

Servo couplings
Safety couplings



The company JAKOB

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

For more than 50 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.

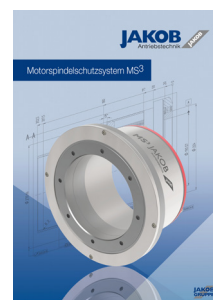
Highly trained engineers and technicians at our facility in Kleinwallstadt are always ready with a solution to best meet your requirements.



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.



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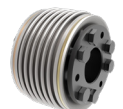
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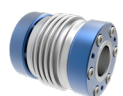
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Servo Couplings I General

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 divided 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.



Safety Couplings I General

Definition – Safety Couplings:

Due to the constantly increasing automation and dynamics of modern work processes, the devices which protect the complex and expensive units against damages in case of errors are becoming more important. JAKOB safety couplings reduce expensive machine damages, repairs and downtime by acting as torque limiters and overload protection absolutely reliably. JAKOB safety couplings are the life insurance for your machines, no matter whether the error occurs due to incorrect operation, programming error, material overload or tool breakage.

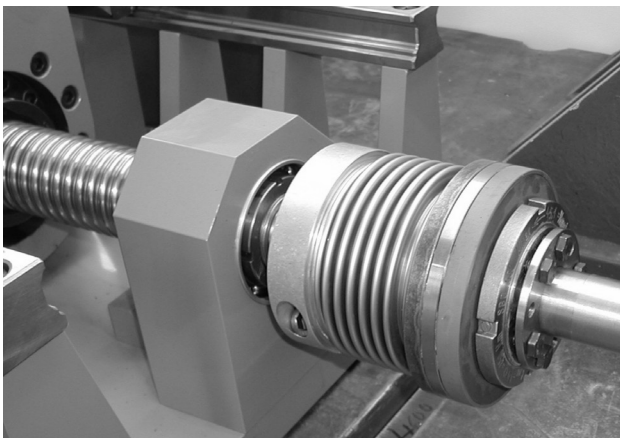
JAKOB safety couplings are the result of decades of continuous research and development as well as the experience gained from numerous different applications worldwide.

Unique design aspects, high-quality materials, precision machining of the individual components are some of the factors which make JAKOB couplings some of the leading couplings today. The safety couplings are used in all areas of the machine tool industry, ranging from critical servo drive applications to overload protection in conveyor systems.

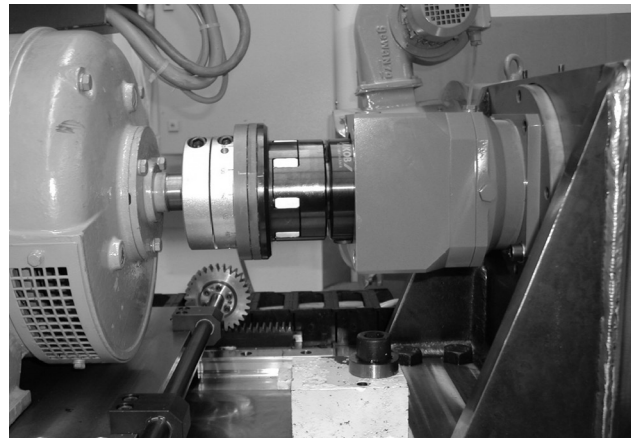
Performance Characteristics – JAKOB Safety Couplings:

- ✓ optimal overload and collision protection to minimize damage
- ✓ backlash-free, precise torque transfer
- ✓ stepless disengagement torque adjustment
- ✓ fixed point reengagement (360° synchronised position)
- ✓ automatic reengaging (optional feature)
- ✓ degressive spring characteristic ✓ precise disengagement function
- ✓ excellent dynamic functional characteristics
- ✓ low moments of inertia ✓ high-speed
- ✓ large selection of types (modular system)
- ✓ integral fitting of pulleys or gear wheels
- ✓ stop-signal (emergency stop) by use of a proximity switch

Application examples:



Collision protection of a drive spindle with safety coupling series SKB-K with bellows attachment



Safety coupling series SKB-E with elastomer attachment for overload protection of a planetary gearbox

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} kgm²]

The values for the moment of inertia are defined for medium hub-bores in the given diameter range D_{min}/D_{max} . Conversion: [kgcm²] = [10^{-4} kgm²]

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 necessary. If the size of the motor is fixed, the necessary nominal torque of the coupling T_{KN} can be calculated as follows:

$$T_N > 1,25 \cdot T_A \max \cdot i$$

$T_A \max$ = 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

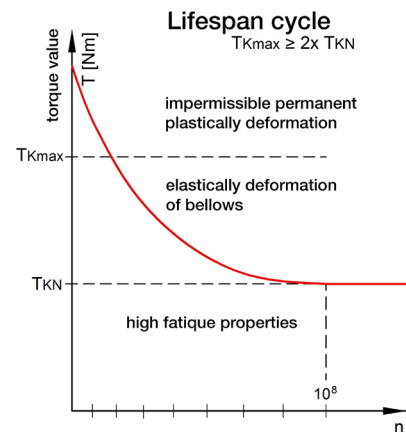
c) according to shaft diameter:

After selecting the coupling type, it must be checked whether the requested shaft diameter corresponds with the allowed diameter (D_{min} / D_{max}) 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 D_{max} of the hub.

note: hub bores which are smaller than “ D_{min} ” 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.

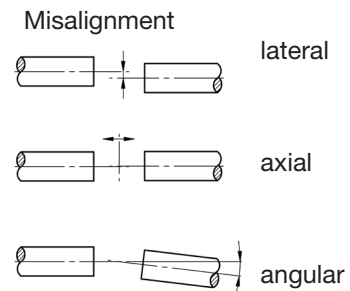


e) max. load:

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

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 $+150^\circ\text{C}$, short-term up to $+200^\circ\text{C}$. 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 $25,000 \text{ min}^{-1}$ (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)

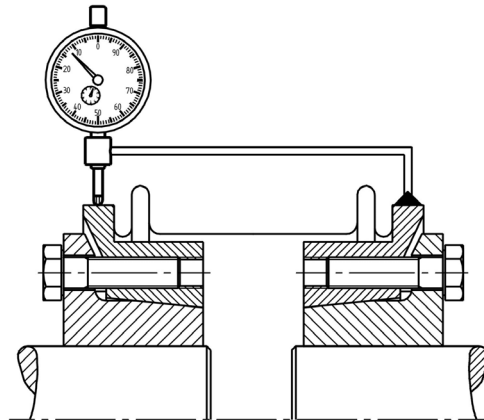
i) maintenance and wear:

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 system). 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.

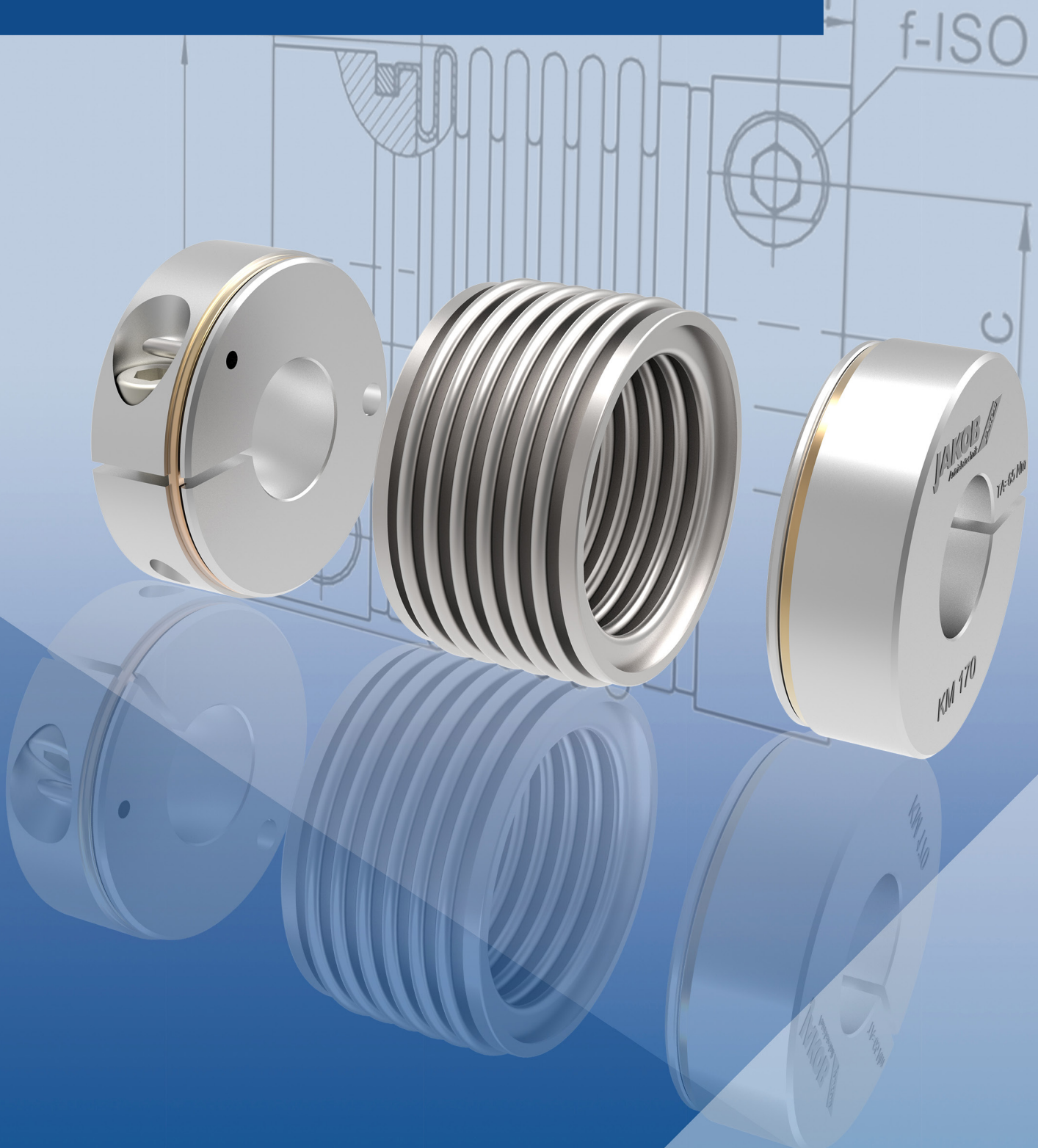
d) disassembly

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!

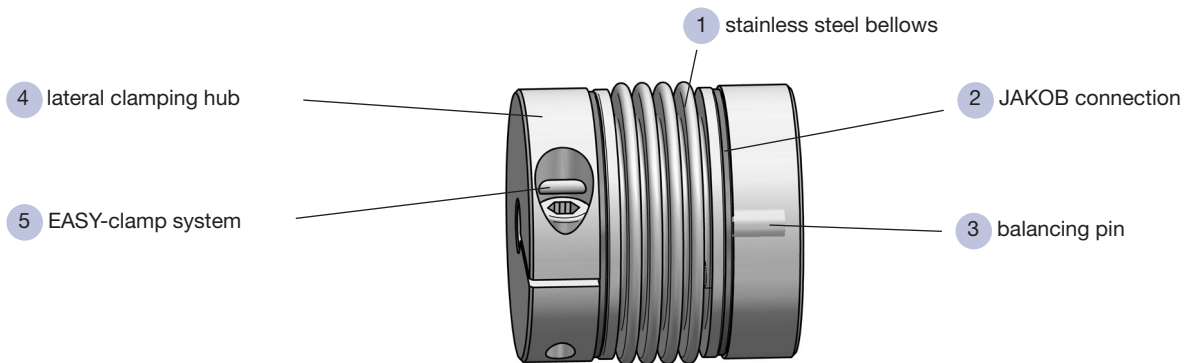
e) special notes

- /// 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 Couplings



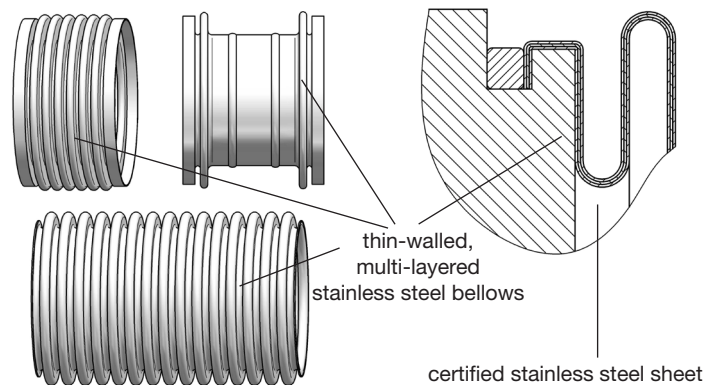
Metal Bellows Servo Couplings | Technical Details



1. Stainless Steel Bellows

advantages:

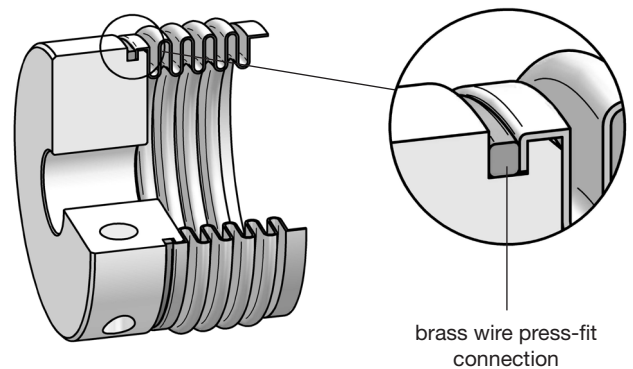
- ✓ absolutely backlash-free, precise torque transmission
- ✓ extremely high torsional stiffness
- ✓ high flexibility for compensation of shaft misalignments
- ✓ minimized moment of inertia
- ✓ maintenance and wear-free up to 300°C
- ✓ high-quality precision manufacture
- ✓ system modules with a multitude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



2. Connection Method

advantages:

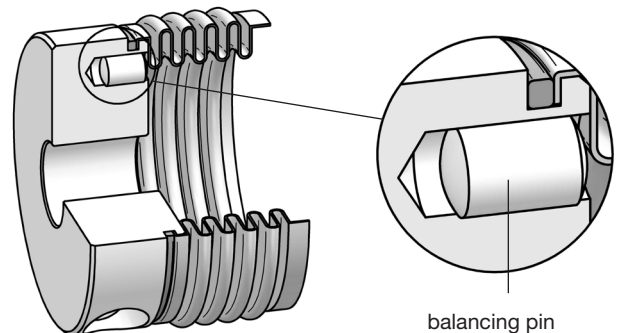
- ✓ JAKOB developed and patented the brass-wire press-fit method in 1974, which is the optimal, backlash-free connection of aluminum hubs with multi-layered stainless steel bellows. Alternatively, the steel or stainless steel hubs are connected to the metal bellows via plasma welding
- ✓ in contrast 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

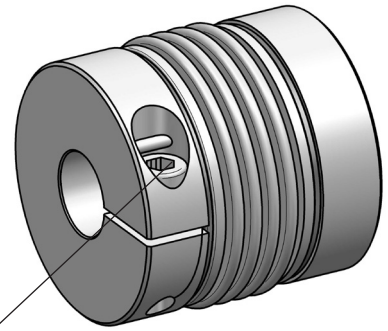


Metal Bellows Servo Couplings | Technical Details

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

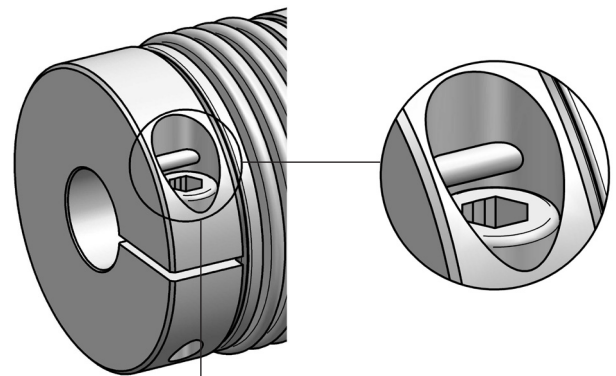


cylinder hex socket screw ISO 4762 / 12.9
zinc flake coating

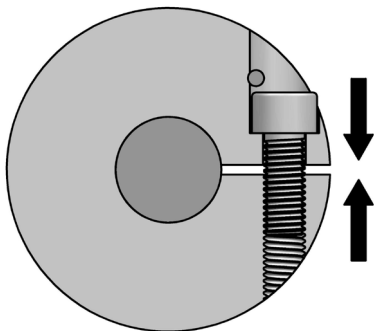
5. EASY-Clamp System

advantages:

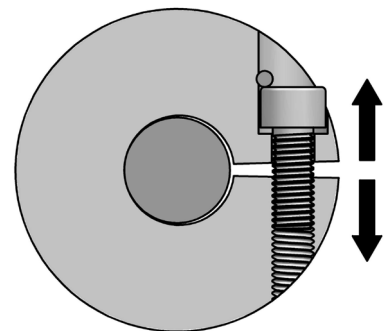
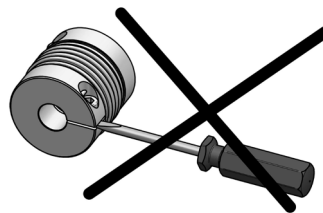
- /// revolution of coupling fitting
- /// no shortening or extension of bellows
- /// grave time saving, no reworking
- /// blind assembly possible, hole in bell housing is enough
- /// compensation of tolerance deviation of shaft-hub-fit
- /// no additional tools necessary
- /// no damage of hub bores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



EASY-clamp system



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

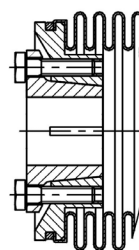


For assembly and disassembly, the hub has to be expanded elastically.

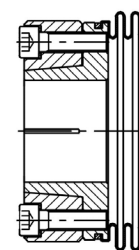
6. Conical Connection

advantages:

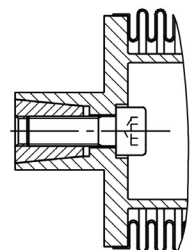
- /// through force amplification (wedge principal), a safe transmission of torque for smaller bore sizes (hub additionally sliced) can be guaranteed
- /// backlash- and maintenance-free, force-fitted
- /// no keyway necessary
- /// rotational symmetry, good balancing for high speed
- /// expanding conical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



conical clamping hub



conical ring hub



expanding conical hub

Metal Bellows Coupling I Series KM

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

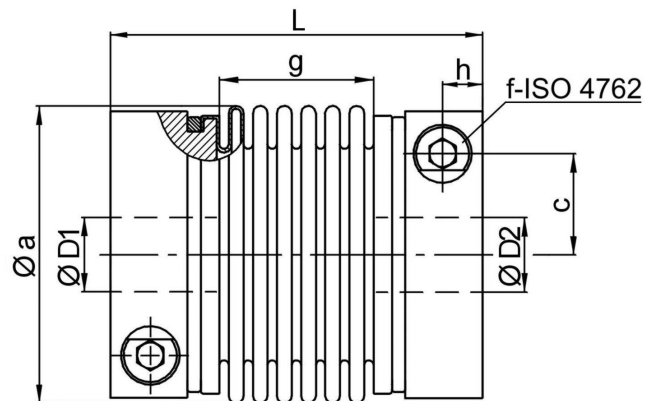
technical data:

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 -	17000
35	35	0,14	5,8	0,8	0,25	51	190	14 -	17000
60	60	0,29	8,7	0,9	0,3	49	260	35 (30)*	16000
80	80	0,79	14	1	0,3	45	280	65 (50)*	12000
170	170	0,83	17	1	0,3	80	470	65 (50)*	12000
270	270	2,2	32	1	0,3	70	450	115 (90)*	10000
400	400	2,4	47	1	0,3	100	640	115 (90)*	10000
600	600	5,3	67	1	0,3	100	980	180(140)*	8000
900	900	9	105	1	0,3	145	1000	180(140)*	7500
1300	1300	14	170	1	0,3	130	920	290 (240)*	6500

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	28 (35)*
80	82	28,5	M 10	38	11,5	90	102	0,8	16	32 (43)*
170	82	28,5	M 10	40	11,5	92	104	0,8	18	32 (43)*
270	101	35	M 12	42	13	100	106	1,4	25	42 (55)*
400	101	35	M 12	48	13	106	112	1,5	28	42 (55)*
600	122	42	M 14	52	16	120	-	2,4	32	55 (68)*
900	133	47	M 14	53	18,5	143	-	3,5	40	65 (75)*
1300	157	54	M 16	55	20	145	-	4,2	48	70 (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 G⁶ D2 = 42 G⁶

Metal Bellows Coupling I Series KP

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

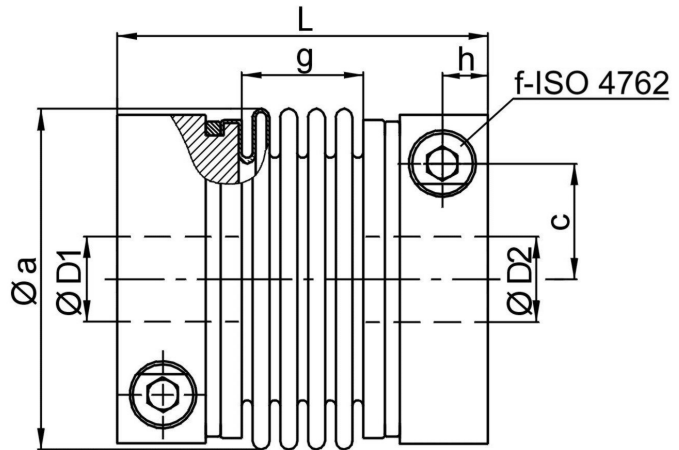
technical data:

KP size	TN [Nm]	moment of inertia [10 ⁻³ kgm ²]	torsional stiffness [Nm/arcmin]	max. shaft misalignment (mm)		axial spring rate [N/mm]	lateral spring rate [N/mm]	tightening torque of screws [Nm] (*)	nmax [upm]
				axial±	lateral				
25	25	0,064	4	0,5	0,15	36	180	8	19000
35	35	0,13	9	0,5	0,2	70	450	14	17000
60	60	0,27	14	0,6	0,2	70	650	35 (30)*	16000
100	100	0,35	20	0,6	0,2	110	1200	35 (30)*	13500
170	170	0,76	28	0,8	0,2	98	1000	65 (50)*	12000
270	270	2	52	0,8	0,2	90	1300	115 (90)*	10000
400	400	2,15	74	0,7	0,2	135	1500	115 (90)*	10000
600	600	5,0	106	0,7	0,2	140	2800	180 (140)*	8000
900	900	9,0	156	0,8	0,2	210	3050	180 (140)*	7500

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: bellows: stainless steel
 hubs: high-tensile strength aluminum 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	28 (35)*
100	71	25	M 8	23	9	68	-	0,5	14	30 (38)*
170	82	28,5	M 10	28	11,5	80	92	0,8	18	32 (43)*
270	101	35	M 12	29	13	87	93	1,3	25	42 (55)*
400	101	35	M 12	33	13	91	97	1,4	28	42 (55)*
600	122	42	M14	36	16	104	-	2,3	32	55 (68)*
900	133	47	M14	37	18,5	127	-	3,3	40	65 (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 Coupling I Series KR

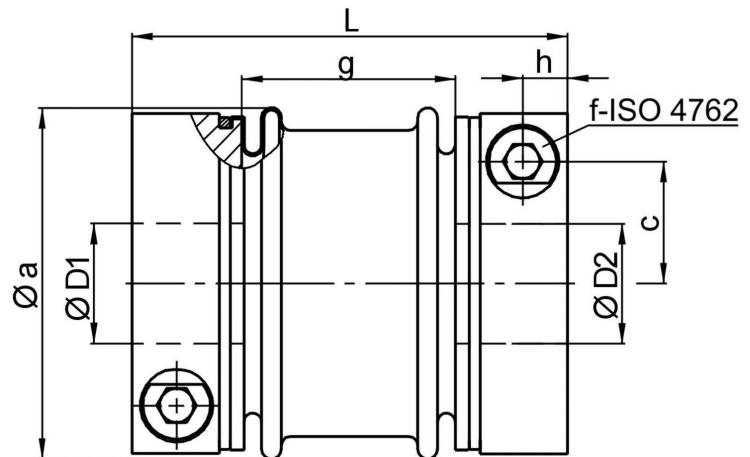
- /// straight bellows
- /// simple installation with lateral EASY-clamping hub
- /// low restoring forces
- /// high torsional stiffness
- /// long design

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 -	17000
50	50	0,12	10	0,3	0,2	160	160	14 -	17000
65	65	0,25	12	0,3	0,3	90	90	35 (30)*	16000
100	100	0,7	23	0,5	0,4	100	100	65 (50)*	12000
200	200	0,84	30	0,3	0,3	220	220	65 (50)*	12000
300	300	2	53	0,4	0,3	210	210	115 (90)*	10000
450	450	2,15	80	0,4	0,3	300	300	115 (90)*	10000
550	550	4,7	98	0,5	0,5	300	300	180 (140)*	8000
1500	1500	13	280	0,6	0,5	520	520	290 (240)*	6500

(*) 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
 bellows: stainless steel 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	28 (35)*
100	82	28,5	M 10	50	11,5	102	114	0,75	16	32 (43)*
200	82	28,5	M 10	56	11,5	108	120	0,8	18	32 (43)*
300	101	35	M 12	65	13	123	129	1,3	28	42 (55)*
450	101	35	M 12	65	13	123	129	1,4	35	42 (55)*
550	122	42	M 14	72	16	140	-	2,2	32	55 (68)*
1500	157	54	M 16	96	20	186	-	4,4	48	70 (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 Coupling 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 kgm ²]	torsional stiffness [Nm/arcmin]			max. lateral shaft misalign- ment [mm]			axial spring rate [N/mm]			lateral spring rate [N/mm]			nmax [µm]
			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	-	
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.

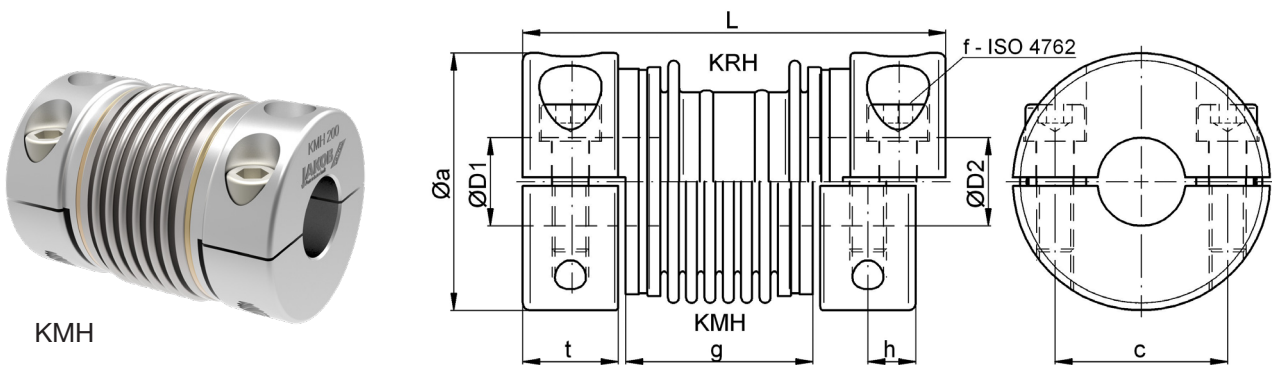
material:

bellows: stainless steel

screws: ISO 4762 / 12.9

hubs: high-tensile strength aluminum

temperature range: -40°C up to 200°C



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

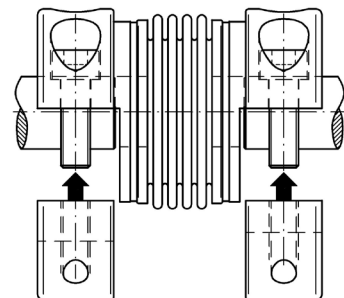
KPH/KMH/ KRH	Øa**	c	f-TA	g			h	L			t	mass ~ [kg]	ØD1/2	
				KPH	KMH	KRH		KPH	KMH	KRH			min	max
10	35	21	M5 - 8 Nm	33	43	-	9	73	83	-	18	0,1	6	15
40	58	36	M8 - 35Nm	39	48	51	13	95	104	107	26	0,5	9	25
80	75	47	M10 - 65Nm	41	51	59	13	97	107	115	26	0,8	12,5	35
200	89	56	M12 - 115Nm	45,5	57,5	73	14	106	118	134	28	1,2	19	42
400	109	72	M14 - 180Nm	52,5	67,5	84	15	117	132	149	30	2,0	24	55
900	132	94	M14 - 180Nm	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 Coupling 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	T _N	moment of inertia	torsional stiffness	max. shaft misalignment [mm]		axial spring rate	lateral spring rate	tightening torque screw	axial pre-load force	n _{max.}
size	[Nm]	[10 ⁻³ kgm ²]	[Nm/arcmin]	axial±	lateral	[N/mm]	[N/mm]	f i [Nm] (*)	ca. [N]	[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	35 (30)*	110	14000
100	100	0,46	12	0,6	0,2	120	1200	35 (30)*	180	13000
170	170	0,90	19	0,8	0,2	100	1000	65 (50)*	150	11000
270	270	2,2	31	0,8	0,2	95	1350	115 (90)*	140	9500
400	400	2,4	45	0,7	0,2	135	1500	115 (90)*	200	9500
600	600	5,8	67	0,7	0,2	145	3000	180 (140)*	220	8000

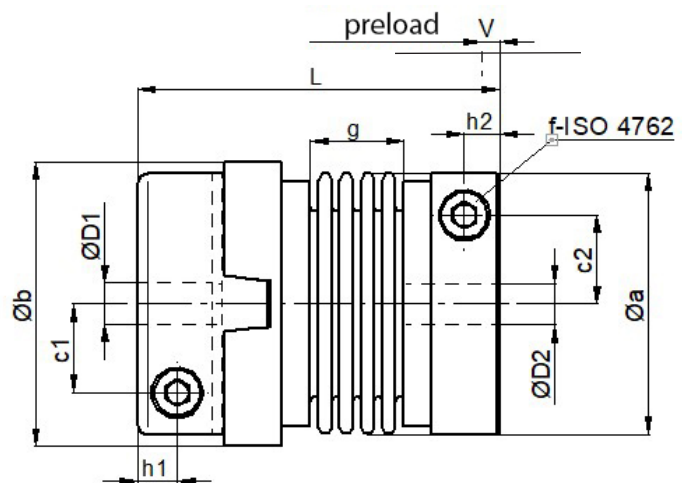
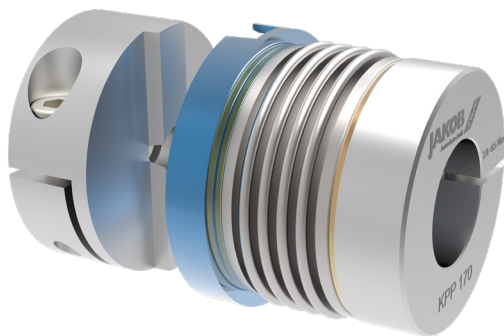
(*) note: reduced tightening torque for bigger hub bore diameter - see also Ø D 1/2max!
temperature range: -40°C up to +200°C

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	13-28 (34)*	13-28 (35)*
100	71	75	25/25	M 8	23,5	8,5/9	1-1,5	86	0,66	14-34 (38)*	14-34 (38)*
170	82	87	28,5/28,5	M 10	28	11/11,5	1-1,5	99,5	0,95	18-35 (43)*	18-35 (43)*
270	101	106	35/35	M 12	29	12/15	1-1,5	106,5	1,6	25-45 (55)*	25-45 (55)*
400	101	106	35/35	M 12	33	12/13	1-1,5	110,5	1,7	28-45 (55)*	28-45 (55)*
600	122	126	43,5/42	M 14	36	13,5/16	1-1,5	122,5	2,7	32-55 (70)*	32-55 (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

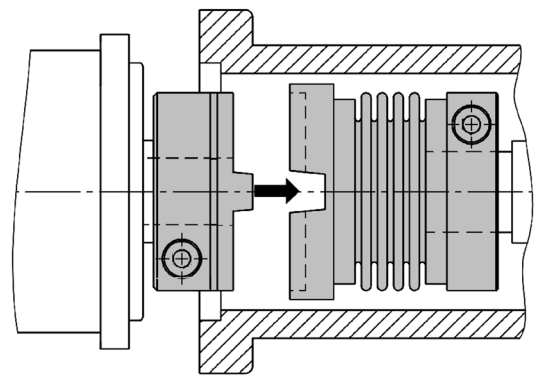
General:

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 facilitated 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.

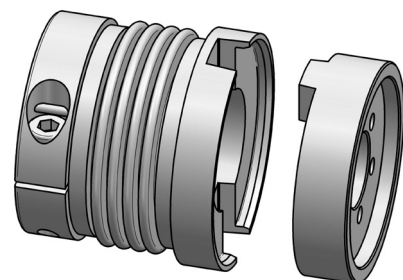
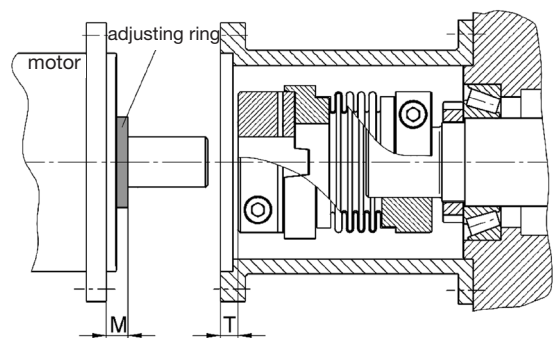
Function:

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 example: KPP-flange type for direct gear extension

Metal Bellows Coupling 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]	moment of inertia [10 ⁻³ kgm ²]	torsional stiffness [Nm/arcmin]			max. shaft misalignment [mm]						axial spring rate [N/mm]			lateral spring rate [N/mm]			nmax. [µm]
			2W	4W	6W	axial±			lateral			2W	4W	6W	2W	4W	6W	
						2W	4W	6W	2W	4W	6W							
40	40	0,18	16	9	6	0,3	0,6	0,8	0,1	0,2	0,3	130	70	50	2500	490	190	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	260	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	17	0,4	0,7	1	0,1	0,2	0,3	170	95	70	5000	1000	470	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	280	156	105	0,4	0,8	1	0,1	0,2	0,3	380	210	140	18000	3050	1000	10000
1300	1300	24	400	225	170	0,4	0,7	1	0,1	0,2	0,3	310	160	120	13000	2100	920	8500
2000	2000	40	400	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

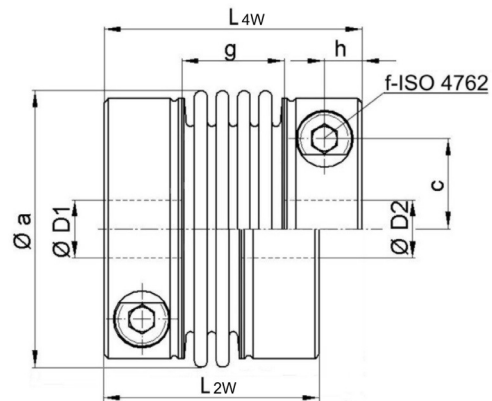
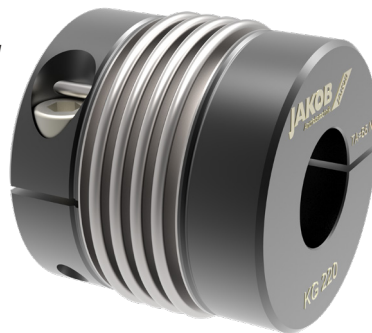
material:

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 ~[kg]	Ø D1/2	
				2W	4W	6W		2W	4W	6W		min	max
40	56	18	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	M10-65 Nm	18	28	41	11,5	63	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	M16-290 Nm	24	40	56	17,5	95	111	127	8,5	50	90
2000	157	58	M20-450 Nm	24	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 Coupling 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

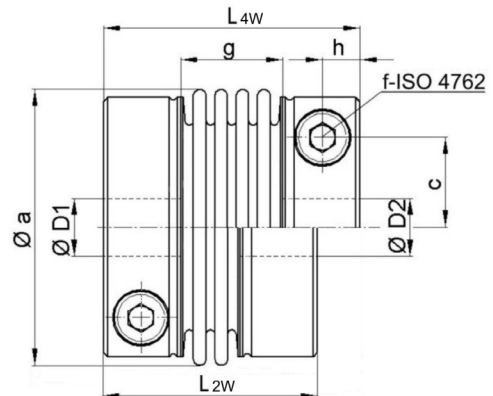
technical data:

KG-VA size	T _N [Nm]	moment of inertia [10 ⁻³ kgm ²]	torsional stiffness [Nm/arcmin]			max. shaft misalignment [mm]						axiale spring rate [N/mm]			lateral spring rate [N/mm]			nmax. [upm]
			2W	4W	6W	axial±			lateral			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
- optional: ISO 4762 / 12.9



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 ~[kg]	Ø D1/2	
				2W	4W	6W		2W	4W	6W		min	max
30	56	18,5	M6-9(14)	14	23	34	7,5	46	55	66	0,5	14(10)	28
60	66	22,5	M8-24(35)	16	24	35	9	53	61	72	0,9	16(11)	35
100	71	25	M8-24(35)	15	25	36	9	52	62	73	1,1	24(17)	40
180	82	27,5	M10-45(65)	18	28	41	11,5	63	73	86	1,5	28(20)	42
280	101	32	M12-80(115)	19	30	49	12,5	71	82	101	2,4	30(22)	50
500	122	39,5	M14-110(180)	22	37	52	15	82	97	112	3,8	42(28)	62
1000	157	54	M16-180(280)	23	40	56	17,5	94	111	127	8,5	54(42)	90

- 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)
- optional: coated screws of property class 12.9 for higher clamping forces or torques see values in brackets
- alternative lengths or hub versions available on request

order example: **KG-VA 180 / 4W**
KG-VA 30 / 2W

D1 = 32 ^{G7}
D1 = 16 ^{G7}

D2 = 35 ^{G7}
D2 = 19 ^{G7}

- **stainless steel screws**
- **screws - 12.9 - coated**

Metal Bellows Coupling 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 spring rate [N/mm]			lateral spring rate [N/mm]			n _{max} [upm]
			2W	4W	6W	axial±			lateral			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

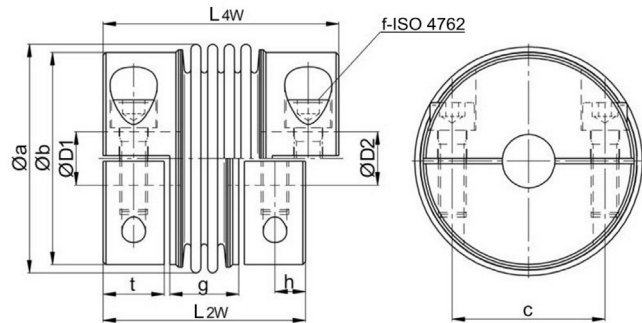
maximum temperature range: -40°C up to +350°C

material:

bellows: stainless steel 1.4571

hubs: steel St 52

screws: ISO 4762 / 12.9



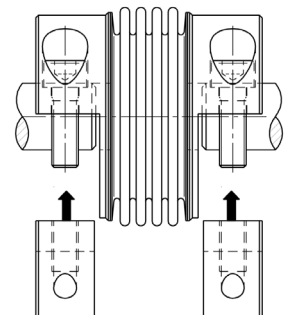
note: Standard versions with 6-corrugated metal bellows 6W, 4-corrugated metal bellows 4W or with 2-corrugated metal bellows 2W -> see values in brackets. Connection of bellows and hubs by micro-plasma welding process.

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

KGH	Ø a	Ø b	c	f-TA	g			h	L			t	mass ~[kg]	Ø D1/2	
					2W	4W	6W		2W	4W	6W			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 Coupling I Series KG-HS

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

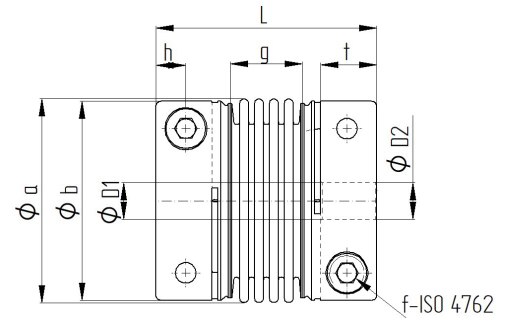
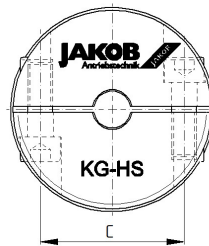
technical data:

KG-HS size	T _N [Nm]	moment of inertia [10 ⁻³ kgm ²]	torsional stiffness [Nm/arcmin]			max. shaft misalignment [mm]			axial spring rate [N/mm]			lateral spring rate [N/mm]			n _{max} [upm]			
			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	95.000
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	78.000
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	40.000
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	35.000
220	220	1,7	50	28	17	0,4	0,7	1	0,1	0,2	0,3	170	95	70	5000	1000	470	27.000
400	400	3,3	93	74	47	0,4	0,7	1	0,1	0,2	0,3	170	130	95	7000	1500	500	23.000
1000	1000	11	280	156	105	0,4	0,8	1	0,1	0,2	0,3	380	210	146	18000	3050	1000	17.000

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. [kg]	Ø D1/2	
					2W	4W	6W	2W	4W	6W				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	16	45
400	101	92	65	M12 - 115 Nm	19	34	49	13	88	103	118	26	2,5	20	50
1000	132	123	92	M14 - 185 Nm	22	38	54	15	96	112	128	28	5,5	32	75

Øb: Projecting edge - screw head

Note: We recommend additional balancing from an operating speed of around 0.3 x n_{max}. 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 Coupling 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 spring rate [N/mm]	lateral spring rate [N/mm]	tightening torque screws "f" [Nm] (*)	nmax. [upm]
				axial±	lateral				
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
2500	2500	103	450	1	0,3	170	1350	210	6500
4000	4000	110	700	3	1,2	480	5000	210	6500

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

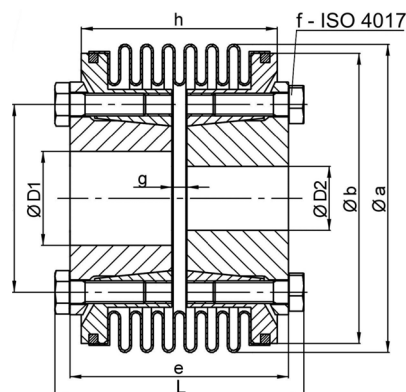
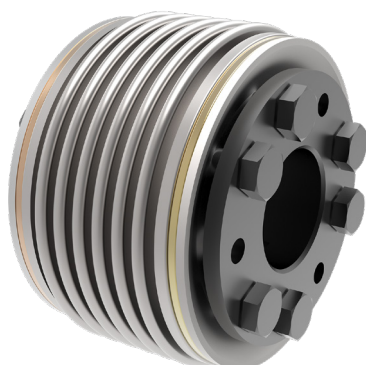
• for higher torques see series KXL

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	mass ~ [kg]	ØD1/2 min	ØD1/2 max	prebored
10	40	34	27	45	M 4	7	33	51	0,22	6	16	5
20	56	52	30	48	M 4	12	44	54	0,4	10	19	8
35	56	52	30	48	M 4	12	44	54	0,4	10	19	8
60	66	62	36	53	M 6	5	47	61	0,8	12	24	11
80	82	78	50	58	M 6	4	52	66	1,3	18	35	17
170	82	78	50	60	M 6	6	54	68	1,3	20	35	17
270	101	96	62	68	M 8	2	58	79	2,4	28	42	25
400	101	96	62	74	M 8	8	64	85	2,5	30	42	25
600	122	112	70	78	M 10	6	68	91	3,6	35	50	28
900	132	127	83	94	M 10	6	76	107	5,5	40	60	34
1300	157	140	98	96	M 12	6	78	111	7,7	40	75	38
2500	203	194	144	147	M 16	8	97	167	22	50	102	49
4000	203	173	144	223	M 16	84	174	243	23	60	102	49

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

Metal Bellows Coupling I Series KSS

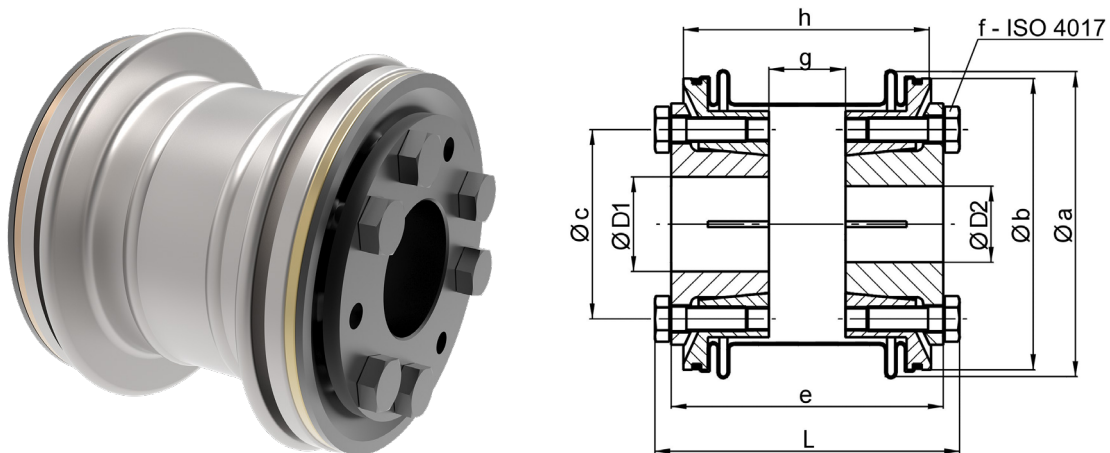
/// straight bellows // conical bush on both sides // low restoring forces // high torsional stiffness

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
2500	2500	100	700	0,4	0,5	520	590	210	6500

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

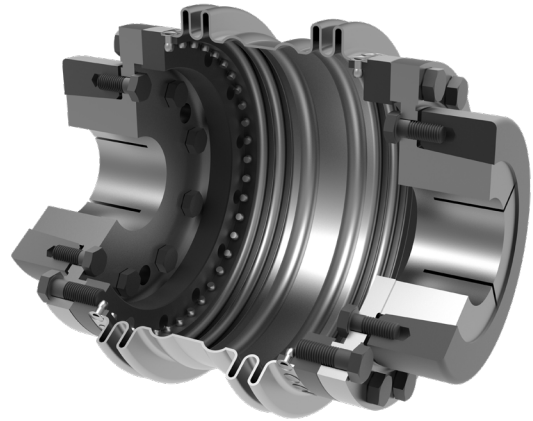
KSS	Øa	Øb	Øc	e	6 x f	g	h	L	mass ~ [kg]	ØD1/2 min	ØD1/2 max	prebored
25	56	52	30	51	M 4	15	47	57	0,4	10	19	8
50	56	52	30	51	M 4	15	47	57	0,4	12	19	8
65	66	62	36	61	M 6	13	55	69	0,7	12	24	11
100	82	78	50	70	M 6	16	64	78	1,2	18	35	17
200	82	78	50	76	M 6	22	70	84	1,25	22	35	17
300	101	96	62	91	M 8	25	81	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
2500	203	194	144	210	M 16	67	161	230	23	50	102	49

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

Metal Bellows Coupling 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

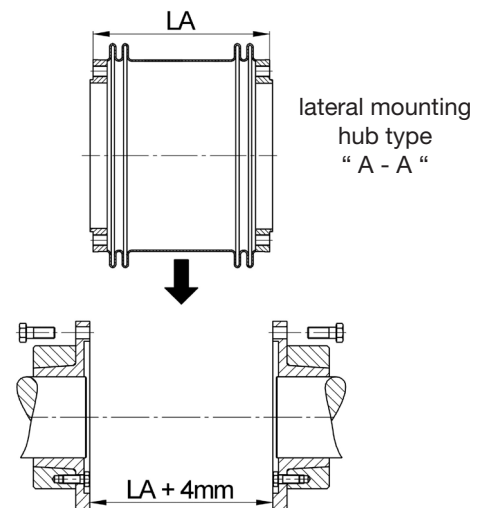
technical data:

KXL	nominal torque	maximum torque	torsional stiffness CT	spring rate		max. shaft misalignment [mm]			nmax.
				axial	angular	axial±	angular	lateral	
Size	T _N [Nm]	T _{max} [Nm]	[Nm/arcmin]	C _a [N/mm]	C _w [N/°]	d _a [mm]	d _w [°]	d _r [mm]	[upm]
4	4000	7000	620	480	35	2,5	1,4	1,0	6000
6,5	6500	11000	1100	550	55	2,5	1,3	1,1	5000
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	mass			moments of inertia		
	per hub A/B	per hub F/G	bellows	per hub A/B	per hub F/G	bellows
Size	m _A /m _B [kg]	m _F /m _G [kg]	m _{BP} [kg]	J _A /J _B [kgm ²]	J _F /J _G [kgm ²]	J _{BP} [kgm ²]
4	8	3	5,7	0,04	0,02	0,04
6,5	12	5	8,0	0,07	0,04	0,08
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



Metal Bellows Coupling I Series KXL

Dimensions [mm]:

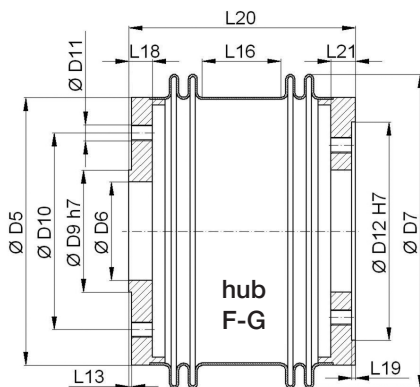
length dimensions according to DIN ISO 2768 cH

Size	4	6,5	9	12	18	32	50
D1 min	60	60	70	80	100	120	140
D2 max	90	100	108	130	150	170	220
D3	157	168	190	205	247	296	380
D5	167	198	256	273	322	406	505
D7	203	236	259	319	372	460	561
D8	152	183	193	208	250	325	416
L1	62	70	77	85	91	105	120
L2	53,5	60,5	66	74	79	93	108
L3	46	50	54	62	66	78	88
L4**	286	321	351	399	442	497	537
L5	-	20	23	23	25	27	30
L6	-	7,5	8,8	10	11,5	12,5	12,5
L7	-	43	48,8	55	62	68	72,5
L8	-	38	48,8	44	55	55	66,5
L9	-	68	75	83	89	103	118
L10**	-	217	239	271	306	337	357
L12**	-	267	293	333	372	415	447
L16*	41	50	59	80	100	110	120
LA ±2	158	177	193	225	256	283	297
L18	21	24	25	25	30	30	34
L20**	164	188	200	232	266	288	304
L21	21	24	25	25	30	30	34
f	12 x M10	12 x M12	12 x M14	14 x M16	12 x M18	12 x M20	16 x M20
i	10 x M10	8 x M12	8 x M14	9 x M14	8 x M16	10 x M16	12 x M20
DT***	4 x M10	4 x M12	8 x M14	9 x M14	8 x M16	5 x M20	6 x M20
TA-f [Nm]	65	115	180	250	350	500	500
TA-i [Nm]	65	115	180	180	250	250	400

*standard length - intermediate part

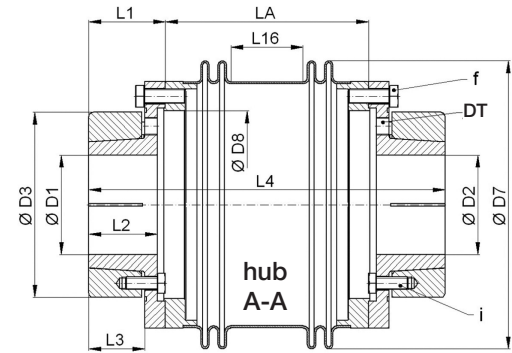
**overall length for standard length L16

***draw-off thread



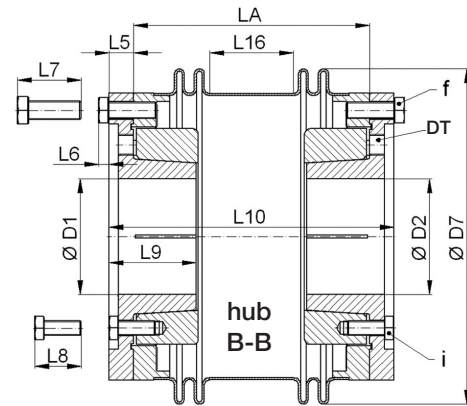
hub type F/G:

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



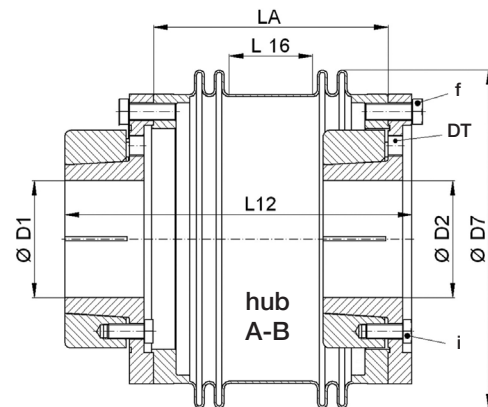
hub type A:

frictional, backlash-free conical clamping ring connection, external free lateral disassembly of the bellows part. The elongation of total length "L4" of the intermediate piece 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 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

Metall Bellows Coupling I Series KPS

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

technical data:

KPS size	T_N [Nm]	moment of inertia [10^{-3}kgm^2]	torsional stiffness [Nm/arcmin]	max. shaft misalignment (mm)		axial spring rate [N/mm]	lateral spring rate [N/mm]	tightening torque of screws [Nm] (*)	nmax. [upm]
				axial±	lateral				
2	2	0,01	0,4	0,25	0,1	32	100	2/2	38000
8	8	0,026	1,9	0,5	0,15	20	90	8/8	24000
20	20	0,13	7	0,5	0,2	70	480	14/14	17000
60	60	0,25	13	0,6	0,2	70	650	35(30)*/35	16000
170	170	0,71	27	0,8	0,2	100	1000	65(50)*/65	12000
400	400	1,9	64	0,7	0,2	135	1500	115(90)*/115	10000
600	600	4,1	107	0,7	0,2	145	3000	180(140)*/180	8000

(*) note: reduced tightening torque for bigger hub bore diameter - see also $\varnothing D 1_{\text{max}}$!

material:

bellows: stainless steel

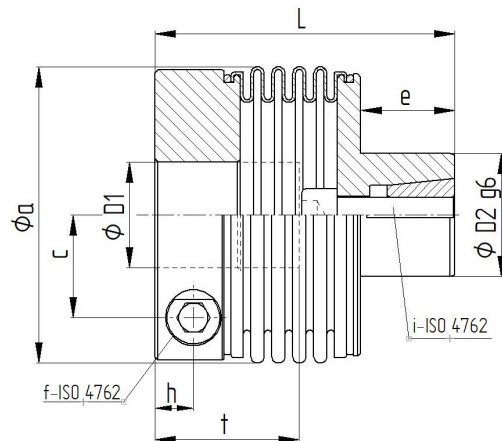
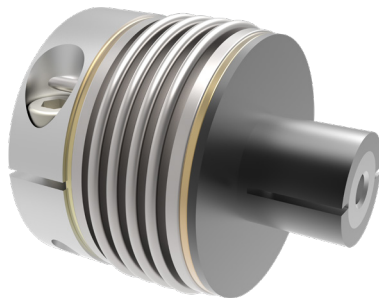
hubs: high-tensile aluminum

expanding cone: heat-treated steel

screws: ISO 4762 / 12.9

temperature range:

-40°C up to +200°C

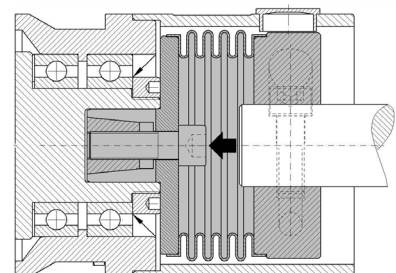


Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

KPS	$\varnothing a$	c	e	f/i	h	L	tmin	tmax	mass ~ [kg]	$\varnothing D1$		$\varnothing D2$	
										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	26	M 8	9	78	19	36	0,5	13	28 (35)	20	28
170	82	28,5	30	M 10	11,5	92	23	43	0,9	18	32 (43)	24	35
400	101	35	32	M 12	13	102	28	50	1,5	28	42 (55)	32	42
600	122	42	42	M 14	16	120,5	30	55	2,5	32	55 (68)	35	48

note: The corresponding shaft bores for the expansion cone pin $\varnothing D2 \text{ g6}$ 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 Coupling 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	nominal torque	moment of inertia	torsional stiffness (stat. $0,5 \times T_N$)	max. shaft displacement (mm)		axial spring rate	lateral spring rate	mass approx.	maximum rot. speed
Size	[Nm]	[10^{-3}kgm^2]	[Nm/arcmin]	axial \pm lateral		[N/mm]	[N/mm]	[kg]	[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

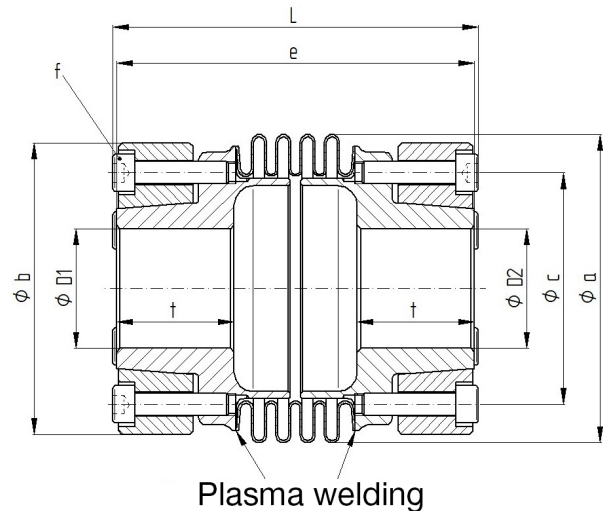
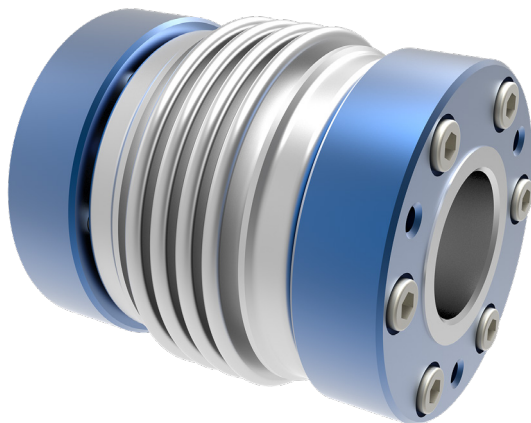
material:

bellows: stainless steel 1.4571

conical hub: stainless steel 1.4301

conical ring: high-tensile aluminum

screws: ISO 4762



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

KHS size	$\varnothing a$	$\varnothing b$	$\varnothing c$	$L \pm 1$	$e \pm 1$	f-max. torque	$t1 / t2$	$\varnothing D1/2$ min	$\varnothing D1/2$ 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	81	80	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 Coupling 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 interface	moment of inertia [10 ⁻³ kgm ²]	torsional stiffness [Nm/arcmin]			max. shaft misalignment [mm]			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	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	170	0,4	0,7	1	0,1	0,2	0,3	310	160	120	4700	1900	920	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:

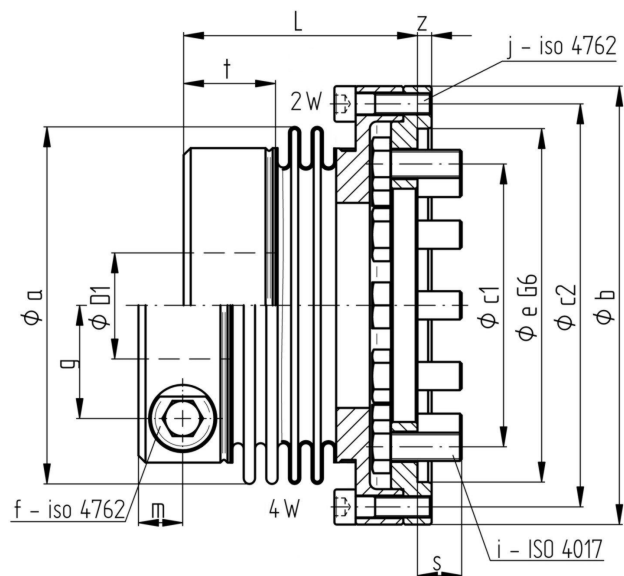
bellows: stainless steel

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
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

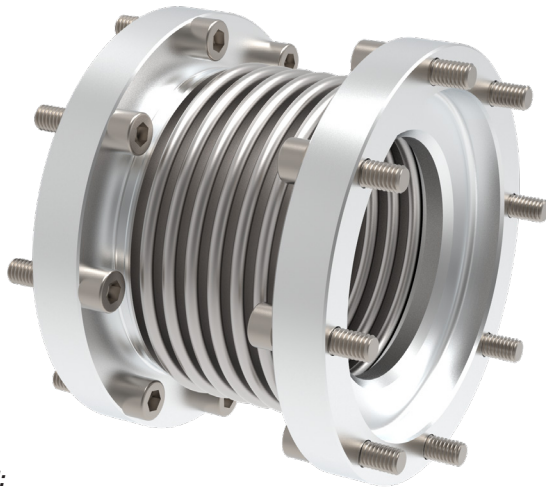
Metal Bellows Couplings I Series KE

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

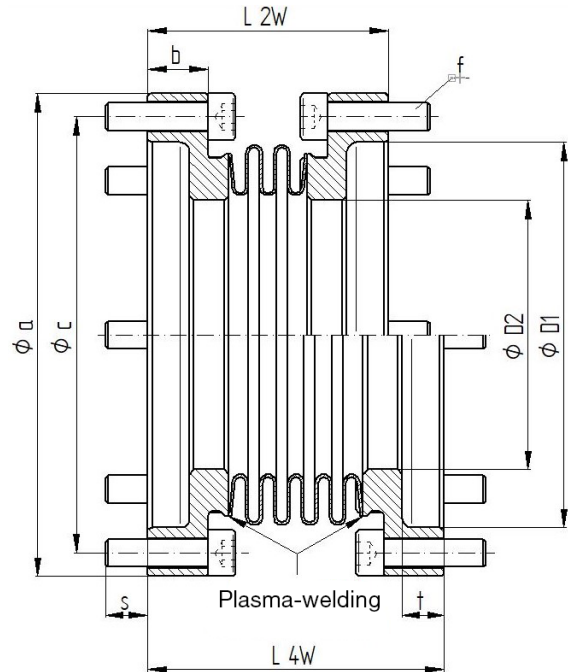
technical data:

KE size	nominal torque [Nm]	moment of inertia [10^{-3}kgm^2]	torsional stiffness [Nm/arcmin]			max. shaft displacement (mm)						axial spring rate [N/mm]			lateral spring rate [N/mm]			nmax [upm]
			2W	4W	6W	axial \pm		lateral		2W	4W	6W	2W	4W	6W	2W	4W	
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 according to DIN ISO 2768 cH

KE size	Øa	Øb	Øc	L ± 1			f	max. torque [Nm]	s	t	mass ~ [kg]	ØD1 (G7)	ØD2 (G7)
				2W	4W	6W							
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

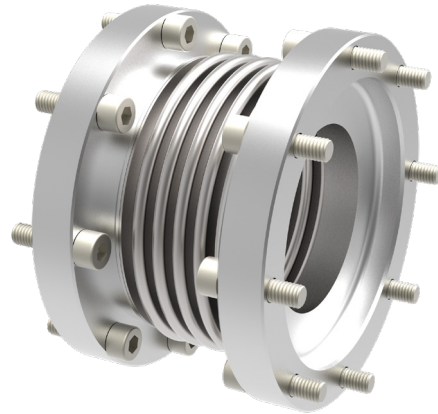
note: Special flange designs with customer-specific dimensions are possible on request.

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

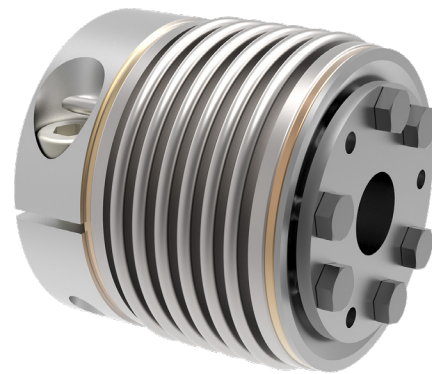
Based on series KE with flange hubs

- ✓ screw connection - external or internal
- ✓ customized version on request
- ✓ variable dimension / all metal bellow versions possible



Combination KM/KSD

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



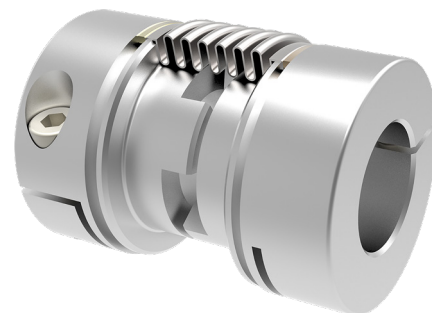
Form-fitted hub version

- ✓ 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

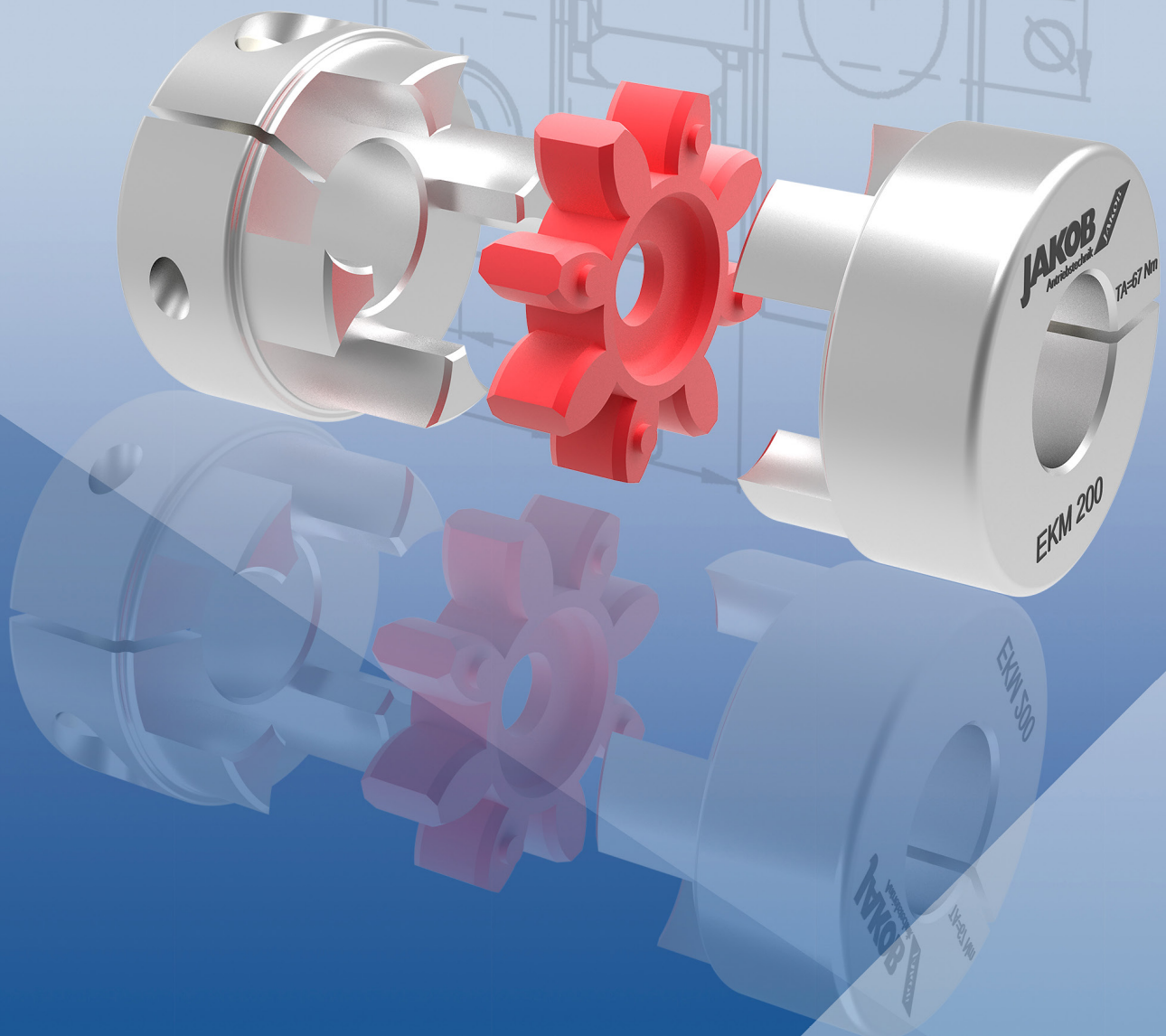


Forced rotation for bellow breaking protection

- ✓ 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



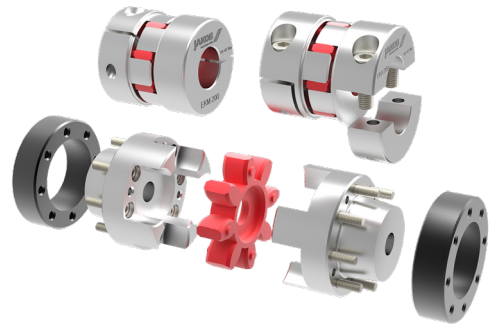
Elastomer couplings



Elastomer Couplings | 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:

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

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 .

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

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	+50°C	+70°C	+90°C	+110°C
factor f_T	1	1,3	1,6	1,8	2

Elastomer Couplings | General

Torsional stiffness factor f_D :

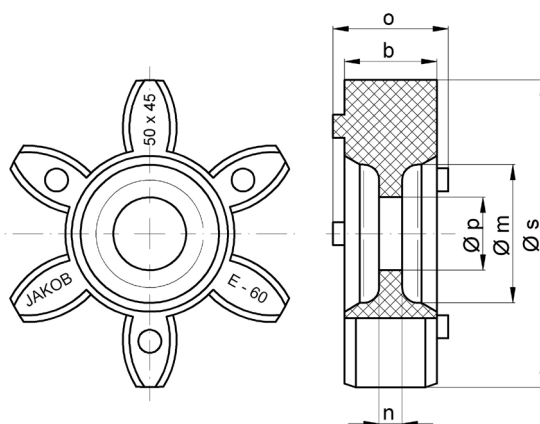
If an exact, accurate transfer of the torque is required, as for instance with servo drives or measuring systems, a high torsional stiffness is absolutely necessary. Here the required drive torque should be multiplied with a operating factor of at least 3 when selecting the size, or a torsionally stiff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

Operating factor f_B :

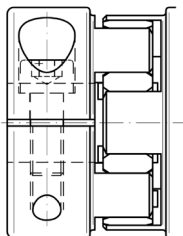
Due to operating factor f_B application specific peculiarities, such as shock loading, are taken into consideration.

Dimensions - elastomer spider [mm]:

Size	$\varnothing s$	$\varnothing m$	n	b	o	$\varnothing p^{+0,5}$
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



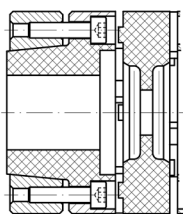
Hub types:



EKM - lateral clamping hub

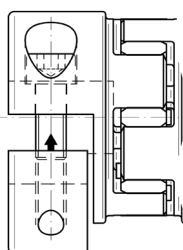
Admissible seat clearance shaft hub: **min. 0,01mm / max. 0,04mm.**

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 system).



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.

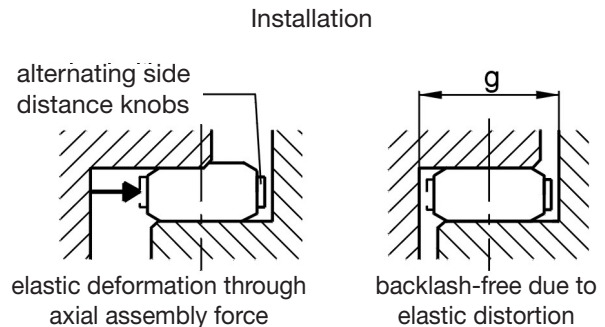
further hub types on request

Elastomer Couplings I Installation Instructions

Installation:

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. $3 \times T_N$) 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 $\varnothing m - 2\text{mm}$
- ✓ For smaller shaft diameters, the conical hub of ESM-couplings is slotted additionally.

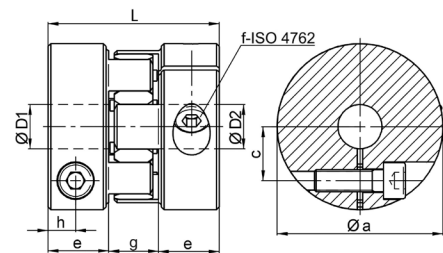
Elastomer Coupling I Series EKM

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	hubs Ø D 1/2	n _{max}
size	[Nm]	[shore]	[10 ⁻³ kgm ²]	[Nm/arcmin]	axial ±	lateral	[N/mm]	prebored	[upm]
8	8	98 Sh-A	0,01	0,09	0,5	0,10	600	Ø 5	29000
15	15	98 Sh-A	0,03	0,24	0,5	0,10	2100	Ø 6,1	23000
20	20	72 Sh-D	0,03	0,46	0,5	0,10	2900	Ø 6,1	23000
30	30	98 Sh-A	0,09	0,7	0,5	0,10	2500	Ø 8,5	19000
45	45	72 Sh-D	0,09	1,1	0,5	0,10	3600	Ø 8,5	19000
60	60	98 Sh-A	0,18	1,0	0,5	0,10	2600	Ø 12	17000
90	90	72 Sh-D	0,18	2,0	0,5	0,10	3700	Ø 12	17000
150	150	98 Sh-A	0,38	1,2	1	0,10	3300	Ø 15	15000
200	200	72 Sh-D	0,38	2,3	1	0,07	4600	Ø 15	15000
300	300	98 Sh-A	1,0	3,6	1	0,12	4500	Ø 18	12000
400	400	72 Sh-D	1,0	7,0	1	0,10	6500	Ø 18	12000
500	500	98 Sh-A	2,2	4,5	1	0,15	5900	Ø 20	9500
700	700	98 Sh-A	5,2	8,0	1	0,15	7000	Ø 24	8000
1000	1000	72 Sh-D	5,2	12	1	0,10	9600	Ø 24	8000
2000	2000	98 Sh-A	50	21	1	0,15	9000	Ø 30	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-TA	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	8	15	-
15	40	13	17	16	8	50	M 5 - 8 Nm	0,12	8	20	-
20	40	13	17	16	8	50	M 5 - 8 Nm	0,12	10	20	-
30	50	16,5	20	18	9	58	M 6 - 14 Nm	0,21	10	25	Ø 30
45	50	16,5	20	18	9	58	M 6 - 14 Nm	0,21	15	25	Ø 30
60	60	19,5	22	18	10	62	M 8 - 35 Nm	0,32	13	28	Ø 32
90	60	19,5	22	18	10	62	M 8 - 35 Nm	0,32	16	28	Ø 32
150	70	23	26,5	20	12	73	M 10 - 65 (50)* Nm	0,52	18	27 (32)*	Ø 38
200	70	23	26,5	20	12	73	M 10 - 65 (50)* Nm	0,52	20	27 (32)*	Ø 38
300	85	29	31	24	14	86	M 12 - 115 (90)* Nm	0,9	20	34 (40)*	Ø 48
400	85	29	31	24	14	86	M 12 - 115 (90)* Nm	0,9	24	34 (40)*	Ø 48
500	100	36	33	28	16	94	M 12 - 115 (90)* Nm	1,5	28	48 (56)*	-
700	120	44	38	33	18	109	M 14 - 180 (140)* Nm	2,5	32	60 (70)*	-
1000	120	44	38	33	18	109	M 14 - 180 (140)* Nm	2,5	42	60 (70)*	-
2000	160	55,5	42	40	21	124	M 16 - 290 Nm	14	50	90	-

note:

(*) reduced tightening torque for bigger hub bore diameter - see also Ø D 1/2max f!
 (**) 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

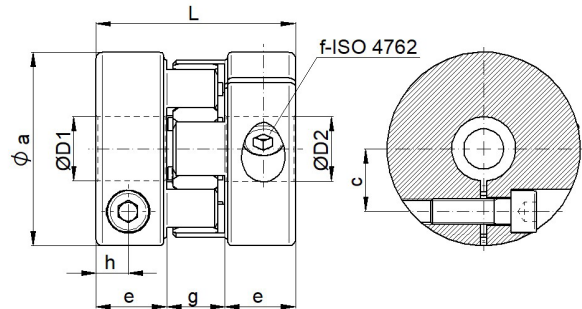
stainless steel

technical data:

EKM-VA size	nominal torque [Nm]	hardness [shore]	moment of inertia [10^{-3}kgm^2]	torsional stiffness (stat. $0,5 \times T_N$) [Nm/arcmin]	max. shaft misalignment (mm)		lateral spring rate [N/mm]	max. speed [Upm]	mass ca. [kg]
					axial \pm	lateral			
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
140	140	72 Sh-D	1	2,3	1	0,07	4600	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



- Standard versions with stainless steel screws A4-80 - note the reduced tightening torque!
- Optionally with coated screws of strength class 12.9 for higher clamping forces or torques

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	7	16	5
12	41	13	17	16	8	50	M5 - 5 Nm	10	20	6,1
16	41	13	17	16	8	50	M5 - 5 Nm	13	20	6,1
50	64	20,5	22	18	10	62	M8 - 24 Nm	14	30	12
70	64	20,5	22	18	10	62	M8 - 24 Nm	19	30	12
100	73	23	26,5	20	12	73	M10 - 45 Nm	18	32	15
140	73	23	26,5	20	12	73	M10 - 45 Nm	24	32	15
220	87	29	31	24	14	86	M12 - 80 Nm	25	42	18
350	107	36	35	28	17	98	M14 - 110 Nm	30	55	20
480	121	44	38	33	18	109	M14 - 110 Nm	38	70	24
650	121	44	38	33	18	109	M14 - 110 Nm	52	70	24

note: Øa: interfering edge - screw head

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

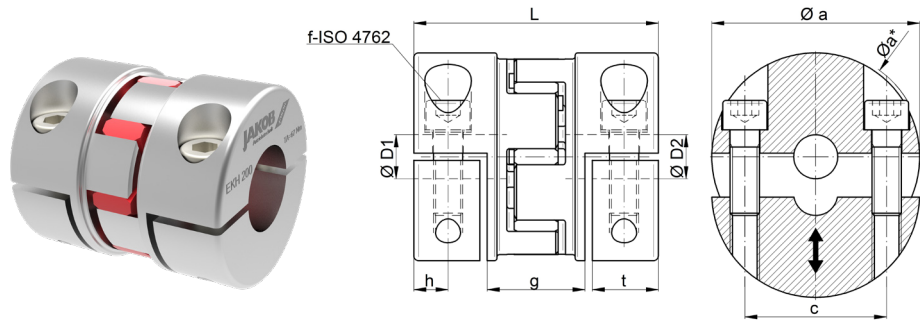
Elastomer Coupling I Series EKH

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

technical data:

EKH	T _N	hardness	moment of inertia	torsional stiffness (stat. 0,5 x T _N)	max. shaft misalignment (mm)		lateral spring rate	tightening torque screw	n _{max}
size	[Nm]	[shore]	[10 ⁻³ kgm ²]	[Nm/arcmin]	axial ±	lateral	[N/mm]	"f" [Nm]	[upm]
15	15	98 Sh-A	0,03	0,24	0,5	0,10	2100	8	19000
20	20	72 Sh-D	0,03	0,46	0,5	0,07	2900	8	19000
30	30	98 Sh-A	0,09	0,7	0,5	0,10	2500	14	15000
45	45	72 Sh-D	0,09	1,1	0,5	0,07	3600	14	15000
60	60	98 Sh-A	0,2	1,0	0,5	0,10	2600	35	14000
90	90	72 Sh-D	0,2	2,0	0,5	0,07	3700	35	14000
150	150	98 Sh-A	0,4	1,2	1	0,10	3300	65	12000
200	200	72 Sh-D	0,4	2,3	1	0,07	4600	65	12000
300	300	98 Sh-A	1,0	3,6	1	0,12	4500	115	10000
400	400	72 Sh-D	1,0	7,0	1	0,10	6500	115	10000
700	700	98 Sh-A	6,0	8,0	1	0,15	7000	180	6500
1000	1000	72 Sh-D	6,0	12	1	0,10	9600	180	6500
2000	2000	98 Sh-A	62	21	1	0,15	9000	290	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	mass ~ [kg]	Ø D 1/2 min	Ø D 1/2 max	Ø D 1/2 prebored
15	40	42	27	26	8,5	16	62	M5	0,17	8	20	8
20	40	42	27	26	8,5	16	62	M5	0,17	10	20	8
30	50	52	34	30	10	18	72	M6	0,3	10	26	10
45	50	52	34	30	10	18	72	M6	0,3	15	26	10
60	60	63	41	30	11,5	22	78	M8	0,5	13	30	12
90	60	63	41	30	11,5	22	78	M8	0,5	16	30	12
150	70	76	48	32	14	26	89	M10	0,75	18	35	16
200	70	76	48	32	14	26	89	M10	0,75	20	35	16
300	85	91	58	40	15	28	102	M12	1,3	20	42	19
400	85	91	58	40	15	28	102	M12	1,3	24	42	19
700	120	125	90	53	18	34	127	M14	3,2	32	70	24
1000	120	125	90	53	18	34	127	M14	3,2	42	70	24
2000	160	165	122	64	24	43	156	M16	18,5	48	100	32

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

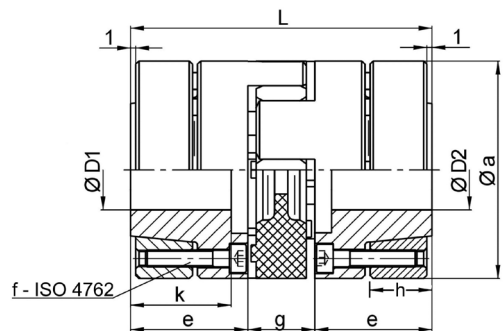
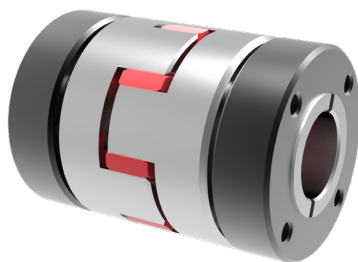
- /// with conical hub and clamping ring // plug-in // backlash-free
- /// rotational symmetry // high speeds

technical data:

ESM-A size	nominal torque [Nm]	hardness [shore]	moment of inertia [10^{-3}kgm^2]	torsional stiffness (stat. $0,5 \times T_N$) [Nm/arcmin]	max. shaft misalignment [mm]		lateral spring rate [N/mm]	tightening torque of screws "f" [Nm]	nmax [upm]
					axial \pm	lateral			
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	66	186	20,4	35	85	34

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

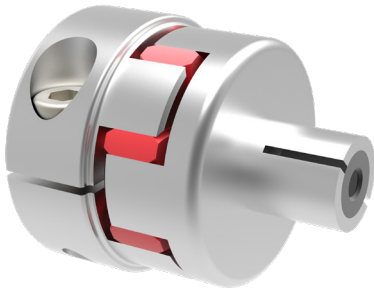
Elastomer Coupling I Series EKS

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

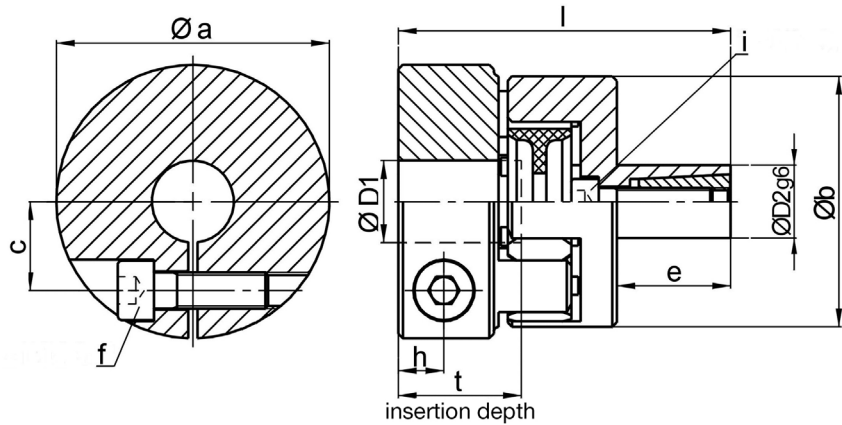
technical data:

EKS size	nominal torque [Nm]	moment of inertia [10^{-3}kgm^2]	torsional stiffness (stat. $0,5 \times T_N$) [Nm/arcmin]	max. shaft misalignment (mm)		lateral spring rate [N/mm]	tightening torque of screws "f" [Nm]		nmax [upm]
				axial \pm	lateral		Exp. hub i:	Clamp. hub f:	
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	65	15000
200	200	0,9	2,0	1	0,12	4500	65	115	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	180	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

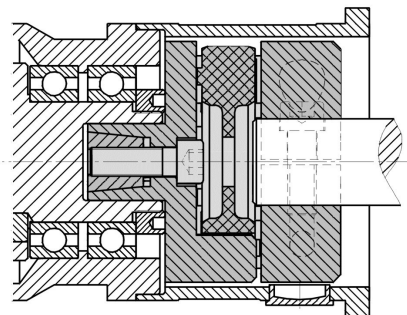


Dimensions [mm]: length dimensions according to DIN ISO 2768 cH

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	8	15	10	16
15	40	40	13	20	M 5	8	M 5	59	16	23	0,2	10	19	14	20
50	60	55	19,5	23	M 8	10	M 6	71	21	29	0,4	15	29	16	24
100	70	65	23	26	M 10	12	M 8	81,5	25	34	0,7	22	33	20	28
200	85	80	29	30	M 12	14	M 10	93	30	41	1,2	30	42	24	35
400	100	100	36	32	M 12	16	M 12	101	32	44	1,7	38	56	32	42
600	120	120	44	42	M 14	18	M 14	122	37	51	3	40	70	35	48

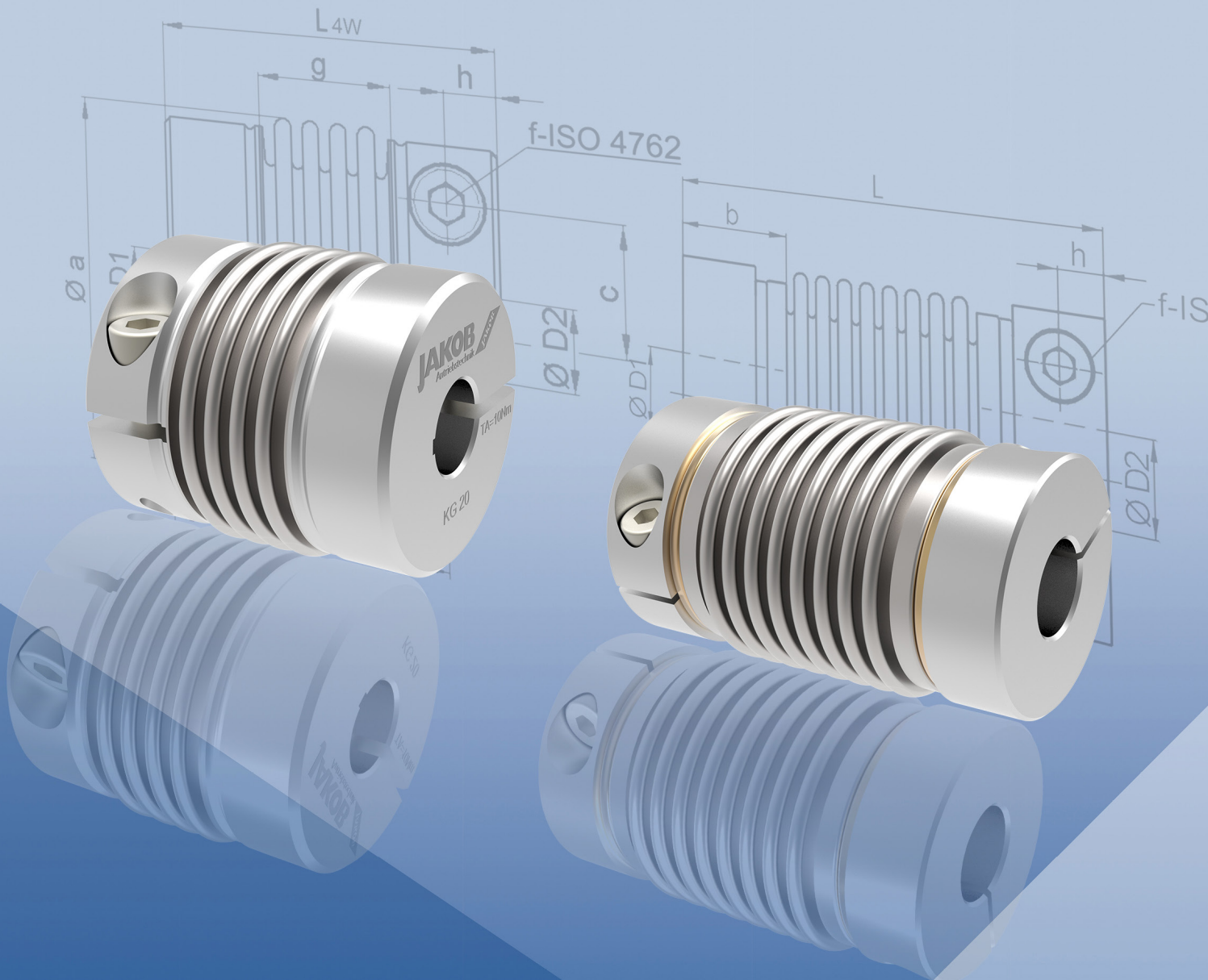
note: The corresponding shaft hole for the Expansion cone spigot $\gg \text{ØD2} \ll$ with manufacturing tolerance H7.

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 couplings



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)		spring rate [N/mm]		mass approx. [kg]	tightening torque of screws [Nm]
				axial ±	lateral	axial ±	lateral		
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

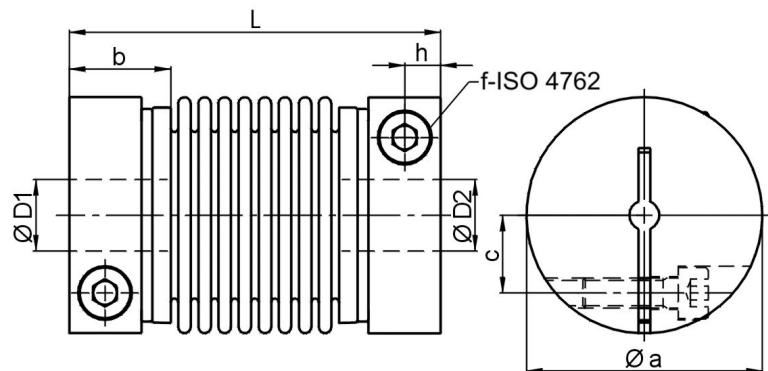
material:

bellows: stainless steel

aluminum

hubs: high-tensile strength

screws: ISO 4762 / 12.9



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

MKM	Øa	b	c	f	h	L ±0,5	ØD1/2min	ØD1/2max
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 available 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)		spring rate [N/mm]		mass approx. [kg]	tightening torque of screws [Nm]
				axial \pm	lateral	axial \pm	lateral		
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

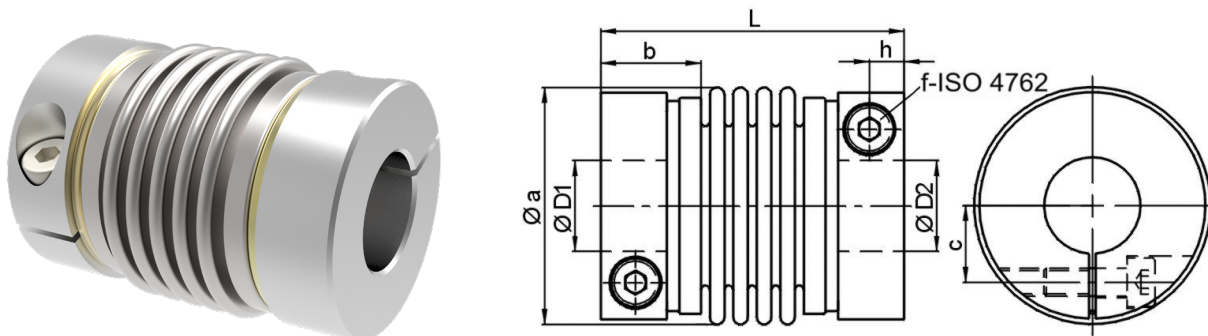
temperature range: -40°C up to +200°C

material:

hubs: high-tensile strength aluminum

bellows: stainless steel

screws: ISO 4762 / 12.9



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

MKP	$\varnothing a$	b	c	f	h	$L \pm 0,5$	$\varnothing D1/2min$	$\varnothing D1/2max$
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 available with EASY-clamp

stock bores D1/D2 (G7)

MKP	$\varnothing 4$	$\varnothing 5$	$\varnothing 6$	$\varnothing 6,35$	$\varnothing 8$	$\varnothing 9,53$	$\varnothing 10$	$\varnothing 12$	$\varnothing 14$	$\varnothing 15$	$\varnothing 16$	$\varnothing 19$	$\varnothing 20$	$\varnothing 24$
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 = $\varnothing 8^{G7}$ D2 = 10^{G7}
 MKP 5 - L - D1 = $\varnothing 10^{G7}$ D2 = 12^{G7}
 MKP 5 - L / L - D1 = $\varnothing 12^{G7}$ D2 = 14^{G7}

Miniature Metal Bellows Coupling I Series MKA

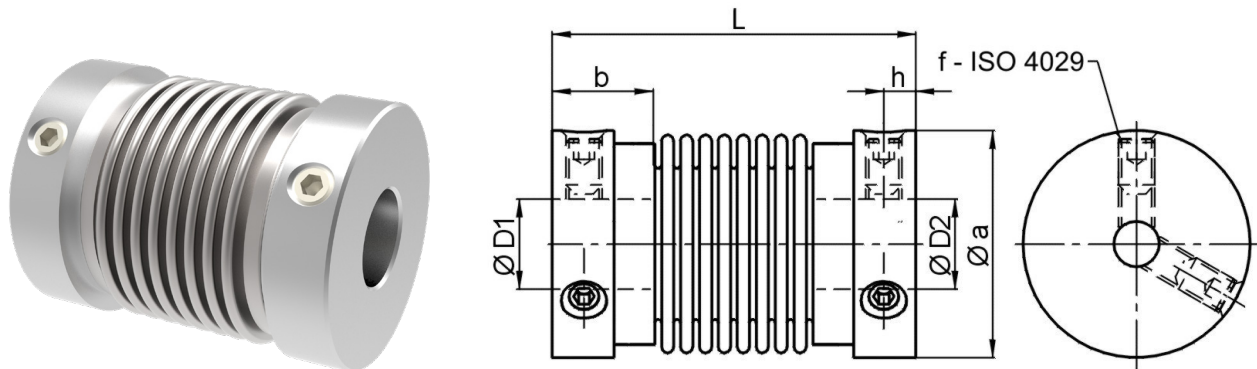
✓ cost-effective version with set screws

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)		spring rate [N/mm]		mass approx. [g]	tightening torque of screws [Nm]
					axial ±	lateral	axial	lateral		
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: hubs: high-tensile strength aluminum
bellows: stainless steel 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 [10-3kgm ²]	torsional stiffness [Nm/arcmin]			max. shaft misalignment (mm)						axial spring rate [N/mm]			lateral spring rate [N/mm]			n _{max} [Upm]
			2W	4W	6W	axial ±			lateral			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

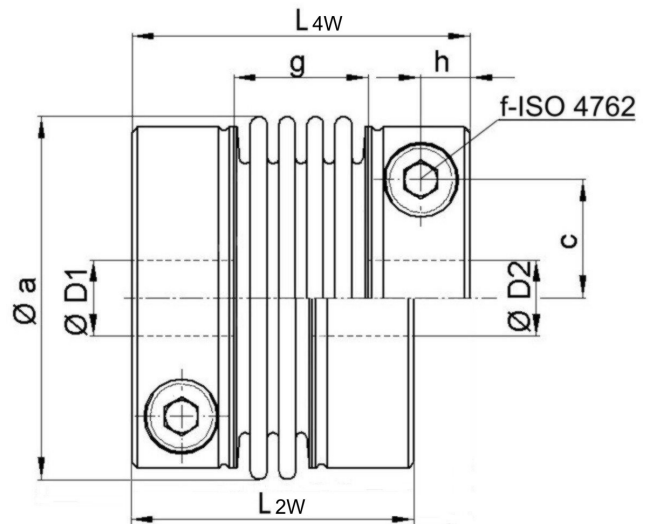
temperature range: -40°C up to +300°C

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	18
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 [kgmm ²]	torsional stiffness [Nm/arcmin]			max. shaft misalignment [mm]						axial spring rate [N/mm]			lateral spring rate [N/mm]			mass approx. [g]
			2W	4W	6W	axial ±			lateral			2W	4W	6W	2W	4W	6W	
						2W	4W	6W	2W	4W	6W							
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

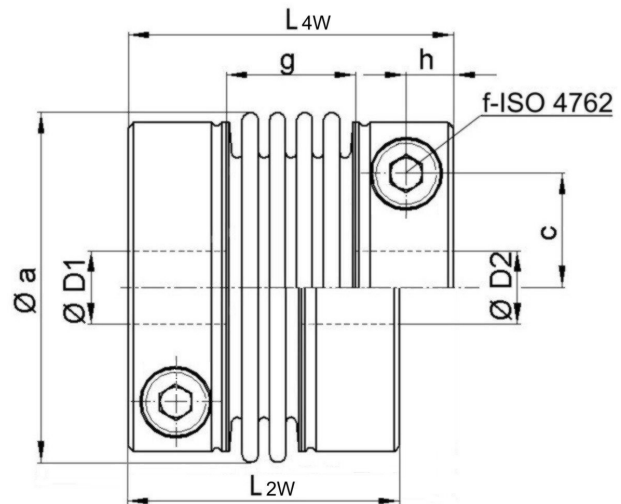
material:

bellows: stainless steel 1.4571 / A4

hubs: 1.4301 / A2

screws: ISO 4762 stainless steel / A4-80

optional: ISO 4762 / 12.9



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	Øa	c	f-TA	g			h	L			ØD1/2 min	ØD1/2 max
				2W	4W	6W		2W	4W	6W		
1,5	19	4,3	2xM2,5-1(1,5)	-	11	-	3,3	-	29	-	3	6,35
4	24	7,3	M3-1(2)	6	10	14	4,5	25	29	33	8(5)	11
8	34	10,5	M4-2,5(4)	11	16	23	5	33	38	45	9(7)	16
15	40	13	M5-5(8)	12	17	23	6	38	43	49	11(8)	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)
- optional: coated screws of property class 12.9 for higher clamping forces or torques see values in brackets
- alternative lengths or hub versions available on request

order example: MKG-VA 4 / 4W D1 = 8^{G7} D2 = 11^{G7} - stainless steel screws
MKG-VA 15 / 2W D1 = 13^{G7} D2 = 20^{G7} - screws - 12.9 - coated
MKG-VA 8 / 6W D1 = 12^{G7} D2 = 16^{G7} - stainless steel screws

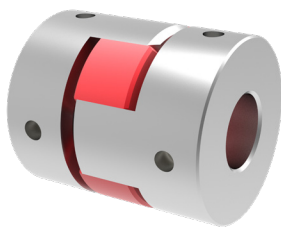
Miniature Elastomer Coupling I Series MJT/MJT-C

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

technical data:

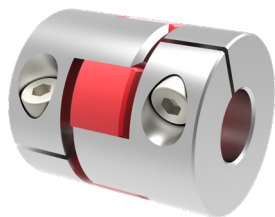
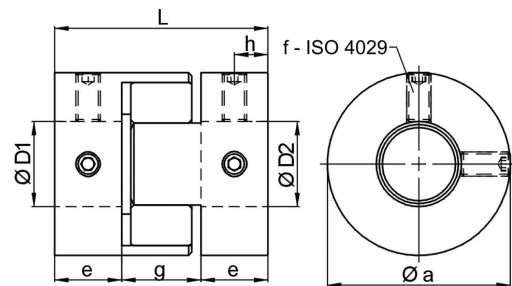
MJT/ MJT-C size	T _N [Nm]	max. speed [min ⁻¹]		moment of inertia [10 ⁻⁶ kgm ²]		torsional stiffness [10 ⁻³ Nm/arcmin]	max. shaft misalignment (mm)		mass approx. [g]	tightening torque of screws [Nm]	
		MJT	MJT-C	MJT	MJT-C		axial ±	lateral		f	i
14-B	0,7	27.000	11.000	0,21	0,16	3	0,6	0,15	7	0,7	0,5
20-B	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

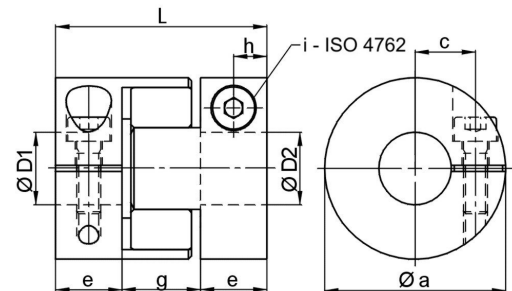


Series MJT

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}

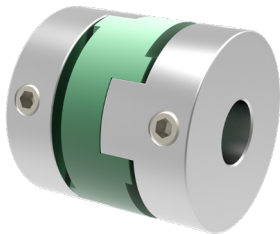
Miniature Oldham-type Coupling I Series MOH/MOH-C

- 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:

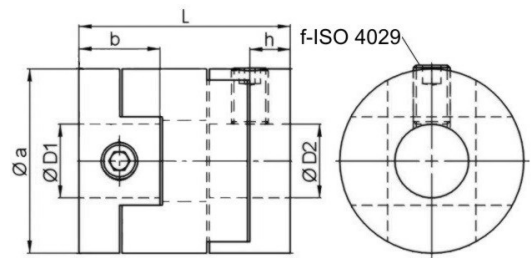
MOH/ MOH-C size	T _N [Nm]	max. speed [min ⁻¹]	moment of inertia [10 ⁻⁶ kgm ²]		torsional stiffness [10 ⁻³ Nm/arcmin]	max. misalignment		mass approx. [g]		tightening torque of screws [Nm]	
			MOH	MOH-C		lateral [mm]	angular [°]	MOH	MOH-C	f	i
16	1	8.000	0,24	0,32	19	1	2	7	10	1	1
20	1,5	7.000	0,81	0,82	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

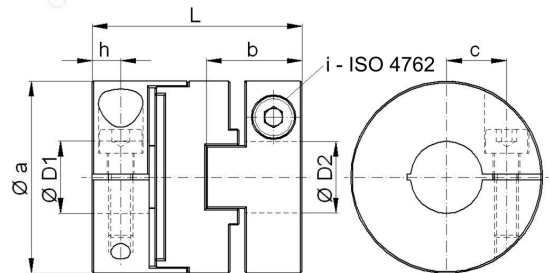


Series MOH

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		c	h		L		f	i
		MOH	MOH-C		MOH	MOH-C	MOH	MOH-C		
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)

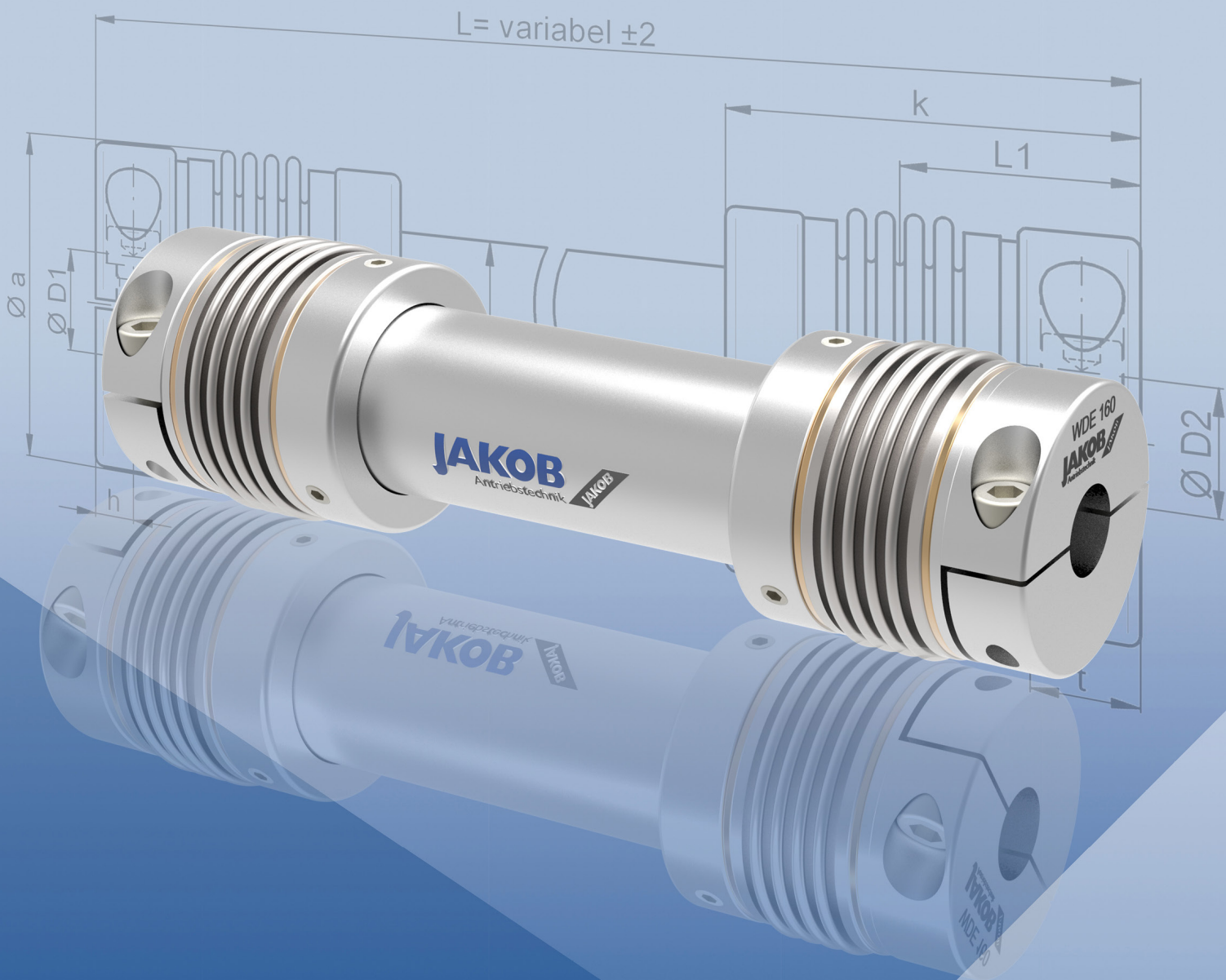
MOH/MOH-C	Ø3	Ø4	Ø5	Ø6	Ø6,35	Ø8	Ø9,53	Ø10	Ø12	Ø14	Ø15	Ø16	Ø19
16	•	•	•	•									
20		•	•	•	•	•							
25			•	•	•	•	•	•					
32				•	•	•	•	•	•	•	•		
43				•	•	•	•	•	•	•	•	•	•

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



Distance Couplings | 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 connecting 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 WD/WDS - Metal bellows

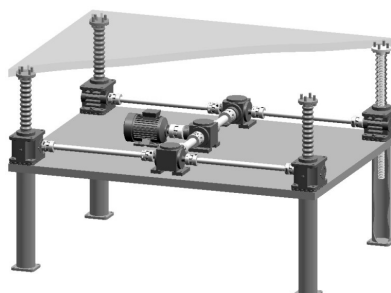
- /// WD: length L = 0,2 - 4 m | Tmax = 90°C
- /// WDS: length L = 0,2 - 6 m | Tmax = 200°C
- /// 7 sizes up to 1600 Nm
- /// integrated gimbal / cardan support
- /// big pipe diameter for max. speeds
- /// high torsional stiffness

Series WDZ - Metal bellows

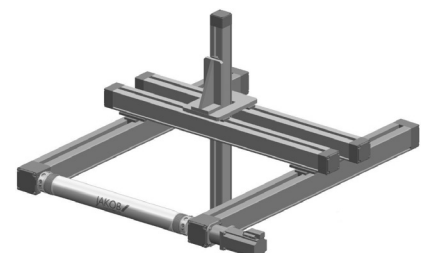
- /// lengths from 105 to 450 mm
- /// 7 sizes up to 1600 Nm
- /// T max = 200°C
- /// alternative to WD / WDS for short lengths

Series WD-VA - Metal bellows

- /// length L = 0,2 - 3 m
- /// 7 sizes up to 1200 Nm
- /// T max = 350°C
- /// stainless steel version



EKHZ - coupling for lifting table drive



WDS - coupling for multi-axis linear module

Distance Couplings I Installation

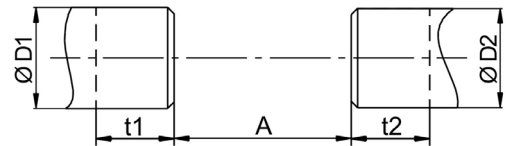
Installation:

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.

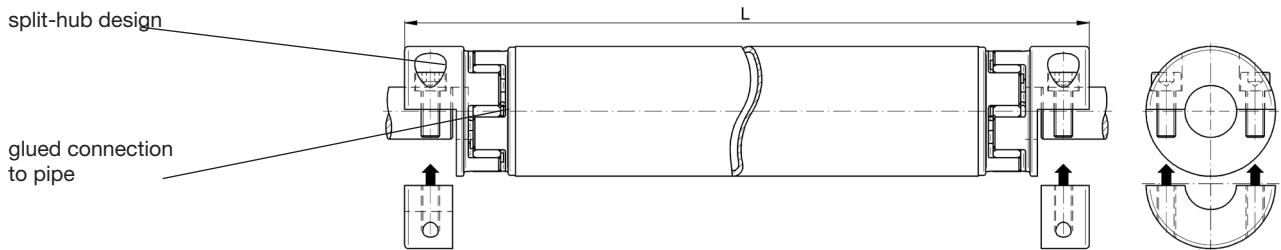
Formula for length determination:

$$L = A + t_1 + t_2 \quad [\text{mm}]$$

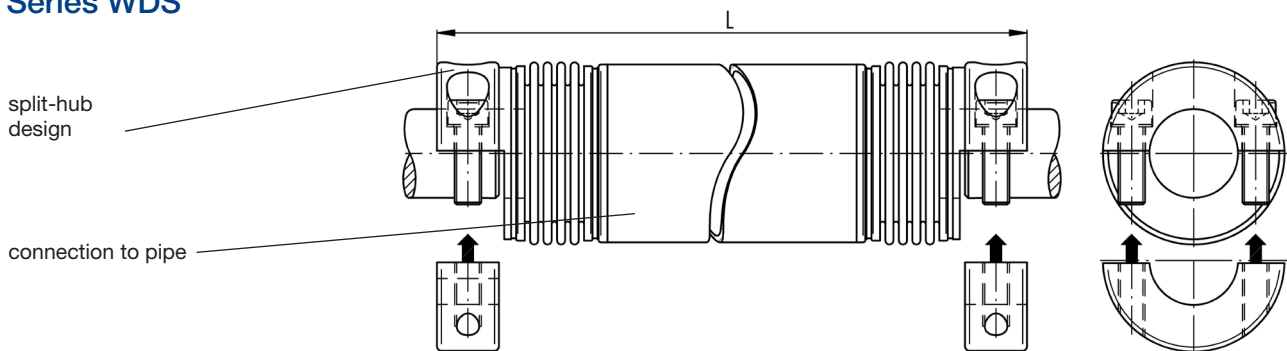
A = shaft separation ± 1
t = plug in depth ± 1
(see data sheets)



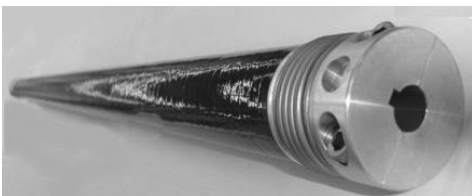
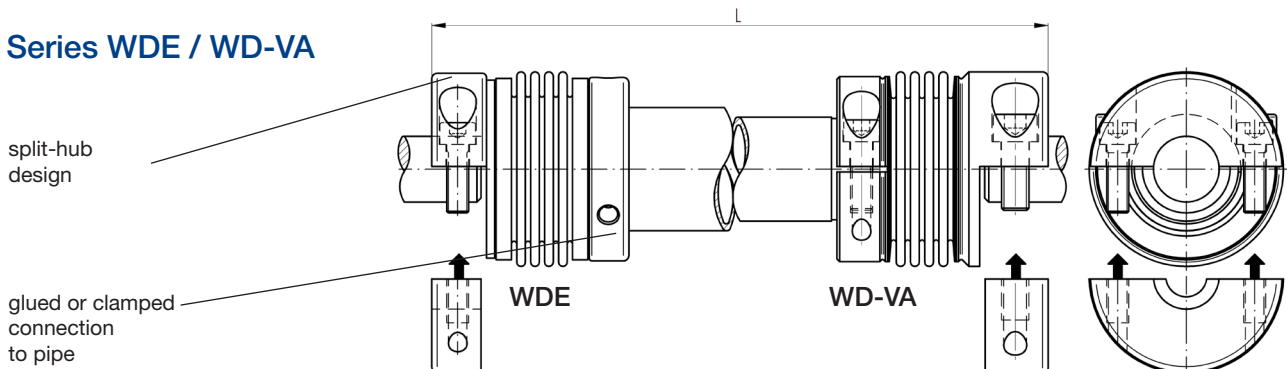
Series EKHZ



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]				moment of inertia [10 ⁻³ kgm ²]				max. speed approx. [min ⁻¹]				mass approx. [kg]			
		1m	2m	3m	4m	1m	2m	3m	4m	1m	2m	3m	4m	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

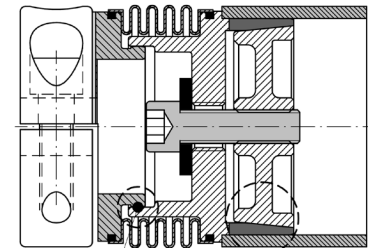
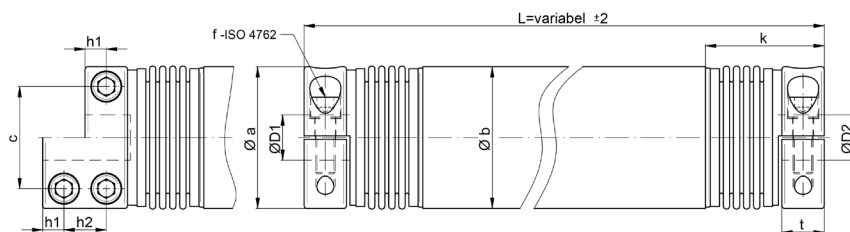
maximum temperature range: -40°C up to +200°C | series WD: -40°C up to +90°C

maximum axial shaft misalignment: $\Delta A = \pm 1,5 \text{ mm}$

maximum angular shaft misalignment : $\alpha = 1^\circ$

maximum lateral shaft misalignment: $\Delta R = \tan \alpha \cdot L_x$ with $L_x = L - (2 \cdot k) / \tan 1^\circ = 0,0174$

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



integrated gimbal
intermediate tube
support

Coupling pipe connection
WDS: Expansion cone clamping
WD: high-strength adhesive

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 Series WDB

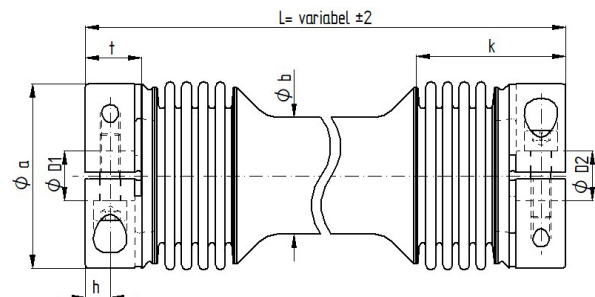
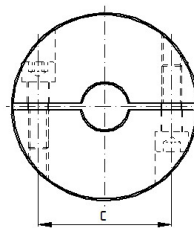
- // variable lengths from 55 to 260 mm // without additional intermediate storage
- // backlash-free, precise torque transmission // low mass moment of inertia
- // special symmetrical clamping hub with high balancing quality and for high operating speeds

technical data:

WDB	nominal torque	torsional stiffness	moment of inertia	mass. approx.	max. operating speed	max. lateral shaft misalignment [mm]		f-tightening torque*
Größe	[Nm]	[Nm/arcmin]	[10 ⁻³ kgm ²]	[kg]	[min ⁻¹]	L _{min}	L _{max}	
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: $\Delta A = \pm 1,5 \text{ mm}$ / maximum angular shaft misalignment: $\alpha = 1^\circ$

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	Øa	Øb	c	h	k ± 1	t	L		ØD1/2		Øprebored min.
size							min	max	min	max(*)	
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}

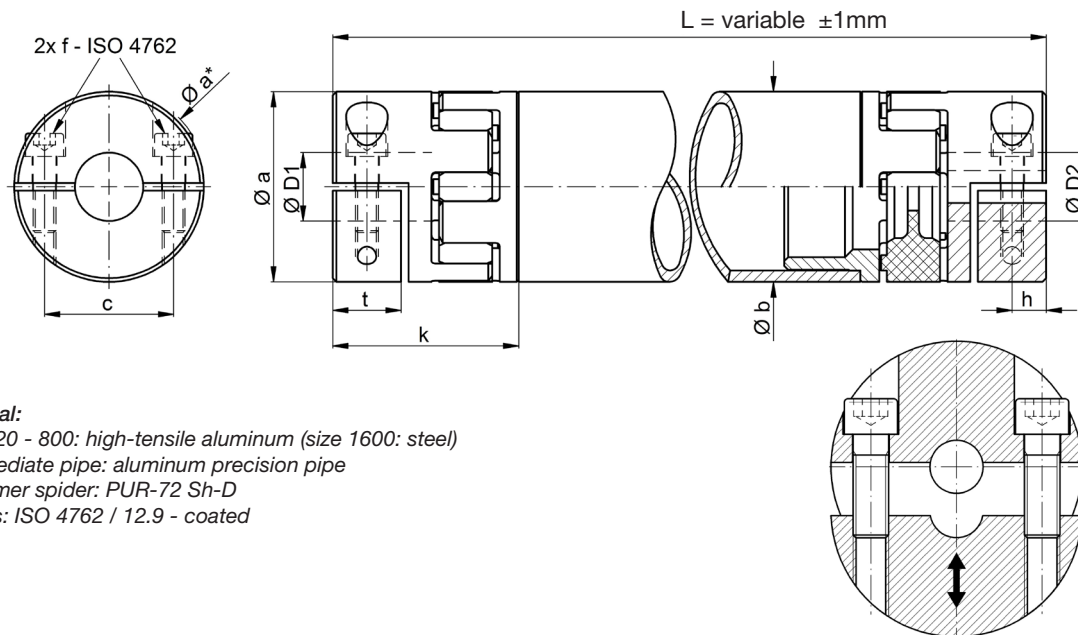
Elastomer Coupling with Intermediate Pipe I EKHZ

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

technical data:

EKHZ	T _N [Nm]	torsional stiffness (stat. at 0,5xT _N) [Nm/arcmin]				moment of inertia [10 ⁻³ kgm ²]				max. speed approx. [min ⁻¹]				mass approx. [kg]			
		0,5m	1m	2m	3m	0,5m	1m	2m	3m	0,5m	1m	2m	3m	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 Couplings with intermediate pipe | WD-VA

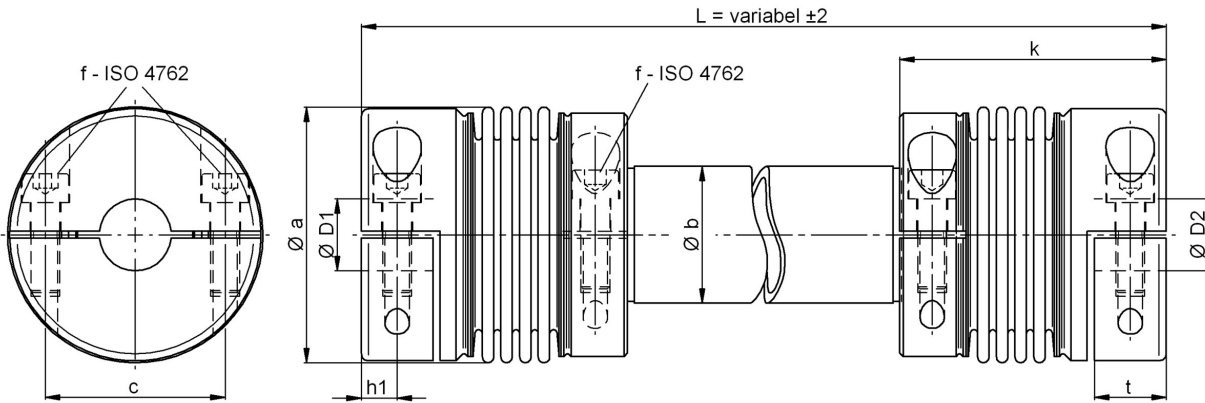
- /// stainless steel design up to 350°C
- /// backlash free, exact torque transfer
- /// variable length up to 3 m
- /// very easy to fit with splitted hub design

stainless
steel

technical data:

WD -VA size	T _N [Nm]	T _{max} [Nm]	torsional stiffness [Nm/arcmin]				moment of inertia [10 ⁻³ kgm ²]				mass [kg]				max. speed approx. [min ⁻¹]			
			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: $\Delta A = \pm 1,5 \text{ mm}$ / maximum angular shaft misalignment: $\alpha = 1^\circ$
 maximum lateral shaft misalignment: $\Delta R = \tan \alpha \times L_x$ with $L_x = L - (2 \times k) / \tan 1^\circ = 0,0174$



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.
- optional: ISO 4762 / 12.9

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 – regard reduced tightening torque!
- check torque transmission of shaft-hub-connection for shaft diameter smaller Dmin (request possible).
- optional coated screws of strength class 12.9 for higher clamping forces or torque - (see value in brackets).
- variable length up to 6m, and higher rotational speed on request

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

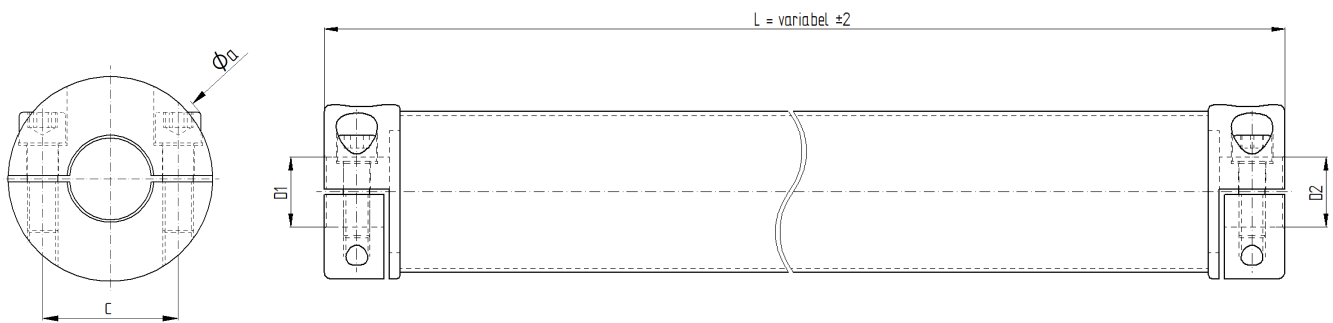
Simple-Flex distance coupling I Series SF

- // 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

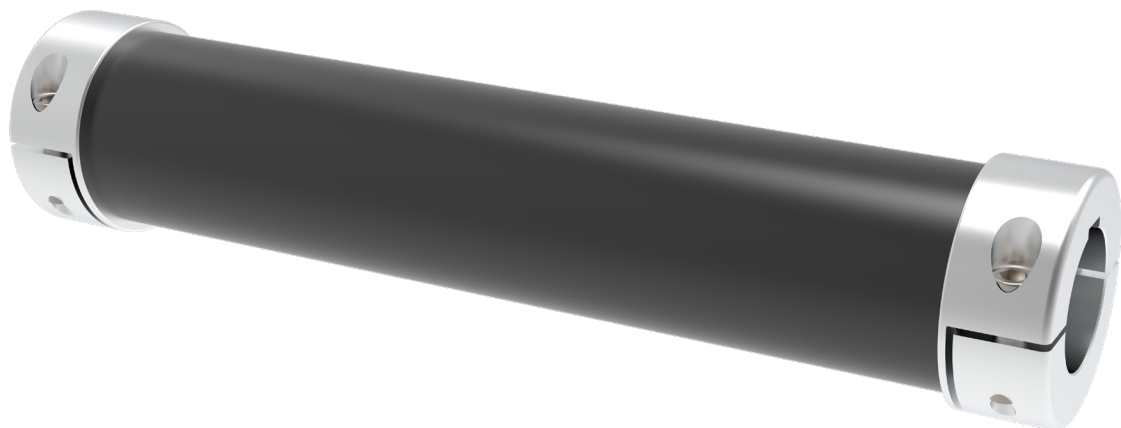
Øa: interfering edge – screw head at half-shell clamping hub



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

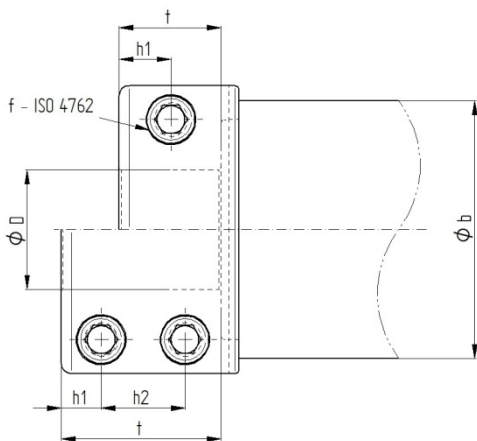
SF size	moment of inertia [10^{-3}kgm^2]						mass [kg]					
	1 m	2 m	3 m	4 m	5 m	6 m	1 m	2 m	3 m	4 m	5 m	6 m
SF 40-KF	1,3	1,5	1,7	1,8	2,0	2,2	1,7	2,1	2,5	2,9	3,3	3,7
SF 40-H	0,7	0,9	1,1	1,2	1,4	1,6	1,1	1,5	1,9	2,3	2,7	3,1
SF 70-KF	6,2	7,1	7,9	8,8	9,7	10,5	3,6	4,3	5,0	5,6	6,3	7,0
SF 70-H	4,0	4,9	5,8	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

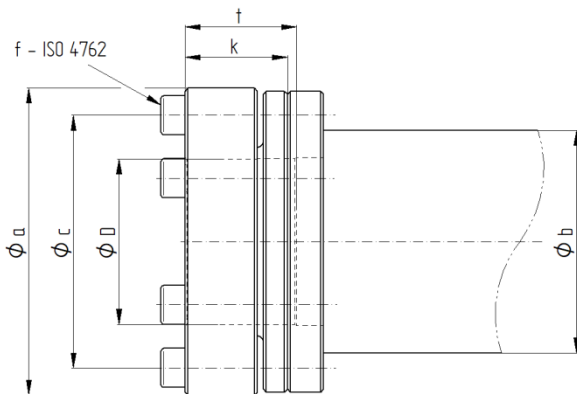
temperature range: -10°C up to +60°C

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

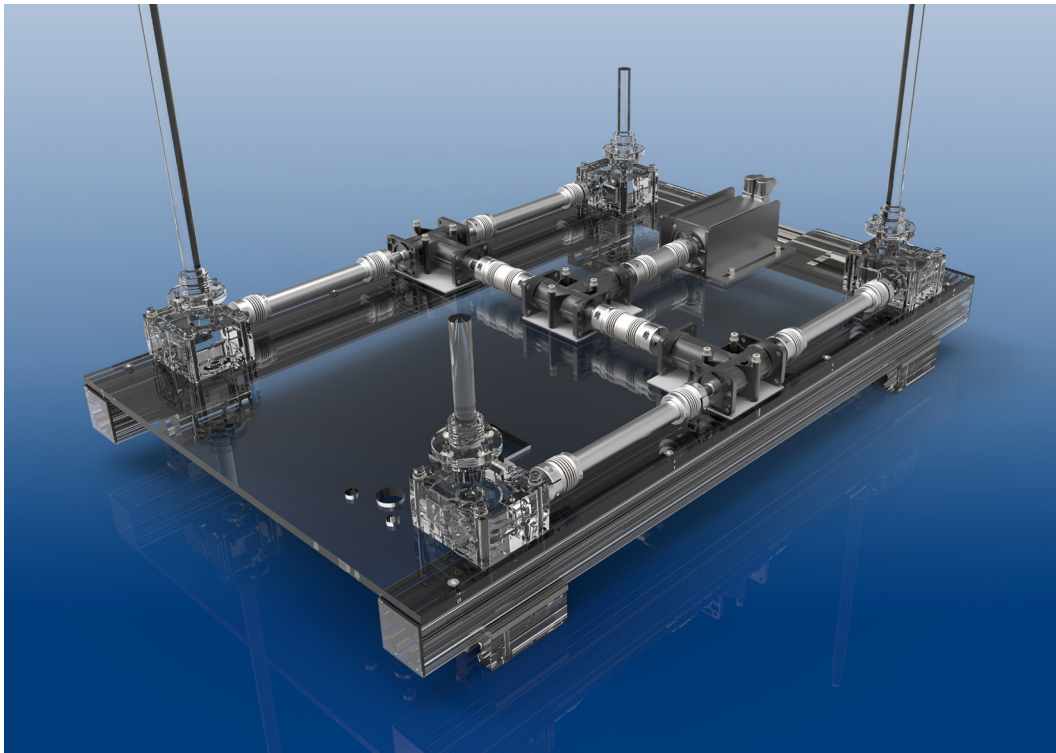
Version SF-KF conical clamping ring hub

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

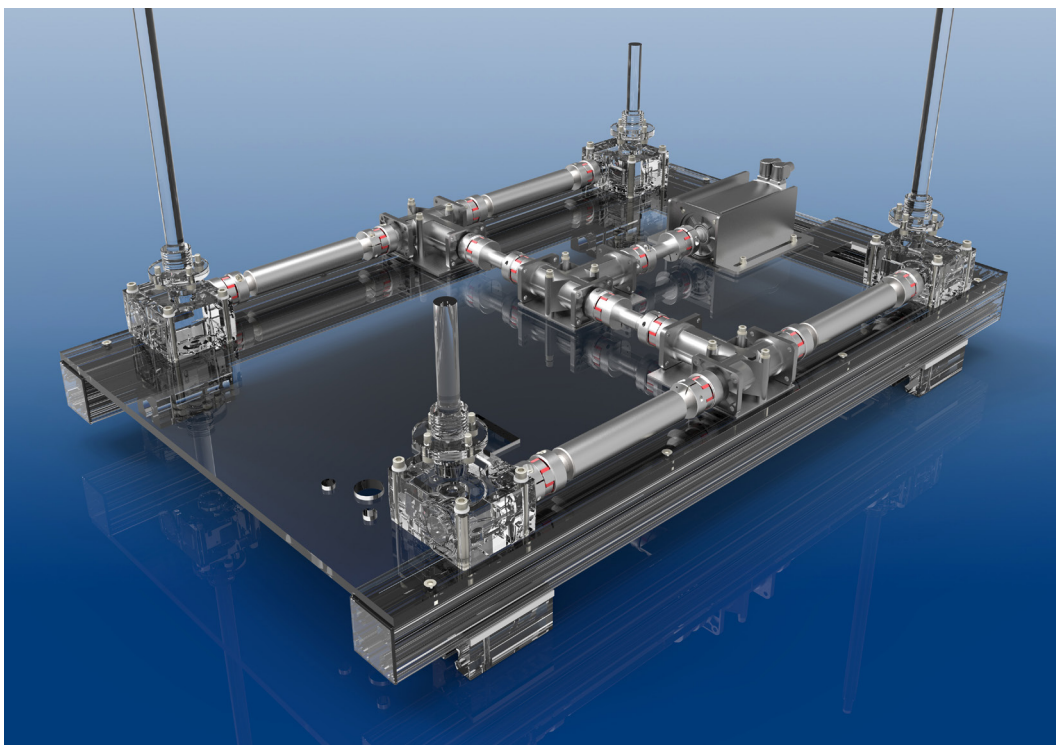
order example: SF 70-H; D1 = 28 F6; D2 = 35 F6; L = 3200

Distance Couplings with Intermediate Pipe

Application example - Lifting table

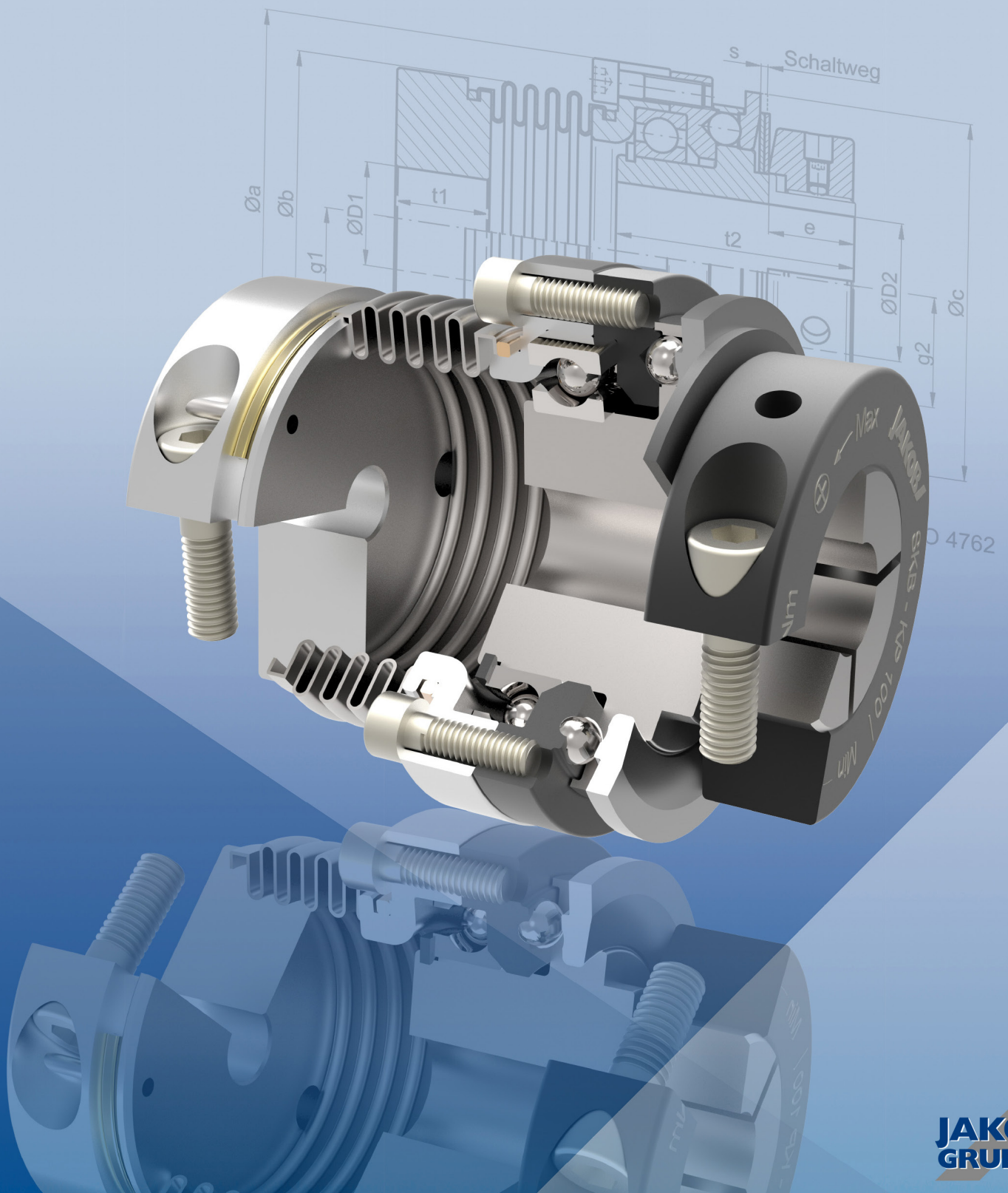


Linear system with metal bellows distance couplings of the WDS series



Linear system with elastomer distance couplings of the EKZ series

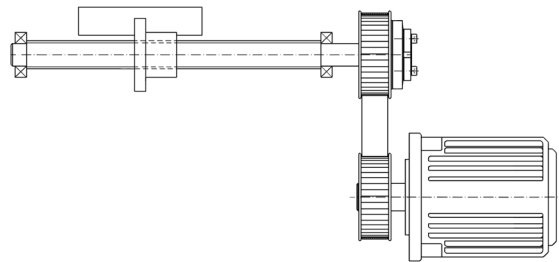
Safety couplings



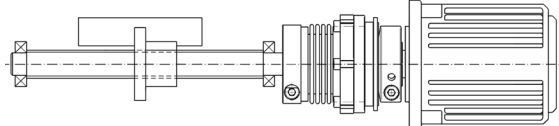
Safety Couplings I Modular System

The safety coupling modular system, consisting of three standard assemblies and several special variants, enables a solution for almost every application. Depending on the application, various add-on elements can be attached to the release mechanism to be attached. For indirect drives, belt pulleys, gear wheels or corresponding connecting parts are flanged on. In the case of direct drives, the release mechanism is supplemented with metal bellows or an elastomer coupling part to compensate for any shaft misalignments. The main selection and design criteria are the torque to be transmitted, the required torsional rigidity, the existing shaft diameter, the installation conditions and other operating parameters such as temperature, shaft offset and operating speed.

indirect drives



direct drives

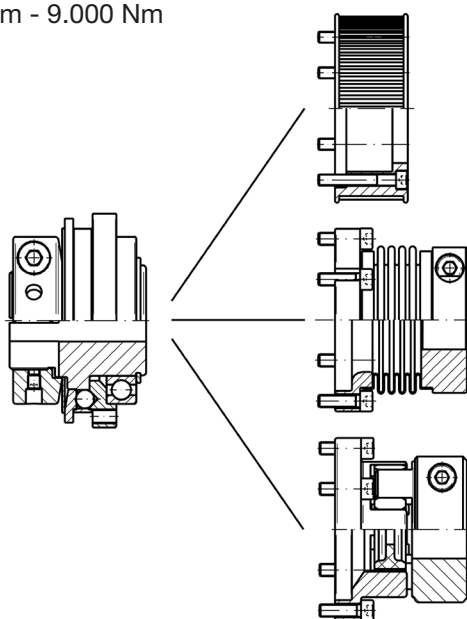


Overview:

safety mechanism

1 Nm - 9.000 Nm

attachments



- /// pulleys
- /// gears
- /// flanges

- /// metal bellows
 - torsionally stiff
 - all-steel-version
 - high operating temperatures
 - variable length

- /// elastomer spider
 - oscillation dampening
 - plug-in, electrically insulating
 - $T_{max} \leq 120^{\circ}C$

series

SK
SKW
SKR

SKB-K

SKW-K

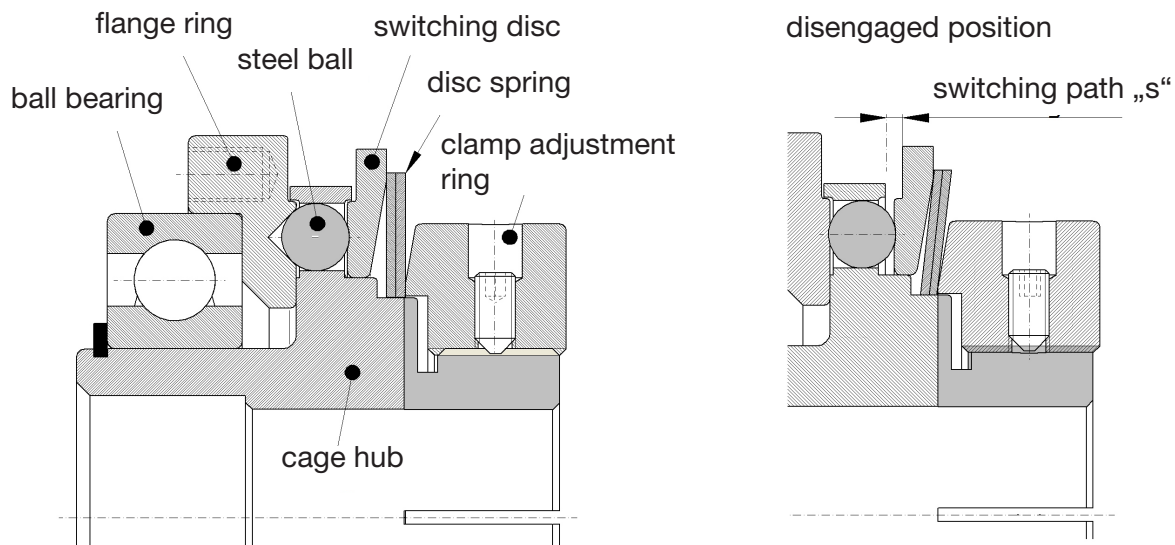
SKB-E

SKW-E

Note:

- /// To reduce wear on the safety coupling mechanism the drive should be stopped as soon as possible after disengagement. The signal of the limit switch can be used for this purpose (emergency-OFF signal)
- /// In vertical drive axes, the slide or the table can drop upon disengagement of the safety coupling due to its own weight and the low residual torque of the safety coupling. To counter this effect, it is suggested that either a compensating weight or an additional brake be provided.
- /// During the coupling selection, the linear measuring system (positioning) must also be considered. When fitting an encoder to the drive motor, a torsionally stiff coupling should be used to get the best results.
- /// For high speed applications, please select types SKY or SKY-ES because of their rotational symmetry. Nominal speed up to $4,000 \text{ min}^{-1}$ as well as safety couplings with release mechanism are possible on request.
- /// The safety coupling is maintenance free under normal operating conditions.
- /// For mounting instructions and explanations about the shaft - hub - connection, please see separate datasheets.

Safety Couplings I Technical Information



The axial stroke of the switching disc is immediately stopped by means of a non-contact or mechanical limit switch (emergency stop) of the drive.

JAKOB safety couplings are designed as predetermined separation points, collision protection or overload limitation in a direct or indirect drive train. The heart of the safety clutch is a high-precision, robust release mechanism with steel balls as a spring-loaded form-fit body. The torque is introduced into the centrally located hub via a non-positive and backlash-free clamp or cone connection. The hub is designed as a ball cage and is used to hold the flange ring, the switching disc with disc spring and the adjusting nut. Special disc springs press the balls into hardened countersinks via a pressure or switching disc bores (calottes) of the flange ring. In normal operation, this means that the drive torque is transmitted backlash-free to the flange ring. A compensating element (metal bellows, elastomer star), a toothed wheel or belt wheel or another connecting part is optionally attached to the flange ring. If the set release torque is exceeded, the flange ring twists relative to the cage hub and the balls are suddenly pushed out of the calottes, interrupting the drive train. The residual torque is a maximum of 10% of the set release torque.

The play-free ball detent mechanism

A backlash-free torque transmission with high torsional rigidity is guaranteed by a specially designed tensioning of the hardened and polished steel balls between the ball cage of the hub and the spherical caps of the flange ring. In reversing operation, the mechanics work equally for both directions of rotation.

The dynamic release behavior

JAKOB safety clutches are characterized by excellent

dynamic release behavior. The reason for this is the degressive spring characteristic as well as the minimized masses (ball and switching disc), which have to be accelerated axially when disengaging. This guarantees that the drive train is interrupted within a few milliseconds in the event of a collision. This results in a very low mass force that has to be added to the spring force. With many other safety clutch types, the dynamic release torque and the switching time can increase significantly due to the large switching masses and linear standard springs.

The re-entry – fixed-point switching

The balls or the cage bores and calottes are distributed asymmetrically around the circumference, so that only one angle-synchronous detent position is possible per 360°. The balls ratchet over once per revolution with little residual torque until they come to a standstill. The repetition accuracy of the set release torque is max. $\pm 5\%$. Special versions of the locking mechanism (6x60° or 8x45° locking) are available on request. After the cause of the failure has been rectified, the clutch automatically re-engages in the synchronous position when operated at low speed (< 30 rpm) and is ready for operation.

Safety Couplings I Technical Information

The degressive spring characteristic

The function of the JAKOB safety couplings is significantly influenced by the disk springs specially developed for this application. Due to the design in the degressive characteristic curve area, the spring force decreases with increasing spring deflection (switching travel), which means that the torque drops immediately when it responds. With usual Spring-loaded overload clutches, on the other hand, increase the spring force and the release torque, e.g. T. significantly. This results in an undefined functional behavior between response and disengagement, as well as a significantly higher residual torque.

Mechanics with backstop

An additional freewheel, which serves as a backstop, prevents disengagement in the opposite direction. Irrespective of the set release torque, this ensures permanent forced driving with the nominal torque. (Upon request)

The unlock mechanic

In applications with high operating speeds (test benches) or long run-on times (immediate stop not possible), it may be necessary to supplement the locking mechanism with a release mechanism. For this purpose, JAKOB has several proven functional variants available, which prevent it from re-engaging until it comes to a standstill.

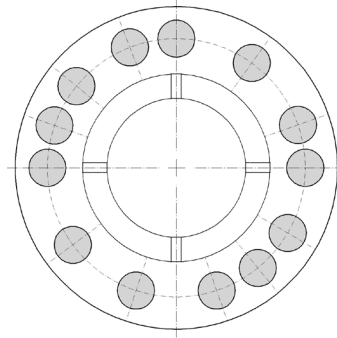
The Labyrinth Seal

In the SKB and SKW series, the locking mechanism is protected by a labyrinth seal against the ingress of coarse dirt particles or heavy leaching of the lubricant. If required, a complete encapsulation of the release mechanism is also possible (on request).

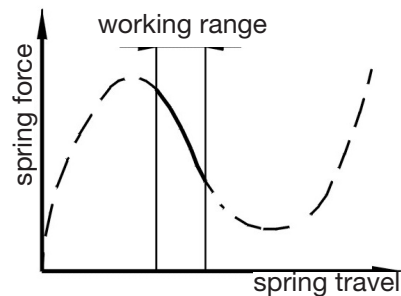
corrosion protection

Most of the series are optionally available in a corrosion-protected material version. A special surface coating of the steel components ensures excellent rust resistance - ball bearings, locking balls, etc. are made of stainless steel and the disc springs are nickel-plated. Safety couplings made entirely of stainless steel, e.g. for the food industry, can also be offered on request.

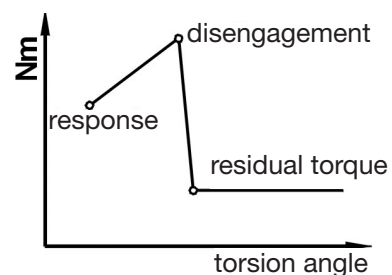
Fixed point switching - asymmetric ball position



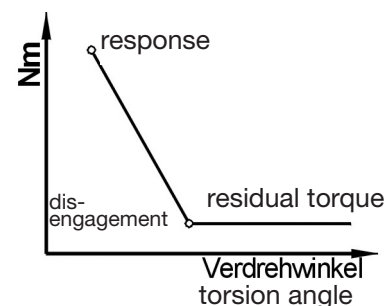
Spring characteristics



Regular form-fit coupling



JAKOB Safety coupling



Safety Couplings I Adjusting the Disengagement Torque

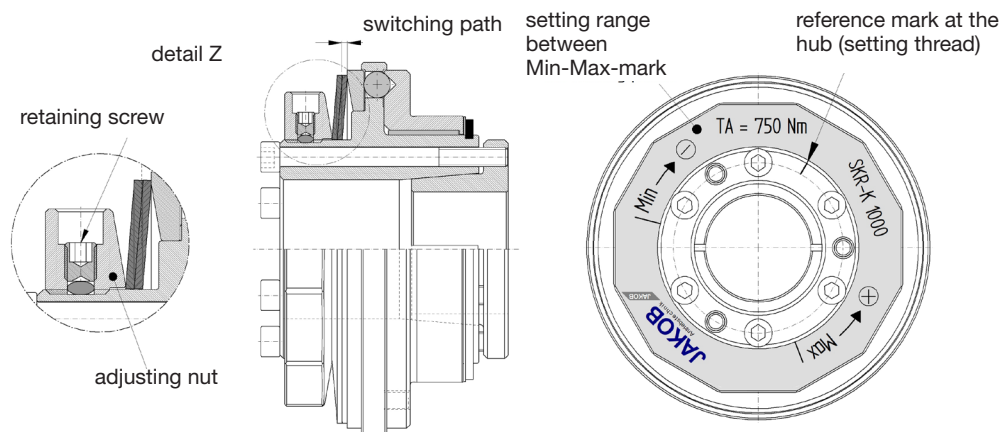
The disengagement torque is generally steplessly adjustable between about 40% and 100% of the nominal clutch torque. If no setting is specified by the customer, the maximum torque (nominal torque) is set. The set, static disengagement torque can easily be readjusted by turning the adjusting nut or the adjusting ring on the machine using a hook wrench. For this purpose, the setting rings of all series are provided with a user-friendly label and the set release torque as well as a marking for the minimum and maximum release torque (T_{min} , T_{max}) are engraved. Additional scaling is possible on request. Higher disengaging torques greater than T_{max} are generally possible, but this results in greater wear on the locking mechanism.

Caution:

Due to the degressive spring characteristics, turning back (counter-clockwise) the adjusting nut means an increase, or a turning in clockwise direction means a reduction of the disengagement torque (see direction arrow at clamping nut)!

Reihe SKW/SKR/SKY

Einstellvorgang für das Ausrückmoment:

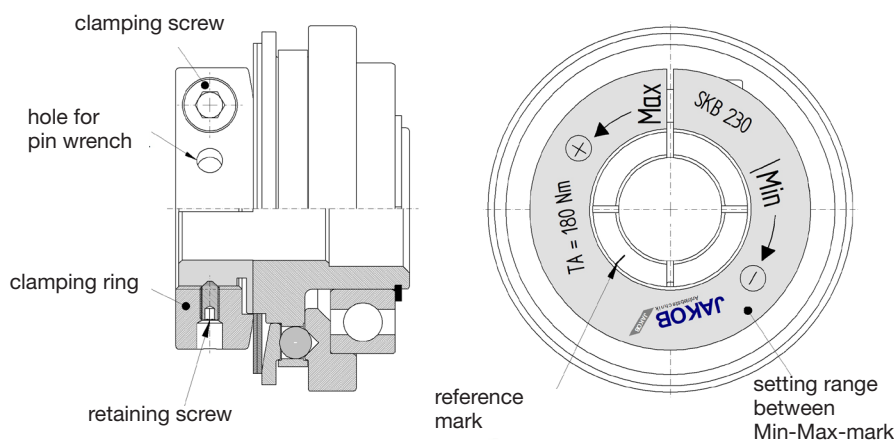


Setting procedure for the release torque:

Completely loosen the locking screws (see Detail Z). Turn the adjusting nut in the minus or plus direction with a hook wrench! Observe the reference mark and min-max mark. After the adjustment, secure the adjustment ring by screwing in the locking screws. Factory setting of the release torque, see ring engraving.

Series SKB

Setting of disengagement torque:



Setting procedure for the release torque:

Loosen the locking screw. When installed, the clamping screw of the clamping ring hub must also be loosened. Then turn the clamping ring in the minus or plus direction - note the reference line and the MIN and MAX markings. The drive shaft should be locked here. Finally, tighten the clamping screw with the specified TS value and screw in the locking screw. Factory setting of TA see ring engraving.

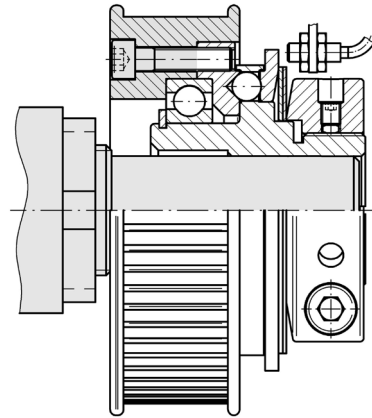
Safety Couplings I *for indirect drives*

- ✓ for the attachment of toothed belt pulleys, gear wheels, chain wheels, flanges, and so on
- ✓ with integrated ball bearing or sliding bearing - for optimal constructional adjustment
- ✓ frictional shaft-hub-connection with conical clamping bush or conical clamping ring or keyway

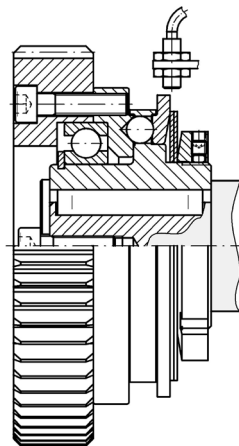
For overload limitation or as collision protection for indirect drives, JAKOB offers the SKB, SKW and SKR series with integrated ball bearings or with integrated slide bearings in the standard range. Toothed belt pulleys, gears or other attachments with a concentricity or axial runout accuracy of a few hundredths of a millimeter can be attached to the respective coupling flange rings. In normal operation, the bearings have the task of absorbing the lateral and axial forces and passing them on to the input or output shaft. By means of a conical clamping ring (SKR-K) or a clamping ring hub (SKB), the set torque is transmitted from the shaft to the clutch hub absolutely backlash-free and friction-locked. If a feather key connection between shaft and hub is sufficient, the inexpensive type SKW can be used. While the SKB and SKW couplings are suitable for normal and large discs and pinions due to the pitch circle diameter of the fastening threads, the SKR series is designed for add-on elements with a large width or small diameter. With the SKR series, extremely compact design solutions are possible thanks to the integrated plain bearing, and the forces are introduced almost centrally to the bearing. Since the clamping ring clamping was also arranged on the inside towards the shaft, the SKR coupling is ideal even in very tight spaces with minimized bearing loads on the motor or transmission. Drive shaft.

Other types of safety couplings for indirect drives, e.g. with a release mechanism, are available on request.

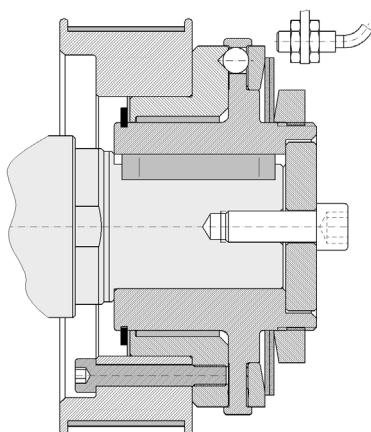
Series SKB



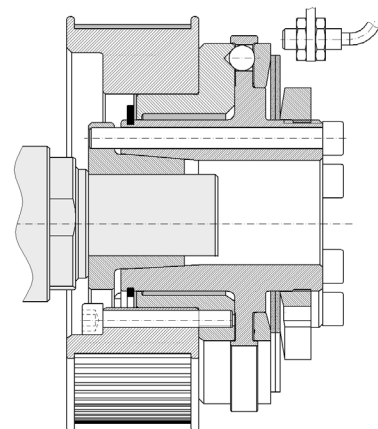
Series SKW



Series SKR-N



Series SKR-K



Safety Coupling I Series SKB for indirect drives

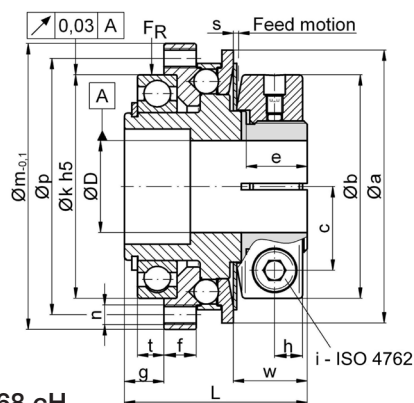
- /// simple installation with clamping ring hub
- /// with integral ball bearing
- /// for high axial and lateral loads
- /// excellent run-out accuracy

technical data:

SKB size	setting range disengagement torque T_{KA} [Nm]	moment of inertia [10 ⁻³ kgm ²]	mass approx. [kg]	tightening torque of screws		max. lateral load F_R [N]	bore diameters $\varnothing D$		
				f [Nm]	i [Nm]		min	max	max. bore- \varnothing PFN-6885
1	0,5 - 1								
2	1 - 2	0,044	0,22	M5 - [8]		2550	5	14	10
6	2 - 6								
12	6 - 12	0,09	0,36	M5 - [8]		5000	6	16	12
15	8 - 15						8	16	
30	13 - 30	0,36	0,8	M6 - [16]		8000	10	25,4	20
45	22 - 45						12	25,4	
60	25 - 60						14	25,4	
100	40 - 100	1,1	1,5	M8 - [35]		9500	18	35	32
150	60 - 150						18	35	
230	80 - 230	4,2	3,3	M10 - [70]		23000	24	44	38
330	130 - 330						24	44	
500	200 - 500	12,2	6,2	M14 - [200]		30000	28	58	50
800	350 - 800						40	58	
1000	500 - 1000	76	20	2xM16 - [250]		50000	42	100	90
2000	800 - 2000						48	100	
3000	1500 - 3000								
6000	3000 - 6000	240	34	10xM10 - [50]		65000	50	120	Optional
9000	3000 - 9000								

temperature range: -30°C up to +200°C

material:
heat-treated steel
optional in stainless version



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

SKB	$\varnothing a$	($\varnothing a^*$)	$\varnothing b$	c	e	f	g	h	$\varnothing k^{h5}$	$\varnothing m$	$\varnothing p$	L	n	s	t	w
1/2	42	-	38	13,5	13	6	6	6	30	40	35	33,5	6xM3	0,8	4	14,6
6/12	48	(42)*	38,5	13,5	13	8	9,8	6	42	52	47	41	6xM3	0,9	7	15,8
15/30/45	66	(60)*	53	19,5	15	9	11,5	7,5	55	69	62	48	6xM4	1,2	8	18,5
60/100/150	83	(76)*	68	25,5	18,5	9	12	8,5	68	87	78	55,5	6xM6	1,6	8	22,4
230/330	109	(104)*	87	32	21	14	16,5	10,5	90	113	102	71,5	6xM8	1,8	12	25,6
500/800	132	-	115	42	30	15	17	13,5	110	136	124	87,5	8xM8	2,5	12	37
1000/2000	185	-	172	69	76	16	28	17/30	140	181	165	142±2	12xM10	3,7	21,5	77
3000/9000	236	-	215	$\varnothing 160$	82	18/14	22	-	180	243	200/225	166	12xM10	3,0	14	87

For size 3000 - 9000 shrink disk clamping instead of clamping ring design

*note: smaller outer diameters of the thrust plate are possible (see values in brackets)

order example:

SKB 30 -

D = 24 ^{H7} -

$T_{KA} = 25$ Nm

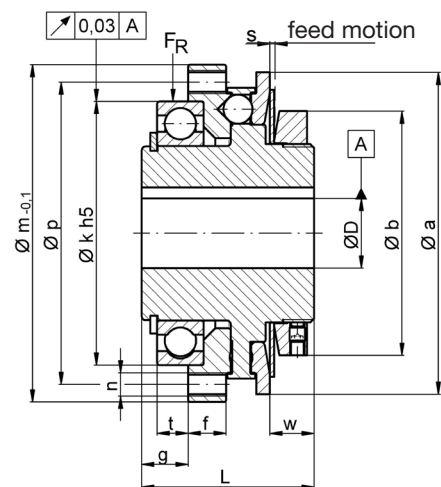
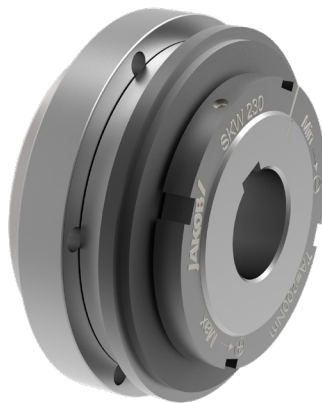
Safety Coupling I Series SKW for indirect drives

- /// cost-effective type // easy keyway connection
- /// with integrated ball bearing for high axial and lateral load

technical data:

SKW Size	setting range disengagement torque T_{KA} [Nm]		moment of inertia [10 ⁻³ kgm ²]	mass approx. [kg]	max. lateral load F_R [N]	n	bore diameters $\varnothing D$	
	min	max					min	max
6	2	- 6	0,08	0,28	5.000	6 x M 3	6	12
12	6	- 12					6	12
15	8	- 15	0,3	0,63	8.000	6 x M 4	8	22
30	13	- 30					10	22
45	22	- 45					10	22
60	25	- 60	0,91	1,25	9.500	6 x M 6	11	32
100	40	- 100					13	32
150	60	- 150					16	32
230	80	- 230					18	38
330	130	- 330	3,70	2,80	23.000	6 x M 8	21	38
500	200	- 500	9,25	4,80	30.000	8 x M 8	26	55
800	350	- 800					38	55
1000	500	- 1000	52	15,5	50.000	12 x M 10	39	90
2000	800	- 2000					52	90
3000	1500	- 3000	160	25	65.000	12 x M 10	50	110
6000	3000	- 6000					50	110
9000	6000	- 9000					50	110

material:
heat-treated steel
temperature range:
-30°C up to +200°C



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

SKW	$\varnothing a$	($\varnothing a^*$)	$\varnothing b$	f	g	$\varnothing k h_5$	$\varnothing m$	$\varnothing p$	L	s	t	w
6/12	48	(42)*	33	8	9,8	42	52	47	31	0,9	7	5,8
15/30/45	66	(60)*	45	9	11,5	55	69	62	38	1,2	8	8,6
60/100/150	83	(76)*	63	9	12	68	87	78	44,5	1,6	8	11,4
230/330	109	(104)*	84	14	16,5	90	113	102	59,5	1,8	12	13,7
500/800	132	-	105	15	17	110	136	124	68,5	2,5	12	18,1
1000/2000	185	-	168	19	28	140	181	165	106	3,7	22,5	40,4
3000-9000	236	-	197	18/14	22	180	243	200/225	128	3,0	14	53

*note: smaller outer diameters of the shift disc are possible (see values in brackets)
with zero clearance conical-hub-connection ($D_{max} = \varnothing 120$) see series SKY

order example: SKW 500 - D = 44^{G6} - PFN 12 P9 x 3,3 - $T_{KA} = 450$ Nm

Safety Coupling I Series SKR for indirect drives

- /// Series SKR-K with cone clamping bush // Series SKR-N with keyway connection
- /// robust slide bearing for high bearing forces and best concentricity
- /// compact attachment and optimum pane integration

technical data:

SKR Size	setting range disengagement torque T_{KA} [Nm]	moment of inertia [10^{-3}kgm^2]	mass. approx. [kg]	tightening torque of screws 6x i - ISO 4762 [Nm]	max. lateral load F_R [N]	bore diameters $\varnothing D$	
						DK from-to	DN from-to
25	10 - 25					8 - 22	8 - 30
40	16 - 40	0,5	0,8	M4 - (3)	40	10 - 22	10 - 30
80	30 - 80					14 - 22	12 - 30
105	50 - 105					12 - 38	12 - 50
180	80 - 180	3	2,5	M6 - (12)	90	14 - 38	16 - 50
380	160 - 380					22 - 38	20 - 50
650	300 - 650	11	5,5	M8 - (30)	150	22 - 48	22 - 65
950	350 - 950					22 - 48	30 - 65
1100	500 - 1100					28 - 70	30 - 95
2200	1000 - 2200	55	14	M10 - (60)	250	42 - 70	45 - 95
3200	1500 - 3200					55 - 70	52 - 95

material:

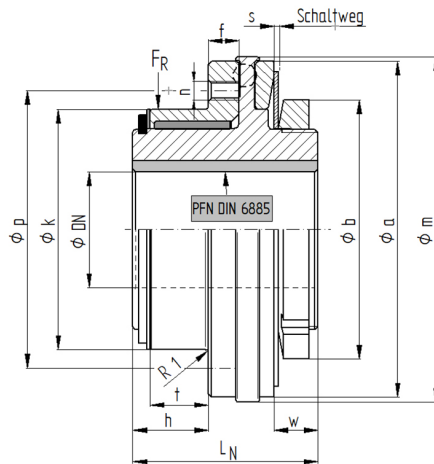
heat-treated steel. temperature range: -30°C up to $+200^\circ\text{C}$



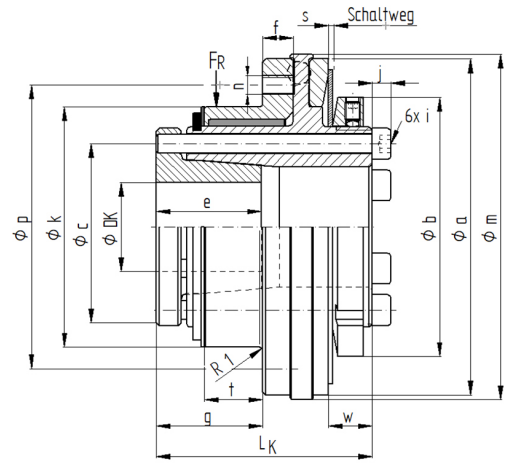
SKR-N



SKR-K



SKR-N



SKR-K

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

SKR	$\varnothing a$	$\varnothing b$	$\varnothing c$	e	f	g	h	j	$\varnothing k^{h7}$	$\varnothing m$	$\varnothing p$	L_K	L_N	n	s	t	w
25/40/80	73,5	52	33	23	7	24	17,2	4	50	77	59	50	43	8xM4	1,2	12,5	10,3
105/180/380	109	84	54	34	10	34,5	24,5	6	78	112	90	70x	60	8xM6	1,6	19	14,2
650/950	139	105	66	37	14	42,5	30	8	100	145	115	90,5	78	8xM8	1,9	24	20
1100/2200/3200	188	170	97	51	14	51,5	36	10	140	196	160	120,5	105	12xM10	3,0	28	35,6

order example: SKR-K 105 - D = 22^{G6} - release torque - TKA = 75 Nm

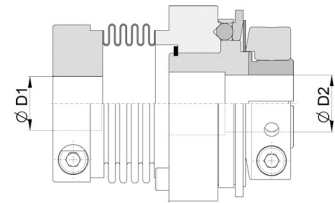
Safety Couplings I *for direct drives*

Large selection of safety coupling types with coupling attachment for shaft-shaft connection

The JAKOB safety couplings for direct drives are a combination of the release mechanism that has been tried and tested and optimized for decades with a coupling element to compensate for misalignments between the input and output shaft. Various versions from an extensive modular system of metal bellows or elastomer couplings can be selected. While the main specific feature of the Metal bellows is the very high torsional rigidity with low restoring forces, the elastomer couplings are characterized by their robustness, excellent damping properties and the possibility of plug-in assembly. Due to the screw connection between the coupling element and the safety part, in the event of damage or Changing the technical operating parameters means replacing the coupling attachment or the safety part anytime possible.

The following series are available as standard:

- Series SKB -> with clamping ring hub $\varnothing D2$
- Series SKY -> with cone clamping bush $\varnothing D2$
- Series SKW -> with feather key connection $\varnothing D2$



Series SKB - KP

with metal bellows 4W + clamping hub



Series SKB - EK

with elastomer star + clamping hub



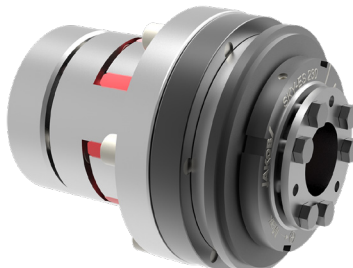
Series SKY - KS

with metal bellows 4W + conical clamping bush



Series SKY - ES

with elastomer spider + cone clamping ring hub



Series SKW - KP

with metal bellows 4W + clamping hub
(optionally with keyway)



Series SKW - EK

with elastomer spider + clamping hub
(optionally with keyway)



Further attachment combinations or hub variants with metal bellows or elastomer star, as well as customer-specific designs are possible on request.

Safety Coupling I Series SKB-KP for direct drives

- /// with bellows attachment // with lateral clamping hub on both sides
- /// EASY-clamping hub on bellows side // compensation of misalignments // low restoring forces

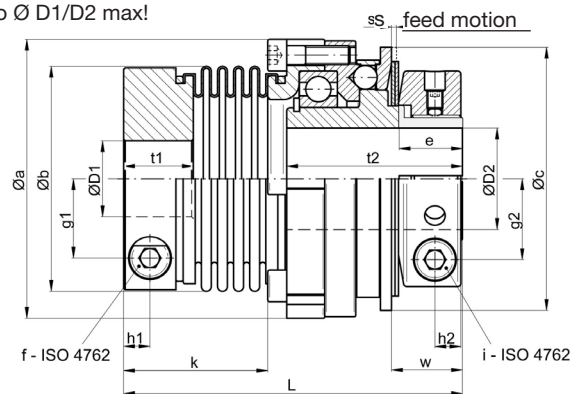
technical data:

SKB-KP size	setting range disengagement torque T_{KA} [Nm]	moment of inertia $[10^{-3} \text{kgm}^2]$	mass approx. [kg]	torsional stiffness [Nm/arcmin]	max. shaft misalignment [mm]		tightening torque of screws		$\varnothing D1$		$\varnothing D2$		$\varnothing D2$ max. PFN 6885
					axial \pm	lateral	f [Nm]	i [Nm]	min	max	min	max	
1	0,5 - 1												
2	1 - 2	0,05	0,26	0,4	0,5	0,1	M3-2	M5-10	5	10(14)*	5	14	10
6	2 - 6												
12	6 - 12	0,13	0,45	2,1	0,5	0,15	M5-8	M5-10	6	19(24)*	6	16	12
15	8 - 15								8	32*	10	25,4	
30	13 - 30	0,5	1,0	9	0,5	0,2	M6-14	M6-18	10	32*	12	25,4	20
45	22 - 45								12	32*	14	25,4	
60	25 - 60								13	30(38)*	18	35	
100	40 - 100	1,5	1,9	20	0,6	0,2	M8-35 (30)*	M8-40	14	30(38)*	18	35	32
150	60 - 150								21	30(38)*	24	35	
230	80 - 230	5,5	3,8	28	0,8	0,2	M10-65 (50)*	M10-80	24	32(43)*	24	44	38
330	130 - 330								30	32(43)*	32	44	
500	200 - 500	14,0	6,8	52	0,8	0,2	M12-115 (90)*	M14-200	35	42(55)*	28	58	50
800	350 - 800	17,2	8,3	106	0,7	0,2	M14-180 (140)*	M14-200	42	55(68)*	40	58	
1000	500 - 1000	80	20	150	0,8	0,2	M14-180 (140)*	2xM16-250	45	65(75)*	42	100	900
2000	800 - 2000	95	23	250	1,5	0,3	M20-580 (450)*	2xM16-250	45	80(90)*	45	100	
3000	1500 - 3000			600		1,2							
6000	3000 - 6000	380	50	1000	3	1,4	10xM12[70]	10xM10[50]	50-130		50-120		Opt.
9000	6000 - 9000			1000		1,4							

(*) note: reduced tightening torque for bigger hub bore diameter - see also $\varnothing D1/D2$ max!
 temperature range: -30°C up to $+200^{\circ}\text{C}$

material:

- safety part:
- heat-treated steel
- clamping hub:
- high-tensile aluminum
- hub 2000-9000: steel
- bellows: stainless steel
- screws: ISO 4762 / 12.9



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

SKB-KP	$\varnothing a$	$\varnothing b$	$\varnothing c$	e	g1	g2	h1	h2	k	$L_{\pm 1}$	s	t1	t2	w
1/2	40,5	24(28)	42	14	7,5	13,5	4,4	6	25	62,5	0,8	8	33	14,6
6/12	52,5	40(45)	48	14	13	13,5	6	6	36,6	81	0,9	16,5	41	16
15/30/45	69	56	66	16	19	19,5	8	7,5	43	94,5	1,2	20	48	18,5
60/100/150	88	71	83	20	25	25,5	9	8,5	45,5	107	1,6	22	55,5	22
230/330	115	82	109	23	28,5	32	11,5	10,5	52	132	1,8	26	72	26
500	137	101	132	32	35	42	13	13,5	60	156	2,5	29	87,5	37
800	137	122	132	32	42	42	16	13,5	74,5	170	2,5	34	87,5	37
1000	181	133	185	74	47	69	18,5	17/30	87,5	220 \pm 2	3,7	45	89	74
2000	181	157	185	74	58	69	22	17/30	112	241	3,7	45	89	74
3000-9000	243	236	236	54	$\varnothing 175$	$\varnothing 160$	-	-	-	336	3,0	74	81	87

note: alternative lengths of bellows are possible on request; bellows side with conical hub: see series SKB-KS
 setting range up to 9000Nm see series SKY-KS

order example: SKB-KP 30 - $D1 = 28^{G6}$ - $D1 = 24^{H7}$ - $T_{KA} = 25 \text{ Nm}$

Safety Coupling I Series SKB-EK for direct drives

// with elastomer attachment // with lateral clamping hub on both sides
 // plug-in // flexible // backlash-free // oscillation dampening

technical data:

SKB -EK size	setting range disengagement torque T_{KA} [Nm]	moment of inertia [10^{-3}kgm^2]	mass approx. [kg]	torsional stiffness [Nm/arcmin]	max. shaft mis- alignment [mm]		tightening torque of screws		\varnothing D1		\varnothing D2		\varnothing D2 max. PFN 6885
					axial \pm	lateral	f [Nm]	i [Nm]	min	max	min	max	
1	0,5 - 1												
2	1 - 2	0,06	0,29	0,005	0,8	0,2	M2,5-1	M5-10	4	10	5	14	10
6	2 - 6												
12	6 - 12	0,13	0,44	0,25	0,5	0,1	M5-8	M5-10	8	20	6	16	12
15	8 - 15								12	32	10	25,4	
30	13 - 30	0,5	1	1	0,5	0,1	M6-14	M6-18	12	32	12	25,4	20
45	22 - 45								14	32	14	25,4	
60	25 - 60								16	38	18	35	
100	40 - 100	1,5	2	1,2	1	0,1	M8-35	M8-40	19	38	18	35	32
150	60 - 150								22	38	24	35	
230	80 - 230	5,6	4,2	3,6	1	0,12	M12-115(90)*	M10-80	20	35(43)*	24	42	38
330	130 - 330								24	35(43)*	32	42	
500	200 - 500	17	8,6	8	1	0,15	M14-180(140)*	M14-220	30	60(70)*	28	58	50
800	350 - 800								40	60(70)*	40	58	
1000	500 - 1000	79	19,5	12	1	0,10	M14-180(140)*	M16-290	42	60(70)*	42	100	90
2000	800 - 2000	116	27,9	21	1	0,15	M16-290	M16-290	50	90	42	100	90

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

material:

safety part: heat treated steel

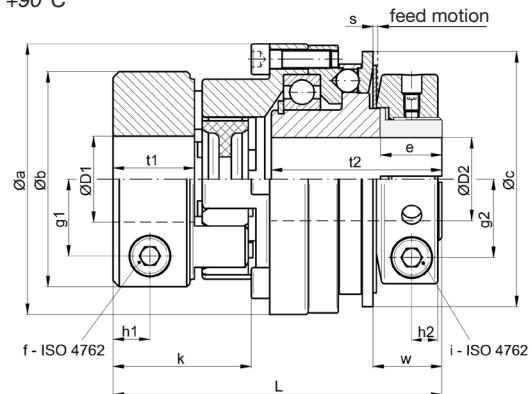
elastomer spider: polyurethane – 98 Shore A

clamping hub: high-tensile aluminum

screws: ISO 4762 / 12.9

(size 2000: tempered steel)

temperature range: -30°C up to +90°C



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

SKB-EK	$\varnothing a$	$\varnothing b$	$\varnothing c$	e	g1	g2	h1	h2	k	L ± 1	s	t1	t2	w
1/2	40,5	20	42	14	6,5	13,5	5	6	28,5	65,5	0,8	10	33	14,6
6/12	52,5	40	48	14	13	13,5	8	6	33	77	0,9	17	41	16
15/30/45	69	55	66	16	20	19,5	10	7,5	39	91,5	1,2	21	48	18,5
60/100/150	88	70	83	20	25	25,5	12	8,5	45	107	1,6	26,5	55,5	22
230/330	115	85	109	23	29	32	14	10,5	54	134	1,8	31	72	26,5
500/800	137	120	132	32	44	42	18	13,5	71	167,5	2,5	38	87,5	37
1000	181	120	185	74	44	69	18	17/30	72	204	3,7	38	89	74
2000	181	160	185	76	55,5	69	21	17/30	84	219	3,7	42	89	77

*note: other shore hardnesses of elastomer spider are possible on request
coupling side with conical hub: see series SKB-ES

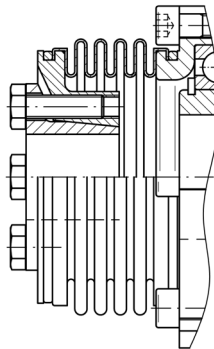
order example: SKB-EK 45 - D1 = 28^{G7} - D2 = 24^{H7} - $T_{KA} = 35 \text{ Nm}$

Safety Couplings | Additional Series

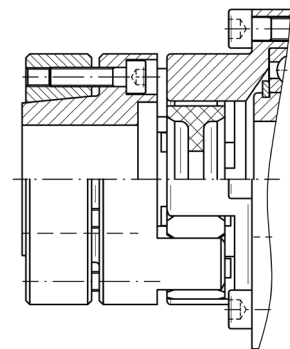
Series

- /// high clamping forces
- /// for smaller shaft diameters
- /// however: more difficult assembly
- /// with ES-hub: blind fitting possible
- /// dimensions on request
or see homepage:
www.jakobantriebstechnik.de

SKB-KS with conical clamping hub

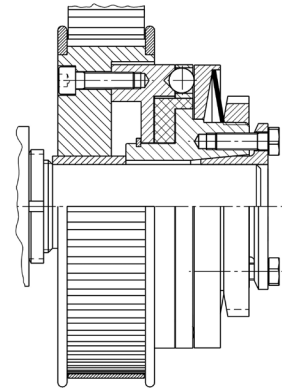


SKB-ES with conical clamping hub



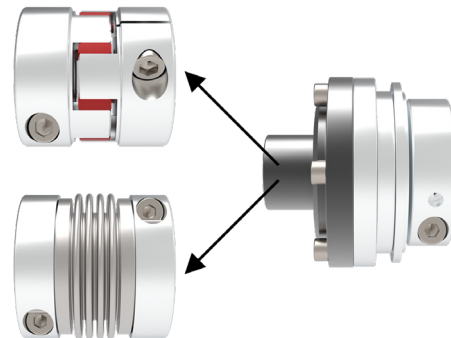
Series SKD/SBE/SK-F with special mechanism

- /// for long run-out times
- /// minimal residual torque
- /// re-engaging only by reverse rotation



Series SKB-WA

- /// Standard SKB type with adapter shaft
- /// for the universal attachment of metal bellows,
Elastomer and spacer couplings



Special series

- /// customized hub versions
and dimensions
- /// operating speeds up to 8.000 rpm
- /// special or stainless steel design
- /// special re-engaging functions
(e.g. for vertical drive axis)

-> please feel free to contact us

Product Overview | 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



Sectional Rail Couplings Series PKH / PKV / PKP

- /// self-locking, kinetic wedge-clamping
- /// pre-centering with alignment pins
- /// electrical clamping-condition control
- /// available in steel and aluminum designs



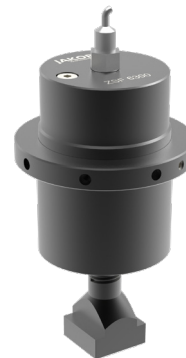
Power Clamping Screw Series SC

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



Spring Clamping Cylinder Series ZSF / 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



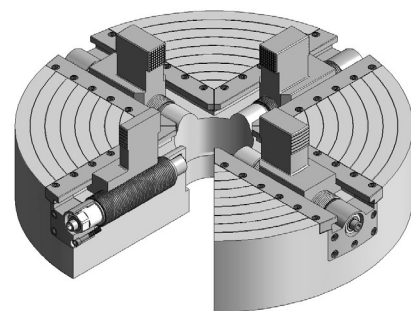
spring clamping cylinder Series ZSF (pulling)



spring clamping cylinder Series ZDF (pushing)

Power Clamping Screws mechanical type: Series MSP/MSPD hydraulic 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

OTT-Jakob Spanntechnik GmbH
Industriestr. 3-7 · 87663 Lengenwang
Fon: (+49) 8364 9821 0 · Fax: (+49) 8364 9821 10
info@ott-jakob.de · www.ott-jakob.de



ALLMATIC-Jakob Spannsysteme GmbH
Jägermühle 10 · 87647 Unterthingau
Fon: (+49) 8377 929 0 · Fax: (+49) 8377 929 380
info@allmatic.de · www.allmatic.de



JAKOB Antriebstechnik GmbH
Daimler Ring 42 · 63839 Kleinwallstadt
Fon: (+49) 6022 2208 0
info@jakobantriebstechnik.de
www.jakobantriebstechnik.de



OPTIMA Spanntechnik GmbH
Postfach 52 · 57584 Scheuerfeld
Fon: (+49) 2741 9789 0 · Fax: (+49) 2741 9789 10
info@optima-spanntechnik.de · www.optima-spanntechnik.de



JAKOB Vakuumtechnik GmbH
Daimler Ring 42 · 63839 Kleinwallstadt
Fon: (+49) 6022 2208 25 · Fax: (+49) 6022 2208 46
info@jakobvakuumtechnik.de · www.jakobvakuumtechnik.de