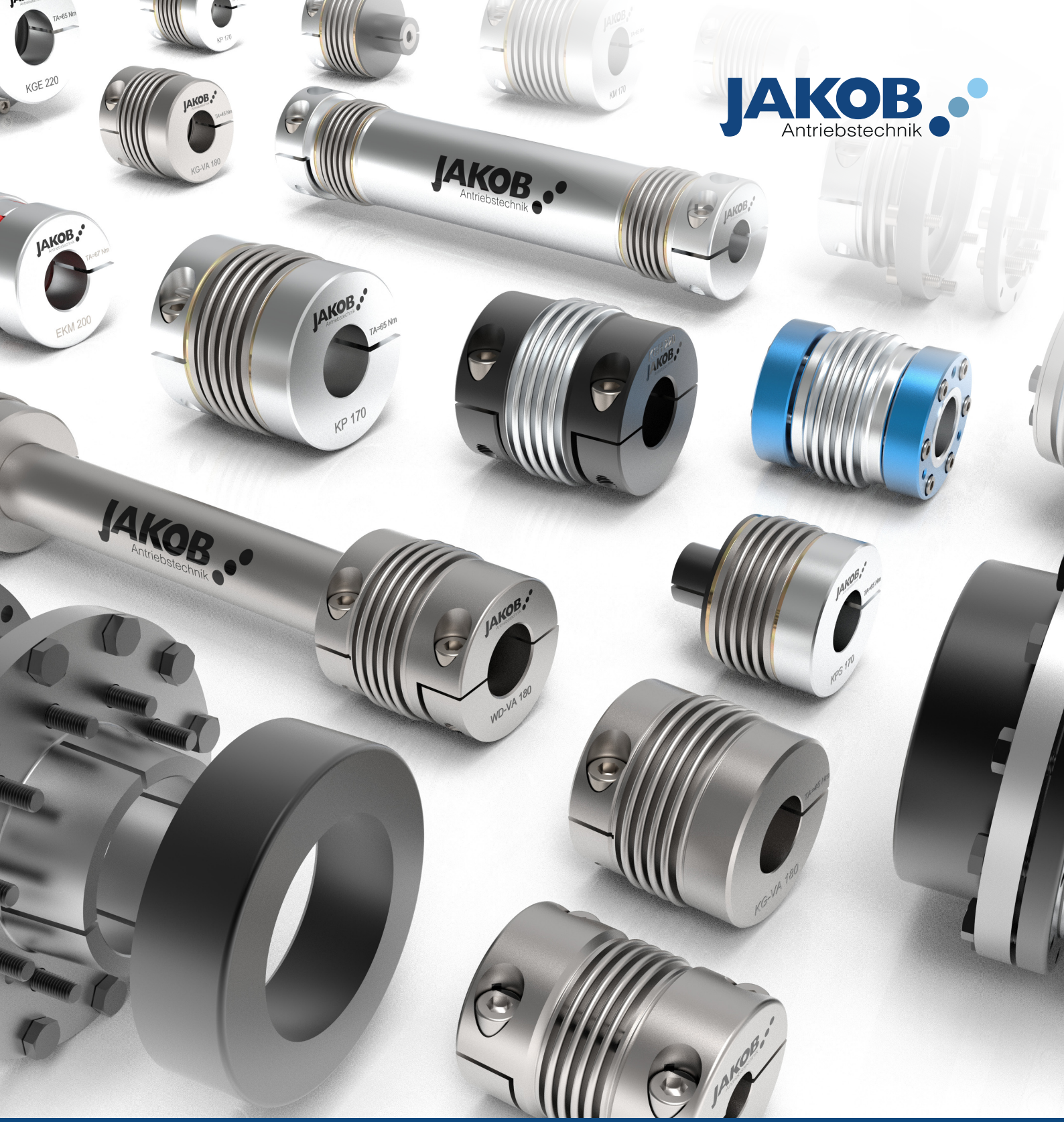


PRODUCT CATALOGUE

SERVO COUPLINGS

The company JAKOB

JAKOB Antriebstechnik GmbH is an internationally leading manufacturer of servo couplings, safety couplings, and mechanical clamping elements.

For more than 55 years JAKOB has been developing and producing various types of torsionally stiff metal bellows couplings and safety couplings for the servo drive industry. Throughout our history we have earned ourselves a reputation of being a reliable and competent partner in the motion and drive industry.

JAKOB is the market leader in the area of mechanical tool and component clamping with its innovative and unique clamping technology.

The JAKOB wedge clamping technology provides the highest clamping forces with low actuation torques and, at the same time, maximum operational safety.

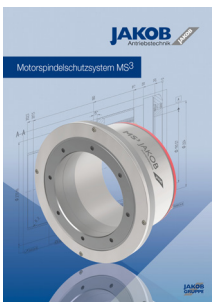
The goal of our servo and safety coupling catalog is to provide a general overview over our standard product range. More detailed information can be obtained at our homepage www.jakobantriebstechnik.de.

Highly trained engineers and technicians at our facility in Kleinwallstadt are always ready with a solution to best meet your requirements.

3D-models in STEP format are available for download at the corresponding site of our homepage. For special dimensions or different drawing types please contact JAKOB. Our other catalogs are also available upon request.

Telephone +49(0)6022 2208-0
www.jakobantriebstechnik.de, info@jakobantriebstechnik.de

All technical details are subject to change. For the most up-to-date data sheets, please check our website.



Servo Couplings I Contents

Metal Bellows Couplings

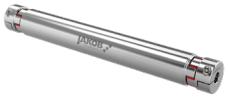
Servo Couplings I Contents

Servo Couplings I Contents

Distance couplings

WD/WDS
- variable length between 0.2 and 6 m • simple installation
- split-hub design • high-speed
- temperature range: -40°C to +200°C

WDB
- variable length up to 260 mm
- simple installation • split-hub design
- high-speed and torsional stiffness



EKHZ
- variable length up to 3 m • stainless
- plug-in • backlash-free • oscillation dampening

WD-VA
- stainless steel version up to 350°C
- split-hub design
- variable length up to 3m

SF
- no additional intermediate storage
- split-hub design
- variable lengths up to 6m

Servo Couplings I General

Definition - Servo Couplings:

Servo couplings are compensating couplings with a backlash free and conformal torque transfer providing high torsional stiffness and a low moment of inertia.
According to these requirements, JAKOB metal bellows couplings can be regarded as the ideal solution. For more than 40 years, they have proven themselves in numerous servo drives as an excellent choice. Elastomer couplings with a flexible polyurethane spider can also represent a perfect alternative for different applications because of their product-specific advantages.

All JAKOB servo couplings are backlash-free and flexible to allow for compensation of shaft misalignments. Because of the unique characteristics of the different series, the designer will most likely find the best solution within the large-scale JAKOB coupling program. The area of application ranges from highly dynamic feed drives of the axes in machine tools to high performance drives in machine tool design.

Characteristics - JAKOB Servo Couplings:

- absolutely backlash-free, precise torque transfer
- low moment of inertia • high balancing quality
- excellent operational characteristics • high speed
- compensation of shaft misalignments • low restoring forces
- frictional, easy-to-fit shaft-hub-connection
- metal bellows: max. torsional stiffness, wear-free, up to 350°C
- elastomer spider: plug-in, oscillation dampening, up to 120°C
- compact dimensions, flexible areas of applications
- large number of types and sizes available (modular system)
- precise production • best quality • long life

The JAKOB Modular System:

As flexible compensating parts, stainless steel bellows are used in different forms as well as polyurethane spiders with different shore hardnesses, oldham-type spacer as polyacetal and stainless steel membrane hubs. Another important aspect is the kind of connection between the drive shafts or the primary shafts and the coupling hubs. Several versions of backlash-free frictional clamping hubs or conical hubs are available.

In this catalog, the most important and widely used series of compensating elements and kinds of hubs, derived from the numerous possibilities of combinations, are described. A well-contrived modular system, which provides multiple uses for many parts, enables production in cost-effective batch sizes and very short delivery periods.

The JAKOB coupling program is devided into the following four main groups:

- metal bellows couplings
- elastomer couplings
- miniature couplings
- distance couplings

For decades, the center of the JAKOB coupling program has been a large variety of different metal bellows couplings.

Couplings I Dimensioning

Technical Information - Definitions / Details:

Nominal torque of the coupling: T_N - [Nm]
The nominal torque of the coupling defines the max. load of the prolonged alternating-stress strength. If in normal operation, T_N is not exceeded, an infinite number of operation cycles can be carried out (see d „durability“).

Moment of inertia: J_K - [10^{-3}kgm^2]
The values for the moment of inertia are defined for medium hub-bores in the given diameter range Dmin/Dmax. Conversion: [kgcm^2] = [10^{-4}kgm^2]

Torsional stiffness: C_{TK} - [Nm/arc min]
The values for the specific torsional stiffness of all couplings are converted from the existing values [103 Nm/rad] to “Newton meter per angular minute”. This enables the constructor to determine the torsion angle failure quite easily (see b below) under consideration of the operating torque. 60 angular minutes (resp. arc minutes) correspond to one angular degree. This defines the conversion factor 1 rad = 57,3° = 3438 arcmin.

Conversion: [103Nm/rad = 0,291 Nm/arcmin] resp. [1Nm/arcmin = 3438 Nm/rad=3,44 kNm/rad]
Example: Size KM 170: 17,5 Nm/arcmin= 60 kNm/rad

Max. misalignment of shafts: [mm]
The maximum misalignment of shafts is the largest allowed misalignment between drive and output shaft, which results from the calculation of the prolonged alternating-stress strength for compensating elements. If the allowed misalignment values are not exceeded, an infinite number of load alternations can be carried out. In exceptional cases (e.g. during fixing) particularly at reduced numbers of load alternations, the misalignment values may be considerably higher (please contact for further consultation).

- **axial misalignment:** usually without problems (expansion due to temperature)
- **angular misalignment:** usually without problems - allowed max. value: 1 to 2 degrees
- **lateral or parallel misalignment:** If the admissible values are considerably exceeded, permanent distortion at the bellows and higher wear of the elastomer spider can occur. Special care must be taken during fitting!

Spring stiffness - axial / lateral: [N/mm]
Restoring forces of metal bellows or elastomer spiders, caused by shaft misalignments.

Dimensioning of the coupling

a) according to torque:

Usually, the size of the coupling is chosen according to the required torque. For exact determination of the necessary drive torque, difficult calculations are neccessary. If the size of the motor is fixed, the necessary nominal torque of the coupling T_{KN} can be calculated as follows:

$$T_N > 1{,}25 \cdot T_A \text{ max} \cdot i$$

T_A max = peak torque of the motor
i = transmission / reduction of the toothed belt drive or the spur-toothed wheel

b) according to torsional stiffness:

For applications with very precise requirements (position control, transmitter), transfer errors due to high elastic deformation can be an important criterion for selection of the coupling. The torsional angle “αT” is calculated as follows:

$$\alpha T = \frac{T_A}{C_{TK}}$$

[arc minutes] with T_A= drive torque [Nm] C_{TK}= torsional stiffness of the coupling [Nm/arcmin]

Very seldomly, metal bellows couplings may have resonance sounds (e.g. a whistling or a humming), when coupling types with a higher torsional stiffness or vibration reducing elastomer couplings are recommended.

Couplings I Dimensioning

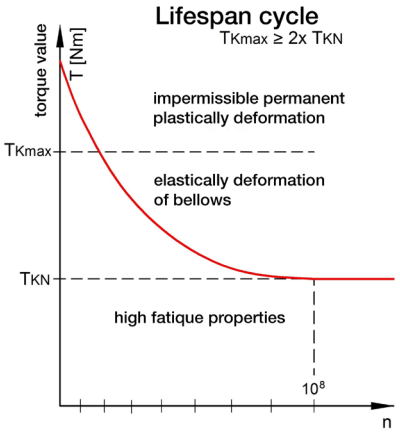
c) according to shaft diameter:

After selecting the coupling type, it must be checked whether the requested shaft diameter corresponds with the allowed diameter (Dmin / Dmax) of the hub bores. Another coupling type or size must be chosen, if the shaft diameter is overdimensioned in relation to the torque, which means it is larger than Dmax of the hub.

note: hub bores which are smaller than “Dmin” are possible, but an optimal transfer of the nominal torque cannot be guaranteed in this case, so a reduction of the drive torque is necessary.

d) durability:

The durability of JAKOB compensating couplings is basically determined by the peak torque and the existing shaft misalignment. If the admissible maximum values for the axial, lateral and angular misalignment are not exceeded and the operating torque is below the nominal torque T_{KN}, then the coupling is within the range of fatigue limit. An infinite number of start-stop-cycles or accelerations and decelerations can be carried out without having to expect a breakdown of the coupling during operation.

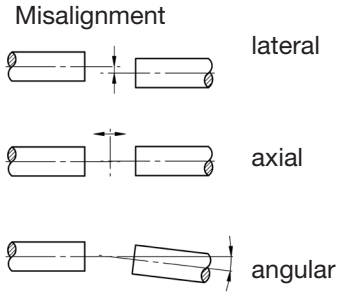


e) max. load:

In special cases, couplings can be overloaded for a short time with twice the nominal torque (2 x T_{KN}). This applies unless otherwise stated on the data sheet for the respective series. The shaft-hub-connection, however, must then be calculated seperately.

f) bearing load:

Due to the flexibility of the compensating couplings in all directions, considerable bearing loads are prevented, in spite of possible axial, lateral or angular misalignment from drive to output shaft. Therefore, an early breakdown or higher wear of the rolling bearing can be prevented. This means less difficult and expensive repairs.



g) operating temperatures:

Metal bellows couplings are, as whole metal couplings, extremely insensitive to temperature. Series with aluminum clamping hubs can be used without restriction from -40 ° C to + 150 ° C, short-term up to + 200 ° C. For models with welded steel or stainless steel hubs, the application temperature is a maximum of 350 ° C. The temperature limits of the elastomer spider are at 90°C (98 Sh-A) and 120°C (72 Sh-D).

h) speeds:

Due to precision machining, the rotation symmetry, and the additional balance pin, the compensating couplings are generally suitable for high speeds even without additional balancing. The standard balancing quality is approx. Q6.3 to Q16. Couplings with conical hubs or hubs with tapered ring can be operated with speeds of over 25,000 min-1 (please contact us for further information). The low moment of inertia also has a positive effect. The type-specific maximum speeds are specified in the data sheets. For very high operating speeds and sensitive drives, we recommend an additional balancing process (optional)

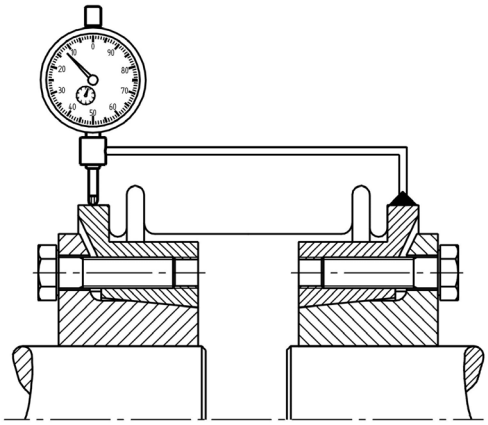
i) maintenance and wear:

Compensating couplings are maintenance and wear free under normal conditions. The polyurethane spiders of the elastomer couplings should be changed in suitable periods, if critical operation parameters are given.

Couplings I Installation Instructions

Alignment of shafts:

Axial and angle misalignment are usually without problems and also simple to measure. To obtain the lateral misalignment, it is recommended to proceed as follows: Fit a dial gauge with an appropriate holding device on one shaft end or on one hub of the coupling and bring the feeler onto the second shaft end or onto the second coupling half (sketch). Now the shafts are turned with the dial gauge and the deflection is read. One half of the total deflection is the lateral misalignment. The admissible value for the shaft misalignments must be taken from the technical data sheets of the appropriate series.



Shaft-hub connection

The couplings are generally supplied with finished bores, in exceptional cases they are also supplied prebored. The seat shaft / hub is to be selected as a transitional seat (example: hub bore diameter 28 G6 - shaft diameter 28 k6). Prior to mounting, the finished bore shaft end conical sleeve should be oiled to prevent fretting corrosion. The coupling is then ready for assembly between the two shafts. An existing keyway in the shaft will not affect the frictional connection.

a) lateral clamping hub

Admissible seat clearance shaft hub: **min. 0,01mm / max. 0,04mm**. Very simple fitting by tightening only one laterally arranged clamping screw (DIN 912). The value for the relevant tightening torques can be found in the data sheets. One hole in the housing is sufficient to tighten the clamping screw (see EASY-clamp sytem). The exception is the KG-HS series with two clamping screws arranged in mirror symmetry.

b) conical hub / conical ring hub

Admissible seat clearance shaft-hub: **max. 0,02 mm.** Assembly of the conical bush or of the conical clamping ring with several, concentrically arranged mounting screws (as a rule 6x DIN 933). One side of the coupling is fit onto the shaft end by evenly tightening the screws crosswise (to prevent uneven draw-on). The drive or output is now turned by a few revolutions, so that the shaft pinion turns in the second hub and the hub can move on the shaft for axial release. Now the six screws of the second hub are also evenly tightened.

c) split-hub

Admissible seat clearance shaft-hub: **min. 0,01mm / max. 0,04mm**. Two lateral clamping screws (DIN 912) are arranged oppositely. The hubs or couplings are split and consist of two loose halves. One of the split-hubs can be put onto the aligned shaft. Tighten clamping screws evenly, alternating between both sides (note specified tightening torques). A larger opening must be provided in the housing for easy installation.

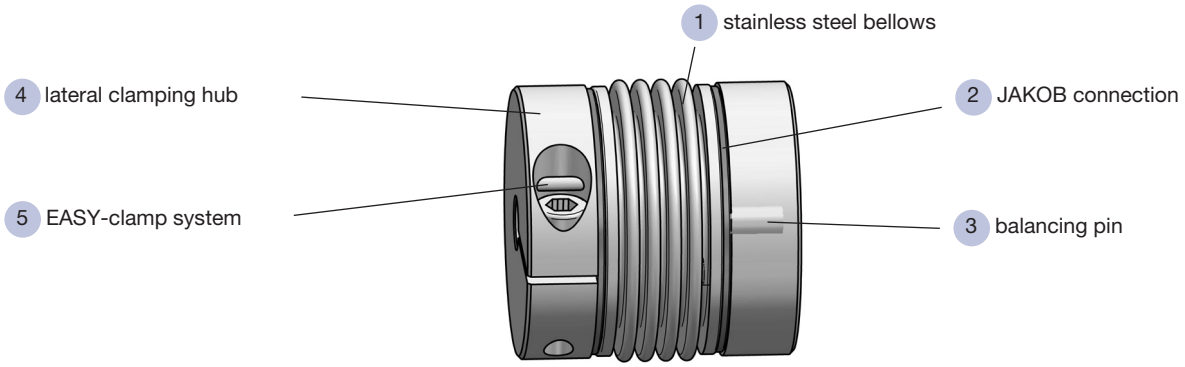
d) disassembly

After releasing the six retaining screws, the hubs are released with three push-off threads each. In axially tight space conditions, it is advisable to screw in and secure the push-off-screws before fitting. For disassembly an opening in the housing should be provided. Disassembly of lateral clamping hub: see EASY-clamp System page 7!

e) special notes

- As the metal bellows consist of thin stainless steel sheeting, special care during fitting and disassembly is necessary. Damages to the bellows can render the coupling useless
- **hub bores which are smaller than "Dmin"** are possible, but an optimal transfer of the nominal torque cannot be guaranteed in this case
- at smaller shaft diameters, the conical hub (larger section thickness) is slotted additionally
- you will find further type specific technical details and characteristics in the data sheets

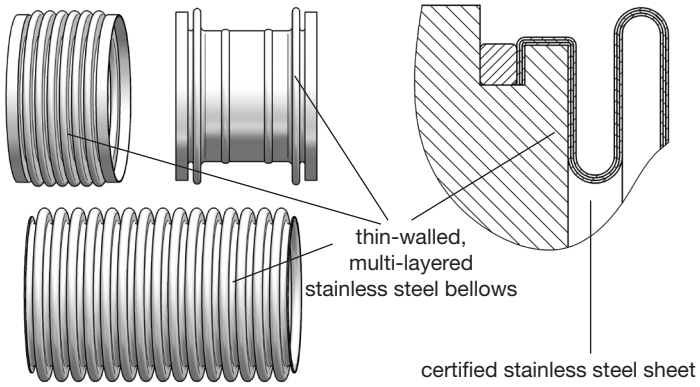
Metal Bellows Servo Couplings I Technical Details



1. Stainless Steel Bellows

advantages:

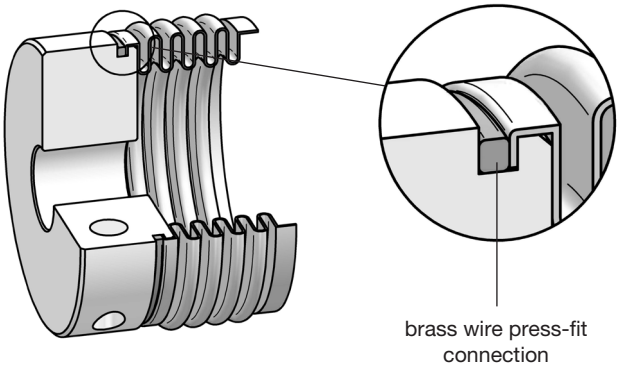
- absolutely backlash-free, precise torque transmission
- extremely high torsional stiffness
- high flexibility for compensation of shaft misalignments
- minimized moment of inertia
- maintenance and wear-free up to 300°C
- high-quality precision manufacture
- system modules with a multitude of different bellows variations
- maximized JAKOB-KNOW-HOW of the specific bellows dimensioning
- 100% final inspection



2. Connection Method

advantages:

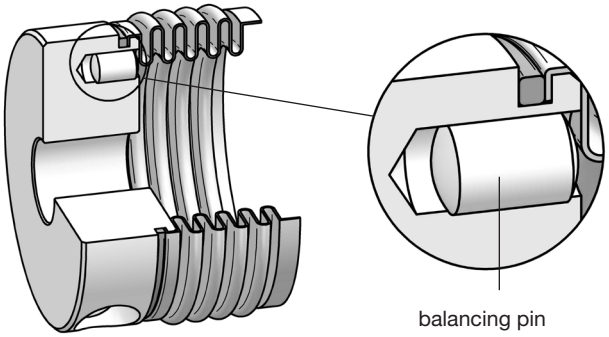
- JAKOB developed and patented the brass-wire press-fit method in 1974, which is the optimal, backlash-free connection of aluminum hubs with multi-layered stainless steel bellows. Alternatively, the steel or stainless steel hubs are connected to the metal bellows via plasma welding
- in contrast to glue connections, these methods are long-life and the torque is safely induced into the hubs



3. Balancing of the Hub

advantages:

- the balancing pin ensures a standard balancing quality of Q16
- high speeds of up to 20.000 rpm
- smooth running to prevent oscillations
- can be specially balanced for balancing quality Q1 - Q2,5

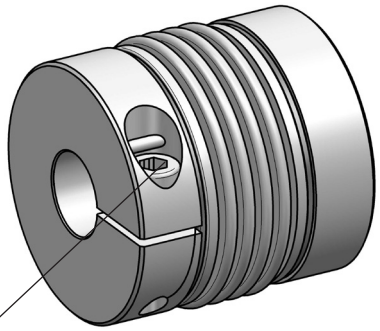


Metal Bellows Servo Couplings I Technical Details

4. Lateral Clamping Hub

advantages:

- clamping hub made from high-tensile aluminum
- simple lateral fitting of shaft-hub-connection
- ensures the backlash-free, force-fitted transfer of the declared nominal torque value (no keyway necessary)
- minimized moment of inertia, low mass, stainless design
- short delivery time due to modulary system
- hub bores (D1/D2 standard tolerance G6); customization possible
- keyway possible on request

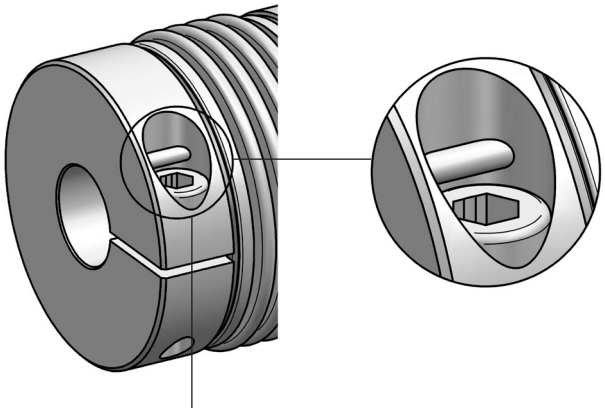


cylinder hex socket screw *ISO 4762 / 12.9*
zinc flake coating

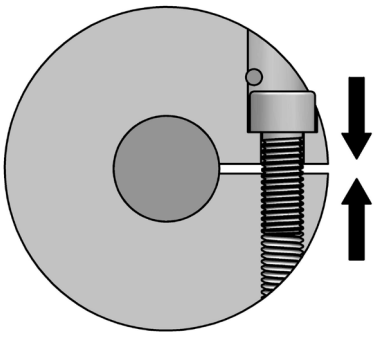
5. EASY-Clamp System

advantages:

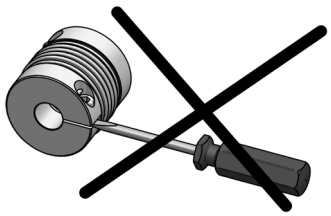
- revolution of coupling fitting
- no shortening or extension of bellows
- grave time saving, no reworking
- blind assembly possible, hole in bell housing is enough
- compensation of tolerance deviation of shaft-hub-fit
- no additional tools necessary
- no damage of hub bores and bellows at demounting of motor

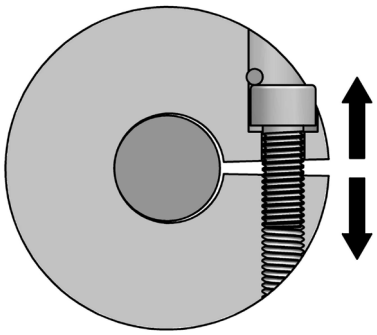


EASY-clamp system



The clamping hub is backlash-free and force-fitted with the shaft.



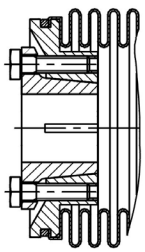


For assembly and disassembly, the hub has to be expanded elastically.

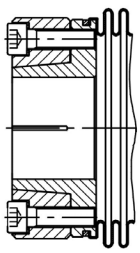
6. Conical Connection

advantages:

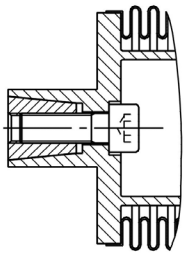
- through force amplification (wedge principal), a safe transmission of torque for smaller bore sizes (hub additionally sliced) can be guaranteed
- backlash- and maintenance-free, force-fitted
- no keyway necessary
- rotational symmetry, good balancing for high speed
- expanding conical hub for axial mounting in hollow shaft



conical clamping hub



conical ring hub



expanding conical hub

Metal Bellows Couplings I Series KM

• 6-corrugation bellows • simple installation with lateral EASY-clamping hub • low-cost standard series

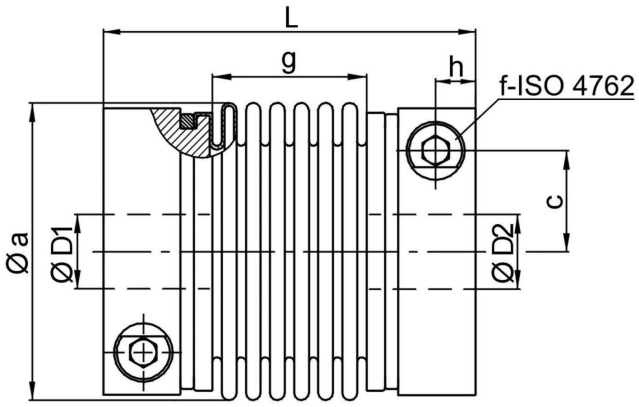
technical data:

KM	TN	moment of inertia	torsional stiffness	max. shaft misalignment (mm)		axial spring rate	lateral spring rate	tightening torque of screws	nmax.
size	[Nm]	[10^{-3}kgm^2]	[Nm/arcmin]	axial±	lateral	[N/mm]	[N/mm]	[Nm] (*)	[upm]
20	20	0,14	5,2	0,8	0,25	51	190	14	20000
35	35	0,14	5,8	0,8	0,25	51	190	14	20000
60	60	0,29	8,7	0,9	0,3	49	260	30	17000
80	80	0,79	14	1	0,3	45	280	50	14000
170	170	0,83	17	1	0,3	80	470	50	14000
270	270	2,2	32	1	0,3	70	450	90	11000
400	400	2,4	47	1	0,3	100	640	90	11000
600	600	5,3	67	1	0,3	100	980	140	9000
900	900	9	105	1	0,3	145	1000	180	8500
1300	1300	14	170	1	0,3	130	920	240	7000

smaller couplings from 0,4 Nm - 12 Nm see series MKM

(*) note: reduced tightening torque for bigger hub bore diameter - see also Ø D 1/2max!
temperature range: -40°C up to +200°C

material:
hubs: high-tensile strength aluminum
screws: ISO 4762 / 12.9
bellows: stainless steel



Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

KM	Øa	c	f	g	h	L	L*	mass ~ [kg]	ØD1/2 min	ØD1/2 max
20	56	19	M 6	30	8	70	81	0,3	8	32
35	56	19	M 6	30	8	70	81	0,3	10	32
60	66	22	M 8	33	9	77	87	0,5	13	35
80	82	28,5	M 10	38	11,5	90	102	0,8	16	43
170	82	28,5	M 10	40	11,5	92	104	0,8	18	43
270	101	35	M 12	42	13	100	106	1,4	25	55
400	101	35	M 12	48	13	106	112	1,5	28	55
600	122	42	M 14	52	16	120	-	2,4	32	68
900	133	47	M 14	53	18,5	143	-	3,5	40	75
1300	157	54	M 16	55	20	145	-	4,2	48	85

note: L* ≙ variable length with bigger clamping hub size (see order example)
· version with steel hub and plasma welded joint, as well as higher torques see series „KG“

order example: KM 170 - D1 = 30 ^{G7} D2 = 35 ^{H6}
KM 170 | 104 - D1 = 28 G^6 D2 = 42 G^6

Metal Bellows Couplings I Series KP

- 4-corrugation bellows • short design • high torsional stiffness
- simple installation with lateral EASY-clamping hub

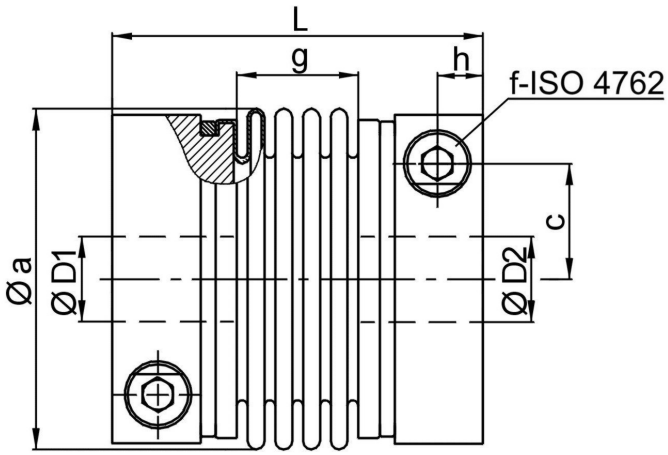
technical data:

KP size	TN [Nm]	moment of inertia [10^{-3}kgm^2]	torsional stiffness [Nm/arcmin]	max. shaft misalignment (mm) axial±	lateral	axial spring rate [N/mm]	lateral spring rate [N/mm]	tightening torque of screws [Nm] (*)	nmax [upm]
25	25	0,064	4	0,5	0,15	36	180	8	23000
35	35	0,13	9	0,5	0,2	70	450	14	20000
60	60	0,27	14	0,6	0,2	70	650	30	17000
100	100	0,35	20	0,6	0,2	110	1200	30	16000
170	170	0,76	28	0,8	0,2	98	1000	50	14000
270	270	2	52	0,8	0,2	90	1300	90	11000
400	400	2,15	74	0,7	0,2	135	1500	90	11000
600	600	5,0	106	0,7	0,2	140	2800	140	9000
900	900	9,0	156	0,8	0,2	210	3050	140	8500

smaller couplings from 2 Nm - 12 Nm see series MKP

(*) note: reduced tightening torque for bigger hub bore diameter - see also Ø D 1/2max!
size **KP 25** - with 5-corrugation bellow and optional with EASY-PIN.
temperature range: -40°C up to +200°C

material:
hubs: high-tensile strength aluminum
bellows: stainless steel
screws: ISO 4762 / 12.9



Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

KP	Øa	c	f	g	h	L	L*	mass ~ [kg]	ØD1/2 min	ØD1/2 max
25	50	17	M 5	24	6	58	-	0,18	10	28
35	56	19	M 6	21	8	61	72	0,3	10	32
60	66	22	M 8	23	9	67	77	0,4	13	35
100	71	25	M 8	23	9	68	-	0,5	14	38
170	82	28,5	M 10	28	11,5	80	92	0,8	18	43
270	101	35	M 12	29	13	87	93	1,3	25	55
400	101	35	M 12	33	13	91	97	1,4	30	55
600	122	42	M14	36	16	104	-	2,3	32	68
900	133	47	M14	37	18,5	127	-	3,3	40	75

note: L* ≙ variable length with bigger clamping hub size (see order example)

order example: KP 170 - D1 = Ø 28 G6 D2 = 35 G6
KP 170 | 92 - D1 = 32 G6 D2 = 42 G6

Metal Bellows Couplings I Series KR

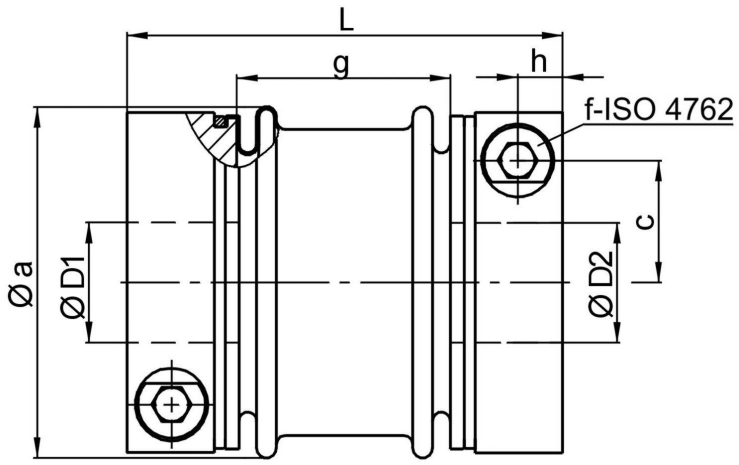
• straight bellows • simple installation with lateral EASY-clamping hub
• low restoring forces • high torsional stiffness • long design

technical data:

KR	T_N	moment of inertia	torsional stiffness	max. shaft misalignment [mm]		axial spring rate	lateral spring rate	tightening torque of screws	nmax.
size	[Nm]	[10^{-3}kgm^2]	[Nm/arcmin]	axial±	lateral	[N/mm]	[N/mm]	[Nm] (*)	[upm]
25	25	0,12	9	0,3	0,2	150	150	14	20000
50	50	0,12	10	0,3	0,2	160	170	14	20000
65	65	0,25	12	0,3	0,3	90	80	30	17000
100	100	0,7	23	0,5	0,4	100	95	50	14000
200	200	0,84	30	0,3	0,3	220	120	50	14000
300	300	2	53	0,4	0,3	210	160	90	11000
450	450	2,15	80	0,4	0,3	300	260	90	11000
550	550	4,7	98	0,5	0,5	300	360	140	9000
1500	1500	13	280	0,6	0,5	520	490	240	7000

(*) note: reduced tightening torque for bigger hub bore diameter - see also Ø D 1/2max!
temperature range: -40°C up to +200°C

material:
bellows: stainless steel
hubs: high-tensile strength aluminum
screws: ISO 4762 / 12.9



Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

KR	Øa	c	f	g	h	L	L*	mass ~ [kg]	ØD1/2 min	ØD1/2 max
25	56	19	M 6	33	8	73	84	0,3	8	32
50	56	19	M 6	33	8	73	84	0,3	10	32
65	66	22	M 8	41	9	85	95	0,4	13	35
100	82	28,5	M 10	50	11,5	102	114	0,75	16	43
200	82	28,5	M 10	56	11,5	108	120	0,8	18	43
300	101	35	M 12	65	13	123	129	1,3	25	55
450	101	35	M 12	65	13	123	129	1,4	35	55
550	122	42	M 14	72	16	140	-	2,2	32	68
1500	157	54	M 16	96	20	186	-	4,4	50	85

note: L* ≙ variable length with bigger clamping hub size (see order example)

order example: KR 100 - D1 = 35 ^{G7} D2 = 35 ^{G7}
KR 200 | 120 - D1 = 32 ^{G6} D2 = 42 ^{G6}

Metal Bellows Couplings I Series KPH / KMH / KRH

• simple installation • split-hub design • backlash-free • torsionally stiff • flexible
• stainless design • variable length

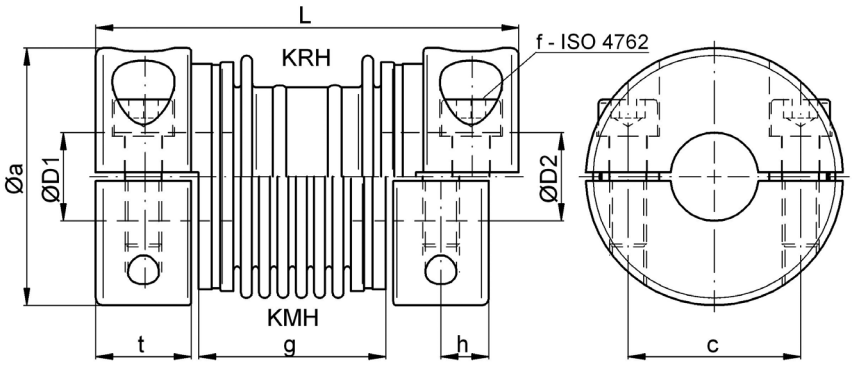
technical data:

KPH/KMH/ KRH Size	nominal torque [Nm]	moment of inertia [10^{-3}kgm²]	torsional stiffness [Nm/arcmin]			max. lateral shaft misalign-ment [mm]			axial spring rate [N/mm]			lateral spring rate [N/mm]			nmax [upm]
			KPH	KMH	KRH	KPH	KMH	KRH	KPH	KMH	KRH	KPH	KMH	KRH	
10	10	0,02	1,7	1,1	-	0,15	0,25	-	70	45	-	224	60	-	28000
40	40	0,2	9	5,8	10	0,2	0,25	0,2	70	51	170	450	190	170	17000
80	80	0,5	14	8,7	12	0,2	0,3	0,3	70	49	95	650	260	80	13000
200	200	1,2	25	17	30	0,2	0,3	0,3	98	80	120	1000	470	120	11000
400	400	3,0	74	47	80	0,2	0,3	0,3	135	100	260	1500	640	260	9500
900	900	8,0	156	105	-	0,2	0,3	-	210	145	-	3050	1000	-	7000

* KRH not available in this size
• three types: type **KPH** with 4-corrugation bellows / type **KMH** mit 6-corrugation bellows / type **KRH** mit 2x 1-corrugation bellows.
• note: for coupling types in split-hub design for higher torques and shorter length see series KGH.

material:
bellows*: stainless steel*
hubs: high-tensile strength aluminum
screws: ISO 4762 / 12.9
temperature range: -40°C up to 200°C

KMH



Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

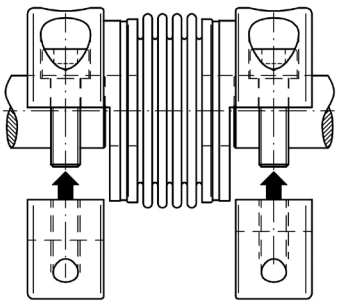
KPH/KMH/ KRH	Øa**	c	f-TA	g			h	L			t	mass ~ [kg]	ØD1/2 min	ØD1/2 max
				KPH	KMH	KRH		KPH	KMH	KRH				
10	35	21	M5 - 8 Nm	33	43	-	9	73	83	-	18	0,1	6	15
40	58	36	M8 - 30Nm	39	48	51	13	95	104	107	26	0,5	9	25
80	75	47	M10 - 50Nm	41	51	59	13	97	107	115	26	0,8	12,5	35
200	89	56	M12 - 90Nm	45,5	57,5	73	14	106	118	134	28	1,2	19	42
400	109	72	M14 - 140Nm	52,5	67,5	84	15	117	132	149	30	2,0	24	55
900	132	94	M14 - 140Nm	62	78	-	16	132	148	-	31	3,3	32	75

** the projecting edge of the screw head is taken into consideration for outer diameter ‘a’

Mounting Instructions:

The split-hub design allows for easy assembly. Further simplification during installation is provided because one half of the split hub can be put onto the shaft. The coupling can rest on the two shaft ends. The second half of the split-hub can then be mounted to the coupling by screwing it on from below with the specified tightening torque. This feature makes a “one man assembly” possible.

Important: the distance between the shafts must be bigger than ‘g’!



order example: **KPH 80 - D1 = 24 G7 D2 = 30 G7**
KMH 400 - D1 = 38 F6 D2 = 48 F6

Metal Bellows Couplings I Series KPP

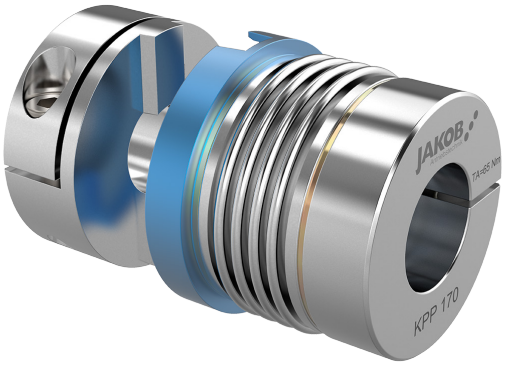
- plug-in design • simple installation • EASY-clamping hub
- high torsional stiffness • backlash-free, precise torque transmission
- sturdy whole metal version

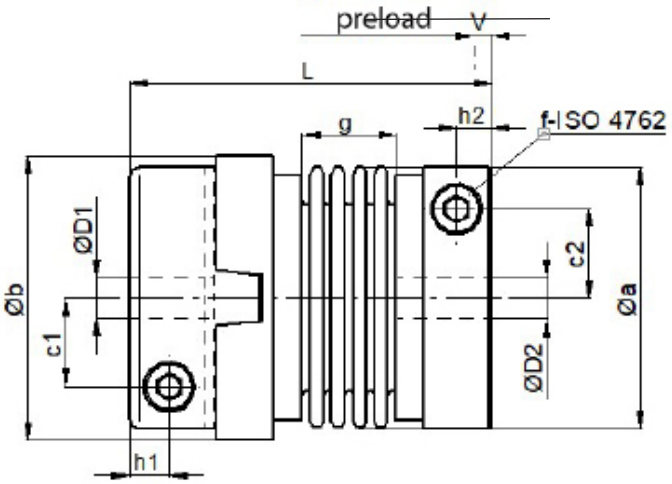
technical data:

KPP size	T_N [Nm]	moment of inertia [10^{-3}kgm^2]	torsional stiffness [Nm/arcmin]	max. shaft misalignment [mm] axial±	lateral	axial spring rate [N/mm]	lateral spring rate [N/mm]	tightening torque screw f | i [Nm] (*)	axial pre-load force ca. [N]	nmax. [upm]
10	10	0,033	2	0,6	0,15	20	93	8	30	23000
20	20	0,17	4,6	0,5	0,2	70	480	14	110	17000
35	35	0,17	5	0,5	0,2	70	480	14	110	17000
60	60	0,34	8	0,6	0,2	70	650	30	110	14000
100	100	0,46	12	0,6	0,2	120	1200	30	180	13000
170	170	0,90	19	0,8	0,2	100	1000	50	150	11000
270	270	2,2	31	0,8	0,2	95	1350	90	140	9500
400	400	2,4	45	0,7	0,2	135	1500	90	200	9500
600	600	5,8	67	0,7	0,2	145	3000	140	220	8000

(*) note: reduced tightening torque for bigger hub bore diameter - see also Ø D 1/2max!
temperature range: -40°C up to +200°C

material:
bellows: stainless steel
hubs: high-tensile strength aluminum
screws: ISO 4762 / 12.9





Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

KPP	Øa	Øb	c1/c2	f	g	h1/h2	V**	L	mass ~ [kg]	ØD1 min-max	ØD2 min-max
10	40	43	13/13	M 5	18	6/6	1-1,5	62	0,15	6-20	6-19
20	56	61	19/19	M 6	21	8/8	1-1,5	77,5	0,38	8-30	8-32
35	56	61	19/19	M 6	21	8/8	1-1,5	77,5	0,38	10-30	10-32
60	66	71	22/22	M 8	23	8,5/9	1-1,5	85,5	0,60	13-34	13-35
100	71	75	25/25	M 8	23,5	8,5/9	1-1,5	86	0,66	14-38	14-38
170	82	87	28,5/28,5	M 10	28	11/11,5	1-1,5	99,5	0,95	18-43	18-43
270	101	106	35/35	M 12	29	12/15	1-1,5	106,5	1,6	25-55	25-55
400	101	106	35/35	M 12	33	12/13	1-1,5	110,5	1,7	30-55	30-55
600	122	126	43,5/42	M 14	36	13,5/16	1-1,5	122,5	2,7	32-70	32-68

* note: reduced tightening torque for bigger hub bore diameter - see also Ø D 1/2max!
**Delivery length L without preload assembly with preload „V“ -> see functional description. Alternative lengths and sizes on request.

note: size KPP 1300 with conical clamping hub on request

order example: KPP 170 - D1 = 28 ^{G7} D2 = 35 ^{H7}

Metal Bellows Coupling I Series KPP I Technical Details

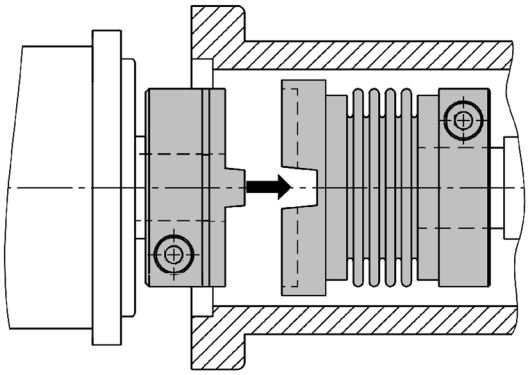
General:

The pluggable, two-part metal bellows couplings are constructed for applications which are difficult to reach, applications without assembly boring for the clamping screws of the coupling hubs or where only blind fitting is possible. For such applications, the assembly is faciliated by the plug-in capability. Also, in case of service, the disassembly is much easier, because the drive unit can be pulled off without the difficult loosening of the hubs.

Product specific characteristics, which define the metal bellows couplings, apply to the KPP couplings as well. These are: absolutely no backlash, high torsional stiffness, low moment of inertia, compensation of misalignments, as well as high operating speeds and high operating temperatures. Depending on special operation parameters, plug-in elastomer couplings of series EKM & ESM provide a good alternative.

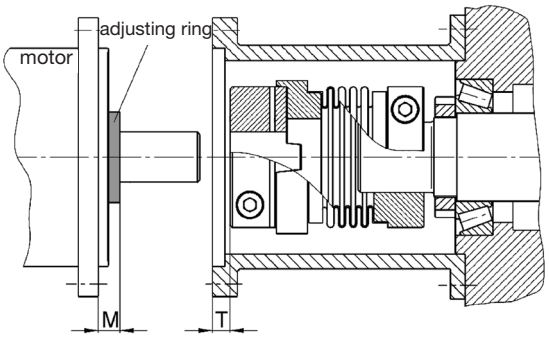
Function:

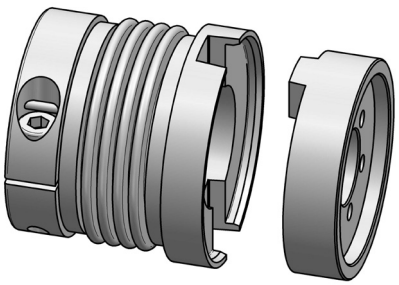
The axial pluggability is achieved by a backlash-free keyway connection in whole metal version (aluminum anodized). For this, one part of the hub is delivered as a conical carrier, the counterpart with a congruent conical keyway. An additional centering element guarantees an exact alignment of both hub halves. To achieve the necessary axial preload of the plug-in connection, the spring tension of the metal bellows is used. For this, the bellow is compressed by 1-1.5 mm during assembly. This means that the unstressed coupling length ‘L’ (see measuring table) is reduced by the preload value ‘V’ after assembly. Because of the low preload, the operational values of the metal bellows are not reduced. The resulting residual forces usually have no negative influence on the shaft bearing.



Assembly Notes:

To guarantee optimal performance of the plug-in connection, the preload value of 1-1.5 mm at the metal bellows must be given special care. In most cases, it is sufficient if the designer considers this. Another possibility for the mechanic is, to mount the whole coupling onto the drive shaft before fitting it to the motor (see drawing). With a depth gauge, the distance value ‘T’ from the bearing surface of the bell to the front-part of the plug-in hub can be measured. The mounting value ‘M’ on the motor shaft is given by adding the distance value ‘T’ to the preload value ‘V’. In series application, the mounting can be facilitated by a great extent by using a corresponding adjustment ring. If the angular position of the carrier to the keyway does not fit during the plugging-in, the metal bellows may be compressed by some more millimeters (this bellows deformation is allowed in exceptional cases). By slow turning of the drive shaft, the carrier fits the keyway in synchronous position and the coupling is ready for use.





application examble: KPP-flange type for direct gear extension

Metal Bellows Couplings I Series KG

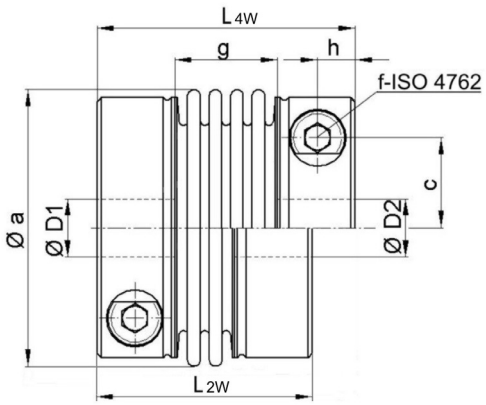
- all-metal version up to 300°C • wear and maintenance free
- very short and variable design • torsionally stiff
- simple installation with EASY-clamping hub

technical data:

KG size	T_N [Nm]	mom. of inertia [10^{-3}kgm²]	torsional stiffness [Nm/arcmin]			max. shaft misalignment [mm] axial±			max. shaft misalignment [mm] lateral			axial spring rate [N/mm]			lateral spring rate [N/mm]			nmax. [upm]
			2W	4W	6W	2W	4W	6W	2W	4W	6W	2W	4W	6W	2W	4W	6W	
40	40	0,21	16	9	6	0,3	0,6	0,8	0,1	0,2	0,3	130	70	50	2500	450	160	23000
80	80	0,44	26	14	9	0,3	0,6	0,8	0,1	0,2	0,3	120	70	50	3500	600	220	20000
140	140	0,74	32	20	13	0,3	0,6	1	0,1	0,2	0,3	210	110	80	7000	1200	400	18000
220	220	1,2	50	28	18	0,4	0,7	1	0,1	0,2	0,3	170	95	70	5000	1000	340	16000
400	400	2,6	93	74	47	0,4	0,7	1	0,1	0,2	0,3	170	130	95	7000	1500	500	13000
700	700	5,4	190	106	68	0,4	0,8	1	0,1	0,2	0,3	260	140	100	15000	2800	980	11000
900	900	11	281	156	115	0,4	0,8	1,2	0,1	0,2	0,3	380	210	145	18000	3050	1000	10000
1300	1300	24	400	225	210	0,4	0,7	1	0,1	0,2	0,3	310	160	200	13000	2100	1400	8500
2000	2000	40	430	340	260	0,4	1	1	0,1	0,2	0,3	310	340	250	13000	4800	1600	8500
3000	3000	75	-	700	490	-	1,5	2	-	0,2	0,4	-	290	200	-	4900	1600	6500

Sizes for smaller nominal torques see miniature couplings series MKG
temperature range: -40°C up to +300°C

material:
bellows: stainless steel 1.4571
hubs: steel St 52 - burnished
screws:
ISO 4762 / 12.9



note: connection between bellows and hub by plasma welding
Three standard versions with 2-corrugated metal bellows 2W, 4-corrugated metal bellows 4W or 6-corrugated metal bellows 6W.• Note for size KG 2000/3000: Technical data for bellows version 4W / 6W instead of 2W / 4W

Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

KG	Ø a	c	f-TA	g			h	L			mass	Ø D1/2	Ø D1/2
				2W	4W	6W		2W	4W	6W	~[kg]	min	max
40	56	20	M6-16 Nm	13	23	34	7,5	45	55	66	0,5	12	32
80	66	22,5	M8-40 Nm	16	24	35	9	53	61	72	0,9	14	35
140	71	27	M8-40 Nm	15	25	36	9	52	62	73	1,1	18	42
220	82	27,5	M10-80 Nm	19	28	41	11,5	64	73	86	1,5	20	42
400	101	32	M12-135 Nm	19	30	49	12,5	71	82	101	2,4	22	50
700	122	40	M12-115 Nm	22	37	52	11,5	70	85	100	3,4	42	64
900	132	45	M14-200 Nm	22	38	54	15,5	86	102	118	5,5	42	70
1300	157	54	M16-300 Nm	23	40	56	17,5	94	111	127	8,5	50	90
2000	157	58	M20-450 Nm	23	40	56	22	113	130	146	12	60	90
3000	203	61	2xM16-300 Nm	-	43	61	18/32	-	187	205	19	60	100

- alternative lengths and hub versions are possible on request

order example: **KG 40 / 4W D1 = 16 G7 D2 = 24 H7**
KG 400 / 2W D1 = 32 G7 D2 = 35 G7
KG 2000 / 6W D1 = 65 G7 D2 = 75 G7

Metal Bellows Couplings I Series KG-VA

- all-stainless steel version up to 350°C • wear and maintenance free
- very short and variable design • torsionally stiff
- simple installation with clamping hub

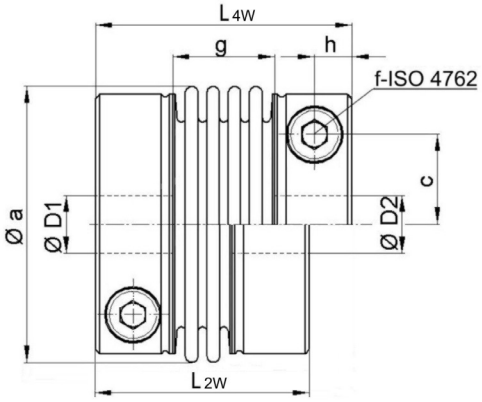
stainless steel

technical data:

KG-VA size	T_N [Nm]	moment of inertia [10^{-3}kgm²]	torsional stiffness [Nm/arcmin]			max. shaft misalignment [mm] axial±				lateral		axiale spring rate [N/mm]			lateral spring rate [N/mm]			nmax. [upm]
			2W	4W	6W	2W	4W	6W	2W	4W	6W	2W	4W	6W	2W	4W	6W	
30	30	0,18	16	9	6	0,3	0,6	0,8	0,1	0,2	0,3	130	70	50	2500	450	190	23000
60	60	0,44	26	14	9	0,3	0,6	0,8	0,1	0,2	0,3	120	70	50	3500	600	260	20000
100	100	0,74	32	20	13	0,3	0,6	1	0,1	0,2	0,3	210	110	80	7000	1200	400	18000
180	180	1,22	50	28	17	0,4	0,7	1	0,1	0,2	0,3	170	95	70	5000	1000	470	16000
280	280	2,6	93	52	47	0,4	0,8	1	0,1	0,2	0,3	170	90	95	7000	1300	500	13000
500	500	6,0	190	106	68	0,4	0,8	1	0,1	0,2	0,3	260	140	100	15000	2800	980	11000
1000	1000	24	400	225	170	0,4	0,7	1	0,1	0,2	0,3	310	160	120	13000	2100	920	8500

Sizes for smaller nominal torque see miniature couplings series MKG-VA
temperature range: -40°C up to +350°C

material:
bellows: stainless steel 1.4571 / A4
hubs: 1.4301 / A2
screws: ISO 4762
stainless steel / A4-80



note: connection between bellows and hub by plasma welding
Three standard variants with 6-corrugated metal bellows 6W, 4-corrugated metal bellows 4W or 2-corrugated metal bellows 2W

Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

KG-VA	Ø a	c	f-TA	g			h	L			mass	Ø D1/2	Ø D1/2
				2W	4W	6W		2W	4W	6W	~[kg]	min	max
30	56	18,5	M6-9	14	23	34	7,5	46	55	66	0,5	14	28
60	66	22,5	M8-24	16	24	35	9	53	61	72	0,9	16	35
100	71	25	M8-24	15	25	36	9	52	62	73	1,1	24	40
180	82	27,5	M10-45	18	28	41	11,5	63	73	86	1,5	28	42
280	101	32	M12-80	19	30	49	12,5	71	82	101	2,4	30	50
500	122	39,5	M14-110	22	37	52	15	82	97	112	3,8	42	62
1000	157	54	M16-180	23	40	56	17,5	94	111	127	8,5	54	90

- clamping hubs generally with stainless steel screws A4-80 without EASY-pin
- check transmission torques of hub-shaft connection for diameters below Dmin (further inquiry possible)
- alternative lenghts or hub versions available on request

order example: **KG-VA 180 / 4W** **D1 = 32 G7** **D2 = 35 G7**
KG-VA 30 / 2W **D1 = 16 G7** **D2 = 19 G7**

Metal Bellows Couplings I Series KGH

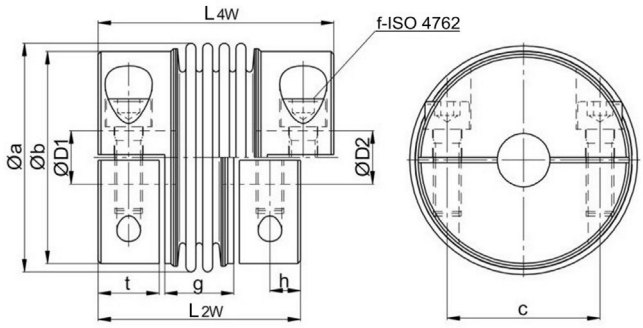
- simple installation - split-hub design
- backlash free - torsionally stiff • wear and maintenance free
- variable length • all-steel-version • up to 350°C

technical data:

KGH size	T_N [Nm]	moment of inertia [10^{-3}kgm^2]	torsional stiffness [Nm/arcmin]			max. shaft misalignment [mm] axial±			lateral			axial spring rate [N/mm]			lateral spring rate [N/mm]			nmax [upm]
			2W	4W	6W	2W	4W	6W	2W	4W	6W	2W	4W	6W	2W	4W	6W	
20	20	0,045	6	3,4	2,4	0,3	0,4	0,5	0,1	0,15	0,25	100	55	50	2100	360	110	23000
40	40	0,2	9	16	6	0,3	0,6	0,8	0,1	0,2	0,25	130	70	50	2500	450	190	17000
80	80	0,5	26	14	9	0,3	0,6	0,8	0,1	0,2	0,3	120	70	50	3500	600	260	14000
140	140	0,8	32	20	13	0,3	0,6	1	0,1	0,2	0,3	110	210	80	7000	1200	400	13000
220	220	1,4	50	28	17	0,4	0,7	1	0,1	0,2	0,3	170	95	70	5000	1000	470	11000
350	350	3,0	93	52	47	0,4	0,8	1	0,1	0,2	0,3	170	90	95	7000	1300	500	9500
700	700	7,3	190	106	68	0,4	0,8	1	0,1	0,2	0,3	260	140	100	15000	2800	980	8000
1800	1800	46	-	300	260	-	1	1	-	0,2	0,3	-	340	250	-	4700	1600	6000

maximum temperature range: -40°C up to +350°C

material:
bellows: stainless steel 1.4571
hubs: steel St 52
screws: ISO 4762 / 12.9



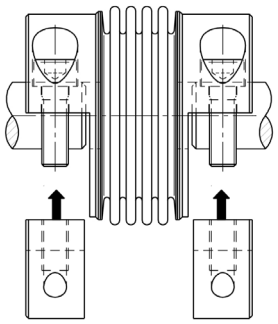
note: Standard versions with 6-corrugated metal bellows 6W, 4-corrugated metal bellows 4W or with 2-corrugated metal bellows 2W -> see values in brackets. Connection of bellows and hubs by micro-plasma welding process.

Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

KGH	Ø a	Ø b	c	f-TA	g			h	L			t	mass	Ø D1/2	Ø D1/2
					2W	4W	6W		2W	4W	6W		~[kg]	min	max
20	40	38	25,5	M5 - 10 Nm	17	22	28	6	45	50	56	12	0,25	8	19
40	56	51	36	M6 - 16 Nm	22	32	42	7,5	56	66	76	15	0,6	12	28
80	66	62	45	M8 - 40 Nm	24	32	43	8	60	68	79	16	0,9	14	35
140	71	71	54	M8 - 40 Nm	23	33	44	8,5	61	71	82	17	1,25	14	42
220	82	76	55	M10 - 80 Nm	27	37	49	11	75	85	97	22	1,8	20	42
350	101	89	64	M12 - 135 Nm	29	40	59	13	83	94	113	24	2,8	22	48
700	122	108	78	M14 - 200 Nm	31	47	62	15	91	107	122	27	4,5	35	62
1800	157	145	108	2x M16 - 300 Nm	-	55	70	18/30	-	190	206	64	15	35	85

Mounting Instructions:

The split-hub design allows for a easy assembly. Further simplification during installation is provided because one half of the split hub is put onto the shaft. This allows that the coupling can rest on the two shaft ends. The second half of the split hub can then be mounted to the coupling by screwing it on from below with the specified tightening torque. This feature makes “one man assembly” possible.



order example: KGH 220 / 4W - D1 = 24 ^{G7} D2 = 30 ^{G7}

Metal Bellows Couplings I Series KG-HS

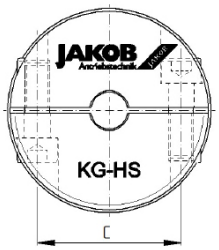
- High-speed version for the highest operating speeds
- Rotationally symmetrical clamping hub for optimum balancing quality

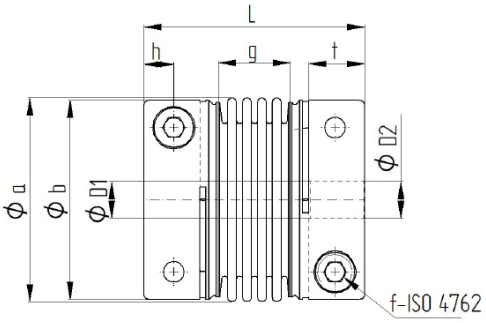
technical data:

KG-HS size	T_N [Nm]	moment of inertia [10^{-3}kgm^2]	torsional stiffness [Nm/arcmin]			max. shaft misalignment [mm] axial±			max. shaft misalignment [mm] lateral			axial spring rate [N/mm]			lateral spring rate [N/mm]			nmax [upm]
			2W	4W	6W	2W	4W	6W	2W	4W	6W	2W	4W	6W	2W	4W	6W	
5	5	0,006	1,3	0,9	0,6	0,2	0,3	0,5	0,05	0,1	0,2	135	75	45	2500	400	140	80.000
10	10	0,035	3,3	2,1	1,3	0,3	0,4	0,5	0,1	0,15	0,25	150	85	60	2300	400	130	57.000
40	40	0,27	16	9	6	0,3	0,6	0,8	0,1	0,2	0,25	130	70	50	2500	450	190	34.000
80	80	0,6	26	14	9	0,3	0,6	0,8	0,1	0,2	0,3	120	70	50	3500	600	260	29.000
220	220	1,7	50	28	17	0,4	0,7	1	0,1	0,2	0,3	170	95	70	5000	1000	470	23.000
400	400	3,3	93	74	47	0,4	0,7	1	0,1	0,2	0,3	170	130	95	7000	1500	500	19.000
1000	1000	11	280	156	105	0,4	0,8	1	0,1	0,2	0,3	380	210	146	18000	3050	1000	14.000

maximum temperature range: -40°C up to +350°C

material:
bellows: stainless steel 1.4571
hubs : Size 5 – 10 stainless steel 1.4301 / size 40 – 400 steel (St52)
screws: ISO 4762 / 12.9





note: Connection of bellows and hubs by micro-plasma welding process.
Three standard variants with 2-corrugated metal bellows 2W, 4-corrugated metal bellows 4W or 6-corrugated metal bellows 6W.

Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

KG-HS	Ø a	Ø b	c	f-TA	g			h	L			t	mass approx.	Ø D1/2	Ø D1/2
					2W	4W	6W		2W	4W	6W		[kg]	min	max
5	24	25,5	16	M3 - 2 Nm	6	11	14	5	33	38	41	10	0,073	6	12
10	34	37	22	M5 - 8 Nm	11	16	23	6,5	48	53	60	13	0,21	8	16
40	56	57	40	M6 - 14 Nm	14	24	34	7,5	56	66	76	15	0,62	10	32
80	66	67	46	M8 - 35 Nm	16	24	35	9,5	66	74	85	18,5	1	12	35
220	82	84	58	M10 - 65 Nm	19	29	41	12	79	89	101	22,5	1,8	14	45
400	101	92	65	M12 - 115 Nm	19	38	49	13	88	103	118	26	2,5	17	50
1000	132	123	92	M14 - 180 Nm	22	38	54	15	96	112	128	28	5,5	20	75

Øb: Projecting edge - screw head
Note: We recommend additional balancing from an operating speed of around 0.3 x nmax. This allows a balancing quality of G 2.5 can be achieved.

order example: KG-HS 5 / 4W - D1 = 8 ^{G7} D2 = 10 ^{G7}
KG-HS 220 / 6W - D1 = 24 ^{G7} D2 = 30 ^{G7}

Metal Bellows Couplings I Series KSD

• 6-corrugation bellows • short design • conical bush on both sides

technical data:

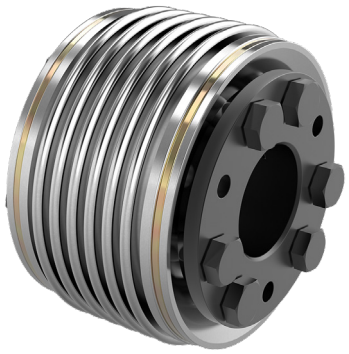
KSD size	T_N [Nm]	moment of inertia [10^{-3}kgm^2]	torsional stiffness [Nm/arcmin]	max. shaft misalignment [mm] axial±	lateral	axial spring rate [N/mm]	lateral spring rate [N/mm]	tightening torque screws „f“ [Nm] (*)	nmax. [upm]
10	10	0,03	2,1	0,6	0,15	20	93	3	30000
20	20	0,1	5,5	0,8	0,25	51	190	3	23000
35	35	0,1	6	0,8	0,25	51	190	3	23000
60	60	0,3	9	0,9	0,3	49	260	10	20000
80	80	0,9	14	1	0,3	48	220	10	16000
170	170	0,9	18	1	0,3	80	400	10	16000
270	270	2,5	32	1	0,3	70	450	25	13000
400	400	2,8	47	1	0,3	100	640	25	13000
600	600	5,5	67	1	0,3	100	980	50	11000
900	900	10	105	1	0,3	145	1000	50	10000
1300	1300	20	170	1	0,3	130	920	90	8500
2000	2000	20	260 (300)	1 (1)	0,3 (0,2)	250 (340)	1600 (4700)	90	8500
3000	3000	90	490 (700)	2 (1,5)	0,4 (0,2)	200 (290)	1600 (4900)	130	6000
4000	4000	110	600 (700)	2,5 (3)	1,2 (1,2)	480 (480)	2000 (5000)	210	6500
6000	6000	130	1100 (1350)	2 (2)	1,1 (1,1)	550 (550)	2500 (6800)	250	6000

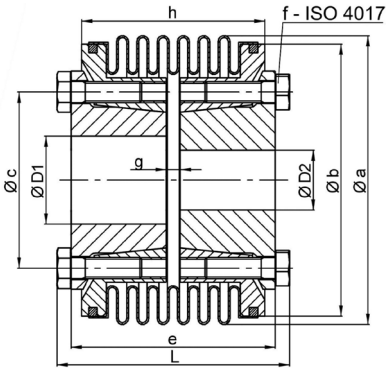
note: KSD size 4000 with 4-corrugation-bellows and shrink disc clamping hub (up to Dmax = **Ø 130mm**)

temperature range:
-40°C up to +300°C

• for higher torques see series KXL

material:
bellows: stainless steel
hubs: heat treated steel
screws: ISO 4017 / 10.9





Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

KSD	Øa	Øb	Øc	e	6 x f	g	h	L	Masse ~[kg]	ØD1/2 min	ØD1/2 max
10	40	34	27	45	M 4	7	33	51	0,22	6	16
20	56	52	30	48	M 4	12	44	54	0,4	10	19
35	56	52	30	48	M 4	12	44	54	0,4	10	19
60	66	62	36	53	M 6	5	47	61	0,8	12	24
80	82	78	50	58	M 6	4	52	66	1,3	18	35
170	82	78	50	60	M 6	6	54	68	1,3	20	35
270	101	96	62	68	M 8	2	58	79	2,4	28	42
400	101	96	62	74	M 8	8	64	85	2,5	30	42
600	122	112	70	78	M 10	6	68	91	3,6	35	50
900	132	127	83	94	M 10	6	76	107	5,5	40	60
1300	157	140	98	96	M 12	6	78	111	7,7	40	75
2000	157	140	98	112 (95)	M 12	22 (5,5)	82 (65,5)	127 (110)	8	40	70
3000	203	176	145	155 (137)	M 14	23 (5)	113 (95)	172 (154)	20	50	100
4000	203	178	144	264 (223)	M 16	125 (84)	215 (174)	284 (243)	22	50	100
6000	236	175	144	279 (229)	M 16	140 (90)	230 (180)	299 (249)	25	50	100

order example: KSD 270 - D1 = 42 ^{G6} D2 = 30 ^{H7}

Metal Bellows Couplings I Series KSS

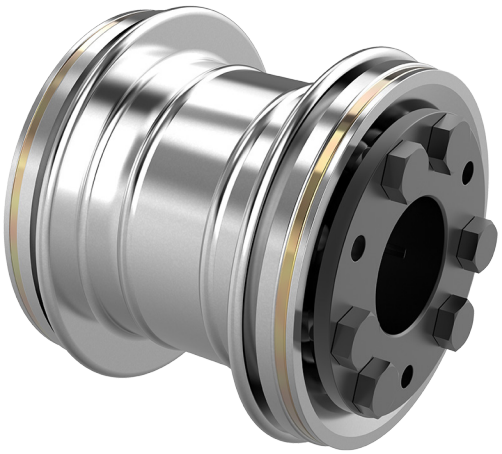
• straight bellows • conical bush on both sides • low restoring forces • high torsional stiffness

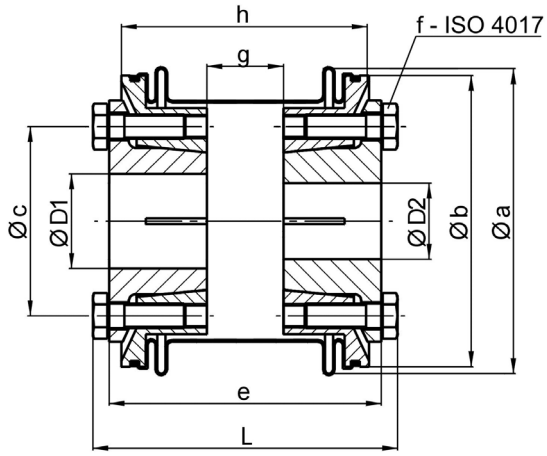
technical data:

KSS	T_N	moment of inertia	torsional stiffness	max. shaft misalignment [mm]		axial spring rate	lateral spring rate	tightening torque screws "f"	nmax.
size	[Nm]	[10^{-3}kgm^2]	[Nm/arcmin]	axial±	lateral	[N/mm]	[N/mm]	[Nm] (*)	[upm]
25	25	0,1	10	0,3	0,2	150	150	3	23000
50	50	0,1	11	0,3	0,2	160	170	3	23000
65	65	0,3	13	0,3	0,3	90	80	10	20000
100	100	0,75	24	0,5	0,4	100	95	10	18000
200	200	0,84	30	0,3	0,3	220	120	10	16000
300	300	2,3	53	0,4	0,3	210	160	25	13000
450	450	2,4	80	0,4	0,3	300	260	25	13000
540	540	4,8	100	0,5	0,5	300	360	50	11000
850	850	18	160	0,7	0,6	200	170	90	8500
1500	1500	19	290	0,6	0,5	520	490	90	8500
2600	2600	90	700	0,5	0,5	550	590	130	6000

temperature range: -40°C up to +300°C
for higher torques see series KXL

material: *hubs: heat treated steel*
screws: ISO 4017 / 10.9 *bellows: stainless steel*





Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

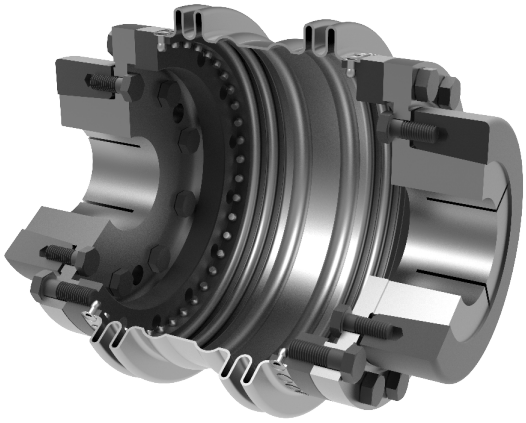
KSS	Øa	Øb	Øc	e	6 x f	g	h	L	mass ~ [kg]	ØD1/2 min	ØD1/2 max	prebored
25	56	52	30	51	M 4	15	47	57	0,4	10	19	8
50	56	52	30	51	M 4	15	47	57	0,4	12	19	8
65	66	62	36	61	M 6	13	55	69	0,7	12	24	11
100	82	78	50	70	M 6	16	64	78	1,2	18	35	17
200	82	78	50	76	M 6	22	70	84	1,25	22	35	17
300	101	96	62	91	M 8	25	81	101	2,2	28	42	25
450	101	96	62	91	M 8	25	81	101	2,3	28	42	25
540	122	112	70	98	M 10	26	88	111	3,4	35	48	28
850	157	140	98	137	M 12	44	119	152	7,5	40	70	38
1500	157	140	98	137	M 12	44	119	152	7,7	42	70	38
2600	203	170	145	219	M 14	87	176	236	20	50	100	49

order example: KSS 450 - D1 = 28 ^{H7} D2 = 35 ^{F6}

Metal Bellows Couplings I Series KXL

• for high torques up to 70.000 Nm • backlash-free, exact torque transfer
• high torsional stiffness • low moments of inertia • high tolerance of shaft misalignments
• three-part construction • easy to fit • variable in use

The metal bellows couplings of the series KXL are constructed for medium size to big drives of up to 70.000 Nm. Although this type of coupling has proven itself reliable for years, the series was completely redesigned in order to make it even more attractive regarding technical parameters as well as the aspect of costs. It is very special because of the three-part construction with a flexible intermediate piece (bellows). This intermediate piece can be disassembled. It consists of an optimal torsionally stiff stainless steel bellows with 2 bellows shafts on each side and an intermediate pipe which is variable in length. The connection with the two hubs is frictionally engaged (screws acc. to ISO 4017/10.9). Therefore, assembly is much easier, as in case of inspection or service, the heavy drive unit or the output unit need not be disassembled. The designer can choose between several hub variations (see selection table). The very good moment of inertia and the rotation symmetrical design ensure good dynamic operation characteristics. KXL couplings are most suitable for precise drives, such as those used in printing machines, cross cutters, main spindle drives, transfer axes or used in combination with gearboxes. Medium transport or a parallel drive chain through the coupling interior is possible.



material:
bellows: stainless steel
flange: heat-treated steel - oxidized
hubs: heat-treated steel - oxidized

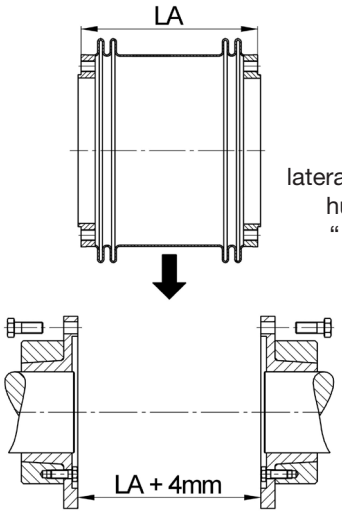
technical data:

KXL	nominal torque	maximum torque	torsional stiffness CT	spring rate		max. shaft misalignment [mm]			nmax.
				axial	angular	axial±	angular	lateral	
size	[Nm]	[10^{-3}kgm²]	[Nm/arcmin]	C_a[N/mm]	C_W [N/°]	d_a [mm]	d_W [°]	d_r [mm]	[upm]
9	9000	15000	1800	550	60	2,5	1,4	1,1	4500
12	12000	17000	2200	490	85	3,5	1,4	1,5	4000
18	18000	26000	3900	530	130	4	1,5	1,6	3500
32	32000	45000	7200	900	180	4	1,4	1,6	2500
50	50000	70000	13500	950	230	4	1,5	1,6	2000

maximum temperature range: -40°C up to +300°C

KXL size	mass			moments of inertia		
	per hub A/B mA/mB [kg]	per hub F/G mF/mG [kg]	bellows mBP [kg]	per hub A/B JA/JB [kgm²]]	per hub F/G JF/FG [kgm²]	bellows JBP [kgm²]
9	16	6,5	10,5	0,12	0,07	0,14
12	21	8	14	0,17	0,08	0,24
18	31	11	20	0,37	0,18	0,47
32	52	20	30	0,94	0,53	1,12
50	95	30	45	2,5	1,4	2,65

note: The technical data corresponds to bellows with standard length 'L16' or 'LA'. Different lengths are available on request



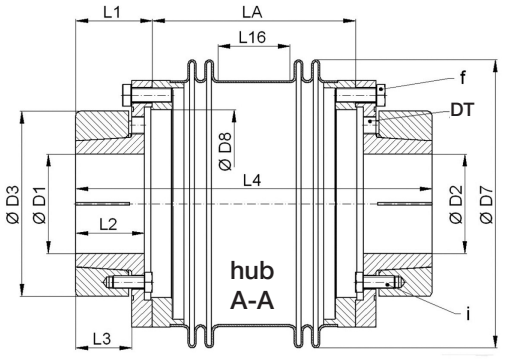
lateral mounting hub type " A - A "

Metal Bellows Couplings I Series KXL

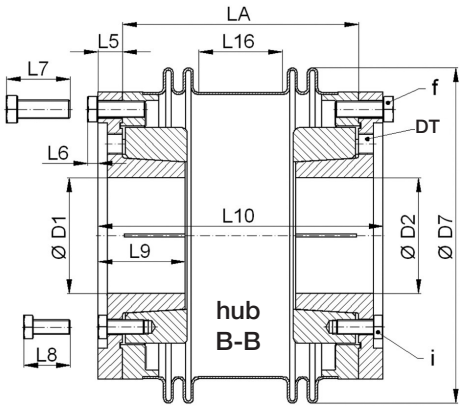
Dimensions [mm]:
length dimensions according to DIN ISO 2768 cH

Size	9	12	18	32	50
D1 min	70	80	100	120	140
D2 max	108	130	150	170	220
D3	190	205	247	296	380
D5	256	273	322	406	505
D7	259	319	372	460	561
D8	193	208	250	325	416
L1	77	85	91	105	120
L2	66	74	79	93	108
L3	54	62	66	78	88
L4**	351	399	442	497	537
L5	23	23	25	27	30
L6	8,8	10	11,5	12,5	12,5
L7	48,8	55	62	68	72,5
L8	48,8	44	55	55	66,5
L9	75	83	89	103	118
L10**	239	271	306	337	357
L12**	293	333	372	415	447
L16*	59	80	100	110	120
LA ±2	193	225	256	283	297
L18	25	25	30	30	34
L20**	200	232	266	288	304
L21	25	25	30	30	34
f	12 x M14	14 x M16	12 x M18	12 x M20	16 x M20
i	8 x M14	9 x M14	8 x M16	10 x M16	12 x M20
AG***	8 x M14	9 x M14	8 x M 16	5 x M20	6 x M20
TA-f [Nm	180	250	350	500	500
TA-i [Nm]	180	180	250	250	400

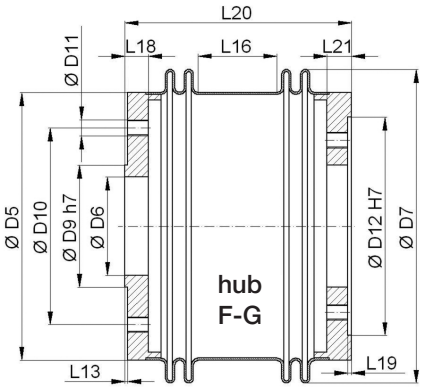
*standard length - intermediate part
**overall length for standard length L16
***draw-off thread



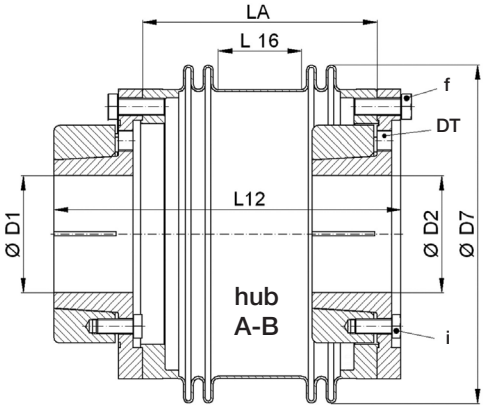
hub type A:
frictional, backlash-free conical clamping ring connection, external free lateral disassembly of the bellow part. The elongation of total length "L4" of the intermediate pice of 4 mm at mounting is already taken into consideration (see mounting picture)



hub type B:
frictional, backlash-free conical clamping ring connection, internal free lateral disassembly of the bellows part is NOT possible



hub type F/G:
attached flange acc. to ISO 9409 or customer requirements - center outside or inside. Dimensions of flange hub types F and G of L13, L19 and D6, D9, D10, D11, D12 customized



hub type A/B:
frictional, backlash-free conical clamping ring connection - external - internal - free lateral disassembly of the bellows part is NOT possible

order example:
KXL 6,5 – AA / L4 = 318 / D1 = 80^{H7} / D2 = 90^{H7}
KXL 13,5 – BG / L16 = 200 / D1 = 120^{G6} / D2 = customer specific

Metal Bellows Couplings I Series KPS

- 4-corrugation bellows • simple installation with lateral EASY-clamping hub
- expanding cone hub for direct mounting

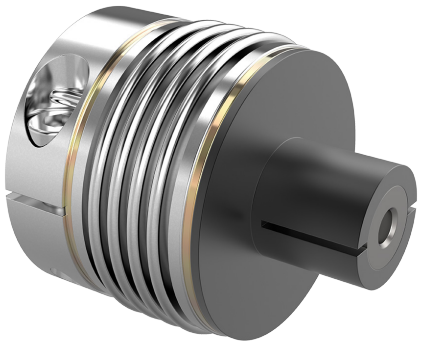
technical data:

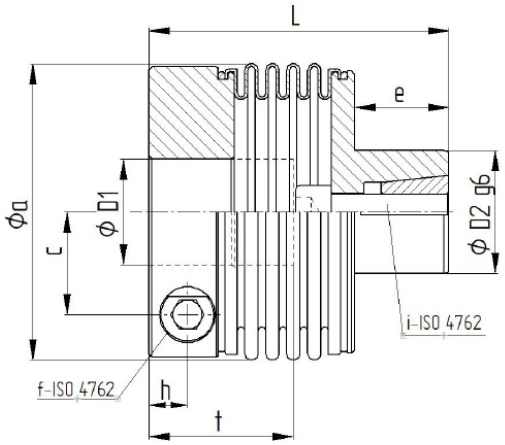
KPS	T_N	moment of inertia	torsional stiffness	max. shaft misalignment (mm)		axial spring rate	lateral spring rate	tightening torque of screws		nmax.
size	[Nm]	[10^{-3}kgm^2]	[Nm/arcmin]	axial±	lateral	[N/mm]	[N/mm]	f	i [Nm]	[upm]
2	2	0,01	0,4	0,25	0,1	32	100	2	2	41000
8	8	0,026	1,9	0,5	0,15	20	90	8	8	25500
20	20	0,13	7	0,5	0,2	70	480	14	14	20000
60	60	0,25	13	0,6	0,2	70	650	30	35	17000
170	170	0,71	27	0,8	0,2	100	1000	50	65	14000
400	400	1,9	64	0,7	0,2	135	1500	90	115	11000
600	600	4,1	107	0,7	0,2	145	3000	140	180	9000

(*) note: reduced tightening torque for bigger hub bore diameter - see also Ø D 1max!

material:
bellows: stainless steel
hubs: high-tensile aluminum
expanding cone: heat-treated steel

screws: ISO 4762 / 12.9
temperature range:
-40°C up to +200°C



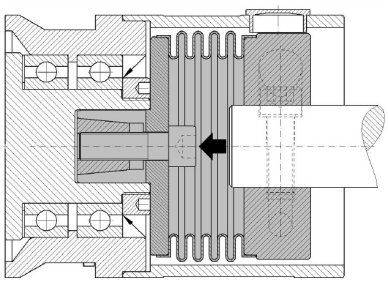


Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

KPS	Ø a	c	e	f/i	h	L	tmin	tmax	mass	Ø D1		Ø D2	
									~ [kg]	min	max	min	max
2	24,5 [27,5]	7,5	10	M 3	4,4	38	10,5	18	0,03	3	10 [14]	8	12
8	39,5 [44,5]	13	20	M 5	6	61	14	31,5	0,16	6	19 [24]	13	20
20	56	19	23	M 6	8	71,5	17	34	0,38	8	32	15	24
60	66	22	25	M 8	9	78	19	36	0,5	13	35	20	28
170	82	28,5	30	M 10	11,5	92	23	43	0,9	18	43	24	35
400	101	35	32	M 12	13	102	28	50	1,5	30	55	32	42
600	122	42	42	M 14	16	120,5	30	55	2,5	32	68	35	48

note: The corresponding shaft bores for the expansion cone pin Ø D2 g6 with manufacturing tolerance H7.
Size KPS2 / KPS 8 without EASY version available with larger hub bores [see square brackets]

mounting instructions: To avoid damage to the metal bellows during installation avoid, the axial assembly force should not act on the clamping hub, but on the conical screw are exercised.



application example: compact and integrated attachment of a KPS

order example: KPS 20 - D1 = 15 ^{H7} - D2 = 20 g6

Metal Bellows Couplings I Series KHS

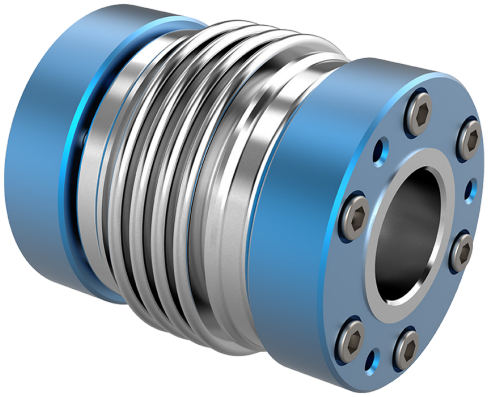
- high-speed version for highest operating speeds
- rotationally symmetrical construction - optimum balance quality
- conical clamping ring hubs on both sides / 4-bladed metal bellows
- corrosion-resistant material version

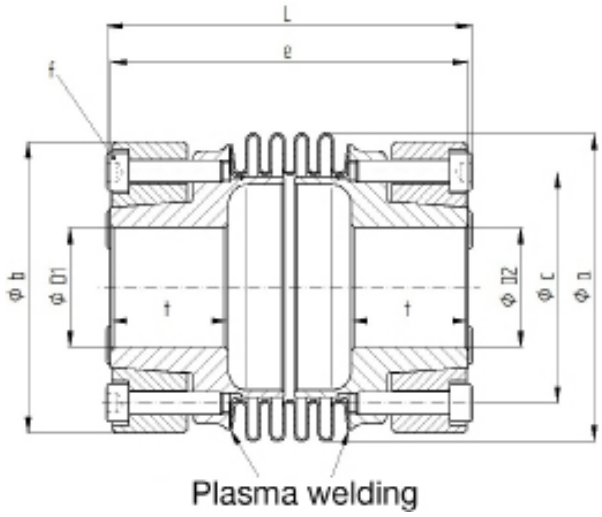
technical data:

KHS Size	nominal torque [Nm]	moment of inertia [10-^{3}kgm^2]	torsional stiffness (stat. 0,5 x T_N) [Nm/arcmin]	max. shaft displacement (mm) axial	± lateral	axial spring rate [N/mm]	lateral spring rate [N/mm]	mass approx. [kg]	maximum rot. speed [Upm]
25	25	0,04	3,4	0,5	0,1	55	360	0.25	57000
50	50	0,18	9	0,6	0,1	70	450	0,5	40000
80	80	0,5	26	0,6	0,1	70	600	1,0	35000
220	220	1,1	37	0,6	0,1	150	1600	1,5	28000
450	450	3,0	70	0,7	0,1	135	1500	3,0	23000
700	700	7,0	100	0,7	0,1	145	3000	4,5	19000

temperature range: -40°C up to +200°C

material:
bellows: stainless steel 1.4571
conical hub: stainless steel 1.4301
conical ring: high-tensile aluminum
screws: ISO 4762





Dimensions [mm]: length dimensions accoring to DIN ISO 2768 cH

KHS size	Øa	Øb	Øc	L ±1	e ±1	f-max. torque	t1 / t2	ØD1/2 min	ØD1/2 max
25	40	38	27	67	63	6x M4 - 3Nm	22	5	15
50	56	53	40	74	72	6x M4 - 4Nm	23	9	22
80	66	66	52	82,5	81,5	6x M5 - 8Nm	27,5	11	32
220	82,5	78	62	98	95	6x M6 - 14Nm	31,5	14	40
450	101	98	78	113	109	6x M8 - 30Nm	38	15	48
700	122	113	91	132	129	6x M10 - 50Nm	45	19	60

note: Optionally balanced with balancing quality „Q1“. Larger sizes on request.

order example: KHS 80 - D1 = 16 ^{G7} D2 = 24 ^{H7}

Metal Bellows Couplings I Series KGE

- for standardized interface connection DIN - EN - ISO 9409 - 1
- two-part connection flange • compact design • temperatures up to 300°C
- simple installation with lateral EASY-clamping hub at output side

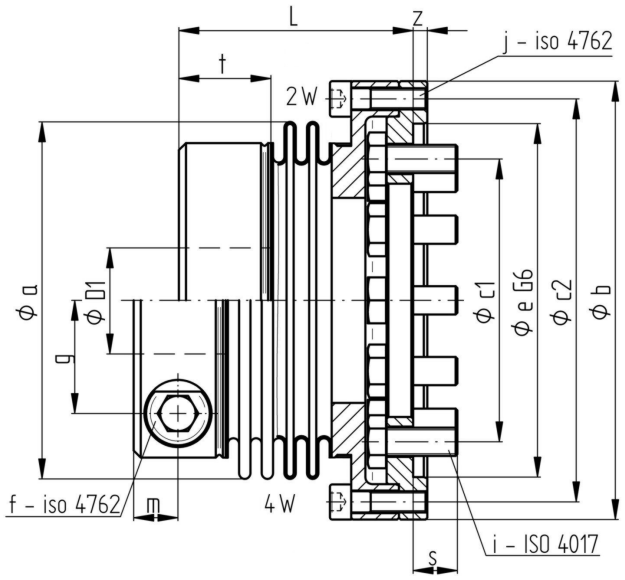
technical data:

KGE size	nominal torque [Nm]	ISO 9409 inter-face	moment of inertia [10^{-3}kgm²]	torsional stiffness [Nm/arcmin]			max. shaft misalignment [mm] axial±			lateral			axial spring rate [N/mm]			lateral spring rate [N/mm]			tightening torque screws [Nm]			nmax [upm]
				2W	4W	6W	2W	4W	6W	2W	4W	6W	2W	4W	6W	2W	4W	6W	f	i	j	
40	40	A-31,5	0,2	6	3,4	6	0,3	0,5	0,8	0,1	0,15	0,25	100	55	50	2100	360	190	16	8	4	23000
140	140	A-50	1,2	32	20	13	0,3	0,6	1	0,1	0,2	0,25	210	110	80	7000	1200	400	40	14	8	18000
220	220	A-63	2	50	28	17	0,4	0,7	1	0,1	0,2	0,3	170	95	70	5000	1000	470	80	14	14	16000
350	350	A-80	4,2	93	52	47	0,4	0,8	1	0,1	0,2	0,3	170	90	95	7000	1300	500	135	35	14	13000
700	700	A-100	9,1	190	106	68	0,4	0,8	1	0,1	0,2	0,3	260	140	100	15000	2800	980	115	65	35	11000
1300	1300	A-125	34	400	225	210	0,4	0,7	1	0,1	0,2	0,3	310	160	200	4700	1900	1400	300	65	35	8500
2000	2000	A-125	42	-	300	260	-	1	1	-	0,2	0,3	-	340	250	-	4700	1900	450	65	35	8500

Standard versions „6W“ with 6-corrugated metal bellows „4W“ with 4-corrugated metal bellows; „2W“ with 2 corrugated metal bellows

- permissible maximum torque = 2 x nominal torque • maximum permissible operating speeds up to 20,000 rpm size

Material:
bellows: stainless steel
flange ring: heat treated steel - carbonized
clamping hub / flange hub: steel (St 52)
screws: ISO 4762/12.9
ISO 4017/10.9



Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

KGE	Ø a	Ø b	Ø c1	Ø c2	e	f-TA	g	i	j	L			m	s	t	z	mass	Ø D1	
										2W	4W	6W					~ [kg]	min	max
40	56	63,5	31,5	56,5	40	M6	18	8xM5	8xM4	46	57	67	7,5	7	16	2,5	0,6	12	32
140	71	88,5	50	80	63	M8	27	8xM6	8xM5	54	64	74	9	9,5	18,5	4	1,3	18	42
220	82	104	63	94	80	M10	27,5	12xM6	8xM6	59	71	84	11,5	10,5	22,5	4	1,7	20	42
350	101	124	80	114	100	M12	32	12xM8	12xM6	67	79	98	12,5	12,5	26	4	2,6	22	50
700	122	155	100	142	130	M12	40	12xM10	12xM8	73	89	103	11,5	15,5	24	4	4,3	42	64
1300	157	184	125	171	160	M16	54	12xM10	16xM8	90	107	124	17,5	18,5	35	4	7,5	45	90
2000	157	184	125	171	160	M20	58	12xM10	16xM8	-	117	133	22	18,5	45	4	9	60	90

order example:	KGE 350 / 4W	ØD1 = 38 G7	/	for ISO 9409 - interface A-80
	KGE 140 / 2W	ØD1 = 28 G7	/	for ISO 9409 - interface A-50

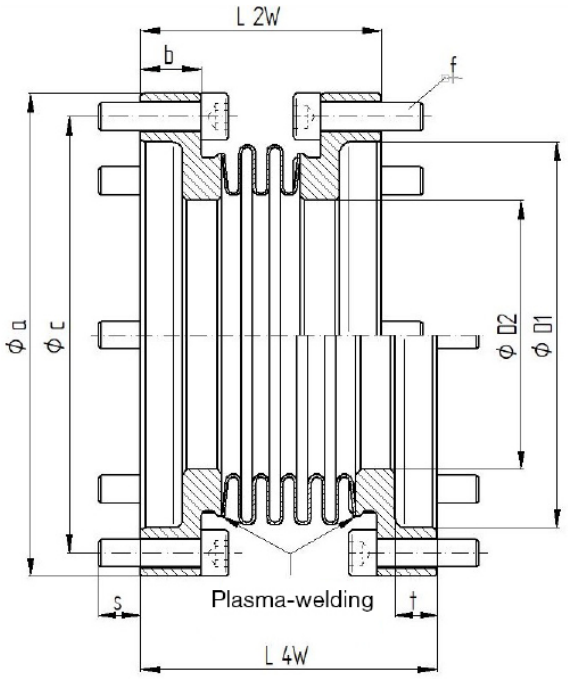
Metal Bellows Couplings I Series KE

- with flange hub on both sides for variable attachment / 2 - 4 - 6 corrugated metal bellows
- optimal balance quality / high operating speeds / rotationally symmetrical design

technical data:

KE	nominal torque	moment of inertia	torsional stiffness [Nm/arcmin]			max. shaft displacement (mm) axial ±			max. shaft displacement (mm) lateral			axial spring rate [N/mm]			lateral spring rate [N/mm]			nmax
size	[Nm]	[10-³kgm²]	2W	4W	6W	2W	4W	6W	2W	4W	6W	2W	4W	6W	2W	4W	6W	[upm]
40	40	0,17	16	9	6	0,3	0,5	0,8	0,1	0,15	0,3	130	75	50	2800	490	160	40000
80	80	1,0	26	14	9	0,3	0,6	0,8	0,1	0,2	0,3	120	70	50	3500	600	260	35000
140	140	1,0	32	20	13	0,3	0,6	1,0	0,1	0,2	0,25	210	110	80	7000	1200	400	32000
220	220	2,1	50	28	20	0,4	0,7	1,0	0,1	0,2	0,25	170	95	70	5000	1000	330	27000
400	400	4,0	93	68	47	0,4	0,8	1,0	0,1	0,15	0,3	170	135	95	7900	1500	500	22000
700	700	11,6	190	106	68	0,4	0,8	1,0	0,1	0,2	0,3	260	140	100	15000	2800	980	18000
2000	2000	25	430	325	225	0,4	1,0	1,0	0,1	0,25	0,4	310	340	250	13000	4700	1600	14000

temperature range: -40°C up to +300°C



material:
bellows: stainless steel 1.4571
flange hub: Steel (St 52)
screws: ISO 4762
optional ISO 4017

Dimensions [mm]: length dimensions accoring to DIN ISO 2768 cH

KE	Øa	Øb	Øc	L ±1			f	max. torque	s	t	mass	ØD1	ØD2
size				2W	4W	6W		[Nm]			~ [kg]	(G7)	(G7)
40	63,5	3,5	56,5	42	52	62	8x M4	4	6,5	6,5	0,29	43	35
80	88,5	11	80	57	65	76	8x M5	8	9	7,5	0,85	68	45
140	88,5	11	80	48	58	69	8x M5	8	9	7,5	0,8	68	48
220	104	13	94	54	64	76	8x M6	14	9	9	1,1	83	58
400	124	13,5	114	57	72	87	12x M6	14	8,5	9,5	1,5	104	70
700	155	15	142	64	80	94	12x M8	35	10	10,5	2,8	125	90
2000	184	16	171	72	88	105	16x M8	35	14	11	4,1	156	120

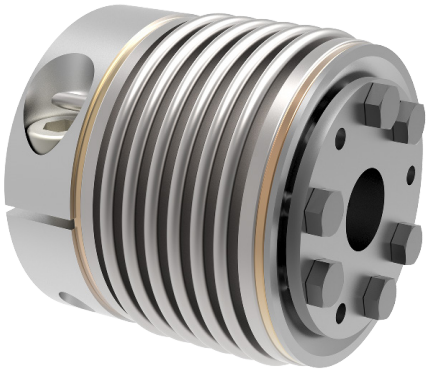
note: Special flange designs with customer-specific dimensions are possible on request.

order example: KE 400 / 4W D1=110 ^{G6} / D2=50 ^{G6} / t=5 / b=15 / c=120 - 8xM8 / L=75

Metal Bellows Couplings I Further Series

Combination KM/KSD

- for connection of drive shafts with different shaft diameters - clamping hub for big diameters,
- conical clamping hub for small diameters

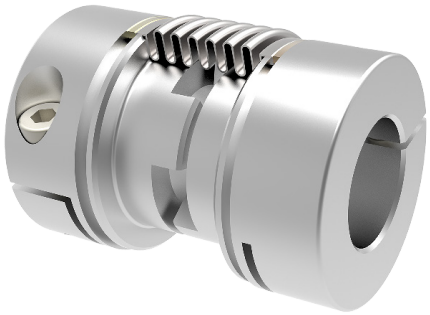


Form-fitted hub version

- clamping hub additional with keyway
- special hubs with internal toothing such as DIN 5480
- low-backlash pluggable or slide mounting for profile shafts
- as forced rotation due to overload (observe Tmax of metal bellow)
- optional for all series on request

Forced rotation for bellow breaking protection

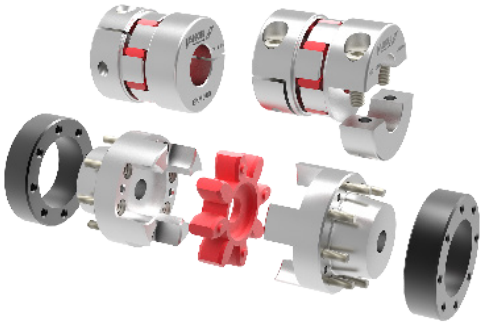
- bellow breaking protection by intern forced rotation (claw stop) for increased system stability in case of malfunction of the metal bellow due to overload or incorrect high shaft misalignment, Generally possible as special solution for all series



Elastomer Couplings I General

Definition – Elastomer Couplings:

Elastomer couplings can be plugged in, are backlash-free, flexible shaft couplings for small to medium torques. An elastomer spider serves as connection and compensating element with involute teeth and a high shore hardness. This is inserted in form-fit, with slight preload between two high-precision machined hubs with involutely shaped jaws. The elastomer spider can compensate slight shaft misalignments, is electrically insulating and has good oscillation dampening characteristics. Two variations with backlash-free, frictional shaft-hub connection are available as standard which ensure safe torque transfer even without keyways.



Characteristics – JAKOB Elastomer Couplings:

- plug-in • backlash-free • flexible • compact
- oscillation dampening • different shore hardnesses
- low moment of inertia • high speeds
- electrically insulating • temperatures up to 120°C

Coupling dimensioning:

The main layout criteria are the required drive torque, the necessary torsional stiffness, the running speeds, the dampening characteristics of the coupling, and the moment of inertia. Additionally, the minimum or maximum possible shaft diameter, the admissible temperature range, operating factors, and the existing shaft misalignment (particularly the lateral misalignment) must be taken into consideration.

Approximation of required torque:

Roughly, the required coupling torque T_K can be calculated as for the following formula:

$$T_K = T_A \bullet f_D \bullet f_T \bullet f_B < T_{KN}$$

T_A = drive torque [Nm]
f_D = torsional stiffness factor
f_T = temperature factor
f_B = operating factor

The calculated coupling torque T_K should not exceed the nominal torque of the selected coupling size. Short term overload up to twice the value of the nominal torque is admissible. The drive torque results from product information of drive motor or can be calculated via motor output P_A.

$$T_A = \frac{9550 \bullet P_A}{n_B}$$

T_A = drive torque [Nm]
P_A = motor output [KW]
n_B = motor speed [min^{-1}]

Temperature factor f_T:

Admissible temperature range for continuous operation
PUR 98 Sh - A: -30°C up to +90°C
PUR 72 Sh - D: -20°C up to +120°C

operating temperature	+30°C -30°C	+50°C	+70°C	+90°C	+110°C
factor f_T	1	1,3	1,6	1,8	2

Elastomer Couplings I General

Torsional stiffness factor f_D:

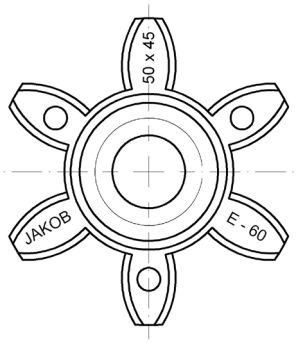
If an exact, accurate transfer of the torque is required, as for instance with servo drives or measuring systems, a high torsional stiffness is absolutely necessary. Here the required drive torque should be multiplied with a operating factor of at least 3 when selecting the size, or a torsionally stiff metal bellows coupling selected from the extensive coupling range in this catalogue.

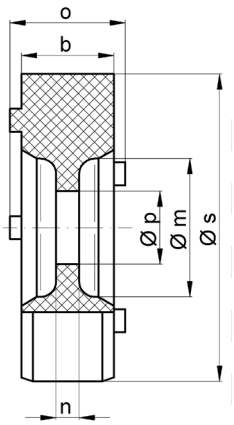
Operating factor f_B:

Due to operating factor f_B application specific peculiarities, such as shock loading, are taken into consideration.

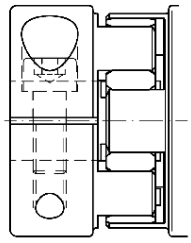
Dimensions - elastomer spider [mm]:

Size	øs	øm	n	b	o	øp$^{+0,5}$
8/10	32	10,5	2	10	13	8,5
15/17/20/25	40	18	3	12	15	9,5
30/43/45/50	50	27	3	14	17	12,5
60/90	55	27	3	14	17	12,5
150/200	65	30	4	18	18	16,5
300/320/400	80	38	4	18	22	16,5
500	100	47	5	22	26	20,5
700/1000	120	58	6	25	30	22,5
2000	160	77	7	32	38	60



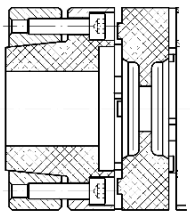


Hub types:



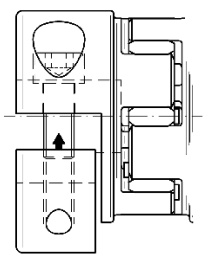
EKM - lateral clamping hub

Admissible seat clearance shaft hub: **min. 0,01mm / max. 0,04mm**.
Very simple fitting by tightening only one laterally arranged clamping screw (DIN 912). The value for the relevant tightening torques can be found in the data sheets. One hole in the housing is sufficient to tighten the clamping screw (see EASY-clamp sytem).



ESM-A - conical hub / conical ring hub

Allowable clearance shaft hub: max.0,02mm. For the ESM-A coupling type, an axial plug-in installation is generally required. For this purpose, both hub parts are previously fastened on the drive and output shaft, the star is inserted into a claw hub, and finally the other claw hub is pushed onto the star by means of an axial mounting force. The conical clamping ring is fastened from “inside” by tightening the fastening screws with hexagon socket crosswise. The hub clearance dimension “g” must be observed and checked. Several release threads are provided for releasing the cone hub.



EKH - split-hub

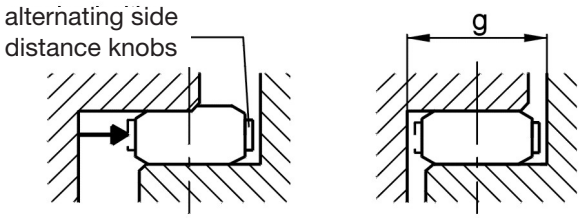
Admissible seat clearance shaft-hub: **min. 0,01mm /max. 0,04mm**.
Two lateral clamping screws (DIN 912) are arranged oppositely. The hubs or couplings are split and consist of two loose halves. One of the split-hubs can be put onto the aligned shaft. Tighten clamping screws evenly, alternating between both sides (note specified tightening torques). A larger opening must be provided in the housing for easy installation.

further hub types on request

Elastomer Couplings I Installation Instructions

Installation:

Installation



The design of the ESM-A couplings requires mounting of the two hub halves on the shaft ends before the actual plug-in assembly. It is important that the mounting screws are tightened crosswise to prevent surface distortion of the conical clamping ring. Couplings of the EKM series on the other hand, can be assembled completely before hub mounting. For mounting the EKM hub, only a laterally arranged clamping screw must be tightened. In the case of the EKH series, the fixed hub halves can be placed on the shaft pegs for easy assembly and fixed by means of two clamping screws with the loose half-shell pieces. Chamfered edges at the face enable the blind assembly with both versions. Due to the obligatory preclamping of the elastomer, an axial assembly force must be applied while sliding together the coupling spider and the jaws. This assembly force can be minimized by slight oiling the spider. For disassembly of the ESM conical hub, draw-off threads are provided for releasing the clamping ring. The relevant tightening torques of the retaining screws can be found in the technical data sheets.

tolerable seat clearance shaft / hub: Series ESM-A: max 0,02 mm
Series EKM/EKH: min 0,01 mm / max 0,04 mm *(see installation instructions page)*

materials: hubs EKM / EKH / ESM-A: high-tensile aluminum
conical ring / taper ring ESM-A / expanding cone EKZ: tempered steel
elastomer spider: polyurethane (98 Shore A / 72 Shore D / others available on request)

Notes:

- The dampening capability of the elastomer spider protects the drive to a high extent from dynamic overload. Both coupling halves are always forced to move (min. $3xT_N$) because of the jaw construction, even if the spider should break down entirely.
- Because of the deformation of the elastomer spider under operation conditions, the housing (bell) should be approximately 5 % bigger than the outer diameter of the coupling itself.
- To ensure satisfactory function, dimension ‘g’ should be complied with as exactly as possible. The distance of the two shaft ends can be smaller than ‘g’ under consideration of measurements ‘m’ and ‘n’ of the spider.
- If required by the application or requested by the customer, diameter ‘p’ of the spider can be expanded up to øm - 2mm
- For smaller shaft diameters, the conical hub of ESM-couplings is slotted additionally.

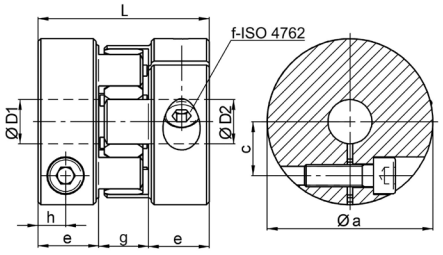
Elastomer Coupling I Series EKM

• with clamping hub on both sides • plug-in • backlash-free • cost-effective standard series

technical data:

EKM	T_N	hardness	moment of inertia	torsional stiffness (stat. 0,5 x T_N)	max. shaft misalignment (mm)		lateral spring rate	nmax
size	[Nm]	[shore]	[10-^{3}kgm^2]	[Nm/arcmin]	axial ±	lateral	[N/mm]	[upm]
8	8	98 Sh-A	0,01	0,09	0,5	0,10	600	29000
15	15	98 Sh-A	0,03	0,24	0,5	0,10	2100	23000
20	20	72 Sh-D	0,03	0,46	0,5	0,10	2900	23000
30	30	98 Sh-A	0,09	0,7	0,5	0,10	2500	19000
45	45	72 Sh-D	0,09	1,1	0,5	0,10	3600	19000
60	60	98 Sh-A	0,18	1,0	0,5	0,10	2600	17000
90	90	72 Sh-D	0,18	2,0	0,5	0,10	3700	17000
150	150	98 Sh-A	0,38	1,2	1	0,10	3300	15000
200	200	72 Sh-D	0,38	2,3	1	0,07	4600	15000
300	300	98 Sh-A	1,0	3,6	1	0,12	4500	12000
400	400	72 Sh-D	1,0	7,0	1	0,10	6500	12000
500	500	98 Sh-A	2,2	4,5	1	0,15	5900	9500
700	700	98 Sh-A	5,2	8,0	1	0,15	7000	8000
1000	1000	72 Sh-D	5,2	12	1	0,10	9600	8000
2000	2000	98 Sh-A	50	21	1	0,15	9000	6000

material:
elastomer spider: polyurethane
hubs: high-tensile strength aluminum
(size 2000: tempered steel)
screws: ISO 4762 / 12.9



Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

EKM	Ø a	c	e	g	h	L	f-T_S	*f-T_S	mass ~ [kg]	Ø D 1/2 min	Ø D 1/2 max	Ø D ** max
8	32	10,5	13,5	13	6	40	M 4 - 4 Nm	-	0,06	6	15	-
15	40	13	17	16	8	50	M 5 - 8 Nm	-	0,12	7	20	-
20	40	13	17	16	8	50	M 5 - 8 Nm	-	0,12	8	20	-
30	50	16,5	20	18	9	58	M 6 - 14 Nm	M 5 - 8 Nm	0,21	10	25	30
45	50	16,5	20	18	9	58	M 6 - 14 Nm	M 5 - 8 Nm	0,21	12	25	30
60	60	19,5	22	18	10	62	M 8 - 35 Nm	M 6 - 14 Nm	0,32	13	28	32
90	60	19,5	22	18	10	62	M 8 - 35 Nm	M 6 - 14 Nm	0,32	14	28	32
150	70	23	26,5	20	12	73	M 10 - 50Nm	M 8 - 35 Nm	0,52	16	32	38
200	70	23	26,5	20	12	73	M 10 - 50 Nm	M 8 - 35 Nm	0,52	18	32	38
300	85	29	31	24	14	86	M 12 - 90 Nm	M 10 - 65 Nm	0,9	20	40	48
400	85	29	31	24	14	86	M 12 - 90 Nm	M 10 - 65 Nm	0,9	24	40	48
500	100	36	33	28	16	94	M 12 - 115 Nm	-	1,5	28	56	-
700	120	44	38	33	18	109	M 14 - 140 Nm	-	2,5	30	70	-
1000	120	44	38	33	18	109	M 14 - 140 Nm	-	2,5	40	70	-
2000	160	55,5	42	40	21	124	M 16 - 290 Nm	-	14	48	90	-

note:
(*) largest possible hub bore diameter with smaller clamping screw thread optionally available.

order example: EKM 90 D1 = 24 ^{G7} D2 = 28 ^{G6}
EKM 150 M8 / M8 - D1 = 35 ^{G7} D2 = 38 ^{H6}

Elastomer Coupling I Series EKM-VA

• stainless steel design - easy to assemble clamping hub • backlash-free
• plug-in • compact • vibration-damping

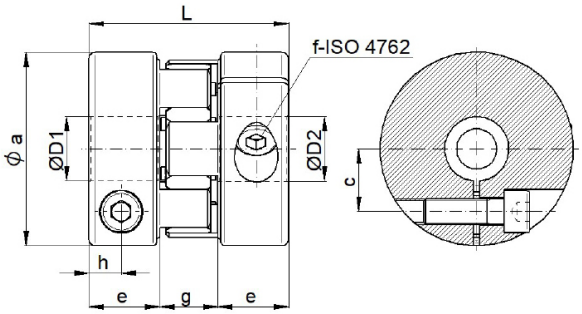
stainless steel

technical data:

EKM-VA size	nominal torque [Nm]	hard-ness [shore]	moment of inertia [10-^{3}kgm^2]	torsional stiffness (stat. 0,5 x T_N) [Nm/arcmin]	max. shaft mis-alignment (mm) axial ±	lateral	lateral spring rate [N/mm]	max. speed [Upm]	mass ca. [kg]
6	6	98 Sh-A	0,26	0,09	0,5	0,1	600	29000	0,2
12	12	98 Sh-A	0,08	0,24	0,5	0,1	2100	23000	0,4
16	16	72 Sh-D	0,08	0,46	0,5	0,1	2900	23000	0,4
50	50	98 Sh-A	0,48	1	0,5	0,1	2600	17000	1
70	70	72 Sh-D	0,48	2	0,5	0,1	3700	17000	1
100	100	98 Sh-A	1	1,2	1	0,1	3300	15000	1,6
220	220	98 Sh-A	2,7	3,6	1	0,12	4500	12000	2,8
350	350	98 Sh-A	7	4,5	1	0,15	5900	9500	5
480	480	98 Sh-A	14	8	1	0,15	7000	8000	7
650	650	72 Sh-D	14	12	1	0,1	9600	8000	7

temperature range: -30°C up to +90°C or -20°C up to +120°C

material:
hubs: stainless steel 1.4305
elastomer spider: Polyurethan
screws: ISO 4762
stainless steel A4-80



Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

EKM-VA	Ø a	c	e	g	h	L	f-T_S	Ø D 1/2 min	Ø D 1/2 max	Ø D 1/2 prebored
6	33	11	13,5	13	6	40	M4 - 2,5 Nm	6	16	5
12	41	13	17	16	8	50	M5 - 5 Nm	8	20	6,1
16	41	13	17	16	8	50	M5 - 5 Nm	10	20	6,1
50	64	20,5	22	18	10	62	M8 - 24 Nm	13	30	12
70	64	20,5	22	18	10	62	M8 - 24 Nm	15	30	12
100	73	23	26,5	20	12	73	M10 – 45 Nm	16	32	15
220	87	29	31	24	14	86	M12 – 80 Nm	20	42	18
350	107	36	35	28	17	98	M14 – 110 Nm	24	55	20
480	121	44	38	33	18	109	M14 – 110 Nm	32	70	24
650	121	44	38	33	18	109	M14 – 110 Nm	42	70	24

note: Øa: interfering edge - screw head

order example: EKM-VA 220 - D1 = 32 ^{G6} D2=38 ^{G6}

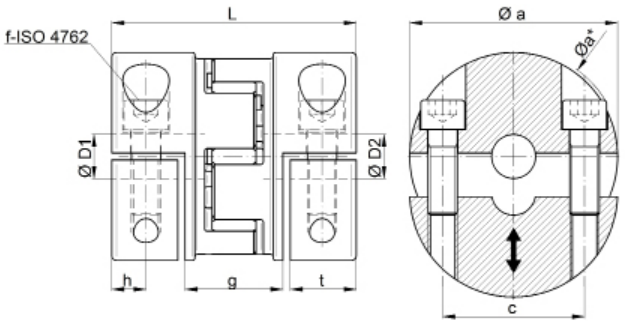
Elastomer Coupling I Series EKH

• with split-hub design • plug-in • backlash-free • stainless

technical data:

EKH size	T_N [Nm]	hardness [shore]	moment of inertia [10^{-3}kgm^2]	torsional stiffness (stat. 0,5 x T_N) [Nm/arcmin]	max. shaft misalignment (mm) axial ±	lateral	lateral spring rate [N/mm]	nmax [upm]
15	15	98 Sh-A	0,03	0,24	0,5	0,10	2100	19000
20	20	72 Sh-D	0,03	0,46	0,5	0,07	2900	19000
30	30	98 Sh-A	0,09	0,7	0,5	0,10	2500	15000
45	45	72 Sh-D	0,09	1,1	0,5	0,07	3600	15000
60	60	98 Sh-A	0,2	1,0	0,5	0,10	2600	14000
90	90	72 Sh-D	0,2	2,0	0,5	0,07	3700	14000
150	150	98 Sh-A	0,4	1,2	1	0,10	3300	12000
300	300	98 Sh-A	1,0	3,6	1	0,12	4500	10000
400	400	72 Sh-D	1,0	7,0	1	0,10	6500	10000
700	700	98 Sh-A	6,0	8,0	1	0,15	7000	6500
1000	1000	72 Sh-D	6,0	12	1	0,10	9600	6500
2000	2000	98 Sh-A	62	21	1	0,15	9000	5000

material:
elastomer spider: polyurethane
split-hubs: high tensile aluminum
(size 2000 heat treated steel)
screws: ISO 4762 / 12.9 - coated



Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

EKH	Ø a	Ø a*	c	g	h	t	L	*f-T_S	mass ~[kg]	Ø D 1/2 min	Ø D 1/2 max
15	40	42	27	26	8,5	16	62	M 5 - 8 Nm	0,17	7	20
20	40	42	27	26	8,5	16	62	M 5 - 8 Nm	0,17	8	20
30	50	52	34	30	10	19	72	M 6 - 14 Nm	0,30	10	26
45	50	52	34	30	10	19	72	M 6 - 14 Nm	0,30	12	26
60	60	63	41	30	11,5	22	78	M 8 - 35 Nm	0,50	12	30
90	60	63	41	30	11,5	22	78	M 8 - 35 Nm	0,50	14	30
150	70	76	48	33	14	26	89	M 10 - 50 Nm	0,75	16	35
300	85	91	58	40	15	28	102	M 12 - 90 Nm	1,30	19	42
400	85	91	58	40	15	28	102	M 12 - 90 Nm	1,30	24	42
700	120	125	90	53	18	34	127	M 14 - 140 Nm	3,20	30	70
1000	120	125	90	53	18	34	127	M 14 - 140 Nm	3,20	42	70
2000	160	165	122	64	24	43	156	M 16 - 290 Nm	18,50	55	100

Installation Instructions:
The split-hub design allows a backlash-free, force-fitted clamping connection with simple operation. Misalignment errors between the input and output shafts can thus be easily controlled and corrected. For easy assembly, the fixed hub halves can be placed on the shaft pegs and the loose hub pieces can be screwed on. In the case of service, the complicated disassembly of the drive and output units isn't necessary. The distance between the drive shaft and the output shaft must be greater than the dimension „g".

order example: EKH 200 - D1 = 26 ^{G6} D2 = 32 ^{H6}

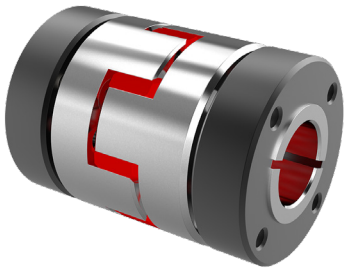
Elastomer Coupling I Series ESM-A

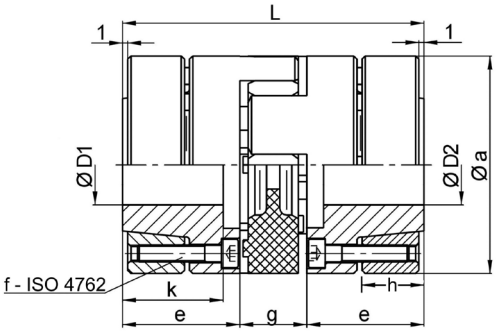
• with conical hub and clamping ring • plug-in • backlash-free
• rotational symmetry • high speeds

technical data:

ESM-A size	nominal torque [Nm]	hard-ness [shore]	moment of inertia [10-3kgm2]	torsional stiffness (stat. 0,5 x T_N) [Nm/arcmin]	max. shaft misalignment [mm] axial ±	lateral	lateral spring rate [N/mm]	tightening torque of screws "f" [Nm]	nmax [upm]
10	10	98Sh-A	0,015	0,09	0,5	0,1	600	2	35000
17	17	98Sh-A	0,05	0,24	0,5	0,1	2100	3	28000
25	25	72Sh-D	0,06	0,46	0,5	0,07	2900	3	28000
43	43	98Sh-A	0,19	0,7	0,5	0,1	2500	6	23000
50	50	72Sh-D	0,19	1,1	0,5	0,07	3600	6	23000
60	60	98Sh-A	0,28	1,0	0,5	0,1	2600	6	21000
90	90	72Sh-D	0,28	2,0	0,5	0,07	3700	6	21000
150	150	98Sh-A	0,65	1,2	1	0,1	3300	6	18000
200	200	72Sh-D	0,65	2,3	1	0,07	4600	6	18000
320	320	98Sh-A	2	3,6	1	0,12	4500	30	14000
400	400	72Sh-D	2	7,0	1	0,1	6500	30	14000
500	500	98Sh-A	5,6	4,5	1	0,15	5900	50	11000
700	700	98Sh-A	13	8	1	0,15	7000	100	9500
1000	1000	72Sh-D	13	12	1	0,1	9600	100	9500
2000	2000	98Sh-A	75	21	1	0,15	9000	100	7000

material:
elastomer spider: polyurethane
(size 2000: tempered steel)
screws: ISO 4762 / 12.9
conical hub: high-tensile
aluminum clamping ring:
heat treated steel - burnished





Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

ESM-A	Ø a	e	f	g	h	k	L	mass ~ [kg]	Ø D 1/2 min	Ø D 1/2 max	Ø D 1/2 prebored
10	32	18,5	4x M 3	13	12	15,5	50	0,11	6	14	5
17	40	25	6x M 4	16	12	21	66	0,28	9	19	9
25	40	25	6x M 4	16	12	21	66	0,28	10	19	9
43	50	30	4x M 5	18	14	25	78	0,4	12	24	10
50	50	30	4x M 5	18	14	25	78	0,4	15	24	10
60	55	30	4x M 5	18	14	25	78	0,6	13	26	12
90	55	30	4x M 5	18	14	25	78	0,6	17	26	12
150	65	35	8x M 5	20	17	30	90	0,9	17	36	12
200	65	35	8x M 5	20	17	30	90	0,9	19	36	12
320	80	45	4x M 8	24	22	40	114	1,9	20	40	18
400	80	45	4x M 8	24	22	40	114	1,9	25	40	18
500	100	55	4x M 10	28	26	49	138	4,5	22	48	20
700	120	61	4x M 12	33	31	54	155	7	25	60	24
1000	120	61	4x M 12	33	31	54	155	7	25	60	24
2000	160	73	8x M 12	40	40	73	186	20,4	35	85	34

order example: ESM-A 150 - D1 = 17 G7 D2 = 22 H6

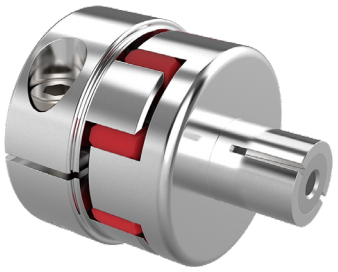
Elastomer Coupling I Series EKS

• pluggable, backlash-free, vibration-damping • Expanding cone hub - radial clamping hub
• minimal space requirement with short overall length thanks to integrated attachment

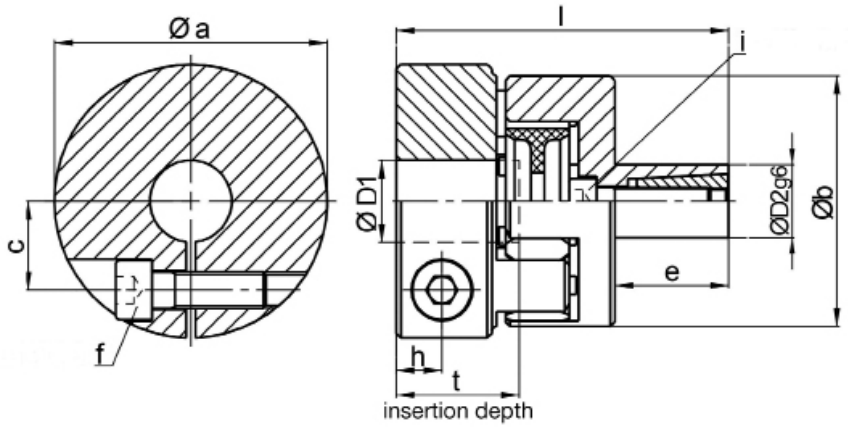
technical data:

EKS size	nominal torque [Nm]	moment of inertia [10-3kgm2]	torsional stiffness (stat. 0,5 x T_N) [Nm/arcmin]	max. shaft misalignment (mm) axial ±	lateral	lateral spring rate [N/mm]	tightening torque of screws "f" [Nm] Exp. hub i:	Clamp. hub f:	nmax [upm]
8	8	0,01	0,04	0,5	0,1	600	4	4	29000
15	15	0,03	0,23	0,5	0,1	2100	8	8	23000
50	50	0,16	0,60	0,5	0,1	2600	14	35	17000
100	100	0,38	1,0	1	0,1	3300	35	50	15000
200	200	0,9	2,0	1	0,12	4500	65	90	12000
400	400	2,2	5,8	1	0,15	5900	115	115	9500
600	600	5,0	8,0	1	0,15	7000	180	140	6000

temperature range: -30°C bis +90°C



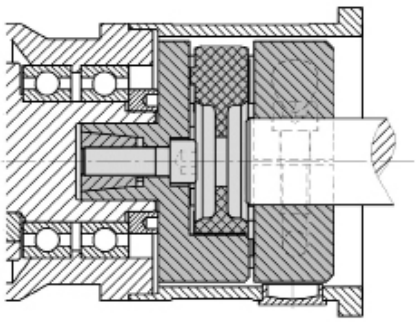
material:
clamping hubs: high-strength aluminum
expansion cone hub: heat treated steel
elastomer spider: polyurethane 98 Sh-A
screws: ISO 4762 12.9 - coated



Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

EKS	Ø a	Ø b	c	e	f	h	i	l	tmin	tmax	mass ~ [kg]	Ø D 1 min	Ø D 1 max	Ø D 2 min	Ø D 2 max
8	32	32	10,5	12	M 4	6	M 4	45	12	19	0,06	6	15	10	16
15	40	40	13	20	M 5	8	M 5	59	16	23	0,2	7	19	13	20
50	60	55	19,5	23	M 8	10	M 6	71	21	29	0,4	13	29	15	24
100	70	65	23	26	M 10	12	M 8	81,5	25	34	0,7	16	33	20	28
200	85	80	29	30	M 12	14	M 10	93	30	41	1,2	20	42	24	35
400	100	100	36	32	M 12	16	M 12	101	32	44	1,7	24	56	32	42
600	120	120	44	42	M 14	18	M 14	122	37	51	3	28	70	35	48

note: The corresponding shaft hole for the Expansion cone spigot >> ØD2 << with manufacturing tolerance H7.



application example:
EKS coupling integrated on the output side to a gear unit

order example: EKS 50 - D1 = Ø 18 ^{G7} D2 = Ø 20 ^{g6}

Miniature Metal Bellows Coupling I Series MKM

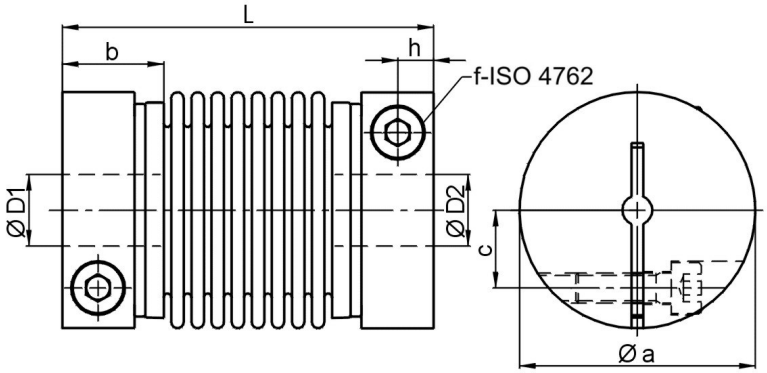
• standard series with lateral clamping hub

technical data:

MKM size	T_N [Nm]	moment of inertia [10^{-6}kgm^2]	torsional stiffness [10^{-3}Nm/arcmin]	max. shaft misalignment (mm) axial ±	lateral	spring rate [N/mm] axial ±	lateral	mass approx. [g]	tightening torque of screws [Nm]
0,4	0,4	0,3	50	0,35	0,2	10	15	10	1
0,9	0,9	0,4	90	0,3	0,2	21	26	12	1
2	2	3,0	230	0,5	0,2	15	15	30	2
4	4	3,0	460	0,4	0,2	35	65	40	2
7	7	14	1100	0,6	0,25	45	60	80	4
8	8	26	1350	0,8	0,3	16	24	130	8
12	12	30	2050	0,7	0,25	40	70	140	8

max. operational speed: 20.000 Upm temperature range: -40°C up to +200°C

material:
bellows: stainless steel
hubs: high-tensile strength *aluminum*
screws: ISO 4762 / 12.9



Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

MKM	Ø a	b	c	f	h	L ±0,5	Ø D 1/2 min	Ø D 1/2 max
0,4	16,5	9	4,6	M 2,5	3,3	30	3	6,35
0,9	16,5	9	4,6	M 2,5	3,3	31,5	3	6,35
2	24,5 (27,5)	13	7,5 (9,6)	M 3	4,4	42	3	10 (14)
4	24,5 (27,5)	13	7,5 (9,6)	M 3	4,4	44	5	10 (14)
7	34	14	11	M 4	5	57	6	17
8	40 (44,5)	16,5	13 (15,5)	M 5	6	60	6	19 (24)
12	40 (44,5)	16,5	13 (15,5)	M 5	6	62	6	19 (24)

on request, couplings from size 2-12 are avaiable with EASY-clamp

stock bores D1/D2 (G7)

MKM	Ø 3	Ø 4	Ø 5	Ø 6	Ø 6,35	Ø 8	Ø 9,53	Ø 10	Ø 12	Ø 14	Ø 15	Ø 16	Ø 19	Ø 20	Ø 24
0,4/0,9	•	•	•	•	•										
2/4		•	•	•	•	•	•	•	L	L					
7				•	•	•	•	•	•	•	•	•			
8/12				•	•	•	•	•	•	•	•	•	•	L	L

note: Larger bore diameter with special hub design „L“ possible - see bracket values in the dimension table, as well as order example.

order example: MKM 4 - D1 = Ø 8 ^{G7} D2 = 10 ^{G7}
MKM 4 - L - D1 = Ø 10 ^{G7} D2 = 12 ^{G7}
MKM 4 - L / L - D1 = Ø 12 ^{G7} D2 = 14 ^{G7}

Miniature Metal Bellows Coupling I Series MKP

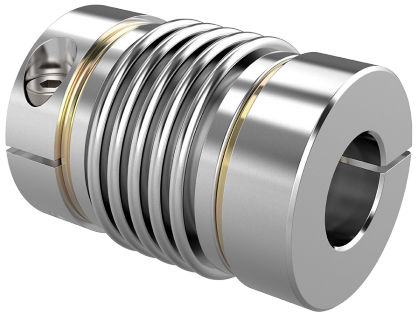
• short design • with lateral clamping hub

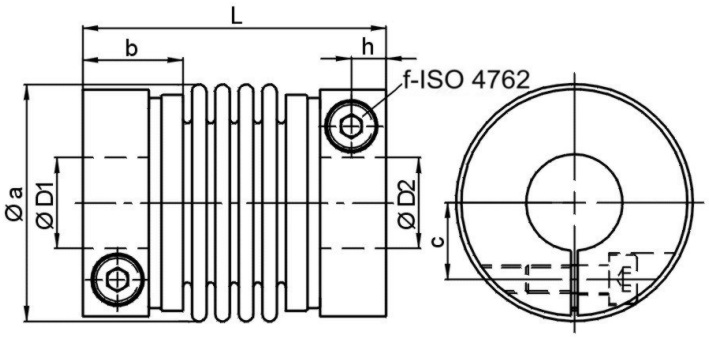
technical data:

MKP size	T_N [Nm]	moment of inertia [10^{-6}kgm^2]	torsional stiffness [Nm/arcmin]	max. shaft misalignment (mm) axial ±	lateral	spring rate [N/mm] axial ±	lateral	mass approx. [kg]	tightening torque of screws [Nm]
2	2	2,5	400	0,3	0,1	32	100	0,030	2
5	5	2,8	800	0,3	0,1	70	400	0,040	2
7	7	12	1700	0,4	0,15	70	220	0,080	4
8	8	25	2100	0,5	0,15	20	90	0,125	8
12	12	28	2600	0,4	0,15	45	190	0,130	8

max. operational speed: 20.000 Upm temperature range: -40°C up to +200°C

material:
bellows: stainless steel
hubs: high-tensile strength aluminum
screws: ISO 4762 / 12.9





Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

MKP	Ø a	b	c	f	h	L ±0,5	Ø D 1/2 min	Ø D 1/2 max
2	24,5 (27,5)	13	7,5 (9,6)	M 3	4,4	35	3	10 (14)
5	24,5 (27,5)	13	7,5 (9,6)	M 3	4,4	36	6	10 (14)
7	34	14	11	M 4	5	47	6	17
8	40 (44,5)	16,5	13 (15,5)	M 5	6	51	6	19 (24)
12	40 (44,5)	16,5	13 (15,5)	M 5	6	51	6	19 (24)

on request, all couplings are avaiable with EASY-clamp

stock bores D1/D2 (G7)

MKP	Ø 4	Ø 5	Ø 6	Ø 6,35	Ø 8	Ø 9,53	Ø 10	Ø 12	Ø 14	Ø 15	Ø 16	Ø 19	Ø 20	Ø 24
2/5	•	•	•	•	•	•	•	L	L					
7			•	•	•	•	•	•	•	•	•			
8/12			•	•	•	•	•	•	•	•	•	•	L	L

note: Larger bore diameter with special hub design „L“ possible - see bracket values in the dimension table, as well as order example.

Bestellbeispiel: MKP 5 - D1 = Ø 8 ^{G7} D2 = 10 ^{G7}
MKP 5 - L - D1 = Ø 10 ^{G7} D2 = 12 ^{G7}
MKP 5 - L / L - D1 = Ø 12 ^{G7} D2 = 14 ^{G7}

Miniature Metal Bellows Coupling I Series MKA

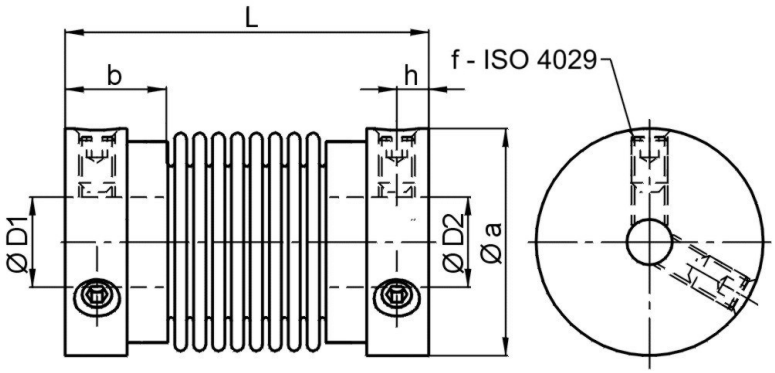
• cost-effective version with set screws

technical data:

MKA size	T_N [Nm]	max. speed [min^{-1}]	moment of inertia [10^{-6}kgm^2]	torsional stiffness [10^{-3}Nm/arcmin]	max. shaft misalignment (mm) axial ±	lateral	spring rate [N/mm] axial	lateral	mass approx. [g]	tightening torque of screws [Nm]
0,4	0,4	20.000	0,19	50	0,2	0,1	10	15	8	1
0,9	0,9	20.000	0,19	90	0,2	0,1	21	26	10	1
2	2	12.000	2,9	230	0,2	0,1	15	15	32	4
4	4	12.000	3,2	460	0,2	0,1	35	65	37	4
6	6	12.000	16	1.100	0,25	0,25	45	60	85	8
8	8	12.000	28	1.300	0,3	0,25	16	24	120	10

temperature range: -20°C up to +90°C

material:
bellows: stainless steel
hubs: high-tensile strength aluminum
set screws: ISO 4029



Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

MKA	Øa	b	f	h	L ±0,5	ØD1/2min	ØD1/2max
0,4	16	7	2x M 3	2,3	26	3	8
0,9	16	7	2x M 3	2,3	27,5	3	8
2	25	11	2x M 4	3,5	38	5	15
4	25	11	2x M 4	3,5	39,5	5	15
6	35	12,5	2x M 5	4,3	54	6	20
8	41	14	2x M 6	5	54,5	6	26

stock bores D1/D2 (G7)

MKA	Ø3	Ø4	Ø5	Ø6	Ø6,35	Ø8	Ø9,53	Ø10	Ø12	Ø15	Ø16	Ø19	Ø24
0,4/0,9	•	•	•	•	•	•							
2/4			•	•	•	•	•	•	•	•			
6				•		•		•	•	•	•		
8				•		•		•	•	•	•	•	•

note: further bore sizes possible on request
for easier disassembly, we recommend to have end faces on the shaft

order example: MKA 2 - D1 = 6 ^{G7} D2 = 8 ^{G7}

Miniature Metal Bellows Coupling I Series MKG

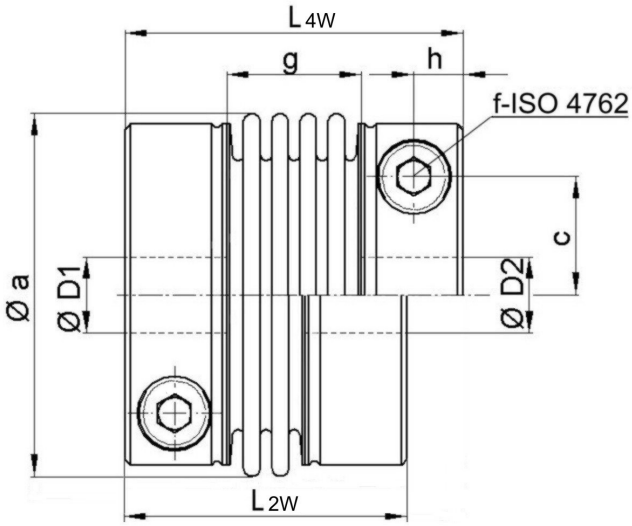
- all-metal version up to 300°C • wear and maintenance free
- very short and variable design • torsionally stiff
- simple installation with optional EASY-clamping hub

technical data:

MKG size	T_N [Nm]	moment of inertia [10-3kgm²]	torsional stiffness [Nm/arcmin]			max. shaft misalignment (mm) axial ±			lateral			axial spring rate [N/mm]			lateral spring rate [N/mm]			nmax [Upm]
			2W	4W	6W	2W	4W	6W	2W	4W	6W	2W	4W	6W	2W	4W	6W	
5	5	0,004	1,3	0,9	0,6	0,2	0,3	0,5	0,05	0,1	0,2	135	75	45	2500	400	140	20000
10	10	0,019	3,3	2,1	1,3	0,3	0,4	0,5	0,1	0,15	0,25	150	85	60	2300	400	130	20000
20	20	0,044	6	3,4	2,4	0,3	0,4	0,5	0,1	0,15	0,25	100	55	50	2100	360	110	20000

temperature range: -40°C up to +300°C

material:
bellows: stainless steel 1.4571
hubs: steel St 52 - burnished
screws: ISO 4762 / 12.9



notes: connection between bellows and hub by plasma welding. Three standard versions with 2-corrugated metal bellows 2W, 4-corrugated metal bellows 4W or 6-corrugated metal bellows 6W.

Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

MKG	Øa	c	f-TA	g			h	L			mass ~ [kg]	ØD1/2 min	ØD1/2 max
				2W	4W	6W		2W	4W	6W			
5	24	7,3	M3-2 Nm	6	10	14	4,5	25	29	33	0,06	6	11
10	34	10	M4-5 Nm	11	16	23	5	33	38	45	0,14	8	16
20	40	13	M5-10 Nm	12	17	23	6	38	43	49	0,22	10	20

- standard clamping hubs without EASY-pin (EASY design optionally possible)
- alternative lengths and hub versions are possible on request

order example: **MKG 5 / 4W D1 = 8 G7 D2 = 11 H7**
MKG 20 / 2W D1 = 10 G7 D2 = 20 H7

Miniature Metal Bellows Coupling I Series MKG-VA

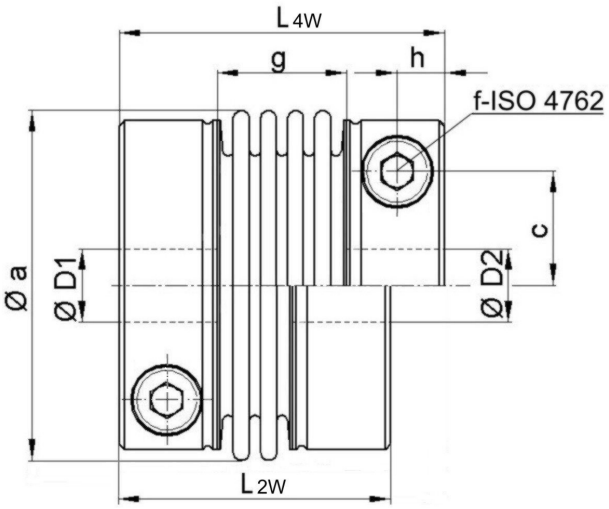
- all-stainless steel version up to 350°C • wear and maintenance free
- very short and variable design • torsionally stiff
- simple installation with clamping hub

technical data:

MKG-VA size	T_N [Nm]	moment of inertia [kgmm²]	torsional stiffness [Nm/arcmin] 2W	4W	6W	max. shaft misalignment [mm] axial ± 2W	4W	6W	lateral 2W	4W	6W	axial spring rate [N/mm] 2W	4W	6W	lateral spring rate [N/mm] 2W	4W	6W	mass approx. [g]
1,5	1,5	1	-	0,3	-	-	0,3	-	-	0,1	-	-	34	-	-	140	-	26
4	4	4	1,3	0,9	14	0,2	0,3	0,5	0,05	0,1	0,2	135	75	45	2500	400	140	60
8	8	19	3,3	2,1	23	0,3	0,4	0,5	0,1	0,15	0,25	150	85	60	2300	400	130	140
15	15	44	6	3,4	23	0,3	0,4	0,5	0,1	0,15	0,25	100	55	50	2100	360	110	220

max. operational speed: 20.000 Upm temperature range: -40°C up to +350°C

material:
bellows: stainless steel 1.4571 / A4
hubs: 1.4301 / A2
screws: ISO 4762 stainless steel / A4-80



notes: connection between bellows and hub by plasma welding. Three standard versions with 6-corrugation bellows 6W, 4-corrugation bellows 4W or 2-corrugation bellows 2W. Size 1.5 with 5-corrugated metal bellows.

Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

MKG-VA	∅a	c	f-TA	g 2W	4W	6W	h	L 2W	4W	6W	ØD1/2 min	ØD1/2 max
1,5	19	4,3	2xM2,5-1	-	11	-	3,3	-	29	-	3	6,35
4	24	7,3	M3-1	6	10	14	4,5	25	29	33	8	11
8	34	10,5	M4-2,5	11	16	23	5	33	38	45	9	16
15	40	13	M5-5	12	17	23	6	38	43	49	11	20

- clamping hubs generally with stainless steel screws A4-80 without EASY-pin - mind reduced actuation torques
- check transmission torques of hub-shaft connection for diameters below Dmin (further inquiry possible)
- alternative lenghts or hub versions available on request

order example: **MKG-VA 4 / 4W** **D1 = 8 G7** **D2 = 11 G7**
MKG-VA 8 / 6W **D1 = 12 G7** **D2 = 16 G7**

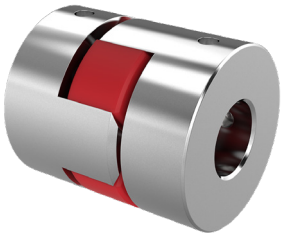
Miniature Elastomer Coupling I Series MJT / MJT-C

• MJT-C: standard series with lateral clamping hub • MJT: cost-effective version with set screws
• plug in • oscillation dampening

technical data:

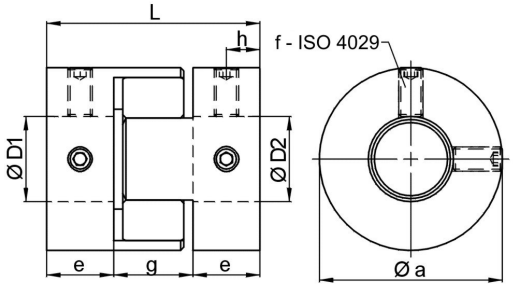
MJT/ MJT-C size	T_N [Nm]	max. speed [min^{-1}]		moment of inertia [10^{-6}kgm^2]		torsional stiffness [10^{-3}Nm/arcmin]	max. shaft mis-alignment (mm)		mass approx. [g]	tightening torque of screws [Nm]	
		MJT	MJT-C	MJT	MJT-C		axial ±	lateral		f	i
14-B	0,7	27.000	11.000	0,21	0,16	3	0,6	0,15	7	0,7	0,5
20-B	1,8	20.000	7.500	1,0	1,1	5	0,8	0,20	18	0,7	1
30-B	4	13.000	5000	5,9	6,2	13	1,0	0,20	48	1,7	2,5
14-R	2	27.000	11.000	0,21	0,16	7	0,6	0,10	7	0,7	0,5
20-R	5	20.000	7.500	1,0	1,1	16	0,8	0,10	18	0,7	1
30-R	12,5	13.000	5.000	5,9	6,2	38	1,0	0,10	48	1,7	2,5

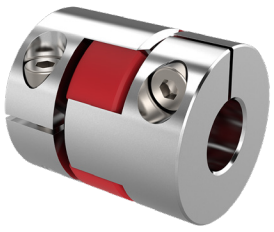
temperature range: -20°C up to +70°C



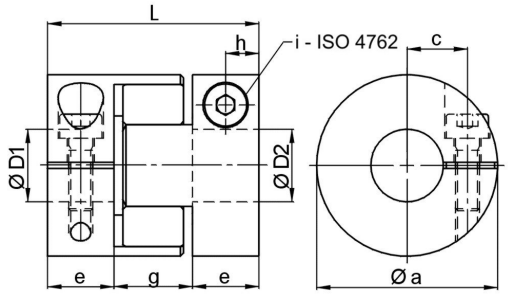
Series MJT

material:
hubs: aluminum
elastomer spider: polyurethane
***B** 80-Sh-A (blue), **R** 98-Sh-A (red)*





Series MJT-C



Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

MJT/MJT-C	Øa	c	e	g	h	L	f	i
14	14	4	7	8	3,5	22	2x M 3	M 2
20	20	6,5	10	10	5	30	2x M 3	M 2,5
30	30	10	11	13	5,5	35	2x M 4	M 4

stock bores D1/D2 (H8)

• MJT ◊ MJT-C

MJT/MJT-C	Ø3	Ø4	Ø5	Ø6	Ø6,35	Ø8	Ø9,53	Ø10	Ø12	Ø14
14	• ◊	• ◊	• ◊	•						
20		◊	• ◊	• ◊	• ◊	• ◊	•	•		
30						• ◊	• ◊	• ◊	• ◊	•

note: further bore sizes possible on request
for easier disassembly of the MJT series, we recommend to have end faces on the shaft

temperature correction for nominal torques

-20°C up to +30°C	+50°C	+70°C
100%	75%	60%

order example: MJT-B30 - D1 = 8 ^{H8} D2 = 10 ^{H8} MJT-C-R 20 - D1 = 5 ^{H8} D2 = 6 ^{H8}

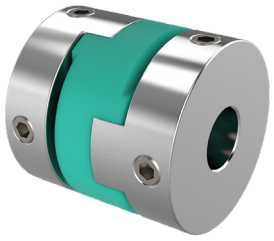
Miniature Oldham-type Coupling I Series MKA

• compensation of big lateral shaft misalignments • plug-in
• MOH-C: standard series with lateral clamping hub • MOH: cost-effective version with set screws

technical data:

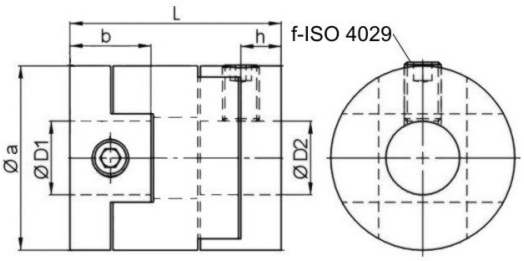
MOH/ MOH-C size	T_N [Nm]	max. speed [min^{-1}]	moment of inertia [10^{-6}kgm^2] MOH	MOH-C	torsional stiffness [10^{-3}Nm/arcmin]	max. misalignment lateral [mm]	angular [°]	mass approx. [g] MOH	MOH-C	tightening torque of screws [Nm] f	i
16	1	8.000	0,24	0,32	19	1	2	7	10	1	1
20	1,5	7.000	0,81	0,82	35	1,5	2	14	16	1,7	1
25	2,5	6.000	1,8	2,6	58	2	2	20	34	1,7	1,5
32	7	4.800	6,7	8,3	180	2,5	2	48	80	4	2,5
43	15	4.000	39	20	340	3	2	160	160	4	5

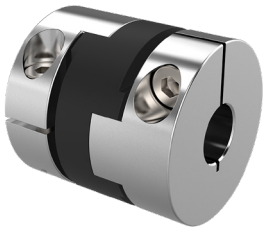
temperature range: -20°C up to +100°C



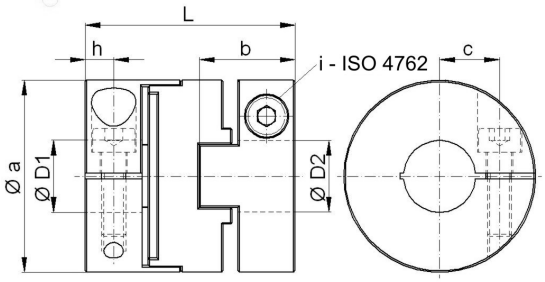
Series MOH

material:
hub: aluminum - alloy
spacer: polyacetal





Series MOH-C



temperature correction for nominal torques

-20°C up to +30°C	+40°C	+60°C	+100°C
100%	80%	60%	50%

Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

MOH/ MOH-C	Øa	b MOH	b MOH-C	c	h MOH	h MOH-C	L MOH	L MOH-C	f	i
16	16	8	9,5	5	2,3	3	18	21	1 x M 3	M 2,6
20	20	9	10	6,5	3,3	3	20	22,5	1 x M 4	M 2,6
25	25	11,5	12	8	3	4	25,5	27	2 x M 4	M 3
32	32	14,5	16	11	4	5	32	35	2 x M 5	M 4
43	43	24	21,5	15	7	7	52	47	2 x M 5	M 5

stock bores D1/D2 (H8)

MOH/MOH-C	Ø3	Ø4	Ø5	Ø6	Ø6,35	Ø8	Ø9,53	Ø10	Ø12	Ø14	Ø15	Ø16	Ø19
16	•	•	•	•									
20		•	•	•	•	•							
25			•	•	•	•	•	•					
32				•	•	•	•	•	•	•	•		
43				•	•	•	•	•	•	•	•	•	•

note: further bore sizes possible on request

order example: MOH 25 - D1 = 8 ^{H8} D2 = 10 ^{H8} MOH-C 32 - D1 = 10 ^{H8} D2 = 12 ^{H8}

Distance Couplings I General

Definition - Distance Couplings:

This category is comprised of several backlash-free coupling series with metal bellows or elastomer star which can cover axial distances of up to 6 m of length. The common main feature of all types is an intermediate part, which is variable in length and can precisely fit the required specifications of the customer. In many cases, they can be used as connecting shaft (synchronizing shaft) and can substitute for conventional constructions of conncecting shafts with complicated additional intermediate bearings. Misalignments, especially parallel misalignments, can be compensated to a higher extent. Furthermore, the stainless material and the easy assembly of all series are valuable assets. A secure, frictional connection with easy operation is assured because of the design in split-hub version (series WD) or with sliding hub (series EKHZ).

Characteristics – JAKOB Distance Couplings:

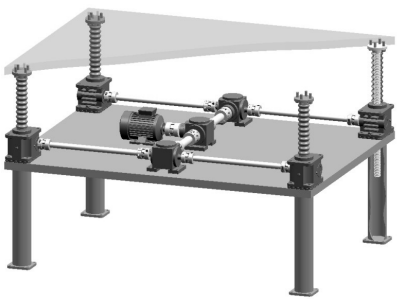
- as connecting shaft without additional intermediate bearing
- up to 6 m axial distance • high operational speed
- high torsional stiffness • backlash-free, precise torque transfer
- compensation of misalignments
- very easy to fit split-hub design
- optional stainless design • maintenance free

Series EKHZ - Elastomer spider
- length L = 0,2 - 3 m
- 7 sizes up to 1600 Nm
- T max = 90°C
- cost-effective type for medium speeds

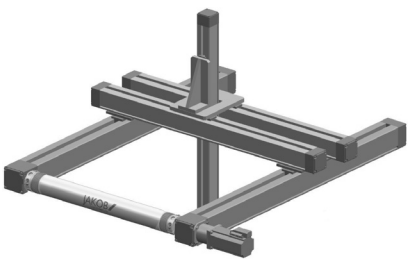
Series WDB - Metal bellows
- lengths from 55 to 300 mm
- 7 sizes up to 1000 Nm
- T max = 350°C
- alternative to WD / WDS for short lengths

Series WD-VA - Metal bellows
- length L = 0,2 - 3 m
- 7 sizes up to 1200 Nm
- T max = 350°C
- stainless steel version

Series WD/WDS - Metal bellows
- WD: length L = 0,2 - 4 m | Tmax = 90°C
- WDS: length L = 0,2 - 6 m | Tmax = 200°C
- 7 sizes up to 1600 Nm
- integrated gimbal / cardan support
- big pipe diameter for max. speeds
- high torsional stiffness



EKHZ - coupling for lifting table drive



WDS - coupling for multi-axis linear module

Distance Couplings I Installation

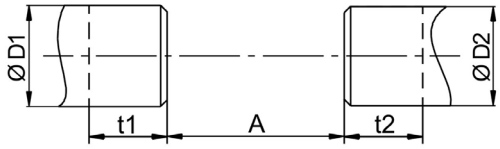
Installation:

The split-hub design allows for easy assembly. Further simplification during installation is provided because one half of the split hub is screwed onto the pipe. This allows resting the coupling on the two shaft ends. The second half of the split-hub can then be mounted to the coupling by screwing it on from below with the specified tightening torque. This feature makes a “one man assembly” possible even with extremely long couplings. During maintenance, EKZ/ WDS/WDE couplings can be exchanged without disassembling the drive or output units.

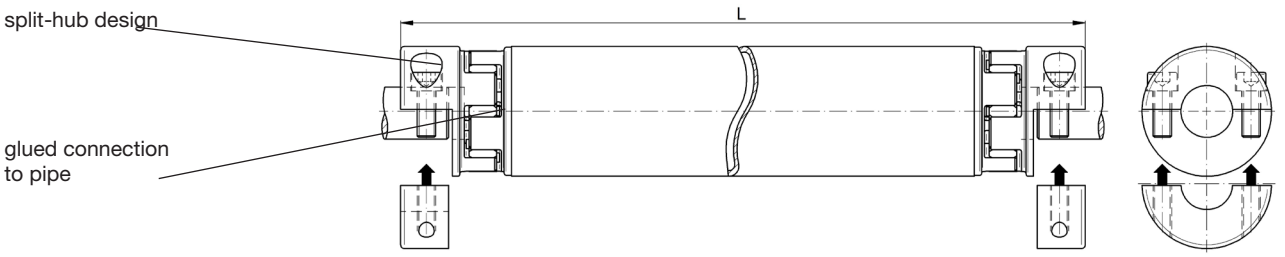
Formula for length determination:

L = A + t1 + t2 [mm]

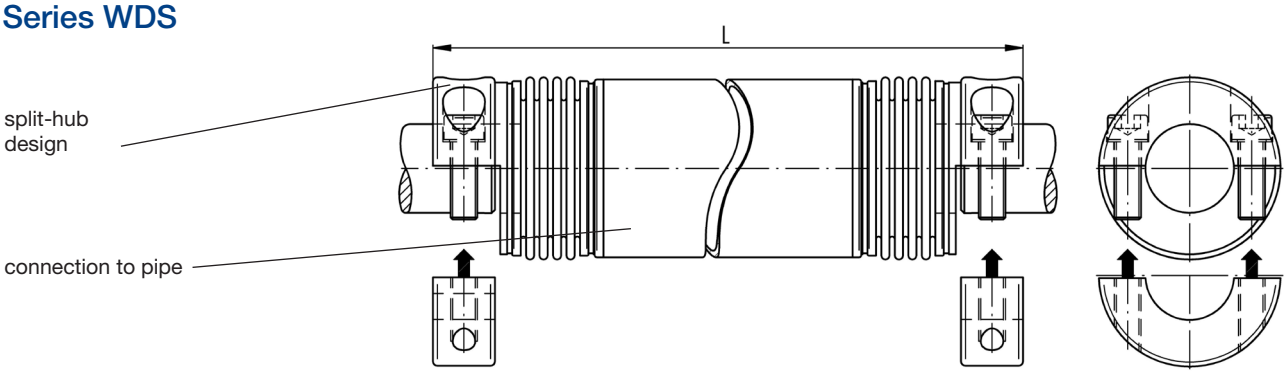
A = shaft seperation ± 1
t = plug in depth ± 1
(see data sheets)



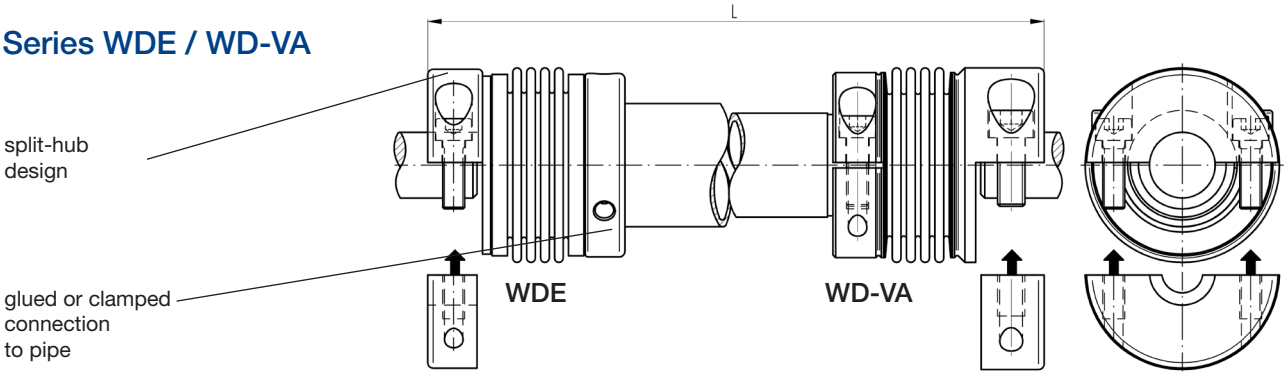
Series EKHZ

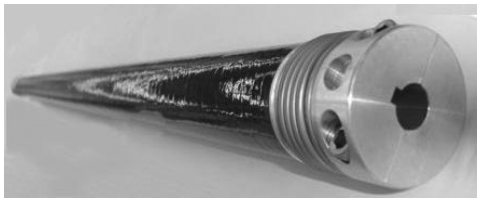


Series WDS



Series WDE / WD-VA





Note: The intermediate pipe can be delivered in different materials and section thicknesses, as well as in straightened and balanced quality for high speeds.

Metal Bellows Coupling with intermediate Pipe I WD / WDS

• backlash-free, precise torque transfer • no additional intermediate bearing
• high-speed and torsional stiffness • simple installation

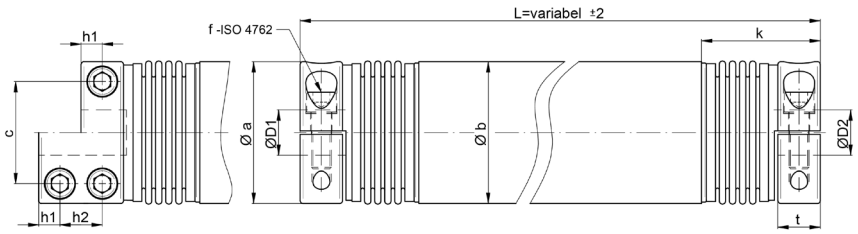
series WD: Variable length up to 4 m / Tmax = 90°C
series WDS: Variable length up to 6 m / Tmax = 200°C

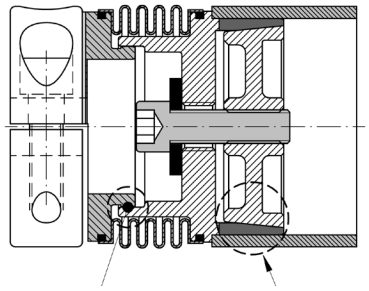
technical data:

WD WDS size	T_N [Nm]	torsional stiffness [Nm/arcmin] 1m	2m	3m	4m	moment of inertia [10^{-3}kgm²] 1m	2m	3m	4m	max. speed approx. [min^{-1}] 1m	2m	3m	4m	mass approx. [kg] 1m	2m	3m	4m
15	15	0,4	0,2	0,15	-	0,2	0,4	0,6	-	3900	880	370	-	0,9	1,5	2,3	-
50	50	1,5	0,8	0,6	0,5	0,9	1,6	2,2	2,9	6000	1300	550	300	1,8	3	4,3	5,5
100	100	2,6	1,5	1,0	0,8	1,8	2,9	4,1	5,3	7300	1600	670	360	2,5	4	5,5	7
200	200	5,9	3,5	2,5	1,9	5,3	9,1	13	17	8000	2100	900	500	3,8	6	8	10
400	400	17	10	7,5	6	12	21	31	40	8000	2700	1100	600	7	11	15	19
800	800	26	16	11	9	32	48	64	80	8000	3400	1400	760	15	20	25	30
1600	1600	61	37	27	21	116	150	190	230	8000	4800	2000	1100	31	38	44	51

maximum temperature range: -40°C up to +200°C | series WD: -40°C up to +90°C	
maximum axial shaft misalignment: $\Delta A = \pm 1,5$ mm	maximum angular shaft misalignment : $\alpha = 1°$
maximum lateral shaft misalignment: $\Delta R = \tan \alpha \bullet L_x$	with $L_x = L - (2 \bullet k) / \tan 1° = 0,0174$

note: lengths of over 4 m and in-house production of intermediate pipe are possible on request





material:
bellows: stainless steel
hubs: sizes 15 - 400: high-tensile aluminum / sizes 800-1600: steel – oxidized
precision intermediate pipe: high tensile aluminum

Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

WD/ WDS size	Øa	Øb	c	f-tightening-torque*	h1	h2	k	t	L_{min}	ØD1/2 min	ØD1/2 max(*)
15	36	35	21	2x M5 - 8Nm	9	-	54	18	160	6	15
50	58	50	36	2x M8 - 35Nm	13	-	67	26	190	9	25
100	75	60	47	2x M10 - 65Nm (50)*	13	-	69	26	210	12,5	31 (35)*
200	89	80	56	2x M12 - 115Nm (80)*	14	-	77	28	220	19	34 (42)*
400	109	100	72	2x M14 - 180Nm (140)*	15	-	84	30	240	24	48 (55)*
800	123	120	80	4x M12 - 115Nm	13	22	101	45	300	24	65
1600	158	160	108	4x M16 - 290Nm	18	30	125	64	360	35	85

• Øa: interfering edge - bolt head
• (*) note: reduced tightening torque (see brackets) for bigger hub bore diameter - see also Ø D 1/2max!
• Size 15 only as WDS type / pipe diameter Øb with WD-800 = 110mm or WD 1600 = 150mm

order example: WDS 400 - D1 = 28 ^{F6} D2 = 38 ^{F6} L = 1850
WD 100 - D1 = 18 ^{F6} D2 = 24 ^{F6} L = 1220

Metal Bellows Coupling with intermediate Pipe I WDB

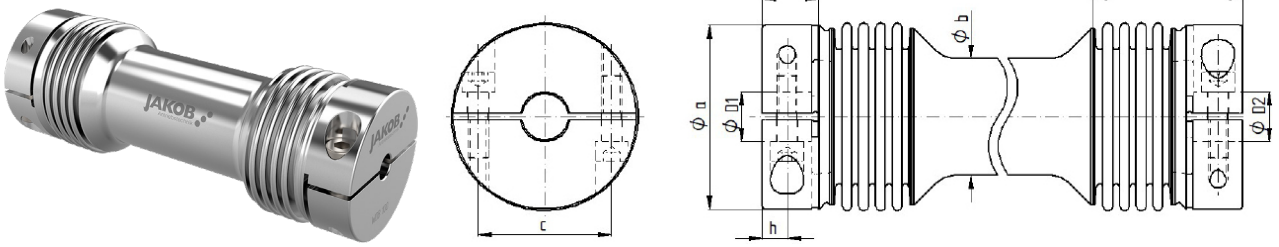
- variable lengths from 55 to 260 mm • without additional intermediate storage
- backlash-free, precise torque transmission • low mass moment of inertia
- special symmetrical clamping hub with high balancing quality and for high operating speeds

technical data:

WDB Größe	nominal torque [Nm]	torsional stiffness [Nm/arcmin]	moment of inertia [10^{-3}kgm²]	mass. approx. [kg]	max. operating speed [min^{-1}]	max. lateral shaft misalignment [mm] L_{min}	L_{max}	f-tightening torque*
4	4	0,3	0,008	0,1	20.000	0,4	2,9	2x M3 - 2 Nm
16	16	1	0,04	0,3	20.000	0,5	2,7	2x M5 - 8 Nm
40	40	4	0,4	1,0	17.000	0,7	2,6	2x M6 - 14 Nm
100	100	7	0,9	1,5	14.000	0,9	2,8	2x M8 - 35 Nm
200	200	13	2,4	2,7	12.000	0,9	2,9	2x M10 - 65 Nm
400	400	22	5	4	10.000	1,1	3,0	2x M12 - 115 Nm
1000	1000	62	15	6,8	8.000	1,3	3,7	2x M14 - 185 Nm

max. permissible axial misalignment: Δ A = ± 1,5 mm / maximum angular shaft misalignment: α = 1°

Two clamping screws per hub
with 180° arrangement



material:
Metal bellows: stainless steel 1.4571 / A4
Hubs: size 4 - 16: stainless steel 1.4301 / size 40-400: steel (S 355)
Intermediate pipe: stainless steel 1.4301
Screws: ISO 4762 Q 12.9 - coated

Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

WDB size	Øa	Øb	c	h	k ± 1	t	L min	L max	ØD1/2 min	ØD1/2 max(*)	Øprebored min.
4	26	15	16	5	24	10	55	200	6	12	6
16	37	22	22	6,5	35	13	75	200	8	16	6
40	57	35	40	7,5	45	15	95	200	12	32	9
100	68	48	46	9,5	49	18,5	110	220	16	35	11
200	84	58	58	12	59	22,5	125	240	20	45	15
400	101	70	65	13	68	26	145	260	28	50	19
1000	132	95	92	15	75	28	160	300	35	75	23

Øa: interfering edge – screw head

order example: WDB 200 L = 180 D1 = 32 ^{G7} D2 = 35 ^{G7}

Elastomer Coupling with intermediate Pipe I EKHZ

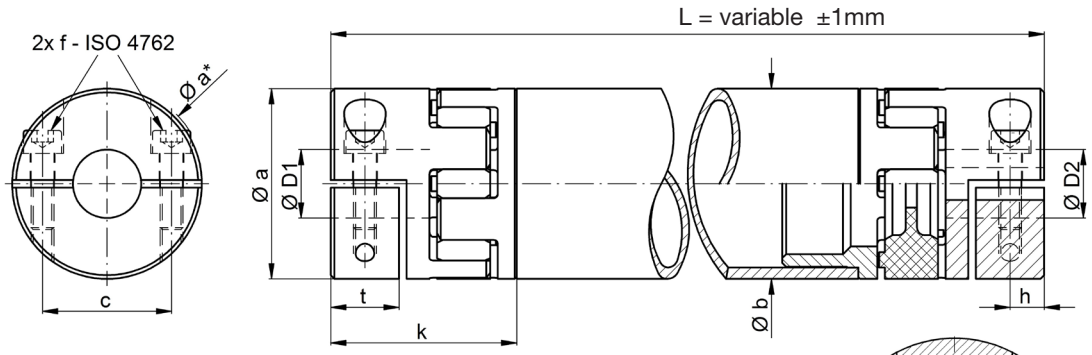
• variable length of up to 3 m • plug-in • backlash-free • oscillation dampening
• rust-proof version • split-hub design - simple installation

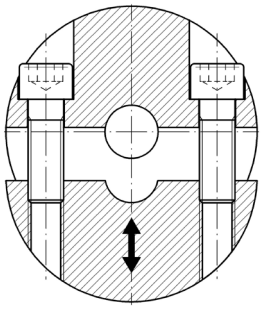
technical data:

EKHZ size	T_N [Nm]	torsional stiffness (stat. at 0,5xT_N) [Nm/arcmin] 0,5m	1m	2m	3m	moment of inertia [10^{-3}kgm^2] 0,5m	1m	2m	3m	max. speed approx. [min^{-1}] 0,5m	1m	2m	3m	mass approx. [kg] 0,5m	1m	2m	3m
20	20	0,19	0,16	0,13	0,1	0,14	0,23	0,42	0,61	3.500	2.700	680	300	0,5	0,9	1,6	2,3
45	45	0,49	0,44	0,35	0,3	0,48	0,82	1,53	2,2	3.500	3.500	990	440	0,9	1,5	2,8	4,0
90	90	0,9	0,8	0,64	0,54	0,8	1,4	2,6	3,8	3.500	3.500	1200	530	1,3	2,0	3,5	5,0
200	200	1,05	0,95	0,79	0,68	1,4	2,4	4,3	6,2	3.500	3.500	1.400	600	1,7	2,5	4,3	6,0
400	400	2,9	2,5	1,9	1,57	3,2	5,1	8,9	12,7	3.500	3.500	1.600	700	2,5	3,5	5,5	7,5
800	800	5,7	5,3	4,7	4,2	14,7	22,9	39,3	55,7	3.500	3.500	2.400	1070	5,8	8,2	13,1	18
1600	1600	10,2	9,7	8,8	8,1	87	107	147	187	3.500	3.500	2.000	1650	22	25	32	39

maximum axial shaft misalignment ± 1 mm maximum lateral shaft misalignment 5 mm per meter overall length

maximum temperature range: -30°C up to +90°C





material:
hubs: 20 - 800: high-tensile aluminum (size 1600: steel)
intermediate pipe: aluminum precision pipe
elastomer spider: PUR-72 Sh-D
screws: ISO 4762 / 12.9 - coated

dimensions [mm]: length dimensions according to DIN ISO 2768 cH

EKHZ size	Øa	Øa*	Øb	c	f-tightening-torque	h	k	L_{min}	t	ØD1/2 min	ØD1/2 max
20	40	42	35	27	M5 - 8 Nm	8,5	43	130	16	10	20
45	50	52	50	34	M6 - 14 Nm	10	50	140	19	15	26
90	60	63	60	41	M8 - 35 Nm	11,5	53	155	22	16	30
200	70	76	70	48	M10 - 65 Nm	14	59	170	26	20	35
400	85	91	80	58	M12 - 115 Nm	15	71	215	28	24	42
800	120	126	120	90	M14 - 180 Nm	18	85	250	34	32	70
1600	160	165	160	122	M16 - 290 Nm	24	105	320	43	48	100

note: Øa* = interfering edge screw head

order example: EKHZ 90 - D1 = 28 ^{F6} D2 = 24 ^{F6} L = 1250

Metal Bellows Coupling with intermediate Pipe I WD-VA

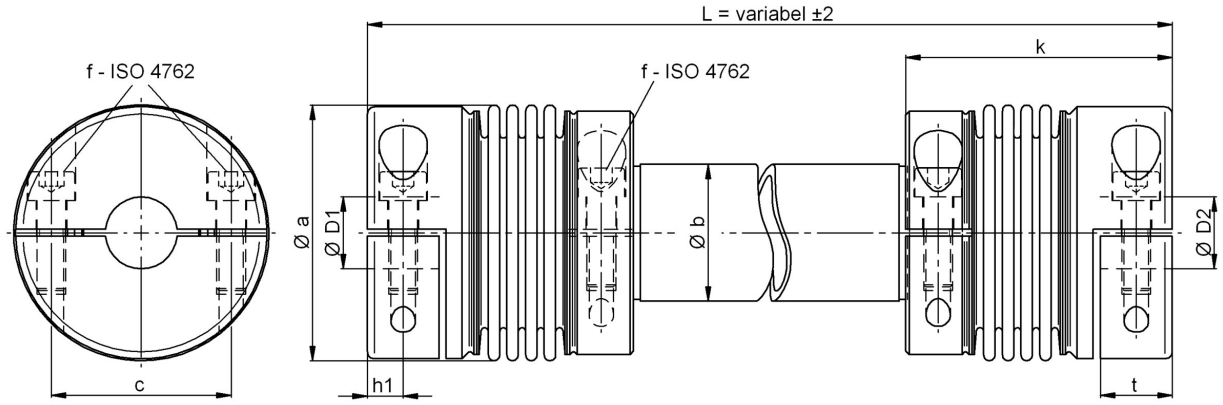
• stainless steel design up to 350°C • backlash free, exact torque transfer
• variable length up to 3 m • very easy to fit with splitted hub design

stainless steel

technical data:

WD -VA	T_N	T_{max}	torsional stiffness [Nm/arcmin]				moment of inertia [10^{-3}kgm²]				mass [kg]				max. speed approx. [min^{-1}]			
size	[Nm]	[Nm]	0,5m	1m	2m	3m	0,5m	1m	2m	3m	0,5m	1m	2m	3m	0,5m	1m	2m	3m
10	10	14	0,22	0,11	0,06	0,04	0,07	0,09	0,13	0,17	0,8	1,2	2,2	3,1	6000	1550	350	150
50	50	70	1,6	0,88	0,46	0,31	0,63	0,81	1,18	1,55	1,9	2,9	5,0	7,0	6000	3400	740	310
120	120	160	3,7	2,0	1,0	0,7	2,1	2,5	3,2	3,9	3,3	4,6	7,3	9,9	6000	4700	1000	400
200	200	280	5,7	3,0	1,5	1,0	3,9	4,5	5,7	6,9	4,7	6,5	10	13	6000	5500	1100	470
350	350	480	9,7	4,8	2,4	1,6	8,4	9,3	11	13	8,4	9,3	12,3	16	6000	6000	1300	550
600	600	750	22	11	5,3	3,5	20	22	26	30	11,5	14	19	24	6000	6000	1700	700
1200	1200	1600	66	36	19	13	66	74	89	104	21	25	33	42	6000	6000	2650	1050

maximum axial shaft misalignment: $\Delta A = \pm 1{,}5$ mm / maximum angular shaft misalignment: $\alpha = 1°$
maximum lateral shaft misalignment: $\Delta R = \tan \alpha \times Lx$ with $Lx = L - (2 \times k) / \tan 1° = 0{,}0174$



material:
bellows: stainless steel 1.4571 / A4
hubs: stainless steel 1.4301 / A2
intermediate pipe: stainless steel A2 bzw. A4
screws: ISO 4762 stainless steel / A4-80.

notice: connection between bellows and hub with plasma welding-process

Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

WD-VA size	Øa	Øa*	Øb	c	f-tightening torque	h	L_{min}	k ±1	t	ØD1/2 min	ØD1/2 max
10	34	36	16	21	M5 - 5 Nm	6,5	92	46	13	7	15
50	56	60	30	28	M8 - 24 Nm	9	126	63	17	12	28
120	71	76	38	38	M10 - 45 Nm	12	154	77	23	19	38
200	82	86	42	56	M12 - 80 Nm	13	173	86,5	25,5	22	42
350	101	103	48	68	M14 - 110Nm	15	194	97	30	30	50
600	122	124	60	80	M16 - 180 Nm	18	230	115	36	32	60
1200	157	161	89	110	M20 - 350 Nm	20	256	128	40	48	85

Øa: interfering edge – screw head

• clamping hubs with stainless steel screws A4/80 without EASY pin –
• variable length up to 6m, and higher rotational speed on request

order example: WD - VA 200 D1 = 32 ^{F6} D2 = 35 ^{F6} L = 800

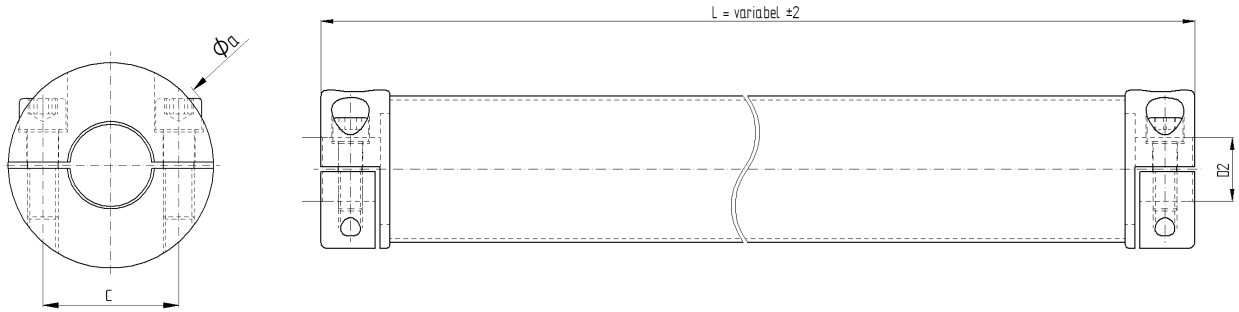
Simple-Flex distance coupling I Series SF

- variable lengths from 0,5 to 6 m • suitable for high operating speeds
- very low weight without compensating coupling elements
- transmission of high torsional moments with small pipe diameter

Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

SF size	Øa	Øb	Øc	e	f-tightening torque	h_1	h_2	k	t	ØD1/2 min	ØD1/2 max
SF 40-KF	75	44	62	-	6x M6 - 14 Nm	-	-	40	30	15	38
SF 40-H	96	44	-	70	2x M10 - 65 Nm	13	-	-	24	25	50
SF 70-KF	102	74	84	-	6x M8 - 30 Nm	-	-	46	37	18	55
SF 70-H	119	74	-	90	2x M12 - 115 Nm	15	-	-	28	45	70
SF 125-H	150	129	-	110	4x M16 - 300 Nm	20	42	-	80	46	80

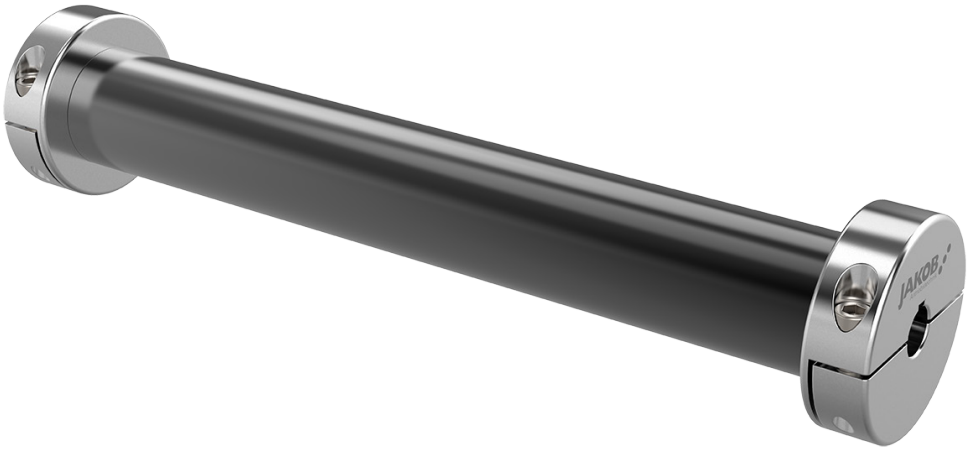
Øa: interfering edge – screw head at half-shell clamping hub



material: hub: high-tensile aluminum intermediate pipe: CFK

max. operating speed:

SF size	max. operating speed [min^{-1}]					
	1 m	2 m	3 m	4 m	5 m	6 m
SF 40-KF	9000	2000	900	500	300	200
SF 40-H	6500	1500	650	360	230	160
SF 70-KF	15500	3500	1500	850	550	370
SF 70-H	11100	2600	1200	620	400	280
SF 125-H	11300	2600	1100	620	400	280



technical data:

SF size	nominal torque / max. torque [Nm]					
	1 m	2 m	3 m	4 m	5 m	6 m
SF 40-KF	250 / 500	220 / 350	180 / 300	150 / 250	130 / 220	120 / 200
SF 40-H	250 / 500	220 / 350	180 / 300	150 / 250	130 / 220	120 / 200
SF 70-KF	600 / 1000	450 / 700	350 / 500	300 / 500	270 / 450	250 / 400
SF 70-H	600 / 1000	450 / 700	350 / 500	300 / 500	270 / 450	250 / 400
SF 125-H	2900 / 4700	2000 / 3300	1700 / 2700	1500 / 2300	1300 / 2100	1200 / 1900

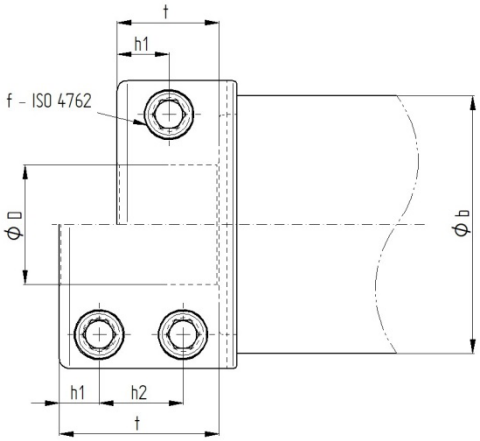
SF size	moment of inertia [10^{-3}kgm^2]						mass [kg]					
	1 m	2 m	3 m	4 m	5 m	6 m	1 m	2 m	3 m	4 m	5 m	6 m
SF 40-KF	1,3	1,5	1,7	1,8	2,0	2,2	1,7	2,1	2,5	2,9	3,3	3,7
SF 40-H	0,7	0,9	1,1	1,2	1,4	1,6	1,1	1,5	1,9	2,3	2,7	3,1
SF 70-KF	6,2	7,1	7,9	8,8	9,7	10,5	3,6	4,3	5,0	5,6	6,3	7,0
SF 70-H	4,0	4,9	5,8	6,7	7,5	8,4	2,2	2,9	3,6	4,3	4,9	5,6
SF 125-H	28,4	33,4	38,4	43,4	48,5	53,5	8,7	10,0	11,2	12,5	13,7	14,9

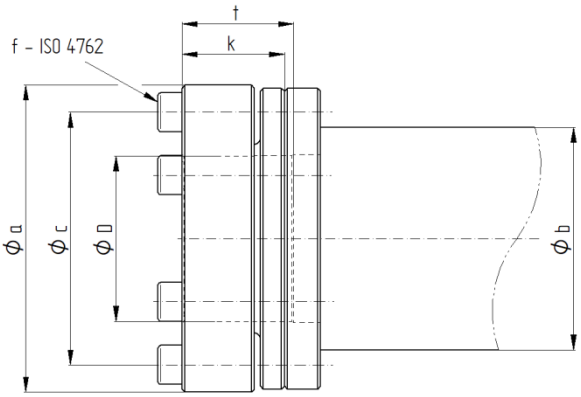
SF size	torsional stiffness [Nm/arcmin]						max. lateral shaft misalignment [mm]					
	1m	2m	3m	4m	5m	6m	1m	2m	3m	4m	5m	6m
40-KF 40-H	0,65	0,32	0,22	0,16	0,13	0,11	4	15	25	35	45	50
70-KF 70-H	3,32	1,66	1,11	0,83	0,66	0,55	2	8	15	20	25	30
SF 125-H	18,12	9,05	6,05	4,54	3,62	3,02	1	5	10	15	20	25

temperature range: -10°C up to +60°C

hub design::

size SF 40-H, SF 70-H





size SF 125-H

Version SF-H: half-shell hub

- easy to assemble with two radial clamping screws
- inexpensive execution
- lowest mass and moments of inertia

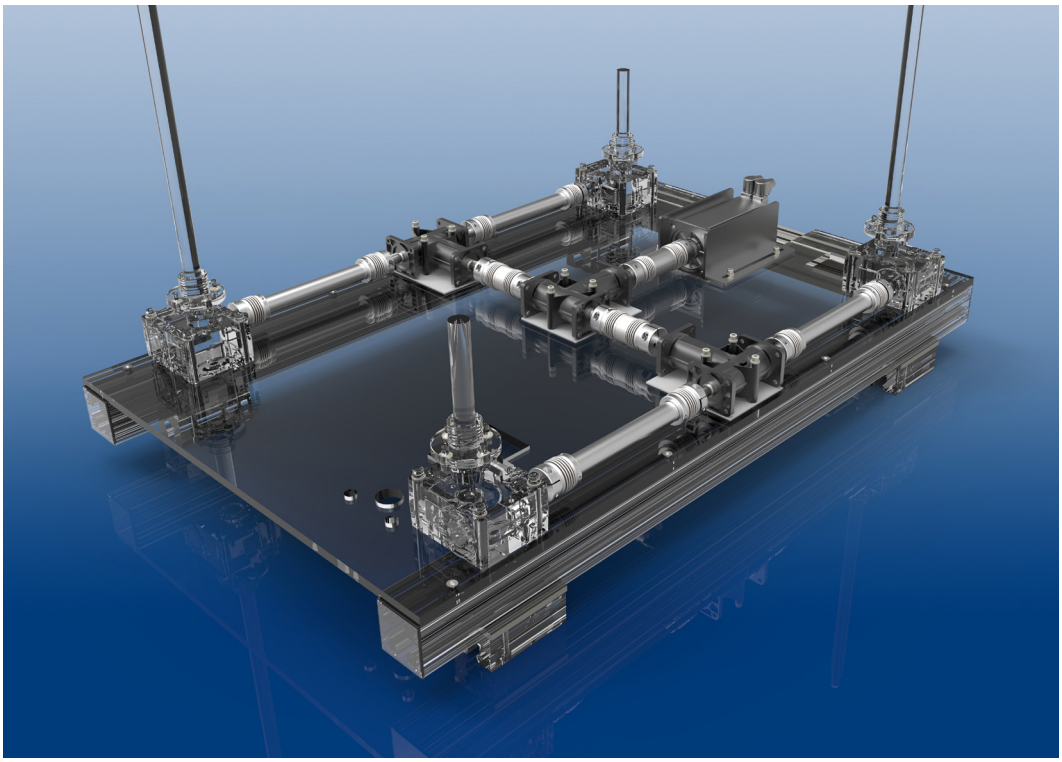
Version SF-KF conical clamping ring hub

- excellent balance quality / highest speeds
- high clamping forces for high torques
- rotationally symmetrical construction

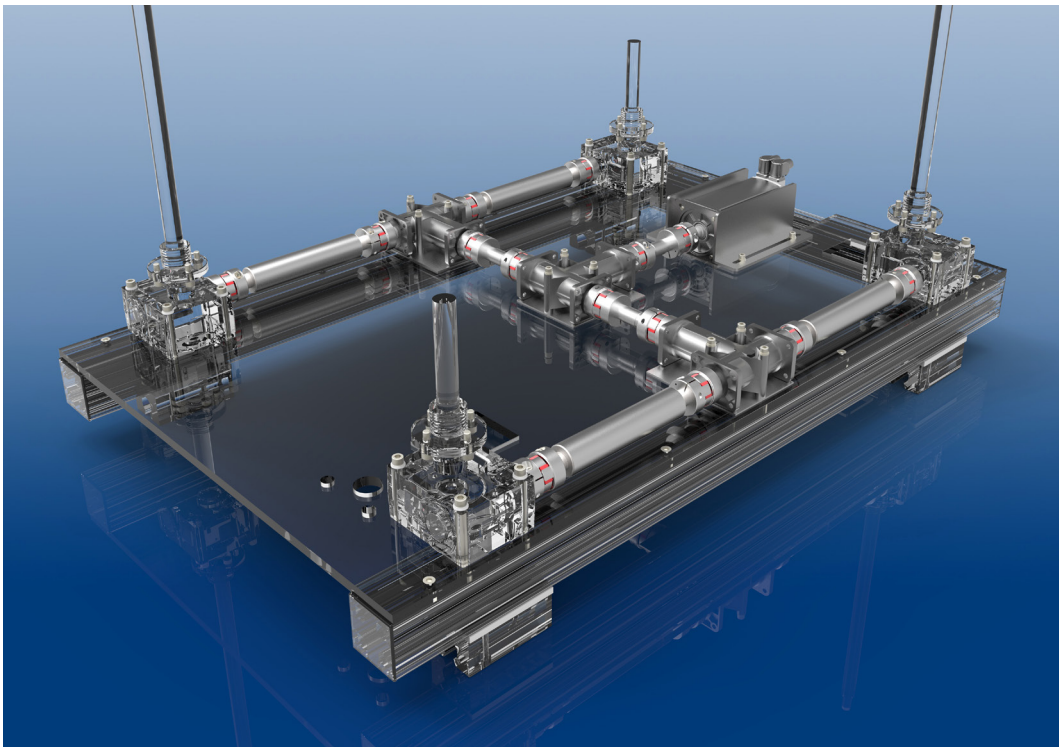
order example: SF 70-H; D1 = 28 ^{F6}; D2 = 35 ^{F6}; L = 3200

Distance Couplings with Intermediate Pipe

Application example - Lifting table



*Linear system with metal bellows distance couplings of the **WDS** series*



*Linear system with elastomer distance couplings of the **EKZ** series*

Product Overview I JAKOB Clamping Technology

Power Clamping Nut Series MCA

- 4 sizes up to 200 kN
- blind hole thread up to M64
- thread protected
- centered operation
- compact design

Power Clamping Nut Series MDA

- 2 sizes up to 180 kN
- through hole thread up to M48
- for variable clamping edges
- unlimited clamping stroke

Spring Clamping Cylinder Series ZSF / ZDF

- numerous sizes up to 350 kN
- mechanical clamping
- hydraulic relasing
- high operational safety
- leak-proof, robust, economical
- temperature range: -30°C to +100°C
- fitting position in any direction

Power Clamping Screw Series SC

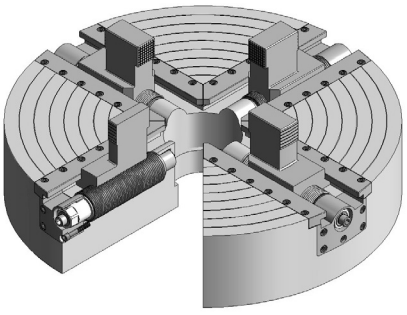
- 5 sizes up to 250 kN
- wedge clamping mechanism
- high clamping forces
- low tightening torques
- maximum operational safety

spring clamping cylinder Series ZSF (pulling)

spring clamping cylinder Series ZDF (pushing)

Power Clamping Screws mechanical type: Series MSP/MSPD hydraulical type: Series HSP

- nominal clamping forces up to 1,200 kN
- maximum operational safety
- large power clamping stroke
- simple operation and fitting
- very large clamping forces at low tightening torques



please ask for our clamping elements catalog

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