THE COUPLING.

R+W®
A POPPE + POTTHOFF COMPANY

PRECISION COUPLINGS

Sizing and selection

Proper sizing of couplings is crucial to ensuring smooth and efficient power transmission. This involves taking the specific requirements and operating conditions of the application into account. Various factors such as torque, speed, temperature and shock loads must be considered when selecting the correct coupling type and size.

According to DIN 740 part 2

Legend Guide book precision couplings

T_{KN}	=	Rated torque of the coupling (Nm)
T_{KMAX}	=	Maximum torque rating of the coupling (Nm)
T_S	=	Peak torque applied to the coupling (Nm)
T_{AS}	=	Peak torque of the drive system (Nm)
T_{AN}	=	Nominal torque of the drive system (Nm)
T_{LN}	=	Nominal torque of the load (Nm)
P	=	Drive power (kW)
n	=	Drive speed ($min.^{-1}$)
s	=	Screw lead (mm)
t	=	Acceleration / deceleration time (s)
ω	=	Angular velocity (1/s)
F_V	=	Feed force (N)
η	=	Spindle efficiency
d_0	=	Pinion dia. (pulley) (mm)
J_1	=	Moment of inertia of driving coupling half (kgm^2)
J_2	=	Moment of inertia of driven coupling half (kgm^2)
J_L	=	Total load inertia (e.g. spindle + slide + workspiece) (kgm^2)
J_A	=	Total driving inertia (motor [including gear ratio]) (kgm^2)
$J_{Masch.}$	=	Total load inertia (e.g. spindle + slide + workpiece + ½ of coupling) (kgm^2)
$J_{Mot.}$	=	Total driving inertia (motor [including gear ratio] + ½ of coupling) (kgm^2)
m	=	Ratio of the moment of inertia of the drive to the load
C_T	=	Torsional stiffness of the coupling (Nm/rad)
f_e	=	Natural frequency of the two mass system (Hz)
f_{er}	=	Excitation frequency of the drive (Hz)
φ	=	Torsional deflection (degree)
α	=	Angular acceleration ($1/s^2$)
υ	=	Temperature at the coupling (observed radiant heat)
S_v	=	Temperature factor
S_A	=	Load factor
S_Z	=	Start factor (factor for the number of starts per hour)
Z_h	=	Number of starts per hour (1/h)

Formulas

According to troque

Couplings are normally sized for the highest torque to be regularly transmitted. The peak torque of the application should not exceed the rated torque of the coupling. The following calculation provides an approximation of the minimum required coupling size, and allows for the maximum rated speed and misalignment to exist in the application:

$$T_{KN} \geq 1.5 \cdot T_{AS} \text{ (Nm)}$$

According to accleration torque

A more detailed calculation takes acceleration and the driving and driven moments of inertia into account. A strong inertia ratio diminishes the effect of the load factor in the sizing calculation.

$$T_{KN} \geq T_{AS} \cdot S_A \cdot \frac{J_L}{J_A + J_L} \text{ (Nm)}$$

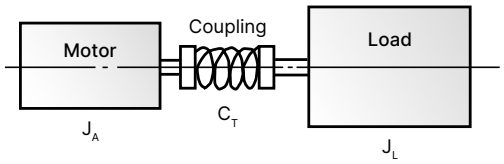
According to resonant frequency

The torsional natural frequency of the coupling must be significantly higher or lower than that of the equipment. For the mechanical substitution model the two mass system applies.

In practice the following applies: $f_e \geq 2 \cdot f_{er}$

$$f_e = \frac{1}{2 \cdot \pi} \sqrt{C_T \cdot \frac{J_A + J_L}{J_A \cdot J_L}} \text{ (Hz)}$$

Two Mass System



According to torsional defelction

To calculate transmission error as a result of torsional stress:

$$\varphi = \frac{180}{\pi} \cdot \frac{T_{AS}}{C_T} \text{ (degree)}$$

Elastomer couplings

Temperature factor S_υ	A	B	C	E
Temperature (υ)	Sh 98 A	Sh 64 D	Sh 80 A	Sh 64 D
> -30°C to -10°C	1.5	1.3	1.4	1.2
> -10°C to +30°C	1.0	1.0	1.0	1.0
> +30°C to +40°C	1.2	1.1	1.3	1.0
> +40°C to +60°C	1.4	1.3	1.5	1.2
> +60°C to +80°C	1.7	1.5	1.8	1.3
> +80°C to +100°C	2.0	1.8	2.1	1.6
> +100°C to +120°C	–	2.4	–	2.0
> +120°C to +150°C	–	–	–	2.8

Coupling selection for operation without shock or reversal

The rated torque of coupling (T_{KN}) must be greater than the rated torque of the load (T_{LN}) taking into account the temperature at the coupling (Temperature factor Sυ). Should T_{LN} be unknown, T_{AN} can be used as a substitute in the formula.

Calculation

$$T_{KN} > T_{AN} \cdot S_\upsilon$$

Supplemental Calculation

$$T_{AN} = \frac{9{,}550 \cdot P}{n}$$

Coupling selection for operation with shock loads

Same basic conditions as above. In addition, the maximum torque rating of the coupling (T_{Kmax}) is dictated by peak torque (T_S) due to shock loads.

Calculation

$$T_{KN} > T_{AN} \cdot S_\upsilon$$

Supplemental Calculation

$$T_{AN} = \frac{9{,}550 \cdot P}{n}$$

Calculation

$$T_{Kmax} > T_S \cdot S_Z \cdot S_\upsilon$$

Supplemental Calculation

$$T_S = \frac{T_{AS} \cdot S_A}{m + 1}$$

$$m = \frac{J_A + J_1}{J_L + J_2}$$

EK SP

Backlash free elastomer couplings Servomax®

0.5 – 25,000 Nm

Areas of application
for vibration damping torque transmission in:
+ Packaging machinery
+ Pump drives
+ Machine tools
+ Lift systems
+ Conveyors
+ Labeling machinery

Service life
When properly selected, handled, and installed, these couplings are maintenance free with infinite service life.

Fit clearance
Overall shaft / hub clearance of 0.01 - 0.05 mm

Features
Elastomer is press fit for zero backlash; standard versions are electrically isolating.

Special solutions
Various materials, tolerances, dimensions and performance ratings available for custom applications on request.

ATEX (Optional)
Available on request.

Ordering Example	EK2	20	A	8	10	XX
Model	●					Special designation only (e.g. special bore tolerance).
Size		●				
Elastomer insert type			●			
Bore Ø D1 H7				●		
Bore Ø D2 H7					●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. EK2 / 20 / A / 8 / 10 / XX)

EK SP

Backlash free **elastomer couplings** **Servomax®** 0.5 – 25,000 Nm

Model		Features	Page
EK1		**With keyway connection** 0.5 – 25,000 Nm • Press fit design • Readily modified for custom dimensions	66-67
EK2		**With clamping hub** 6 – 2,150 Nm • High concentricity • Backlash free • Easy mounting	68
EKL		**With clamping hub** 0.5 - 2,150 Nm • Compact design • Low moment of inertia • Easy mounting	69
EKH		**With split clamping hub** 4 – 25,000 Nm • For lateral installation • Allows for pre-aligned shafts • Easy mounting	70-71
EK6		**With conical clamping ring** 4 – 25,000 Nm • High concentricity • High clamping pressure • Self centering hub design • Allows for axial installation	72-73

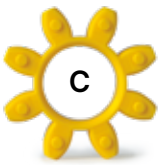
Model		Features	Page
SP6		**For high speed spindle applications** 60 - 2,150 Nm • Very high precision • Very high concentricity • High clamping force • Symmetrically machined hubs	74
EK7		**With expanding shaft** 2 – 2,150 Nm • For hollow shaft mounting • Expanding shaft through axial tightening • Short body length after installation	75
EKZ		**Intermediate spacer** 2 – 2,150 Nm • High lateral misalignment • Easy to mount • Vibration damping	76

General informations R+W elastomer couplings

Sizes 2 – 800

Shore hardness
98 Sh A

Shore hardness
64 Sh D



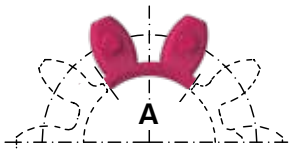
Shore hardness
80 Sh A

Shore hardness
65 Sh D

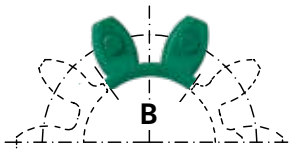
Shore hardness
64 Sh D

Sizes 2.500 – 9.500

The coupling includes 5x elastomer segments

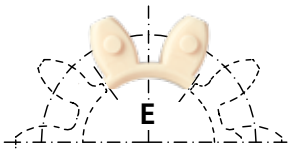


Shore hardness 98 Sh A



Shore hardness 64 Sh D

Shore hardness 65 Sh D



Shore hardness 64 Sh D

Description of the elastomer inserts

Type	Shore hardness	Color	Material	Relative damping (Ψ)	Temperature range	Features
A	98 Sh A	red	TPU	0.4 - 0.5	-30°C to +100°C	high damping
B	64 Sh D	green	TPU	0.3 - 0.45	-30°C to +120°C	high torsional stiffness
C	80 Sh A	yellow	TPU	0.3 - 0.4	-30°C to +100°C	very high damping
D*	65 Sh D	black	TPU	0.3 - 0.45	-10°C to + 70°C	electrically conductive
E	64 Sh D	beige	Hytrel	0.3 - 0.45	-50°C to +150°C	temperature resistant

* The electrical conductivity of the elastomer material is to prevent the electrostatic charging of the elastomer coupling system, to reduce the risk of sparking in operation. ATEX technical data is available upon request. The values of the relative damping were determined at 10 Hz and +20° C.

Sizes EK

Size*		2			5			10			20			60		
Type (Elastomer insert)		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Static torsional stiffness (Nm/rad)	C_T	50	115	17	150	350	53	260	600	90	1,140	2,500	520	3,290	9,750	1,400
Dynamic torsional stiffness (Nm/rad)	C_{Tdyn}	100	230	35	300	700	106	541	1,650	224	2,540	4,440	876	7,940	11,900	2,072
Lateral (mm)	Max. values	0.08	0.06	0.2	0.08	0.06	0.2	0.1	0.08	0.22	0.1	0.08	0.25	0.12	0.1	0.25
Angular (degree)		1	0.8	1.2	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2
Axial (mm)		±1			±1			±1			±1,5			±1,5		

Size*		150			300			400			450			600		
Type (Elastomer insert)		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Static torsional stiffness (Nm/rad)	C_T	4,970	10,600	2,000	12,400	18,000	3,000	14,200	24,200	3,650	15,100	27,000	4,120	25,000	49,100	7,550
Dynamic torsional stiffness (Nm/rad)	C_{Tdyn}	13,400	29,300	3,590	23,700	40,400	6,090	43,200	66,300	7,050	55,400	81,200	11,600	63,600	136,800	21,200
Lateral (mm)	Max. values	0.15	0.12	0.3	0.18	0.14	0.35	0.2	0.16	0.35	0.2	0.18	0.35	0.22	0.18	0.36
Angular (degree)		1	0.8	1.2	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2	1	0.8	1.2
Axial (mm)		±1,8			±2			±2			±2					

Size*		800			2.500		4.500		9.500	
Type (Elastomer insert)		A	B	C	A	B	A	B	A	B
Static torsional stiffness (Nm/rad)	C_T	41,300	66,080	10,320	87,600	109,000	167,000	372,000	590,000	670,000
Dynamic torsional stiffness (Nm/rad)	C_{Tdyn}	82,600	180,150	28,600	175,000	216,000	337,000	743,000	1,180,000	1,340,000
Lateral (mm)	Max. values	0.25	0.2	0.4	0.5	0.3	0.5	0.3	0.6	0.4
Angular (degree)		1	0.8	1.2	1.5	1	1.5	1	1.5	1
Axial (mm)		±2			±3		±3		±4	

Static torsional stiffness at 50% T_{KN} Dynamic torsional stiffness at T_{KN}

* Note: The technical values for elastomer inserts D and E correspond to the values for B, due to the identical Shore hardness.

EK1

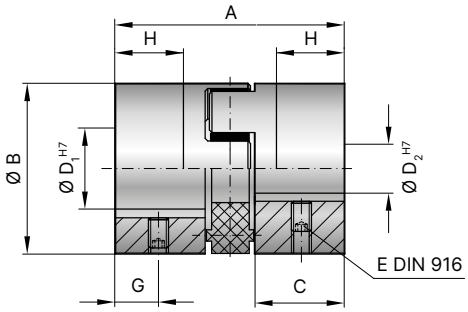
With keyway connection

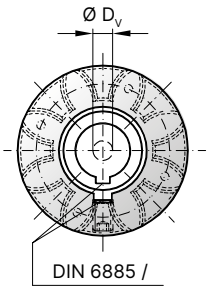
0.5 - 2,150 Nm

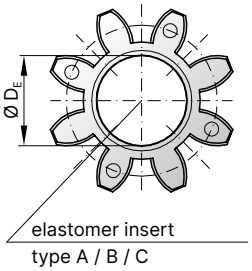
Feataures
- Press fit design
- Readily modified for custom dimensions
- Low backlash (keyway)

Material
- **Hubs:** up to size 600 high strength aluminum; size 800 steel
- **Elastomer:** wear resistant thermally stable TPU

Design
Two concentrically machined hubs with curved jaws, keyways, and set screws.







Optional:
Conical bores for Fanuc motors and other tapered shafts available.

Model EK1

Size		2			5			10			20			60			150			300			400			450			600			800		
Type (Elastomer insert)		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Rated torque (Nm)	T_{KN}	2	2.4	0.5	9	12	2	12.5	16	4	17	21	6	60	75	20	160	200	42	325	405	84	410	520	90	530	660	95	700	840	150	950	1,100	240
Max. torque (Nm)	T_{Kmax}	4	4.8	1	18	24	4	25	32	6	34	42	12	120	150	35	320	400	85	650	810	170	820	1,040	180	1,060	1,350	190	1,400	1,680	300	1,900	2,150	400
Overall length (mm)	A	20			34			35			66			78			90			114			120			126			147			162		
Outside diameter (mm)	B/B_1	15			25			32			42			56			66.5			82			95			102			120			136.5		
Mounting length (mm)	C	6.5			12			12			25			30			35			45			46			50			57			65		
Inside diameter (pilot bored) (mm)	D_V	3			4			6			7			9			14			16			20			22			25			29		
Inside diameter range H7 (mm)	$D_{1/2}$	3 - 9			6 - 15			6 - 18			8 - 25			12 - 32			19 - 38			20 - 45			25-50			28 - 60			30-70			32 - 80		
Inside diameter of elastomer (mm)	D_E	6.2			10.2			14.2			19.2			26.2			29.2			36.2			43			46.2			55			60.5		
Set screws (DIN 916)	E	see table (depending on bore Ø)**																																
Distance (mm)	G	3			5			6			9			11			12			15			16			17			23			30		
Possible shortening length(mm)	H	4			6			6			19			22			26			32			35			37			40			43		
Moment of inertia per hub (10^{-3} kgm²)	J_1/J_2	0.0001			0.001			0.003			0.02			0.06			0.2			0.6			1.1			1.5			3.5			19		
Approx. weight (kg)		0.008			0.03			0.08			0.15			0.35			0.7			1.4			1.9			2.3			3.7			15.5		
Speed standard(min^{-1})		15,000			15,000			13,000			12,500			11,000			10,000			9,000			8,500			8,000			6,800			4,000		
Speed balanced ($10^3 min^{-1}$)		60	67	45	57	65	43	53	63	40	45	60	35	31	31	25	22	26	18	22	26	16	17	18	13	16	17	12	14	14	10	13	13	8

For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts **see pages 64.**

**** set screw size**

D_1/D_2	- Ø 10	Ø 10.1 - 12	Ø 12,1 - 30	Ø 30.1 - 60	Ø 60.1 - 95	Ø 95.1 - 130	Ø 130.1 - 170
E	M4	M4	M5	M8	M10	M12	M16

EK1

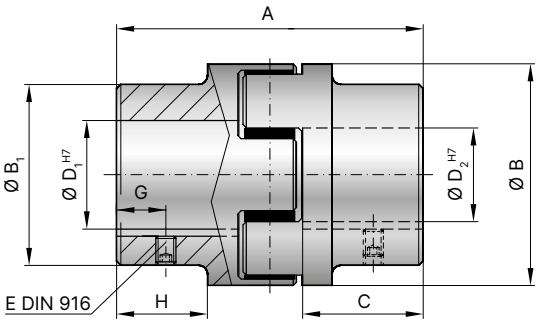
With keyway connection

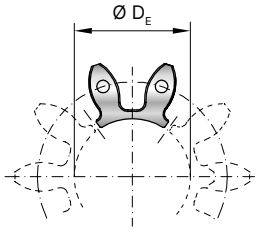
1,950 – 25,000 Nm

Feataures
- Press fit design
- Readily modified for custom dimensions
- Low backlash (keyway)

Material
- **Hubs:** GGG40
- **Elastomer:** wear resistant thermally stable TPU

Design
Two concentrically machined hubs with curved jaws, keyways, and set screws. Elastomer insert consist of 5 segments.





elastomer insert type A / B

Model EK1

Serie			2,500		4,500		9,500	
Type (Elastomer insert)			A	B	A	B	A	B
Rated torque	(Nm)	T_{KN}	1,950	2,450	5,000	6,200	10,000	12,500
Max. torque	(Nm)	T_{Kmax}	3,900	4,900	10,000	12,400	20,000	25,000
Overall length	(mm)	A	213		272		341	
Outside diameter	(mm)	B/B_1	160 / 154		225 / 190		290 / 240	
Mounting length	(mm)	C	88		113		142	
Inside diameter (pilot bored)	(mm)	D_V	28		39		49	
Inside diameter range H7	(mm)	$D_{1/2}$	30 - 95		40 - 130		50 - 170	
Inside diameter of elastomer	(mm)	D_E	80		111		145	
Set screws (DIN 916)		E	see table (depending on bore Ø)**					
Distance	(mm)	G	25		30		40	
Possible shortening length	(mm)	H	69		89		110	
Moment of inertia per hub	(10^{-3} kgm²)	J_1/J_2	40		147		480	
Approx. weight	(kg)		12.5		25		53	
Speed standard	(min^{-1})		3,500		3,000		2,000	
Speed balanced	($10^3 min^{-1}$)		10	10	8	8	6.5	6.5

For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts see pages 64.

EK2

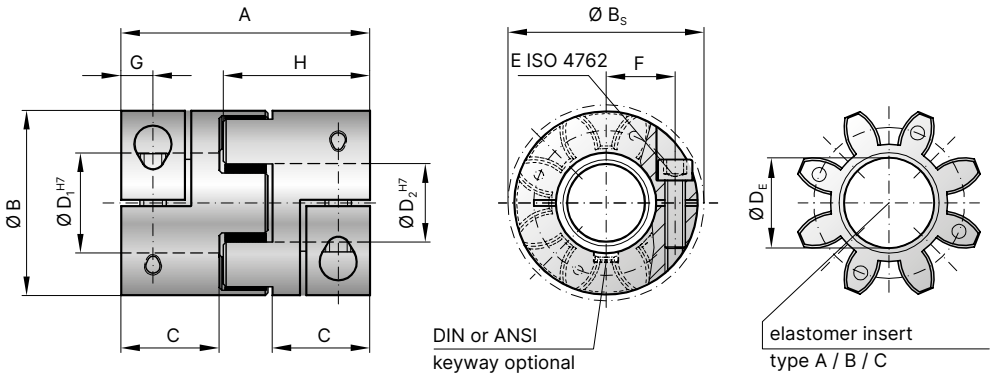
With clamping hub

6 – 2,150 Nm

Feataures
- Easy mounting
- Highly concentric assembly
- Vibration damping

Material
- **Hubs:** up to size 600 high strength aluminum; size 800 steel
- **Elastomer:** wear resistant thermally stable TPU

Design
Two concentrically machined hubs with curved jaws and clamping screws.



Model EK2

Size			20			60			150			300			400			450			600			800		
Type (Elastomer insert)			A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Rated torque	(Nm)	T_{KN}	17	21	6	60	75	20	160	200	42	325	405	84	410	520	90	530	660	95	700	840	150	950	1,100	240
Max. torque	(Nm)	T_{Kmax}	34	42	12	120	150	35	320	400	85	650	810	170	820	1,040	180	1,060	1,350	190	1,400	1,680	300	1,900	2,150	400
Overall length	(mm)	A	66			78			90			114			118			126			147			162		
Outside diameter	(mm)	B	42			56			66.5			82			95			102			120			136.5		
Outside diameter with screw head	(mm)	B_S	44.5			57			68			85			96			105			122.5			139		
Mounting length	(mm)	C	25			30			35			45			46			50			57			65		
Inside diameter range H7	(mm)	$D_{1/2}$	8 - 25			12 - 32			19 - 36			20 - 45			25-50			28 - 60			30-70			35 - 80		
Inside diameter of elastomer	(mm)	D_E	19.2			26.2			29.2			36.2			43			46.2			55			60.5		
Clamping screw (ISO 4762)		E	M5			M6			M8			M10			M12			M12			M12			M16		
Tightening torque of the clamping screw	(Nm)		8			15			35			70			120			120			120			290		
Distance between centers	(mm)	F	15.5			21			24			29			32			38			47			50.5		
Distance	(mm)	G	8.5			10			12			15			15			17.5			20			23		
Hub length	(mm)	H	39			46			52.5			66			69			73			83			93.5		
Moment of inertia per hub	(10^{-3} kgm²)	J_1/J_2	0.02			0.08			0.1			0.5			1			1.4			3.2			17		
Approx. weight	(kg)		0.2			0.35			0.6			1.1			1.5			2			3.2			12.7		
Speed standard	(min^{-1})		12,500			11,000			10,000			9,000			8,500			8,000			6,800			4,000		
Speed balanced	($10^3 min^{-1}$)		45	60	35	31	31	25	22	26	18	22	26	16	17	18	13	16	17	12	14	14	10	13	13	8

For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts see pages 64.

EKL

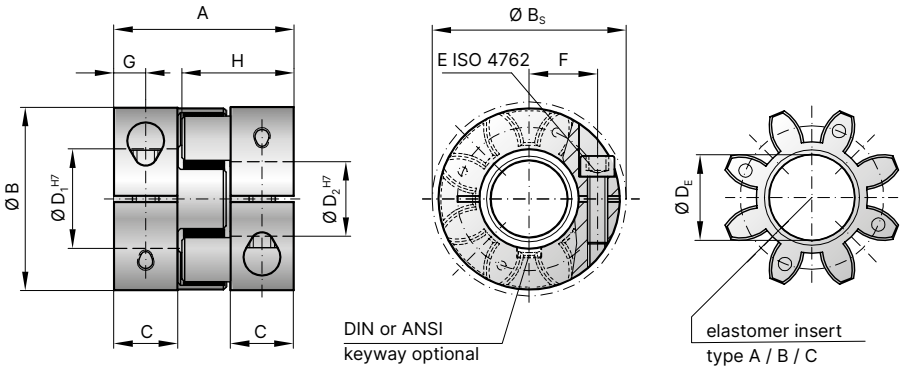
Compact version with clamping hub

0.5 – 2,150 Nm

Feataures
- Short overall length
- Easy mounting
- Vibration damping

Material
- **Hubs:** up to size 600 high strength aluminum; size 800 steel
- **Elastomer:** wear resistant thermally stable TPU

Design
Two concentrically machined hubs with curved jaws and clamping screws.



Model EKL

Size			2			5			10			20			60			150			300			400			450			600			800		
Type (Elastomer insert)			A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Rated torque	(Nm)	T_{KN}	2	2.4	0.5	9	12	2	12.5	16	4	17	21	6	60	75	20	160	200	42	325	405	84	410	520	90	530	660	95	700	840	150	950	1,100	240
Max. torque	(Nm)	T_{Kmax}	4	4.8	1	18	24	4	25	32	6	34	42	12	120	150	35	320	400	85	650	810	170	820	1,040	180	1,060	1,350	190	1,400	1,680	300	1,900	2,150	400
Overall length	(mm)	A	20			26			32			50			58			62			86			90			94			111			123		
Outside diameter	(mm)	B	16			25			32			42			56			66.5			82			95			102			120			136.5		
Outside diameter with screw head	(mm)	B_S	17			25			32			44.5			57			68			85			98			105			122			139		
Mounting length	(mm)	C	6			8			10.3			17			20			21			31			32			34			40			46		
Inside diameter range H7	(mm)	$D_{1/2}$	3 - 8			4 - 12.7			4 - 16			8 - 25			12 - 32			19 - 36			20 - 45			25 - 50			28 - 60			30 - 70			35 - 80		
Inside diameter of elastomer	(mm)	D_E	6.2			10.2			14.2			19.2			26.2			29.2			36.2			43			46.2			55			60.5		
Clamping screw (ISO 4762)		E	M2			M3			M4			M5			M6			M8			M10			M12			M12			M12			M16		
Tightening torque of the clamping screw	(Nm)		0.6			2			4			8			15			35			70			120			120			120			290		
Distance between centers	(mm)	F	5.5			8			10.5			15.5			21			24			29			33.5			38			47			50.5		
Distance	(mm)	G	3			4			5			8.5			10			11			15			16			17.5			20			23		
Hub length	(mm)	H	12			16.7			20.7			31			36			39			52			55			57			68			74		
Moment of inertia per hub	(10^{-3} kgm²)	J_1/J_2	0.0003			0.002			0.003			0.01			0.04			0.08			0.5			0.8			1.1			2.66			14		
Approx. weight	(kg)		0.008			0.02			0.05			0.12			0.3			0.5			0.9			1.1			1.5			2.5			9		
Speed standard	(min^{-1})		15,000			15,000			13,000			12,500			11,000			10,000			9,000			8,500			8,000			6,800			4,000		
Speed balanced	($10^3 min^{-1}$)		60	67	45	57	65	43	53	63	40	45	60	35	31	31	25	22	26	18	22	26	16	17	18	13	16	17	12	14	14	10	13	13	8

For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts **see pages 64.**

EKH

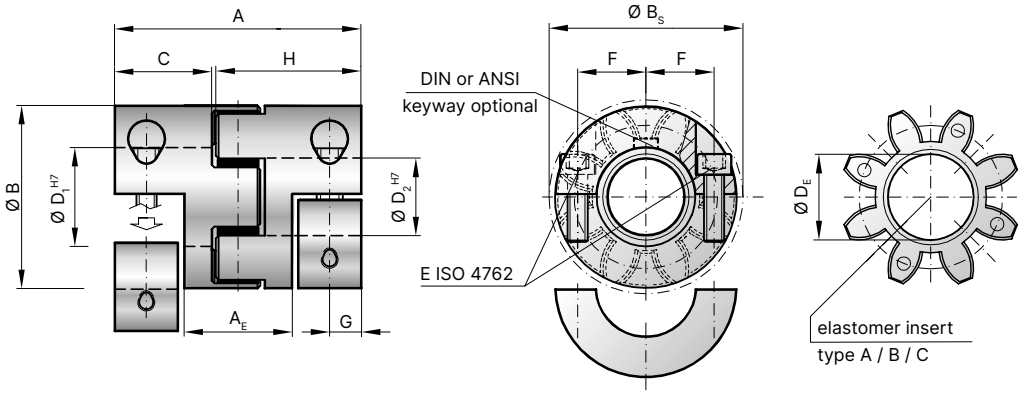
With split clamping hub

4 – 2,150 Nm

Feataures
- Lateral mounting
- Easy installation and removal
- Allows for pre-alignment of shafts

Material
- **Hubs:** up to size 600 high strength aluminum; size 800 steel
- **Elastomer:** wear resistant thermally stable TPU

Design
Two concentrically machined, fully split hubs with curved jaws and clamping screws.



Model EKH

Size			10			20			60			150			300			400			450			600			800		
Type (Elastomer insert)			A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Rated torque	(Nm)	T_{KN}	12.6	16	4	17	21	6	60	75	20	160	200	42	325	405	84	410	520	90	530	660	95	700	840	150	950	1,100	240
Max, torque	(Nm)	T_{Kmax}	25	32	6	34	42	12	120	150	35	320	400	85	650	810	170	820	1,040	180	1,060	1,350	190	1,400	1,680	300	1,900	2,150	400
Overall length	(mm)	A	53			66			78			90			114			120			126			141			162		
Length of center section	(mm)	A_E	20			28.8			34			38			50			52			52			56			65		
Outside diameter	(mm)	B	32			42			56			66.5			82			95			102			120			136.5		
Outside diameter with screw head	(mm)	B_S	32			44.5			57			68			85			98			105			122			139		
Mounting length	(mm)	C	20			25			30			35			45			47			50			55			65		
Inside diameter range H7	(mm)	$D_{1/2}$	6 - 16			8 - 25			12 - 32			19 - 36			20 - 45			25 - 50			28 - 60			30 - 70			35 - 80		
Inside diameter of elastomer	(mm)	D_E	14.2			19.2			26.2			29.2			36.2			43			46.2			55			60.5		
Clamping screw (ISO 4762)		E	4 x M4			4 x M5			4 x M6			4 x M8			4 x M10			4 x M12			4 x M12			4 x M12			4 x M16		
Tightening torque of the clamping screw	(Nm)		4			8			15			35			70			120			120			120			290		
Distance between centers	(mm)	F	10.5			15.5			21			24			29			33.5			38			47			50.5		
Distance	(mm)	G/G_1	7.5			8.5			10			12			15			16			17.5			20			23		
Hub length	(mm)	H/H_1	31			39			46			52.5			66			73			73			83			93.5		
Moment of inertia per hub	(10^{-3} kgm^2)	J_1/J_2	0.005			0.02			0.06			0.1			0.55			1.11			1.6			3.45			18.5		
Approx, weight	(kg)		0.08			0.15			0.35			0.6			1.2			1.57			2.1			3.22			14.8		
Speed standard	(min^{-1})		13,000			12,500			11,000			10,000			9,000			8,500			8,000			6,800			4,000		
Speed balanced	(10^3min^{-1})		53	63	40	45	60	35	31	31	25	22	26	18	22	26	16	17	18	13	16	17	12	14	14	10	13	13	8

For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts see pages 64.

EKH

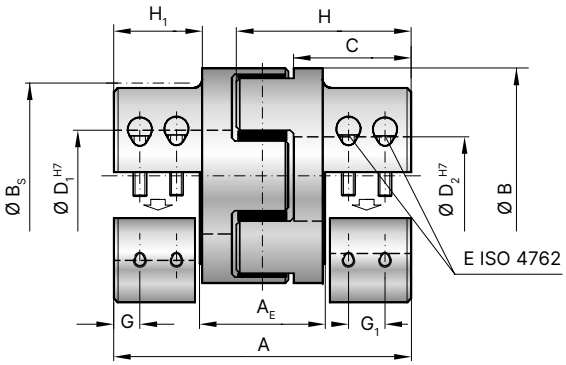
With split clamping hub

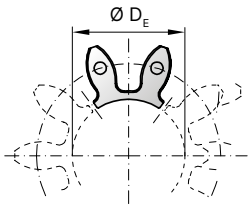
1,950 – 25,000 Nm

Feataures
- Lateral mounting
- Easy installation and removal
- Allows for pre-alignment of shafts

Material
- **Hubs:** GGG40
- **Elastomer:** wear resistant thermally stable TPU

Design
Two concentrically machined, fully split hubs with curved jaws and clamping screws. Elastomer insert consist of 5 segments.





elastomer insert type A / B

Model EKH

Size			2,500		4,500		9,500	
Type (Elastomer insert)			A	B	A	B	A	B
Rated torque	(Nm)	T_{KN}	1,950	2,450	5,000	6,200	10,000	12,500
Max. torque	(Nm)	T_{Kmax}	3,900	4,900	10,000	12,400	20,000	25,000
Overall length	(mm)	A	213		272		341	
Length of center section	(mm)	A_E	78		104		131	
Outside diameter	(mm)	B	160		225		290	
Outside diameter with screw head	(mm)	B_S	156		199		243	
Mounting length	(mm)	C	85		113		140	
Inside diameter range H7	(mm)	$D_{1/2}$	35 - 90		40 - 120		50 - 140	
Inside diameter of elastomer	(mm)	D_E	80		111		145	
Clamping screw (ISO 4762)		E	8 x M16		8 x M20		8 x M24	
Tightening torque of the clamping screw	(Nm)		300		600		1,100	
Distance between centers	(mm)	F	57		75		90	
Distance	(mm)	G/G_1	18 / 30		24 / 41		30 / 48	
Hub length	(mm)	H/H_1	120 / 69		154 / 89		193 / 110	
Moment of inertia per hub	(10^{-3} kgm²)	J_1/J_2	40		147		480	
Approx. weight	(kg)		12.5		25		53	
Speed standard	(min^{-1})		3,000		3,500		2,000	
Speed balanced	($10^3 min^{-1}$)		10	10	8	8	6.5	6.5

For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts see pages 64.

EK6

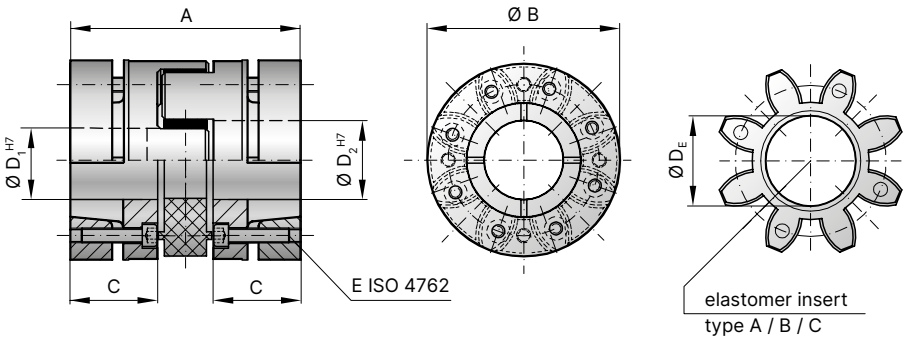
With conical clamping ring

4 – 2,150 Nm

Feataures
- High clamping pressure
- Self centering on shaft
- Very high concentricity

Material
- **Hubs:** up to size 600 high strength aluminum; size 800 steel
- **Elastomer:** wear resistant thermally stable TPU

Design
Two concentrically machined hubs with curved jaws and conical clamping rings.



Model EK6

Size			10			20			60			150			300			400			450			600			800		
Type (Elastomer insert)			A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Rated torque	(Nm)	T_{KN}	12.6	16	4	17	21	6	60	75	20	160	200	42	325	405	84	410	520	90	530	660	95	700	840	150	950	1,100	240
Max. torque	(Nm)	T_{Kmax}	25	32	6	34	42	12	120	150	35	320	400	85	650	810	170	820	1,040	180	1,060	1,350	190	1,400	1,680	300	1,900	2,150	400
Overall length	(mm)	A	42			56			64			76			96			104			110			121			138		
Outside diameter	(mm)	B/B_1	32			43			56			66.5			82			95			102			120			136.5		
Mounting length	(mm)	C	15			20			23			28			36			39			42			44.5			53		
Inside diameter range H7	(mm)	$D_{1/2}$	6 - 16			8 - 24			12 - 32			19 - 35			20 - 45			25 -50			28 - 55			30 - 70			32 - 80		
Inside diameter of elastomer	(mm)	D_E	14.2			19.2			26.2			29.2			36.2			43			46.2			55			60.5		
Clamping screw (ISO 4762)		E	3x M3			6x M4			4x M5			8x M5			8x M6			8x M8			8x M8			8x M8			8x M10		
Tightening torque of the clamping screw	(Nm)		2			3			6			7			12			20			25			35			55		
Moment of inertia per hub	(10^{-3} kgm^2)	J_1/J_2	0.004			0.015			0.05			0.1			0.3			0.8			0.85			3			9.2		
Approx. weight	(kg)		0.08			0.12			0.3			0.6			1.1			1.5			2.1			2.9			12		
Speed standard	(min^{-1})		20,000			19,000			14,000			13,000			10,000			9,500			9,000			6,800			4,000		
Speed balanced	(10^3min^{-1})		53	63	40	45	60	35	31	31	25	22	26	18	22	26	16	17	18	13	16	17	12	14	14	10	13	13	8

For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts see pages 64.

EK6

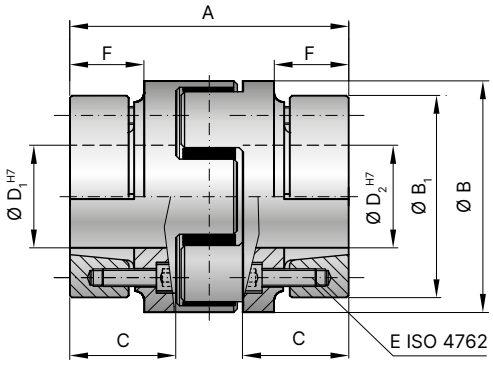
With conical clamping ring

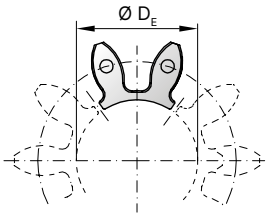
1,950 – 25,000 Nm

Feataures
- High clamping pressure
- Self centering on shaft
- Very high concentricity

Material
- **Hubs:** GGG40
- **Elastomer:** wear resistant thermally stable TPU

Design
Two concentrically machined hubs with curved jaws and conical clamping rings. Elastomer insert consist of 5 segments.





elastomer insert type A / B

Model EK6

Size			2,500		4,500		9,500	
Type (Elastomer insert)			A	B	A	B	A	B
Rated torque	(Nm)	T_{KN}	1,950	2,450	5,000	6,200	10,000	12,500
Max. torque	(Nm)	T_{Kmax}	3,900	4,900	10,000	12,400	20,000	25,000
Overall length	(mm)	A	177		227		282	
Outside diameter	(mm)	B/B_1	160 / 159		225 / 208		290 / 285	
Mounting length	(mm)	C	70		90		112	
Inside diameter range H7	(mm)	$D_{1/2}$	40 - 95		50 - 130		60 - 170	
Inside diameter of elastomer	(mm)	D_E	80		111		145	
Clamping screw (ISO 4762)		E	10x M10		10x M12		10x M16	
Tightening torque of the clamping screw	(Nm)		60		100		160	
Distance	(mm)	F	51		66		80	
Moment of inertia per hub	(10^{-3} kgm²)	J_1/J_2	31.7		135.7		469.2	
Approx. weight	(kg)		19.5		35		73	
Speed standard	(min^{-1})		3,500		3,000		2,000	
Speed balanced	($10^3 min^{-1}$)		10	10	8	8	6.5	6.5

For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts see pages 64.

SP6

High speed with conical clamping ring

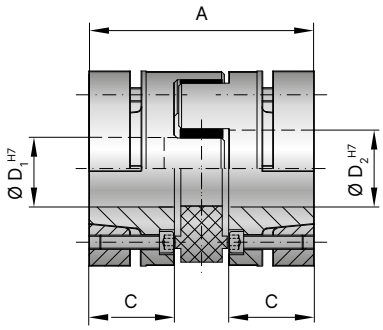
60 – 2,150 Nm

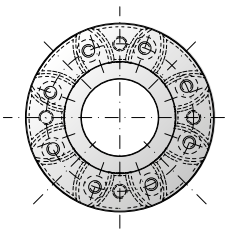
Feataures
- Very high precision
- Very high concentricity
- High clamping force
- Symmetrically machined hubs

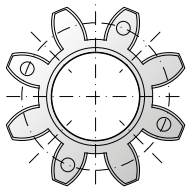
Material
- **Hubs:** high strength aluminium; optional steel
- **Clamping ring:** high strength aluminium; optional steel
- **Elastomer:** wear resistant thermally stable TPU

Design
Two precision machined hubs with curved jaws and conical clamping rings.

Fit clearance
Overall shaft / hub tolerance 0.01 - 0.025 mm







High speed

Model SP6

Size		60		150			300		400		450			600		800	
Type (Elastomer insert)		A	B	A		B	A	B	A	B	A		B	A	B	A	B
Rated torque (Nm)	T_{KN}	60	75	160		200	325	405	410	520	530		660	700	840	950	1,100
Max. torque* (Nm)	T_{Kmax}	120	150	320		400	650	810	820	1,040	1,060		1,350	1,400	1,680	1,900	2,150
Overall length (mm)	A	64	78	80	90	100	114		126		110	126	140	160		138	
Outside diameter (mm)	B	55		65			80		95		102			120		136.5	
Mounting length (mm)	C	23	30	30	35	40	45		50		42	50	57	65		53	
Inside diameter range H7 (mm)	$D_{1/2}$*	14 - 32		19 - 38			20 - 48**		25 - 50		28 - 55			35 - 70		40 - 80	
Inside diameter of elastomer (mm)	D_E	26.2		29.2			36.2		43		46.2			55		60.5	
Hub material)		AL / optional steel														steel	
Clamping screw (ISO 4762)	E	4x M5		8x M5			8x M6		8x M8		8x M8			8x M8		8x M10	
Tightening torque of the clamping screw - AL / steel (Nm)		6 / 6	7 / 7	7 / 8.5	7.5 / 8.5	8.5 / 8.5	14 / 14		23 / 30		25 / 30			30 / 35		46 / 63	
Moment of inertia per hub AL / steel (10^{-3} kgm²)	J_1/J_2	0.06 / 0.15	0.08 /0.20	0.16 /0.38	0.18 / 0.44	0.20 / 0.50	0.52 / 1.29		1.25 / 3.05		1.33 / 3.31	1.55 / 3.88	1.74 / 4.38	3.80 / 9.60		5.52 / 13.72	
Approx. weight AL / steel (kg)		0.25 / 0.62	0.32 / 0.78	0.46 / 1.10	0.53 / 1.30	0.60 / 1.43	1.00 / 2.41		1.76 / 4.17		1.70 / 4.00	1.90 / 4.70	2.20 /5.20	3.22 / 8.00		3.73/ 9.17	
Speed standard (min-1)		28,000		26,000			26,000		19,000		18,000			15,000		13,500	

For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts **see pages 64.**

* Recommended fit pairing H7 / k6; H6 / j5 (short spindle); starting at Ø55 G7 / m6
** from Ø46 to 48 with custom hub

EK7

With expanding shaft

2 – 2,150 Nm

Feataures

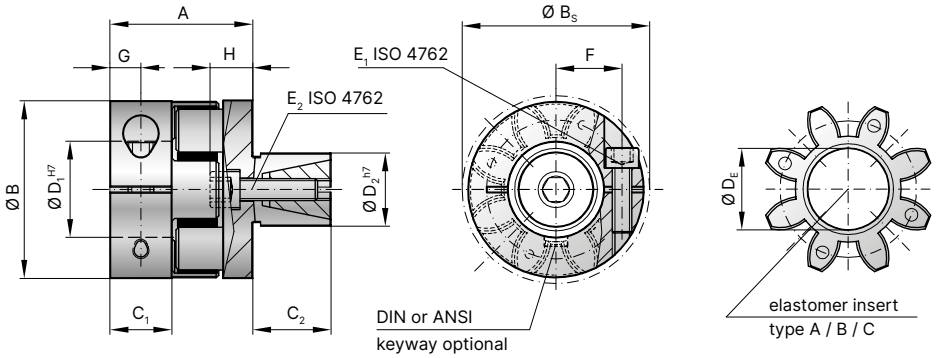
- For hollow shaft mounting
- Short overall length
- Solution for mismatched bore / shaft diameters

Material

- **Hubs:** up to size 600 high strength aluminum; size 800 steel
- **Expanding shaft hub:** steel
- **Elastomer:** wear resistant thermally stable TPU

Design

One concentrically machined hub with clamping screw and curved jaws. One concentrically machined hub with expanding shaft system and curved jaws.



Model EK7

Size			5			10			20			60			150			300			400			450			600			800		
Type (Elastomer insert)			A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Rated torque	(Nm)	T_{KN}	9	12	2	12.5	16	4	17	21	6	60	75	20	160	200	42	325	405	84	410	520	90	530	660	95	700	840	150	950	1,100	240
Max. torque	(Nm)	T_{Kmax}	18	24	4	25	32	6	34	42	12	120	150	35	320	400	85	650	810	170	820	1,040	180	1,060	1,350	190	1,400	1,680	300	1,900	2,150	400
Overall length	(mm)	A	22.3			28			40			46			51			62			74			76			88			94		
Outside diameter	(mm)	B	25			32			42			56			66.5			82			95			102			120			136.5		
Outside diameter with screw head	(mm)	B_S	25			32			44.5			57			68			85			98			105			122			139		
Mounting length	(mm)	C_1	8			10.3			17			20			21			31			32			34			40			46		
Mounting length	(mm)	C_2	12			20			25			27			32			45			50			55			55			60		
Inside diameter range H7	(mm)	D_1	4 - 12.7			5 - 16			8 - 25			12 - 32			19 - 36			20 - 45			25 - 50			28 - 60			30 - 70			35 - 80		
Outside diameter range h7	(mm)	D_2	10 - 16			13 - 25			14 - 30			23 - 38			26 - 45			38 - 60			40 - 65			42 - 70			42 - 75			42 - 80		
Inside diameter of elastomer	(mm)	D_E	10.2			14.2			19.2			26.2			29.2			36.2			43			46.2			55			60.5		
Clamping screw (ISO 4762)		E_1	M3			M4			M5			M6			M8			M10			M12			M12			M12			M16		
Tightening torque	(Nm)		2			4			8			15			35			70			120			120			120			290		
Clamping screw (ISO 4762)		E_2	M4			M5			M6			M8			M10			M12			M16			M16			M16			M16		
Tightening torque	(Nm)		4			9			12			32			60			110			240			240			240			300		
Distance between centers	(mm)	F	8			10.5			15.5			21			24			29			33.5			38			47			50.5		
Distance	(mm)	G	4			5			8.5			10			11			15			16			17.5			20			23		
Length	(mm)	H	7			7			10			11			16			20			27			27			27			27		
Moment of inertia D_1	(10^{-3} kgm²)	J_1	0.002			0.003			0.01			0.04			0.08			0.5			0.82			1.1			2.66			14		
Moment of inertia D_2	(10^{-3} kgm²)	J_2	0.002			0.01			0.04			0.1			0.2			1			1.92			2.6			4.97			9		
Approx. weight	(kg)		0.04			0.05			0.12			0.3			0.5			0.9			2.82			3.5			4.88			7.6		
Speed standard	(min^{-1})		15,000			13,000			12,500			11,000			10,000			9,000			8,500			8,000			6,800			4,000		
Speed balanced	($10^3 min^{-1}$)		57	65	43	53	63	40	45	60	35	31	31	25	22	26	18	22	26	16	17	18	13	16	17	12	14	14	10	13	13	8

For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts **see pages 64.**

EKZ

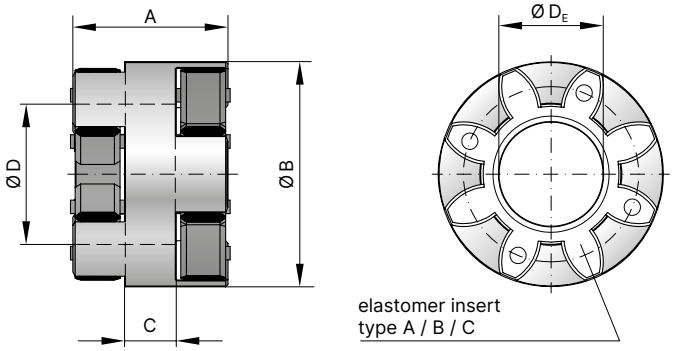
Intermediate spacer

0.5 – 2,150 Nm

Feataures
- High lateral misalignment
- Easy to mount
- Combine with any two hub designs

Material
- **Hubs:** high strength aluminum
- **Elastomer:** wear resistant thermally stable TPU

Design
A concentrically machined spacer with curved jaws. 2x elastomer segment press fit for zero backlash; standard versions are electrically isolating.



Model EKZ

Size			2			5			10			20			60			150			300			400			450			600			800		
Type (Elastomer insert)			A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Rated torque	(Nm)	T_{KN}	2	2.4	0.5	9	12	2	12.5	16	4	17	21	6	60	75	20	160	200	42	325	405	84	410	520	90	530	660	95	700	840	150	950	1,100	240
Max, torque	(Nm)	T_{Kmax}	4	4.8	1	18	24	4	25	32	6	34	42	12	120	150	35	320	400	85	650	810	170	820	1,040	180	1,060	1,350	190	1,400	1,680	300	1,900	2,150	400
Overall length	(mm)	A	20			26			30			39			48			53			62			74			86			86			81		
Outside diameter	(mm)	B	16			25			32			42			56			66.5			82			94			102			119			136.5		
Hub length	(mm)	C	9			9			9			10			16			18			20			28			40			30			25		
Inside diameter	(mm)	D	9			15			18			25			32			38			45			50			60			65			80		
Inside diameter of elastomer	(mm)	D_E	6.2			10.2			14.2			19.2			26.2			29.2			36.2			43			46.2			55			60.5		
Moment of inertia	(10^{-3} kgm²)	J_1/J_2	0.0001			0.0005			0.002			0.008			0.03			0.05			0.1			0.47			0.6			1.39			1.1		
Approx, weight	(kg)		0.007			0.02			0.04			0.09			0.21			0.33			0.58			0.675			1.38			1.24			1.24		
Speed standard	(min^{-1})		15,000			15,000			13,000			12,500			11,000			10,000			9,000			8,500			8,000			6,800			4,000		

For information on shaft misalignment, torsional stiffness, and other details about the elastomer inserts **see pages 64.**

Notes