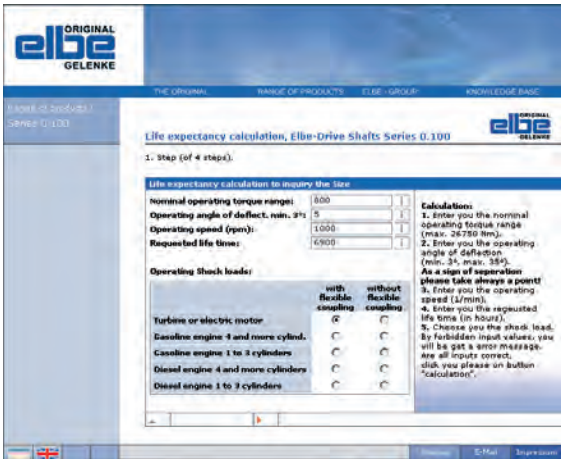
info@elbedobrasil.com.br
www.elbe-group.com

Online:
Drive-Shaft Calculation
www.elbe-group.com

Five steps to find your Drive-Shaft.

1. Enter you the nominal operating torque range.
2. Enter you the operating angle of deflection.
3. Enter you the operating speed.
4. Enter you the regeusted life time.
5. Choose you the shock load, click you please on button “calculation”.

Life expectancy calculation.



www.elbe-group.com

Note

Further technical development and adaptation to our customers' requirements may result in modications of technical characteristics of products. These modifications are subject to change without notice. We are not obliged to modify products that have already been supplied. We also reserve the right to withdraw items from our product range. Working instructions and recommendations on the use and the reliability of products are non-binding and do not replace any legal or professional provisions in the respective countries.

For further information please see **www.elbe-group.de**

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Photo: Claas


Photo: Dreistern

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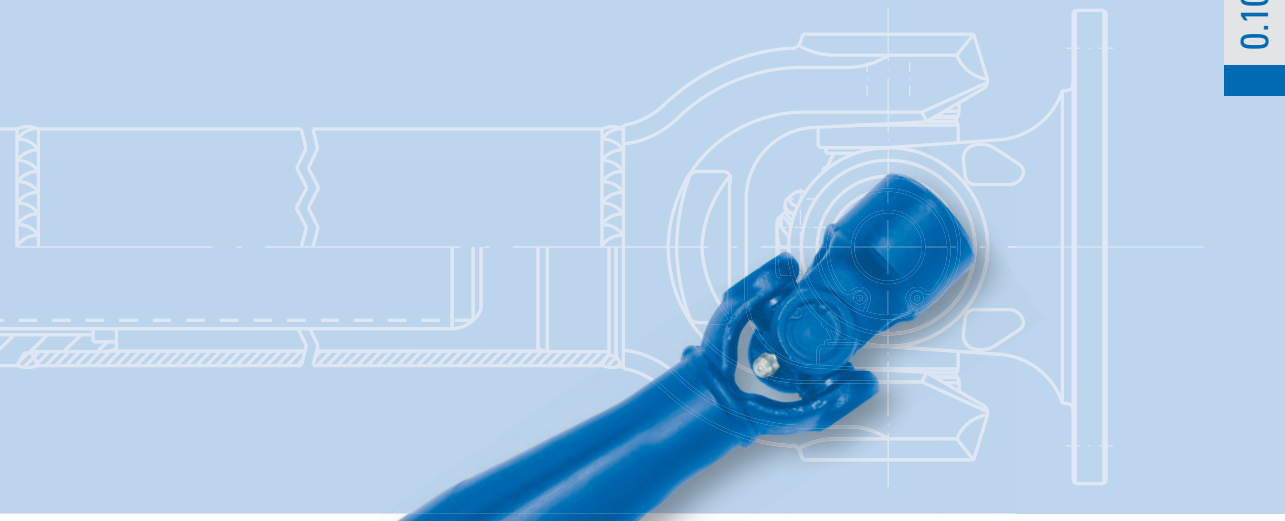
ORIGINAL
elbe
GELENKE



Depending on the configurations, the Original Elbe Universal Joint Shafts consist of fork parts, joint crosses, needle or roller bearings, splined length extensions and precision tubing.

Fork parts are made using closed die forgings while joint crosses are made from cold press or closed die forgings. Highly stressed areas of the universal drive shafts are heat treated to obtain an optimum combination of hardness and toughness. Subsequently, joint cross journals and bearing seats are ground to very fine tolerances.

Each fork part is bored to enable mounting of the needle or roller bearing housings. Hub splines for length extension are broached and the mating external splines are rolled. If it becomes necessary to reduce the sliding force of the splines, they can be coated with a high quality plastic.

The rolling process for producing splines hardens the surface and obtains a higher load capacity which results in a lower wear at the tooth flanks compared to milled splines. This rolling process is advantageous because it does not interrupt the grain flow.

When assembling Universal Joint Shafts the bearing housings, and as a result the joint crosses, are locked into place with snap rings.

The U-Joints are greased according to customer specifications (i.e. with high temperature grease, extended life grease or low temperature grease).

There are three methods to maintain the u-joint bearing:

- Central Lubrication:
  Grease nipples are located inside at the joint crosses. The bearing housings are supplied with grease through lube passages.
- External Lubrication:
  The grease nipple is attached at the outside of one of the bearing housings with the grease distributed through lube passages.
- Maintenance-free:
  Under corresponding application conditions and/or using optimised sealing systems it is possible to dispense with lubrication.

Optimised sealing systems offer superior protection against the penetration of dirt and moisture so that they can be perfectly used under severe environmental conditions where mud, dust, sand and water are present. Furthermore the environment will also be protected since leaking of grease from the bearing housings is prevented.

As previously mentioned, there are two bearing versions available:

- Roller Bearings, using this type of bearings the service life is higher by a factor of 2 or 3 over the needle bearing version.
- Needle Bearings

After assembly, Cardan Shafts are balanced at the appropriate operating speed. This ensures that troublesome vibrations resulting in damaged components are avoided.

General Specifications of Universal Joint Drive Shafts Series 0.100:
Maximum angle of deflection: up to 35°
Torque range: up to 35000 Nm
Flange or Hub Connection

Md_{Nom}: Nominal torque for preselection on the basis of the operating moment. The respective permissible torque has to be calculated individually depending on the remaining operational characteristics, such as shock load, angle of deflection, rotation speed, etc. (see technical annex, item 6.2 and 6.3)

Md_{Lim}: Limit torque, which may be transmitted momentarily from the universal drive joint without functional damage if limited frequency is ensured.

The listed torque ratings refer to the standard versions, hub, flange, etc. The actual torque allowed depends on the design.

For more detailed information please refer to the which follow datasheets.

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Service Phone Europe +49 (0) 71 42 / 353-0
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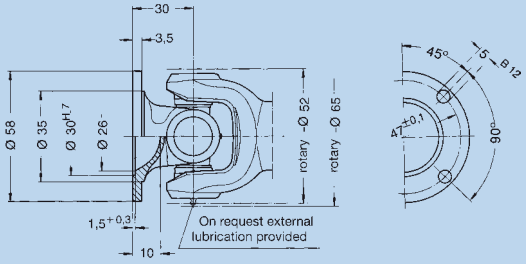
Cardan Drive-Shafts

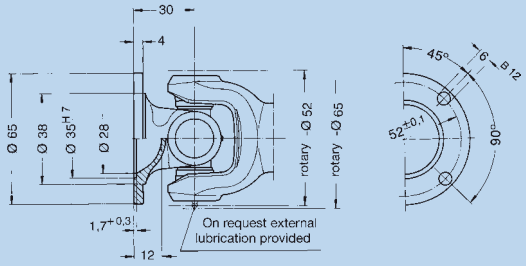
Needle bearing version

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.



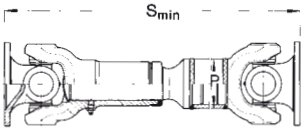
On both sides standard flange
end number: 0.105.XX0



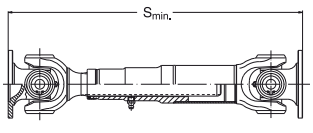
On both sides larger flange
end number: 0.105.XX1

ß* = Maximum angle of deflection per joint
J_m = Moment of inertia
G = Weight
S_{min} = Minimum length of tubular types
S_1 = Compressed lengths
S_2 = of short types
X_1 = Extension at S_{min} resp. S_1
X_2 = Extension at S_2
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
P_2 = Alternative tube
P_3

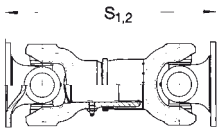
Universal Cardan Drive-Shafts with extension



additional spline protection on request



no spline protection available

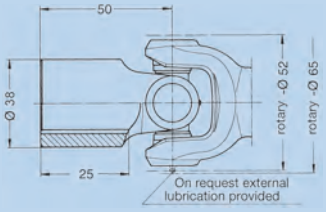


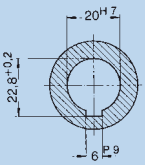
Please indicate requested length „S" and max. r.p.m. when ordering!		Tubular Type normal extension				Tubular Type larger extension				Short Type I		
Order number		**0.105.100**	**0.105.101**	**0.105.102**	–	**0.105.110**	**0.105.111**	**0.105.112**	–	**0.105.130**	**0.105.131**	**0.105.132**
Angle of deflection ß*	°	30	25	30	–	30	25	30	–	30	25	30
Flange-Ø	mm	58	65	Hub	–	58	65	Hub	–	58	65	Hub
S_{min} resp. S_1	mm	240	240	280	–	257	257	297	–	165	165	205
S_2	mm	–	–	–	–	–	–	–	–	175	175	215
X resp. X_1	mm	25	25	25	–	40	40	40	–	20	20	20
X_2	mm	–	–	–	–	–	–	–	–	25	25	25
P_1	mm	**28 x 1,5**	**28 x 1,5**	**28 x 1,5**	–	**28 x 1,5**	**28 x 1,5**	**28 x 1,5**	–	–	–	–
P_2	mm	40 x 2	40 x 2	40 x 2	–	40 x 2	40 x 2	40 x 2	–	–	–	–
P_3	mm	–	–	–	–	–	–	–	–	–	–	–
Spline dim. DIN 5480	mm	20x1,5x12	20x1,5x12	20x1,5x12	–	20x1,5x12	20x1,5x12	20x1,5x12	–	20x1,5x12	20x1,5x12	20x1,5x12
Number of flange holes		4	4	–	–	4	4	–	–	4	4	–
J_m (at S_{min} resp. S_1)	kgm^2	0,000185	0,00022	0,00019	–	0,00019	0,000225	0,000195	–	0,00018	0,00021	0,000185
J_m (at S_2)	kgm^2	–	–	–	–	–	–	–	–	0,00021	0,00024	0,000215
J_m/100 mm standard tube	kgm^2	0,000017	0,000017	0,000017	–	0,000017	0,000017	0,000017	–	–	–	–
G (at S_{min} resp. S_1)	kg	1,18	1,25	1,31	–	1,26	1,33	1,39	–	0,93	1,00	1,07
G (at S_2)	kg	–	–	–	–	–	–	–	–	0,98	1,05	1,12
G/100 mm standard tube	kg	0,1	0,1	0,1	–	0,1	0,1	0,1	–	–	–	–

* Please refer to point 6.7 of the technical attachment

Size 0.105 | Md_{Nom} 190 Nm | Md_{Lim} 250 Nm

One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.



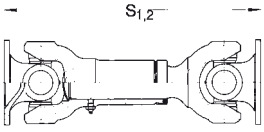


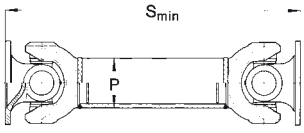
Key-way according to DIN 6885 sheet 1

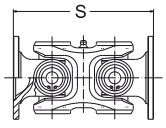
On both sides connecting hub
without key-way end number: 0.105.XX2
with key-way end number: 0.105.XX3

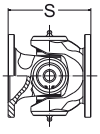
Cardan Drive-Shafts without extension

Universal Joints without extension









additional spline protection on request

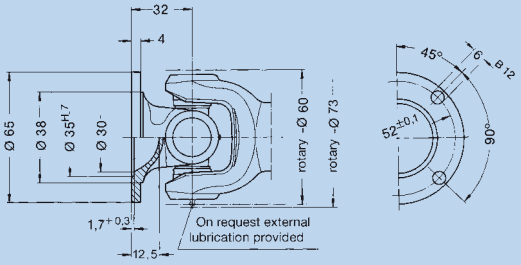
Short Type II				Tubular Type				Universal Joint Double			Universal Joint Single			
0.105.140	**0.105.141**	**0.105.142**	–	**0.105.200**	**0.105.201**	**0.105.202**	–	**0.105.300**	**0.105.301**	**0.105.302**	**0.105.400**	**0.105.401**	**0.105.402**	–
30	25	30	–	30	25	30	–	30	25	30	30	25	30	–
58	65	Hub	–	58	65	Hub	–	58	65	Hub	58	65	Hub	–
195	195	235	–	160	160	200	–	110	110	150	60	60	100	–
215	215	255	–	–	–	–	–	–	–	–	–	–	–	–
25	25	25	–	–	–	–	–	–	–	–	–	–	–	–
25	25	25	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	**28 x 1,5**	**28 x 1,5**	**28 x 1,5**	–	–	–	–	–	–	–	–
–	–	–	–	40 x 2	40 x 2	40 x 2	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
20x1,5x12	20x1,5x12	20x1,5x12	–	–	–	–	–	–	–	–	–	–	–	–
4	4	–	–	4	4	–	–	4	4	–	4	4	–	–
0,00022	0,00025	0,000225	–	0,000152	0,000187	0,000157	–	0,00012	0,00015	0,000125	0,000072	0,00011	0,000077	–
0,00024	0,00027	0,000245	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	0,000017	0,000017	0,000017	–	–	–	–	–	–	–	–
0,99	1,06	1,12	–	0,88	0,95	1,01	–	0,69	0,76	0,83	0,40	0,47	0,53	–
1,3	1,10	1,17	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	0,1	0,1	0,1	–	–	–	–	–	–	–	–

Cardan Drive-Shafts

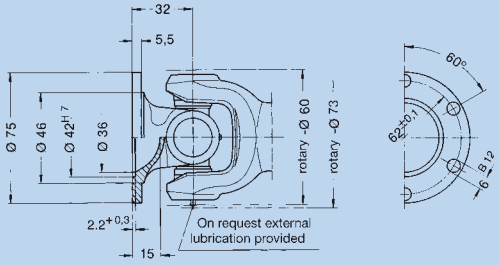
Needle bearing version

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.



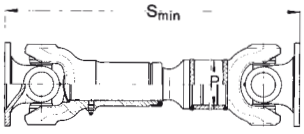
On both sides standard flange
end number: 0.106.XX0



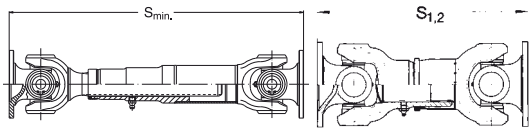
On both sides larger flange
end number: 0.106.XX1

ß* = Maximum angle of deflection per joint
J_m = Moment of inertia
G = Weight
S_{min} = Minimum length of tubular types
S_1 = Compressed lengths
S_2 = of short types
X_1 = Extension at S_{min} resp. S_1
X_2 = Extension at S_2
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
P_2 = Alternative tube
P_3

Universal Cardan Drive-Shafts with extension



additional spline protection on request



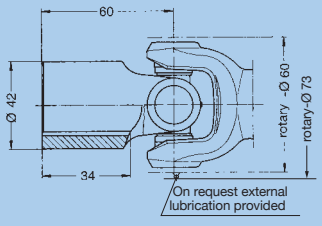
no spline protection available

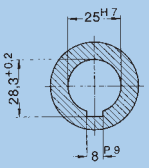
Please indicate requested length „S" and max. r.p.m. when ordering!		Tubular Type normal extension				Tubular Type larger extension				Short Type I		
Order number		**0.106.100**	**0.106.101**	**0.106.102**	–	**0.106.110**	**0.106.111**	**0.106.112**	–	**0.106.130**	**0.106.131**	**0.106.132**
Angle of deflection ß*	°	30	20	30	–	30	20	30	–	30	20	30
Flange-Ø	mm	65	75	Hub	–	65	75	Hub	–	65	75	Hub
S_{min} resp. S_1	mm	260	260	315	–	290	290	345	–	180	180	236
S_2	mm	–	–	–	–	–	–	–	–	200	200	256
X resp. X_1	mm	30	30	30	–	60	60	60	–	20	20	20
X_2	mm	–	–	–	–	–	–	–	–	30	30	30
P_1	mm	**32 x 1,5**	**32 x 1,5**	**32 x 1,5**	–	**32 x 1,5**	**32 x 1,5**	**32 x 1,5**	–	–	–	–
P_2	mm	50 x 2	50 x 2	50 x 2	–	50 x 2	50 x 2	50 x 2	–	–	–	–
P_3	mm	70 x 3	70 x 3	70 x 3	–	70 x 3	70 x 3	70 x 3	–	–	–	–
Spline dim. DIN 5480	mm	25x1,5x15	25x1,5x15	25x1,5x15	–	25x1,5x15	25x1,5x15	25x1,5x15	–	25x1,5x15	25x1,5x15	25x1,5x15
Number of flange holes		4	6	–	–	4	6	–	–	4	6	–
J_m (at S_{min} resp. S_1)	kgm^2	0,000415	0,000587	0,000448	–	0,00044	0,000612	0,00047	–	0,00039	0,00056	0,00042
J_m (at S_2)	kgm^2	–	–	–	–	–	–	–	–	0,00042	0,00059	0,00045
J_m/100 mm standard tube	kgm^2	0,000026	0,000026	0,000026	–	0,000026	0,000026	0,000026	–	–	–	–
G (at S_{min} resp. S_1)	kg	1,77	1,95	2,02	–	1,87	2,04	2,11	–	1,39	1,56	1,64
G (at S_2)	kg	–	–	–	–	–	–	–	–	1,54	1,71	1,78
G/100 mm standard tube	kg	0,11	0,11	0,11	–	0,11	0,11	0,11	–	–	–	–

* Please refer to point 6.7 of the technical attachment

Size 0.106 | Md_{Nom} 400 Nm | Md_{Lim} 520 Nm

One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.

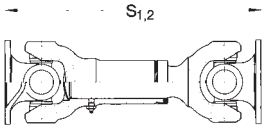


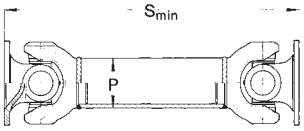


Key-way according to DIN 6885 sheet 1

On both sides connecting hub
without key-way end number: 0.106.XX2
with key-way end number: 0.106.XX3

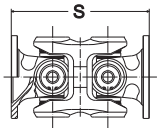
Cardan Drive-Shafts without extension

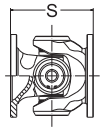




additional spline protection on request

Universal Joints without extension





Short Type II				Tubular Type				Universal Joint Double			Universal Joint Single			
0.106.140	**0.106.141**	**0.106.142**	–	**0.106.200**	**0.106.201**	**0.106.202**	–	**0.106.300**	**0.106.301**	**0.106.302**	**0.106.400**	**0.106.401**	**0.106.402**	–
30	20	30	–	30	20	30	–	30	20	30	30	20	30	–
65	75	Hub	–	65	75	Hub	–	65	75	Hub	65	75	Hub	–
220	220	276	–	165	165	220	–	120	120	176	64	64	120	–
235	235	291	–	–	–	–	–	–	–	–	–	–	–	–
30	30	30	–	–	–	–	–	–	–	–	–	–	–	–
30	30	30	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	**32 x 1,5**	**32 x 1,5**	**32 x 1,5**	–	–	–	–	–	–	–	–
–	–	–	–	50 x 2	50 x 2	50 x 2	–	–	–	–	–	–	–	–
–	–	–	–	70 x 3	70 x 3	70 x 3	–	–	–	–	–	–	–	–
25x1,5x15	25x1,5x15	25x1,5x15	–	–	–	–	–	–	–	–	–	–	–	–
4	6	–	–	4	6	–	–	4	6	–	4	6	–	–
0,00043	0,00060	0,00046	–	0,000336	0,00051	0,00036	–	0,00028	0,00045	0,00031	0,00015	0,00032	0,00018	–
0,00045	0,00062	0,00048	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	0,000026	0,000026	0,000026	–	–	–	–	–	–	–	–
1,58	1,75	1,83	–	1,16	1,34	1,41	–	0,99	1,16	1,24	0,56	0,73	0,80	–
1,63	1,80	1,87	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	0,11	0,11	0,11	–	–	–	–	–	–	–	–

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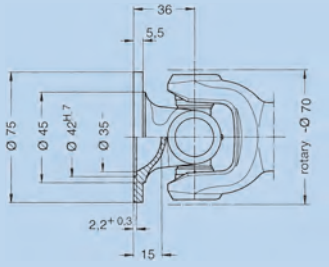
■ Service Phone Europe ■ +49 (0) 71 42 / 353-0
ORIGINAL elbe GELENKE

Cardan Drive-Shafts

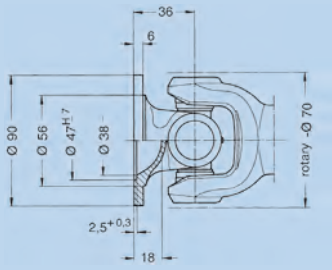
Needle bearing version

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.



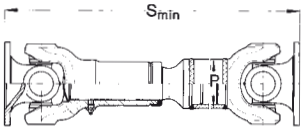
On both sides standard flange
end number: 0.107.XX0



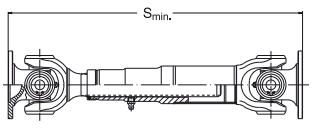
On both sides larger flange
end number: 0.107.XX1

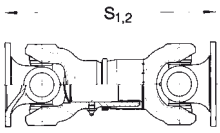
ß* = Maximum angle of deflection per joint
J_m = Moment of inertia
G = Weight
S_{min} = Minimum length of tubular types
S_1 = Compressed lengths
S_2 = of short types
X_1 = Extension at S_{min} resp. S_1
X_2 = Extension at S_2
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
P_2 = Alternative tube
P_3

Universal Cardan Drive-Shafts with extension



additional spline protection on request





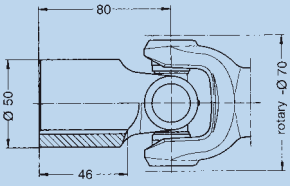
no spline protection available

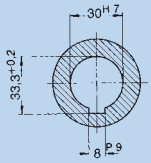
Please indicate requested length „S" and max. r.p.m. when ordering!		Tubular Type normal extension				Tubular Type larger extension				Short Type I		
Order number		**0.107.100**	**0.107.101**	**0.107.102**	–	**0.107.110**	**0.107.111**	**0.107.112**	–	**0.107.130**	**0.107.131**	**0.107.132**
Angle of deflection ß*	°	30	18	30	–	30	18	30	–	30	18	30
Flange-Ø	mm	75	90	Hub	–	75	90	Hub	–	75	90	Hub
S_{min} resp. S_1	mm	300	300	390	–	360	360	450	–	200	200	288
S_2	mm	–	–	–	–	–	–	–	–	225	225	313
X resp. X_1	mm	35	35	35	–	70	70	70	–	25	25	25
X_2	mm	–	–	–	–	–	–	–	–	35	35	35
P_1	mm	**40 x 2**	**40 x 2**	**40 x 2**	–	**40 x 2**	**40 x 2**	**40 x 2**	–	–	–	–
P_2	mm	50 x 2	50 x 2	50 x 2	–	50 x 2	50 x 2	50 x 2	–	–	–	–
P_3	mm	70 x 3	70 x 3	70 x 3	–	70 x 3	70 x 3	70 x 3	–	–	–	–
Spline dim. DIN 5480	mm	28x1,5x17	28x1,5x17	28x1,5x17	–	28x1,5x17	28x1,5x17	28x1,5x17	–	28x1,5x17	28x1,5x17	28x1,5x17
Number of flange holes		6	4	–	–	6	4	–	–	6	4	–
J_m (at S_{min} resp. S_1)	kgm^2	0,00098	0,00127	0,00121	–	0,00104	0,00133	0,00127	–	0,00089	0,00118	0,00112
J_m (at S_2)	kgm^2	–	–	–	–	–	–	–	–	0,00092	0,00120	0,00115
J_m/100 mm standard tube	kgm^2	0,000068	0,000068	0,000068	–	0,000068	0,000068	0,000068	–	–	–	–
G (at S_{min} resp. S_1)	kg	2,60	2,90	3,29	–	3,04	3,35	3,73	–	1,98	2,29	2,67
G (at S_2)	kg	–	–	–	–	–	–	–	–	2,21	2,51	2,90
G/100 mm standard tube	kg	0,19	0,19	0,19	–	0,19	0,19	0,19	–	–	–	–

* Please refer to point 6.7 of the technical attachment

Size 0.107 | Md_{Nom} 920 Nm | Md_{Lim} 1200 Nm

One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.

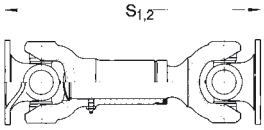


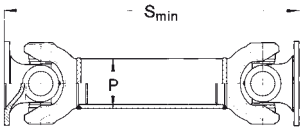


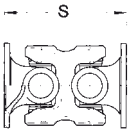
Key-way according to DIN 6885 sheet 1

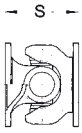
On both sides connecting hub
without key-way end number: 0.107.XX2
with key-way end number: 0.107.XX3

Cardan Drive-Shafts without extension | Universal Joints without extension









additional spline protection on request

Short Type II				Tubular Type				Universal Joint Double			Universal Joint Single			
0.107.140	**0.107.141**	**0.107.142**	–	**0.107.200**	**0.107.201**	**0.107.202**	–	**0.107.300**	**0.107.301**	**0.107.302**	**0.107.400**	**0.107.401**	**0.107.402**	–
30	18	30	–	30	18	30	–	30	18	30	30	18	30	–
75	90	Hub	–	75	90	Hub	–	75	90	Hub	75	90	Hub	–
250	250	338	–	200	200	290	–	140	140	228	72	72	160	–
270	270	358	–	–	–	–	–	–	–	–	–	–	–	–
35	35	35	–	–	–	–	–	–	–	–	–	–	–	–
35	35	35	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	**40 x 2**	**40 x 2**	**40 x 2**	–	–	–	–	–	–	–	–
–	–	–	–	50 x 2	50 x 2	50 x 2	–	–	–	–	–	–	–	–
–	–	–	–	70 x 3	70 x 3	70 x 3	–	–	–	–	–	–	–	–
28x1,5x17	28x1,5x17	28x1,5x17	–	–	–	–	–	–	–	–	–	–	–	–
6	4	–	–	6	4	–	–	6	4	–	6	4	–	–
0,00093	0,00121	0,00116	–	0,00078	0,00107	0,00101	–	0,00069	0,00098	0,00092	0,00031	0,00060	0,00054	–
0,00096	0,00124	0,00118	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	0,000068	0,000068	0,000068	–	–	–	–	–	–	–	–
2,27	2,58	2,96	–	1,89	2,20	2,58	–	1,51	1,82	2,21	0,81	1,12	1,50	–
2,36	2,67	3,05	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	0,19	0,19	0,19	–	–	–	–	–	–	–	–

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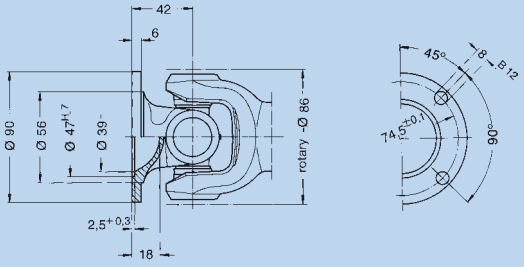
Cardan Drive-Shafts

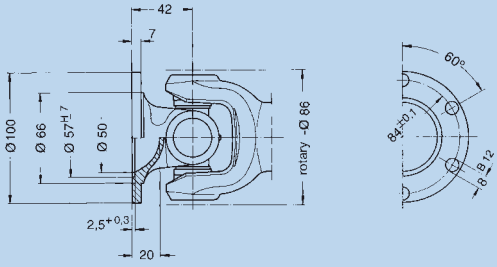
Needle bearing version

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.



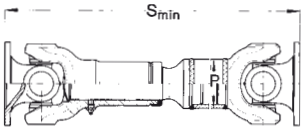
On both sides standard flange
end number: 0.109.XX0



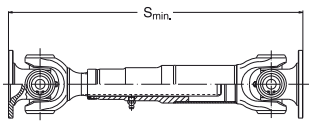
On both sides larger flange
end number: 0.109.XX1

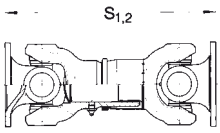
ß* = Maximum angle of deflection per joint
J_m = Moment of inertia
G = Weight
S_{min} = Minimum length of tubular types
S_1 = Compressed lengths
S_2 = of short types
X_1 = Extension at S_{min} resp. S_1
X_2 = Extension at S_2
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
P_2 = Alternative tube
P_3 = Alternative tube

Universal Cardan Drive-Shafts with extension



additional spline protection on request





no spline protection available

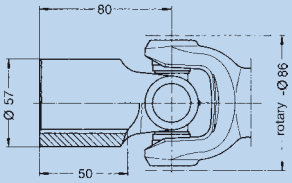
Please indicate requested length „S" and max. r.p.m. when ordering!

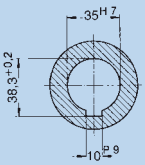
		Tubular Type normal extension				Tubular Type larger extension				Short Type I		
Order number		**0.109.100**	**0.109.101**	**0.109.102**	**0.109.105**	**0.109.110**	**0.109.111**	**0.109.112**	**0.109.115**	**0.109.130**	**0.109.131**	**0.109.132**
Angle of deflection ß*	°	20	18	20	35	20	18	20	35	20	18	20
Flange-Ø	mm	90	100	Hub	90	90	100	Hub	90	90	100	Hub
S_{min} resp. S_1	mm	348	348	423	375	393	393	468	425	225	225	301
S_2	mm	–	–	–	–	–	–	–	–	250	250	326
X resp. X_1	mm	40	40	40	40	80	80	80	80	25	25	25
X_2	mm	–	–	–	–	–	–	–	–	40	40	40
P_1	mm	**50 x 2**	**50 x 2**	**50 x 2**	**50 x 2**	**50 x 2**	**50 x 2**	**50 x 2**	**50 x 2**	**–**	**–**	**–**
P_2	mm	70 x 3	70 x 3	70 x 3	70 x 3	70 x 3	70 x 3	70 x 3	70 x 3	–	–	–
P_3	mm	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	–	–	–
Spline dim. DIN 5480	mm	32x2x14	32x2x14	32x2x14	32x2x14	32x2x14	32x2x14	32x2x14	32x2x14	32x2x14	32x2x14	32x2x14
Number of flange holes		4	6	–	4	4	6	–	4	4	6	–
J_m (at S_{min} resp. S_1)	kgm^2	0,00249	0,00286	0,00267	0,00281	0,00259	0,00296	0,00277	0,00291	0,00221	0,00258	0,00239
J_m (at S_2)	kgm^2	–	–	–	–	–	–	–	–	0,00226	0,00263	0,00244
J_m/100 mm standard tube	kgm^2	0,00014	0,00014	0,00014	0,00014	0,00014	0,00014	0,00014	0,00014	–	–	–
G (at S_{min} resp. S_1)	kg	4,91	5,12	5,68	5,10	5,41	5,61	6,18	5,71	3,80	4,00	4,57
G (at S_2)	kg	–	–	–	–	–	–	–	–	4,11	4,31	4,88
G/100 mm standard tube	kg	0,24	0,24	0,24	0,24	0,24	0,24	0,24	0,24	–	–	–

* Please refer to point 6.7 of the technical attachment

Size 0.109 | Md_{Nom} 1700 Nm | Md_{Lim} 2200 Nm

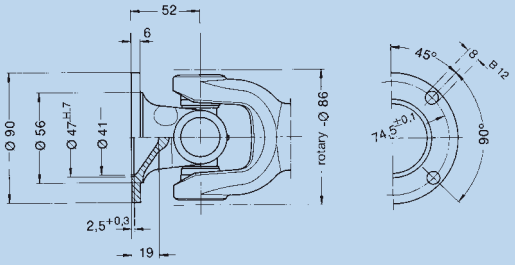
One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.





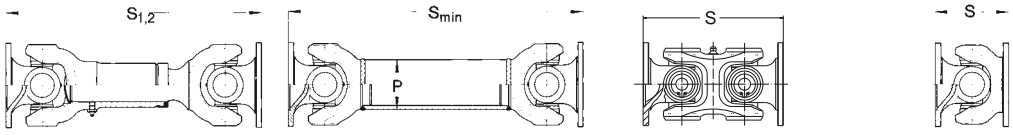
Key-way according to DIN 6885 sheet 1

On both sides connecting hub
without key-way end number: 0.109.XX2
with key-way end number: 0.109.XX3



On both sides flange for larger angle deflection
end number: 0.109.XX5

Cardan Drive-Shafts without extension | Universal Joints without extension



additional spline protection on request

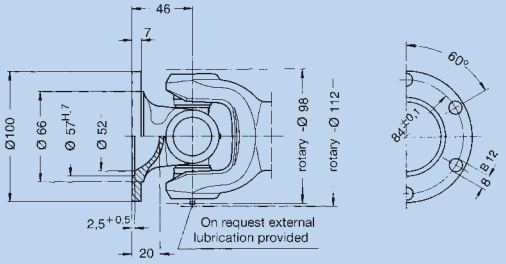
Short Type II				Tubular Type				Universal Joint Double			Universal Joint Single			
0.109.140	**0.109.141**	**0.109.142**	**0.109.145**	**0.109.200**	**0.109.201**	**0.109.202**	**0.109.205**	**0.109.300**	**0.109.301**	**0.109.302**	**0.109.400**	**0.109.401**	**0.109.402**	**0.109.405**
20	18	20	35	20	18	20	35	20	18	20	20	18	20	35
90	100	Hub	90	90	100	Hub	90	90	100	Hub	90	100	Hub	90
280	280	356	315	216	216	291	235	152	152	228	84	84	160	104
310	310	386	345	–	–	–	–	–	–	–	–	–	–	–
40	40	40	40	–	–	–	–	–	–	–	–	–	–	–
40	40	40	40	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	**50 x 2**	**50 x 2**	**50 x 2**	**50 x 2**	–	–	–	–	–	–	–
–	–	–	–	70 x 3	70 x 3	70 x 3	70 x 3	–	–	–	–	–	–	–
–	–	–	–	80 x 4	80 x 4	80 x 4	80 x 4	–	–	–	–	–	–	–
32x2x14	32x2x14	32x2x14	32x2x14	–	–	–	–	–	–	–	–	–	–	–
4	6	–	4	4	6	–	4	4	6	–	4	6	–	4
0,00238	0,00275	0,00256	0,00270	0,00239	0,00276	0,00257	0,00239	0,00166	0,00299	0,00184	0,00075	0,0011	0,00093	0,00107
0,00256	0,00293	0,00274	0,00288	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	0,00014	0,00014	0,00014	0,00014	–	–	–	–	–	–	–
4,22	4,43	5,00	4,58	3,73	3,94	4,50	3,88	3,02	3,23	3,79	1,71	1,92	2,49	1,87
4,38	4,59	5,15	4,66	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	0,24	0,24	0,24	0,24	–	–	–	–	–	–	–

Cardan Drive-Shafts

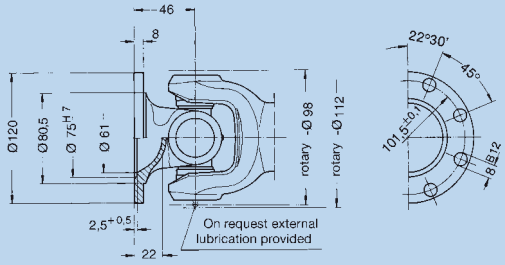
Roller bearing version

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.



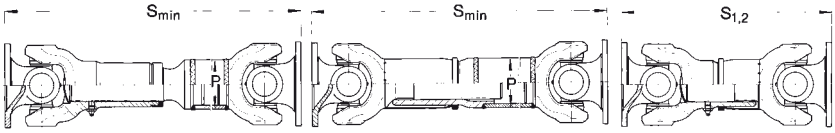
On both sides standard flange
end number: 0.110.XX0



On both sides larger flange
end number: 0.110.XX1

ß* = Maximum angle of deflection per joint
J_m = Moment of inertia
G = Weight
S_{min} = Minimum length of tubular types
S_1 = Compressed lengths
S_2 = of short types
X_1 = Extension at S_{min} resp. S_1
X_2 = Extension at S_2
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
P_2 = Alternative tube
P_3

Universal Cardan Drive-Shafts with extension



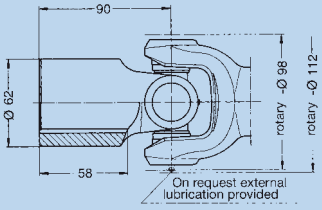
additional spline protection on request

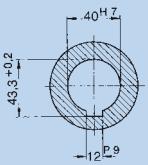
Please indicate requested length „S" and max. r.p.m. when ordering!		Tubular Type normal extension				Tubular Type larger extension				Short Type I		
Order number		**0.110.100**	**0.110.101**	**0.110.102**	**0.110.105**	**0.110.110**	**0.110.111**	**0.110.112**	**0.110.115**	**0.110.130**	**0.110.131**	**0.110.132**
Angle of deflection ß*	°	20	18	20	35	20	18	20	35	20	18	20
Flange-Ø	mm	100	120	Hub	100	100	120	Hub	100	100	120	Hub
S_{min} resp. S_1	mm	374	374	464	405	464	464	554	490	255	255	343
S_2	mm	–	–	–	–	–	–	–	–	280	280	368
X resp. X_1	mm	40	40	40	40	95	95	95	95	30	30	30
X_2	mm	–	–	–	–	–	–	–	–	40	40	40
P_1	mm	**50 x 3**	**50 x 3**	**50 x 3**	**50 x 3**	**50 x 3**	**50 x 3**	**50 x 3**	**50 x 3**	**–**	**–**	**–**
P_2	mm	70 x 3	70 x 3	70 x 3	70 x 3	70 x 3	70 x 3	70 x 3	70 x 3	–	–	–
P_3	mm	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	–	–	–
Spline dim. DIN 5480	mm	35x2x16	35x2x16	35x2x16	35x2x16	35x2x16	35x2x16	35x2x16	35x2x16	35x2x16	35x2x16	35x2x16
Number of flange holes		6	8	–	6	6	8	–	6	6	8	–
J_m (at S_{min} resp. S_1)	kgm^2	0,00378	0,0051	0,0040	0,0041	0,00406	0,00538	0,00428	0,00438	0,00389	0,00521	0,00410
J_m (at S_2)	kgm^2	–	–	–	–	–	–	–	–	0,00404	0,00536	0,00426
J_m/100 mm standard tube	kgm^2	0,00019	0,00019	0,00019	0,00019	0,00019	0,00019	0,00019	0,00019	–	–	–
G (at S_{min} resp. S_1)	kg	6,32	6,77	7,08	6,56	7,48	7,93	8,23	7,62	5,12	5,57	5,87
G (at S_2)	kg	–	–	–	–	–	–	–	–	5,44	5,89	6,19
G/100 mm standard tube	kg	0,35	0,35	0,35	0,35	0,35	0,35	0,35	0,35	–	–	–

* Please refer to point 6.7 of the technical attachment

Size 0.110 | Md_{Nom} 2300 Nm | Md_{Lim} 3000 Nm

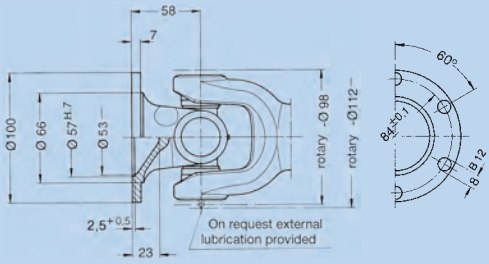
One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.





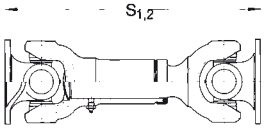
Key-way according to DIN 6885 sheet 1

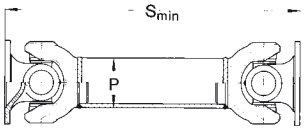
On both sides connecting hub
without key-way end number: 0.110.XX2
with key-way end number: 0.110.XX3

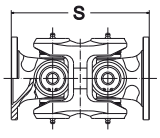


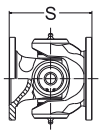
On both sides flange for larger angle deflection
end number: 0.110.XX5

Cardan Drive-Shafts without extension | Universal Joints without extension









additional spline protection on request

Short Type II				Tubular Type				Universal Joint Double			Universal Joint Single			
0.110.140	**0.110.141**	**0.110.142**	**0.110.145**	**0.110.200**	**0.110.201**	**0.110.202**	**0.110.205**	**0.110.300**	**0.110.301**	**0.110.302**	**0.110.400**	**0.110.401**	**0.110.402**	**0.110.405**
20	18	20	35	20	18	20	35	18	18	18	20	18	20	35
100	120	Hub	100	100	120	Hub	100	100	120	Hub	100	120	Hub	100
310	310	398	355	250	250	338	270	160	160	248	92	92	180	116
340	340	428	385	–	–	–	–	–	–	–	–	–	–	–
40	40	40	40	–	–	–	–	–	–	–	–	–	–	–
40	40	40	40	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	**50 x 3**	**50 x 3**	**50 x 3**	**50 x 3**	–	–	–	–	–	–	–
–	–	–	–	70 x 3	70 x 3	70 x 3	70 x 3	–	–	–	–	–	–	–
–	–	–	–	80 x 4	80 x 4	80 x 4	80 x 4	–	–	–	–	–	–	–
35x2x16	35x2x16	35x2x16	35x2x16	–	–	–	–	–	–	–	–	–	–	–
6	8	–	6	6	8	–	6	6	8	–	6	8	–	6
0,00415	0,00547	0,00437	0,00519	0,00352	0,00484	0,00374	0,00456	0,00319	0,00451	0,00340	0,00152	0,00284	0,00173	0,00204
0,00430	0,00562	0,00452	0,00542	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	0,00019	0,00019	0,00019	0,00019	–	–	–	–	–	–	–
5,63	6,08	6,38	6,05	4,9	5,35	5,65	5,02	3,98	4,43	4,73	2,25	2,70	3,00	2,39
5,88	6,33	6,63	6,25	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	0,35	0,35	0,35	0,35	–	–	–	–	–	–	–

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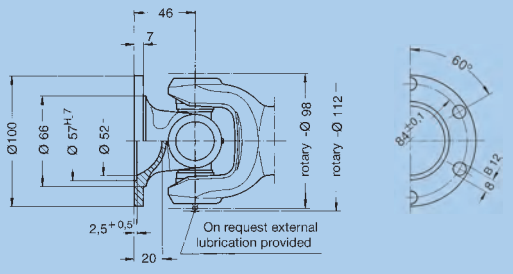
■ Service Phone Europe ■ +49 (0) 71 42 / 353-0
ORIGINAL elbe GELENKE

Cardan Drive-Shafts

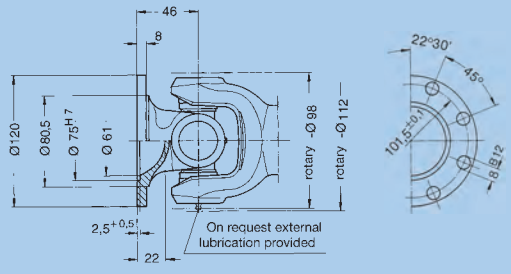
Roller bearing version

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.



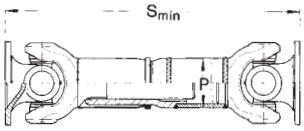
On both sides standard flange
end number: 0.111.XX0



On both sides larger flange
end number: 0.111.XX1

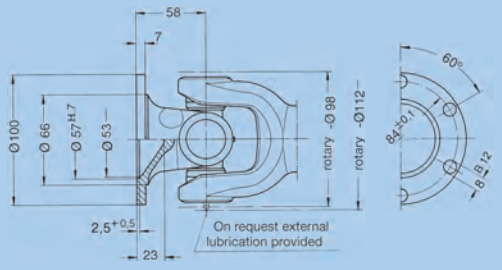
ß* = Maximum angle of deflection per joint
J_m = Moment of inertia
G = Weight
S_{min} = Minimum length of tubular types
S_1 = Compressed lengths
S_2 = of short types
X_1 = Extension at S_{min} resp. S_1
X_2 = Extension at S_2
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
P_2 = Alternative tube
P_3 = Alternative tube

Universal Cardan Drive-Shafts with extension

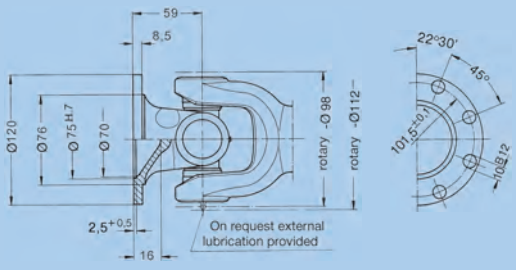


Please indicate requested length „S" and max. r.p.m. when ordering!		Tubular Type normal extension			
Order number		**0.111.110**	**0.111.111**	**0.111.115**	**0.111.116**
Angle of deflection ß*	°	20	18	35	35
Flange-Ø	mm	100	120	100	120
S_{min} resp. S_1	mm	416	416	440	442
S_2	mm	416	416	440	442
X resp. X_1	mm	120	120	120	120
X_2	mm	70	70	70	70
P_1	mm	**75 x 2**	**75 x 2**	**75 x 2**	**75 x 2**
P_2	mm	–	–	–	–
P_3	mm	–	–	–	–
Spline dim. DIN 5480	mm	42x1,75x22	42x1,75x22	42x1,75x22	42x1,75x22
Number of flange holes		6	8	6	8
J_m (at S_{min} resp. S_1)	kgm^2	–	–	–	–
J_m (at S_2)	kgm^2	–	–	–	–
J_m/100 mm standard tube	kgm^2	0,0005	0,0005	0,0005	0,0005
G (at S_{min} resp. S_1)	kg	8,48	8,93	8,66	9,24
G (at S_2)	kg	7,93	8,38	8,11	8,69
G/100 mm standard tube	kg	0,36	0,36	0,36	0,36

* Please refer to point 6.7 of the technical attachment

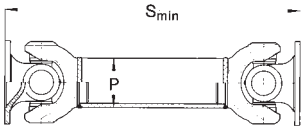


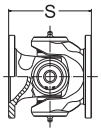
On both sides flange for larger angle deflection
end number: 0.111.XX5



On both sides larger flange for larger angle deflection
end number: 0.111.XX6

Cardan Drive-Shafts without extension | **Universal Joints without extension**





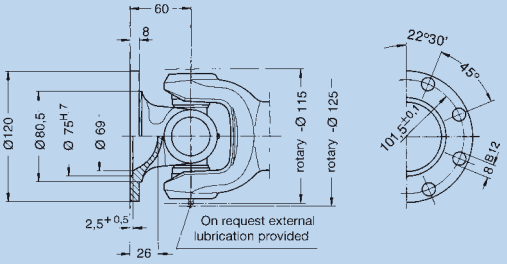
Tubular Type				Universal Joint Single		
0.111.200	**0.111.201**	**0.111.205**	**0.111.206**	**0.111.406**		
20	18	35	35	35		
100	120	100	120	120		
242	242	266	268	118		
–	–	–	–	–		
–	–	–	–	–		
–	–	–	–	–		
75 x 2	**75 x 2**	**75 x 2**	**75 x 2**	**–**		
–	–	–	–	–		
–	–	–	–	–		
–	–	–	–	–		
6	8	6	8	8		
–	–	–	–	–		
–	–	–	–	–		
0,0005	0,0005	0,0005	0,005	–		
5,2	5,65	5,38	5,96	2,98		
–	–	–	–	–		
0,36	0,36	0,36	0,36	–		

Cardan Drive-Shafts

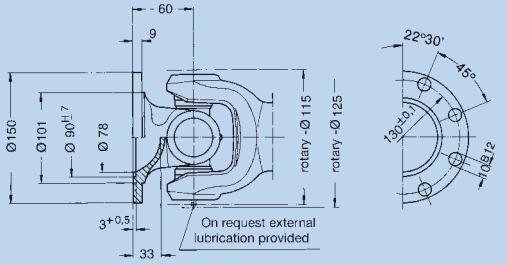
Needle or Roller bearing version

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.



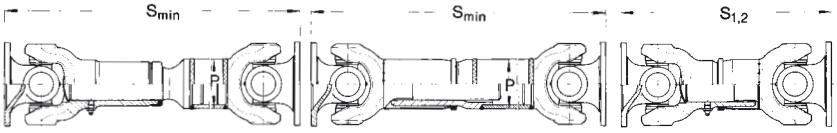
On both sides standard flange
end number: 0.112.XX0



On both sides larger flange
end number: 0.112.XX1

ß* = Maximum angle of deflection per joint
J_m = Moment of inertia
G = Weight
S_{min} = Minimum length of tubular types
S_1 = Compressed lengths
S_2 = of short types
X_1 = Extension at S_{min} resp. S_1
X_2 = Extension at S_2
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
P_2 = Alternative tube
P_3

Universal Cardan Drive-Shafts with extension



additional spline protection on request

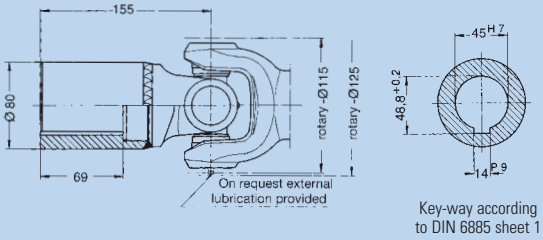
Please indicate requested length „S" and max. r.p.m. when ordering!

		Tubular Type normal extension				Tubular Type larger extension				Short Type I		
Order number		**0.112.100**	**0.112.101**	**0.112.102**	**0.112.105**	**0.112.110**	**0.112.111**	**0.112.112**	**0.112.115**	**0.112.130**	**0.112.131**	**0.112.132**
Angle of deflection ß*	°	20	18	20	35	20	18	20	35	20	18	20
Flange-Ø	mm	120	150	Hub	120	120	150	Hub	120	120	150	Hub
S_{min} resp. S_1	mm	473	473	664	505	523	523	714	580	325	325	515
S_2	mm	–	–	–	–	–	–	–	–	360	360	550
X resp. X_1	mm	60	60	60	60	120	120	120	120	35	35	35
X_2	mm	–	–	–	–	–	–	–	–	50	50	50
P_1	mm	**60 x 4**	**60 x 4**	**60 x 4**	**60 x 4**	**60 x 4**	**60 x 4**	**60 x 4**	**60 x 4**	**–**	**–**	**–**
P_2	mm	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	–	–	–
P_3	mm	90 x 4	90 x 4	90 x 4	90 x 4	90 x 4	90 x 4	90 x 4	90 x 4	–	–	–
Spline dim. DIN 5480	mm	42x2x20	42x2x20	42x2x20	42x2x20	42x2x20	42x2x20	42x2x20	42x2x20	42x2x20	42x2x20	42x2x20
Number of flange holes		8	8	–	8	8	8	–	8	8	8	–
J_m (at S_{min} resp. S_1)	kgm^2	0,01021	0,01390	0,01210	0,01278	0,0108	0,01449	0,01270	0,01560	0,01039	0,01408	0,01230
J_m (at S_2)	kgm^2	–	–	–	–	–	–	–	–	0,01059	0,01797	0,01248
J_m/100 mm standard tube	kgm^2	0,00045	0,00045	0,00045	0,00045	0,00045	0,00045	0,00045	0,00045	–	–	–
G (at S_{min} resp. S_1)	kg	10,66	12,02	15,24	10,82	11,55	12,91	16,14	12,53	8,75	10,11	13,33
G (at S_2)	kg	–	–	–	–	–	–	–	–	9,22	10,58	13,80
G/100 mm standard tube	kg	0,55	0,55	0,55	0,55	0,55	0,55	0,55	0,55	–	–	–

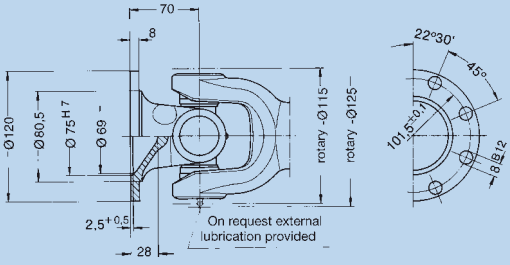
* Please refer to point 6.7 of the technical attachment

Size 0.112 | Md_{Nom} 3350 Nm | Md_{Lim} 4350 Nm

One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.

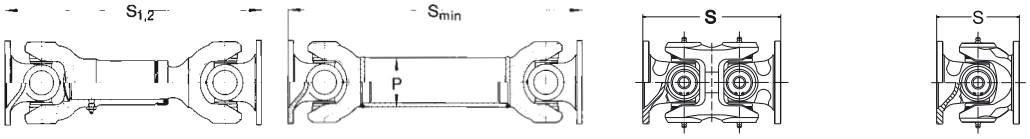


On both sides connecting hub
without key-way end number: 0.112.XX2
with key-way end number: 0.112.XX3



On both sides flange for larger angle deflection
end number: 0.112.XX5

Cardan Drive-Shafts without extension | Universal Joints without extension



additional spline protection on request

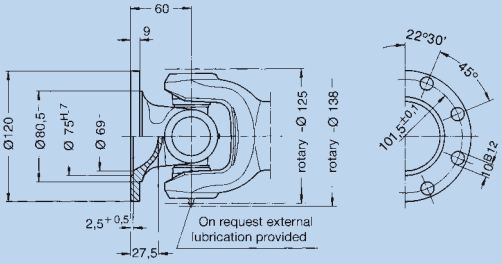
Short Type II				Tubular Type				Universal Joint Double			Universal Joint Single			
0.112.140	**0.112.141**	**0.112.142**	**0.112.145**	**0.112.200**	**0.112.201**	**0.112.202**	**0.112.205**	**0.112.300**	**0.112.301**	**0.112.302**	**0.112.400**	**0.112.401**	**0.112.402**	**0.112.405**
20	18	20	35	20	18	35	35	20	18	20	20	18	35	35
120	150	Hub	120	120	150	Hub	120	120	150	Hub	120	150	Hub	120
400	400	590	435	301	301	490	320	200	200	390	120	120	310	140
430	430	620	470	–	–	–	–	–	–	–	–	–	–	–
60	60	60	60	–	–	–	–	–	–	–	–	–	–	–
60	60	60	60	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	**60 x 4**	**60 x 4**	**60 x 4**	**60 x 4**	–	–	–	–	–	–	–
–	–	–	–	80 x 4	80 x 4	80 x 4	80 x 4	–	–	–	–	–	–	–
–	–	–	–	90 x 4	90 x 4	90 x 4	90 x 4	–	–	–	–	–	–	–
42x2x20	42x2x20	42x2x20	42x2x20	–	–	–	–	–	–	–	–	–	–	–
8	8	–	8	8	8	–	8	8	8	–	8	8	–	8
0,01195	0,01564	0,01384	0,01323	0,00961	0,0133	0,0115	0,01089	0,00904	0,01273	0,0109	0,00354	0,00723	0,00543	0,00598
0,01199	0,01568	0,01388	0,01327	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	0,00045	0,00045	0,00045	0,00045	–	–	–	–	–	–	–
9,66	11,02	14,24	9,99	7,88	9,24	12,45	8,13	6,44	7,8	11,02	3,71	5,07	8,29	3,97
9,99	11,35	14,57	10,32	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	0,55	0,55	0,55	0,55	–	–	–	–	–	–	–

Cardan Drive-Shafts

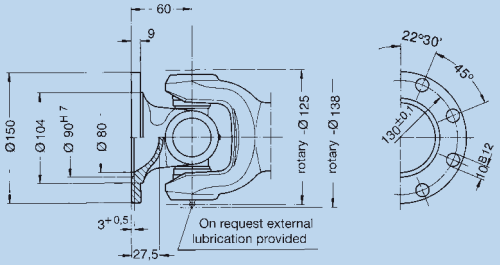
Needle or Roller bearing version

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.



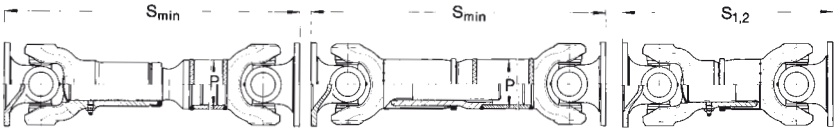
On both sides standard flange
end number: 0.113.XX0



On both sides larger flange
end number: 0.113.XX1

ß* = Maximum angle of deflection per joint
J_m = Moment of inertia
G = Weight
S_{min} = Minimum length of tubular types
S_1 = Compressed lengths
S_2 = of short types
X_1 = Extension at S_{min} resp. S_1
X_2 = Extension at S_2
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
P_2 = Alternative tube
P_3

Universal Cardan Drive-Shafts with extension



additional spline protection on request

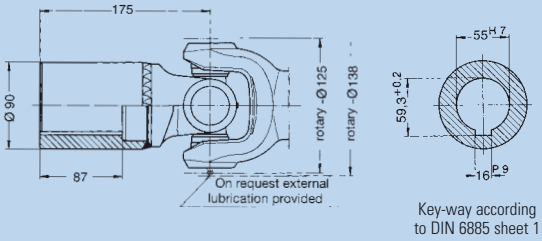
Please indicate requested length „S" and max. r.p.m. when ordering!

		Tubular Type normal extension				Tubular Type larger extension				Short Type I		
Order number		**0.113.100**	**0.113.101**	**0.113.102**	**0.113.105**	**0.113.110**	**0.113.111**	**0.113.112**	**0.113.115**	**0.113.130**	**0.113.131**	**0.113.132**
Angle of deflection ß*	°	20	18	20	35	20	18	20	35	20	18	20
Flange-Ø	mm	120	150	Hub	120	120	150	Hub	120	120	150	Hub
S_{min} resp. S_1	mm	491	491	721	530	556	556	786	580	345	345	575
S_2	mm	–	–	–	–	–	–	–	–	375	375	605
X resp. X_1	mm	60	60	60	60	130	130	130	130	35	35	35
X_2	mm	–	–	–	–	–	–	–	–	50	50	50
P_1	mm	**70 x 4**	**70 x 4**	**70 x 4**	**70 x 4**	**70 x 4**	**70 x 4**	**70 x 4**	**70 x 4**	**–**	**–**	**–**
P_2	mm	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	80 x 4	–	–	–
P_3	mm	100 x 4	100 x 4	100 x 4	100 x 4	100 x 4	100 x 4	100 x 4	100 x 4	–	–	–
Spline dim. DIN 5480	mm	50x2x24	50x2x24	50x2x24	50x2x24	50x2x24	50x2x24	50x2x24	50x2x24	50x2x24	50x2x24	50x2x24
Number of flange holes		8	8	–	8	8	8	–	8	8	8	–
J_m (at S_{min} resp. S_1)	kgm^2	0,01811	0,0218	0,01897	0,0199	0,02019	0,02388	0,02211	0,02324	0,01773	0,02142	0,02302
J_m (at S_2)	kgm^2	–	–	–	–	–	–	–	–	0,01807	0,02176	0,02336
J_m/100 mm standard tube	kgm^2	0,00071	0,00071	0,00071	0,00071	0,00071	0,00071	0,00071	0,00071	–	–	–
G (at S_{min} resp. S_1)	kg	13,66	15,02	19,88	14,55	15,46	16,82	21,75	16,12	11,31	12,67	17,53
G (at S_2)	kg	–	–	–	–	–	–	–	–	12,03	13,39	18,25
G/100 mm standard tube	kg	0,65	0,65	0,65	0,65	0,65	0,65	0,65	0,65	–	–	–

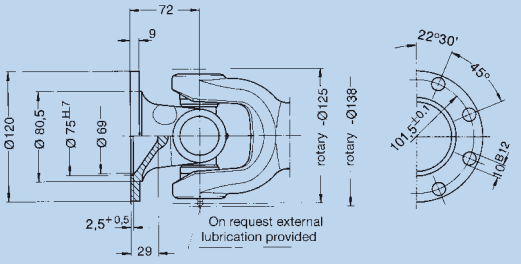
* Please refer to point 6.7 of the technical attachment

Size 0.113 | Md_{Nom} 4100 Nm | Md_{Lim} 5350 Nm

One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.

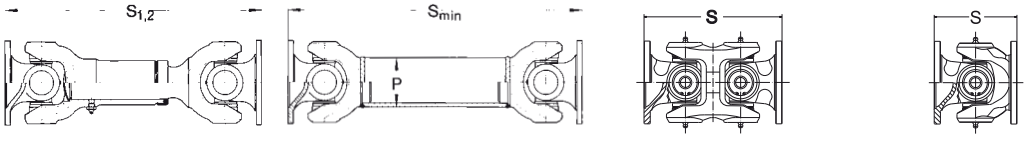


On both sides connecting hub
without key-way end number: 0.113.XX2
with key-way end number: 0.113.XX3



On both sides flange for larger angle deflection
end number: 0.113.XX5

Cardan Drive-Shafts without extension | Universal Joints without extension



additional spline protection on request

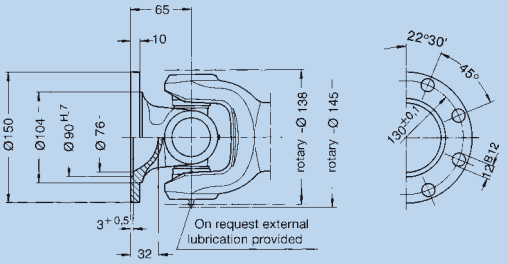
Short Type II				Tubular Type				Universal Joint Double			Universal Joint Single			
0.113.140	**0.113.141**	**0.113.142**	**0.113.145**	**0.113.200**	**0.113.201**	**0.113.202**	**0.113.205**	**0.113.300**	**0.113.301**	**0.113.302**	**0.113.400**	**0.113.401**	**0.113.402**	**0.113.405**
20	18	20	35	20	18	35	35	12	12	12	20	18	35	35
120	150	Hub	120	120	150	Hub	120	120	150	Hub	120	150	Hub	120
420	420	650	460	307	307	534	330	200	200	430	120	120	350	144
450	450	680	495	–	–	–	–	–	–	–	–	–	–	–
60	60	60	60	–	–	–	–	–	–	–	–	–	–	–
60	60	60	60	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	**70 x 4**	**70 x 4**	**70 x 4**	**70 x 4**	–	–	–	–	–	–	–
–	–	–	–	80 x 4	80 x 4	80 x 4	80 x 4	–	–	–	–	–	–	–
–	–	–	–	100 x 4	100 x 4	100 x 4	100 x 4	–	–	–	–	–	–	–
50x2x24	50x2x24	50x2x24	50x2x24	–	–	–	–	–	–	–	–	–	–	–
8	8	–	8	8	8	–	8	8	8	–	8	8	–	8
0,01512	0,01881	0,02041	0,01836	0,01436	0,01805	0,0156	0,01591	0,01336	0,01705	0,01465	0,00510	0,00879	0,01039	0,00998
0,01546	0,01915	0,02075	0,01866	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	0,00071	0,00071	0,00071	0,00071	–	–	–	–	–	–	–
12,60	13,96	18,83	13,47	9,36	10,72	15,56	10,02	7,97	9,33	14,04	4,42	5,78	10,66	5,10
12,94	14,30	19,17	13,92	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	0,65	0,65	0,65	0,65	–	–	–	–	–	–	–

Cardan Drive-Shafts

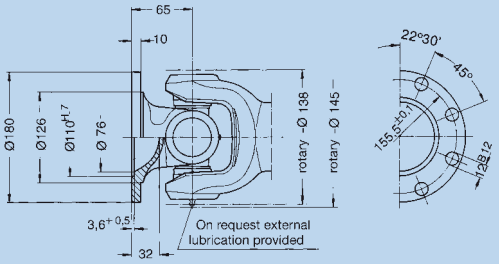
Roller bearing version

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.



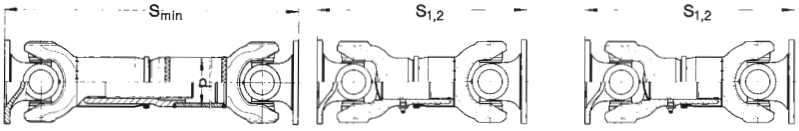
On both sides standard flange
end number: 0.148.XX0



On both sides larger flange
end number: 0.148.XX1

ß* = Maximum angle of deflection per joint
J_m = Moment of inertia
G = Weight
S_{min} = Minimum length of tubular types
S_1 = Compressed lengths
S_2 = of short types
X_1 = Extension at S_{min} resp. S_1
X_2 = Extension at S_2
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
P_2 / P_3 = Alternative tube

Universal Cardan Drive-Shafts with extension

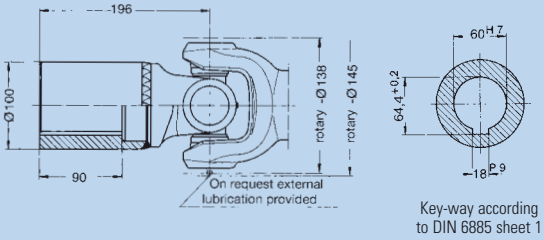


Please indicate requested length „S" and max. r.p.m. when ordering!		Tubular Type larger extension				Short Type I			Short Type II			
Order number		**0.148.110**	**0.148.111**	**0.148.112**	**0.148.115**	**0.148.130**	**0.148.131**	**0.148.132**	**0.148.140**	**0.148.141**	**0.148.142**	**0.148.145**
Angle of deflection ß*	°	20	20	35	35	20	20	20	20	20	20	35
Flange-Ø	mm	150	180	Hub	120/150	150	180	Hub	150	180	Hub	120/150
S_{min} resp. S_1	mm	550	550	812	580	360	360	622	460	460	722	490
S_2	mm	–	–	–	–	400	400	662	–	–	–	–
X resp. X_1	mm	110	110	110	110	40	40	40	80	80	80	80
X_2	mm	–	–	–	–	80	80	80	–	–	–	–
P_1	mm	**80 x 4**	**80 x 4**	**80 x 4**	**80 x 4**	–	–	–	–	–	–	–
P_2	mm	90 x 4	90 x 4	90 x 4	90 x 4	–	–	–	–	–	–	–
P_3	mm	100 x 4	100 x 4	100 x 4	100 x 4	–	–	–	–	–	–	–
Spline dim. DIN 5480	mm	55x2,5x20	55x2,5x20	55x2,5x20	55x2,5x20	55x2,5x20	55x2,5x20	55x2,5x20	55x2,5x20	55x2,5x20	55x2,5x20	55x2,5x20
Number of flange holes		8	8	–	8	8	8	–	8	8	–	8
J_m (at S_{min} resp. S_1)	kgm^2	0,0323	0,0342	0,0406	0,0332	0,0247	0,0267	0,03414	0,0294	0,0314	0,03884	0,0304
J_m (at S_2)	kgm^2	–	–	–	–	0,0267	0,0287	0,03614	–	–	–	–
J_m/100 mm standard tube	kgm^2	0,00109	0,00109	0,00109	0,00109	–	–	–	–	–	–	–
G (at S_{min} resp. S_1)	kg	20,87	22,17	29,77	22,19	15,63	16,93	24,53	18,37	19,67	27,27	19,69
G (at S_2)	kg	–	–	–	–	16,88	17,55	25,77	–	–	–	–
G/100 mm standard tube	kg	0,75	0,75	0,75	0,75	–	–	–	–	–	–	–

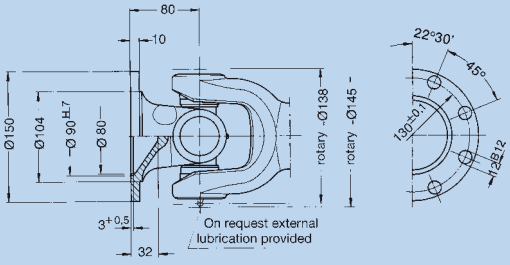
* Please refer to point 6.7 of the technical attachment

Size 0.148 | Md_{Nom} 5500 Nm | Md_{Lim} 7050 Nm

One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.

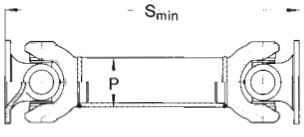


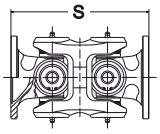
On both sides connecting hub
without key-way end number: 0.148.XX2
with key-way end number: 0.148.XX3

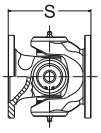


On both sides flange for larger angle deflection
end number: 0.148.XX5

Cardan Drive-Shafts without extension | Universal Joints without extension







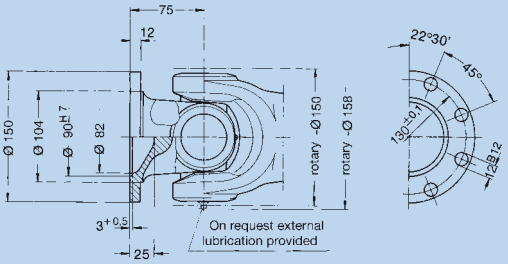
Tubular Type				Universal Joint Double			Universal Joint Single				
0.148.200	**0.148.201**	**0.148.202**	**0.148.205**	**0.148.300**	**0.148.301**	**0.148.302**	**0.148.400**	**0.148.401**	**0.148.402**	**0.148.405**	
20	20	35	35	20	20	20	20	20	35	35	
150	180	Hub	120/150	150	180	Hub	150	180	Hub	120/150	
345	345	607	375	235	235	497	130	130	392	160	
–	–	–	–	–	–	–	–	–	–	–	
–	–	–	–	–	–	–	–	–	–	–	
–	–	–	–	–	–	–	–	–	–	–	
80 x 4	**80 x 4**	**80 x 4**	**80 x 4**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	
90 x 4	90 x 4	90 x 4	90 x 4	–	–	–	–	–	–	–	
100 x 4	100 x 4	100 x 4	100 x 4	–	–	–	–	–	–	–	
–	–	–	–	–	–	–	–	–	–	–	
8	8	–	8	8	8	–	8	8	–	8	
0,0217	0,0237	0,03144	0,0227	0,0149	0,0161	0,0162	0,0106	0,0126	0,02004	0,0117	
–	–	–	–	–	–	–	–	–	–	–	
0,00109	0,00109	0,00109	0,00109	–	–	–	–	–	–	–	
14,53	15,83	23,43	15,85	11,92	13,22	20,82	6,75	8,05	15,54	8,08	
–	–	–	–	–	–	–	–	–	–	–	
0,75	0,75	0,75	0,75	–	–	–	–	–	–	–	

Cardan Drive-Shafts

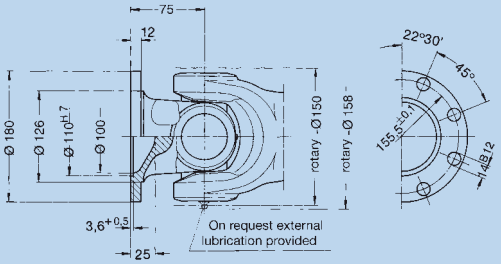
Roller bearing version

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.



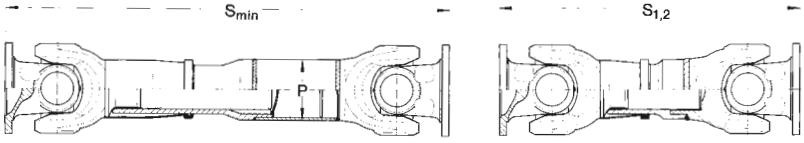
On both sides standard flange
end number: 0.158.XX0



On both sides larger flange
end number: 0.158.XX1

ß* = Maximum angle of deflection per joint
J_m = Moment of inertia
G = Weight
S_{min} = Minimum length of tubular types
S_1 = Compressed lengths
S_2 = of short types
X_1 = Extension at S_{min} resp. S_1
X_2 = Extension at S_2
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
P_2 = Alternative tube
P_3 = Alternative tube

Universal Cardan Drive-Shafts with extension

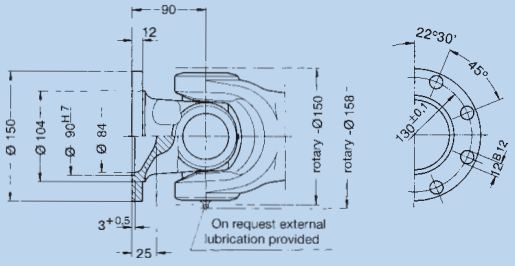


Please indicate requested length „S" and max. r.p.m. when ordering!

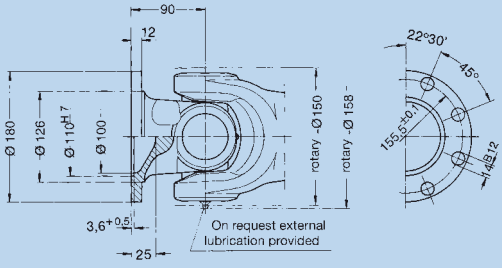
		Tubular Type larger extension					Short Type I			
Order number		**0.158.110**	**0.158.111**	**0.158.115**	**0.158.116**		**0.158.130**	**0.158.131**	**0.158.135**	**0.158.136**
Angle of deflection ß*	°	20	20	35	35		20	20	35	35
Flange-Ø	mm	150	180	150	180		150	180	150	180
S_{min} resp. S_1	mm	710	710	742	742		400	400	545	545
S_2	mm	–	–	–	–		465	465	585	585
X resp. X_1	mm	110	110	110	110		50	50	40	40
X_2	mm	–	–	–	–		80	80	80	80
P_1	mm	**90 x 4**	**90 x 4**	**90 x 4**	**90 x 4**		–	–	–	–
P_2	mm	100 x 4	100 x 4	100 x 4	100 x 4		–	–	–	–
P_3	mm	120 x 5	120 x 5	120 x 5	120 x 5		–	–	–	–
Spline dim. DIN 5480	mm	60x2,5x22	60x2,5x22	60x2,5x22	60x2,5x22		60x2,5x22	60x2,5x22	60x2,5x22	60x2,5x22
Number of flange holes		8	8	8	8		8	8	8	8
J_m (at S_{min} resp. S_1)	kgm^2	–	–	0,04531	0,05034		0,04114	0,0464	0,04291	0,04817
J_m (at S_2)	kgm^2	–	–	–	–		0,04193	0,0472	0,04340	0,04870
J_m/100 mm standard tube	kgm^2	0,00157	0,00157	0,00157	0,00157		–	–	–	–
G (at S_{min} resp. S_1)	kg	31,1	31,8	31,76	33,38		19,62	21,18	25,92	27,54
G (at S_2)	kg	–	–	–	–		22,05	23,61	27,27	28,89
G/100 mm standard tube	kg	0,85	0,85	0,85	0,85		–	–	–	–

* Please refer to point 6.7 of the technical attachment

Size 0.158 | Md_{Nom} 8200 Nm | Md_{Lim} 10650 Nm

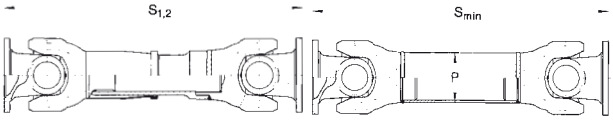


On both sides flange for larger angle deflection
end number: 0.158.XX5



On both sides larger flange for larger angle deflection
end number: 0.158.XX6

Cardan Drive-Shafts without extension



Universal Joints without extension

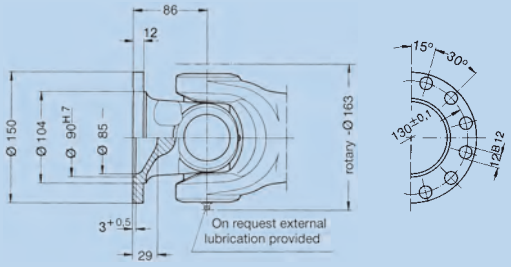
Short Type II				Tubular Type				Universal Joint Double			Universal Joint Single			
0.158.140	**0.158.141**	**0.158.145**	**0.158.146**	**0.158.200**	**0.158.201**	**0.158.205**	**0.158.206**	**0.158.300**	**0.158.301**		**0.158.400**	**0.158.401**	**0.158.405**	**0.158.406**
20	20	35	35	20	20	35	35	20	20		20	20	35	35
150	180	150	180	150	180	150	180	150	180		150	180	150	180
610	610	640	640	425	425	455	455	330	330		150	150	180	180
650	650	680	680	–	–	–	–	–	–		–	–	–	–
110	110	110	110	–	–	–	–	–	–		–	–	–	–
130	130	130	130	–	–	–	–	–	–		–	–	–	–
–	–	–	–	**90 x 4**	**90 x 4**	**90 x 4**	**90 x 4**	–	–		–	–	–	–
–	–	–	–	100 x 4	100 x 4	100 x 4	100 x 4	–	–		–	–	–	–
–	–	–	–	120 x 5	120 x 5	120 x 5	120 x 5	–	–		–	–	–	–
60x2,5x22	60x2,5x22	60x2,5x22	60x2,5x22	–	–	–	–	–	–		–	–	–	–
8	8	8	8	8	8	8	8	8	8		8	8	8	8
–	–	0,04409	0,04935	–	–	0,04340	0,04865	–	–		0,02055	0,02581	0,02417	0,02944
–	–	–	–	–	–	–	–	–	–		–	–	–	–
–	–	–	–	0,00157	0,00157	0,00157	0,00157	–	–		–	–	–	–
28,72	30,28	29,14	30,76	20,26	21,82	21,12	22,74	18,00	18,00		8,34	9,90	9,20	10,82
30,32	31,8	31,09	32,71	–	–	–	–	–	–		–	–	–	–
–	–	–	–	0,85	0,85	0,85	0,85	–	–		–	–	–	–

Cardan Drive-Shafts

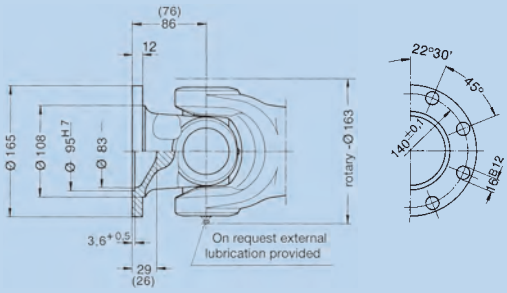
Roller bearing version

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.



On both sides standard flange
end number: 0.117.XX0

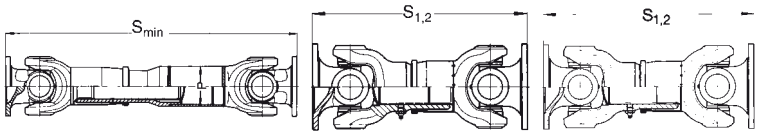


On both sides larger flange (Ø 165 mm)
end number: 0.117.XX1

Dimensions in brackets are only valid for short type I

ß* = Maximum angle of deflection per joint
J_m = Moment of inertia
G = Weight
S_{min} = Minimum length of tubular types
S_1 = Compressed lengths
S_2 = of short types
X_1 = Extension at S_{min} resp. S_1
X_2 = Extension at S_2
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
P_2 / P_3 = Alternative tube

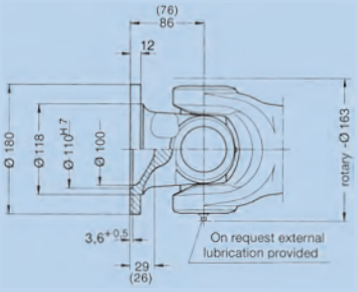
Universal Cardan Drive-Shafts with extension

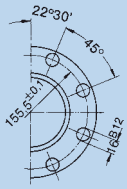


Please indicate requested length „S" and max. r.p.m. when ordering!		Tubular Type larger extension			Short Type I		Short Type II		
Order number		**0.117.110**	**0.117.111**	**0.117.111**	**0.117.121**	**0.117.121**	**0.117.130**	**0.117.131**	**0.117.131**
Angle of deflection ß*	°	30	30	30	24	24	30	30	30
Flange-Ø	mm	150	165	180	165	180	150	165	180
S_{min} resp. S_1	mm	660	660	660	400	400	495	495	495
S_2	mm	–	–	–	440	440	555	555	555
X resp. X_1	mm	110	110	110	40	40	45	45	45
X_2	mm	–	–	–	50	50	80	80	80
P_1	mm	**100 x 5**	**100 x 5**	**100 x 5**	–	–	–	–	–
P_2	mm	120 x 5	120 x 5	120 x 5	–	–	–	–	–
P_3	mm	–	–	–	–	–	–	–	–
Spline dim. DIN 5480	mm	65x2,5x24	65x2,5x24	65x2,5x24	65x2,5x24	65x2,5x24	65x2,5x24	65x2,5x24	65x2,5x24
Number of flange holes		12	8	8	8	8	12	8	8
J_m (at S_{min} resp. S_1)	kgm^2	0,04834	0,05185	0,05463	0,0467	0,0491	0,04286	0,04678	0,04917
J_m (at S_2)	kgm^2	–	–	–	0,04898	0,05138	0,04439	0,04899	0,05139
J_m/100 mm standard tube	kgm^2	0,00265	0,00265	0,00265	–	–	–	–	–
G (at S_{min} resp. S_1)	kg	35,03	35,51	36,56	25,61	26,52	28,21	28,69	29,74
G (at S_2)	kg	–	–	–	27,29	28,20	30,88	31,36	32,41
G/100 mm standard tube	kg	1,17	1,17	1,17	–	–	–	–	–

* Please refer to point 6.7 of the technical attachment

Size 0.117 | Md_{Nom} 10000 Nm | Md_{Lim} 13000 Nm

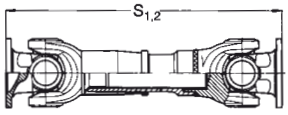


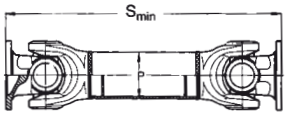


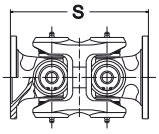
On both sides larger flange (Ø 180 mm) end number: 0.117.XX1

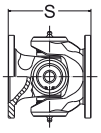
Dimensions in brackets are only valid for short type I

Cardan Drive-Shafts without extension | Universal Joints without extension









Short Type III				Tubular Type				Universal Joint Double				Universal Joint Single			
0.117.140	**0.117.141**	**0.117.141**		**0.117.200**	**0.117.201**	**0.117.201**		**0.117.300**	**0.117.301**	**0.117.301**		**0.117.400**	**0.117.401**	**0.117.401**	
30	30	30		30	30	30		15	15	15		30	30	30	
150	165	180		150	165	180		150	165	180		150	165	180	
600	600	600		430	430	430		296	296	296		172	172	172	
–	–	–		–	–	–		–	–	–		–	–	–	
110	110	110		–	–	–		–	–	–		–	–	–	
–	–	–		–	–	–		–	–	–		–	–	–	
–	–	–		**100 x 5**	**100 x 5**	**100 x 5**		–	–	–		–	–	–	
–	–	–		120 x 5	120 x 5	120 x 5		–	–	–		–	–	–	
–	–	–		–	–	–		–	–	–		–	–	–	
–	–	–		–	–	–		–	–	–		–	–	–	
12	8	8		12	8	8		12	8	8		12	8	8	
0,04665	0,05125	0,05365		0,04054	0,04424	0,04796		0,037	0,0423	0,0468		0,01879	0,02133	0,02568	
–	–	–		–	–	–		–	–	–		–	–	–	
–	–	–		0,00265	0,00265	0,00265		–	–	–		–	–	–	
33,45	33,93	34,98		25,31	25,79	26,84		21,02	21,50	22,57		10,99	11,47	12,52	
–	–	–		–	–	–		–	–	–		–	–	–	
–	–	–		1,17	1,17	1,17		–	–	–		–	–	–	

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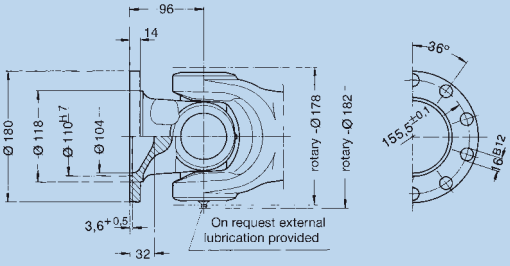
Cardan Drive-Shafts

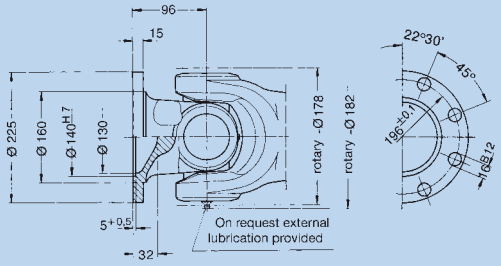
Roller bearing version

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.



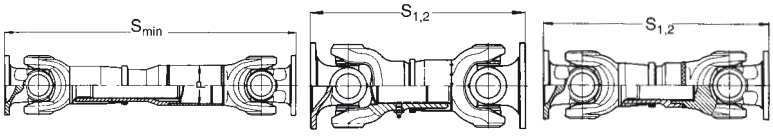
On both sides standard flange
end number: 0.120.XX0



On both sides larger flange
end number: 0.120.XX1

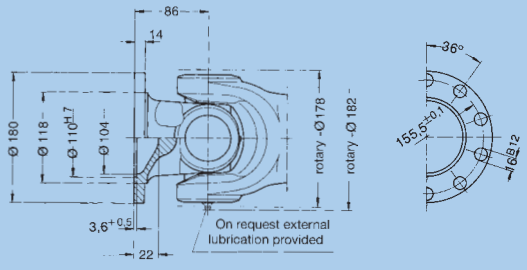
ß* = Maximum angle of deflection per joint
J_m = Moment of inertia
G = Weight
S_{min} = Minimum length of tubular types
S_1 = Compressed lengths
S_2 = of short types
X_1 = Extension at S_{min} resp. S_1
X_2 = Extension at S_2
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
P_2 / P_3 = Alternative tube

Universal Cardan Drive-Shafts with extension



Please indicate requested length „S" and max. r.p.m. when ordering!		Tubular Type larger extension				Short Type I			Short Type II			
Order number		**0.120.110**	**0.120.111**			**0.120.120**			**0.120.130**	**0.120.131**		
Angle of deflection ß*	°	30	30			16			30	30		
Flange-Ø	mm	180	225			180			180	225		
S_{min} resp. S_1	mm	740	740			470			560	560		
S_2	mm	–	–			500			600	600		
X resp. X_1	mm	110	110			55			45	45		
X_2	mm	–	–			60			60	60		
P_1	mm	**110 x 6**	**110 x 6**			**–**			**–**	**–**		
P_2	mm	120 x 6	120 x 6			–			–	–		
P_3	mm	–	–			–			–	–		
Spline dim. DIN 5480	mm	75x2,5x28	75x2,5x28			75x2,5x28			75x2,5x28	75x2,5x28		
Number of flange holes		10	8			10			10	8		
J_m (at S_{min} resp. S_1)	kgm^2	0,10213	0,14413			0,07320			0,07839	0,12039		
J_m (at S_2)	kgm^2	–	–			0,07493			0,08070	0,12270		
J_m/100 mm standard tube	kgm^2	0,004175	0,004175			–			–	–		
G (at S_{min} resp. S_1)	kg	48,75	52,89			36,26			40,27	44,41		
G (at S_2)	kg	–	–			37,76			42,42	46,56		
G/100 mm standard tube	kg	1,54	1,54			–			–	–		

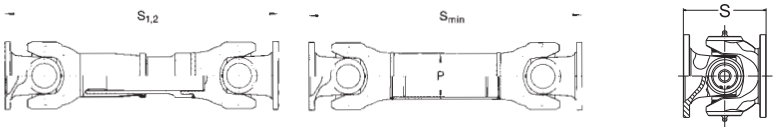
* Please refer to point 6.7 of the technical attachment



Shorter flange to short type I

Cardan Drive-Shafts without extension

Universal Joints without extension



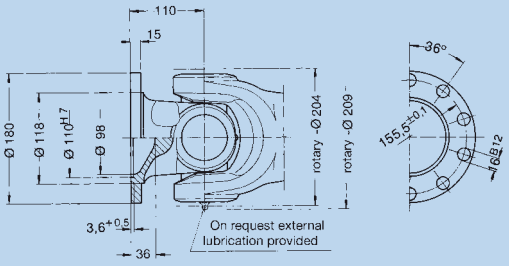
Short Type III				Tubular Type				Universal Joint Single			
0.120.140	**0.120.141**			**0.120.200**	**0.120.201**			**0.120.400**	**0.120.401**		
30	30			30	30			30	30		
180	225			180	225			180	225		
650	650			465	465			192	192		
–	–			–	–			–	–		
110	110			–	–			–	–		
–	–			–	–			–	–		
–	–			**110 x 6**	**110 x 6**			–	–		
–	–			120 x 6	120 x 6			–	–		
–	–			–	–			–	–		
75x2,5x28	75x2,5x28			–	–			–	–		
10	8			10	8			10	8		
0,08228	0,12428			0,07247	0,11447			0,03696	0,07896		
–	–			–	–			–	–		
–	–			0,004175	0,004175			–	–		
45,10	49,24			33,90	38,05			14,10	18,88		
–	–			–	–			–	–		
–	–			1,54	1,54			–	–		

Cardan Drive-Shafts

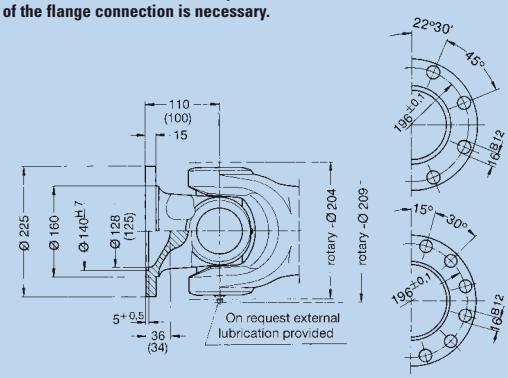
Roller bearing version

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.



On both sides standard flange
end number: 0.122.XX0

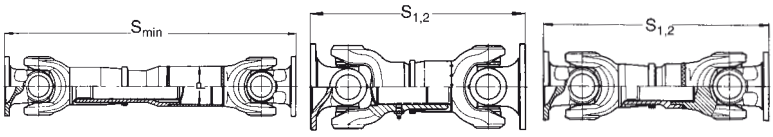


On both sides larger flange (Ø 225 mm)
end number: 0.122.XX1

Dimensions in brackets are only valid for short type I

ß* = Maximum angle of deflection per joint
J_m = Moment of inertia
G = Weight
S_{min} = Minimum length of tubular types
S_1 = Compressed lengths
S_2 = of short types
X_1 = Extension at S_{min} resp. S_1
X_2 = Extension at S_2
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
P_2 / P_3 = Alternative tube

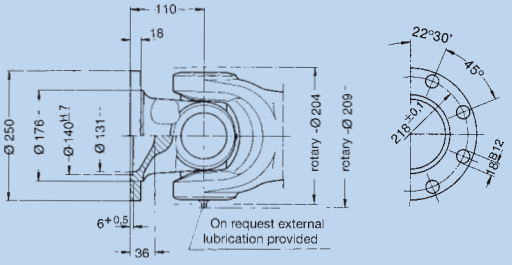
Universal Cardan Drive-Shafts with extension



Please indicate requested length „S" and max. r.p.m. when ordering!		Tubular Type larger extension				Short Type I			Short Type II			
Order number		**0.122.110**	**0.122.111**	**0.122.111**	**0.122.111**	**0.122.121**			**0.122.130**	**0.122.131**	**0.122.131**	**0.122.131**
Angle of deflection ß*	°	30	30	30	25	25			30	30	30	25
Flange-Ø	mm	180	225	225	250	225			180	225	225	250
S_{min} resp. S_1	mm	830	830	830	830	550			650	650	650	650
S_2	mm	–	–	–	–	600			–	–	–	–
X resp. X_1	mm	140	140	140	140	40			80	80	80	80
X_2	mm	–	–	–	–	55			–	–	–	–
P_1	mm	**120 x 6**	**120 x 6**	**124 x 8**	**124 x 8**	**–**			**–**	**–**	**–**	**–**
P_2	mm	140 x 6,5	140 x 6,5	140 x 6,5	140 x 6,5	–			–	–	–	–
P_3	mm	–	–	–	–	–			–	–	–	–
Spline dim. DIN 5480	mm	90x2,5x34	90x2,5x34	90x2,5x34	90x2,5x34	90x2,5x34			90x2,5x34	90x2,5x34	90x2,5x34	90x2,5x34
Number of flange holes		10	8	12	8	8			10	8	12	8
J_m (at S_{min} resp. S_1)	kgm^2	0,1558	0,1781	0,1792	0,1884	0,1453			0,1202	0,1565	0,1565	0,1853
J_m (at S_2)	kgm^2	–	–	–	–	0,1509			–	–	–	–
J_m/100 mm standard tube	kgm^2	0,00550	0,00550	0,00774	0,00774	–			–	–	–	–
G (at S_{min} resp. S_1)	kg	72,05	76,93	77,49	80,82	61,04			60,67	65,55	65,55	68,79
G (at S_2)	kg	–	–	–	–	64,85			–	–	–	–
G/100 mm standard tube	kg	1,69	1,69	2,29	2,29	–			–	–	–	–

* Please refer to point 6.7 of the technical attachment

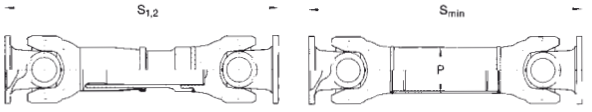
Size 0.122 | Md_{Nom} 26750 Nm | Md_{Lim} 35000 Nm

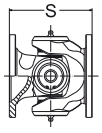


On both sides larger flange (Ø 250 mm)
end number: 0.122.XX1

Cardan Drive-Shafts without extension

Universal Joints without extension





Short Type III				Tubular Type				Universal Joint Single				
0.122.140	**0.122.141**	**0.122.141**	**0.122.141**	**0.122.200**	**0.122.201**	**0.122.201**	**0.122.201**	**0.122.400**	**0.122.401**	**0.122.401**	**0.122.401**	
30	30	30	25	30	30	30	25	30	30	30	25	
180	225	225	250	180	225	225	250	180	225	225	250	
720	720	720	720	520	520	520	520	220	220	220	220	
–	–	–	–	–	–	–	–	–	–	–	–	
110	110	110	110	–	–	–	–	–	–	–	–	
–	–	–	–	–	–	–	–	–	–	–	–	
–	**–**	**–**	**–**	**120 x 6**	**120 x 6**	**124 x 8**	**124 x 8**	**–**	**–**	**–**	**–**	
–	–	–	–	140 x 6,5	140 x 6,5	140 x 6,5	140 x 6,5	–	–	–	–	
–	–	–	–	–	–	–	–	–	–	–	–	
90x2,5x34	90x2,5x34	90x2,5x34	90x2,5x34	–	–	–	–	–	–	–	–	
10	8	12	8	10	8	12	8	10	8	12	8	
0,1272	0,1636	0,1636	0,1840	0,1195	0,1642	0,1645	0,1846	0,05597	0,0923	0,0923	0,1211	
–	–	–	–	–	–	–	–	–	–	–	–	
–	–	–	–	0,00550	0,00550	0,00774	0,00774	–	–	–	–	
66,07	70,95	70,95	74,19	45,70	50,58	50,91	54,24	20,77	25,64	25,64	28,86	
–	–	–	–	–	–	–	–	–	–	–	–	
–	–	–	–	1,69	1,69	2,29	2,29	–	–	–	–	

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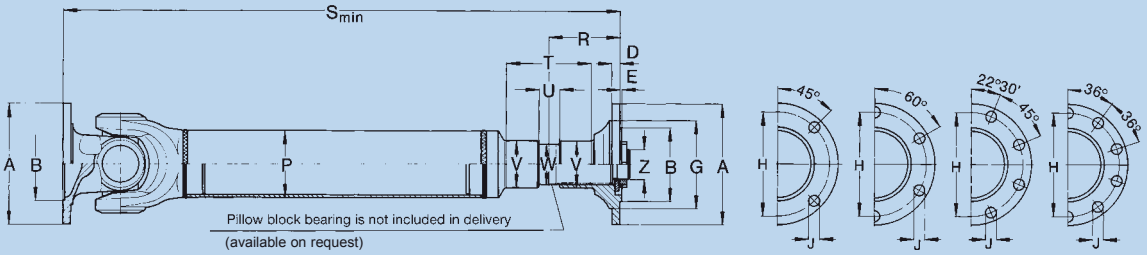
Universal-Joint Intermediate Shafts | Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.



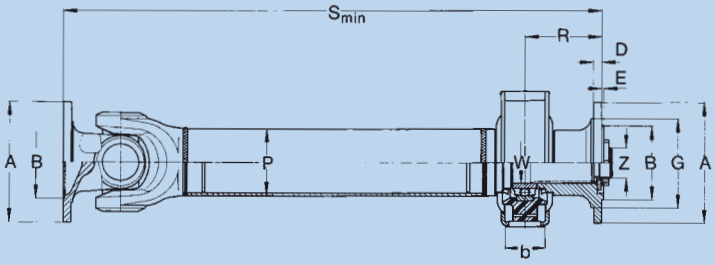
For missing dimensions and details see according series.

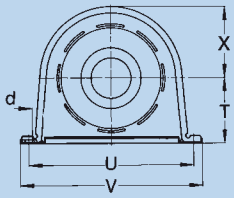
Please indicate requested length „S" and max. r.p.m. when ordering!

Universal-Joint Intermediate Shaft for SKF-pillow block bearing (are not included in delivery)

Order number		0.109.250	0.110.250	0.112.250	0.113.250	0.148.250	0.158.250	0.117.251	0.120.250	0.122.250	0.122.251
Md_{Nom}	Nm	1700	2300	3350	4100	5500	8200	10000	16850	26750	26750
Angle of deflection ß*	°	20	20	20	20	20	35	30	30	30	30
For pillow block bearing		SNL 207	SNL 207	SNL 209	SNL 209	SNL 211	SNL 211	SNL 213	SNL 215	SNL 216	SNL 216
A	mm	90	100	120	120	150	150	180	180	180	225
B_{h6}^{H7}	mm	47	57	75	75	90	90	110	110	110	140
D	mm	8	8	9	9	10	10	12	14	14	15
$E_{-0,2}$	mm	2,3	2,3	2,3	2,3	2,8	2,8	2,8	2,8	2,8	4,5
$G_{-0,3}$	mm	61,1	70,6	88,1	84,1	110,6	110,6	131	131	131	171,5
$H^{\pm 0,1}$	mm	74,5	84	101,5	101,5	130	130	155,5	155,5	155,5	196
J^{B12}	mm	8	8	8	10	12	12	16	16	16	16
P_1	mm	**50 x 2**	**50 x 3**	**60 x 4**	**70 x 4**	**80 x 4**	**90 x 4**	**100 x 5**	**110 x 6**	**120 x 6**	**124 x 8**
P_2	mm	70 x 3	70 x 3	80 x 4	80 x 4	90 x 4	100 x 4	120 x 5	120 x 6	124 x 8	140 x 6,5
P_3	mm	80 x 4	80 x 4	90 x 4	100 x 4	100 x 4	120 x 5	–	–	–	–
R	mm	68,5	68,5	71,5	71,5	87,5	87,5	105,5	115,5	135,5	135,5
S_{min}	mm	253	269	305	308	360	420	446	480	540	540
T	mm	100	100	100	100	112	112	125	142	147	147
U	mm	23	23	23	23	25	25	31	31	33	33
V_{h9}	mm	45	45	55	55	65	65	75	85	90	90
W	mm	35	35	45	45	55	55	65	75	80	80
Z	mm	M16 x 1,5	M16 x 1,5	M20 x 1,5	M20 x 1,5	M32 x 1,5	M32 x 1,5	M45 x 1,5	M45 x 1,5	M45 x 1,5	M45 x 1,5
Weight	kg	3,95	4,68	7,60	8,59	14,25	17,90	25,64	32,06	–	47,44
Tooth/spline dim.	mm	35 x 31	35 x 31	45 x 41	45 x 41	55 x 50	55 x 50	62x54x20	70x61x20	75x66x22	75x66x22
Number of flange holes		4	6	8	8	8	8	8	10	10	8
J_m (at S_{min})	kgm^2	0,000531	0,00324	0,008786	0,01198	0,02496	0,04510	0,04564	0,1089	–	–
J_m/100 mm standard tube	kgm^2	0,00014	0,00019	0,00044	0,00071	0,00109	0,00157	0,00265	0,00418	–	–
G (at S_{min})	kg	4,0	4,7	7,5	9,0	13,3	18,5	25,9	31,7	46,0	47,5
G/100 mm standard tube	kg	0,24	0,35	0,55	0,65	0,75	0,85	1,17	1,54	1,69	2,29

* Please refer to point 6.7 of the technical attachment





For missing dimensions and details see according series.
Flange illustrations see intermediate shafts without pillow block bearings.

Please indicate requested length „S" and max. r.p.m. when ordering!

Universal-Joint Intermediate Shaft cpl. with elastic pillow block bearing

Order number		0.109.260	0.110.260	0.112.260	0.113.260	0.148.260	0.158.260	0.117.261	0.120.260
Md_{Nom}	Nm	1700	2300	3350	4100	5500	8200	10000	16850
Angle of deflection ß*	°	20	20	20	20	20	35	30	30
For pillow block bearing		1000 958 350	1000 958 350	1000 958 450	1000 958 450	1000 958 500	1000 958 550	1000 958 600	1000 958 700
A	mm	90	100	120	120	150	150	180	180
B^{H7}_{h6}	mm	47	57	75	75	90	90	110	110
b	mm	45	45	58	58	58	60	60	63,5
D	mm	8	8	9	9	10	12	12	14
d	mm	12,8	12,8	13	13	14,2	15	15	16
$E_{-0,2}$	mm	2,3	2,3	2,3	2,3	2,3	2,8	2,8	2,8
$G_{-0,3}$	mm	61,1	70,6	88,1	84,1	110,6	110,6	133	131
$H^{\pm 0,1}$	mm	74,5	84	101,5	101,5	130	130	155,5	155,5
J^{B12}	mm	8	8	8	10	12	12	16	16
P_1	mm	**50 x 2**	**50 x 3**	**60 x 4**	**70 x 4**	**80 x 4**	**90 x 4**	**100 x 5**	**110 x 6**
P_2	mm	70 x 3	70 x 3	80 x 4	80 x 4	90 x 4	100 x 4	120 x 5	120 x 6
P_3	mm	80 x 4	80 x 4	90 x 4	100 x 4	100 x 4	120 x 5	–	–
R	mm	68,3	68,3	71,3	71,5	87,5	95	100	107
S_{min}	mm	238	254	293	296	339	410	405	425
T	mm	58,8	58,8	70	70	70	71,5	80	85,5
U	mm	168	168	193,6	193,6	193,6	193,6	200	219,2
V	mm	198	198	228	228	228	230	243	260
W	mm	35	35	45	45	50	55	60	70
X	mm	73	69	–	–	–	–	–	–
Z	mm	M16 x 1,5	M16 x 1,5	M20 x 1,5	M20 x 1,5	M32 x 1,5	M32 x 1,5	M45 x 1,5	M45 x 1,5
Tooth/spline dim.	mm	35 x 31	35 x 31	45 x 41	45 x 41	50 x 45	55 x 50	60x2,5x22	70x2,5x26
Number of flange holes		4	6	8	8	8	8	8	10
J_m (at S_{min})	kgm^2	0,000514	0,00322	0,008748	0,01194	0,02485	0,04503	0,04523	0,10788
J_m/100 mm standard tube	kgm^2	0,00014	0,00019	0,00044	0,00071	0,00109	0,00157	0,00265	0,00418
G (at S_{min})	kg	5,40	6,18	9,99	10,69	16,12	20,05	28,40	34,06
G/100 mm standard tube	kg	0,24	0,35	0,55	0,65	0,75	0,85	1,17	1,54

ß = Maximum angle of deflection per joint
J_m = Moment of inertia
G = Weight
S_{min} = Minimum length of tubular types

P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed

P_2 = Alternative tube
P_3
* Please refer to point 6.7 of the technical attachment

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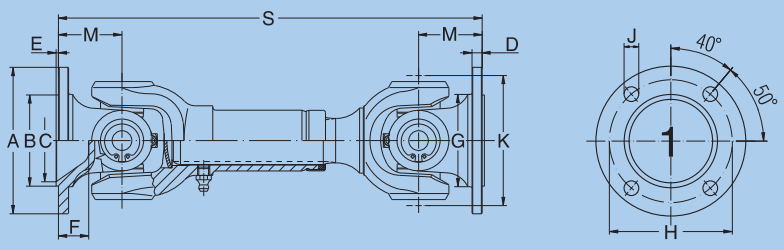
Cardan Drive-Shafts

for SAE-flange-connection, with extension

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.

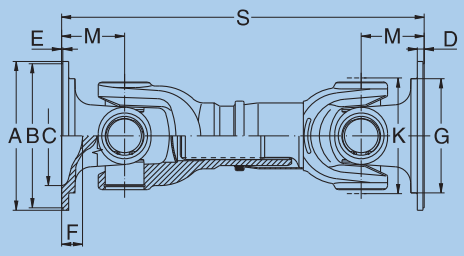


For missing dimensions and details see according series.

Please indicate compressed length „S" and max. r.p.m. when ordering!

Cardan-Drive-Shafts for SAE-flange-connection, with extension; Size 0.107							Size 0.109	
Order number	**0.107.138.001**	**0.107.138.002**	**0.107.148.001**	**0.107.148.002**	**0.107.108.001**	**0.107.118.001**	**0.109.138.201**	**0.109.138.202**
SAE-flange-connection	**1100**	**1100**	**1100**	**1100**	**1100**	**1100**	**1310**	**1310**
Elbe joint size	**0.107**	**0.107**	**0.107**	**0.107**	**0.107**	**0.107**	**0.109**	**0.109**
Md_{Nom} Nm	920	920	920	920	920	920	1700	1700
Angle of deflection ß* °	18	18	18	18	18	18	18	18
A mm	87,3	87,3	87,3	87,3	87,3	87,3	96,8	96,8
$B_{-0,04}$ mm	57,15	57,15	57,15	57,15	57,15	57,15	60,32	60,32
C mm	44	44	44	44	44	44	54	54
D mm	5,2	5,2	5,2	5,2	5,2	5,2	6,7	6,7
E mm	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$
F mm	18	18	18	18	18	18	20	20
G mm	54	54	54	54	54	54	61	61
$H_{\pm 0,1}$ mm	69,85	69,85	69,85	69,85	69,85	69,85	79,4	79,4
J^{B12} mm	7,9	7,9	7,9	7,9	7,9	7,9	9,5	9,5
K mm	70	70	70	70	70	70	86	86
M mm	36	36	36	36	36	36	42	42
S_{min} mm	200	225	250	270	300	360	225	250
X (extension) mm	25	35	35	35	35	70	25	40
Tooth/spline dim. mm	28x1,5x17	28x1,5x17	28x1,5x17	28x1,5x17	28x1,5x17	28x1,5x17	32x2x14	32x2x14
Type of flange	1	1	1	1	1	1	1	1

ß* = Maximum angle of deflection per joint
S = Compressed lengths; corresponds to the length of standard type
* Please refer to point 6.7 of the technical attachment



For missing dimensions and details see according series.

				Size 0.110					
0.109.148.201	**0.109.148.202**	**0.109.108.201**	**0.109.118.201**	**0.110.138.001**	**0.110.138.002**	**0.110.148.001**	**0.110.148.002**	**0.110.108.001**	**0.110.118.001**
1310	**1310**	**1310**	**1310**	**1350/1410**	**1350/1410**	**1350/1410**	**1350/1410**	**1350/1410**	**1350/1410**
0.109	**0.109**	**0.109**	**0.109**	**0.110**	**0.110**	**0.110**	**0.110**	**0.110**	**0.110**
1700	1700	1700	1700	2300	2300	2300	2300	2300	2300
18	18	18	18	18	18	18	18	18	18
96,8	96,8	96,8	96,8	116	116	116	116	116	116
60,32	60,32	60,32	60,32	69,85	69,85	69,85	69,85	69,85	69,85
54	54	54	54	55	55	55	55	55	55
6,7	6,7	6,7	6,7	7,5	7,5	7,5	7,5	7,5	7,5
$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$
20	20	20	20	20	20	20	20	20	20
61	61	61	61	68	68	68	68	68	68
79,4	79,4	79,4	79,4	95,25	95,25	95,25	95,25	95,25	95,25
9,5	9,5	9,5	9,5	11,2	11,2	11,2	11,2	11,2	11,2
86	86	86	86	98	98	98	98	98	98
42	42	42	42	46	46	46	46	46	46
280	310	348	393	255	280	310	340	374	464
40	40	40	80	30	40	40	40	40	95
32x2x14	32x2x14	32x2x14	32x2x14	35x2x16	35x2x16	35x2x16	35x2x16	35x2x16	35x2x16
1	1	1	1	1	1	1	1	1	1

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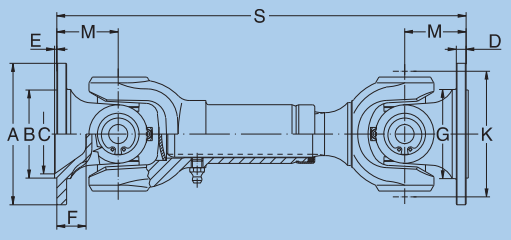
ORIGINAL elbe GELENKE

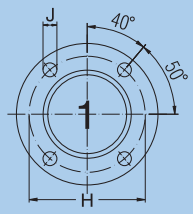
Cardan Drive-Shafts

for SAE-flange-connection, with extension

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.



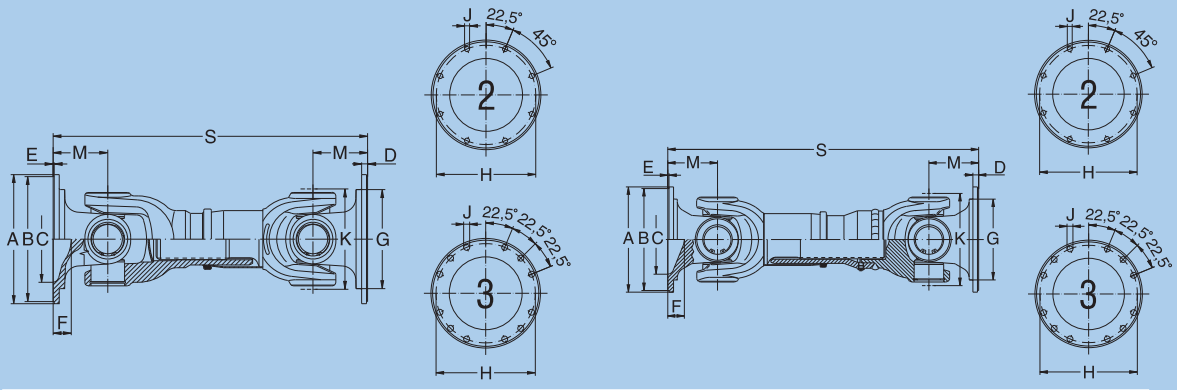


For missing dimensions and details see according series.

Please indicate compressed length „S" and max. r.p.m. when ordering!

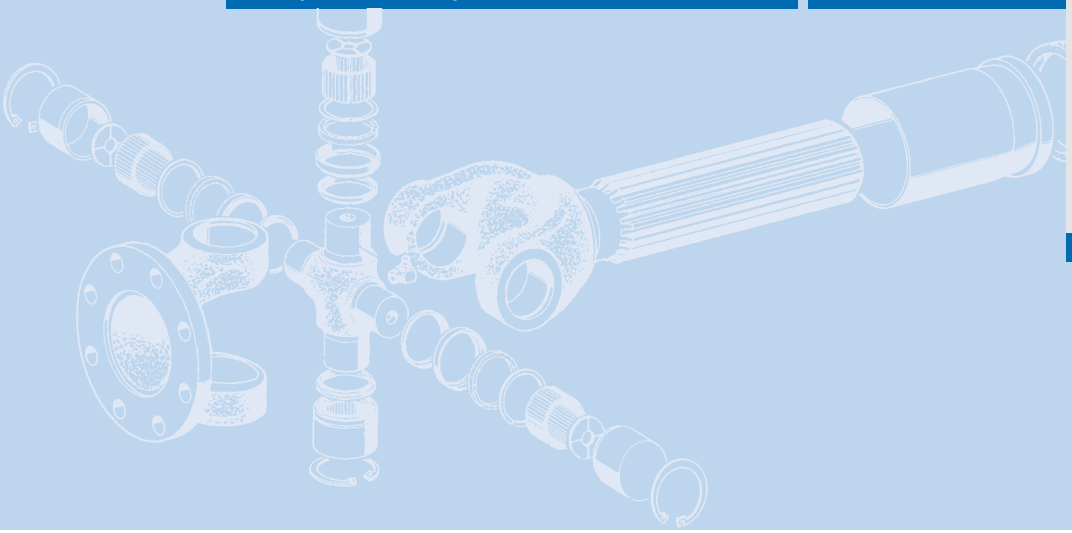
Cardan-Drive-Shafts for SAE-flange-connection, with extension; Size 0.112								Size 0.148	
Order number		**0.112.138.201**	**0.112.138.202**	**0.112.148.201**	**0.112.148.202**	**0.112.108.201**	**0.112.118.201**	**0.148.138.001**	**0.148.138.002**
SAE-flange-connection		**1510**	**1510**	**1510**	**1510**	**1510**	**1510**	**1600**	**1600**
Elbe joint size		**0.112**	**0.112**	**0.112**	**0.112**	**0.112**	**0.112**	**0.148**	**0.148**
Md_{Nom}	Nm	3350	3350	3350	3350	3350	3350	5500	5500
Angle of deflection ß*	°	18	18	18	18	18	18	18	18
A	mm	146	146	146	146	146	146	174,6	174,6
$B_{-0,04}$	mm	95,25	95,25	95,25	95,25	95,25	95,25	168,22	168,22
C	mm	82	82	82	82	82	82	98	98
D	mm	9,1	9,1	9,1	9,1	9,1	9,1	9,5	9,5
E	mm	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,5_{-0,1}$	$1,6^{+0,2}$	$1,6^{+0,2}$
F	mm	33	33	33	33	33	33	32	32
G	mm	90	90	90	90	90	90	132	132
$H_{\pm 0,1}$	mm	120,65	120,65	120,65	120,65	120,65	120,65	155,6	155,6
J^{B12}	mm	12,7	12,7	12,7	12,7	12,7	12,7	9,5	9,5
K	mm	115	115	115	115	115	115	145	145
M	mm	60	60	60	60	60	60	65	65
S_{min}	mm	325	360	400	430	473	523	360	400
X (extension)	mm	35	50	60	60	60	120	40	80
Tooth/spline dim.	mm	42x2x20	42x2x20	42x2x20	42x2x20	42x2x20	42x2x20	55x2,5x20	55x2,5x20
Type of flange		1	1	1	1	1	1	2	2

ß = Maximum angle of deflection per joint
S = Compressed lengths; corresponds to the length of standard type
* Please refer to point 6.7 of the technical attachment



For missing dimensions and details see according series.

	Size 0.120					Size 0.122		
0.148.148.001	**0.148.118.001**	**0.120.138.001**	**0.120.138.002**	**0.120.148.001**	**0.120.118.001**	**0.122.138.001**	**0.122.148.001**	**0.122.118.001**
1600	**1600**	**1800**	**1800**	**1800**	**1800**	**1900**	**1900**	**1900**
0.148	**0.148**	**0.120**	**0.120**	**0.120**	**0.120**	**0.122**	**0.122**	**0.122**
5500	5500	16850	16850	16850	16850	26750	26750	26750
18	18	30	30	30	30	30	30	30
174,6	174,6	203,2	203,2	203,2	203,2	276,2	276,2	276,2
168,22	168,22	196,82	196,82	196,82	196,82	222,2	222,2	222,2
98	98	135	135	135	135	137,5	137,5	137,5
9,5	9,5	11,1	11,1	11,1	11,1	14,2	14,2	14,2
1,6 $^{+0,2}$	1,6 $^{+0,2}$	2,3 $^{+0,2}$	2,3 $^{+0,2}$	2,3 $^{+0,2}$	2,3 $^{+0,2}$	2,4 $^{+0,2}$	2,4 $^{+0,2}$	2,4 $^{+0,2}$
32	32	32	32	32	32	37	37	37
132	132	156	156	156	156	190	190	190
155,6	155,6	184,15	184,15	184,15	184,15	247,6	247,6	247,6
9,5	9,5	11,2	11,2	11,2	11,2	16	16	16
145	145	178	178	178	178	204	204	204
65	65	96	96	96	96	111	111	111
460	550	560	600	650	740	652	722	830
80	110	45	60	110	110	80	110	140
55x2,5x20	55x2,5x20	75x2,5x28	75x2,5x28	75x2,5x28	75x2,5x28	90x2,5x34	90x2,5x34	90x2,5x34
2	2	3	3	3	3	2	2	2



Components, Spares and Accessories for Universal-Joint Drive Shafts and Universal Joints Series 0.100

On the following four pages you will find exploded views of the most common Cardan Shaft configurations. These will act as a guide when selecting and ordering any spare parts by showing assembly layout, part name and individual components.

However, it should be noted that many components listed cannot be purchased separately, but as subassemblies. For instance, when encountering a defective joint bearing, it would be pointless to replace only the bearing housing. The entire cross-kit assembly must be replaced. The same concept applies for the spline assembly, since the spline shaft and spline hub are subjected to the same wear rates.

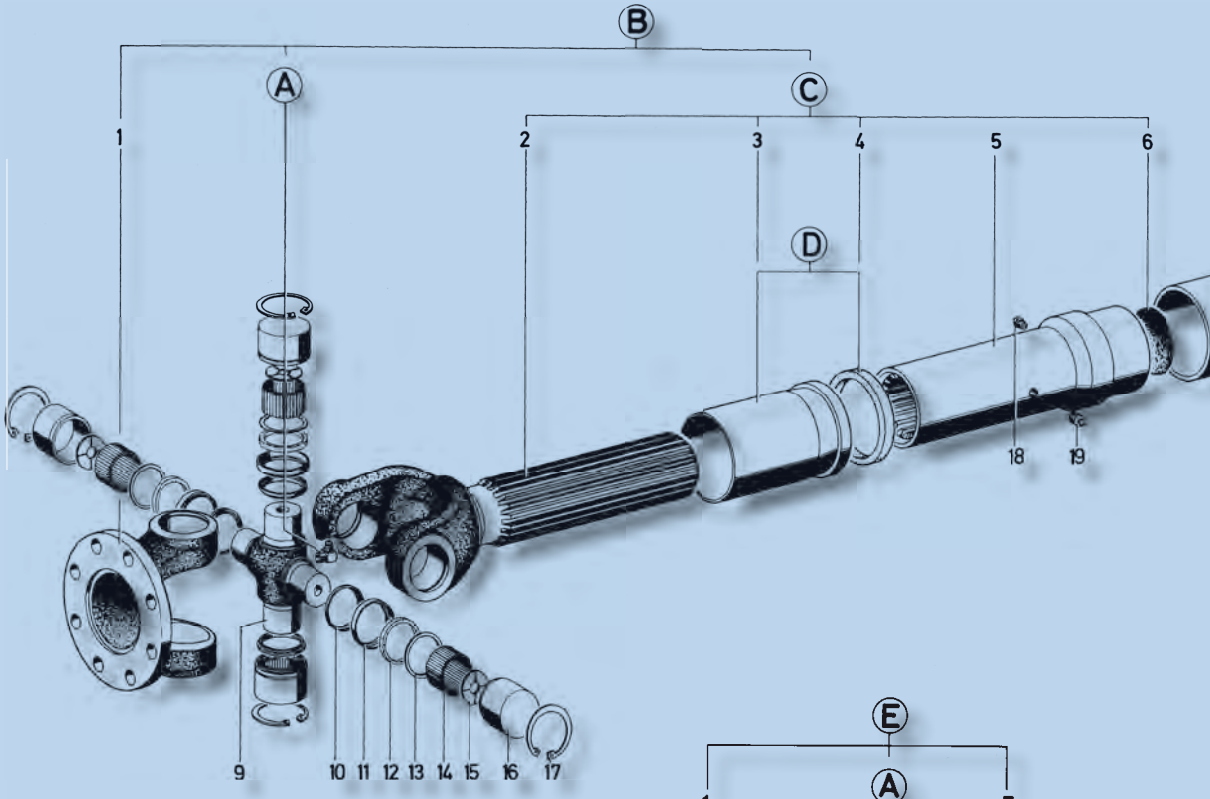
The following pages show the most important components and / or replacement subassemblies with their respective ordering numbers and mounting dimensions.

Only cross-kits intended for use at large deflection angles will be equipped with thrust washers (item 15 on the following page). Please note the written notations placed above the different design options, such as „standard type", „type for external lubrication", etc. These notations also apply to other components.

Each Elbe Cardan Shaft is dynamically balanced.

When worn parts are replaced on high speed shafts, rebalancing is required. Repaired Cardan Shafts operating at low speeds do not require rebalancing. As a general rule, depending on the U-joint size, configuration and application, rebalancing will not be required at operating speeds between 500 and 800 rpm.

Upon request, we will send repair instructions for replacing cross kits on Cardan Shafts and Joints.



Universal-Joint Drive Shaft with extension and tube insert

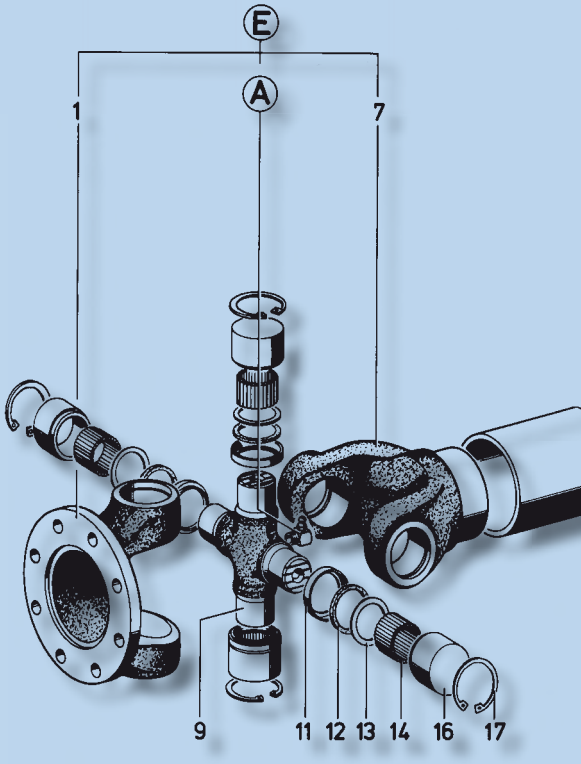
joint-size 0.148, 0.158, 0.117, 0.120, 0.122; catalog pages 20 to 29

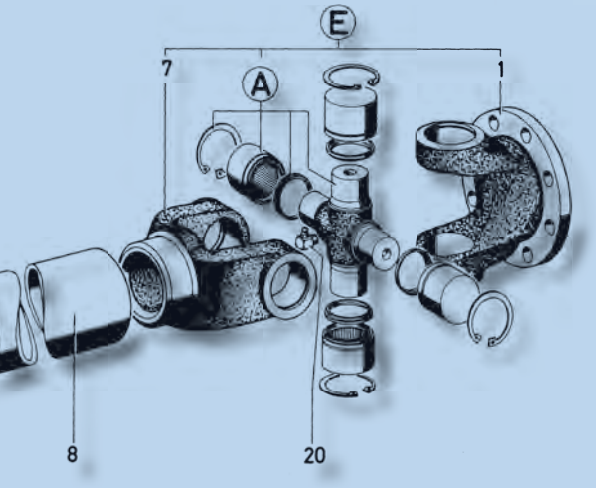
Complete build up or exchange units:

A Complete cross kit, consisting of parts 9–17 and 20
B Complete slip joint (sliding sleeve type), consisting of parts 1–6, 18, 19 and A
C Complete length extension assembly, consisting of parts 2–6, 18 and 19
D Complete protective cover, consisting of parts 3 and 4
E Complete fixed joint, consisting of parts 1, 7 and A

Individual components:

1 Fork flange	11 Socket
2 Fork shaft	12 Lip seal
3 Protective tube	13 Washer
4 Ring seal	14 Bearing rollers
5 Sliding sleeve	15 Thrust washer
6 Plug	16 Bearing housing
7 Weld fork	17 Snap ring
8 Connecting tube	18 Vent
9 Cross Units	19 Grease nipple, type A
10 Oil splash ring	20 Grease nipple, type C





Universal-Joint Drive Shaft with extension and tube insert

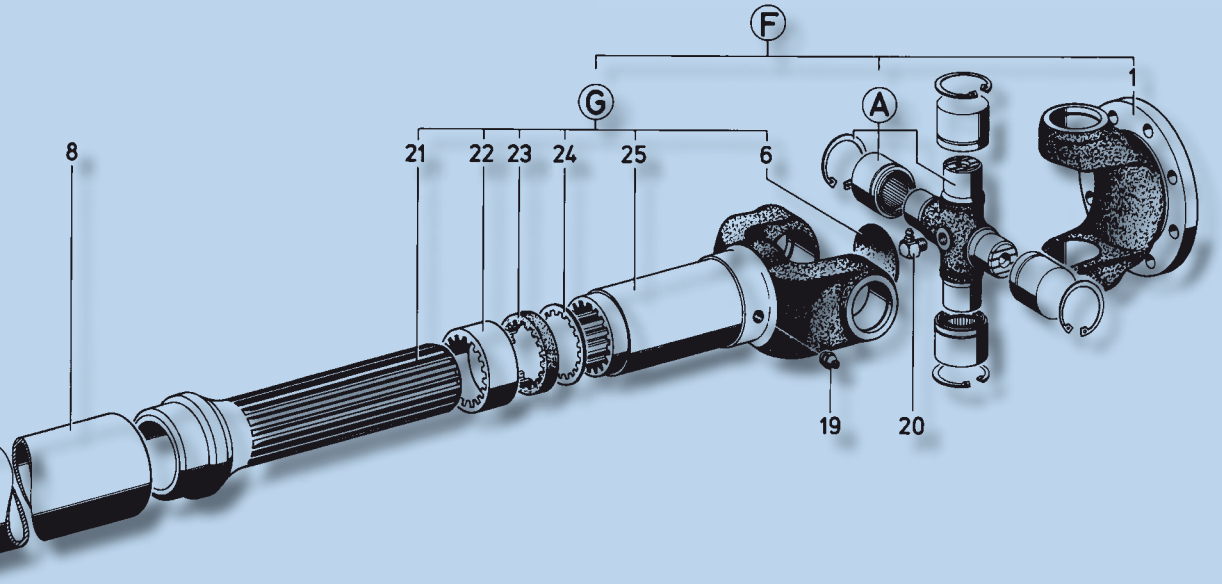
joint-size 0.105 to 0.113; catalog pages 4 to 19

Complete build up or exchange units:

A Complete cross kit, consisting of parts 9, 11–14, 16, 17 and 20
E Complete fixed joint, consisting of parts 1, 7 and A
F Complete slip joint, consisting of parts 1, 6, 19, 21–25 and A
G Complete length extension assembly, consisting of parts 6, 19, 21–25

Individual components:

1 Fork flange
6 Plug
7 Weld fork
8 Connecting tube
9 Cross Units
11 Socket
12 Lip seal
13 Washer
14 Bearing needles
16 Bearing housing
17 Snap ring
19 Grease nipple, type A
20 Grease nipple, type C
21 Spline shaft
22 Spline cover
23 Spline seal
24 Spline washer
25 Sliding element



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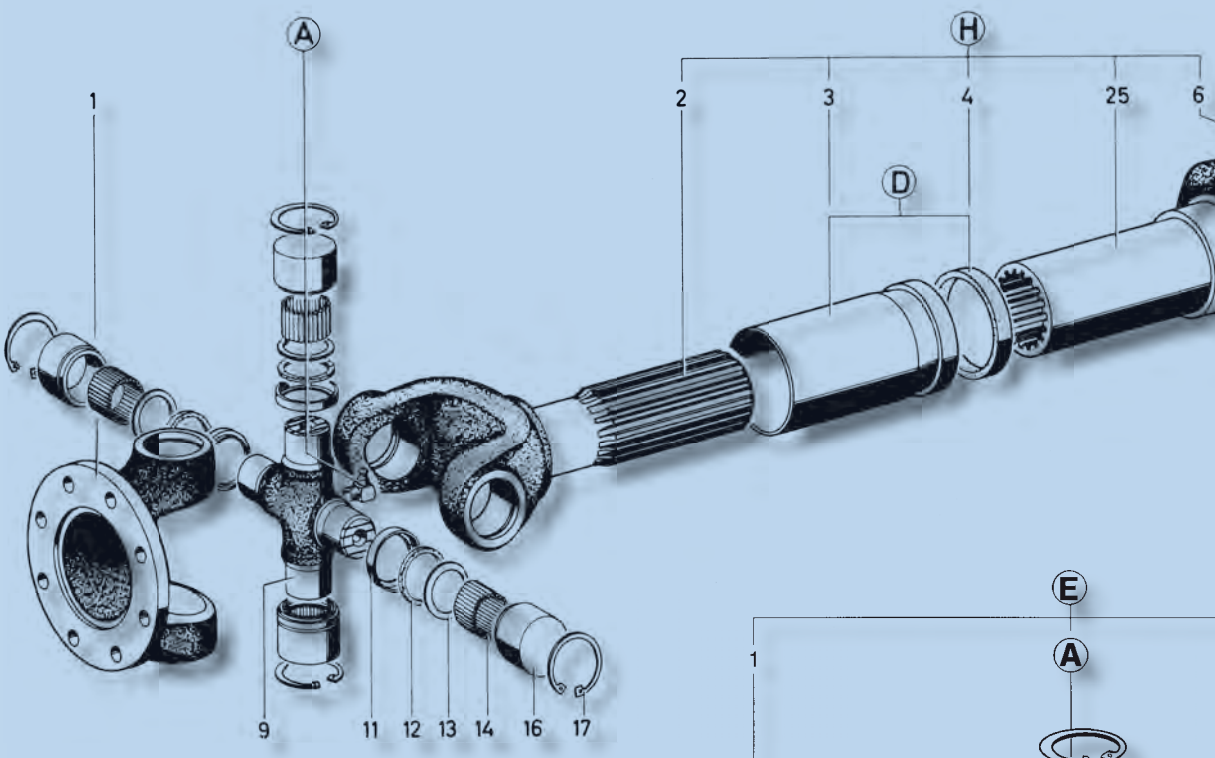
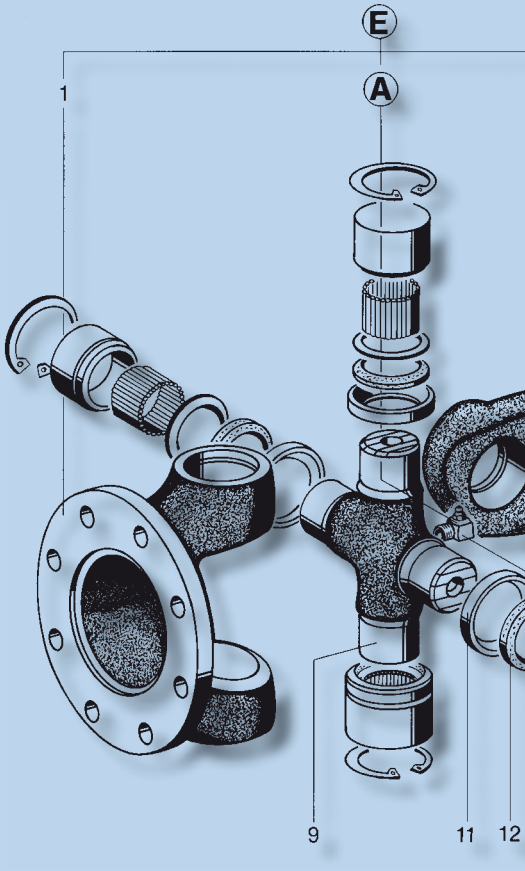




Universal-Joint Drive Shaft with extension, short type

joint-size 0.105 to 0.122; catalog pages 4 to 29

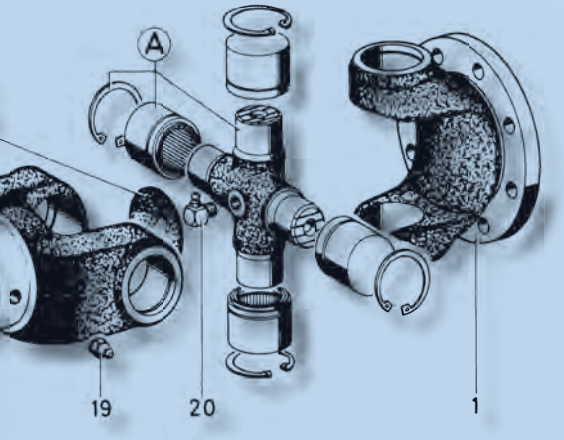
Complete build up or exchange units:

A Complete cross kit, consisting of parts 9, 11–14, 16, 17 and 20
D Complete protective section, consisting of parts 3 and 4
H Complete center assembly, consisting of parts 2–4, 6, 19 and 25

Individual components:

1 Fork flange
2 Fork shaft
3 Protective tube
4 Ring seal
5 Sliding sleeve
6 Plug
9 Cross Units
11 Socket
12 Lip seal
13 Washer
14 Bearing rollers
16 Bearing housing
17 Snap ring
19 Grease nipple, type A
20 Grease nipple, type C
25 Sliding element

Note:
When ordering the protective section D or central assembly H, indicate which telescoped length „S" these parts are needed for.



Universal-Joint Shaft

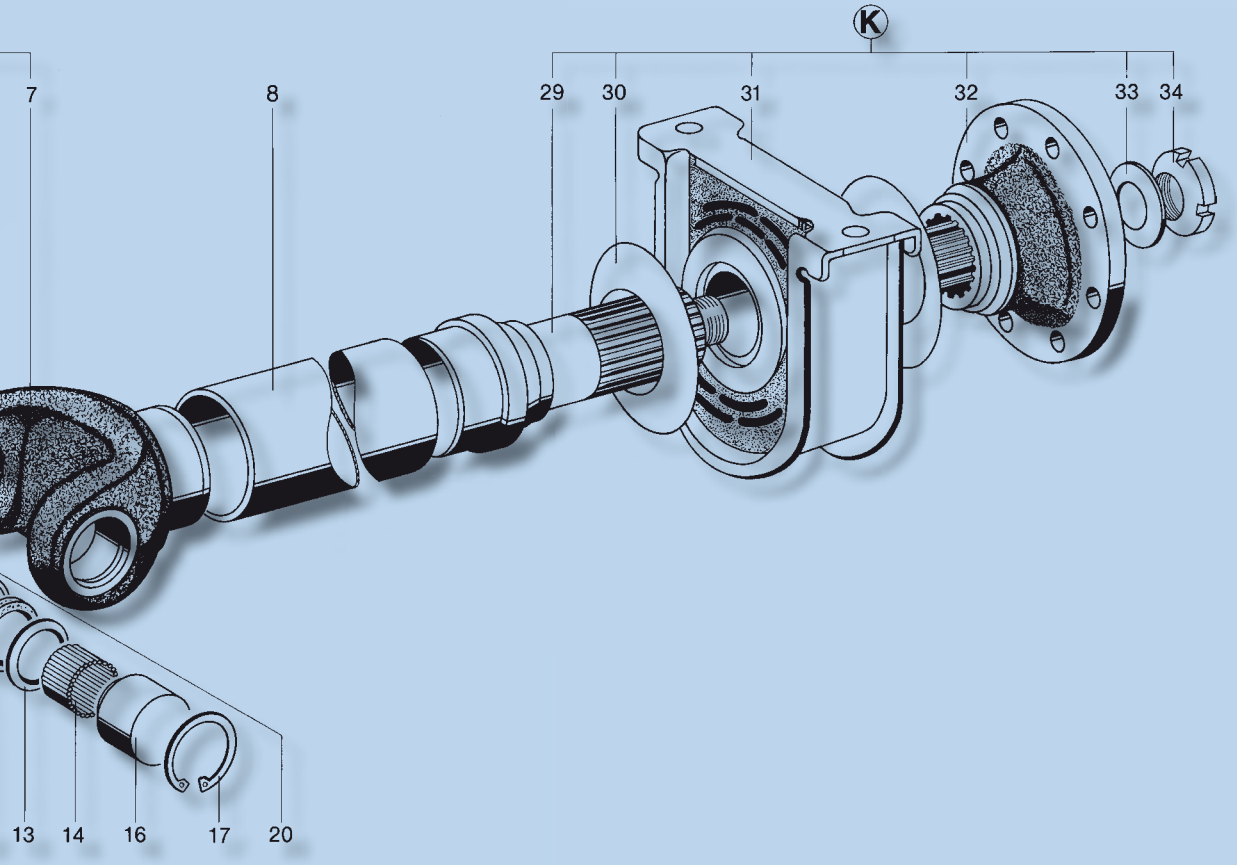
joint-size 0.109 to 0.120; catalog pages 30 to 31

Complete build up or exchange units:

A Complete cross kit, consisting of parts 9, 11–14, 16, 17 and 20
E Complete fixed joint, consisting of parts 1, 7 and A
K Intermediate shaft assembly, consisting of parts 29–34

Individual components:

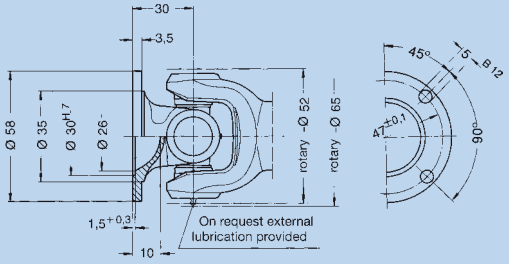
1 Fork flange
7 Weld fork
8 Connecting tube
9 Cross Units
11 Socket
12 Lip seal
13 Washer
14 Bearing rollers
17 Snap ring
20 Grease nipple, type C
29 Intermediate shaft pivot
30 Dirt shield
31 Elastic pillow block
32 Companion flange
33 Washer
34 Slotted nut



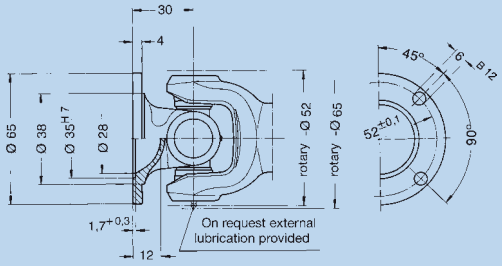
Components, Spares and Accessoires

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.

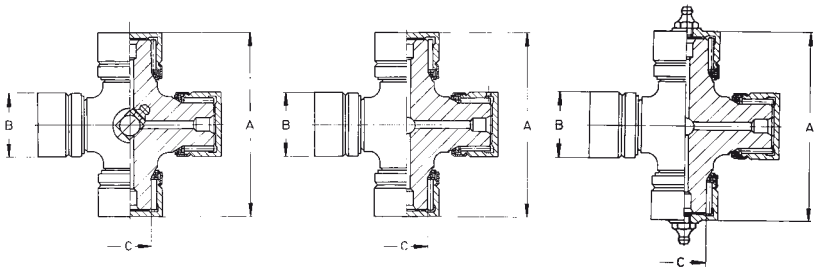


Standard flange
end number: 0.105.XX0



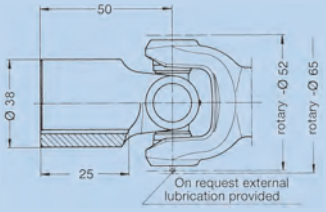
Larger flange
end number: 0.105.XX1

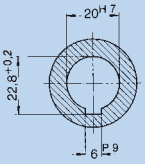
Cross Units, Needle bearing version



		Standard version Needle bearing		Lubrication for version 0.100.3XX Needle bearing		Version suitable for external lubrication Needle bearing	
Order number		**0.105.010**		**0.105.011**		**0.105.012**	
A	mm	41		41		41	
B	mm	17		17		17	
C	mm	9		9		9	
Snap rings included	mm	J 17 x 1		J 17 x 1		J 17 x 1	
Weight	kg	0,098		0,098		0,102	

One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.



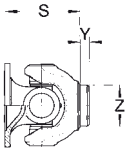


Key-way according to DIN 6885 sheet 1

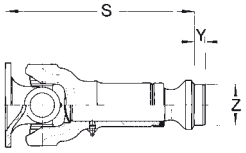
Connecting hub
without key-way end number: 0.105.XX2
with key-way end number: 0.105.XX3

ß*= Maximum angle of deflection per joint
X = Preferred extension (larger extension available up to approx. 9 x spline o. D.)

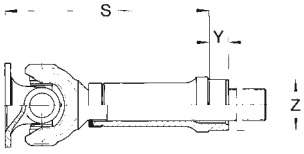
Fixed joint



Slip joint



Slip joint (sliding sleeve type)



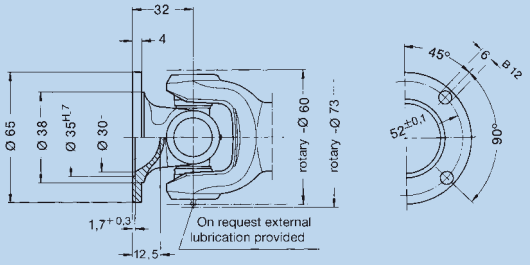
Please indicate compressed length „S", extension and required type of flange when ordering!

		Needle bearing version											
		without extension				standard extension				larger extension			
Order number		**0.105.050**	**0.105.051**	**0.105.052**	–	**0.105.060**	**0.105.061**	**0.105.062**	–	**0.105.070**	**0.105.071**	**0.105.072**	–
Angle of deflection ß*	°	30	25	30	–	30	25	30	–	30	25	30	–
Weight	kg	0,42	0,46	0,49	–	0,73	0,77	0,80	–	0,79	0,83	0,86	–
Flange-Ø	mm	58	65	Hub	–	58	65	Hub	–	58	65	Hub	–
S	mm	62	62	82	–	150	150	170	–	160	160	180	–
X	mm	–	–	–	–	25	25	25	–	40	40	40	–
Y	mm	13	13	13	–	13	13	13	–	8	8	8	–
Z	mm	25,25	25,25	25,25	–	25,25	25,25	25,25	–	25,25	25,25	25,25	–
Spline dim. DIN 5480	mm	–	–	–	–	20x1,5x12	20x1,5x12	20x1,5x12	–	20x1,5x12	20x1,5x12	20x1,5x12	–
Number of flange holes		4	4	–	–	4	4	–	–	4	4	–	–

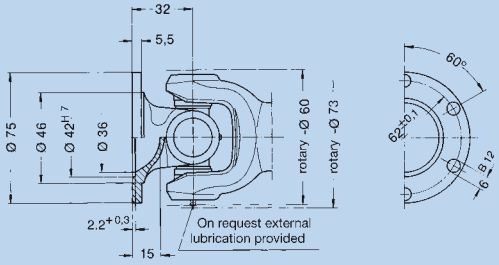
* Please refer to point 6.7 of the technical attachment.

The dimensions Z,Y and S will be changed within a product change.
Please contact us for further questions.

At utilisation of the nominal torque a verification of the flange connection is necessary.

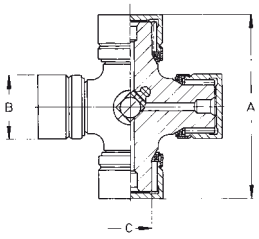


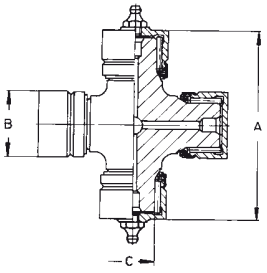
Standard flange
end number: 0.106.XX0



Larger flange
end number: 0.106.XX1

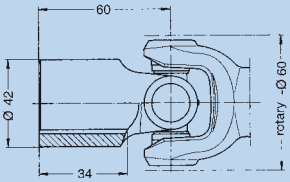
Cross Units, Needle bearing version

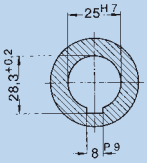




		Standard version Needle bearing			Version suitable for external lubrication Needle bearing	
Order number		**0.106.010**			**0.106.012**	
A	mm	48			48	
B	mm	19			19	
C	mm	12,7			12,7	
Snap rings included	mm	J 19 x 1			J 19 x 1	
Weight	kg	0,14			0,144	

One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.



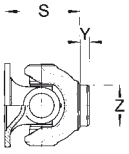


Key-way according to DIN 6885 sheet 1

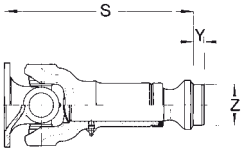
Connecting hub
without key-way end number: 0.106.XX2
with key-way end number: 0.106.XX3

ß*= Maximum angle of deflection per joint
X = Preferred extension (larger extension available up to approx. 9 x spline o. D.)

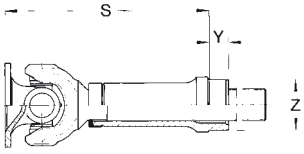
Fixed joint



Slip joint



Slip joint (sliding sleeve type)



Please indicate compressed length „S", extension and required type of flange when ordering!

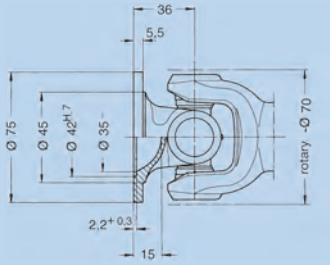
Needle bearing version

		without extension				standard extension				larger extension			
Order number		**0.106.050**	**0.106.051**	**0.106.052**	**–**	**0.106.060**	**0.106.061**	**0.106.062**	**–**	**0.106.070**	**0.106.071**	**0.106.072**	**–**
Angle of deflection ß*	°	30	20	30	–	30	20	30	–	30	20	30	–
Weight	kg	0,56	0,65	1,30	–	1,18	1,27	1,30	–	1,25	1,34	1,37	–
Flange-Ø	mm	65	75	Hub	–	65	75	Hub	–	65	75	Hub	–
S	mm	64	64	92	–	167	167	195	–	177	177	205	–
X	mm	–	–	–	–	30	30	30	–	60	60	60	–
Y	mm	13	13	13	–	13	13	13	–	9	9	9	–
Z	mm	29,25	29,25	29,25	–	29,25	29,25	29,25	–	29,25	29,25	29,25	–
Spline dim. DIN 5480	mm	–	–	–	–	25x1,5x15	25x1,5x15	25x1,5x15	–	25x1,5x15	25x1,5x15	25x1,5x15	–
Number of flange holes		4	6	–	–	4	6	–	–	4	6	–	–

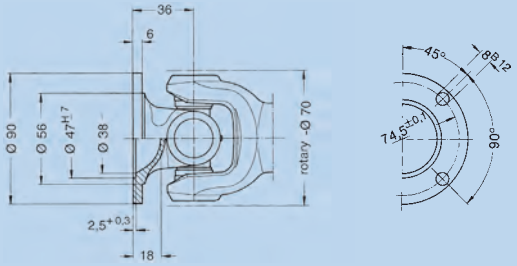
* Please refer to point 6.7 of the technical attachment.

The dimensions Z,Y and S will be changed within a product change.
Please contact us for further questions.

At utilisation of the nominal torque a verification of the flange connection is necessary.

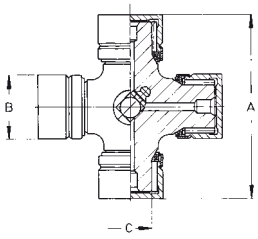


Standard flange
end number: 0.107.XX0



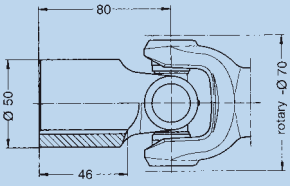
Larger flange
end number: 0.107.XX1

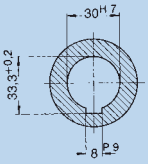
Cross Units, Needle bearing version



		Standard version Needle bearing		
Order number		**0.107.010**		
A	mm	58		
B	mm	22		
C	mm	16		
Snap rings included	mm	J 22 x 1		
Weight	kg	0,224		

One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.



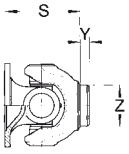


Key-way according to DIN 6885 sheet 1

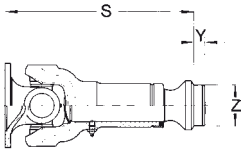
Connecting hub
without key-way end number: 0.107.XX2
with key-way end number: 0.107.XX3

ß*= Maximum angle of deflection per joint
X = Preferred extension (larger extension available up to approx. 9 x spline o. D.)

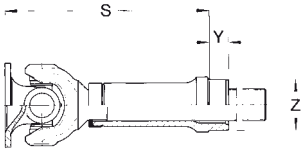
Fixed joint



Slip joint



Slip joint (sliding sleeve type)



Please indicate compressed length „S", extension and required type of flange when ordering!

Needle bearing version

		without extension				standard extension				larger extension			
Order number		**0.107.050**	**0.107.051**	**0.107.052**	–	**0.107.060**	**0.107.061**	**0.107.062**	–	**0.107.070**	**0.107.071**	**0.107.072**	–
Angle of deflection ß*	°	30	18	30	–	30	18	30	–	30	18	30	–
Weight	kg	0,91	1,06	1,25	–	1,63	1,78	1,97	–	1,98	2,13	2,32	–
Flange-Ø	mm	75	90	Hub	–	75	90	Hub	–	75	90	Hub	–
S	mm	82	82	126	–	187	187	231	–	197	197	241	–
X	mm	–	–	–	–	35	35	35	–	70	70	70	–
Y	mm	13	13	13	–	13	13	13	–	15	15	15	–
Z	mm	36,25	36,25	36,25	–	36,25	36,25	36,25	–	36,25	36,25	36,25	–
Spline dim. DIN 5480	mm	–	–	–	–	28x1,5x17	28x1,5x17	28x1,5x17	–	28x1,5x17	28x1,5x17	28x1,5x17	–
Number of flange holes		6	4	–	–	6	4	–	–	6	4	–	–

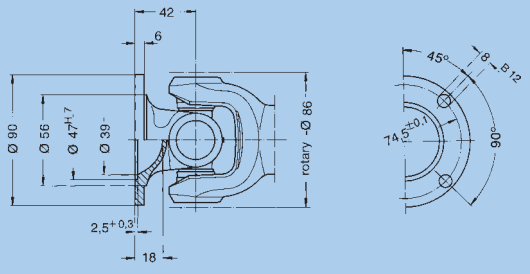
* Please refer to point 6.7 of the technical attachment.

The dimensions Z,Y and S will be changed within a product change.
Please contact us for further questions.

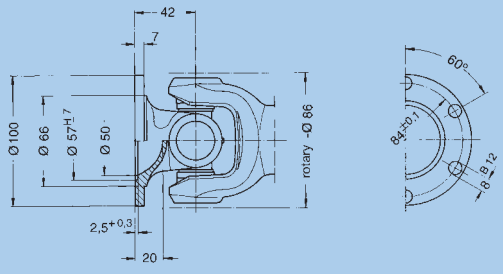
Components, Spares and Accessoires

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.

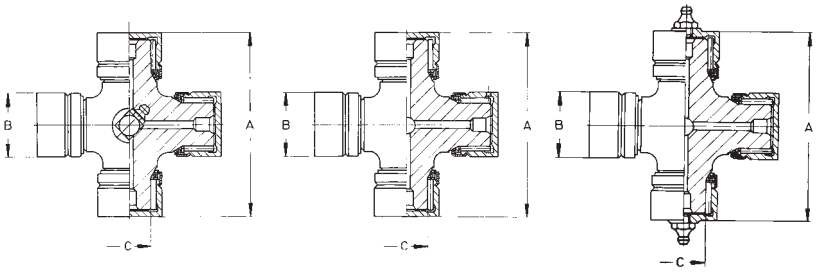


Standard flange
end number: 0.109.XX0



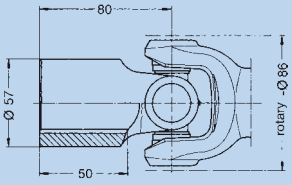
Larger flange
end number: 0.109.XX1

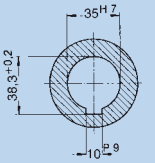
Cross Units, Needle bearing version



		Standard version Needle bearing		Lubrication for Version 0.100.3XX Needle bearing		Version suitable for external lubrication Needle bearing	
Order number		**0.109.010**		**0.109.011**		**0.109.012**	
A	mm	70,9		70,9		70,9	
B	mm	28,5		28,5		28,5	
C	mm	19,87		19,87		19,87	
Snap rings included	mm	J 29 x 1,2		J 29 x 1,2		J 29 x 1,2	
Weight	kg	0,508		0,504		0,66	

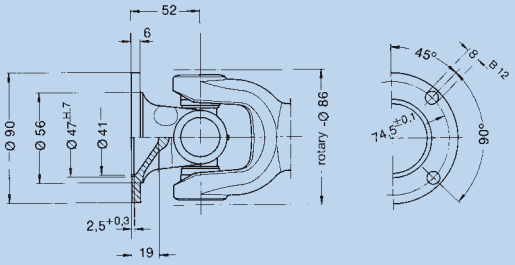
One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.





Key-way according to DIN 6885 sheet 1

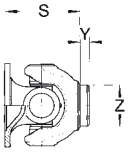
Connecting hub
without key-way end number: 0.109.XX2
with key-way end number: 0.109.XX3



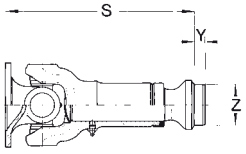
Flange for larger deflection
end number: 0.109.XX5

ß*= Maximum angle of deflection per joint
X = Preferred extension (larger extension available up to approx. 9 x spline o. D.)

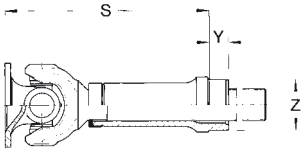
Fixed joint



Slip joint



Slip joint (sliding sleeve type)



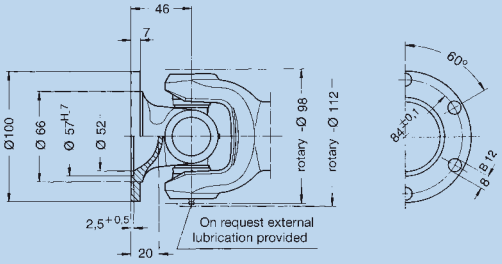
Please indicate compressed length „S", extension and required type of flange when ordering!

		Needle bearing version											
		without extension				standard extension				larger extension			
Order number		**0.109.050**	**0.109.051**	**0.109.052**	**0.109.055**	**0.109.060**	**0.109.061**	**0.109.062**	**0.109.065**	**0.109.070**	**0.109.071**	**0.109.072**	**0.109.075**
Angle of deflection ß*	°	20	18	20	35	20	18	20	35	20	18	20	35
Weight	kg	1,82	1,93	2,21	1,90	3,01	3,12	3,40	3,12	3,39	3,50	3,78	3,61
Flange-Ø	mm	90	100	Hub	90	90	100	Hub	90	90	100	Hub	90
S	mm	90	90	128	100	225	225	263	242	222	222	260	241
X	mm	–	–	–	–	40	40	40	40	80	80	80	80
Y	mm	14	14	14	14	15	15	15	15	18	18	18	18
Z	mm	46,25	46,25	46,25	46,25	46,25	46,25	46,25	46,25	46,25	46,25	46,25	46,25
Spline dim. DIN 5480	mm	–	–	–	–	32x2x14	32x2x14	32x2x14	32x2x14	32x2x14	32x2x14	32x2x14	32x2x14
Number of flange holes		4	6	–	4	4	6	–	4	4	6	–	4

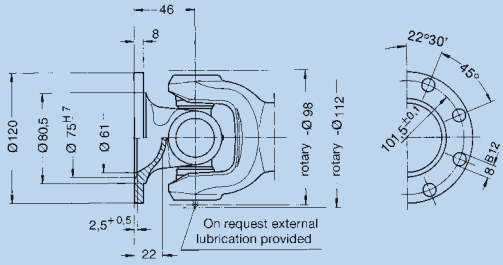
* Please refer to point 6.7 of the technical attachment.

The dimensions Z,Y and S will be changed within a product change.
Please contact us for further questions.

At utilisation of the nominal torque a verification of the flange connection is necessary.

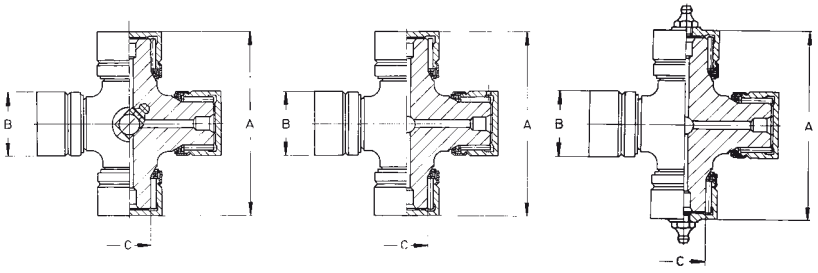


Standard flange
end number: 0.110.XX0



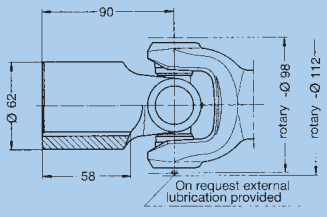
Larger flange
end number: 0.110.XX1

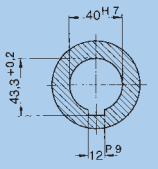
Cross Units, Roller bearing version



		Standard version Roller bearing		Lubrication for version 0.100.3XX Roller bearing		Version suitable for external lubrication Roller bearing	
Order number		**0.110.015**		**0.110.017**		**0.110.016**	
A	mm	83		83		83	
B	mm	30		30		30	
C	mm	20,02		20,02		20,02	
Snap rings included	mm	J 30 x 1,2		J 30 x 1,2		J 30 x 1,2	
Weight	kg	0,66		0,65		0,66	

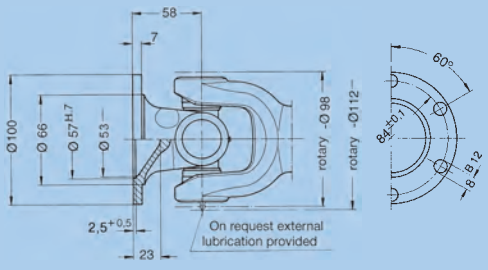
One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.





Key-way according to DIN 6885 sheet 1

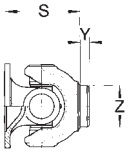
Connecting hub
without key-way end number: 0.110.XX2
with key-way end number: 0.110.XX3



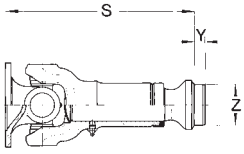
Flange for larger deflection
end number: 0.110.XX5

ß*= Maximum angle of deflection per joint
X = Preferred extension (larger extension available up to approx. 9 x spline o. D.)

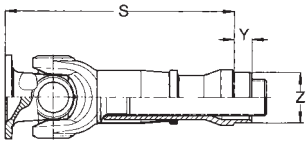
Fixed joint



Slip joint



Slip joint (sliding sleeve type)



Please indicate compressed length „S", extension and required type of flange when ordering!

		Roller bearing version											
		without extension				standard extension				larger extension			
Order number		**0.110.050**	**0.110.051**	**0.110.052**	**0.110.055**	**0.110.060**	**0.110.061**	**0.110.062**	**0.110.065**	**0.110.070**	**0.110.071**	**0.110.072**	**0.110.075**
Angle of deflection ß*	°	20	18	20	35	20	18	20	35	20	18	20	35
Weight	kg	2,38	2,60	2,75	2,45	3,83	4,06	4,20	4,01	4,70	4,92	5,07	4,77
Flange-Ø	mm	100	120	Hub	100	100	120	Hub	100	100	120	Hub	100
S	mm	105	105	149	117	237	237	281	256	244	244	288	256
X	mm	–	–	–	–	40	40	40	40	95	95	95	95
Y	mm	15	15	15	15	15	15	15	15	18	18	18	18
Z	mm	44,25	44,25	44,25	44,25	44,25	44,25	44,25	44,25	44,25	44,25	44,25	44,25
Spline dim. DIN 5480	mm	–	–	–	–	35x2x16	35x2x16	35x2x16	35x2x16	35x2x16	35x2x16	35x2x16	35x2x16
Number of flange holes		6	8	–	6	6	8	–	6	6	8	–	6

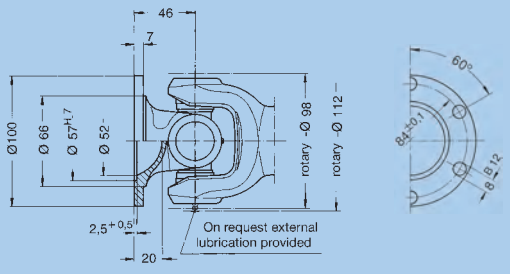
* Please refer to point 6.7 of the technical attachment.

The dimensions Z,Y and S will be changed within a product change.
Please contact us for further questions.

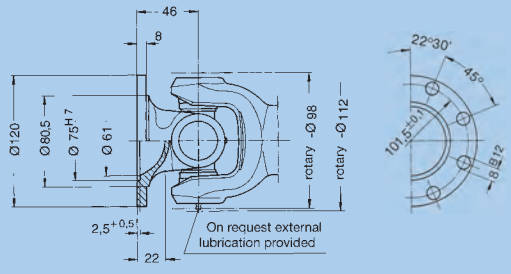
Components, Spares and Accessoires

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.

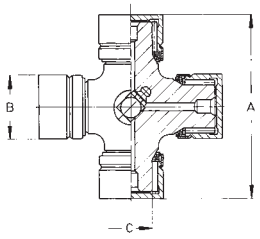


On both sides standard flange
end number: 0.111.XX0

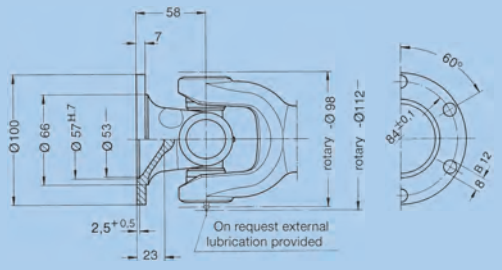


On both sides larger flange
end number: 0.111.XX1

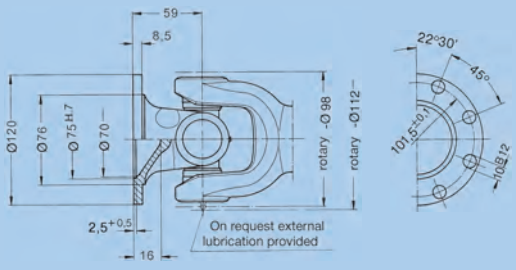
Cross Units, Roller bearing version



		Standard version Roller bearing	
Order number		**0.110.015**	
A	mm	83	
B	mm	30	
C	mm	20	
Snap rings included	mm	J 30 x 1,2	
Weight	kg	0,63	



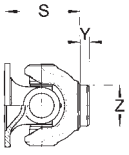
On both sides flange for larger angle deflection
end number: 0.111.XX5



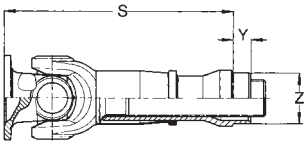
On both sides larger flange for larger angle deflection
end number: 0.111.XX6

ß*= Maximum angle of deflection per joint
X = Preferred extension (larger extension available up to approx. 9 x spline o. D.)

Fixed joint



Slip joint (sliding sleeve type)



Please indicate compressed length „S", extension and required type of flange when ordering!

Roller bearing version

		without extension				larger extension			
Order number		**0.111.050**	**0.111.051**	**0.111.055**	**0.111.056**	**0.111.070**	**0.111.071**	**0.111.075**	**0.111.076**
Angle of deflection ß*	°	20	18	35	35	20	18	35	35
Weight	kg	2,55	2,77	2,64	2,92	5,83/5,28	6,05/5,50	5,92/5,37	6,20/5,66
Flange-Ø	mm	100	120	100	120	100	120	100	120
S	mm	106	106	118	119	280	292	288	293
X	mm	–	–	–	–	120/70	120/70	120/70	120/70
Y	mm	10	10	10	10	10	10	10	10
Z	mm	70,85	70,85	70,85	70,85	70,85	70,85	70,85	70,85
Spline dim. DIN 5480	mm	–	–	–	–	42x1,75x22	42x1,75x22	42x1,75x22	42x1,75x22
Number of flange holes		6	8	6	8	6	8	6	8

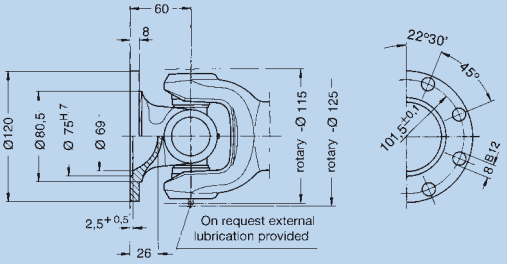
* Please refer to point 6.7 of the technical attachment.

The dimensions Z,Y and S will be changed within a product change.
Please contact us for further questions.

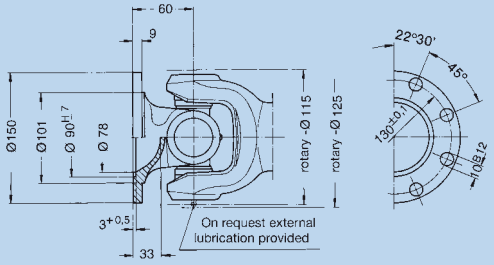
Components, Spares and Accessoires

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.

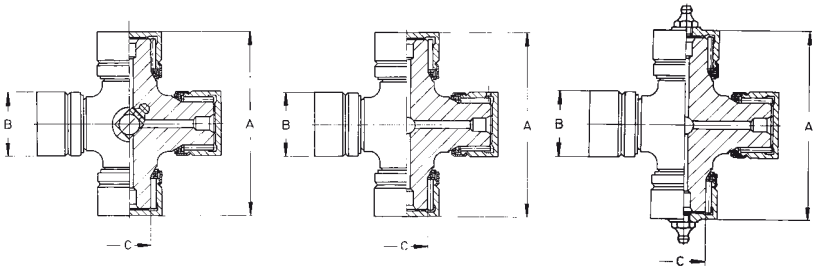


Standard flange
end number: 0.112.XX0



Larger flange
end number: 0.112.XX1

Cross Units

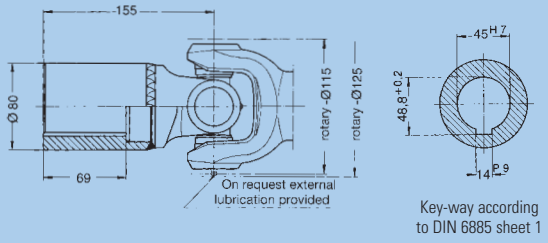


		Needle bearing version					
		Standard version Needle bearing		Lubrication for version 0.100.3XX Needle bearing		Version suitable for external lubrication Needle bearing	
Order number		**0.112.010**		**0.112.011**		**0.112.012**	
A	mm	97		97		97	
B	mm	35		35		35	
C	mm	23,04		23,04		23,04	
Snap rings included	mm	J 35 x 1,5		J 35 x 1,5		J 35 x 1,5	
Weight	kg	1,03		1,02		1,03	

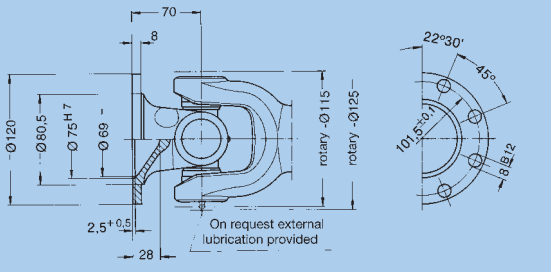
		Roller bearing version					
		Standard version Roller bearing		Lubrication for version 0.100.3XX Roller bearing		Version suitable for external lubrication Roller bearing	
Order number		**0.112.015**		**0.112.017**		**0.112.016**	
A	mm	97		97		97	
B	mm	35		35		35	
C	mm	24,8		24,8		24,8	
Snap rings included	mm	J 35 x 1,5		J 35 x 1,5		J 35 x 1,5	
Weight	kg	1,06		1,05		1,06	

Size 0.112 | Md_{Nom} 3350 Nm | Md_{Lim} 4350 Nm

One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.



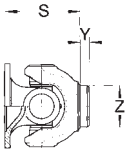
Connecting hub
without key-way end number: 0.112.XX2
with key-way end number: 0.112.XX3



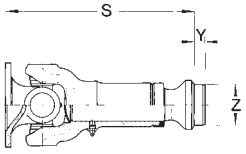
Flange for larger angle of deflection
end number: 0.112.XX5

ß*= Maximum angle of deflection per joint
X = Preferred extension (larger extension available up to approx. 9 x spline o. D.)

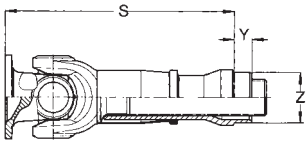
Fixed joint



Slip joint



Slip joint (sliding sleeve type)



Please indicate compressed length „S", extension and required type of flange when ordering!

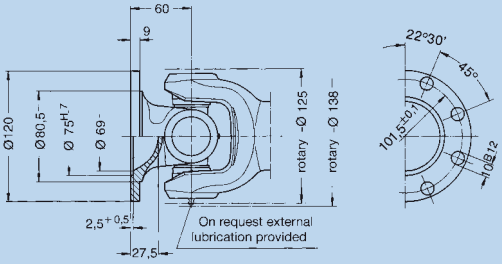
		Needle resp. Roller bearing version											
		without extension				standard extension				larger extension			
Order number		**0.112.050**	**0.112.051**	**0.112.052**	**0.112.055**	**0.112.060**	**0.112.061**	**0.112.062**	**0.112.065**	**0.112.070**	**0.112.071**	**0.112.072**	**0.112.075**
Angle of deflection ß*	°	20	18	20	35	20	18	20	35	20	18	20	35
Weight	kg	3,80	4,48	6,09	3,93	6,63	7,31	8,92	6,73	7,26	7,94	9,55	7,94
Flange-Ø	mm	120	150	Nabe	120	120	150	Nabe	120	120	150	Nabe	120
S	mm	135	135	220	145	306	306	401	330	318	318	413	335
X	mm	–	–	–	–	60	60	60	60	120	120	120	120
Y	mm	10	10	10	10	10	10	10	10	10	10	10	10
Z	mm	51,85	51,85	51,85	51,85	51,85	51,85	51,85	51,85	51,85	51,85	51,85	51,85
Spline dim. DIN 5480	mm	–	–	–	–	42x2x20	42x2x20	42x2x20	42x2x20	42x2x20	42x2x20	42x2x20	42x2x20
Number of flange holes		8	8	–	8	8	8	–	8	8	8	–	8

* Please refer to point 6.7 of the technical attachment.

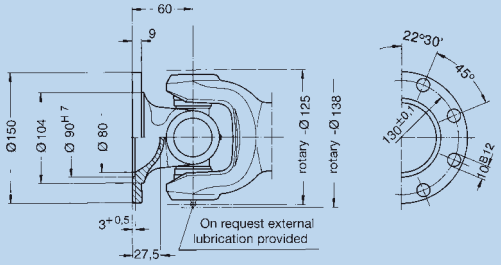
The dimensions Z,Y and S will be changed within a product change.
Please contact us for further questions.

Components, Spares and Accessoires | Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.

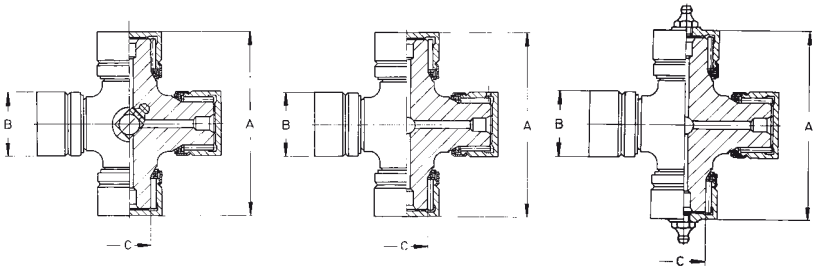


Standard flange
end number: 0.113.XX0



Larger flange
end number: 0.113.XX1

Cross Units

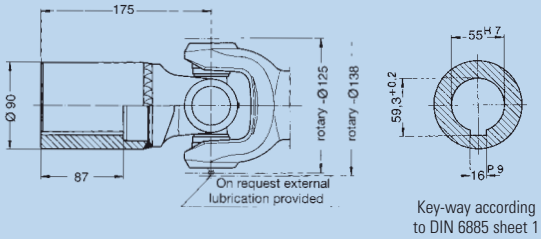


		Needle bearing version					
		Standard version Needle bearing		Lubrication for version 0.100.3XX Needle bearing		Version suitable for external lubrication Needle bearing	
Order number		**0.113.010**		**0.113.011**		**0.113.012**	
A	mm	106		106		106	
B	mm	38		38		38	
C	mm	26,28		26,28		26,28	
Snap rings included	mm	J 38 x 1,5		J 38 x 1,5		J 38 x 1,5	
Weight	kg	1,32		1,32		1,33	

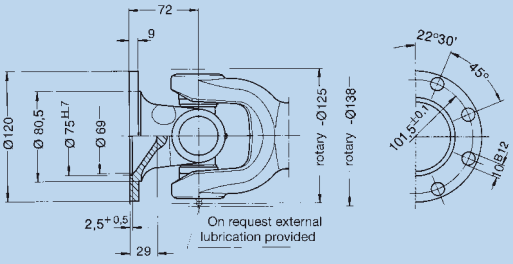
		Roller bearing version					
		Standard version Roller bearing				Version suitable for external lubrication Roller bearing	
Order number		**0.113.015**				**0.113.016**	
A	mm	106				106	
B	mm	38				38	
C	mm	25,7				25,7	
Snap rings included	mm	J 38 x 1,5				J 38 x 1,5	
Weight	kg	1,25				1,34	

Size 0.113 | Md_{Nom} 4100 Nm | Md_{Lim} 5350 Nm

One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.



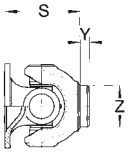
Connecting hub
without key-way end number: 0.113.XX2
with key-way end number: 0.113.XX3



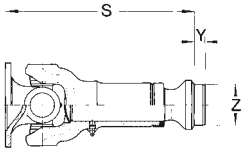
Flange for larger angle of deflection
end number: 0.113.XX5

ß*= Maximum angle of deflection per joint
X = Preferred extension (larger extension available up to approx. 9 x spline o. D.)

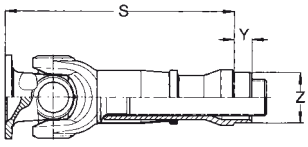
Fixed joint



Slip joint



Slip joint (sliding sleeve type)



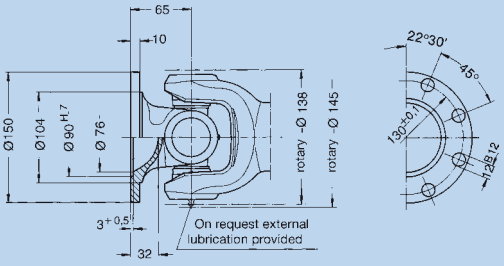
Please indicate compressed length „S", extension and required type of flange when ordering!

		Needle resp. Roller bearing version											
		without extension				standard extension				larger extension			
Order number		**0.113.050**	**0.113.051**	**0.113.052**	**0.113.055**	**0.113.060**	**0.113.061**	**0.113.062**	**0.113.065**	**0.113.070**	**0.113.071**	**0.113.072**	**0.113.075**
Angle of deflection ß*	°	20	18	20	35	20	18	20	35	20	18	20	35
Weight	kg	4,52	5,20	7,63	4,85	8,85	9,53	11,96	9,40	10,24	10,92	13,35	10,57
Flange-Ø	mm	120	150	Hub	120	120	150	Hub	120	120	150	Hub	120
S	mm	128	128	243	140	318	318	433	343	320	320	435	332
X	mm	–	–	–	–	60	60	60	60	130	130	130	130
Y	mm	20	20	20	20	22	22	22	22	22	22	22	22
Z	mm	62,25	62,25	62,25	62,25	62,25	62,25	62,25	62,25	62,25	62,25	62,25	62,25
Spline dim. DIN 5480	mm	–	–	–	–	50x2x24	50x2x24	50x2x24	50x2x24	50x2x24	50x2x24	50x2x24	50x2x24
Number of flange holes		8	8	–	8	8	8	–	8	8	8	–	8

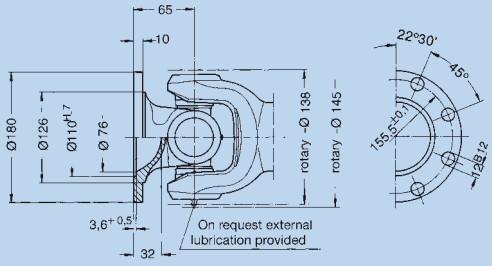
* Please refer to point 6.7 of the technical attachment.

The dimensions Z,Y and S will be changed within a product change.
Please contact us for further questions.

At utilisation of the nominal torque a verification of the flange connection is necessary.

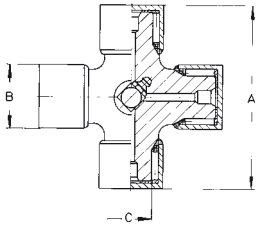


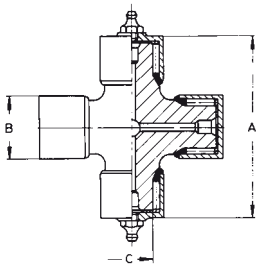
Standard flange
end number: 0.148.XX0



Larger flange
end number: 0.148.XX1

Cross Units, Roller bearing version

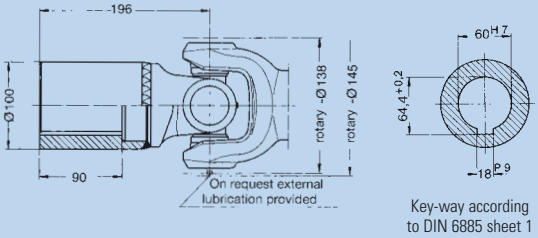




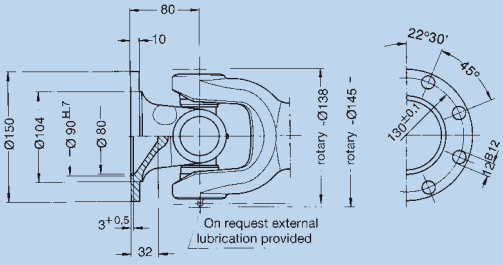
		Standard version Roller bearing			Version suitable for external lubrication Roller bearing	
Order number		**0.148.015**			**0.148.016**	
A	mm	117,5			117,5	
B	mm	42			42	
C	mm	27,8			27,8	
Snap rings included	mm	J 42 x 1,75			J 42 x 1,75	
Weight	kg	1,69			1,7	

Size 0.148 | Md_{Nom} 5500 Nm | Md_{Lim} 7050 Nm

One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.



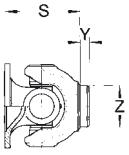
Connecting hub
without key-way end number: 0.148.XX2
with key-way end number: 0.148.XX3



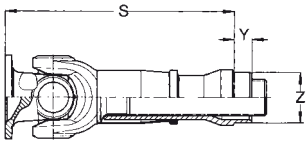
Flange for larger angle of deflection
end number: 0.148.XX5

ß*= Maximum angle of deflection per joint
X = Preferred extension (larger extension available up to approx. 9 x spline o. D.)

Fixed joint



Slip joint (sliding sleeve type)



Please indicate compressed length „S", extension and required type of flange when ordering!

		Roller bearing version							
		without extension				larger extension			
Order number		**0.148.050**	**0.148.051**	**0.148.052**	**0.148.055**	**0.148.070**	**0.148.071**	**0.148.072**	**0.148.075**
Angle of deflection ß*	°	20	20	35	35	20	20	20	35
Weight	kg	7,06	7,71	11,51	7,72	13,23	13,88	17,68	13,89
Flange-Ø	mm	150	180	Hub	120/150	150	180	Hub	120/150
S	mm	145	145	276	160	328	328	459	343
X	mm	–	–	–	–	110	110	110	110
Y	mm	25	25	25	25	25	25	25	25
Z	mm	72,25	72,25	72,25	72,25	72,25	72,25	72,25	72,25
Spline dim. DIN 5480	mm	–	–	–	–	55x2,5x20	55x2,5x20	55x2,5x20	55x2,5x20
Number of flange holes		8	8	–	8	8	8	–	8

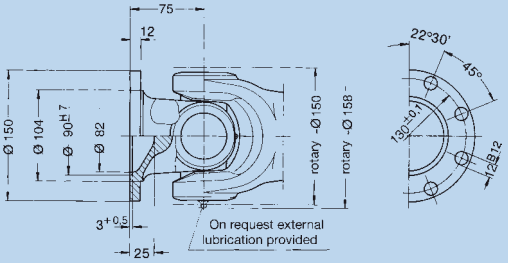
* Please refer to point 6.7 of the technical attachment.

The dimensions Z,Y and S will be changed within a product change.
Please contact us for further questions.

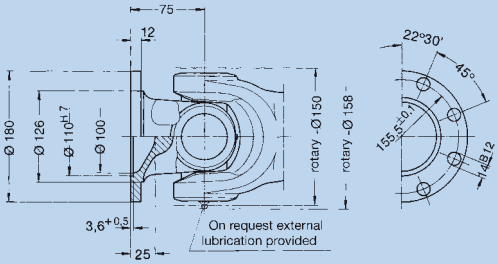
Components, Spares and Accessoires

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.

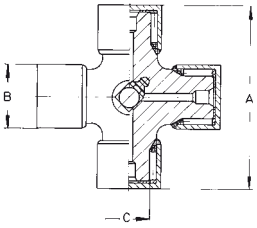


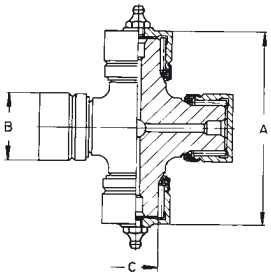
Standard flange
end number: 0.158.XX0



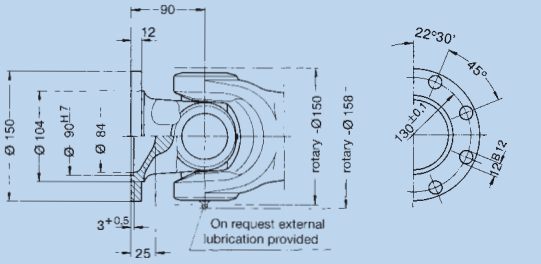
Larger flange
end number: 0.158.XX1

Cross Units, Roller bearing version

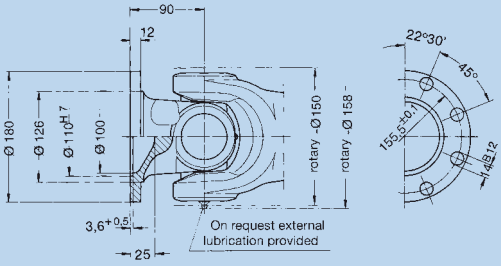




		Standard version Roller bearing			Version suitable for external lubrication Roller bearing	
Order number		**0.158.015**			**0.158.016**	
A	mm	126			126	
B	mm	48			48	
C	mm	33,15			33,15	
Snap rings included	mm	J 48 x 1,75			J 48 x 1,75	
Weight	kg	2,28			2,29	



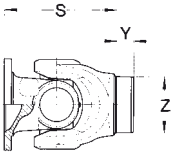
Flange for larger deflection
end number: 0.158.XX5



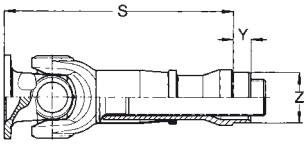
Larger flange for larger deflection
end number: 0.158.XX6

ß*= Maximum angle of deflection per joint
X = Preferred extension (larger extension available up to approx. 9 x spline o. D.)

Fixed joint



Slip joint (sliding sleeve type)



Please indicate compressed length „S", extension and required type of flange when ordering!

		Roller bearing version							
		without extension				larger extension			
Order number		**0.158.050**	**0.158.051**	**0.158.055**	**0.158.056**	**0.158.070**	**0.158.071**	**0.158.075**	**0.158.076**
Angle of deflection ß*	°	20	20	35	35	20	20	35	35
Weight	kg	10,12	10,90	10,55	11,36	20,78	21,56	21,21	22,02
Flange-Ø	mm	150	180	150	180	150	180	150	180
S	mm	185	185	200	200	475	475	490	490
X	mm	–	–	–	–	110	110	110	110
Y	mm	22	22	22	22	25	25	25	25
Z	mm	82,25	82,25	82,25	82,25	82,25	82,25	82,25	82,25
Spline dim. DIN 5480	mm	–	–	–	–	60x2,5x22	60x2,5x22	60x2,5x22	60x2,5x22
Number of flange holes		8	8	8	8	8	8	8	8

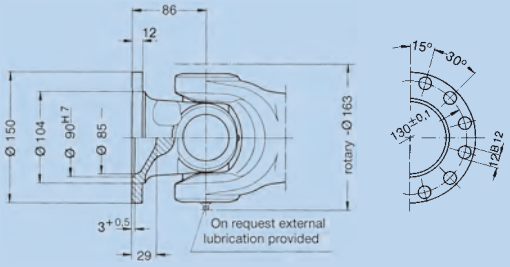
* Please refer to point 6.7 of the technical attachment.

The dimensions Z,Y and S will be changed within a product change.
Please contact us for further questions.

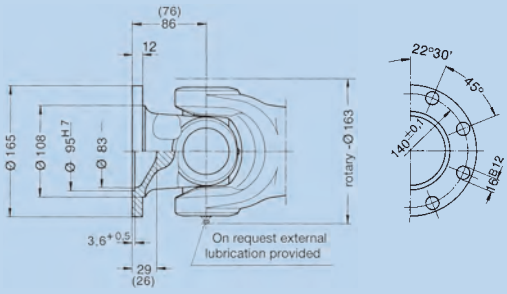
Components, Spares and Accessoires

Series 0.100

At utilisation of the nominal torque a verification of the flange connection is necessary.



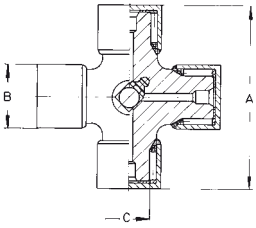
On both sides standard flange
end number: 0.117.XX0

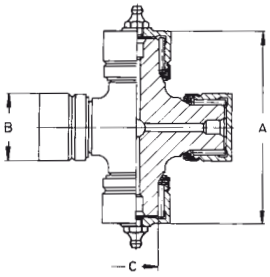


On both sides larger flange (Ø 165 mm)
end number: 0.117.XX1

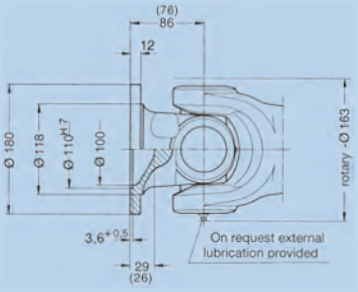
Dimensions in brackets are only valid for short type I

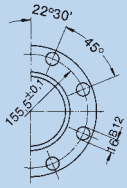
Cross Units, Roller bearing version





		Standard version Roller bearing			Version suitable for external lubrication Roller bearing	
Order number		**0.117.015**			**0.117.016**	
A	mm	135			135	
B	mm	53			53	
C	mm	37,34			37,34	
Snap rings included	mm	J 53 x 2			J 53 x 2	
Weight	kg	3,26			3,28	



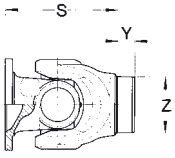


On both sides larger flange (Ø 180 mm) end number: 0.117.XX1

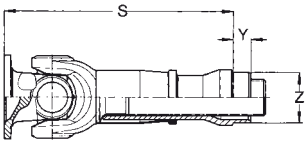
Dimensions in brackets are only valid for short type I

ß*= Maximum angle of deflection per joint
X = Preferred extension (larger extension available up to approx. 9 x spline o. D.)

Fixed joint



Slip joint (sliding sleeve type)



Please indicate compressed length „S", extension and required type of flange when ordering!

		Roller bearing version							
		without extension				larger extension			
Order number		**0.117.050**	**0.117.051**	**0.117.051**	–	**0.117.070**	**0.117.071**	**0.117.071**	–
Angle of deflection ß*	°	30	30	30	–	30	30	30	–
Weight	kg	12,29	12,52	13,06	–	21,99	22,13	22,75	–
Flange-Ø	mm	150	165	180	–	150	165	180	–
S	mm	184	184	184	–	412/(457)	412/(457)	412/(457)	–
X	mm	–	–	–	–	110	110	110	–
Y	mm	28	28	28	–	30	30	30	–
Z	mm	90,25	90,25	90,25	–	90,25	90,25	90,25	–
Spline dim. DIN 5480	mm	–	–	–	–	65x2,5x24	65x2,5x24	65x2,5x24	–
Number of flange holes		12	8	8	–	12	8	8	–

* Please refer to point 6.7 of the technical attachment.

The dimensions Z,Y and S will be changed within a product change.
Please contact us for further questions.

■ Service Phone North America ■ +1 – 269/6377999
■ Service Phone Europe ■ +49 (0) 71 42 / 353-0
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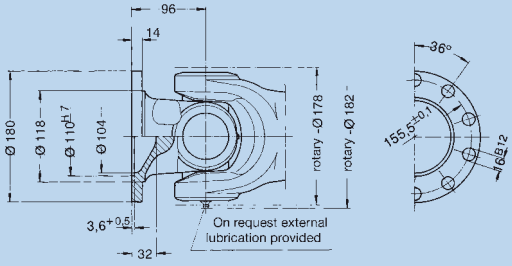
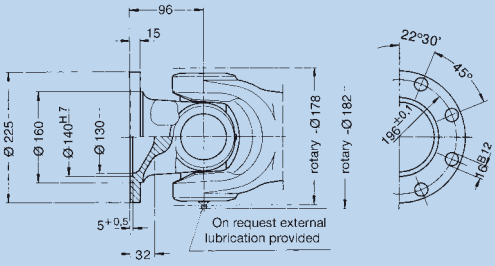
At utilisation of the nominal torque a verification of the flange connection is necessary.

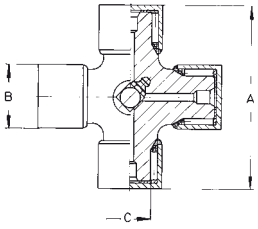


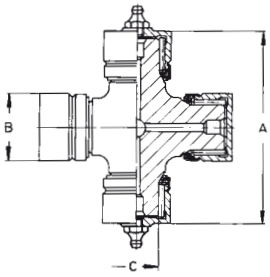
Standard flange
end number: 0.120.XX0



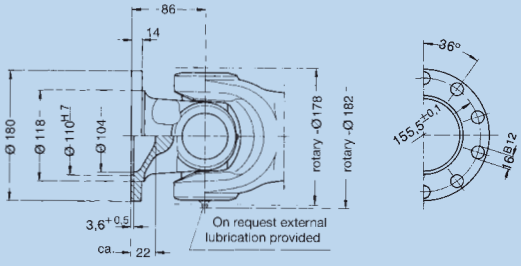
Larger flange
end number: 0.120.XX1

Cross Units, Roller bearing version





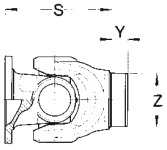
		Standard version Roller bearing			Version suitable for external lubrication Roller bearing	
Order number		**0.120.015**			**0.120.016**	
A	mm	152			152	
B	mm	57			57	
C	mm	40,9			40,9	
Snap rings included	mm	J 57 x 2			J 57 x 2	
Weight	kg	4,19			4,21	



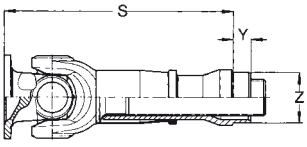
Shorter flange to short type I

ß*= Maximum angle of deflection per joint
X = Preferred extension (larger extension available up to approx. 9 x spline o. D.)

Fixed joint



Slip joint (sliding sleeve type)



Please indicate compressed length „S", extension and required type of flange when ordering!

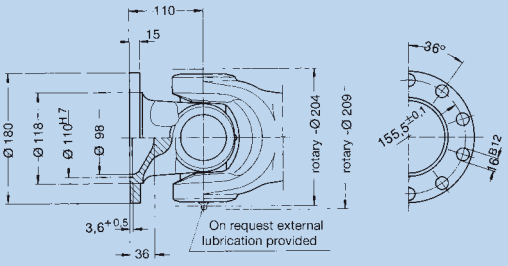
Roller bearing version

		without extension				larger extension			
Order number		**0.120.050**	**0.120.051**	–	–	**0.120.070**	**0.120.071**	–	–
Angle of deflection ß*	°	30	30	–	–	30	30	–	–
Weight	kg	16,47	18,54	–	–	30,88	32,95	–	–
Flange-Ø	mm	180	225	–	–	180	225	–	–
S	mm	201	201	–	–	448/(486)	448/(486)	–	–
X	mm	–	–	–	–	110	110	–	–
Y	mm	30	30	–	–	30	30	–	–
Z	mm	98,25	98,25	–	–	98,25	98,25	–	–
Spline dim. DIN 5480	mm	–	–	–	–	75x2,5x28	75x2,5x28	–	–
Number of flange holes		10	8	–	–	10	8	–	–

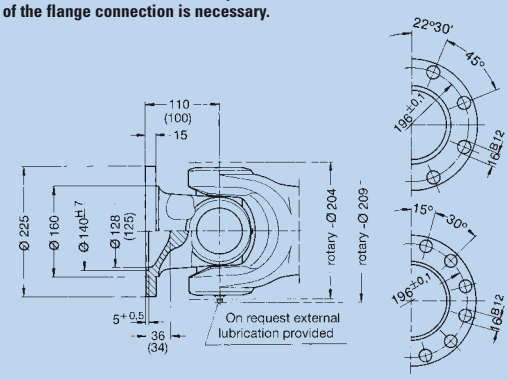
* Please refer to point 6.7 of the technical attachment.

The dimensions Z,Y and S will be changed within a product change.
Please contact us for further questions.

At utilisation of the nominal torque a verification of the flange connection is necessary.



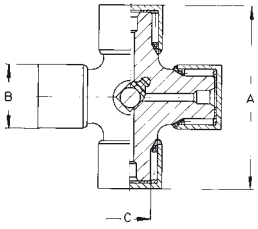
Standard flange
end number: 0.122.XX0

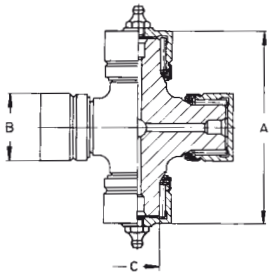


Larger flange (Ø 225 mm)
end number: 0.122.XX1

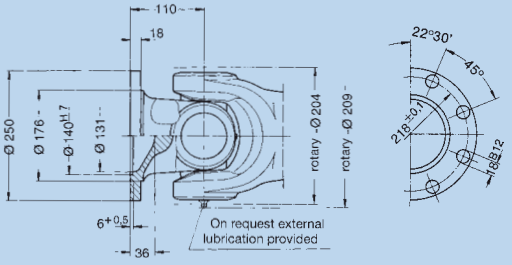
Dimensions in brackets are only valid for short type I

Cross Units, Roller bearing version





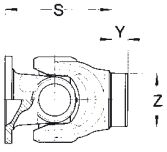
		Standard version Roller bearing			Version suitable for external lubrication Roller bearing	
Order number		**0.122.015**			**0.122.016**	
A	mm	172			172	
B	mm	65			65	
C	mm	47,7			47,7	
Snap rings included	mm	J 65 x 2,5			J 65 x 2,5	
Weight	kg	6,15			6,17	



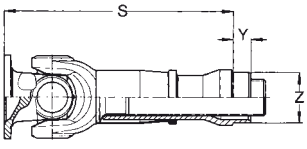
Larger flange (Ø 250 mm)
end number: 0.122.XX1

ß*= Maximum angle of deflection per joint
X = Preferred extension (larger extension available up to approx. 9 x spline o. D.)

Fixed joint



Slip joint (sliding sleeve type)

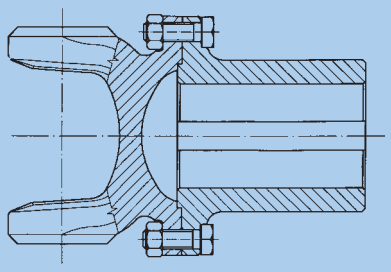


Please indicate compressed length „S", extension and required type of flange when ordering!

		Roller bearing version							
		without extension				larger extension			
Order number		**0.122.050**	**0.122.051**	**0.122.051**	**0.122.051**	**0.122.070**	**0.122.071**	**0.122.071**	**0.122.071**
Angle of deflection ß*	°	30	30	30	25	30	30	30	25
Weight	kg	22,26	24,70	24,65	26,32	47,95	50,39	50,34	52,00
Flange-Ø	mm	180	225	225	250	180	225	225	250
S	mm	225	225	225	225	496	496	496	496
X	mm	–	–	–	–	140	140	140	140
Y	mm	30	30	30	30	28	28	28	28
Z	mm	108,25	108,25	108,25	108,25	108,25	108,25	108,25	108,25
Spline dim. DIN 5480	mm	–	–	–	–	90x2,5x34	90x2,5x34	90x2,5x34	90x2,5x34
Number of flange holes		10	8	12	8	10	8	12	8

* Please refer to point 6.7 of the technical attachment.

The dimensions Z,Y and S will be changed within a product change.
Please contact us for further questions.



The tightening torques listed in the table are maximum values which are based on the combined stress from tension and torsion to reach 90 % of the minimum yield value. They are only valid for normal surface finishes and when slight lubrication is applied to the thread and contact surfaces of bolt heads and nuts. If threads have received special treatment, tightening torques must be reduced accordingly. To achieve maximum friction, flange faces should be clean, free of lubrication and the surface finish should not exceed 25 µm.

Bolts are normally inserted from the companion flange side and turned diameter „C" serves as a bolt head lock. Only on certain Universal Joint sizes can the bolts be inserted from the Universal Joint side without any reworking.

When encountering distinct reversing operation, it is advisable to reinforce the bolts with adapter sleeves or to employ serrated flanges.

The indicated numbers per Kit refer to a drive shaft having 2 flanges.

Flange bolt Kit

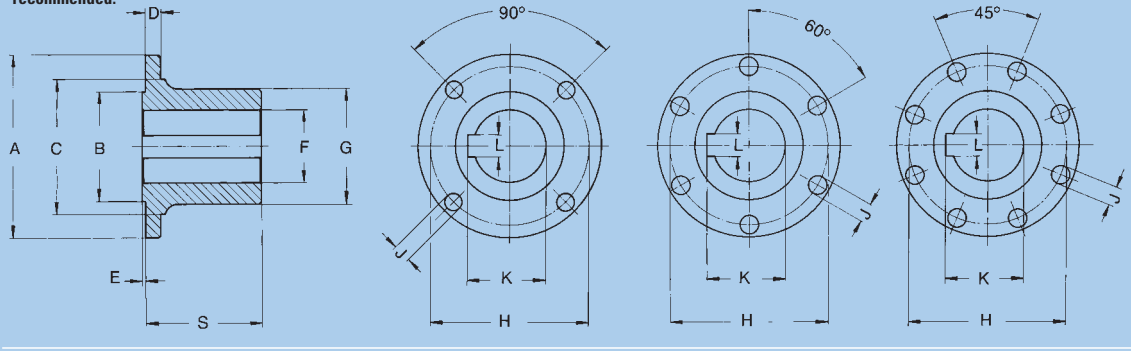
Order number		0.105.192.001	0.106.192.001	0.107.192.001	0.109.192.001	0.110.192.001	0.112.192.001	0.113.192.001	0.148.192.001	0.158.192.001	0.117.192.001
for joint size		105	105/106	106/107	107/109	109/110	110/112	112/113	148	158	117
Flange-Ø A	mm	58	65	75	90	100	120	120/150	150/180	150/180	150
Hexagon head bolts DIN EN ISO 4014-10.9	mm	M5 x 14	M6 x 18	M6 x 18	M8 x 24	M8 x 24	M8 x 26	M10 x 30	M12 x 35	M12 x 40	M12 x 40
Number per Kit		8	8	12	8	12	16	16	16	16	24
Hexagon head bolts DIN EN ISO 7042-10	mm	M5	M6	M6	M8	M8	M8	M10	M12	M12	M12
Number per Kit		8	8	12	8	12	16	16	16	16	24
Tightening torque	Nm	8,5	14	14	35	35	35	69	120	120	120

Order number		0.117.192.002	0.117.192.003	0.120.192.001	0.120.192.002	0.122.192.002	0.122.192.003
for joint size		117	158/117	120/122	120/122	120/122	122
Flange-Ø A	mm	165/180	165/180	180	180/225	225	250
Hexagon head bolts DIN EN ISO 4014-10.9	mm	M16 x 45	M14 x 42	M16 x 50	M16 x 50	M16 x 50	M18 x 60
Number per Kit		16	16	20	16	24	16
Hexagon head bolts DIN EN ISO 7042-10	mm	M16	M14	M16	M16	M16	M18
Number per Kit		16	16	20	16	24	16
Tightening torque	Nm	295	190	295	295	295	450

Flange with cross serration

Order number		0.112.192.003	0.158.192.005	0.117.192.008
for joint size		111/112/113/148	158/117	117/120/122
Flange-Ø A	mm	120	150	180
Hexagon head bolts DIN EN ISO 4014-8.8	mm	M10 x 40	M12 x 40	M14 x 45
Number per Kit		8	8	8
Hexagon head bolts DIN EN ISO 7042-10	mm	M10	M12	M14
Number per Kit		8	8	8
Tightening torque	Nm	46	79	125

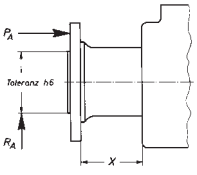
One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.



Companion Flanges

Order number		1.105.240	1.106.240	1.107.240	1.109.240	1.110.240	1.112.240	1.113.240	1.148.240	1.148.240	1.148.240	1.158.240	1.158.240
for joint size	Nm	**0.105**	**0.106**/0.105	**0.107**/0.106	**0.109**/0.107	**0.110**/0.109	**0.112**/0.110	**0.113**	**0.113**	**0.148**	**0.148**	**0.158**	**0.158**
A	mm	58	65	75	90	100	120	120	150	150	180	150	180
B_{h6}	mm	30	35	42	47	57	75	75	90	90	110	90	110
$C_{-0,2}$	mm	38,8	41,8	51,8	61,2	70,7	88,2	84,1	112,6	110,6	136,0	110,6	133
D	mm	4	5	6	8	8	9	10	10	10	12	12	14
$E_{-0,2}$	mm	1,4	1,6	1,9	2,3	2,3	2,3	2,3	2,8	2,8	2,8	2,8	2,8
F^{H7}	mm	20	25	30	35	40	45	55	55	60	60	65	65
G	mm	32	40	45	52	60	80	80	95	95	118	95	118
$H^{\pm 0,1}$	mm	47	52	62	74,5	84	101,5	101,5	130	130	155,5	130	155,5
J^{B12}	mm	5	6	6	8	8	8	10	10	12	12	12	14
K	mm	22,8	28,3	33,3	38,3	43,3	48,8	59,3	59,3	64,4	64,4	69,4	69,4
L^{P9}	mm	6	8	8	10	12	14	16	16	18	18	18	18
S	mm	30	40	48	55	62	70	85	85	100	100	115	115
Number of flange holes		4	4	6	4	6	8	8	8	8	8	8	8

Order number		1.117.240	1.117.240	1.117.240	1.120.240	1.120.240	1.122.240	1.122.240	1.122.240	1.122.240
for joint size	Nm	**0.117**	**0.117**	**0.117**	**0.120**/0.122	**0.120**	**0.122**	**0.122**	**0.122**	**0.122**
A	mm	150	165	180	180	225	180	225	225	250
B_{h6}	mm	90	95	110	110	140	110	140	140	140
$C_{-0,2}$	mm	110,6	115,5	131	131	171,5	131	171,5	171,5	190,5
D	mm	12	14	14	14	15	14	15	15	18
$E_{-0,2}$	mm	2,8	2,8	2,8	2,8	4,5	2,8	4,5	4,5	5,5
F^{H7}	mm	80	80	80	80	110	80	110	110	110
G	mm	110,6	115,5	118	118	165	118	165	165	188
$H^{\pm 0,1}$	mm	130	140	155,5	155,5	196	155,5	196	196	218
J^{B12}	mm	12	16	16	16	16	16	16	16	18
K	mm	85,4	85,4	85,4	85,4	116,4	85,4	116,4	116,4	116,4
L^{P9}	mm	22	22	22	22	28	22	28	28	28
S	mm	125	125	125	125	170	125	280	280	280
Number of flange holes		12	8	8	10	8	10	8	12	8

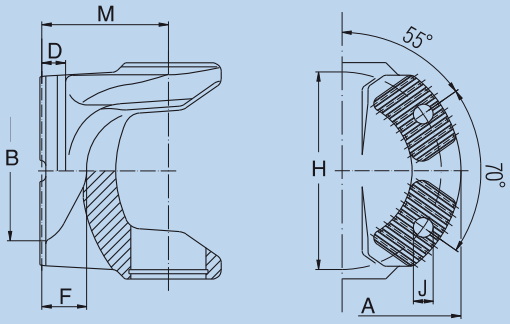


When companion flanges are produced in-house, the following shoud be observed:

1. Flange surface finish should not exceed 25 µm.
2. The configuration of the companion flanges must be such, that distance „X" is at least as long as tbe bolt, included the head.
3. To operate in a trouble-free manner, there must be a good concentricity between the companion flanges and Universal Joint flanges. On high speed shafts face P_A run out and concentricity deviation R_A should not exceed 0,04 mm.

Components, Spares and Accessoires | Series 0.100 | Size 0.111–0.122

Md_{Nom} 2300–26750 Nm | Md_{Lim} 3500–35000 Nm



ß = Maximum angle of deflection per joint
Cross serration according DIN ISO 12667

Flanges, Cross-serrated

Order number		1.111.302	1.112.302	1.113.302	1.148.302	1.148.302	1.158.302	1.158.302	1.117.302	1.117.302	1.120.302	1.122.302
Md_{Lim}	Nm	3500	4350	5350	7050	7050	10650	10650	13000	13000	21900	35000
Angle of deflection ß*	°	25	20	23	30	25	20	35	30	30	30	30
A approx.	mm	118	122	120	120	153	153	179	153	179	179	179
B approx.	mm	72	72	63	75	90	92	105	93	106	106	106
$D^{\pm 1}$	mm	13	13	14	14,5	15,5	15,5	16	15,5	18	18	19
F approx.	mm	22	26	25,5	24	24	29	25	32,5	45	33,5	34
$H^{\pm 0,1}$	mm	100	100	100	100	130	130	150	130	150	150	150
J	mm	11	11	11	11	13	13	15	13	15	15	15
M	mm	52	60	72,5	75	70	75	90	90	90	96	100
Weight	kg	1,35	1,83	2,10	2,37	2,83	2,98	4,76	4,40	5,32	5,50	7,19

* Please refer to point 6.7 of the technical attachment

Cardan Drive-Shafts

Series 0.200

ORIGINAL elbe GELENKE


ORIGINAL
elbe
GELENKE

Series 0.200 Drive Shafts were developed to meet the specific demands of agricultural and engineering equipment and the use of the Cardan Shaft in powered steering axles.

Series 0.200 shafts are typified by large deflection angles and large length compensations.

Since agricultural equipment applications require fast and simple mounting arrangements, a flange version was not considered. Rather a hub arrangement was chosen.

Depending on the size, these drive shafts are equipped with needle bearings or roller bearings.

Upon request, series 0.200 Cardan Shafts can be equipped with fast disconnecting or clamping devices. Basic design and manufacturing are similar to the 0.100 series.

General technical data of series 0.200:
maximum angle of deflection: up to 45°
Torque range: up to 1300 Nm
Hub arrangement

For more detailed information please refer to the datasheets which follow.

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■ Service Phone Europe ■ +49 (0) 71 42 / 353-0
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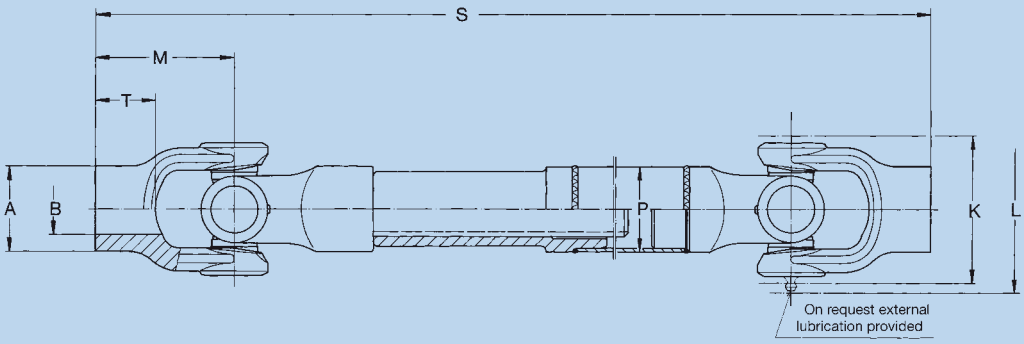
Needle bearing version



On both sides connecting hub without key-way end number: 0.204.XX0
0.204.XX1

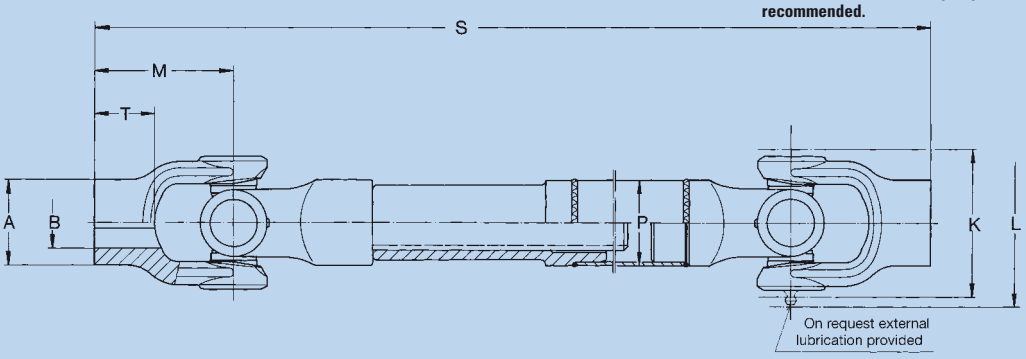
Please indicate compressed length „S", extension and max. r.p.m. when ordering!

Universal Cardan Drive-Shafts with lenght compensation, without key-way

Order number		0.204.100	0.206.100	0.206.101	0.210.100	
Md_{max}	Nm	100	250	250	1300	
Angle of deflection ß	°	35	45	45	45	
A approx.	mm	32	43	50	62	
B^{H7}	mm	18	25	30	40	
K approx.	mm	44	60	60	98	
L approx.	mm	58	73	73	112	
M	mm	45	60	75	115	
P	mm	32x1,5	40x2	40x2	50x3	
S_{min}	mm	260	337	367	655	
T	mm	22	30	42	63	
X	mm	45	35	35	100	
Spline dim. DIN 5480	mm	20x1,5x12	25x1,5x15	25x1,5x15	35x2x16	
G (at S_{min})	kg	1,18	2,28	2,77	9,78	
G/100 mm standard tube	kg	0,11	0,14	0,14	0,35	
G/100 mm extension	kg	0,20	0,31	0,31	0,63	

Md_{max} = Maximum permitted torque. See technical annex
ß = Maximum angle of deflection
G = Weight (kg)
S_{min} = Minimum compressed length for preferrend extension range
X = Preferred extension (larger extensions available up to approx. 10 x spline o. D.)

One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.



On both sides connecting hub with key-way end number: 0.204.XX3 Key-way according to DIN 6885 sheet 1
0.204.XX4

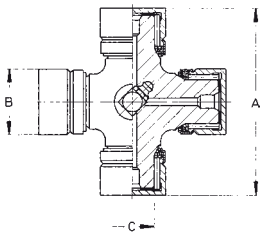
Please indicate compressed length „S", extension and max. r.p.m. when ordering!

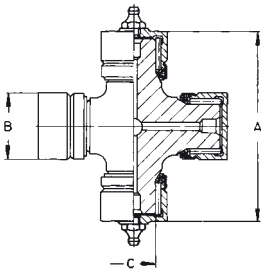
Universal Cardan Drive-Shafts with lenght compensation, with key-way on both sides

Order number		0.204.103	0.206.103	0.206.104	0.210.103	
Md_{max}	Nm	100	250	250	1300	
Angle of deflection ß	°	35	45	45	45	
A approx.	mm	32	43	50	62	
B^{H7}	mm	18	25	30	40	
K approx.	mm	44	60	60	98	
L approx.	mm	58	73	73	112	
M	mm	45	60	75	115	
P	mm	32x1,5	40x2	40x2	50x3	
S_{min}	mm	260	337	367	655	
T	mm	22	30	42	63	
X	mm	45	35	35	100	
Spline dim. DIN 5480	mm	20x1,5x12	25x1,5x15	25x1,5x15	35x2x16	
G (at S_{min})	kg	1,18	2,28	2,77	9,78	
G/100 mm standard tube	kg	0,11	0,14	0,14	0,35	
G/100 mm extension	kg	0,20	0,31	0,31	0,63	

Md_{max} = Maximum permitted torque. See technical annex
ß = Maximum angle of deflection
G = Weight (kg)
S_{min} = Minimum compressed length for preferrend extension range
X = Preferred extension (larger extensions available up to approx. 10 x spline o. D.)

Cross Units





Needle bearing version

		Standard version Needle Bearing				Version for external lubrication Needle Bearing		
Order number		**0.204.010**	**0.106.010**			**0.204.012**	**0.106.012**	
A	mm	36	48			36	48	
B	mm	14	19			14	19	
C	mm	7,7	12,7			7,7	12,7	
Snap rings included	mm	J 14 x 1	J 19 x 1			J 14 x 1	J 19 x 1	
Weight	kg	0,064	0,143			0,069	0,144	
used for		**0.204**	**0.206**			**0.204**	**0.206**	

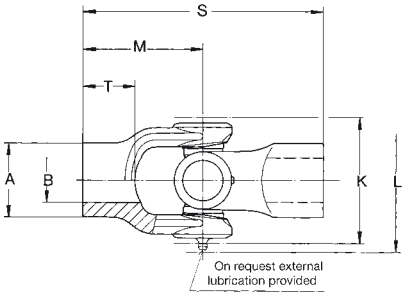
Roller bearing version

		Standard version Roller Bearing				Version for external lubrication Roller Bearing		
Order number		**0.110.015**				**0.110.016**		
A	mm	83				83		
B	mm	30				30		
C	mm	20,02				20,02		
Snap rings included	mm	J 30 x 1,2				J 30 x 1,2		
Weight	kg	0,66				0,66		
used for		**0.210**				**0.210**		

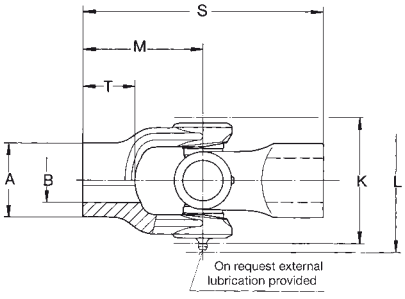
One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.

Md_{max} = Maximum permitted torque. See technical appendage
ß = Maximum angle of deflection
G = Weight (kg)

Cardan-Joints single, without key-way



Cardan-Joints single, with key-way

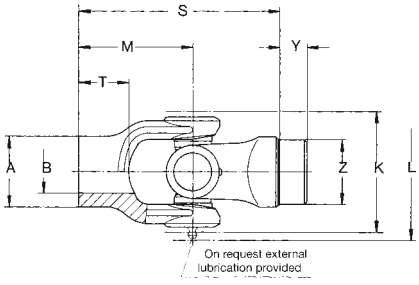


Key-way according to DIN 6885 sheet 1

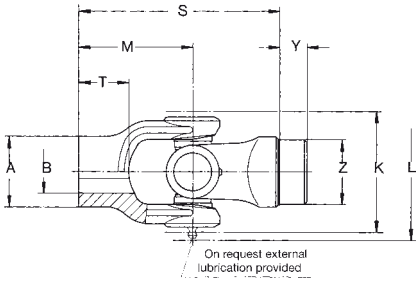
		Needle bearing version									
Order number		**0.204.400**	**0.204.410**	**0.206.400**	**0.206.410**	**0.210.400**	**0.204.403**	**0.204.413**	**0.206.403**	**0.206.413**	**0.210.403**
Md_{max}	Nm	100	100	250	250	1300	100	100	250	250	1300
Angle of deflection ß	°	45	35	45	45	45	45	35	45	45	45
A approx.	mm	35	32	50	43	62	35	32	50	43	62
B^{H7}	mm	18	18	30	25	40	18	18	30	25	40
K approx.	mm	44	44	60	60	98	44	44	60	60	98
L approx.	mm	58	58	73	73	112	58	58	73	73	112
M	mm	54	45	75	60	115	54	45	75	60	115
S	mm	108	90	150	120	230	108	90	150	120	230
T	mm	35	22	42	30	63	35	22	42	30	63
G (at S)	kg	0,43	0,34	1,22	0,73	3,37	0,43	0,34	1,22	0,73	3,37

Md_{max} = Maximum permitted torque.
See technical appendage
ß = Maximum angle of deflection

Fixed Joints, without key-way



Fixed Joints, with key-way



Key-way according to DIN 6885 sheet 1

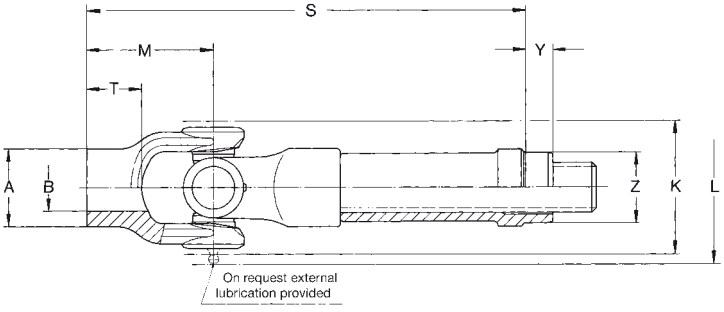
		Needle bearing version							
Order number		**0.204.050**	**0.206.050**	**0.206.051**	**0.210.050**	**0.204.053**	**0.206.053**	**0.206.054**	**0.210.053**
Md_{max}	Nm	100	250	250	1300	100	250	250	1300
Angle of deflection ß	°	35	45	45	45	35	45	45	45
Weight	kg	0,34	0,82	1,07	3,16	0,34	0,82	1,07	3,16
A approx.	mm	32	43	50	62	32	43	50	62
B^{H7}	mm	18	25	30	40	18	25	30	40
K approx.	mm	44	60	60	98	44	60	60	98
L approx.	mm	58	73	73	112	58	73	73	112
M	mm	45	60	75	115	45	60	75	115
S	mm	74	100	115	185	74	100	115	185
T	mm	22	30	42	63	22	30	42	63
Y	mm	7	20	20	20	7	20	20	20
Z_{k8}	mm	29,25	37,25	37,25	44,25	29,25	37,25	37,25	44,25

One keyway is not enough to transmit the max. torque. In such case a second keyway or an internal spline is recommended.

Md_{max} = Maximum permitted torque. See technical appendage
ß = Maximum angle of deflection
X = Preferred extension (larger extensions available up to approx. 10 x spline o. D.)
G = Weight (kg)

Slip Joints, without key-way

Slip Joints, with key-way



Key-way according to DIN 6885 sheet 1

Please indicate extension range when ordering!

Needle bearing version

Order number		0.204.070	0.206.070	0.206.071	0.210.070	0.204.073	0.206.073	0.206.074	0.210.073
Md_{max}	Nm	100	250	250	1300	100	250	250	1300
Angle of deflection ß	°	35	45	45	45	35	45	45	45
Weight	kg	0,80	1,39	1,63	6,28	0,80	1,39	1,63	6,28
G / 100 mm standard tube	kg	0,20	0,31	0,31	0,63	0,20	0,31	0,31	0,63
A approx.	mm	32	43	50	62	32	43	50	62
B^{H7}	mm	18	25	30	40	18	25	30	40
K approx.	mm	44	60	60	98	44	60	60	98
L	mm	52	73	73	112	52	73	73	112
M	mm	45	60	75	115	45	60	75	115
S	mm	158	190	215	371	158	190	205	371
T	mm	22	30	42	63	22	30	42	63
X	mm	45	35	35	100	45	35	35	100
Y	mm	18	15	15	18	18	15	15	18
Z_{k8}	mm	29,25	37,25	37,25	44,25	29,25	37,25	37,25	44,25
Spline dim. DIN 5480	mm	20 x 1,5 x 12	25 x 1,5 x 15	25 x 1,5 x 15	35 x 2 x 16	20 x 1,5 x 12	25 x 1,5 x 15	25 x 1,5 x 15	35 x 2 x 16

The dimensions Z,Y and S will be changed within a product change.
Please contact us for further questions.

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ORIGINAL elbe GELENKE

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GELENKE

The series 0.300 is available in two configurations.

a) As a Centered Double Joint in connection with a single Joint with length compensation. This arrangement is mainly encountered on construction equipment with articulated steering. The centered double joint has the advantage of not requiring the support by an intermediate bearing. This results in lower installation times for the drive lines, and thus in cost savings.

b) The second configuration consists of two Centered Double Joints with length extension. Since the difference in an angle between both single joints is up to approximately 3 degrees, this configuration ensures almost uniform speed and torque transmittal. The difference in angle creates a fluctuation smaller than 0,0027, an amount, so small that it can be disregarded. To determine the amount of fluctuation, see Application Guidelines.

The centred double joint consists of two fork parts, which incorporate a centering device enclosed in a rubber boot for protection against dirt and moisture.

In this series, individual customer requirements are normally checked by the Elbe Technical Group.

General technical data of series 0.300:

Maximum angle of deflection:	up to 42°
Torque Range:	up to 15200 Nm
Flange Connection	

For more detailed information please refer to the datasheets which follow.

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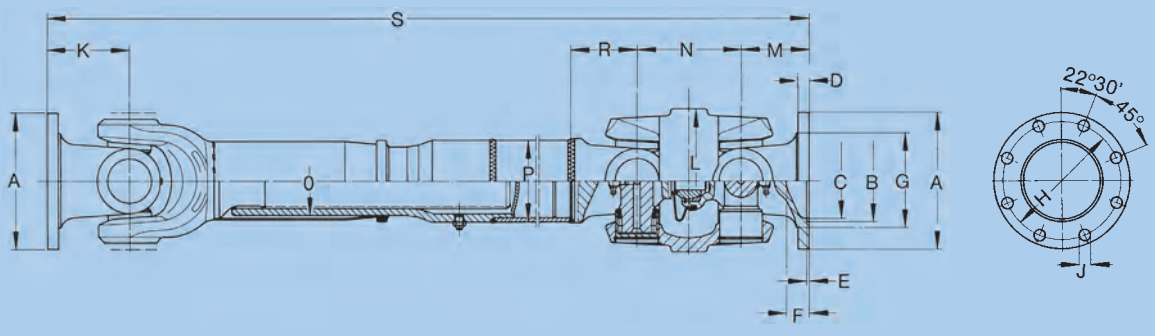
Roller bearing version

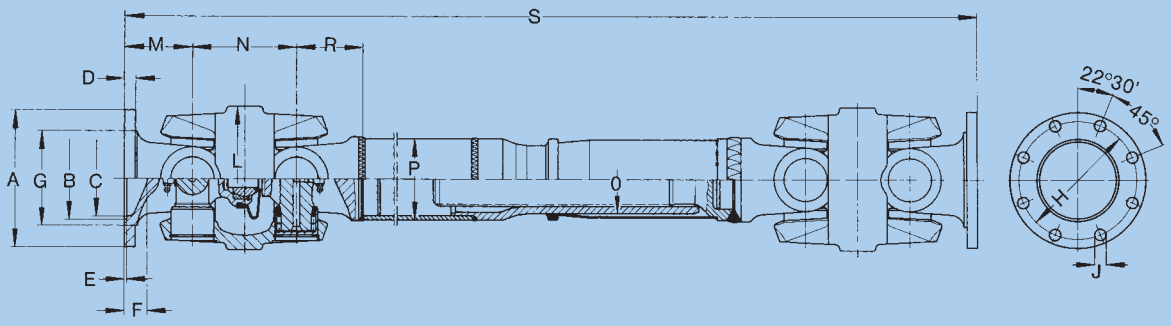


Single joint and centered double joint connected with each other by length extension

Please indicate compressed length „S", extension and max. r.p.m. when ordering!

Cardan drive-shafts, double / single joint with length extension

Order number		0.313.114	0.358.114	0.320.114
Md_{max}	Nm	4000	7400	15200
Angle of deflection ß	°	35/40	35/46	30/42
A	mm	120	150	180
B^{H7}	mm	75	90	110
C	mm	70	82	104
D	mm	9	12	14
$E^{+0,5}$	mm	2,5	3	3,6
F	mm	27,5	25	22
G	mm	80,5	104	118
$H^{\pm 0,1}$	mm	101,5	130	155,5
$J^{B\ 12}$	mm	10	12	16
K	mm	72	90	96
L	mm	138	158	180
M	mm	60	75	86
N	mm	105	115	140
O	mm	62	75	93
P_1	mm	**70x4**	**90x4**	**110x6**
P_2	mm	80x4	100x4	120x6
P_3	mm	100x4	120x5	–
R	mm	62	75	88
S_{min}	mm	670	810	822
X	mm	130	110	110
Weight	kg	–	39,37	–
Spline dim DIN 5480	mm	50x2,0x24	60x2,5x22	75x2,5x28
Number of flange holes		8	8	10



On both sides with centered double joint, connected with each other by length extension

Please indicate compressed length „S", extension and max. r.p.m. when ordering!

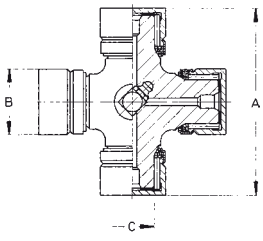
Cardan drive-shafts, double joint with length extension

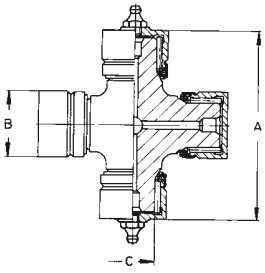
Order number		0.313.115	0.358.115	0.320.115
Md_{max}	Nm	4000	7400	15200
Angle of deflection ß	°	40	46	42
A	mm	120	150	180
B^{H7}	mm	75	90	110
C approx.	mm	70	84	104
D	mm	9	12	14
$E^{+0,5}$	mm	2,5	3	3,6
F	mm	27,5	25	22
G	mm	80,5	104	118
$H_{\pm 0,1}$	mm	101,5	130	155,5
$J^{B\,12}$	mm	10	12	16
L	mm	138	158	180
M	mm	60	75	86
N	mm	105	115	140
O	mm	62	75	93
P_1	mm	**70x4**	**90x4**	**110x6**
P_2	mm	80x4	100x4	120x6
P_3	mm	100x4	120x5	–
R	mm	62	75	88
S_{min}	mm	757	924	980
X	mm	65	110	110
Weight	kg	–	48,18	–
Spline dim DIN 5480	mm	50x2,0x24	60x2,5x22	75x2,5x28
Number of flange holes		8	8	10

Md_{max} = Maximum permitted torque. See technical appendage
ß = Maximum angle of deflection (per joint)
S_{min} = Minimum compressed length for preferred extension
X = Preferred extension (larger extensions available up to approx. 9 x spline o. D.)
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
P_2 / P_3 = Alternative tube

By **0.313** only external lubrication possible

Cross Units





Needle bearing version

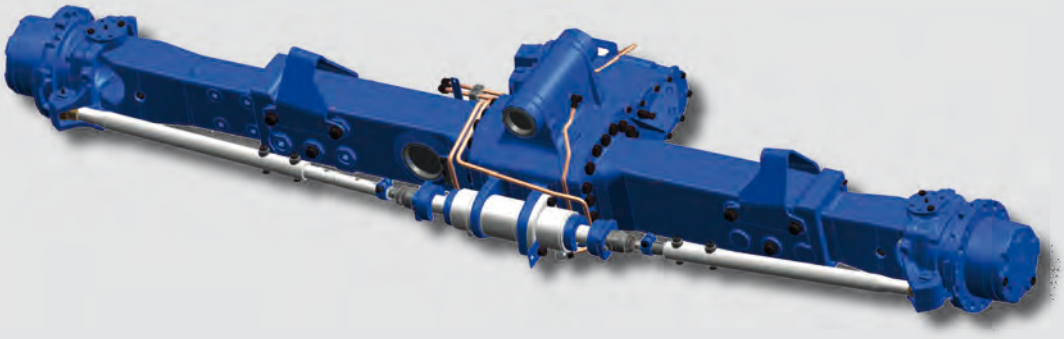
						Version suitable for external lubrication Needle bearing	
Order number						**0.113.012**	
A	mm					106	
B	mm					38	
C	mm					26,28	
Snap rings included	mm					J 38 x 1,5	
Weight	kg					1,33	
used for						**0.313**	

Roller bearing version

		Standard version Roller bearing				Version suitable for external lubrication Roller bearing	
Order number		**0.158.015**	**0.120.015**			**0.113.016**	
A	mm	126	152			106	
B	mm	48	57			38	
C	mm	33,15	40,9			25,7	
Snap rings included	mm	J 48 x 1,75	J 57 x 2			J 38 x 1,5	
Weight	kg	2,28	4,21			1,34	
used for		**0.358**	**0.320**			**0.313**	

Cardan Drive-Shafts

Series 0.400



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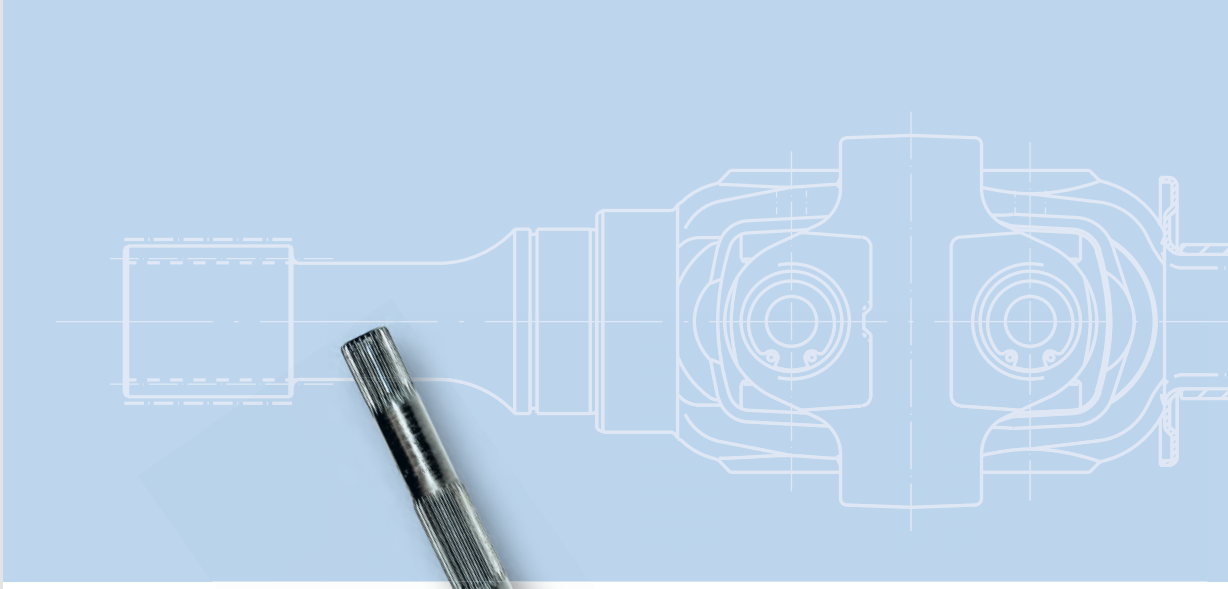



elge
elge

This Double Joint is used primarily in vehicles with powered steering axles.

As the design drawing shows, the forks can function as hubs and/or fork shafts. The connection between the forks and the center piece is provided by the cross, as is the case with all other Cardan Shafts.

Each hub is equipped with an internal spline which provides a positive connection to the input and output shaft. The outside diameter, which serves as a seat for support bearings, is ground to a very fine finish.

The fork shafts are equipped with a tooth system – that transfers the torque – and bearing points. Type and size of the tooth system can be designed individually. There are also different requirements on the surface characteristics of the bearing blocks which we can meet.

Since the principles of kinematics that apply to all Cardan Shafts are also valid for Double Joints, again measures must be taken to keep fluctuating output motions as low as possible.

For more information concerning fluctuating output motions please refer to the technical annex, Application Guidelines and Calculation Data, where you will find a detailed description of the necessary measures.

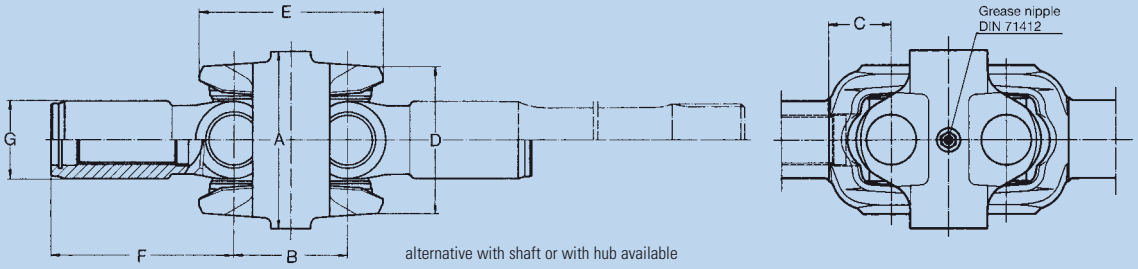
General technical data of series 0.400:

Maximum angle of deflection:	up to 55°
Torque range:	up to 6100 Nm
Hub Connection	
Fork Shafts Connection	

For more detailed information please refer to the datasheets which follow.

■ Service Phone North America ■ +1 – 269/6377999
■ Service Phone Europe ■ +49 (0) 71 42 / 353-0
ORIGINAL elbe GELENKE

double-joint version for Steering Axles



alternative with shaft or with hub available

All series are available with sun pinion-forkshaft.

Cardan Drive-Shafts, double-joint version for Steering Axles, Needle bearing version

Order number		0.403.300	0.408.500	0.409.500	0.411.500	0.412.500
Md_{Lim}	Nm	1800	2250	3500	5800	7500
Angle of deflection ß	°	55	52	50	50	50
A	mm	87	96	111	126	138
B	mm	57	63	70	81	89
C	mm	33	33	41,5	39	48
D	mm	68	78	90	105	114
E	mm	89	101	111,5	128	144
F	mm	–	89	100	113	143
G	mm	–	46	46	56	60

All series are available with sun pinion-forkshaft.

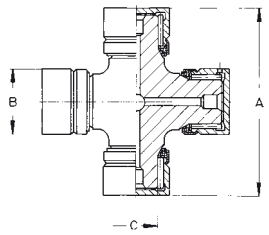
Cardan Drive-Shafts, double-joint version for Steering Axles, Roller bearing version

Order number		0.409.500	0.411.500	0.412.500
Md_{Lim}	Nm	3500	5800	7500
Angle of deflection ß	°	52	52	50
A	mm	111	126	138
B	mm	70	81	92
C	mm	41,5	41	48
D	mm	90	105	113,5
E	mm	111,5	131	144
F	mm	100	112	143
G	mm	46	56	60

Other Dimensions and larger angles of deflection on request.
Angle of deflection up 55° on request.

Md_{Lim} = Maximum operating torque referring to center piece including spider-set by 0° position
ß = Maximum angle of deflection, when ordering, please indicate this together with required shaft dimension.
For application principles, Center offset and max. axial float see technical annex.

Cross Units



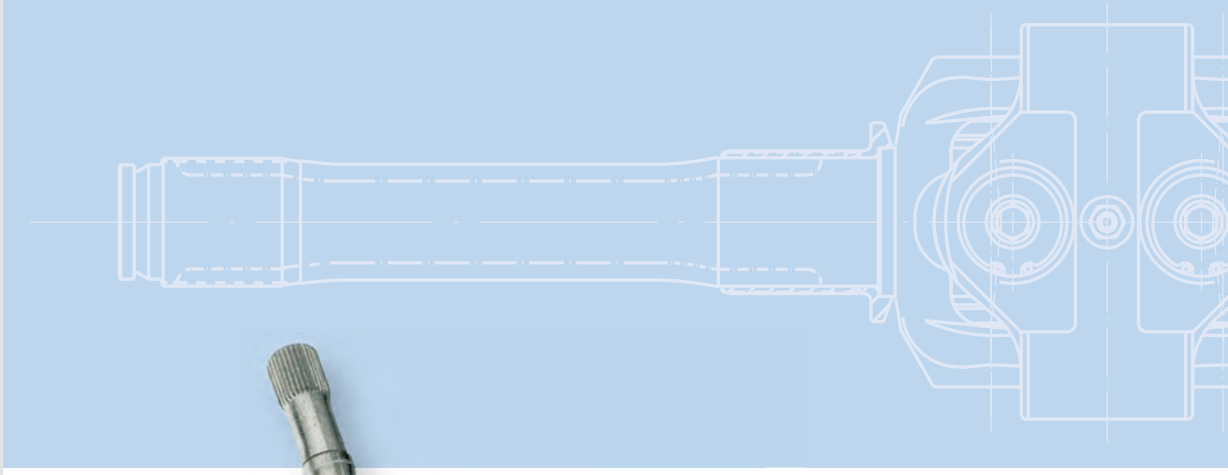
Needle bearing version

		Standard version Needle bearing					
Order number		**0.403**	**0.408.011.015**	**0.110.011**	**0.112.011**	**0.113.011**	
A	mm	62,6	70,7	83	97	106	
B	mm	23,8	28,5	30	35	38	
C	mm	16	19,87	19,9	23,04	26,28	
Snap ring included	mm	J 24 x 1,2	J 29 x 1,2	J 30 x 1,2	J 35 x 1,5	J 38 x 1,5	
Weight	kg	–	0,51	0,66	0,98	1,30	
used for		**0.403**	**0.408**	**0.409**	**0.411**	**0.412**	

Roller bearing version

		Standard version Roller bearing			
Order number		**0.110.017**	**0.112.017**	**0.412**	
A	mm	83	97	105,6	
B	mm	30	35	40	
C	mm	20,02	24,08	27,9	
Snap ring included	mm	J 30 x 1,2	J 35 x 1,5	J 40 x 1,75	
Weight	kg	0,66	0,94	–	
used for		**0.409**	**0.411**	**0.412**	

ORIGINAL elbe GELENKE



This Double Joint is used for the same application as series 0.400, namely in steering axles of all wheel drive vehicles. However, the design of series 0.500 differs slightly from that of series 0.400.

a) The joint pivots are not located in one plane thus enabling a more compact design. This feature shortens the distance between the center piece which results in a shorter installation length.

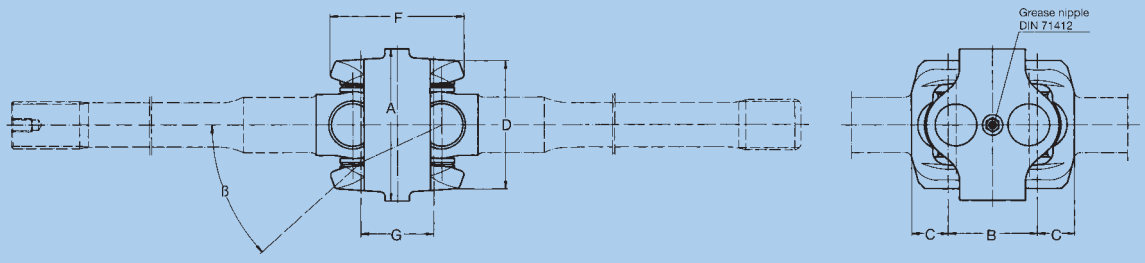
b) Series 0.500 offers more joint sizes than series 0.400 thus covering a wider torque range.

Since the same principles of kinematics apply to both series, please refer to the technical annex: Application Guidelines and Calculation Data. The measures to be taken to minimize fluctuation are described there.

General technical data of series 0.500:
Maximum angle of deflection: up to 50°
Torque range: up to 16900 Nm
Fork Shaft Design

For more detailed information please refer to the datasheets which follow.

double-joint version for Steering Axles



Cardan Drive-Shafts, double-joint version for Steering Axles, Needle bearing version

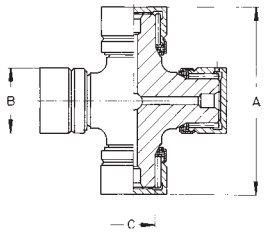
Order number		0.509.3	0.511.3	0.512.3	0.513.3	0.514.3	0.516.3	0.518.3
Md_{max}	Nm	2860	5200	7150	8450	13400	13000	16900
Angle of deflection ß	°	42 / 47	42 / 47	42 / 47	42 / 47	42	42 / 47	42 / 47
A	mm	105	128	138	146	152	174	195
B	mm	63 / 66	73 / 83	81 / 86	86 / 90	98	103 / 108	110 / 116
C	mm	26	31	33	37	37	43	45
D	mm	86	104	115	118	128	145	162
F	mm	94 / 99	108 / 119	121 / 125	130 / 134	136	150 / 156	158 / 164
G	mm	53 / 56	61 / 71	66 / 71	71 / 75	76	83 / 88	90 / 96

Cardan Drive-Shafts, double-joint version for Steering Axles, Roller bearing version

Order number		0.510.3	0.511.3	0.512.3
Md_{max}	Nm	4160	5200	7150
Angle of deflection ß	°	* / 50	42 / 47	42 / 47
A	mm	115	128	138
B	mm	* / 77	73 / 83	84 / 89
C	mm	30	31	33
D	mm	95	104	116
F	mm	* / 109	108 / 119	125
G	mm	* / 63	61 / 71	69 / 74

Md_{max} = Maximum operating torque referring to center piece including spider-set by 0° position
ß = Maximum angle of deflection, when ordering, please indicate this together with required shaft dimension. For application principles, Center offset and max. axial float see technical annex.
* = on request

Cross Units



Needle bearing version

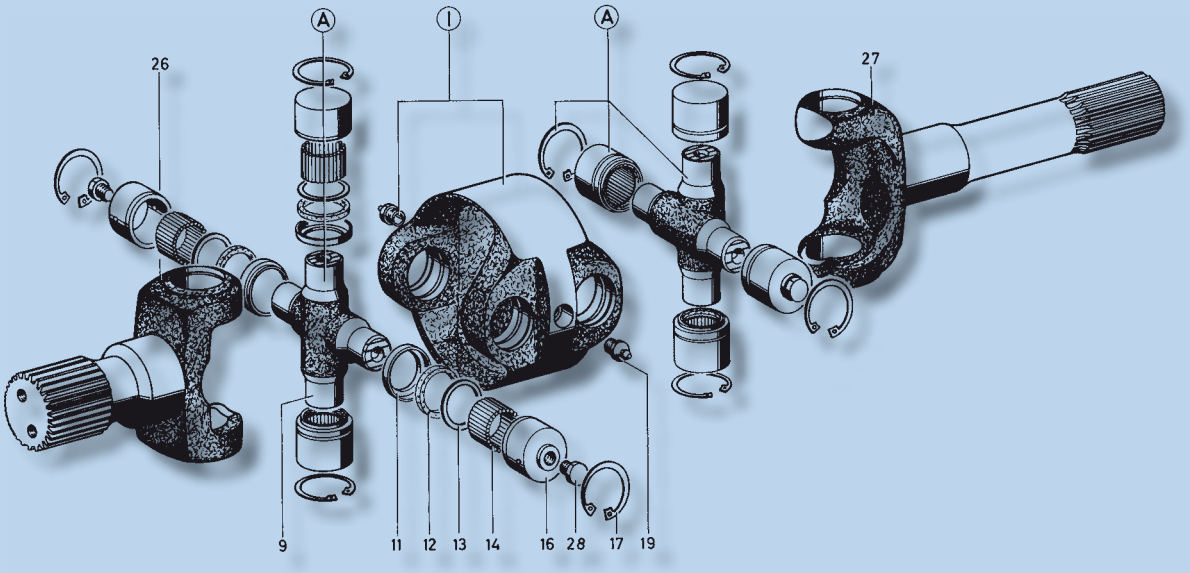
Standard version
Needle bearing

Order number		0.509.021	0.511.021	0.512.021	0.513.021	0.514.021	0.516.021	0.518.021
A	mm	79	96	107	110	120	134	152
B	mm	30	35	38	42	48	50	50
C	mm	19,9	23,04	26,28	28,6	35,6	33,4	33,4
Snap rings included	mm	J 30 x 1,2	J 35 x 1,5	J 38 x 1,5	J 42 x 1,75	J 48 x 1,75	J 50 x 2	J 50 x 2
Weight	kg	0,60	0,95	1,32	1,70	2,40	3,00	3,40
used for		**0.509**	**0.511**	**0.512**	**0.513**	**0.514**	**0.516**	**0.518**

Roller bearing version

Standard version
Roller bearing

Order number		0.510.021	0.511.021	0.512.021
A	mm	87	96	106,5
B	mm	35	35	40
C	mm	24,8	24,8	27,94
Snap rings included	mm	J 35 x 1,5	J 35 x 1,5	J 40 x 1,75
Weight	kg	0,83	0,98	1,60
used for		**0.510**	**0.511**	**0.512**



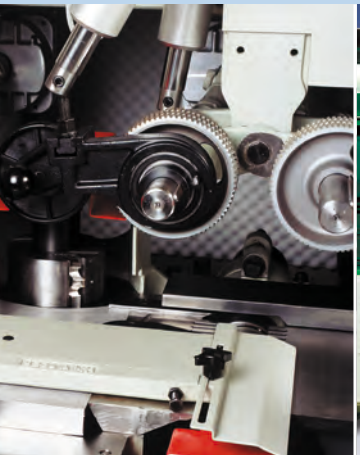
Cardan Drive-Shafts, double-joint version for Steering Axies

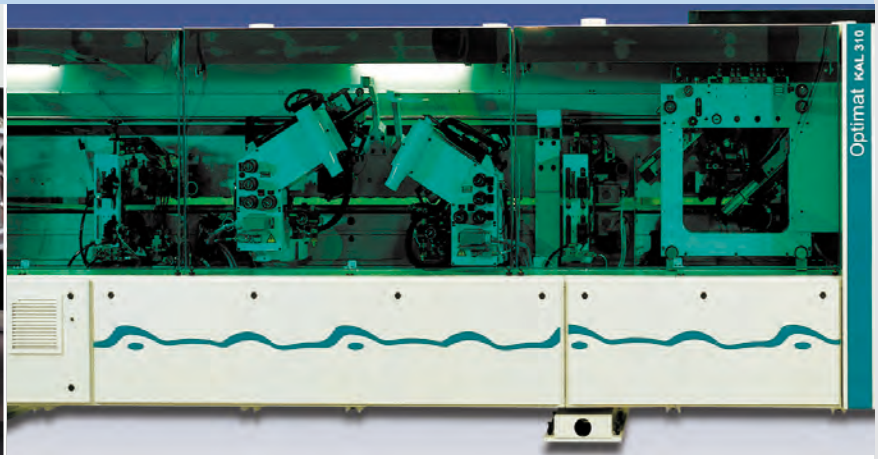
Complete build up or exchange units:

A Complete cross kit, consisting of parts 9, 11–14, 16, 17 and 28
I Center piece with grease nipple

Individual components:

9 Cross Unit
11 Socket
12 Lip seal
13 Washer
14 Bearing rollers
16 Bearing housing
17 Snap ring
19 Grease nipple, type A
26 Fork shaft, short
27 Fork shaft, long
28 Locking screw





elso

Precision needle bearing joints and shafts according to DIN 808 are used when precise power transmission at high speeds (up to 5000 rpm) is to be ensured.

The hardened and ground spider journals rest in sealed needle bearing bushings.

Due to permanent lubricating with high-quality special roller bearing grease, the joints are entirely maintenance-free and are therefore preferably used in areas with limited access in mechanical engineering.

A considerable advantage compared to sliding bearing supported joints is the enormously high efficiency at a given deflection angle.

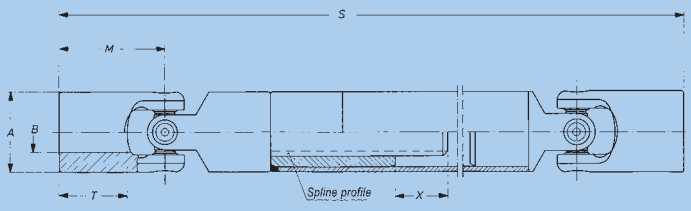
Further information on the use of needle bearing precision joints and shafts can be found under „Information on the use" in the Technical Annex, chapter 8.

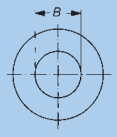
Page 146 also provides information on surface refinement processes.

General technical data of production series 0.600:
Max. angle of deflection: 45°
Torque range: up to 250 Nm

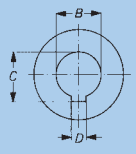
For more detailed information please refer to the datasheets which follow.

Needle bearing version, with length compensation

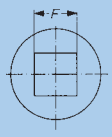




Standard bore



with key-way
DIN 6885 sheet 1



Inner square

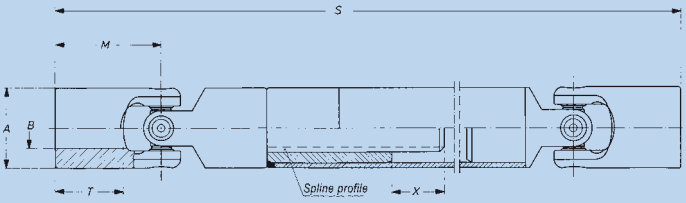
Please indicate compressed length „S", extension and required type of flange when ordering!

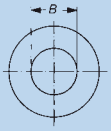
Precision Cardan Shafts, Standard bore

Precision Cardan Shafts,

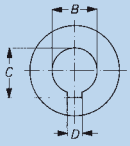
Order number		0.616.100	0.620.100	0.625.100	0.632.100	0.640.100	0.650.100	0.663.100	0.616.103	0.620.103
Md_{max}	Nm	6	15	20	40	80	120	250	6	15
Angle of deflection ß	°	45	45	45	45	45	45	45	45	45
Weight by S_1	kg	0,20	0,33	0,59	1,09	2,13	4,0	8,25	0,20	0,33
Weight by S_2	kg	0,24	0,39	0,68	1,21	2,28	4,44	8,75	0,24	0,39
Weight by S_3	kg	0,26	0,42	0,72	1,35	2,57	4,98	9,70	0,26	0,42
A	mm	16	20	25	32	40	50	63	16	20
*B^{H7}	mm	10	12	16	20	25	32	40	10	12
*$C^{+0,2}$	mm	–	–	–	–	–	–	–	11,4	13,8
*D^{P9}	mm	–	–	–	–	–	–	–	3	4
*F^{H9}	mm	–	–	–	–	–	–	–	–	–
M	mm	26	31	37	43	54	66	83	26	31
$S_1 + X_1$	mm	165 + 15	174 + 20	198 + 25	234 + 30	301 + 40	372 + 50	475 + 70	165 + 15	174 + 20
$S_2 + X_2$	mm	185 + 30	194 + 40	228 + 55	264 + 60	321 + 60	422 + 100	505 + 100	185 + 30	194 + 40
$S_3 + X_3$	mm	210 + 60	224 + 70	248 + 75	294 + 90	371 + 110	472 + 150	585 + 180	210 + 60	224 + 70
T	mm	15	18	22	25	32	40	50	15	18
Spline profile	mm	6x7,5x10,2	6x11x14	6x11x14	6x16x20	6x21x25	6x28x34	6x36x42	6x7,5x10,2	6x11x14

These drive shafts are also available with rapid-change coupling.
* = Customized bores, key-way and inner square dimensions possible
Md_{max} = Max. permissible torque
ß = Max. angle of deflection per joint
S_1
S_2 = preferred lengths, compressed
S_3
X_1 = Maximum extension for S_1
X_2 = Maximum extension for S_2
X_3 = Maximum extension for S_3
For application criteria and calculations refer to technical annex

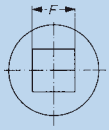




Standard bore



with key-way
DIN 6885 sheet 1



Inner square

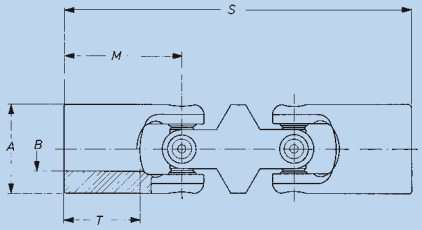
Bore with key-way DIN 6885, Sheet 1

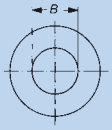
0.625.103	0.632.103	0.640.103	0.650.103	0.663.103
20	40	80	120	250
45	45	45	45	45
0,59	1,09	2,13	4,0	8,25
0,68	1,21	2,28	4,44	8,75
0,72	1,35	2,57	4,98	9,70
25	32	40	50	63
16	20	25	32	40
18,3	22,8	28,3	35,3	43,3
5	6	8	10	12
–	–	–	–	–
37	43	54	66	83
198 + 25	234 + 30	301 + 40	372 + 50	475 + 70
228 + 55	264 + 60	321 + 60	422 + 100	505 + 100
248 + 75	294 + 90	371 + 110	472 + 150	585 + 180
22	25	32	40	50
6x11x14	6x16x20	6x21x25	6x28x34	6x36x42

Precision Cardan Shafts, Inner square

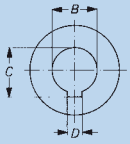
0.616.104	0.620.104	0.625.104	0.632.104	0.640.104	0.650.104	0.663.104
6	15	20	40	80	120	250
45	45	45	45	45	45	45
0,20	0,33	0,59	1,09	2,13	4,0	8,25
0,24	0,39	0,68	1,21	2,28	4,44	8,75
0,26	0,42	0,72	1,35	2,57	4,98	9,70
16	20	25	32	40	50	63
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–
8	10	12	16	20	25	32
26	31	37	43	54	66	83
165 + 15	174 + 20	198 + 25	234 + 30	301 + 40	372 + 50	475 + 70
185 + 30	194 + 40	228 + 55	264 + 60	321 + 60	422 + 100	505 + 100
210 + 60	224 + 70	248 + 75	294 + 90	371 + 110	472 + 150	585 + 180
15	18	22	25	32	40	50
6x7,5x10,2	6x11x14	6x11x14	6x16x20	6x21x25	6x28x34	6x36x42

double, DIN 808, Needle bearing version

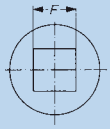




Standard bore



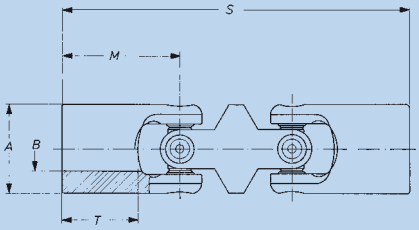
with key-way
DIN 6885 sheet 1

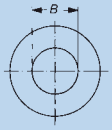


Inner square

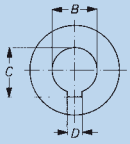
		Precision Cardan Shafts, Standard bore							Precision Cardan Shafts,	
Order number		**0.616.300**	**0.620.300**	**0.625.300**	**0.632.300**	**0.640.300**	**0.650.300**	**0.663.300**	**0.616.303**	**0.620.303**
Md_{max}	Nm	6	15	20	40	80	120	250	6	15
Angle of deflection ß	°	45	45	45	45	45	45	45	45	45
Weight	kg	0,08	0,14	0,24	0,50	0,95	1,71	3,06	0,08	0,14
A	mm	16	20	25	32	40	50	63	16	20
*B^{H7}	mm	10	12	16	20	25	32	40	10	12
*$C^{+0,2}$	mm	–	–	–	–	–	–	–	11,4	13,8
*D^{P9}	mm	–	–	–	–	–	–	–	3	4
*F^{H9}	mm	–	–	–	–	–	–	–	–	–
M	mm	26	31	37	43	54	66	83	26	31
S	mm	74	88	104	124	156	188	238	74	88
T	mm	15	18	22	25	32	40	50	15	18

* = Customized bores, key-way and inner square dimensions possible
Md_{max} = Max. permissible torque
ß = Max. angle of deflection per joint
For application criteria and calculations refer to technical annex

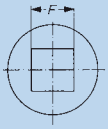




Standard bore



with key-way
DIN 6885 sheet 1



Inner square

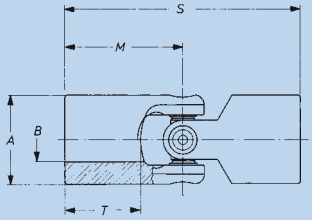
Bore with key-way DIN 6885, Sheet 1

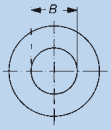
0.625.303	0.632.303	0.640.303	0.650.303	0.663.303
20	40	80	120	250
45	45	45	45	45
0,24	0,50	0,95	1,71	3,06
25	32	40	50	63
16	20	25	32	40
18,3	22,8	28,3	35,3	43,3
5	6	8	10	12
–	–	–	–	–
37	43	54	66	83
104	124	156	188	238
22	25	32	40	50

Precision Cardan Shafts, Inner square

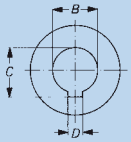
0.616.304	0.620.304	0.625.304	0.632.304	0.640.304	0.650.304	0.663.304
6	15	20	40	80	120	250
45	45	45	45	45	45	45
0,08	0,14	0,24	0,50	0,95	1,71	3,06
16	20	25	32	40	50	63
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–
8	10	12	16	20	25	32
26	31	37	43	54	66	83
74	88	104	124	156	188	238
15	18	22	25	32	40	50

single, DIN 808, Needle bearing version

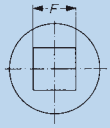




Standard bore



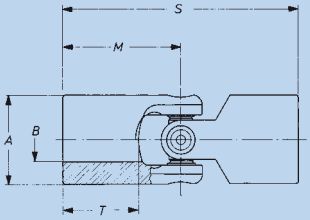
with key-way
DIN 6885 sheet 1

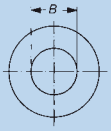


Inner square

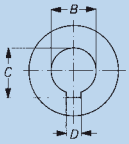
		Precision Cardan Shafts, Standard bore							Precision Cardan Shafts,	
Order number		**0.616.400**	**0.620.400**	**0.625.400**	**0.632.400**	**0.640.400**	**0.650.400**	**0.663.400**	**0.616.403**	**0.620.403**
Md_{max}	Nm	6	15	20	40	80	120	250	6	15
Angle of deflection ß	°	45	45	45	45	45	45	45	45	45
Weight	kg	0,05	0,10	0,16	0,31	0,61	1,15	2,17	0,05	0,10
A	mm	16	20	25	32	40	50	63	16	20
*B^{H7}	mm	10	12	16	20	25	32	40	10	12
*$C^{+0,2}$	mm	–	–	–	–	–	–	–	11,4	13,8
*D^{P9}	mm	–	–	–	–	–	–	–	3	4
*F^{H9}	mm	–	–	–	–	–	–	–	–	–
M	mm	26	31	37	43	54	66	83	26	31
S	mm	52	62	74	86	108	132	166	52	62
T	mm	15	18	22	25	32	40	50	15	18

* = Customized bores, key-way and inner square dimensions possible
Md_{max} = Max. permissible torque
ß = Max. angle of deflection per joint
For application criteria and calculations refer to technical annex

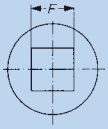




Standard bore



with key-way
DIN 6885 sheet 1



Inner square

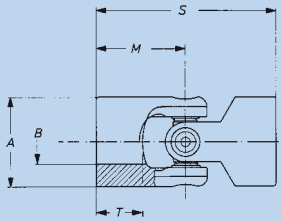
Bore with key-way DIN 6885, Sheet 1

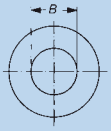
0.625.403	0.632.403	0.640.403	0.650.403	0.663.403
20	40	80	120	250
45	45	45	45	45
0,16	0,31	0,61	1,15	2,17
25	32	40	50	63
16	20	25	32	40
18,3	22,8	28,3	35,3	43,3
5	6	8	10	12
–	–	–	–	–
37	43	54	66	83
74	86	108	132	166
22	25	32	40	50

Precision Cardan Shafts, Inner square

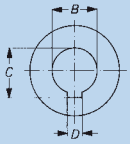
0.616.404	0.620.404	0.625.404	0.632.404	0.640.404	0.650.404	0.663.404
6	15	20	40	80	120	250
45	45	45	45	45	45	45
0,05	0,10	0,16	0,31	0,61	1,15	2,17
16	20	25	32	40	50	63
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–
8	10	12	16	20	25	32
26	31	37	43	54	66	83
52	62	74	86	108	132	166
15	18	22	25	32	40	50

single, Short Version, DIN 808, Needle bearing version

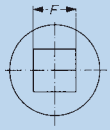




Standard bore



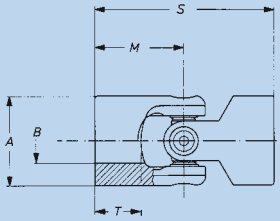
with key-way
DIN 6885 sheet 1

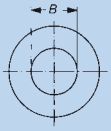


Inner square

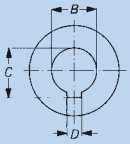
		Precision Cardan Shafts, Standard bore							Precision Cardan Shafts,	
Order number		**0.616.410**	**0.620.410**	**0.625.410**	**0.632.410**	**0.640.410**	**0.650.410**	**0.663.410**	**0.616.413**	**0.620.413**
Md_{max}	Nm	6	15	20	40	80	120	250	6	15
Angle of deflection ß	°	45	45	45	45	45	45	45	45	45
Weight	kg	0,03	0,07	0,10	0,22	0,42	0,80	1,88	0,03	0,07
A	mm	16	20	25	32	40	50	63	16	20
*B^{H7}	mm	8	10	12	16	20	25	32	8	10
*$C^{+0,2}$	mm	–	–	–	–	–	–	–	9	11,4
*D^{P9}	mm	–	–	–	–	–	–	–	2	3
*F^{H9}	mm	–	–	–	–	–	–	–	–	–
M	mm	20	24	28	34	41	52,5	65	20	24
S	mm	40	48	56	68	82	105	130	40	48
T	mm	11	13	15	18**	20**	27**	36	11	13

* = Customized bores, key-way and inner square dimensions possible
** = Bore depth smaller than DIN 808
Md_{max} = Max. permissible torque
ß = Max. angle of deflection per joint
For application criteria and calculations refer to technical annex

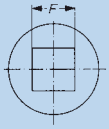




Standard bore



with key-way
DIN 6885 sheet 1



Inner square

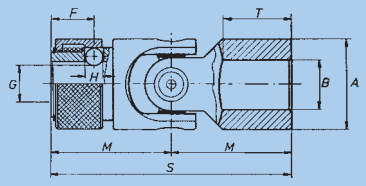
Bore with key-way DIN 6885, Sheet 1

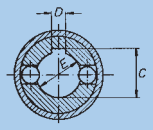
0.625.413	0.632.413	0.640.413	0.650.413	0.663.413
20	40	80	120	250
45	45	45	45	45
0,10	0,22	0,42	0,80	1,88
25	32	40	50	63
12	16	20	25	32
13,8	18,3	22,8	28,3	35,3
4	5	6	8	10
–	–	–	–	–
28	34	41	52,5	65
56	68	82	105	130
15	18**	20**	27**	36

Precision Cardan Shafts, Inner square

0.616.414	0.620.414	0.625.414	0.632.414	0.640.414	0.650.414	0.663.414
6	15	20	40	80	120	250
45	45	45	45	45	45	45
0,03	0,07	0,10	0,22	0,42	0,80	1,88
16	20	25	32	40	50	63
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–
6	8	10	14	19	24	30
20	24	28	34	41	52,5	65
40	48	56	68	82	105	130
11	13	15	18**	20**	27**	36

single, with rapid-change coupling, DIN 808, Needle bearing version





with key-way

Precision Cardan Joints, with rapid-change coupling, Bore with key-way

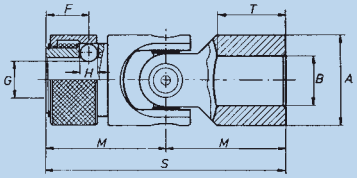
Order number		0.616.423	0.620.423	0.625.423	0.632.423	0.640.423	0.650.423	0.663.423
Md_{max}	Nm	6	15	20	40	80	120	250
Angle of deflection ß	°	45	45	45	45	45	45	45
Weight	kg	0,05	0,10	0,16	0,31	0,61	1,15	1,90
A	mm	16	20	25	32	40	50	63
*B^{H7}	mm	8	10	14	16	20	25	30
*$C^{+0,2}$	mm	9	11	15,3	17,3	21,7	26,7	31,7
*D^{H8}	mm	2	3	5	5	6	8	8
*E^{H7}	mm	8	10	14	16	20	25	30
F	mm	9,5	11,5	13,5	14	19	20,5	25
G	mm	7	8,7	13	14,8	18	23	28
H	mm	3,5	4	4	6,35	8	10	10
M	mm	26	31	37	43	54	66	83
S	mm	52	62	74	86	108	132	166
*SW	mm	–	–	–	–	–	–	–
T	mm	15	18	22	25	32	40	50

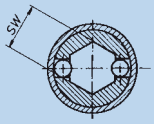
■ T I P ■

There are application examples in which frequent removal of the universal joint shaft or the joint from the drive or the output shaft is required.

In this case the use of a rapid-change coupling allows to change the shaft within very short time. This is done manually without any tools.

Torque transmission is ensured via a hexagonal profile or a feather key. Two steel balls which grip into a circular groove at the shaft connection provide axial locking of the shaft.



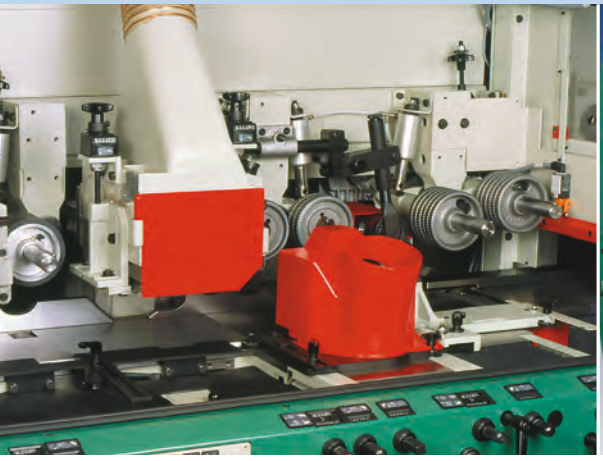


Inner hexagon

Precision Cardan Joints, with rapid-change coupling, Inner hexagon

0.616.426	0.620.426	0.625.426	0.625.427	0.632.426	0.640.426	0.650.426	0.663.426	0.663.427
6	15	20	20	40	80	120	250	250
45	45	45	45	45	45	45	45	45
0,05	0,10	0,16	0,16	0,31	0,61	1,15	1,90	1,90
16	20	25	25	32	40	50	63	63
8	10	14	14	16	20	25	30	30
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
9,5	11,5	13,5	13,5	14	19	20,5	25	25
6,3	8	13	10,5	14,8	18	23	28	33
3,5	4	4	4	6,35	8	10	10	10
26	31	37	37	43	54	66	83	83
52	62	74	74	86	108	132	166	166
7,2	9,06	14,04	11,15	16	20	25	30	35
15	18	22	22	25	32	40	50	50

* = Customized bores, key-way and inner hexagon dimensions possible
Md$_{max}$ = Max. permissible torque
ß = Max. angle of deflection per joint
For application criteria and calculations refer to technical annex



elso

Cardan joints and cardan shafts according to DIN 808 are supported by sliding bearings and their use is consequently restricted to low-speed drives.

The respective permissible maximum speeds depend on the deflection angle and the load, however, they must not exceed 1000 rpm.

We strongly recommend to consult our Technical Advice Service in cases of uncertainty.

To ensure trouble-free operation, the joints must always be sufficiently lubricated. This may also be done by means of bellows and grease filling.

Further information on the use of cardan joints and cardan shafts can be found under "Information on the use" in the Technical Annex, chapter 8.

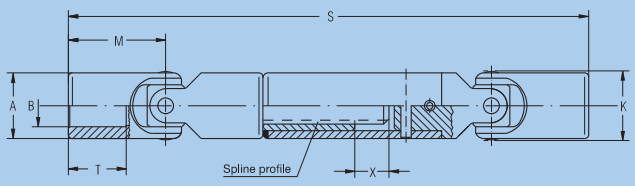
Page 146 provides information on surface refinement processes.

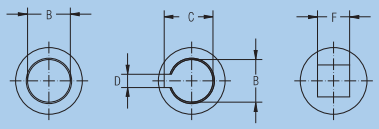
General technical description of production series 0.700:

Max. angle of deflection :	45°
Torque range:	up to 450 Nm
Material:	11SMnPb 30 k
Material No.	1.0718
Special material:	X 17 CrNi 16-2
Material No.	1.4057 (corrosion- and acid-resistant)

For more detailed information please refer to the datasheets which follow.

with length compensation





Standard bore | with key-way DIN 6885 sheet 1 | Inner square

Please indicate compressed length „S", extension and required type of flange when ordering!

Cross Cardan Shafts, Standard bore

Cross Cardan Shafts,

Order number		0.716.100	0.720.100	0.725.100	0.732.100	0.740.100	0.750.100	0.763.100	0.716.103	0.720.103
Md_{max}	Nm	8	20	30	60	160	290	450	8	20
Angle of deflection ß	°	45	45	45	45	45	45	45	45	45
Weight by S_1	kg	0,20	0,33	0,59	1,09	2,13	4,0	8,24	0,20	0,33
Weight by S_2	kg	0,24	0,39	0,68	1,21	2,28	4,44	8,74	0,24	0,39
Weight by S_3	kg	0,26	0,42	0,72	1,35	2,57	4,98	9,72	0,26	0,42
A	mm	16	20	25	32	40	50	63	16	20
$*B^{H7}$	mm	10	12	16	20	25	32	40	10	12
$*C^{+0,2}$	mm	–	–	–	–	–	–	–	11,4	13,8
$*D^{P9}$	mm	–	–	–	–	–	–	–	3	4
$*F^{H9}$	mm	–	–	–	–	–	–	–	–	–
K	mm	17,5	21,5	26,5	33,5	42	52,5	65	17,5	21,5
M	mm	26	31	37	43	54	66	83	26	31
$S_1 + X_1$	mm	165 + 15	174 + 20	198 + 25	234 + 30	301 + 40	372 + 50	475 + 70	165 + 15	174 + 20
$S_2 + X_2$	mm	185 + 30	194 + 40	228 + 55	264 + 60	321 + 60	422 + 100	505 + 100	185 + 30	194 + 40
$S_3 + X_3$	mm	210 + 60	224 + 70	248 + 75	294 + 90	371 + 110	472 + 150	585 + 180	210 + 60	224 + 70
T	mm	15	18	22	25	32	40	50	15	18
Spline profile	mm	6x7,5x10,2	6x11x14	6x11x14	6x16x20	6x21x25	6x28x34	6x36x42	6x7,5x10,2	6x11x14

These drive shafts are also available with rapid-change coupling.

* = Customized bores, key-ways and inner square dimensions possible

Md_{max} = Max. permissible torque (when using material 1.4057 divide the Md_{max}-value in halves)

ß = Max. angle of deflection per joint

S_1

S_2 = preferred lengths, compressed

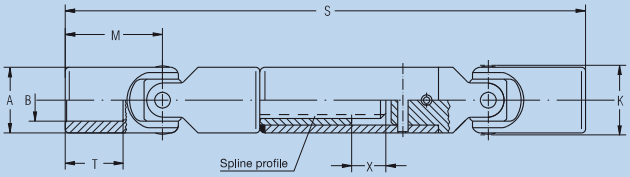
S_3

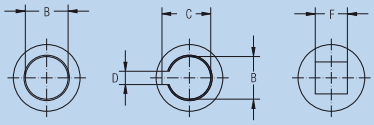
X_1 = Maximum extension for S_1

X_2 = Maximum extension for S_2

X_3 = Maximum extension for S_3

For application criteria and calculations refer to technical annex





Standard bore | with key-way DIN 6885 sheet 1 | Inner square

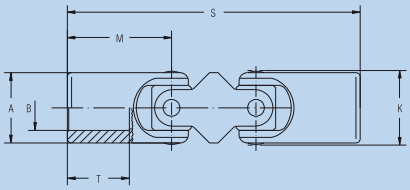
Bore with key-way DIN 6885, Sheet 1

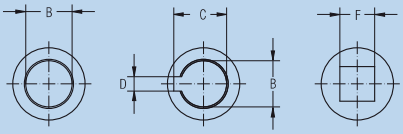
0.725.103	0.732.103	0.740.103	0.750.103	0.763.103
30	60	160	290	450
45	45	45	45	45
0,59	1,09	2,13	4,0	8,24
0,68	1,21	2,28	4,44	8,74
0,72	1,35	2,57	4,98	9,72
25	32	40	50	63
16	20	25	32	40
18,3	22,8	28,3	35,3	43,3
5	6	8	10	12
–	–	–	–	–
26,5	33,5	42	52,5	65
37	43	54	66	83
198 + 25	234 + 30	301 + 40	372 + 50	475 + 70
228 + 55	264 + 60	321 + 60	422 + 100	505 + 100
248 + 75	294 + 90	371 + 110	472 + 150	585 + 180
22	25	32	40	50
6x11x14	6x16x20	6x21x25	6x28x34	6x36x42

Cross Cardan Shafts, Inner square

0.716.104	0.720.104	0.725.104	0.732.104	0.740.104	0.750.104	0.763.104
8	20	30	60	160	290	450
45	45	45	45	45	45	45
0,20	0,33	0,59	1,09	2,13	4,0	8,24
0,24	0,39	0,68	1,21	2,28	4,44	8,74
0,26	0,42	0,72	1,35	2,57	4,98	9,72
16	20	25	32	40	50	63
–	–	–	–	–	–	–
–	–	–	–	–	–	–
–	–	–	–	–	–	–
8	10	12	16	20	25	32
17,5	21,5	26,5	33,5	42	52,5	65
26	31	37	43	54	66	83
165 + 15	174 + 20	198 + 25	234 + 30	301 + 40	372 + 50	475 + 70
185 + 30	194 + 40	228 + 55	264 + 60	321 + 60	422 + 100	505 + 100
210 + 60	224 + 70	248 + 75	294 + 90	371 + 110	472 + 150	585 + 180
15	18	22	25	32	40	50
6x7,5x10,2	6x11x14	6x11x14	6x16x20	6x21x25	6x28x34	6x36x42

double, DIN 808

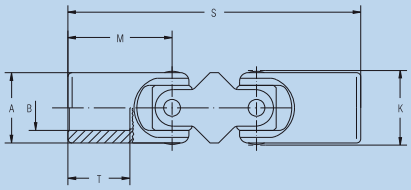


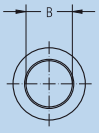


Standard bore | with key-way DIN 6885 sheet 1 | Inner square

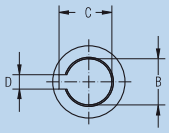
		Cross Joints, double, Standard bore								Cross Joints, double,	
Order number		**0.713.300**	**0.716.300**	**0.720.300**	**0.725.300**	**0.732.300**	**0.740.300**	**0.750.300**	**0.763.300**	**0.713.303**	**0.716.303**
Md_{max}	Nm	6	8	20	30	60	160	290	450	6	8
Angle of deflection ß	°	45	45	45	45	45	45	45	45	45	45
Weight	kg	0,04	0,08	0,14	0,24	0,50	0,95	1,71	3,51	0,04	0,08
A	mm	13	16	20	25	32	40	50	63	13	16
*B^{H7}	mm	8	10	12	16	20	25	32	40	8	10
*$C^{+0,2}$	mm	–	–	–	–	–	–	–	–	9	11,4
*D^{P9}	mm	–	–	–	–	–	–	–	–	2	3
*F^{H9}	mm	–	–	–	–	–	–	–	–	–	–
K	mm	14	17,5	21,5	26,5	33,5	42	52,5	65	14	17,5
M	mm	21	26	31	37	43	54	66	83	21	26
S	mm	60	74	88	104	124	156	188	238	60	74
T	mm	12	15	18	22	25	32	40	50	12	15

* = Customized bores, key-ways and inner square dimensions possible
Md_{max} = Max. permissible torque (when using material 1.4057 divide the Md_{max}-value in halves)
ß = Max. angle of deflection per joint
For application criteria and calculations refer to technical annex

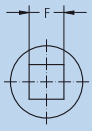




Standard bore



with key-way
DIN 6885 sheet 1



Inner square

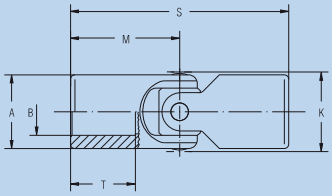
Bore with key-way DIN 6885, Sheet 1

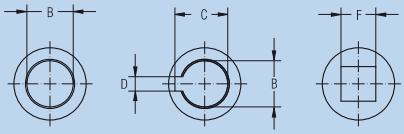
0.720.303	0.725.303	0.732.303	0.740.303	0.750.303	0.763.303
20	30	60	160	290	450
45	45	45	45	45	45
0,14	0,24	0,50	0,95	1,71	3,51
20	25	32	40	50	63
12	16	20	25	32	40
13,8	18,3	22,8	28,3	35,3	43,3
4	5	6	8	10	12
–	–	–	–	–	–
21,5	26,5	33,5	42	52,5	65
31	37	43	54	66	83
88	104	124	156	188	238
18	22	25	32	40	50

Cross Joints, double, Inner square

0.713.304	0.716.304	0.720.304	0.725.304	0.732.304	0.740.304	0.750.304	0.763.304
6	8	20	30	60	160	290	450
45	45	45	45	45	45	45	45
0,04	0,08	0,14	0,24	0,50	0,95	1,71	3,51
13	16	20	25	32	40	50	63
–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–
6	8	10	12	16	20	25	32
14	17,5	21,5	26,5	33,5	42	52,5	65
21	26	31	37	43	54	66	83
60	74	88	104	124	156	188	238
12	15	18	22	25	32	40	50

single, DIN 808

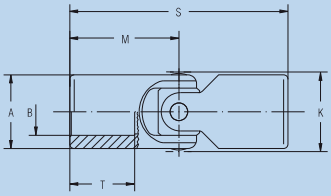


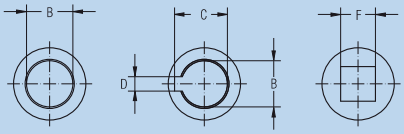


Standard bore | with key-way DIN 6885 sheet 1 | Inner square

		Cross Joints, single, Standard bore								Cross Joints, single,	
Order number		**0.713.400**	**0.716.400**	**0.720.400**	**0.725.400**	**0.732.400**	**0.740.400**	**0.750.400**	**0.763.400**	**0.713.403**	**0.716.403**
Md_{max}	Nm	6	8	20	30	60	160	290	450	6	8
Angle of deflection ß	°	45	45	45	45	45	45	45	45	45	45
Weight	kg	0,03	0,05	0,10	0,16	0,31	0,61	1,15	2,38	0,03	0,05
A	mm	13	16	20	25	32	40	50	63	13	16
*B^{H7}	mm	8	10	12	16	20	25	32	40	8	10
*$C^{+0,2}$	mm	–	–	–	–	–	–	–	–	9	11,4
*D^{P9}	mm	–	–	–	–	–	–	–	–	2	3
*F^{H9}	mm	–	–	–	–	–	–	–	–	–	–
K	mm	14	17,5	21,5	26,5	33,5	42	52,5	65	14	17,5
M	mm	21	26	31	37	43	54	66	83	21	26
S	mm	42	52	62	74	86	108	132	166	42	52
T	mm	12	15	18	22	25	32	40	50	12	15

* = Customized bores, key-ways and inner square dimensions possible
Md_{max} = Max. permissible torque (when using material 1.4057 divide the Md_{max}-value in halves)
ß = Max. angle of deflection per joint
For application criteria and calculations refer to technical annex





Standard bore | with key-way DIN 6885 sheet 1 | Inner square

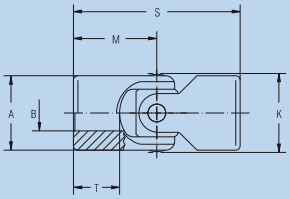
Bore with key-way DIN 6885, Sheet 1

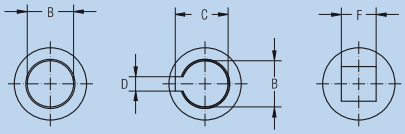
0.720.403	0.725.403	0.732.403	0.740.403	0.750.403	0.763.403
20	30	60	160	290	450
45	45	45	45	45	45
0,10	0,16	0,31	0,61	1,15	2,38
20	25	32	40	50	63
12	16	20	25	32	40
13,8	18,3	22,8	28,3	35,3	43,3
4	5	6	8	10	12
–	–	–	–	–	–
21,5	26,5	33,5	42	52,5	65
31	37	43	54	66	83
62	74	86	108	132	166
18	22	25	32	40	50

Cross Joints, single, Inner square

0.713.404	0.716.404	0.720.404	0.725.404	0.732.404	0.740.404	0.750.404	0.763.404
6	8	20	30	60	160	290	450
45	45	45	45	45	45	45	45
0,03	0,05	0,10	0,16	0,31	0,61	1,15	2,38
13	16	20	25	32	40	50	63
–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–
6	8	10	12	16	20	25	32
14	17,5	21,5	26,5	33,5	42	52,5	65
21	26	31	37	43	54	66	83
42	52	62	74	86	108	132	166
12	15	18	22	25	32	40	50

single, Short version, DIN 808

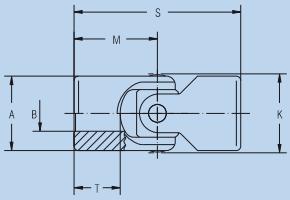


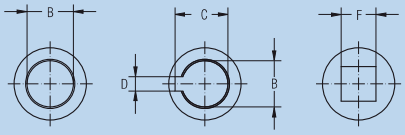


Standard bore | with key-way DIN 6885 sheet 1 | Inner square

		Cross Joints, single, Short version, Standard bore								Cross Joints, single,	
Order number		**0.716.410**	**0.716.411**	**0.720.410**	**0.725.410**	**0.732.410**	**0.740.410**	**0.750.410**	**0.763.410**	**0.716.413**	**0.720.413**
Md_{max}	Nm	8	8	20	30	60	160	290	450	8	20
Angle of deflection ß	°	45	45	45	45	45	45	45	45	45	45
Weight	kg	0,02	0,03	0,07	0,10	0,22	0,42	0,80	2,12	0,03	0,07
A	mm	16	16	20	25	32	40	50	63	16	20
*B^{H7}	mm	6	8	10	12	16	20	25	32	8	10
*$C^{+0,2}$	mm	–	–	–	–	–	–	–	–	9	11,4
*D^{P9}	mm	–	–	–	–	–	–	–	–	2	3
*F^{H9}	mm	–	–	–	–	–	–	–	–	–	–
K	mm	17,5	17,5	21,5	26,5	33,5	42	52,5	65	17,5	21,5
M	mm	17	20	24	28	34	41	52,5	65	20	24
S	mm	34	40	48	56	68	82	105	130	40	48
T	mm	9	11	13	15	19	21**	28**	36	11	13

* = Customized bores, key-ways and inner square dimensions possible
** = Bore depth smaller than DIN 808
Md_{max} = Max. permissible torque (when using material 1.4057 divide the Md_{max}-value in halves)
ß = Max. angle of deflection per joint
For application criteria and calculations refer to technical annex





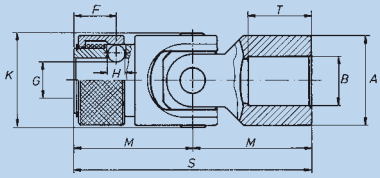
Standard bore | with key-way DIN 6885 sheet 1 | Inner square

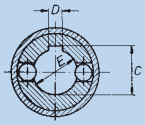
Short vers., Bore with key-way DIN 6885, Sheet 1

Cross Joints, single, Short version, Inner square

0.725.413	0.732.413	0.740.413	0.750.413	0.763.413	0.716.414	0.720.414	0.725.414	0.732.414	0.740.414	0.750.414	0.763.414
30	60	160	290	450	8	20	30	60	160	290	450
45	45	45	45	45	45	45	45	45	45	45	45
0,10	0,22	0,42	0,80	2,12	0,03	0,07	0,10	0,22	0,42	0,80	2,12
25	32	40	50	63	16	20	25	32	40	50	63
12	16	20	25	32	–	–	–	–	–	–	–
13,8	18,3	22,8	28,3	35,3	–	–	–	–	–	–	–
4	5	6	8	10	–	–	–	–	–	–	–
–	–	–	–	–	6	8	10	14	19	24	30
26,5	33,5	42	52,5	65	17,5	21,5	26,5	33,5	42	52,5	65
28	34	41	52,5	65	20	24	28	34	41	52,5	65
56	68	82	105	130	40	48	56	68	82	105	130
15	19	21**	28**	36	11	13	15	19	21**	28**	36

single, with rapid-change coupling, DIN 808





with key-way

Cross Joints, with rapid-change coupling, Bore with key-way

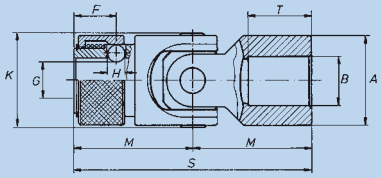
Order number		0.716.423	0.720.423	0.725.423	0.732.423	0.740.423	0.750.423	0.763.423
Md_{max}	Nm	8	20	30	60	160	290	450
Angle of deflectionl ß	°	45	45	45	45	45	45	45
Weight	kg	0,05	0,10	0,16	0,31	0,61	1,15	2,08
A	mm	16	20	25	32	40	50	63
*B^{H7}	mm	8	10	14	16	20	25	30
*$C^{+0,2}$	mm	9	11	15,3	17,3	21,7	26,7	31,7
*D^{H8}	mm	2	3	5	5	6	8	8
*E^{H7}	mm	8	10	14	16	20	25	30
F	mm	9,5	11,5	13,5	14	19	20,5	25
G	mm	7	8,7	13	14,8	18	23	28
H	mm	3,5	4	4	6,35	8	10	10
K	mm	17,5	21,5	26,5	33,5	42	52,5	65
M	mm	26	31	37	43	54	66	83
S	mm	52	62	74	86	108	132	166
*SW^{H7}	mm	–	–	–	–	–	–	–
T	mm	15	18	22	25	32	40	50

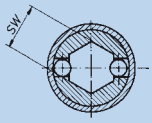
■ T I P ■

There are application examples in which frequent removal of the universal joint shaft or the joint from the drive or the output shaft is required.

In this case the use of a rapid-change coupling allows to change the shaft within very short time. This is done manually without any tools.

Torque transmission is ensured via a hexagonal profile or a feather key. Two steel balls which grip into a circular groove at the shaft connection provide axial locking of the shaft.





Inner hexagon

Cross Joints, with rapid-change coupling, Inner hexagon

0.716.426	0.720.426	0.725.426	0.725.427	0.732.426	0.740.426	0.750.426	0.763.426	0.763.427
8	20	30	30	60	160	290	450	450
45	45	45	45	45	45	45	45	45
0,05	0,10	0,16	0,16	0,31	0,61	1,15	2,08	2,08
16	20	25	25	32	40	50	63	63
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
9,5	11,5	13,5	13,5	14	19	20,5	25	25
6,3	8	13	10,5	14,8	18	23	28	33
3,5	4	4	4	6,35	8	10	10	10
17,5	21,5	26,5	26,5	33,5	42	52,5	65	65
26	31	37	37	43	54	66	83	83
52	62	74	74	86	108	132	166	166
7,2	9,06	14,04	11,15	16	20	25	30	35
15	18	22	22	25	32	40	50	50

* = Customized bores, key-ways and inner hexagon dimensions possible
Md_{max} = Max. permissible torque (when using material 1.4057 divide the Md_{max}-value in halves)
ß = Max. angle of deflection per joint
For application criteria and calculations refer to technical annex

elso

Ball and socket joints and shafts of our production series 0.800 are supported by gliding bearings and therefore can only be used at low speeds.

The permissible maximum speeds depend on the deflection angle and the load, however, they should not exceed 500 rpm.

We strongly recommend to consult our Technical Advice Service in cases of uncertainty.

Unlike cardan joints, ball and socket joints cannot be exposed to axial stress.

To ensure trouble-free operation, the joints must always be sufficiently lubricated. This may also be done by means of bellows with grease or oil filling.

Further information on the use of ball and socket joints and shafts can be found under „Information on the use" in the Technical Annex, chapter 8.

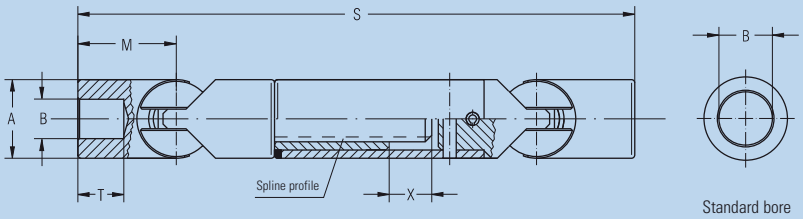
Page 146 provides information on surface refinement processes.

General technical data of the production series 0.800:

Max. angle of deflection:	35°
Torque range:	up to 1370 Nm
Material:	11SMnPb 30 k
Material No.	1.0718
Special material:	X 17 CrNi 16-2
Material No.	1.4057 (corrosion- and acid-resistant)

For more detailed information please refer to the datasheets which follow.

with length compensation, Standard bore

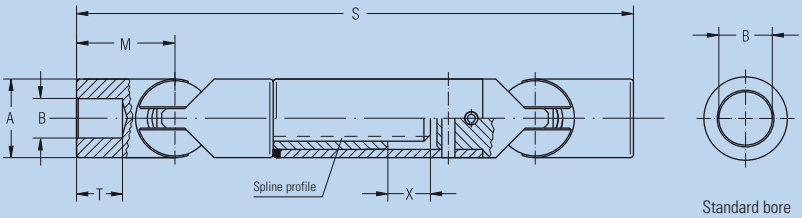


When ordering, please indicate compressed length and extension!

Ball and Socket Shafts, Standard bore

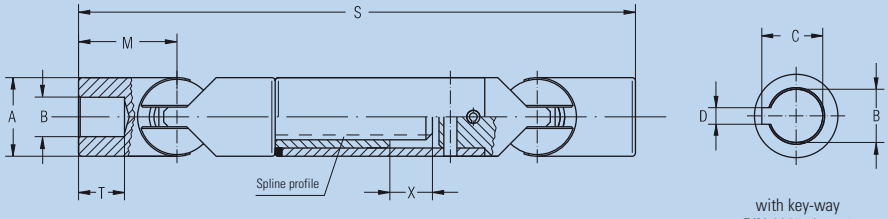
Order number		0.820.100	0.824.100	0.828.100	0.832.100	0.836.100	0.840.100	0.845.100
Md_{max}	Nm	20	30	50	60	120	160	200
Angle of deflection ß	°	35	35	35	35	35	35	35
Weight by S_1	kg	0,32	0,50	0,78	1,10	1,58	2,17	2,92
Weight by S_2	kg	0,36	0,58	0,85	1,22	1,72	2,28	3,38
Weight by S_3	kg	0,40	0,62	0,98	1,33	1,82	2,52	3,68
A	mm	20	24	28	32	36	40	45
*B^{H7}	mm	10	12	14	16	18	20	22
*$C^{+0,2}$	mm	–	–	–	–	–	–	–
*D^{P9}	mm	–	–	–	–	–	–	–
*F^{H9}	mm	–	–	–	–	–	–	–
M	mm	25	30	35	40	45	50	55
$S_1 + X_1$	mm	150 + 20	170 + 25	200 + 30	220 + 30	250 + 35	280 + 40	300 + 40
$S_2 + X_2$	mm	170 + 40	200 + 55	220 + 50	250 + 60	280 + 65	300 + 60	350 + 90
$S_3 + X_3$	mm	200 + 70	220 + 75	250 + 80	280 + 90	300 + 85	350 + 110	400 + 140
T	mm	13	14	17	19	22	24	26
Spline profile	mm	6x11x14	6x11x14	6x16x20	6x16x20	6x18x22	6x21x25	6x21x25

* = Customized bores, key-ways and inner square dimensions possible
Md_{max} = Max. permissible torque (when using material 1.4057 divide the Md_{max}-value in halves)
ß = Max. angle of deflection per joint
S_1
S_2 = preferred lengths, compressed
S_3
X_1 = Maximum extension for S_1
X_2 = Maximum extension for S_2
X_3 = Maximum extension for S_3
For application criteria and calculations refer to technical annex



0.850.100	0.855.100	0.860.100	0.865.100	0.870.100	0.880.100	0.890.100	0.896.100	
290	440	520	700	820	930	1060	1250	
35	35	35	35	35	35	35	35	
4,27	5,50	7,78	10,4	13,6	20,1	27,7	35,8	
4,58	5,98	8,45	10,8	14,7	21,9	30,6	38,7	
5,18	6,62	9,58	11,8	16,2	24,5	33,5	41,7	
50	55	60	65	70	80	90	100	
25	30	35	40	45	50	60	70	
–	–	–	–	–	–	–	–	
–	–	–	–	–	–	–	–	
–	–	–	–	–	–	–	–	
62,5	67,5	82,5	95	105	115	130	145	
350 + 50	400 + 50	450 + 50	520 + 70	580 + 70	630 + 70	700 + 70	800 + 100	
400 + 100	450 + 100	500 + 100	550 + 100	630 + 120	700 + 140	800 + 170	900 + 200	
450 + 150	500 + 160	580 + 180	630 + 180	700 + 190	800 + 240	900 + 270	1000 + 300	
30	35	42	46	52	58	70	80	
6x28x34	6x28x34	6x36x42	6x36x42	52x44x18	58x50x18	62x54x20	62x54x20	

with length compensation, Bore with key-way DIN 6885, Sheet 1



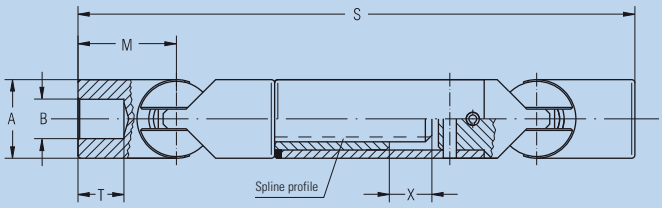
with key-way
DIN 6885 sheet 1

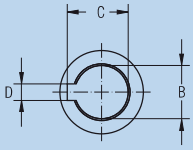
When ordering, please indicate compressed length and extension!

Ball and Socket Shafts, Bore with key-way DIN 6885, Sheet 1

Order number		0.820.103	0.824.103	0.828.103	0.832.103	0.836.103	0.840.103	0.845.103
Md_{max}	Nm	20	30	50	60	120	160	200
Angle of deflection ß	°	35	35	35	35	35	35	35
Weight by S_1	kg	0,32	0,50	0,78	1,10	1,58	2,17	2,92
Weight by S_2	kg	0,36	0,58	0,85	1,22	1,72	2,28	3,38
Weight by S_3	kg	0,40	0,62	0,98	1,33	1,82	2,52	3,68
A	mm	20	24	28	32	36	40	45
$*B^{H7}$	mm	10	12	14	16	18	20	22
$*C^{+0,2}$	mm	11,4	13,8	16,3	18,3	20,8	22,8	24,8
$*D^{P9}$	mm	3	4	5	5	6	6	6
$*F^{H9}$	mm	–	–	–	–	–	–	–
M	mm	25	30	35	40	45	50	55
$S_1 + X_1$	mm	150 + 20	170 + 25	200 + 30	220 + 30	250 + 35	280 + 40	300 + 40
$S_2 + X_2$	mm	170 + 40	200 + 55	220 + 50	250 + 60	280 + 65	300 + 60	350 + 90
$S_3 + X_3$	mm	200 + 70	220 + 75	250 + 80	280 + 90	300 + 85	350 + 110	400 + 140
T	mm	13	14	17	19	22	24	26
Spline profile	mm	6x11x14	6x11x14	6x16x20	6x16x20	6x18x22	6x21x25	6x21x25

* = Customized bores, key-ways and inner square dimensions possible
Md_{max} = Max. permissible torque (when using material 1.4057 divide the Md_{max}-value in halves)
ß = Max. angle of deflection per joint
S_1
S_2 = preferred lengths, compressed
S_3
X_1 = Maximum extension for S_1
X_2 = Maximum extension for S_2
X_3 = Maximum extension for S_3
For application criteria and calculations refer to technical annex

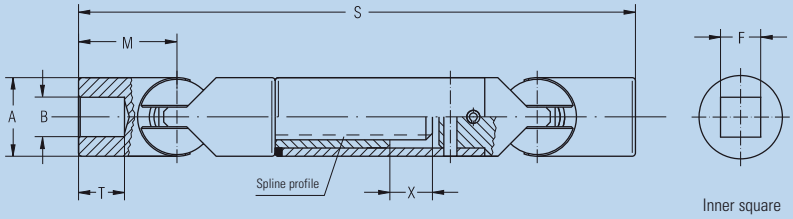




with key-way
DIN 6885 sheet 1

0.850.103	0.855.103	0.860.103	0.865.103	0.870.103	0.880.103	0.890.103	0.896.103	
290	440	520	700	820	930	1060	1250	
35	35	35	35	35	35	35	35	
4,27	5,50	7,78	10,4	13,6	20,1	27,7	35,8	
4,58	5,98	8,45	10,8	14,7	21,9	30,6	38,7	
5,18	6,62	9,58	11,8	16,2	24,5	33,5	41,7	
50	55	60	65	70	80	90	100	
25	30	35	40	45	50	60	70	
28,3	33,3	38,3	43,3	48,8	53,8	64,4	74,9	
8	8	10	12	14	14	18	20	
–	–	–	–	–	–	–	–	
62,5	67,5	82,5	95	105	115	130	145	
350 + 50	400 + 50	450 + 50	520 + 70	580 + 70	630 + 70	700 + 70	800 + 100	
400 + 100	450 + 100	500 + 100	550 + 100	630 + 120	700 + 140	800 + 170	900 + 200	
450 + 150	500 + 160	580 + 180	630 + 180	700 + 190	800 + 240	900 + 270	1000 + 300	
30	35	42	46	52	58	70	80	
6x28x34	6x28x34	6x36x42	6x36x42	52x44x18	58x50x18	62x54x20	62x54x20	

with length compensation, Inner square

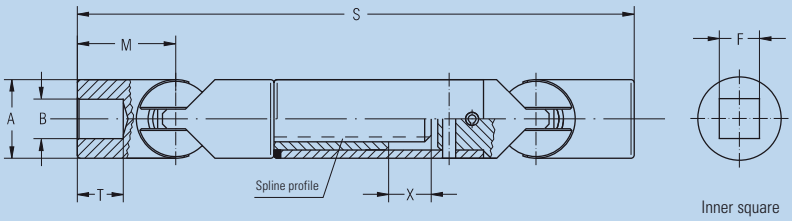


When ordering, please indicate compressed length and extension!

Ball and Socket Shafts, Inner square

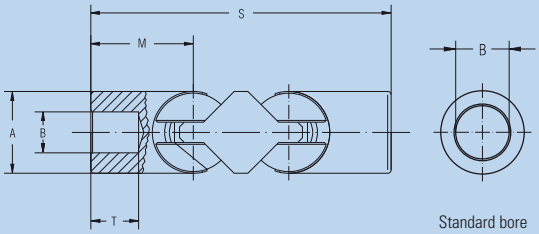
Order number		0.820.104	0.824.104	0.828.104	0.832.104	0.836.104	0.840.104	0.845.104
Md_{max}	Nm	20	30	50	60	120	160	200
Angle of deflection ß	°	35	35	35	35	35	35	35
Weight by S_1	kg	0,32	0,50	0,78	1,10	1,58	2,17	2,92
Weight by S_2	kg	0,36	0,58	0,85	1,22	1,72	2,28	3,38
Weight by S_3	kg	0,40	0,62	0,98	1,33	1,82	2,52	3,68
A	mm	20	24	28	32	36	40	45
$*B^{H7}$	mm	–	–	–	–	–	–	–
$*C^{+0,2}$	mm	–	–	–	–	–	–	–
$*D^{P9}$	mm	–	–	–	–	–	–	–
$*F^{H9}$	mm	10	12	14	16	18	20	22
M	mm	25	30	35	40	45	50	55
$S_1 + X_1$	mm	150 + 20	170 + 25	200 + 30	220 + 30	250 + 35	280 + 40	300 + 40
$S_2 + X_2$	mm	170 + 40	200 + 55	220 + 50	250 + 60	280 + 65	300 + 60	350 + 90
$S_3 + X_3$	mm	200 + 70	220 + 75	250 + 80	280 + 90	300 + 85	350 + 110	400 + 140
T	mm	13	14	17	19	22	24	26
Spline profile	mm	6x11x14	6x11x14	6x16x20	6x16x20	6x18x22	6x21x25	6x21x25

* = Customized bores, key-ways and inner square dimensions possible
Md_{max} = Max. permissible torque (when using material 1.4057 divide the Md_{max}-value in halves)
ß = Max. angle of deflection per joint
S_1
S_2 = preferred lengths, compressed
S_3
X_1 = Maximum extension for S_1
X_2 = Maximum extension for S_2
X_3 = Maximum extension for S_3
For application criteria and calculations refer to technical annex



0.850.104	0.855.104	0.860.104	0.865.104	0.870.104	0.880.104	0.890.104	0.896.104	
290	440	520	700	820	930	1060	1250	
35	35	35	35	35	35	35	35	
4,27	5,50	7,78	10,4	13,6	20,1	27,7	35,8	
4,58	5,98	8,45	10,8	14,7	21,9	30,6	38,7	
5,18	6,62	9,58	11,8	16,2	24,5	33,5	41,7	
50	55	60	65	70	80	90	100	
–	–	–	–	–	–	–	–	
–	–	–	–	–	–	–	–	
–	–	–	–	–	–	–	–	
25	30	32	36	40	42	50	54	
62,5	67,5	82,5	95	105	115	130	145	
350 + 50	400 + 50	450 + 50	520 + 70	580 + 70	630 + 70	700 + 70	800 + 100	
400 + 100	450 + 100	500 + 100	550 + 100	630 + 120	700 + 140	800 + 170	900 + 200	
450 + 150	500 + 160	580 + 180	630 + 180	700 + 190	800 + 240	900 + 270	1000 + 300	
30	35	42	46	52	58	70	80	
6x28x34	6x28x34	6x36x42	6x36x42	52x44x18	58x50x18	62x54x20	62x54x20	

double, Standard bore

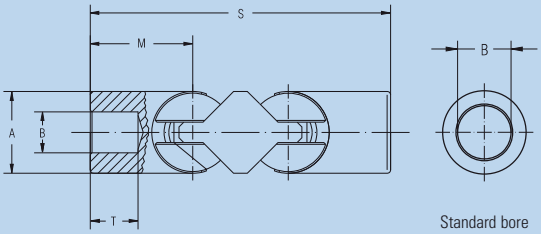


Standard bore

Ball ans Socket Joints, double, Standard bore

Order number		0.820.300	0.824.300	0.828.300	0.832.300	0.836.300	0.840.300	0.845.300
Md_{max}	Nm	20	30	50	60	120	160	200
Angle of deflection ß	°	35	35	35	35	35	35	35
Weight	kg	0,14	0,22	0,38	0,55	0,78	1,08	1,48
A	mm	20	24	28	32	36	40	45
*B^{H7}	mm	10	12	14	16	18	20	22
*$C^{+0,2}$	mm	–	–	–	–	–	–	–
*D^{P9}	mm	–	–	–	–	–	–	–
*F^{H9}	mm	–	–	–	–	–	–	–
M	mm	25	30	35	40	45	50	55
S	mm	74	88	103	118	133	148	163
T	mm	13	14	17	19	22	24	26

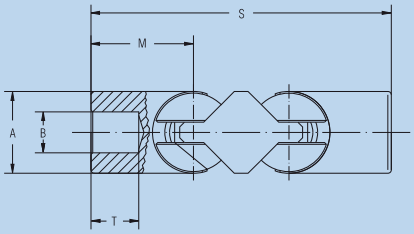
* = Customized bores, key-ways and inner square dimensions possible
Md_{max} = Max. permissible torque (when using material 1.4057 divide the Md_{max}-value in halves)
ß = Max. angle of deflection per joint
For application criteria and calculations refer to technical annex

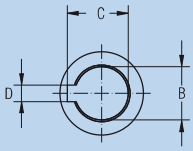


Standard bore

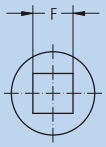
0.850.300	0.855.300	0.860.300	0.865.300	0.870.300	0.880.300	0.890.300	0.896.300	0.897.300
290	440	520	700	820	930	1060	1250	1370
35	35	35	35	35	35	35	35	35
2,08	2,62	3,65	4,78	5,88	8,52	11,7	15,5	21,8
50	55	60	65	70	80	90	100	110
25	30	35	40	45	50	60	70	75
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
62,5	67,5	82,5	95	105	115	130	145	160
185	200	237	267	292	322	362	404	444
30	35	42	46	52	58	70	80	85

double, Bore with key-way DIN 6885, Sheet 1; Inner square





with key-way
DIN 6885 sheet 1



Inner square

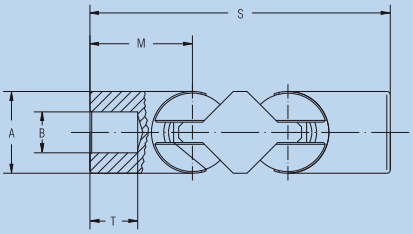
Ball and Socket Joints, double, Bore with key-way DIN 6885, Sheet 1

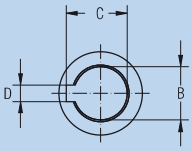
Order number		0.820.303	0.824.303	0.828.303	0.832.303	0.836.303	0.840.303	0.845.303
Md_{max}	Nm	20	30	50	60	120	160	200
Angle of deflection ß	°	35	35	35	35	35	35	35
Weight	kg	0,14	0,22	0,38	0,55	0,78	1,08	1,48
A	mm	20	24	28	32	36	40	45
*B^{H7}	mm	10	12	14	16	18	20	22
*$C^{+0,2}$	mm	11,4	13,8	16,3	18,3	20,8	22,8	24,8
*D^{P9}	mm	3	4	5	5	6	6	6
*F^{H9}	mm	–	–	–	–	–	–	–
M	mm	25	30	35	40	45	50	55
S	mm	74	88	103	118	133	148	163
T	mm	13	14	17	19	22	24	26

Ball and Socket Joints, double, Inner square

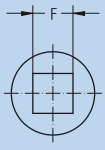
Order number		0.820.304	0.824.304	0.828.304	0.832.304	0.836.304	0.840.304	0.845.304
Md_{max}	Nm	20	30	50	60	120	160	200
Angle of deflection ß	°	35	35	35	35	35	35	35
Weight	kg	0,14	0,22	0,38	0,55	0,78	1,08	1,48
A	mm	20	24	28	32	36	40	45
*B^{H7}	mm	–	–	–	–	–	–	–
*$C^{+0,2}$	mm	–	–	–	–	–	–	–
*D^{P9}	mm	–	–	–	–	–	–	–
*F^{H9}	mm	10	12	14	16	18	20	22
M	mm	25	30	35	40	45	50	55
S	mm	74	88	103	118	133	148	163
T	mm	13	14	17	19	22	24	26

* = Customized bores, key-ways and inner square dimensions possible
Md_{max} = Max. permissible torque (when using material 1.4057 divide the Md_{max}-value in halves)
ß = Max. angle of deflection per joint
For application criteria and calculations refer to technical annex





with key-way
DIN 6885 sheet 1

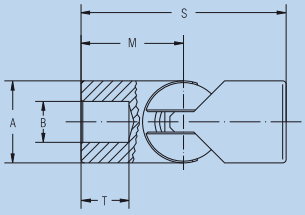


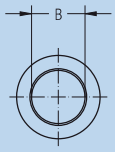
Inner square

0.850.303	0.855.303	0.860.303	0.865.303	0.870.303	0.880.303	0.890.303	0.896.303	0.897.303
290	440	520	700	820	930	1060	1250	1370
35	35	35	35	35	35	35	35	35
2,08	2,62	3,65	4,78	5,88	8,52	11,7	15,5	21,8
50	55	60	65	70	80	90	100	110
25	30	35	40	45	50	60	70	75
28,3	33,3	38,3	43,3	48,8	53,8	64,4	74,9	79,9
8	8	10	12	14	14	18	20	20
–	–	–	–	–	–	–	–	–
62,5	67,5	82,5	95	105	115	130	145	160
185	200	237	267	292	322	362	404	444
30	35	42	46	52	58	70	80	85

0.850.304	0.855.304	0.860.304	0.865.304	0.870.304	0.880.304	0.890.304	0.896.304	0.897.304
290	440	520	700	820	930	1060	1250	1370
35	35	35	35	35	35	35	35	35
2,08	2,62	3,65	4,78	5,88	8,52	11,7	15,5	21,8
50	55	60	65	70	80	90	100	110
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
25	30	32	36	40	42	50	54	58
62,5	67,5	82,5	95	105	115	130	145	160
185	200	237	267	292	322	362	404	444
30	35	42	46	52	58	70	80	85

single, Standard bore



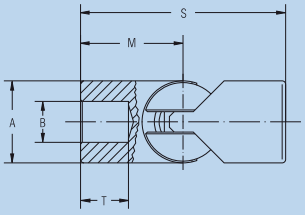


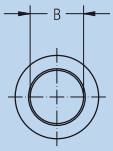
Standard bore

Ball and Socket Joints, single, Standard bore

Order number		0.813.400	0.816.400	0.820.400	0.824.400	0.828.400	0.832.400	0.836.400	0.840.400
Md_{max}	Nm	6	8	20	30	50	60	120	160
Angle of deflection ß	°	35	35	35	35	35	35	35	35
Weight	kg	0,03	0,05	0,09	0,15	0,24	0,36	0,53	0,72
A	mm	13	16	20	24	28	32	36	40
*B^{H7}	mm	6	8	10	12	14	16	18	20
*$C^{+0,2}$	mm	–	–	–	–	–	–	–	–
*D^{P9}	mm	–	–	–	–	–	–	–	–
*F^{H9}	mm	–	–	–	–	–	–	–	–
M	mm	17,5	20	25	30	35	40	45	50
S	mm	35	40	50	60	70	80	90	100
T	mm	10	10	13	14	17	19	22	24

* = Customized bores, key-ways an inner square dimensions possible
Md_{max} = Max. permissible torque (when using material 1.4057 divide the Md_{max}-value in halves)
ß = Max. angle of deflection per joint
For application criteria and calculations refer to technical annex

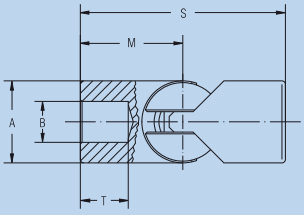


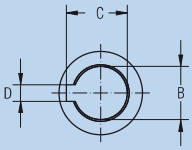


Standard bore

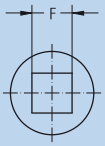
0.845.400	0.850.400	0.855.400	0.860.400	0.865.400	0.870.400	0.880.400	0.890.400	0.896.400	0.897.400
200	290	440	520	700	820	930	1060	1250	1370
35	35	35	35	35	35	35	35	35	35
1,02	1,40	1,75	2,52	3,32	4,15	6,02	8,04	10,6	15,3
45	50	55	60	65	70	80	90	100	110
22	25	30	35	40	45	50	60	70	75
–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–
55	62,5	67,5	82,5	95	105	115	130	145	160
110	125	135	165	190	210	230	260	290	320
26	30	35	42	46	52	58	70	80	85

single, Bore with key-way DIN 6885, Sheet 1; Inner square





with key-way
DIN 6885 sheet 1



Inner square

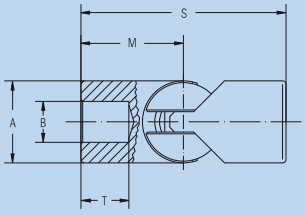
Ball and Socket Joints, single, Bore with Key-way DIN 6885, Sheet 1

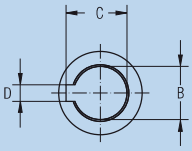
Order number		0.820.403	0.824.403	0.828.403	0.832.403	0.836.403	0.840.403
Md_{max}	Nm	20	30	50	60	120	160
Angle of deflection ß	°	35	35	35	35	35	35
Weight	kg	0,09	0,15	0,24	0,36	0,53	0,72
A	mm	20	24	28	32	36	40
*B^{H7}	mm	10	12	14	16	18	20
*$C^{+0,2}$	mm	11,4	13,8	16,3	18,3	20,8	22,8
*D^{P9}	mm	3	4	5	5	6	6
*F^{H9}	mm	–	–	–	–	–	–
M	mm	25	30	35	40	45	50
S	mm	50	60	70	80	90	100
T	mm	13	14	17	19	22	24

Ball and Socket Joints, single, Inner square

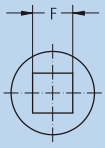
Order number		0.820.404	0.824.404	0.828.404	0.832.404	0.836.404	0.840.404
Md_{max}	Nm	20	30	50	60	120	160
Angle of deflection ß	°	35	35	35	35	35	35
Weight	kg	0,09	0,15	0,24	0,36	0,53	0,72
A	mm	20	24	28	32	36	40
*B^{H7}	mm	–	–	–	–	–	–
*$C^{+0,2}$	mm	–	–	–	–	–	–
*D^{P9}	mm	–	–	–	–	–	–
*F^{H9}	mm	10	12	14	16	18	20
M	mm	25	30	35	40	45	50
S	mm	50	60	70	80	90	100
T	mm	13	14	17	19	22	24

* = Customized bores, key-ways an inner square dimensions possible
Md_{max} = Max. permissible torque (when using material 1.4057 divide the Md_{max}-value in halves)
ß = Max. angle of deflection per joint
For application criteria and calculations refer to technical annex





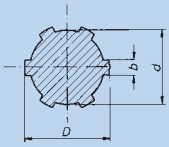
with key-way
DIN 6885 sheet 1



Inner square

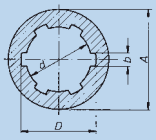
0.845.403	0.850.403	0.855.403	0.860.403	0.865.403	0.870.403	0.880.403	0.890.403	0.896.403	0.897.403
200	290	440	520	700	820	930	1060	1250	1370
35	35	35	35	35	35	35	35	35	35
1,02	1,40	1,75	2,52	3,32	4,15	6,02	8,04	10,6	15,3
45	50	55	60	65	70	80	90	100	110
22	25	30	35	40	45	50	60	70	75
24,8	28,3	33,3	38,3	43,3	48,8	53,3	64,4	74,9	79,9
6	8	8	10	12	14	14	18	20	20
–	–	–	–	–	–	–	–	–	–
55	62,5	67,5	82,5	95	105	115	130	145	160
110	125	135	165	190	210	230	260	290	320
26	30	35	42	46	52	58	70	80	85

0.845.404	0.850.404	0.855.404	0.860.404	0.865.404	0.870.404	0.880.404	0.890.404	0.896.404	0.897.404
200	290	440	520	700	820	930	1060	1250	1370
35	35	35	35	35	35	35	35	35	35
1,02	1,40	1,75	2,52	3,32	4,15	6,02	8,04	10,6	15,3
45	50	55	60	65	70	80	90	100	110
–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–
22	25	30	32	36	40	42	50	54	58
55	62,5	67,5	82,5	95	105	115	130	145	160
110	125	135	165	190	210	230	260	290	320
26	30	35	42	46	52	58	70	80	85



Spline Shafts DIN ISO 14

Material: C40 k, 1.0511 oder C45 k, 1.0503
Material: 35 S 20 k, 1.0726



Spline Bore Hubs DIN ISO 14

Material: 11SMnPb 30 k, 1.0718

Also available with Spigots

Spline Shafts DIN ISO 14

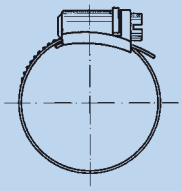
Order number		1.000.524.001	1.000.524.002	1.000.524.003	1.000.524.004	1.000.524.005	1.000.524.007	1.000.524.006
Designation		B 6 x 11 x 14	B 6 x 16 x 20	B 6 x 18 x 22	B 6 x 21 x 25	B 6 x 28 x 32	B 6 x 28 x 34	B 6 x 36 x 42
D	mm	14	20	22	25	32	34	42
d	mm	11	16	18	21	28	28	36
b	mm	3	4	5	5	7	7	8
Available in all lenghts up to	mm	3000	3000	3000	3000	500*	3000	500*

Material: C40 k, 1.0511 oder C45 k, 1.0503
*= Material: 35 S 20 k, 1.0726

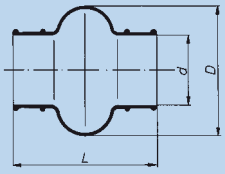
Spline Bore Hubs DIN ISO 14

Order number		1.000.511.001	1.000.511.002	1.000.511.003	1.000.511.004	1.000.511.005	1.000.511.007	1.000.511.006
Designation		A 6 x 11 x 14	A 6 x 16 x 20	A 6 x 18 x 22	A 6 x 21 x 25	A 6 x 28 x 32	A 6 x 28 x 34	A 6 x 36 x 42
D	mm	14	20	22	25	32	34	42
d	mm	11	16	18	21	28	28	36
b	mm	3	4	5	5	7	7	8
A	mm	20	28	36	40	50	50	60
Lenght*	mm	50	60	70	70	80	60	100

*= max. grip lenght even
Material: 11SMnPb 30 k, 1.0718



Material: steel, zinc-plated or stainless steel, corrosion- and acid-resistant



Material: neoprene; temperature-resistant up to 100 °C

Hose Clips, steel, zinc-plated

Order number		1.000.961.011	1.000.961.029	1.000.961.003	1.000.961.006	1.000.961.012	1.000.961.013	1.000.961.014	1.000.961.010
Joint-size		0.716/0.816/ 0.720/0.820	0.824/0.725/ 0.828	0.732/0.832/ 0.836	0.740/0.840/ 0.845	0.750/0.850/ 0.855	0.860/0.865	0.870	0.880
Clamping range	mm	12 – 20	20 – 32	25 – 40	32 – 50	40 – 60	50 – 70	60 – 80	70 – 90

Hose Clips, stainless steel, corrosion- and acid-resistant

Order number		1.000.961.020	1.000.961.022	1.000.961.023	1.000.961.024	1.000.961.025	1.000.961.026	1.000.961.027	1.000.961.028
Joint-size		0.716/0.816/ 0.720/0.820	0.824/0.725/ 0.828	0.732/0.832/ 0.836	0.740/0.840/ 0.845	0.750/0.850/ 0.855	0.860/0.865	0.870	0.880
Clamping range	mm	12 – 20	20 – 32	25 – 40	32 – 50	40 – 60	50 – 70	60 – 80	70 – 90

Bellows

Order number		1.000.830.009	1.000.830.010	1.000.830.013	1.000.830.014	1.000.830.002	1.000.830.003
Joint-size		0.716/0.816	0.720/0.820	0.725/0.824	0.828	0.732/0.832	0.836
L	mm	40	47	52	58	67	74
D	mm	31	33	46	50	54	65
d	mm	16	20	25	28	32	36

1.000.830.004	1.000.830.015	1.000.830.016	1.000.830.006	1.000.830.007	1.000.830.017
0.740/0.840	0.845	0.750/0.850	0.855/0.860	0.865/0.870	0.880
84	97	110	122	132	157
75	82	90	100	110	131
040	45	50	56	65	80

Appearance and protection. The following methods help to avoid corrosion damage:

a) by influencing the properties of the coreactants and/or changing the reaction conditions;
b) by separating the metal material from the corrosive agent by applying protective coatings and
c) by electrochemical procedures.

Chroming
This surface refinement method provides excellent protection against corrosion. A chromed part exhibits outstanding visual appearance through its shiny surface allone.

Phosphating
To obtain efficient lasting protection, additional treatment processes that are matched with the intended use of the phosphated metal surface are required, e.g. application of anti-corrosion oil or wax or coating with paint materials.

Zinc-plating
This surface refinement method allows to achieve outstanding protection against corrosion.

Stainless Steel
Different stainless steel materials are available. The use of stainless steel provides best protection against corrosion. It is for use in specific applications as well.

Aluminium
The use of aluminium provides best protection against corrosion. It is for use in specific applications as well and achieves significant weight reduction.

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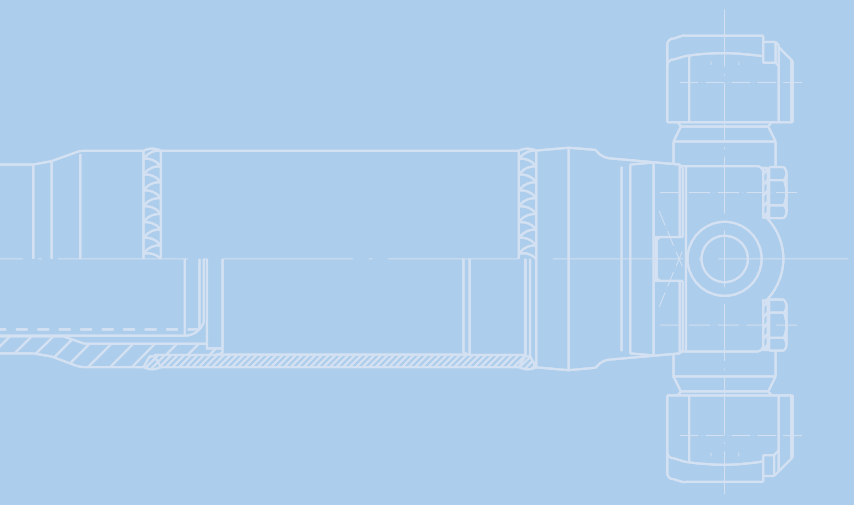
GELENKE



The complete manufacturing process with all its advantages is identical with the description of the series 0.100.

The bearings of this series feature roller bearing design with all the advantages previously described.

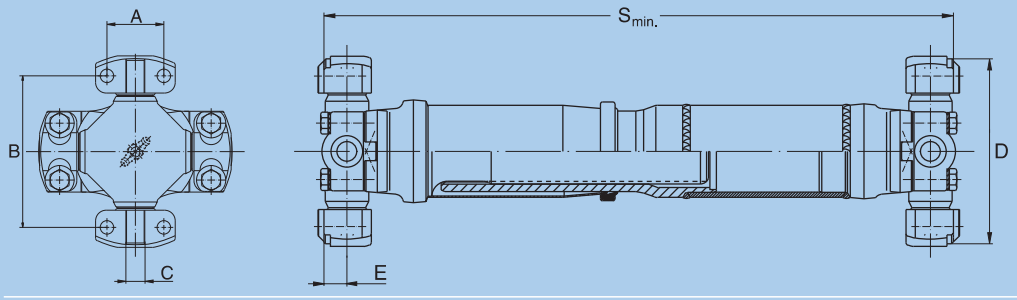
The main advantage of this wing-style version is the positive-fit connection resulting from the key of the bearing housing and the key-way of the flange. Therefore the torque is transmitted in a more defined way in comparison to the friction connection.

The four screws used to mount the flange to the universal joint allow fast assembling and disassembling.

General technical data of series 0.900:
Maximum angle of deflection: up to 30°
Torque range: up to 26700 Nm

Detailed information can be obtained from the data sheets that follow.

with extension, Roller bearing



Size 110, Tubular Type, larger extension
end number: 0.9XX.110

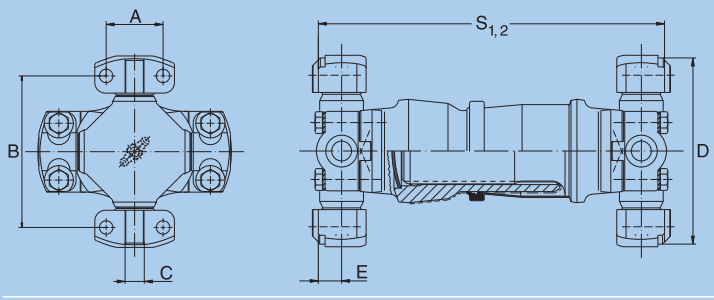
Additional lenght and types on request.

Wing-Style, Tubular Type, larger extension, Roller bearing version

Order number		0.950.110	0.960.110	0.970.110	0.985.110	0.990.110		
Series		5C	6C	7C	8.5C	9C		
Md_{lim}	Nm	5500	7800	10100	18300	26700		
Angle of deflection ß*	°	25	25	25	25	25		
S_{min}	mm	400	402	465	575	575		
S_1	mm	–	–	–	–	–		
S_2	mm	–	–	–	–	–		
X	mm	105	105	110	110	110		
X_1	mm	–	–	–	–	–		
X_2	mm	–	–	–	–	–		
P_1	mm	**60 x 4**	**70 x 4**	**80 x 4**	**100 x 5**	**110 x 6**		
G (at S_{min})	kg	9,85	12,90	17,74	32,89	40,73		
G/100 mm standard tube	kg	0,55	0,65	0,75	1,17	1,54		
Spline dim. DIN 5480	mm	42 x 2,0 x 20	50 x 2,0 x 24	55 x 2,5 x 20	65 x 2,5 x 24	75 x 2,5 x 28		
$A_{\pm 0,2}$	mm	42,9	42,9	49,2	71,4	71,4		
$B_{\pm 0,2}$	mm	88,9	114,3	117,5	123,9	168,3		
C_{h8}	mm	14,26	14,26	15,85	15,85	15,85		
$D_{-0,04}$	mm	115,06	140,46	148,39	165,08	209,52		
E (Subtraction measure)	mm	17,5	17,5	20,6	25,4	25,4		

* Please refer to point 6.7 of the technical attachment

Md_{lim} = Maximum permitted torque. See technical annex
ß* = Maximum angle of deflection
S_{min} = Minimum length of tubular types
S_1 = Compressed lengths
S_2 = of short types
X_1 = Extension at S_{min} resp. S_1
X_2 = Extension at S_2
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
G = Weight



Size 130, Short Type
end number: 0.9XX.130

Additional lenght and types on request.

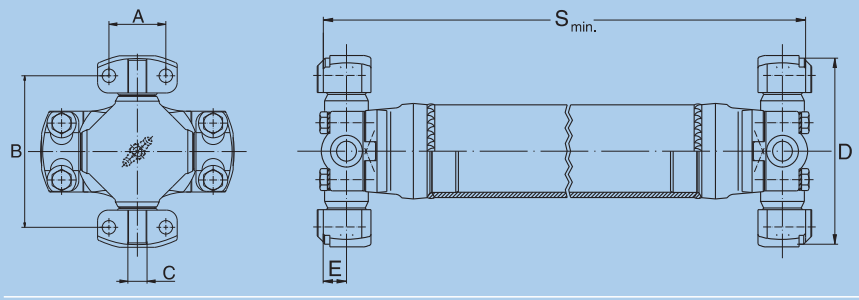
Wing-Style, Short Type, Roller bearing version

Order number		–	**0.960.130**	**0.970.130**	**0.985.130**	**0.990.130**		
Series		–	6C	7C	8.5C	9C		
Md_{lim}	Nm	–	7800	10100	18300	26700		
Angle of deflection ß*	°	–	25	25	25	25		
S_{min}	mm	–	–	–	–	–		
S_1	mm	–	260	292	330	370		
S_2	mm	–	–	–	–	–		
X	mm	–	–	–	–	–		
X_1	mm	–	45	50	45	45		
X_2	mm	–	–	–	–	–		
P_1	mm	–	–	–	–	–		
G (at S_1)	kg	–	9,93	13,18	22,98	32,10		
Spline dim. DIN 5480	mm	–	50x2,0x24	55x2,5x20	65x2,5x24	75x2,5x28		
$A_{\pm 0,2}$	mm	–	42,9	49,2	71,4	71,4		
$B_{\pm 0,2}$	mm	–	114,3	117,5	123,9	168,3		
C_{h8}	mm	–	14,26	15,85	15,85	15,85		
$D_{-0,04}$	mm	–	140,46	148,39	165,08	209,52		
E (Subtraction measure)	mm	–	17,5	20,6	25,4	25,4		

* Please refer to point 6.7 of the technical attachment

Md_{lim} = Maximum permitted torque. See technical annex
ß* = Maximum angle of deflection
S_{min} = Minimum length of tubular types
S_1 = Compressed lengths
S_2 = of short types
X_1 = Extension at S_{min} resp. S_1
X_2 = Extension at S_2
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
G = Weight

without extension, Roller bearing



Size 200, Tubular Type
end number: 0.9XX.200

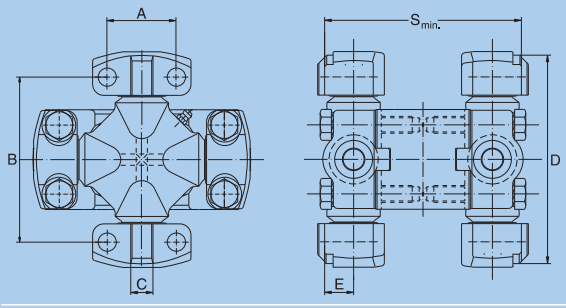
Additional lenght and types on request.

Wing-Style, Tubular Type, Roller bearing version

Order number		0.950.200	0.960.200	0.970.200	0.985.200	0.990.200		
Series		5C	6C	7C	8.5C	9C		
Md_{lim}	Nm	5500	7800	10100	18300	26700		
Angle of deflection ß*	°	25	25	25	25	25		
S_{min}	mm	205	206	245	315	295		
S_1	mm	–	–	–	–	–		
S_2	mm	–	–	–	–	–		
X	mm	–	–	–	–	–		
X_1	mm	–	–	–	–	–		
X_2	mm	–	–	–	–	–		
P_1	mm	**60x4**	**70x4**	**80x4**	**100x5**	**110x6**		
G (at S_{min})	kg	6,40	8,01	10,54	21,55	23,83		
G/100 mm standard tube	kg	0,55	0,65	0,75	1,17	1,54		
Spline dim. DIN 5480	mm	–	–	–	–	–		
$A_{\pm 0,2}$	mm	42,9	42,9	49,2	71,4	71,4		
$B_{\pm 0,2}$	mm	88,9	114,3	117,5	123,9	168,3		
C_{h8}	mm	14,26	14,26	15,85	15,85	15,85		
$D_{-0,04}$	mm	115,06	140,46	148,39	165,08	209,52		
E (Subtraction measure)	mm	17,5	17,5	20,6	25,4	25,4		

* Please refer to point 6.7 of the technical attachment

Md_{lim} = Maximum permitted torque. See technical annex
ß* = Maximum angle of deflection
S_{min} = Minimum length of tubular types
S_1 = Compressed lengths
S_2 = of short types
X_1 = Extension at S_{min} resp. S_1
X_2 = Extension at S_2
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
G = Weight



Size 300 Universal Joint double
end number: 0.9XX.300

Additional lenght and types on request.

Wing-Style, Universal Joint Double, Roller bearing version

Order number		0.950.300	0.960.300	0.970.300	–	0.985.300	
Series		5C	6C	7C	–	8.5C	
Md_{lim}	Nm	5500	7800	10100	–	18300	
Angle of deflection ß*	°	10	25	10	–	10	
S_{min}	mm	141	188	140	–	169	
S_1	mm	–	–	–	–	–	
S_2	mm	–	–	–	–	–	
X	mm	–	–	–	–	–	
X_1	mm	–	–	–	–	–	
X_2	mm	–	–	–	–	–	
P_1	mm	–	–	–	–	–	
G (at S_{min})	kg	6,75	7,50	11,0	–	17,0	
Spline dim. DIN 5480	mm	–	–	–	–	–	
$A_{\pm 0,2}$	mm	42,9	42,9	49,2	–	71,4	
$B_{\pm 0,2}$	mm	88,9	114,3	117,5	–	123,9	
C_{h8}	mm	14,26	14,26	15,85	–	15,85	
$D_{-0,04}$	mm	115,06	140,46	148,39	–	165,08	
E (Subtraction measure)	mm	17,5	17,5	20,6	–	25,4	

* Please refer to point 6.7 of the technical attachment

Md_{lim} = Maximum permitted torque. See technical annex
ß* = Maximum angle of deflection
S_{min} = Minimum length of tubular types
S_1 = Compressed lengths
S_2 = of short types
X_1 = Extension at S_{min} resp. S_1
X_2 = Extension at S_2
P_1 = Tube diameter. Dimensions in bold type for normal applications. Alternative dimensions are for long shafts at high speeds, see technical annex domain speed
G = Weight

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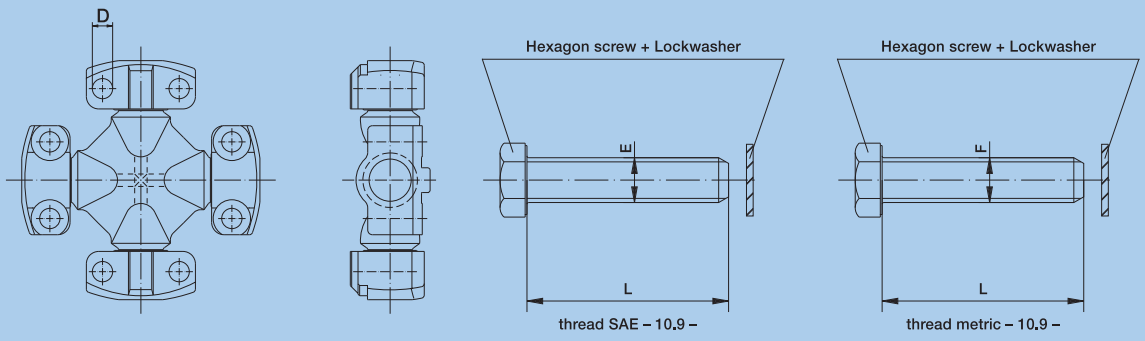


Cross Units, Roller bearing version

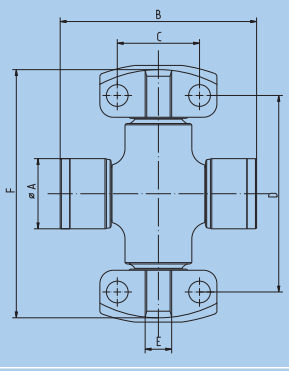
Order number		0.950.023	0.960.023	0.970.023	0.985.023	0.990.023
Series		5C	6C	7C	8.5C	9C
bore dimension Ø D	mm	$10,2^{+0,4}$	$10,2^{+0,4}$	$13,0^{+0,4}$	$13,0^{+0,4}$	$13,0^{+0,4}$

Screw kit SAE – 10.9 –

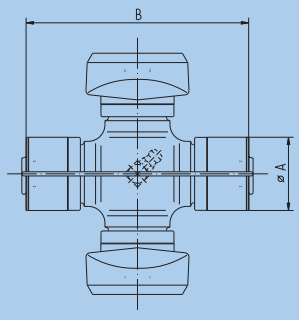
Order number		0.950.192.001	0.970.192.001	0.985.192.001
thread Ø E x L	inch	3/8"-24-UNF x 1 3/4"	1/2"-20-UNF x 2"	1/2"-20-UNF x 2,5"
Screw torque	Nm	62_{-4}	135_{-7}	135_{-7}
used for		**0.950.023/0.960.023**	**0.970.023/0.980.023**	**0.985.023/0.990.023**

Screw kit metric – 10.9 –

Order number		0.950.192.002	0.970.192.002	0.985.192.002
thread Ø F x L	mm	M10 x 1,25 x 45	M12 x 1,5 x 55	M12 x 1,5 x 60
Screw torque	Nm	70_{-4}	120_{-7}	120_{-7}
used for		**0.950.023/0.960.023**	**0.970.023/0.980.023**	**0.985.023/0.990.023**



Combination cross kits



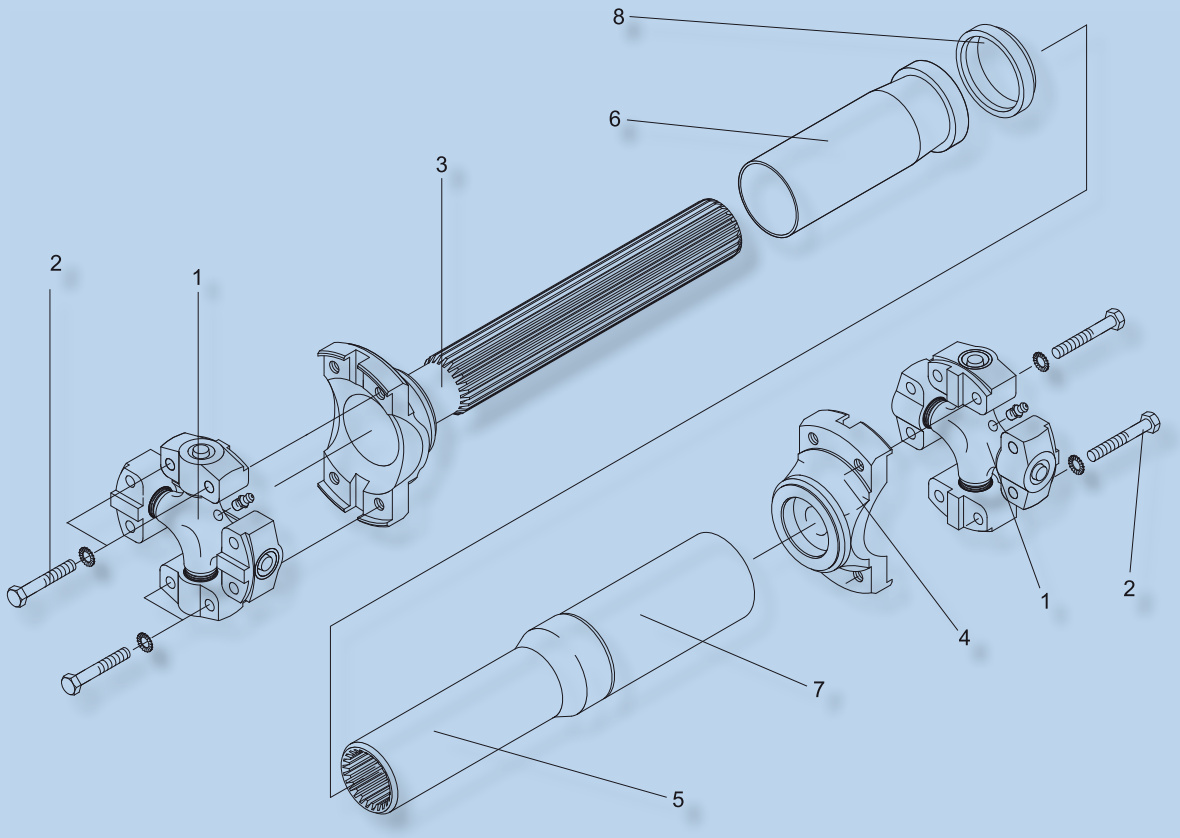
Cross kits for Half Round Yokes

Combination cross kits, Roller bearing version

Order number		0.950.023.015	0.950.023.011/012	0.960.023.016	0.960.023.019	0.960.023.017	0.970.023.012
Grease nipple		no	no	no	yes	no	no
Ø A	mm	35	38	38	38	48	42
B	mm	97	106	106	106	126	117,5
C	mm	42,9	42,9	42,9	42,9	42,9	49,2
D	mm	88,9	88,9	114,3	114,3	114,3	117,5
E	mm	14,26	14,26	14,26	14,26	14,26	15,85
F	mm	115,06	115,06	140,46	140,46	140,46	148,39
used for		**5C/112**	**5C/113**	**6C/113**	**6C/113**	**6C/158**	**7C/148**

Cross kits for Half Round Yokes, Roller bearing

Order number		0.100.015.011	0.112.015.013	
Ø A	mm	$34{,}915^{\pm 0{,}015}$	$34{,}915^{\pm 0{,}015}$	
B	mm	126,1	$106{,}26^{\pm 0{,}1}$	
used for / description		**0.100.259.011/ inter mediate shaft**	**0.100.300.220/ Universal Joint double**	

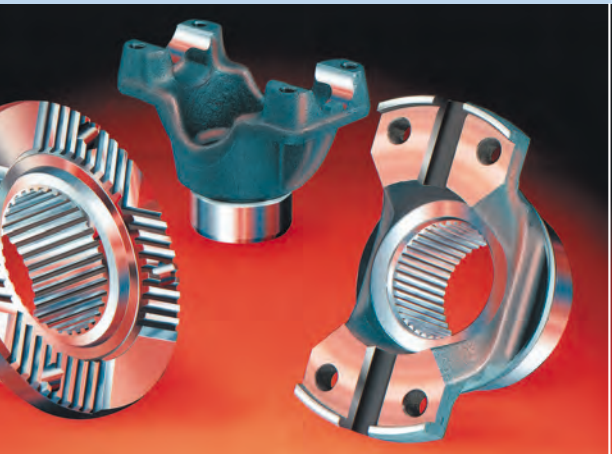


Cardan Drive-Shafts Wing Style

Individual components:

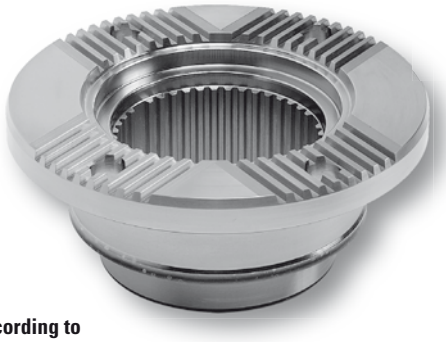
1	Cross kit complete	5	Sliding sleeve
2	Screw kit	6	Protective tube
3	Flange-shaft	7	Connecting tube
4	Weld pivot	8	Ring seal

Drive Flanges/Spiders



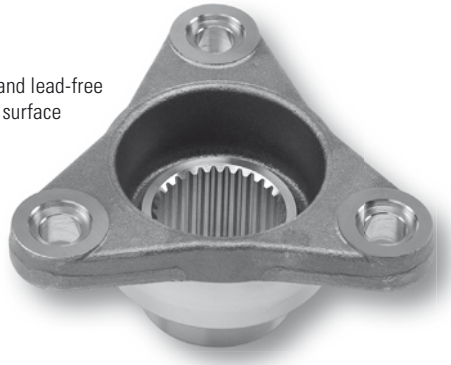
elso

Design: end plate
– Induction-hardened and lead-free ground seal bearing surface
– Internal splines



Design according to DIN ISO 8667
– Induction-hardened and lead-free ground seal bearing surface
– Internal splines
– Cross-serration 70°

Design: triangular
– Induction-hardened and lead-free ground seal bearing surface
– Internal splines



Design according to DIN 7646
– Induction-hardened and lead-free ground seal bearing surface
– Case-hardened version
– Internal splines

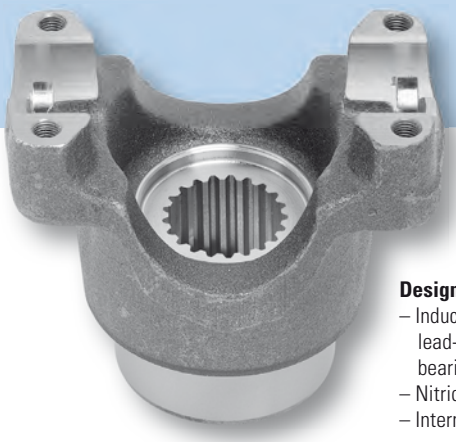
Technical Description

In vehicle construction and mechanical engineering drive flanges form the connection between drive and cardan shaft.

Using modern machine equipment, we manufacture products on the basis of high-quality forgings according to customer drawings.

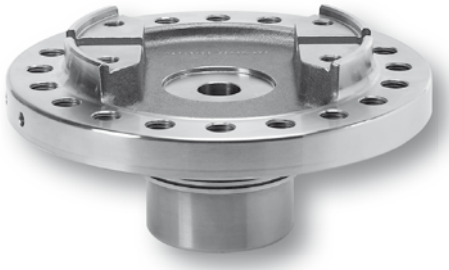
The drive flanges can be manufactured with internal and external splines as well as with hardened and lead-free ground seal bearing surface.

Please refer to the pages that follow for further information on our product range.

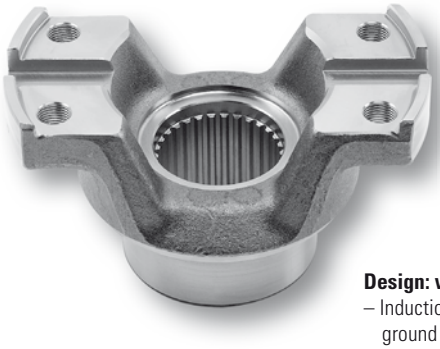


Design: half round
– Induction-hardened and lead-free ground seal bearing surface
– Nitrided
– Internal splines

Design: rectangular
– Induction-hardened and lead-free ground seal bearing surface
– Internal splines



Special design: wing style
– Induction-hardened and lead-free ground seal bearing surface
– Internal splines



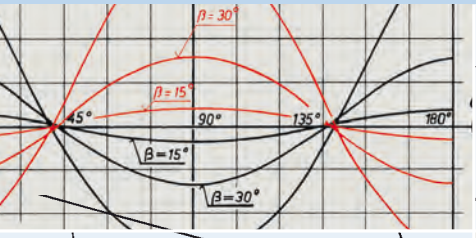
Design: wing style
– Induction-hardened and lead-free ground seal bearing surface
– Nitrided
– Internal splines

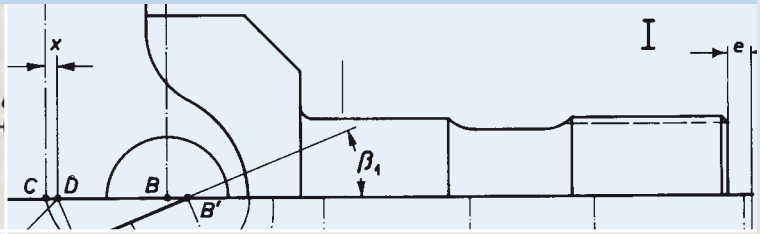
Technical Description

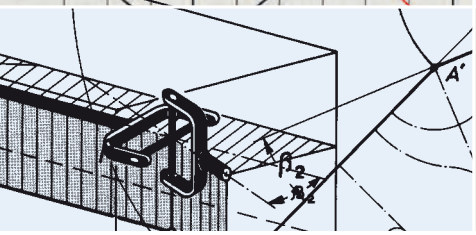
The main application field of our spiders is the integration into cardan joints. The spider is the main component of the cardan joint. Spiders, however, are also used in numerous other applications.
Our product range includes e.g. also so-called „compensation spiders" for differential gears and spiders for tool technology.
Our spiders are made of high-quality pressed or forged blanks. Processing such as turning, case-hardening and grinding is carried out at our production facilities and strict quality control processes are adhered to.

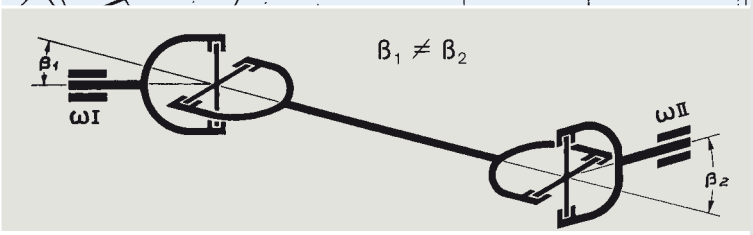
General technical data for spiders:
Trunnion diameter: 4 mm to 48 mm
For torque range: 6 Nm to 35000 Nm

Complete spider kits with needle or roller bearing supported bushings are part of the delivery program of our cardan shaft service.


β = 30°
β = 15°
45°
90°
135°
180°
β=15°
β=30°


x
I
e
C
D
B
B'
β1


A'
β2


β1 ≠ β2
β1
ωI
ωII
β2

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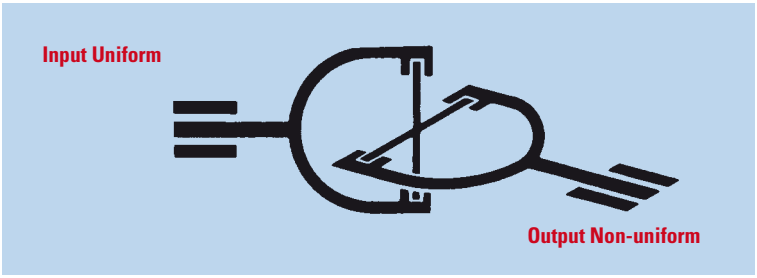
1. Installation and arrangement of universal drivelines

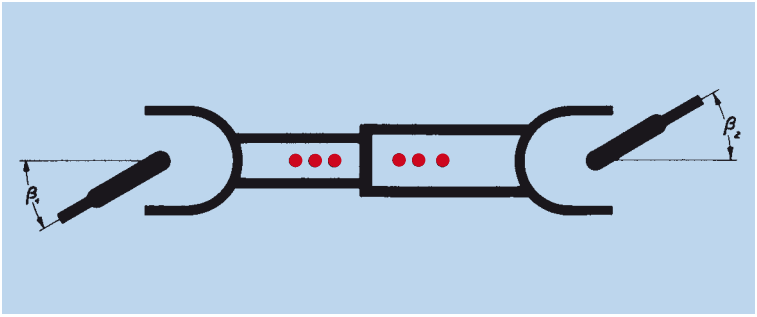
1.1 Basic installation rules

When a single universal-, cross- or ball joint is rotated uniformly in an angled position, a non-uniform motion occurs at the output side. (See motion characteristices and torques under 2).



This fluctuation is eliminated when two single joints are connected, forming a driveline. To obtain complete synchronous motion, the following conditions must be met:

a) Equal deflection angles at both joints ($ß_1 = ß_2$)
b) The two inner forks must be on one plane.
c) In- and output shaft must also lie on one plane.



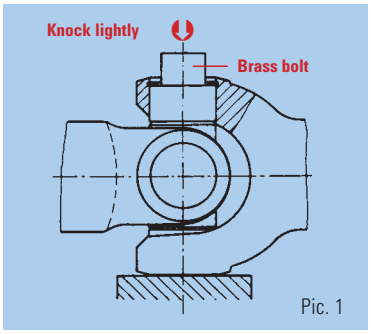
Exception:
If a driveline is angled three-dimensionally, in- and output shafts are not located in one plane. To obtain a uniform output motion, it is necessary in this case to offset the inner forks relative to each other so that they end up in the same plane of deflection created by their joints. Also, the three-dimensional deflection angles must be equal. (Our Engineering Department will glady assist you in determining the correct angular offset).

Note:
Incorrectly assembled universal joints do not equalize fluctuating output motion. They amplify it. This can lead to early joint bearing and spline failure. Therefore, when assembling the two driveline halves, the marker points on the spline shaft and spline sleeve must face each other.

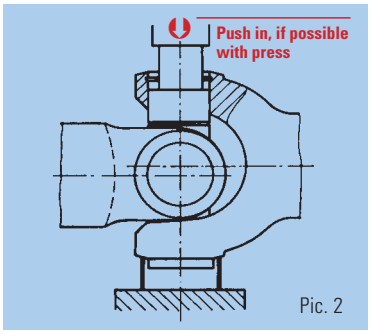
The cross Journals and the needle bearing cups wear simultaneously. It is therefore necessary to replace both the cross and the needle bearings, if they show signs of wear.

1.2 Disassembly

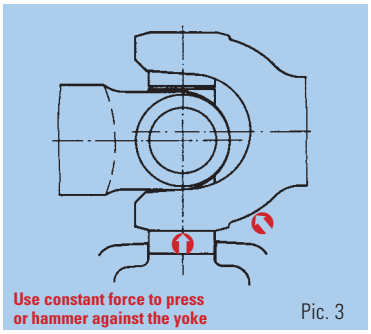
1. Eliminate the tension between circlips and cups (see picture 1).
2. Remove circlips (with special pliers).
3. Press out one cup at each yoke (see picture 2).
4. Grip cups extending out of the yokes and pull them out (see picture 3). Use aluminium or plastic hammer.
5. Press out and pull off the opposite cup.
6. Remove cross (see picture 4).



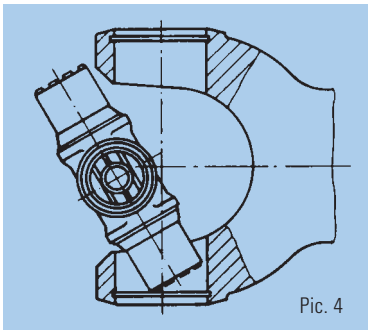
Pic. 1



Pic. 2

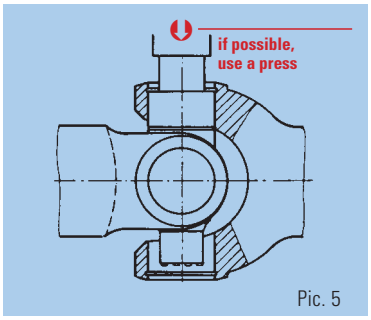


Pic. 3

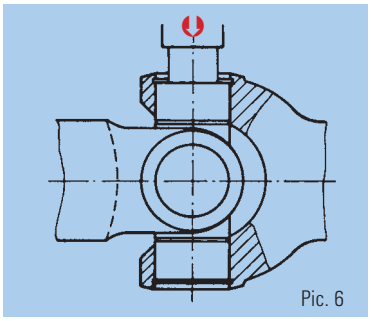

Pic. 4

1.3 Assembly.

1. Insert the cross (see picture 4).
2. Press in the bearing cup on one side and secure it with a circlip (see picture 5).
3. Press in and secure the opposite cup (see picture 6).
4. Insert the cross in the second yoke.Then press in the bearing cup and secure it.
5. Tensions in the universal joint can be eliminated by lightly tapping against the yokes with a hammer. The joint will then move more freely.



Pic. 5


Pic. 6

Instructions for Exchanging the Cross Assemblies in Double Joints for Steering Axles:
The bearing cups of the centre piece are fitted with a detaching thread. These cups can therefore be removed with a puller after removing the screw plugs.
All other steps for assembling and disassembling are the same as described above.

Attention:
Before pressing in the bearing cups, make sure that all needles are in contact with the inside diameter of the cup.
After replacing any worn parts, high-speed shafts must be rebalanced in accordance with rating G16 acc. to DIN ISO 21940. If the shaft is only subjected to low speeds, rebalancing is not necessary. The speed limit lies between 500 and 800 rpm depending on size and design of the shaft.
If, for any special reason, high-speed shafts cannot be rebalanced, the individual components of the yoke should be carefully marked before disassembling so that they can be realigned exactly afterwards. In this way the unbalance can be limited to a minimum.

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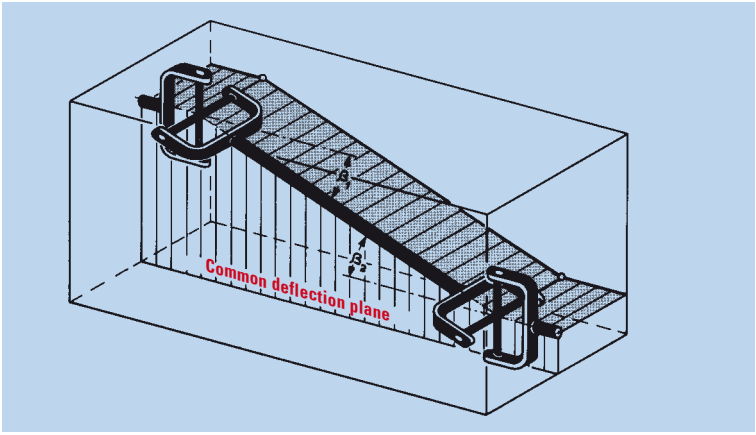
1.4 Arrangement configuration

Z-Configuration:

Input and output shaft are parallel to each other on one plane.

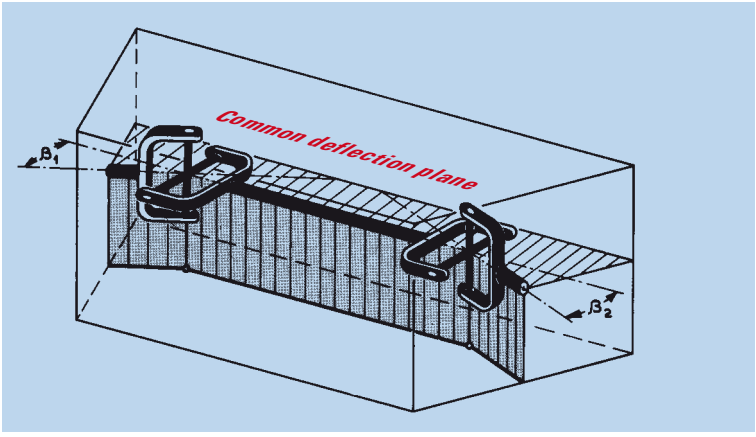
Requirement: $ß_1 = ß_2$



W-Configuration:

Input and output shaft intersect on one plane.

Requirement: $ß_1 = ß_2$



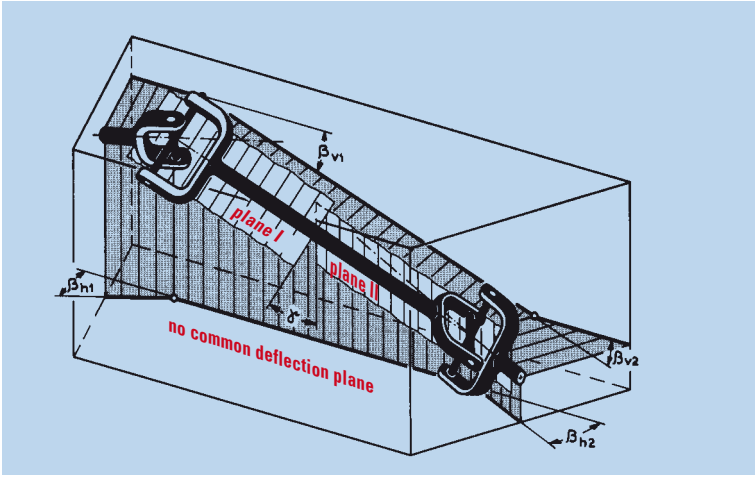
Three-dimensional configuration:

(Combined Z and W configuration)
Input and output shaft cross each other offset in space. No common plane exists. Therefore the inner forks must be offset by the angle γ (See 1.1 „Exception").

Requirement: $ß_{R1} = ß_{R2}$

The resultant three-dimensional deflection angle $ß_R$ derived from the vertical and horizontal angular deviation, is calculated as:

$$ß_R = \arctan \sqrt{\tan^2 ß_v + \tan^2 ß_h}$$



2. Motion relationships and torques

2.1 Rotation angle of a single joint

as a function of deflection angle ß

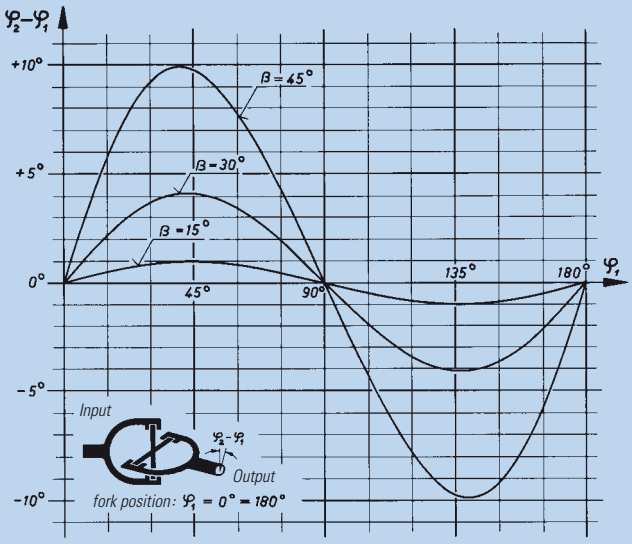
φ_1 = Input – rotation angle
φ_2 = Output – rotation angle

If a single joint is deflected by angle ß and rotated in this condition, rotation angle φ_2 of the output shaft differs from rotation angle φ_1 of the input shaft. The relationship between the two rotation angles is as follows:

$$\tan \varphi_2 = \frac{\tan \varphi_1}{\cos ß}$$

As can be seen from the adjacent diagram, maximum lead occurs at about 45 °, maximum lag at about 135°.

Fork position $\varphi_1 = 0°$ is then obtained, when the input fork is located in the deflection plane of the joint.

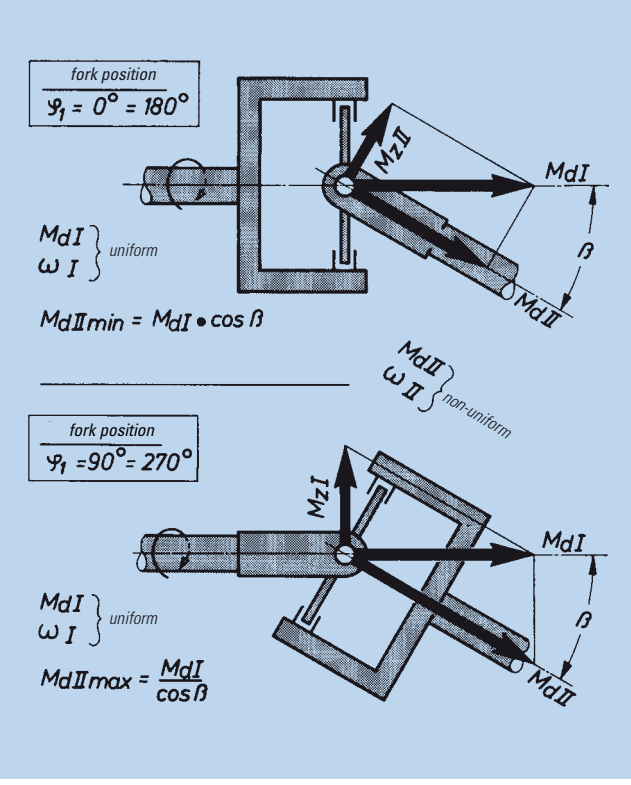


2.2 Motion and torque characteristics of a sigle joint

as a function of deflection angle ß

M_{dI} = Input torque
M_{dII} = Output torque
ω_I = Input – angular velocity
ω_{II} = Output – angular velocity

When analyzing the motion and torque characteristics of a singular joint, it is found that with a constant angular velocity- and torque input, a fluctuating motion and torque curve is obtained at the output. The reason for this fluctuation can easily be illustrated by following the torque characteristics at the fork position $\varphi_1 = 0°$ and $\varphi_1 = 90°$ as shown at left. Since the torque can only be transmitted in the spider plane, the spider however, depending on the fork position, is always at a right angle to the input or output axis, output torque fluctuates twice per revolution between $M_{dI} \cdot \cos ß$ and $M_{dI}/\cos ß$.



The transmitted power, however, is constant, if you disregard friction losses in the bearings.

Therefore, the following applies:

$$N_I = N_{II} = \text{Constant}$$

$$M_{dI} \cdot \omega_I = M_{dII} \cdot \omega_{II} = \text{Constant}$$

$$\frac{M_{dI}}{M_{dII}} = \frac{\omega_{II}}{\omega_I} = \frac{\cos ß}{1 - \cos^2 \varphi_1 \cdot \sin^2 ß}$$

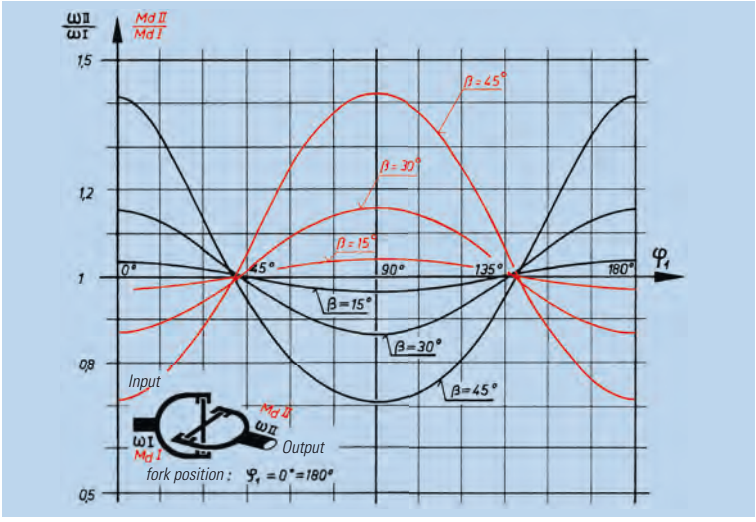
For fork position $\varphi_1 = 0°$ we obtain:

$$\frac{M_{dI}}{M_{dII\,min}} = \frac{1}{\cos ß} = \frac{\omega_{II\,max}}{\omega_I}$$

and for fork position $\varphi_1 = 90°$:

$$\frac{M_{dI}}{M_{dII\,max}} = \cos ß = \frac{\omega_{II\,min}}{\omega_I}$$

$$\frac{M_{dI}}{M_{dII}} = \frac{\omega_{II}}{\omega_I} \qquad \frac{\omega_I}{\omega_{II}} = \frac{M_{dII}}{M_{dI}}$$



2.3 Motion and torque characteristic of a universal driveline

as a function of deflection angles $ß_1$ and $ß_2$

Section 2.2 illustrates that angular velocity and torque at the output of a single joint follow a sinusoidal pattern with a 180° cycle. Maximum angular velocity $\omega_{II\,max}$ max coincides with minimum torque $M_{d\,II\,min}$ and vice versa. From this it can be deduced that a uniform output is possible, when a second joint, with a 90° phase shift is connected to the first joint by means of a shaft. Then, the non-uniform motion of the first joint can be balanced by the non-uniform motion of the second joint. The required 90° phase shift is always met, when the two inner forks happen to be in the deflection plane of their respective joints. Moreover, the two deflection angles $ß_1$ und $ß_2$ of both joints must be the same. (See also Section 1.1 and 1 .4).

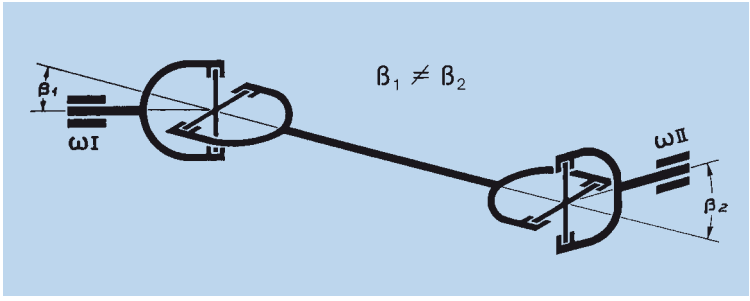
With unequal deflection angles, complete compensation is not possible.
For $ß_2 > ß_1$ the following applies:

$$\left(\frac{\omega_{II\,min}}{\omega_I}\right)_{max} = \frac{\cos ß_1}{\cos ß_2}$$

$$\left(\frac{\omega_{II\,min}}{\omega_I}\right)_{min} = \frac{\cos ß_2}{\cos ß_1}$$

$$\left(\frac{M_{dII}}{M_{dI}}\right)_{max} = \frac{\cos ß_1}{\cos ß_2}$$

$$\left(\frac{M_{dII}}{M_{dI}}\right)_{min} = \frac{\cos ß_2}{\cos ß_1}$$



3. Fluctuation rate

3.1 Single joint

As explained under 2.1, on a single joint the output velocity deviates from the input velocity. This means, the speed ratio is not uniform. This non-uniformity (fluctuation) can be calculated as a dimensionless value:

Fluctation rate

$$U = \frac{\omega_{2\,max} - \omega_{2\,min}}{\omega_1} = \frac{1}{\cos ß} - \cos ß$$

3.2 Universal driveline (2 joints connected in series)

If the preconditions listed in Chapter 1 for obtaining a complete motion compensation cannot be met, it must be aimed for that:
$U \leqq 0{,}0027$.

3.3 Universal driveline with more than two joints

Design requirements might dictate the use of a universal driveline that employs more than 2 joints. This universal driveline, however, must then incorporate an intermediate bearing.
Here, also, the condition applies:
$U_{Res} \leqq 0{,}0027$.
Here, U_{Res} expresses the total fluctuation of the driveline.
Observe, when determining U_{Res}:

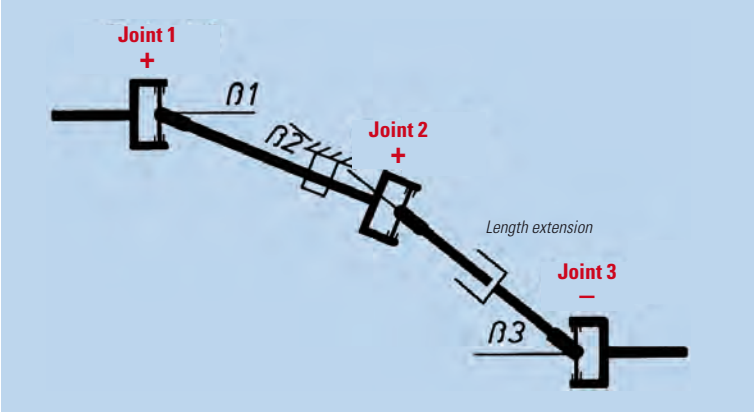
a) Joints with the same fork position get the same sign.
b) The fluctuation rate of each joint must be calculated individually U_1, U_2, U_3.
c) The signs must be observed when adding:

$$U_{Res} = \pm U_1 \pm U_2 \pm U_3$$

Since the rate of fluctuation is a function of deflection angle ß, a limiting condition can be set in regard to the resulting deflection angle $ß_{res}$

$$ß_{res} = \sqrt{\pm ß_1^2 \pm ß_2^2 \pm ß_3^2} \leqq 3°$$

$ß_{res}$ corresponds to the deflection angle of a single joint if it were to replace the entire driveline.



4. Offset angle

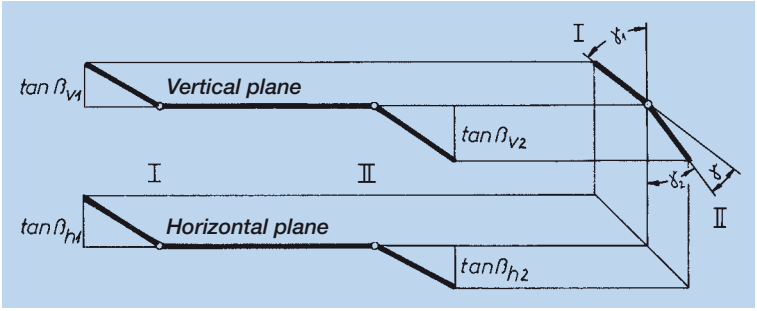
On drivelines with three-dimensional deflection angles, input and output shaft are not located in one plane. This results, if no special measures are taken, in a non-uniform output motion. The constantly repeating acceleration and deceleration unleashes inertia forces which can greatly reduce the life of the joints.

However, not only the driveline, the driven equipment also is subjected to these forces and vibration caused by them. To avoid this, the inner forks must be offset relative to each other such that each fork ends up in the plane of deflection of its joint. The angle between both deflection planes is called offset angle γ and it can be obtained as follows.

Example 1

$$\tan \gamma_1 = \frac{\tan ß_{h1}}{\tan ß_{v1}} \quad ; \quad \tan \gamma_2 = \frac{\tan ß_{h2}}{\tan ß_{v2}}$$

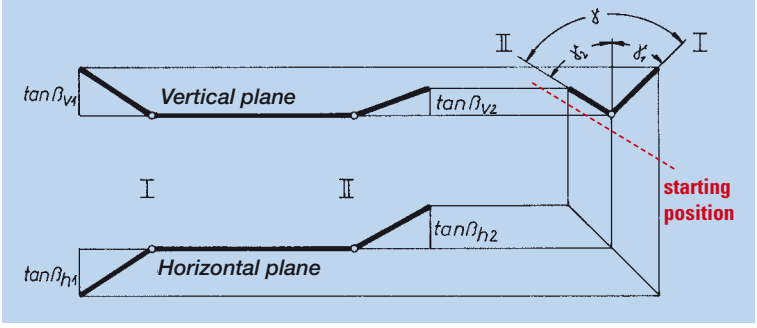
Offset angle $\gamma = \gamma_1 - \gamma_2$



Example 2

$$\tan \gamma_1 = \frac{\tan ß_{h1}}{\tan ß_{v1}} \quad ; \quad \tan \gamma_2 = \frac{\tan ß_{h2}}{\tan ß_{v2}}$$

Offset angle $\gamma = \gamma_1 + \gamma_2$



As shown by the graphic illustrations, in both examples two directions of rotation are possible:

Example 1:
a) Rotate joint 1 counter clockwise by the offset angle
b) Rotate joint 2 clockwise by the offset angle.
The direction for viewing is, in both cases, from joint 1 to joint 2.

Example 2:
a) Rotate joint 1 counter clockwise by the offset angle
b) Rotate joint 2 clockwise by the offset angle.
The direction for viewing is, in both case, from joint 1 to joint 2.

To determine the turning direction of the offset angle, you always have to take the graphic illustration.
Only in this way is it possible to find the right direction of rotation and to determine whether the offset angle γ_1 and γ_2 have to be summed or have to be subtracted

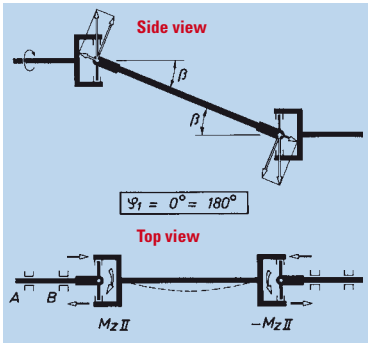
5. Additional moments on the drive line; Bearing loads on the input and output shaft

In Section 2.2 it was shown that the torque is transmitted only in the spider plane and that depending on the fork position, the spider can be perpendicular either to the input axis or the output axis.
What additional forces and moments this causes on the driveline as well as on the bearings of the input and output shaft, is explained briefly in the following chapter.

5.1 With Z-Arrangement

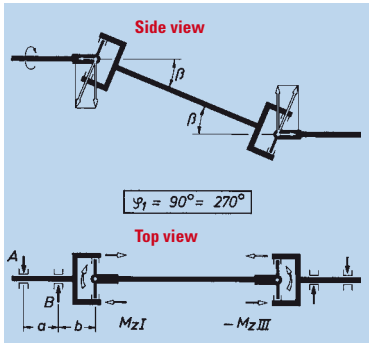
The adjacent illustration shows the location and direction of the additional forces and moments on drivelines having a Z-arrangement, in particular for yoke angles $\varphi_1 = 0°$ and $\varphi_1 = 90°$. This shows clearly, that the driveline center part is stressed by the torque which fluctuates between $M_{dl} \cdot \cos ß$ and $M_{dl} / \cos ß$ in torsion and by the additional periodically alternating, moment M_{ZII} in bending.
(See also Section 6.8).
Likewise, input and output shaft are stressed by M_{ZI} and M_{ZIII} periodically alternating in bending. The resulting bearing loads A and B vary twice per revolution between 0 and maximum value.

Bearing loads on input and output shaft with Z-arrangement



Driveline-center part stressed in bending

$$A = B = 0$$



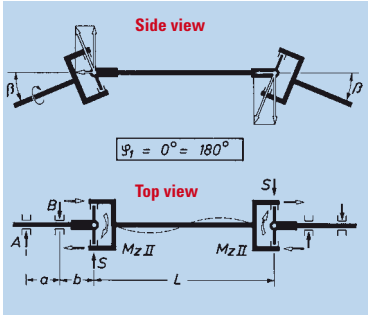
Driveline-center part stressed in bending

$$A_{max} = B_{max} = \frac{Mdl \cdot \tan ß}{a} \quad [N]$$

5.2 With W-Arrangement

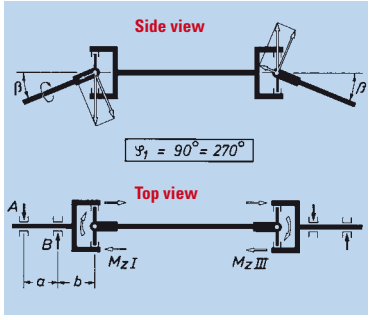
According to the adjacent illustration, with the W-arrangement, an additional force, "S" is introduced, caused by the additional moments M_{ZII} acting in the same direction. The maximum force value occurs at fork position $\varphi_1 = 0°$, and it is transmitted to the input and output shaft by the faces of the spider pins.

Bearing loads on input and output shaft with W-arrangement



Input and output shaft stressed in bending

$$A = \frac{2 \cdot M_{dl} \cdot \sin ß \cdot b}{L \cdot a} \qquad B = \frac{2 \cdot M_{dl} \cdot \sin ß \cdot (a+b)}{L \cdot a}$$



Input and output shaft stressed in bending

$$A = B = \frac{M_{dl} \cdot \tan ß}{a} \quad [N]$$

5.3 Caused by axial displacement forces

If a driveline with an adjustable spline is being changed in length while under torque, in both cases, Z- or W configuration, addition bearing loads are introduced, resulting from the friction caused in the spline. The axial displacement force Pa responsible for these bearing loads is calculated as follows:

$$P_a = 2 \cdot M_{dl} \cdot \mu \left(\frac{1}{dm} + \frac{\sin ß}{Ü} \right) \quad [N]$$

d_m is the spline pitch diameter, Ü the spline overlap. Depending on configuration and lubrication, the coefficient of friction for steel on steel must be assumed to range from 0.11 to 0.15. Plastic coated splines have considerably better sliding characteristics. Here, the friction value is approximately 0.08. Rilsan coated splines are available from size 0.109 up.

6. Fundamental data for sizing of universal drivelines

To size universal drivelines properly, various conditions and factors must be considered. In view of the multitude of possible applications, exact, generally valid rules cannot be provided. The following information is therefore used for the first rough determination of size. In case of doubt, we will gladly compute the required joint sizes for you and, in this context, we like to refer to the technical questionnaires starting on page 189.

6.1 Torques

The max. permitted torques Md_{max} stated for the individual drive-shaft sizes apply normally only for short-term peak loads.
Md_{nom}: Nominal torque for pre-selection on the basis of the operating moment.
Md_{lim}: Limit torque that may be transmitted temporarily from the universal-drive-joint at limited frequency without functional damage.

The respective permissible torque has to be calculated individually depending on the remaining operating data, such as shock loads, angle of deflection, rotation,etc. (See item 6.2 and 6.3)

6.2 Shock loads

Depending on the type of power input or installation, a driveline can be subjected to shock loads considerably above the rated torque. To take those into account, shock service factors must be implemented. Following are some shock-service factors for the most common drives

Prime mover	with flexible coupling	without flexible coupling
Turbine or electric motor	1	1 to 1,5
Gasoline engine, 4 and more cylinders	1,25	1,75
Gasoline engine, 1 to 3 cylinders	1,5	2
Diesel engine, 4 and more cylinders	1,5	2
Diesel engine, 1 to 3 cylinders	2	2,5

Of course, not only the drives, but, in many instances, also the driven equipment is responsible for shock loads. Because of the magnitude of different possibilities, general data valid for every use cannot be supplied.

6.3 Life expectancy – calculation

The decisive factor with regard to life expectancy of universal drivelines is usually the joint bearing. Therefore, in order to determine the individually required joint size, the life expectancy diagram shown later on should be used. This diagram allows to:

a) determine the theoretical life expectancy of a selected driveline as a function of prevailing operating conditions, or
b) to determine the required joint size for a given life expectancy.

In this case, the rated input torque is multiplied by the appropriate service (shock) factor and the M_d such obtained entered in the following diagram. Other factors, such as correction - or deflection angle factor do not have to be considered since they are already incorporated in the diagram.

On machines or vehicles with changing operating conditions, at first, the individual life expectancy values (for each condition) must be determined from the diagram. Then the overall life expectancy L_{hR} can be calculated as follows:
q_1, q_2 … = time share in [%]
L_{h1}, L_{h2} … expressed in 10^3 [Hours]

$$L_{hR} = \frac{100\,000}{\frac{q_1}{L_{h1}} + \frac{q_3}{L_{h2}} + \ldots + \frac{qn}{L_{hn}}} \text{ [Hours]}$$

6.4 Life expectancy-Diagram

In view of the multitude of applications, it is not possible to determine the suitability of a driveline by tests. Therefore, the selection and analysis of the required joint size is done by calculations. These are based on the computation of the dynamic load carrying capacity of full rotation needle - and roller bearings according to ISO recommendation R 281. The life expectancy diagrams shown in the catalogue are based on this recommendation and also on an equation formula especially suited for obtaining nominal life expectancy on universal joints. The thus obtained life expectancy lists the hours of operation that will be reached or exceeded by 90% of a larger number of equivalent universal joint bearings.

There are also methods of obtaining the modified life expectancy. In this case varying survival probabilities, material quality and operating conditions are taken into account. The present technical know how does not allow statements to be made about variations in life expectancy performance resulting from differences in steel quality (grain, hardness, impurities). For this reason, no guidelines have been set in the International Standards.

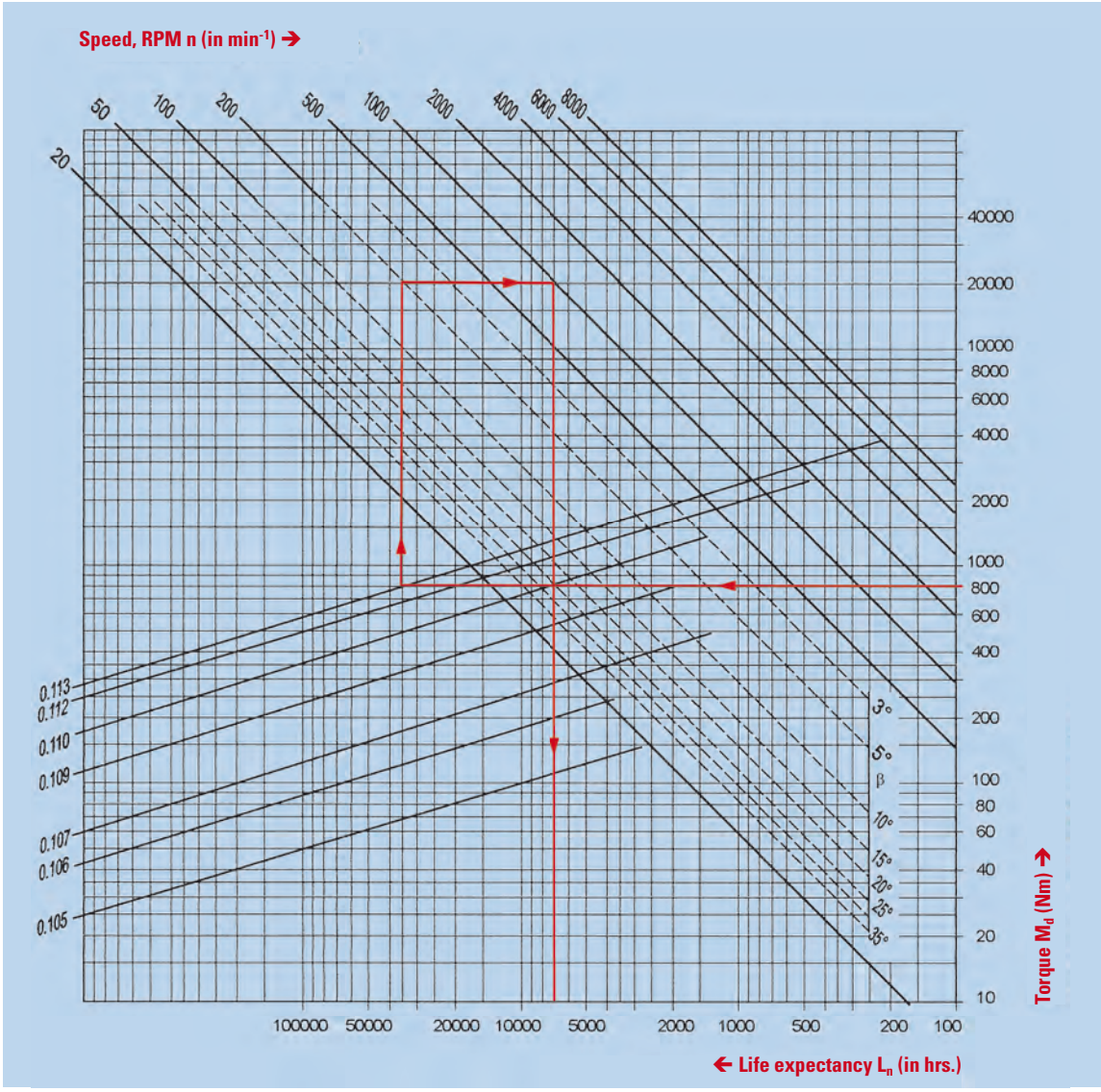
All pertinent operating conditions, such as operating temperature, lubrication intervals, the type of grease used and its viscosity in operation, must also be considered. Since these factors vary from case to case, it is not possible to determine the modified life expectancy and accordingly, a life expectancy diagram valid for universal use.

The two following life expectancy diagrams will allow you to roughly determine the nominal life expectancy.

If the deflection angle is smaller than ß = 3°, ß = 3 should be used. Otherwise, the obtained result will be less accurate.

If it is necessary to determine the life expectancy accurately, kindly consult the ELBE Engineering Department.

6.5 Life expectancy diagram, Needle bearing



Example

Universal driveline 0.113

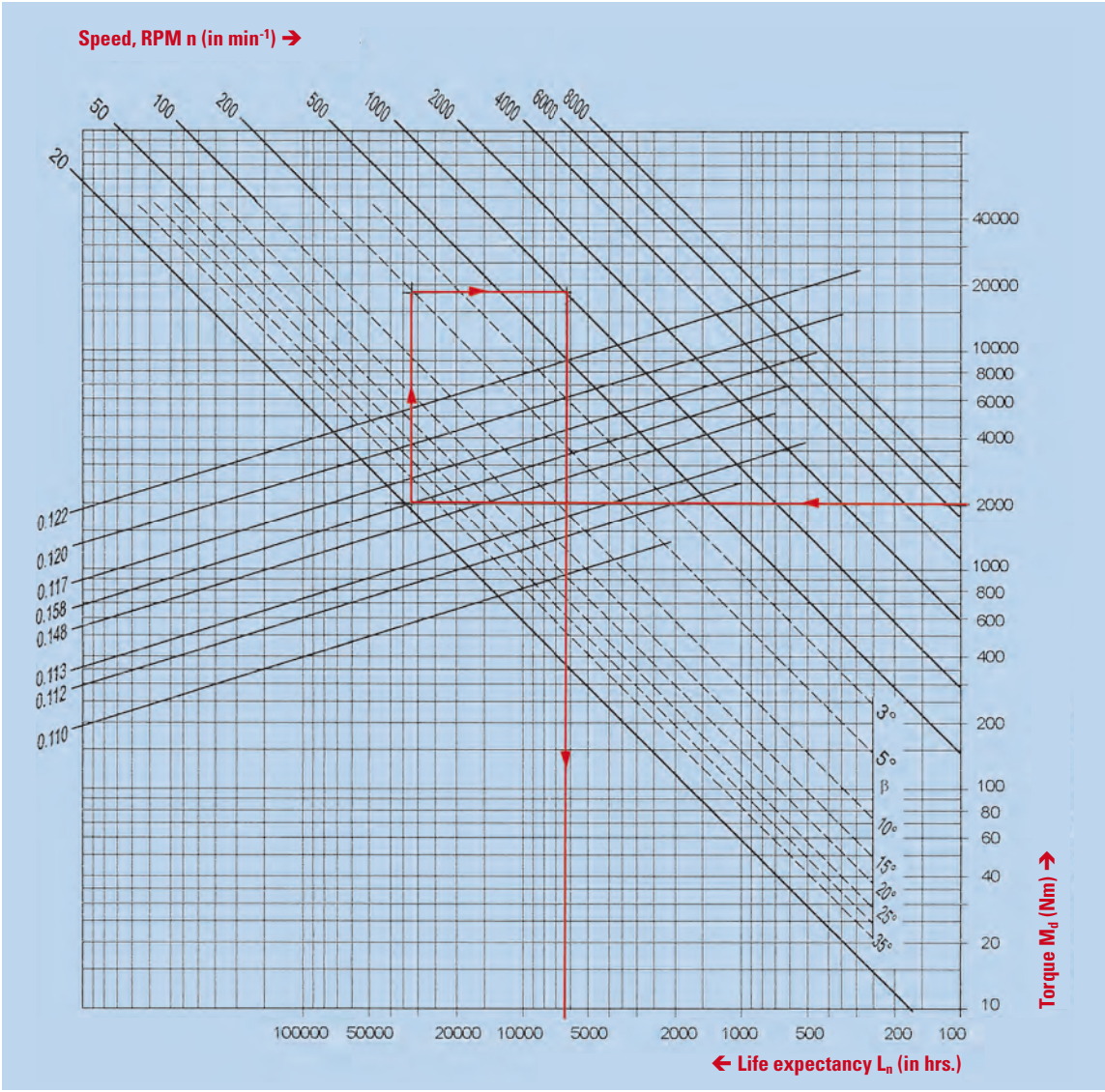
Torque	M_d	=	800 Nm
Deflection angle	ß	=	5°
RPM	n	=	1000 min^{-1}

➔ **Life expectancy = 6900 hrs.**

Procedure:

Torque ➔ Joint size ➔ Defelction angle ➔ RPM ➔ Life expectancy

6.6 Life expectancy diagram, Roller bearing



Example

Universal driveline 0.158			
Torque	M_d	=	2000 Nm
Deflection angle	ß	=	5°
RPM	n	=	1000 min

➔ **Life expectancy = 7000 hrs.**

Procedure:
Torque ➔ Joint size ➔ Defelction angle ➔ RPM ➔ Life expectancy

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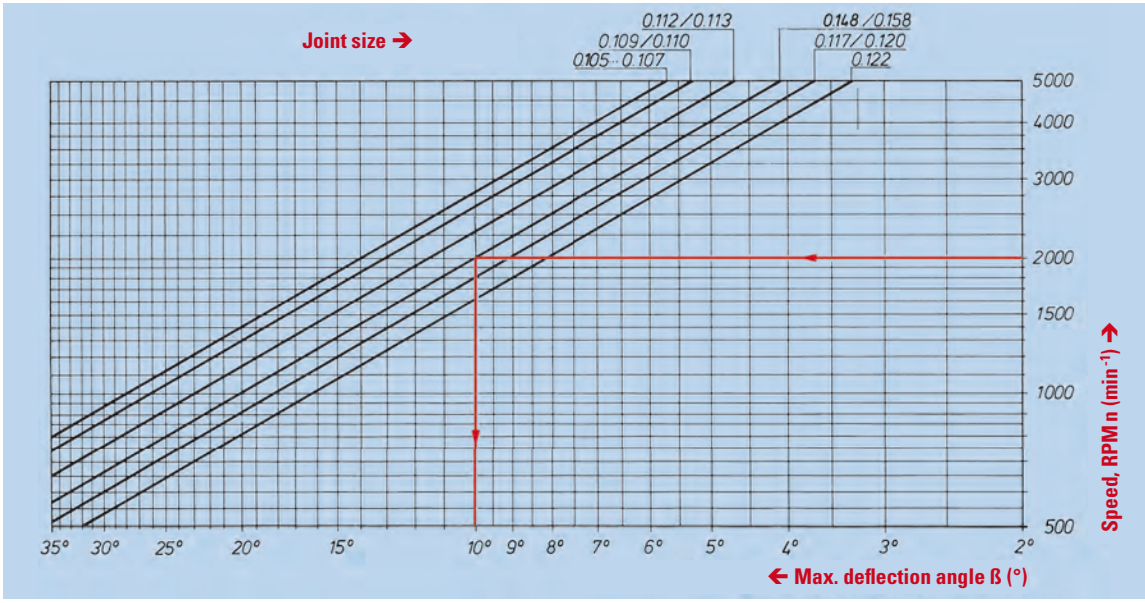
6.7 RPM and deflection angle

As shown in 2.3 by taking certain precautions, a constant output can be obtained on a universal driveline. The center part, however, still retains a non-uniform motion; it is subjected twice per revolution to an acceleration and deceleration. The resulting acceleration torque caused this way is a function of the mass moment of inertia of the driveline's center part as well as of rpm and deflection angle. When regarding smoothness of operation and wear, the product of rpm and deflection angle should not be too high. For use in general mechanical engineering, appropriate guide values can be taken from the diagram below, which is designed for universal drivelines having a standard tubing of up to 1500 mm length.
For vehicle drive trains, these guide values must often be exceeded. Here, at most, up to 1.5 times the diagram value can be permitted.



6.8 Critical speeds

As shown in 5.1, the center part of the angled driveline, when transmitting torque, is stressed periodically in bending by additional moment M_{ZII}. This incites the center part to vibrate. If the frequency of this bending vibration approaches the natural frequency of the driveline, maximum stress in all components, buckling of the shaft and development of noise will result.

To avoid this, long and fast running drivelines must be checked for critical bending vibration speeds. The critical, first order bending vibration speed of a driveline employing tubing can be roughly calculated as follows:

$$n_{kr} \approx 1{,}21 \cdot 10^8 \frac{\sqrt{D^2 + d^2}}{L^2} \quad [\text{min}^{-1}]$$

D = Tubing-outside diameter [mm]
d = Tubing-inside diameter [mm]
L = Center part length in [mm]

Drivelines are used in the subcritical zone only. For reasons of safety, it must be ensured that the maximum operating speed is far enough away from its system's resonance (critical) speed. Therefore, the following applies:

Max. Operating Speed $n_{max} \approx 0{,}65 \cdot n_{cr}$ [RPM]

6.9 Larger tubing diameters

The critical bending vibration speed of a driveline is, as can be seen from the critical rpm formula, a function of tubing diameters and length of center part. By going to larger tubing diameters, the critical speed of a driveline can be increased. However, the diameter increase must remain within defined limits since a certain relationship between tubing dimensions and joint size must be adhered to.

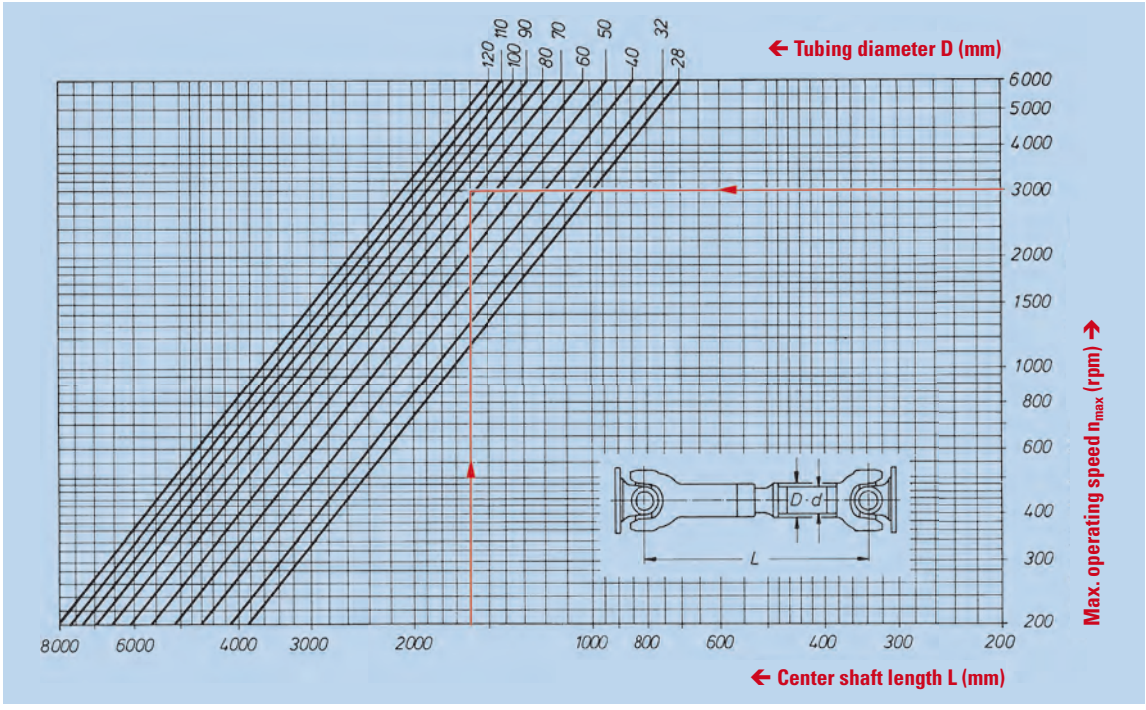
The dimension sheets of the different driveline models list the possible tubing dimensions for each size. In all the cases where a single driveline is insufficient, multiple arrangements with intermediate bearings must be used.

It must be noted that larger tubing diameters are feasible only above a certain shaft length. The following minimum lengths can be used as an angle line.

Flange diameter	[mm]	Up to 65	75 to 100	120 to 180
Min. length S	[mm]	650	950	1250

6.10 Tubing diagram

For determining the required tubing diameter when maximum operating speed n_{max} and center part length L are given.



Example:

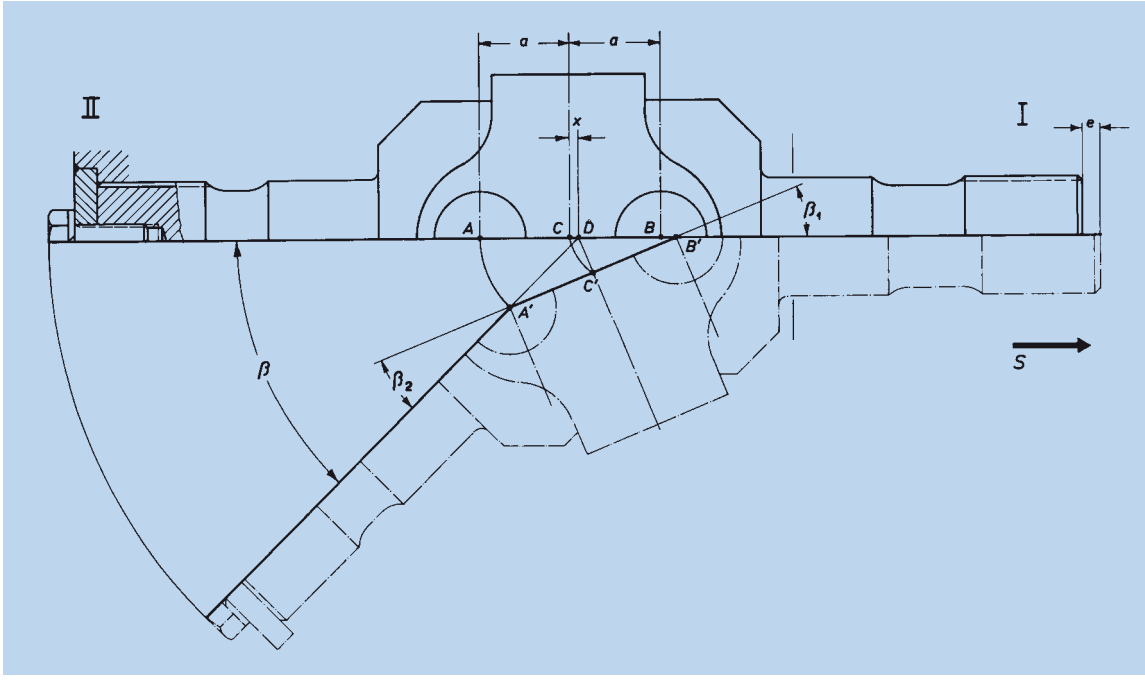
Center shaft length L = 1600 mm
Max. operating speed n_{max} = 3000 RPM
} Obtained: Tubing diameter ≧ 70 mm

7. Application principles for double joint shafts in steering axles

The double joint shafts of series 0.400.5 and 0.500.3 are intended for use in powered steering axles only.

7.1 Kinematic conditions

As shown in the sketch below, when steering is activated, the axle system is rotated around pin center **D**. The double joint deflects at its two joint pivot points **A** and **B**. Since shaft II is fixed axially, shaft I must move in the direction **S**. This causes unequal joint deflection angles **ß$_1$** and **ß$_2$**, and therefore, also a non-uniform (fluctuating) output motion. The fluctuation can be kept very small provided joint center **C** is offset toward the fixed side by the compensation value X. This way, at a certain deflection angle (= synchronous motion angle **ß$_x$**) completely uniform motion is obtained, i.e., the two joint deflection angles **ß$_1$** and **ß$_2$** are equal.
ßx = 30° bis 35° would be an appropriate synchronous motion angle to select



A, B = Joint pivot point
C = center of the double joint
D = rotation pin center
a = distance of a joint point from the center ot the double joint
e = axial movement of floating shaft
X = center offset on installation
ß$_x$ = uniform motion angle (synchronous)
ß = total deflection angle
ß$_1$, ß$_2$ = deflection angle of each individual joint

7.2 Center offset value x and max. slide movement e

$$X = \frac{a}{\cos \frac{ß_x}{2}} - a$$

The center offset **X** required for smooth output can be derived from distance a and synchronous motion angle ß:

Calculated center offset value **X** for individual joint sizes:
Series 0.400, synchronous motion angle $ß_x = 35°$

Joint size	**0.408**	**0.409**	**0.411**	**0.412**
Deflection angle ß °	50	50	50	50
x [mm]	1,5	1,7	2,0	2,2

Series 0.500, synchronous motion angle $ß_x = 32°$

Joint size	**0.509**	**0.510**	**0.511**	**0.512**	**0.513**	**0.514**	**0.516**	**0.518**
Deflection angle ß °	42 | 47	| 50	42 | 47	42 | 47	42 | 47	42	42 | 47	42 | 47
x [mm]	1,3 | 1,3	| 1,6	1,5 | 1,6	1,6 | 1,7	1,7 | 1,8	2,0	2,1 | 2,2	2,2 | 2,3

Sliding motion **e** at deflection angle ß, and also as a function of distance a and uniform motion angle $ß_x$, can be calculated as follows:

$$e = 2a \left(\frac{\sin^2 \frac{ß}{2} + \sqrt{\cos^2 \frac{ßx}{2} - \sin^2 \frac{ß}{2} \cdot \cos^2 \frac{ß}{2}}}{\cos \frac{ßx}{2}} - 1 \right)$$

Max. slide motion **e** for the individual joint sizes:
Series 0.400, synchronous motion angle $ß_x = 35°$

Joint size	**0.408**	**0.409**	**0.411**	**0.412**
Deflection angle ß °	50	50	50	50
e [mm]	6,5	7,2	8,3	9,2

Series 0.500, uniform synchronous motion angle $ß_x = 32°$

Joint size	**0.509**	**0.510**	**0.511**	**0.512**	**0.513**	**0.514**	**0.516**	**0.518**
Deflection angle ß °	42 | 47	| 50	42 | 47	42 | 47	42 | 47	42	42 | 47	42 | 47
e [mm]	4,5 | 6,0	| 7,9	5,2 | 6,9	5,8 | 7,8	6,1 | 8,1	7,0	7,3 | 9,7	7,8 | 10,5

7.3 Sizing of double joint shafts

Max. possible torque should be used for determining the required joint size. This could be the input torque, calculated from prime mover output, gear ratio and power distribution, or also the tire slippage torque, derived from allowable axle loading, static tire radius and coefficient of friction. The lower of the two values represents the maximum operating torque which should be used for determining the proper joint size. The double joint shaft selected this way will have adequate life expectancy, since the time percentage of maximum loading is usually low.

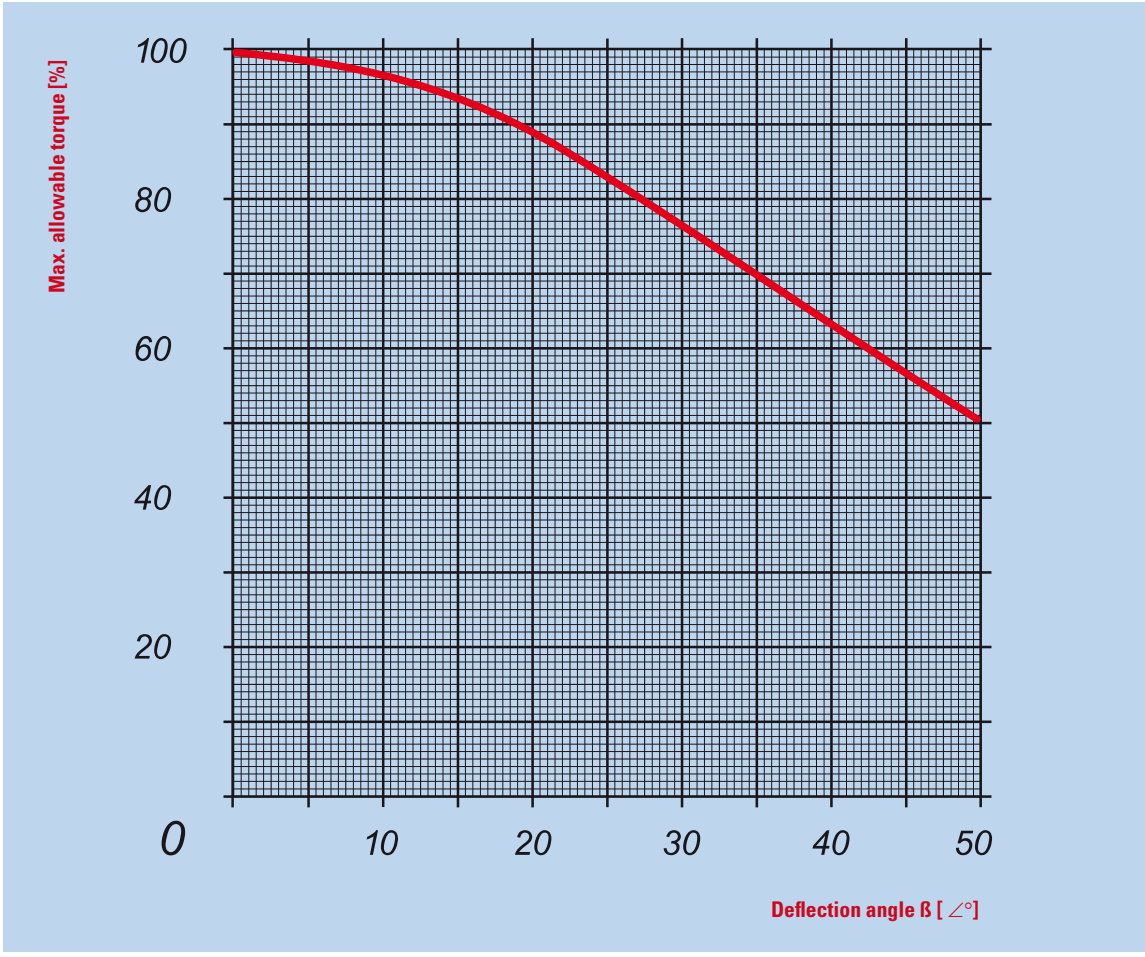
7.4 Loads on the shaft bearing

Double joint shafts, when not centered, must have a bearing support at both shaft halves right next to the joint with one shaft half fixed axially and the other floating axially. When torque is being transmitted, additional forces occur which must be taken into account when sizing the bearings.

7.5 Torque capacity of double joints as a function of deflection angle

Under torque, different force conditions exist at the joint spider pins and center piece with the double joint in an angled position than in a straight position. The reason for this is that the torque to be transmitted is not distributed evenly over the joint spider pins any longer. Also, as mentioned in Chapter 5, an additional moment occurs. This additional moment must be combined with the torque to be transmitted.

This resulting moment leads to higher compression loads and to a larger bending stress within the joint spider pins. The diagram below allows to take these factors into account. It shows the percentage the maximum allowable torque must be reduced in relation to the deflection angle.

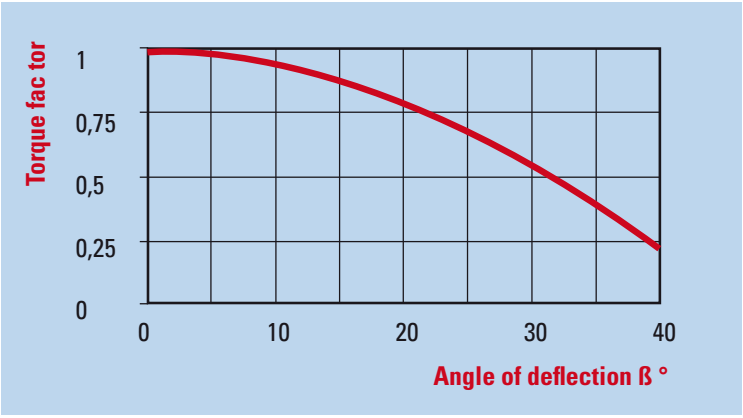


8. Hints for the application of pin and block cardan joints, ball and socket cardan joints

Torque calculation for needle bearing equipped precision cardan shafts, pin and block cardan joints, ball and socket cardan joints, single

The values Md_{max} listed in the diagram represent limit values that may not be exceeded. They are admissible to the full extent only at small rotation speed and minor angle of deflection respectively during intermittent operation.

The transmissible torque varies depending on the size of the angle of deflection.



Needle bearing equipped precision cardan joints

Permitted max. operation moments of the needle bearing equipped precision cardan joints (Torque in Nm)..

Joint type	Speed (r.p.m.) 250	500	1000	2000	3000	4000	5000
0.616	11	10	8	6	5,5	5,1	4,8
0.620	28	25	19	15	14	12,5	12
0.625	35	30	25	20	18,5	17	16
0.632	70	60	50	40	37	34	32
0.640	150	130	100	80	74	68	64
0.650	220	190	150	120	110	100	95
0.663	450	400	310	250	220	200	190

Pin and Block cardan joint, Ball and socket cardan joint, single

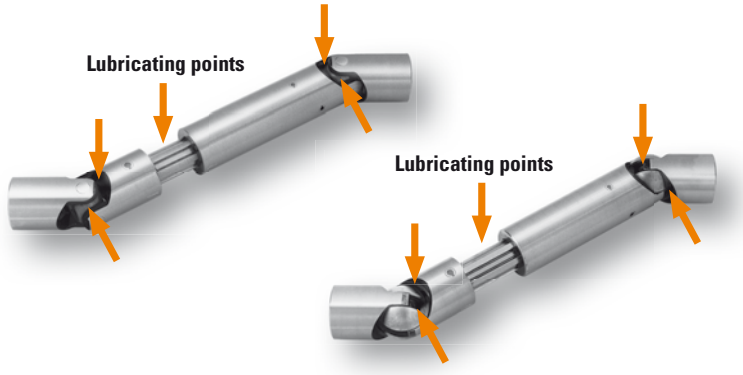
The empirical formula on the right can be used for the rolled calculation of the required joint size.

At	Md_{max}	Speed x bending angle ≤ 500
At 0,5 x	Md_{max}	Speed x bending angle ≤ 5000

Recommendations for maintenance

An adequate lubrication shall be ensured for universal and ball-and-socket joints in permanent operation. Where drip oiling is not feasible, the joints have to be once daily lubricated (for lubricating points see arrow). Joints may also be enveloped in bellows; such bellows for these tow joint types may be ordered from us.

For utilization of cardan shafts under extreme climatical conditions (high and low temperatures) consult us first.



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9. Transport and storage – installation information

Our universal drivelines are delivered ready for installation. If not otherwise specified by the customer, they are balanced dynamically at n = 2000 RPM according to classification Q 16 of the VDI recommendation 2060.

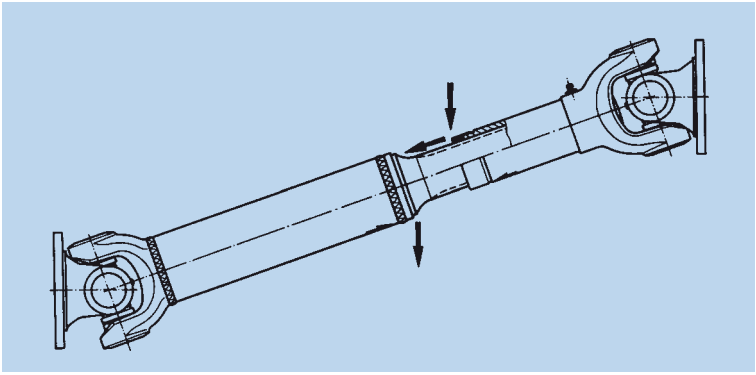
9.1 Transport and storage

To retain the high degree of balance, the drivelines must be protected during transportation or storage from blows or jolts. It is recommended to transport them in horizontal position. When transporting them vertically, appropriate measures must be taken to avoid separation of the driveline halves. A horizontal position is also preferred for storage of the driveline, since doing so eliminates tipping over and possible damage. Never store drivelines on the floor, but if possible, on wooden shelves. In case of prolonged storage, blank metal parts must be checked for corrosion, and if necessary, treated again with a corrosion inhibiting oil.

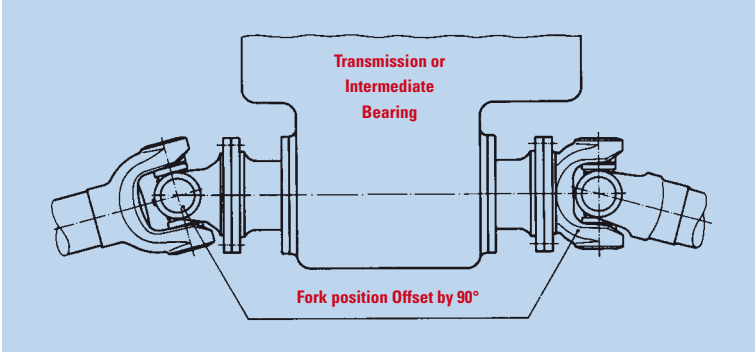
9.2 Installation

Before installing drivelines, all traces of rust inhibitor, dirt and grease must be removed from the flange surfaces to preserve the coefficient of friction vital for torque transmission.

Drivelines should not be separated at the splines and the halves interchanged, otherwise the quality of balance is greatly impaired. For the same reason, balance plates should not be removed.
Prior to installing drivelines, it must be checked that they are assembled correctly, which means that the marking arrows on the splined shaft and splined hub must face each other (See also notation on Page 170).



These drivelines should be arranged such that the spline, whenever possible, is protected from dirt and moisture. As a rule, this means installing the driveline according to the sketch above, where the spline seal points downwards so that spray water hitting it runs away from the spline.



If two or more drivelines are arranged in series behind each other, it is recommended that they be mounted offset to each other by 90°. Doing so will at least partially cancel to the outside the effect of the mass acceleration forces caused by the fluctuation motion of the driveline center parts.

The necessary bolting hardware for flange mounting can also be supplied by us on request. For bolt grades and necessary bolt torques, see page 74. When torquing down the bolts, if possible, a torque wrench should be used and the torque should be applied evenly in a crosswise pattern.

Our drivelines are delivered grease-packed, ready for installation. However, after prolonged storage, it is advisable to reapply grease before putting them into service.

10. Safety instructions and Maintenance

10.1 Safety instructions

The operator has to take corresponding safety precautions that will exclude dangers to persons and material by rotating drive shafts or their components.

- On working on the drive-shafts the **drive has to be in quiescent condition** – set down engine and secure, so that the drive can't be activated unauthorised by a third person.
- Installation, assembly and maintenance work may be performed only by **competent personnel**.
- When installing and disassembling and when transporting of the drive shafts don't reach into the joints to avoid contusions caused by **tilting flanges or components**. Take suitable measures to avoid that drive-shafts-shares **slide apart unintentionally** and cause injuries or damage.
- Fast mode or/and long shafts should be lined with protection devices like safety shackle and guard and protected against touching or point potential dangers explicitly out.
- Don't place weights onto shafts in standstill, don't place, hang or fasten tools or other objects on the shafts.

The user or operator hast to observe the legal safety regulations and has to make arrangements before beginning the maintenance-work.

To avoid damages or dangers observe the following **basic information**:

- The permitted **operating speed** may not be exceeded.
- Don't exceed the permitted **angle of deflection**.
- In case of shafts with **length extension** the maximum permitted X-value may not be exceeded. It is recommended to use 1/3 of the complete length extension.
- The drive shaft has to be checked regularly for modified **running noises** and **vibrations** and if necessary to check the changing of the **joint slackness** and of the length extension in standstill.
- The **balance status** of drive shafts may not be changed.
- Don't make modifications or unauthorized repairs without the **written approval** of the manufacturer, as dangers for humans and material result and any claim of warranty becomes void.
- Drive shafts may not be cleaned with **pressure water** or **steam jet** to avoid damage of the seals and to prevent the penetration of water and dirt.
- When cleaning don't use **aggressive cleanser**.
- **Protect plastics-coated profiles** and sliding surfaces against mechanical, thermal and chemical damages. Sliding surfaces for seals have to be covered before colouring.
- The drive shafts may only be installed in fluid or solid media with written approval of the manufacturer.
- **Local heating** of the drive shafts (e. g. flame cleaning of colour residues) must not be carried out to avoid significant changes of the true running characteristics.

10.2 General maintenance information

ELBE drive shafts will be delivered as fully finished power units, are ready for use greased and balanced. To guarantee the characteristics specified in the documentation, the condition upon delivery may not be changed.

The maintenance-cycle of the drive shafts depends particularly on the application conditions.

Above-average load, variations in temperature and the effect of dirt and water render it necessary to observe shorter maintenance intervals to guarantee the safe and efficient application.

We recommend coordinating the inspection intervals of the drive shafts with the ones of other machine parts or with the service intervals of the machine or of the vehicle.

Inspection and maintenance are required at least once a year.

Application field Joint	control and maintenance intervals	length extension
Commercial vehicles in street application	50.000 km or 1 year	maintenance-free
Commercial vehicles in street- and territory application	25.000 km or 6 months	maintenance-free
Commercial vehicles in pure construction-site and territory application	10.000 km or 1 month	maintenance-free or 100 hours
Earth-moving and construction machines	250 operating hours or 1 month	maintenance-free or 100 hours
Stationary plant and machines construction	500 operating hours or 3 months	maintenance-free or 3 months

10.3 Lubrication guidelines

ELBE cardan-drive-shafts are normally equipped with 3 cone-grease-nipples DIN 71412. Thereby every joint will be greased over per grease nipple, the third nipple serves for relubrication of the spline profile.

This nipple is omitted for plastic-coated lenght extensions.

10.3.1 Lubricants

- Temperature range -30°C up to max. +70°C: For relubrication of the drive shafts use only **lithium-saponified greases** of consistency class 2 with penetration 265/295 and drop point approx. 180°C.
  The lubrications may not contain **MoS2**-additives.
- Temperature range up to approx. +250°C, (**High-temperature-version**): use HT-greases of the consistency 2. Special versions up to +250°C are partly available.
- Temperature range from approx. -60°C up to +110°C (**low-temperature-version**): use TT-greases of the consistency 1 or 2

10.3.2 Maintenance-free Cardan Shafts

- **Maintenance-free** versions of our shafts are possible in certain applications.
- However, the following **factors** in application and operating conditions are important to **consider**:
  – High ambient temperatures
  – Unfavorable angle/speed ratios
- **Furthermore, deterioration** of the **lubrication** needs to be considered. Since no relubrication is possible, we **recommend periodic replacement** of the **spider units**.

10.4 Technical information

- Before lubricating **clean grease nipples!**
- The relubrication of the spline-length-extension should be carried out **at compressed length** S_{min} or in the shortest operation status (vehicle loaded). Non-observance may result in excess axial forces.
- Air vent may not be taken off or be replaced by standard grease nipples.
- The lubricant may not be pressed in with excessive pressure or with hard lubrication impact.
- Max. permitted **lubrication pressure: 20 bar**.
- The cross units have to relubricated over the grease nipples in the centre of the cross or on the bottom of a bearing housing of the cross. It must be ensured that grease is pressed in until it **leaks from all four seals of each bearing**.
- This is the only way to ensure that all four bearings have received fresh grease.
- Some versions of double drive-shafts are equipped with a grease nipple on the centre piece of the joint, over which both cross joints can be relubricated at the same time through lubrication ducts (**central lubrication**).
- Drive shafts that are stored more than 6 months have to be lubricated before starting.

10.5 Control information

- Fittings and connection flanges have to be checked for firm connection.
- Drive shafts should be checked in operation for abnormal noises or vibrations, to determine the cause and initiate repair work.
- Before lubrication, check the driveshaft for looseness in the joints or splines.
- The connection side of the drive shaft flanges and companion flanges must be cleaned before installation. They must not be greased or oiled.
- Corrosion inhibitors and paint residues must be thouroughly removed. Possible light transportation damage should be corrected (nicks and scratches).
- Companion flanges have to be checked for face and OD runout.

Technical Questionnaire for the selection of Double Cardan Transmission Shafts

Customer: _____ Issuers name: _____ Date: _____

Phone: _____ Fax: _____

E-Mail: _____ Adress: _____

Vehicle manufacturer: _____ Vehicle model: _____

Date for prototypes: _____ Start of production: _____ Annual volume: _____ over x years

Type of vehicle

Agricultural tractor ☐ Earth moving machine ☐ Number of wheels x number of driven wheels

Construction machine ☐ Commercial vehicle ☐ 4 x 4 ☐ 6 x 6 ☐ 8 x 8 ☐ _____ ☐

Military vehicle ☐ _____ ☐

Axle data

Max. axle input torque	TAi	[Nm]	Max. axle load	FA	[N]
Max. axle input speed	nAi	[min^{-1}]	Axle weight distribution left / right	DL ___ / ___	[%]
Differential gear ratio	iD		Tyres		
Wheel hub ratio	iH		Static load radius	Rs	[mm]
Torque distribution left / right incl. differential lock	Ds ___ / ___	[%]	Dynamic load radius	Rd	[mm]
Max. braking torque	TBr	[Nm]	Friction coefficient	μ	

Data for life time calculation

Kind of operation	Continuous torque [Nm]	Continuous speed [min^{-1}]	Continuous angle [∠°] (1)	Time [%]

(1) Steering angle

Requested lifetime: _____ [h]

Functional requirements

Max. axle steering angle ß _____ [∠°] Peak temperatures $T_{peakmax}$ _____ [+° C]

Max. service temperature T_{Pmax} _____ [° C] $T_{peakmin}$ _____ [-° C]

Min. service temperature T_{Pmin} _____ [° C]

Comments

_____

_____

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Technical Questionnaire for the selection of Cardan-Propshafts
Vehicle application

Customer: _____ Issuers name: _____ Date: _____

Phone: _____ Fax: _____

E-Mail: _____ Adress: _____

Vehicle manufacturer: _____ Vehicle model: _____

Date for prototypes: _____ Start of production: _____ Annual volume: _____ over x years

Type of vehicle

Truck ☐ SUV ☐ Military vehicle ☐

Bus ☐ Construction / Earth moving machine ☐ Vehicle speed max.: _____ [km/h]

Number of wheels x number of driven wheels

4 x 2 ☐ 4 x 4 ☐ 6 x 2 ☐ 6 x 4 ☐ 6 x 6 ☐ 8 x 2 ☐ 8 x 4 ☐ 8 x 6 ☐ 8 x 8 ☐

All wheel drive permanent yes ☐ no ☐

Kind of operation: % of life required

On road short distance ☐ _____ [%] Others ☐ _____ [%]

On road long distance ☐ _____ [%] Use of trailer ☐ _____ [%]

Urban ☐ _____ [%]

Off road ☐ _____ [%] Required life _____ [km]

Environmental requirements

Operating temperature max.: _____ [° C] min.: _____ [° C] Storage temperature max.: _____ [° C] min.: _____ [° C]

Others: _____

Engine / Motor

Diesel ☐ Gas ☐ Electric ☐

N° of cylinders _____

Max. power _____ [KW] Max. torque _____ [Nm]

Max. speed _____ [min^{-1}] Overspeed _____ [min^{-1}]

Gear box

automatic ☐ manual ☐

i low _____ i reverse _____

i high _____

Converter stall ratio _____

Transfer case

i low _____ i high _____

Input max. _____ [Nm] Output max. _____ [Nm]

Diff.-lock yes ☐ no ☐

Torque distribution:

Diff. open: ___ / ___ [%] Diff. locked: ___ / ___ [%]

Axle

rigid ☐ independent suspension ☐

i diff. _____ i Axle _____ i hub _____

Diff.-lock yes ☐ no ☐

Torque distribution:

Diff. open: ___ / ___ [%] Diff. locked: ___ / ___ [%]

Tyre

Size _____ r stat _____ [mm] Friction factor _____ μ

Type _____ r dyn _____ [mm]

Weights

	flat		_____ % grade
GVW	_____ [kg]		
GCW	_____ [kg]		
Trailer	_____ [kg]		
F_{A1}	_____ [kg]	F_{A1}	_____ [kg]
F_{A2}	_____ [kg]	F_{A2}	_____ [kg]
R_{A1}	_____ [kg]	R_{A1}	_____ [kg]
R_{A2}	_____ [kg]	R_{A2}	_____ [kg]

F_{A1} = First front axle

F_{A2} = Second front axle

R_{A1} = First rear axle (after T-case)

R_{A2} = Second rear axle

M = fixed middle section of the output prop shaft

Propshaft length

	operating	maximum	minimum
Gearbox - T-case	_____ [mm]	_____ [mm]	_____ [mm]
T-case-F_{A1}	_____ [mm]	_____ [mm]	_____ [mm]
T-case-F_{A2}	_____ [mm]	_____ [mm]	_____ [mm]
T-case-R_{A1}	_____ [mm]	_____ [mm]	_____ [mm]
T-case-R_{A2}	_____ [mm]	_____ [mm]	_____ [mm]

Propshaft angles

	vertical	horizontal	compound max.
Gearbox - T-case	_____ [°]	_____ [°]	_____ [°]
M-F_{A1}	_____ [°]	_____ [°]	_____ [°]
M-R_{A1}	_____ [°]	_____ [°]	_____ [°]

In addition following information required

– Propshaft arrangement (sketch)
– Flange connections _____
– Swing diameter limited max. _____ [mm]
– Mission / load spectrum

Remarks

_____

_____

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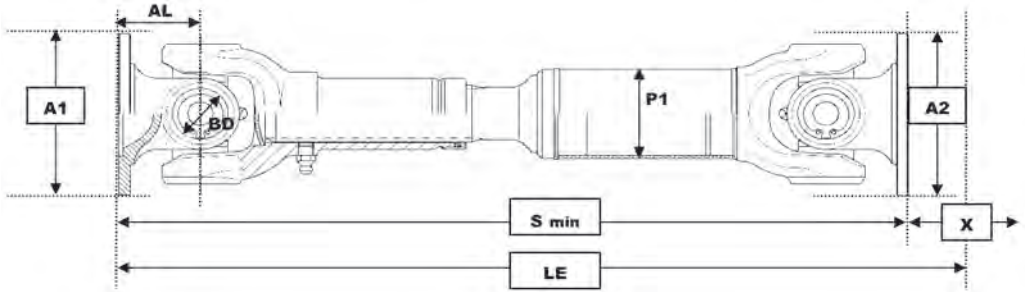
Technical Questionnaire for the selection of Cardan-Propshafts
Industrial application

Company: _____ Street: _____

Contact: _____ Zip Code/City: _____

Branch: _____ Phone: _____

E-Mail: _____ Fax: _____



Length

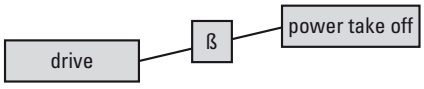
LE Installation length (= length Smin + 1/2 extension X) _____ mm

S min Compressed length _____ mm

X Extension ☐ necessary ☐ not necessary _____ mm

Angle of deflection

ß _____ °



Connection left side

A1 ☐ Flange Diameter (outside) _____ mm

☐ Cross-serrated Number of holes _____ hole

☐ Flat Diameter of holes _____ mm

☐ Hub Drill hole ____ mm Keyway ____ mm

Connection right side

A2 ☐ Flange Diameter (outside) _____ mm

☐ Cross-serrated Number of holes _____ hole

☐ Flat Diameter of holes _____ mm

☐ Hub Drill hole ____ mm Keyway ____ mm

Further dimensions

AL Fork-eye-distance (from middle of yoke to end of flange) A1 _____ A2 _____

BD Diameter of bearing bush (from cross-unit) A1 _____ A2 _____

P1 Diameter of tube _____ mm

Torque / r.p.m.

Torque Md Nom In use _____ Nm

Md Lim Maximum _____ Nm

Speed _____ rpm

Quantity / Purpose of use / Alternative offerer

Quantity _____ pieces

Purpose of use _____

Alternative offerer _____ Item.-No. _____