PRECISE AND COMPACT.

SERVOMAX®
ELASTOMER COUPLINGS

SERIES EK | 2 – 2,000 Nm

R+W®
COUPLING TECHNOLOGY

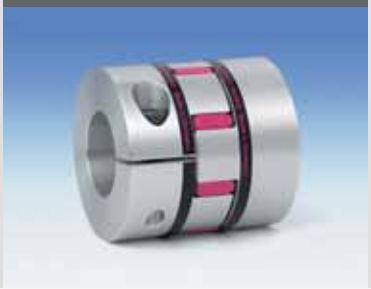
THE ULTIMATE COUPLING FROM 2 – 2,000 Nm

www.rwcouplings.com

optional stainless steel

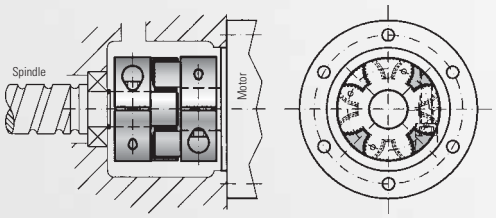
MODELS	PROPERTIES	APPLICATION EXAMPLES

EKL



with clamping hub, compact version

- short compact design
- low inertia
- easy assembly

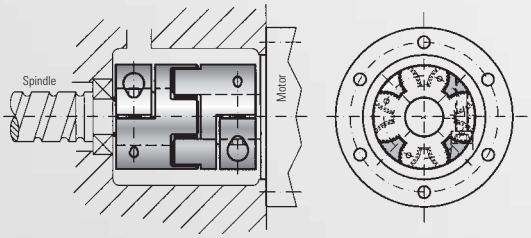


see page 6

EK2

with clamping hub

- very smooth running
- counterbalanced type
- easy assembly

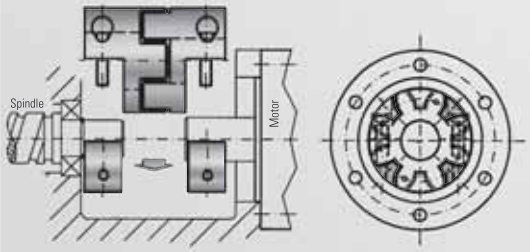


see page 7

EKH

with split clamping hubs

- easy assembly
- radial mounting, due to split clamping hubs

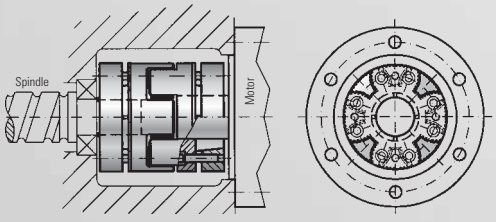


see page 8

EK6

with conical clamping ring

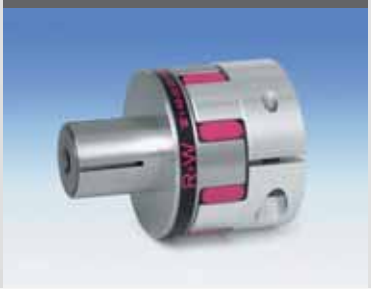
- very smooth running
- high clamping forces
- mounts axially



see page 9

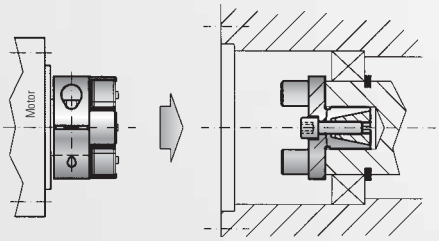
MODELS	PROPERTIES	APPLICATION EXAMPLES

EK7



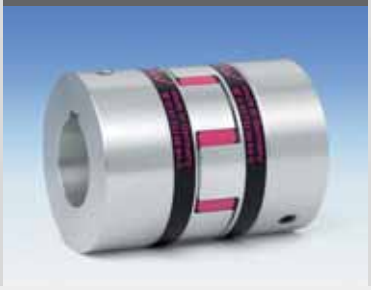
with expanding shaft

- axial hub mounting with expanding shaft
- very smooth running
- high clamping forces



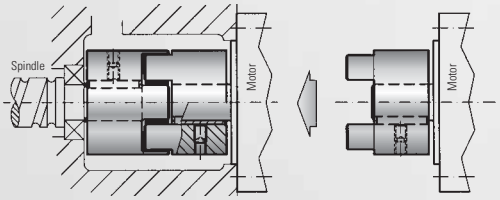
see page 10/11

EK1



with keyway-connection

- favorably priced design
- easy to modify

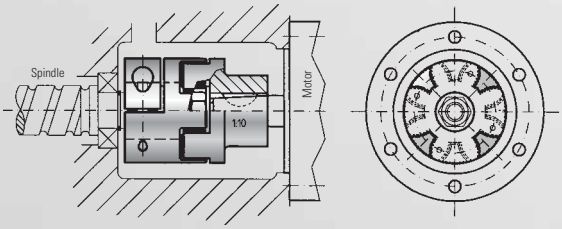


see page 12

EK4

for conical shaft ends

- for conical shaft ends e.g. Fanuc motors
- easy mounting
- conical hub mounts axially

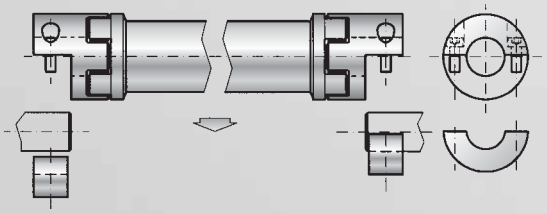


see page 13

EZ2

line shaft with split clamping hub

- radial mounting due to split hubs
- no intermediate support bearing necessary
- conical clamping hubs available
- length up to 4 m



see page 14/15

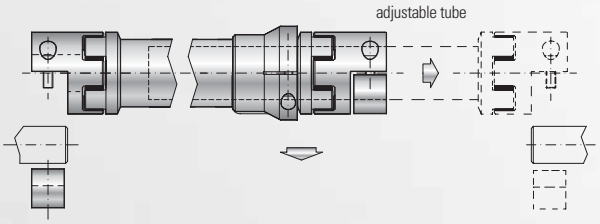
optional stainless steel

MODELS	PROPERTIES	APPLICATION EXAMPLES

EZV

Line shaft, variable in length

- flexible length
- lateral mounting due to split hubs
- no pillow block bearing necessary
- length up to 4 m

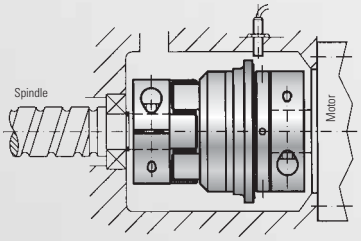


see page 16/17

ES2

torque limiter with clamping hub

- reliable torque overload protection
- backlash free due to patented R+W design
- easy to mount

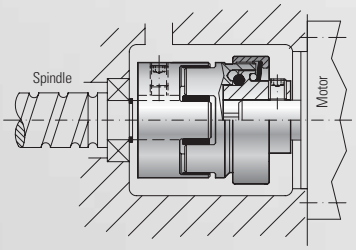


see page 18/19/20

ESL

torque limiter „Economy Class“

- low price
- compact
- multi-position



see page 21

EEx

for the use in explosive environments

- available for the full product range
- for the hazardous areas 1/21 and 2/22 the SERVOMAX EEx Elastomer couplings are registered according to the directive ATEX 95a

see page 23

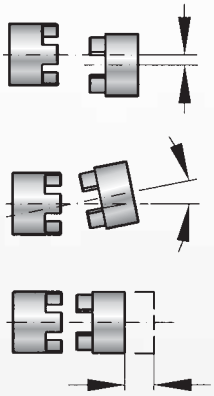
SERVOMAX® ELASTOMER COUPLINGS

Areas of application:

- Servo drives
- Machine tools
- Packaging machinery
- Plant automation
- Printing machinery
- Industrial robots
- Measurement and positioning units
- general mechanical engineering
- Linking screw jacks, linear actuaters, encoders

Properties of the product range:

- vibration damping
- electrically insulating (standard)
- backlash-free
- press-fit design
- compensation for lateral-, angular- and axial misalignment



Function

The equalizing element of an EK coupling is the elastomer insert. It transmits the torque without backlash and vibration. The elastomer insert defines the features of the entire coupling and/or of the entire drive system.

The coupling is backlash free due to pretensioning of the elastomer insert between the two coupling halves.The Servomax-Coupling compensates for lateral, angular and axial misalignment.

Type A
Shore hardness 98 Sh A

Type B
Shore hardness 64 Sh D

Type C
Shore hardness 80 Sh A

Type D*
Shore hardness 92 Sh A

Specification 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*	92 Sh A	black	TPU	0.3 - 0.45	-10°C to +70°C	electrically conductive*

* Due to the electrically conductive properties of the insert electrostatic load of the coupling is prevented. This eliminates sparks during normal operation (Explosive areas). Technical datas available.

The values of the relative damping were determined at 10 Hz and +20˚C.

Model row EK		Series																										
		2			5			10			20			60			150			300			450			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
Static torsional stiffness (Nm/rad)	C_T	50	115	17	150	350	53	260	600	90	1140	2500	520	3290	9750	1400	4970	10600	1130	12400	18000	1280	15100	27000	4120	41300	66080	10320
Dynamic torsional stiffness (Nm/rad)	C_{Tdyn}	100	230	35	300	700	106	541	1650	224	2540	4440	876	7940	11900	1350	13400	29300	3590	23700	40400	6090	55400	81200	11600	82600	180150	28600
Lateral (mm)	Max. values	0.08	0.06	0.1	0.08	0.06	0.1	0.1	0.08	0.12	0.1	0.08	0.15	0.12	0.1	0.15	0.15	0.12	0.2	0.18	0.14	0.25	0.2	0.18	0.25	0.25	0.2	0.3
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	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			±2			±2			±2			±2			±2			±2		

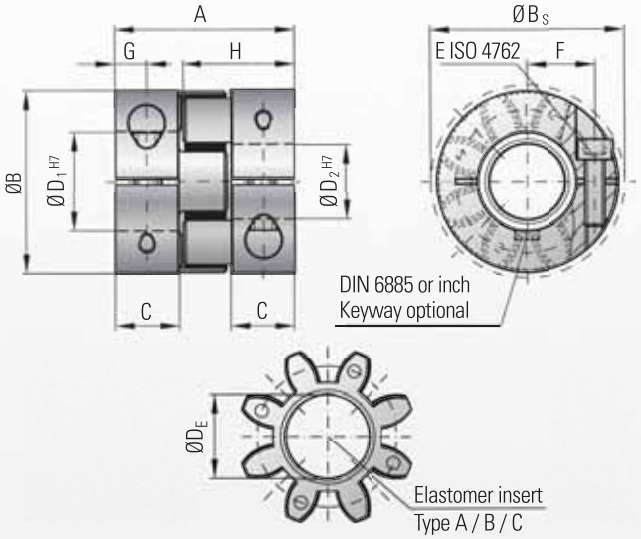
Static torsional stiffness at 50% T_{KN} Dynamic torsional stiffness at T_{KN} 1 Nm = 8.85 in lbs

optional stainless steel

MODEL **EKL**

BACKLASH FREE ELASTOMER COUPLINGS

Compact version



Properties:
- short compact design
- easy assembly
- vibration damping
- electrically insulating
- backlash-free
- press-fit design

Material: Clamping hub: up to series 450 high strength aluminum, from series 800 and up steel
Elastomer insert: precision molded, wear resistant, and thermally stable polymer

Design: Two coupling hubs are concentrically machined with concave driving jaws

***Speeds:** Over 4,000 rpm a finely balanced version is available

Tolerance: On the hub/shaft connection 0.01 to 0.05 mm

Model EKL			Series																									
			2			5			10			20			60			150			300			450			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}	2	2.4	0.5	9	12	2	12.5	16	4	17	21	6	60	75	20	160	200	42	325	405	84	530	660	95	950	1100	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	1060	1350	190	1900	2150	400
Overall length	(mm)	A	20			26			32			50			58			62			86			94			123		
Outer diameter	(mm)	B	16			25			32			42			56			66.5			82			102			136.5		
Outer diameter with screwhead	(mm)	B_S	17			25			32			44.5			57			68			85			105			139		
Mounting length	(mm)	C	6			8			10.3			17			20			21			31			34			46		
Inner diameter range H7	(mm)	$D_{1/2}$	3 - 8			4 - 12.7			4 - 16			8 - 25			12 - 32			19 - 36			20 - 45			28 - 60			35 - 80		
Inner diameter max. (elastomer)	(mm)	D_E	6.2			10.2			14.2			19.2			26.2			29.2			36.2			46.2			60.5		
Mounting Screw (ISO 4762/12.9)		E	M2			M3			M4			M5			M6			M8			M10			M12			M16		
Tightening torque of the mounting screw	(Nm)		0.6			2			4			8			15			35			70			120			290		
Distance between centers	(mm)	F	5.5			8			10.5			15.5			21			24			29			38			50.5		
Distance	(mm)	G	3			4			5			8.5			10			11			15			17.5			23		
Hub length	(mm)	H	12			16.7			20.7			31			36			39			52			57			74		
Moment of inertia per Hub	(10^{-3} kgm^2)	J_1/J_2	0.0003			0.001			0.01			0.01			0.08			0.15			0.4			1.3			7.8		
Approx. weight	(kg)		0.008			0.02			0.05			0.12			0.3			0.5			0.9			1.5			8.5		
Speed*	(rpm)		28000			22000			20000			19000			14000			11500			9500			8000			4000		

Information about static and dynamic torsional stiffness as well as max. possible misalignment see page 5

1 Nm = 8.85 in lbs

** Maximum transferable torque of the clamping hub depends on the bore diameters (bore/shaft clearance 0.01 mm to 0.05 mm shaft oiled)

Series	Ø 3	Ø 4	Ø 5	Ø 8	Ø 16	Ø 19	Ø 25	Ø 30	Ø 32	Ø 35	Ø 45	Ø 50	Ø 55	Ø 60	Ø 65	Ø 70	Ø 75	Ø 80
2	0,2	0,8	1,5	2,5														
5		1,5	2	8														
10			4	12	32													
20				20	35	45	60											
60					50	80	100	110	120									
150						120	160	180	200	220								
300						200	230	300	350	380	420							
450								420	480	510	600	660	750	850				
800										700	750	800	835	865	900	925	950	1000

Higher torque through additional key possible.

Ordering example

EKL / 60 / A / 19.05 /24 / XX

- Model
- Series
- Type Elastomer insert
- Bore Ø D1 H7
- Bore Ø D2 H7
- Non standard e.g. finely balanced

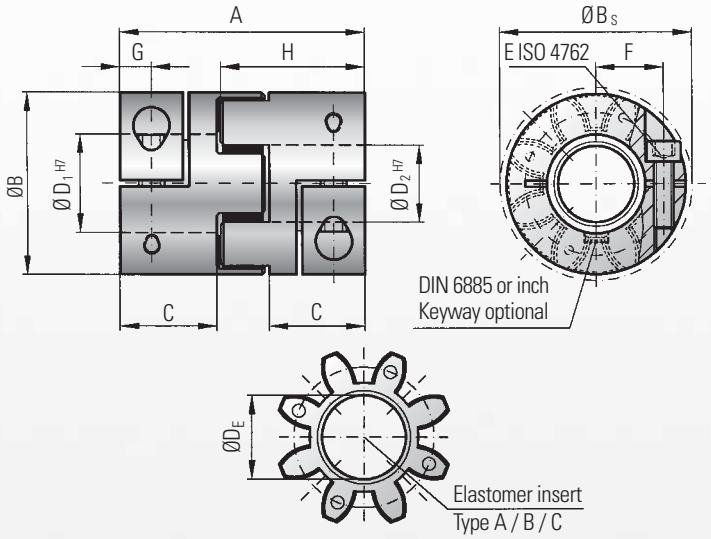
All data is subject to change without notice.

optional stainless steel

MODEL **EK2**

BACKLASH FREE ELASTOMER COUPLINGS

with clamping hubs



Properties:
- easy assembly
- concentrically machined hubs
- vibration damping
- electrically insulating
- backlash-free
- press-fit design

Material: Clamping hub: up to series 450 high strength aluminum, from series 800 and up steel
Elastomer insert: precision molded, wear resistant, and thermally stable polymer

Design: Two coupling hubs are concentrically machined with concave driving jaws

***Speeds:** Over 10,000 rpm a finely balanced version is available

Tolerance: On the hub/shaft connection 0.01 to 0.05 mm

Model EK 2			Series																	
			20			60			150			300			450			800		
Type (Elastomer insert)			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	530	660	95	950	1100	240
Max. torque**	(Nm)	T_{Kmax}	34	42	12	120	150	35	320	400	85	650	810	170	1060	1350	190	1900	2150	400
Overall length	(mm)	A	66			78			90			114			126			162		
Outer diameter	(mm)	B	42			56			66.5			82			102			136.5		
Outer diameter with screwhead	(mm)	B_S	44.5			57			68			85			105			139		
Mounting length	(mm)	C	25			30			35			45			50			65		
Inner diameter range H7	(mm)	$D_{1/2}$	8 - 25			12 - 32			19 - 36			20 - 45			28 - 60			35 - 80		
Inner diameter max. (elastomer)	(mm)	D_E	19.2			26.2			29.2			36.2			46.2			60.5		
Mounting screw (ISO 4762/12.9)		E	M5			M6			M8			M10			M12			M16		
Tightening torque of the mounting screw	(Nm)		8			15			35			70			120			290		
Distance between centers	(mm)	F	15.5			21			24			29			38			50.5		
Distance	(mm)	G	8.5			10			12			15			17.5			23		
Hub length	(mm)	H	39			46			52.5			66			73			93.5		
Moment of inertia per Hub	(10^{-3} kgm^2)	J_1/J_2	0.02			0.09			0.2			0.6			1.5			9.5		
Approx. weight	(kg)		0.15			0.35			0.6			1.1			1.7			10		
Speed*	(rpm)		19000			14000			11500			9500			8000			4000		

Information about static and dynamic torsional stiffness as well as max. possible misalignment see page 5

1 Nm = 8.85 in lbs

** Maximum transferable torque of the clamping hub depends on the bore diameters

Series	Ø 8	Ø 16	Ø 19	Ø 25	Ø 30	Ø 32	Ø 35	Ø 45	Ø 50	Ø 55	Ø 60	Ø 65	Ø 70	Ø 75	Ø 80
20	20	35	45	60											
60		50	80	100	110	120									
150			120	160	180	200	220								
300			200	230	300	350	380	420							
450					420	480	510	600	660	750	850				
800							700	750	800	835	865	900	925	950	1000

Higher torque through additional key possible.

Ordering example

EK2 / 60 / A /19.05 / 24 / XX

- Model
- Series
- Type Elastomer insert
- Bore Ø D1 H7
- Bore Ø D2 H7
- Non standard e.g. finely balanced

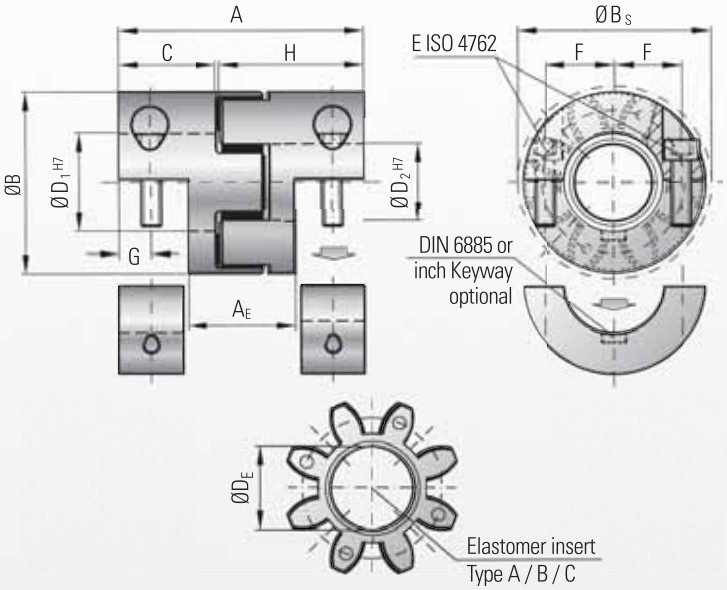
All data is subject to change without notice.

optional stainless steel

MODEL **EKH**

BACKLASH FREE ELASTOMER COUPLINGS

with split clamping hubs



Properties:
- radial mounting possible
- high concentricity
- damps vibrations
- electrical insulating
- easy mounting
- backlash-free

Material: Clamping hub: up to series 450 high strength aluminum, from series 800 and up steel
Elastomer insert: precision molded, wear resistant, and thermally stable polymer

Design: Two split coupling hubs are concentrically machined with concave driving jaws

***Speeds:** Over 10,000 rpm a finely balanced version is available

Tolerance: On the hub/shaft connection 0.01 to 0.05 mm

Model EKH			Series																	
			20			60			150			300			450			800		
Type (Elastomer insert)			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	530	660	95	950	1100	240
Max. torque**	(Nm)	T_{Kmax}	34	42	12	120	150	35	320	400	85	650	810	170	1060	1350	190	1900	2150	400
Overall length	(mm)	A	66			78			90			114			126			162		
Insertion length	(mm)	A_E	28			33			37			49			51			65		
Outer diameter	(mm)	B	42			56			66.5			82			102			136.5		
Outer diameter with screwhead	(mm)	B_S	44.5			57			68			85			105			139		
Mounting length	(mm)	C	25			30			35			45			50			65		
Inner diameter range H7	(mm)	$D_{1/2}$	8 - 25			12 - 32			19 - 36			20 - 45			28 - 60			35 - 80		
Inner diameter max. (elastomer)	(mm)	D_E	19.2			26.2			29.2			36.2			46.2			60.5		
Mounting screw (ISO 4762/12.9)		E	M5			M6			M8			M10			M12			M16		
Tightening torque of the mounting screw	(Nm)		8			15			35			70			120			290		
Distance between centers	(mm)	F	15.5			21			24			29			38			50.5		
Distance	(mm)	G	8.5			10			12			15			17.5			23		
Hub length	(mm)	H	39			46			52.5			66			73			93.5		
Moment of inertia per Hub	(10^{-3} kgm^2)	J_1/J_2	0.02			0.09			0.2			0.6			1.5			9.5		
Approx. weight	(kg)		0.15			0.35			0.6			1.1			1.7			10		
Speed*	(rpm)		19000			14000			11500			9500			8000			4000		

Information about static and dynamic torsional stiffness as well as max. possible misalignment see page 5

1 Nm = 8.85 in lbs

** Maximum transferable torque of the clamping hub depends on the bore diameters

Serie	Ø 8	Ø 16	Ø 19	Ø 25	Ø 30	Ø 32	Ø 35	Ø 45	Ø 50	Ø 55	Ø 60	Ø 65	Ø 70	Ø 75	Ø 80
20	30	40	50	65											
60		65	120	150	180	200									
150			180	240	270	300	330								
300			300	340	450	520	570	630							
450					630	720	770	900	1120	1180	1350				
800							1050	1125	1200	1300	1400	1450	1500	1550	1600

Higher torque through additional key possible.

Ordering example

EKH / 60 / A / 19.05 / 24 / XX

- Model
- Series
- Type Elastomer insert
- Bore Ø D1 H7
- Bore Ø D2 H7
- Non standard e.g. finely balanced

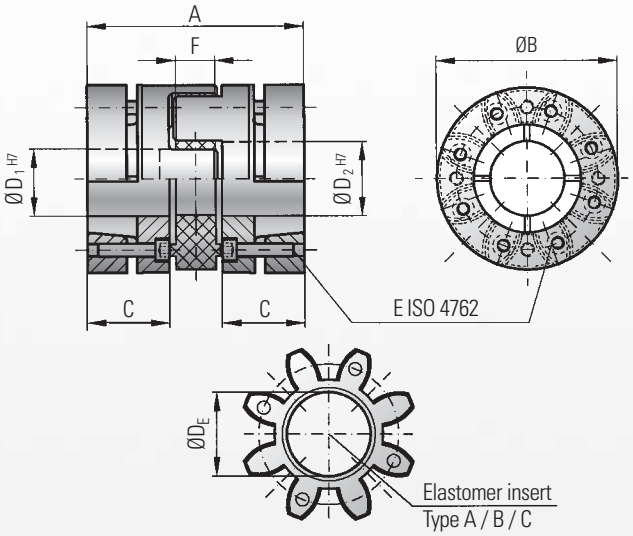
All data is subject to change without notice.

optional stainless steel

MODEL **EK6**

BACKLASH FREE ELASTOMER COUPLINGS

with conical clamping ring



Properties:

- high clamping forces
- concentrically machined
- easy mounting
- damps vibrations
- electrical insulating
- backlash-free
- press-fit design
- axial mounting possible

Material: Clamping hub and conical clamping: up to series 450 high strength aluminum, from series 800 and up steel
Elastomer insert: precision molded, wear resistant, and thermally stable polymer

Design: Two coupling hubs are concentrically machined with concave driving jaws

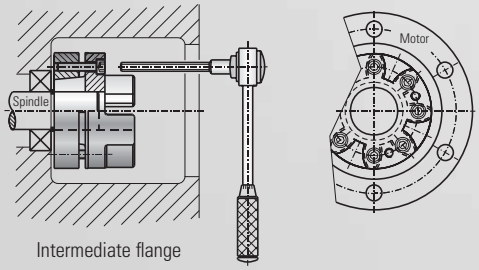
Tolerance: On the hub/shaft connection 0.01 to 0.05 mm

Model EK 6		Series																					
		10			20			60			150			300			450			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
Rated torque (Nm)	T_{KN}	12.6	16	4	17	21	6	60	75	20	160	200	42	325	405	84	530	660	95	950	1100	240
Max. torque (Nm)	T_{Kmax}	25	32	6	34	42	12	120	150	35	320	400	85	650	810	170	1060	1350	190	1900	2150	400
Overall length (mm)	A	42			56			64			76			96			110			138		
Outer diameter (mm)	B	32			43			56			66			82			102			136.5		
Mounting length (mm)	C	15			20			23			28			36			42			53		
Inner diameter range H7 (mm)	$D_{1/2}$	6 - 16			8 - 24			12 - 32			19 - 35			20 - 45			28 - 55			32 - 80		
Inner diameter max. (elastomer) (mm)	D_E	14.2			19.2			26.2			29.2			36.2			46.2			60.5		
Mounting screw (ISO 4762/12.9)	E	3x M3			6x M4			4x M5			8x M5			8x M6			8x M8			8x M10		
Tightening torque of the mounting screw (Nm)		2			3			6			7			12			35			55		
Width Elastomer insert (mm)	F	9.5			12			14			15			18			20			25		
Moment of inertia per Hub (10^{-3} kgm²)	J_1/J_2	0.01			0.015			0.08			0.15			0.4			1.3			9.2		
Approx. weight (kg)		0.08			0.12			0.3			0.5			0.9			1.5			9.6		
Speed (rpm)		20 000			19 000			14 000			11 500			9 500			8 000			4 000		

Information about static and dynamic torsional stiffness as well as max. possible misalignment see page 5

1 Nm = 8.85 in lbs

Access holes in the mounting flange are not necessary for EK 6 couplings.
The unique assembly screw design (shown below) allows for easy axial mounting and dismounting of the coupling.



Intermediate flange

Ordering example

EK6 / 60 / A / 19.05 /24 / XX

- Model
- Series
- Type Elastomer insert
- Bore Ø D1 H7
- Bore Ø D2 H7
- Non standard e.g. anodized

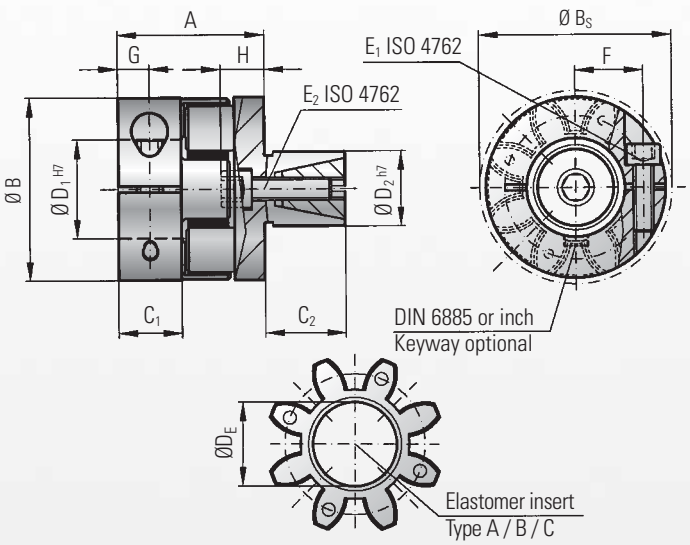
All data is subject to change without notice.

optional stainless steel

MODEL **EK7**

BACKLASH FREE ELASTOMER COUPLINGS

with expanding shaft



Properties:
- short compact design
- easy mounting
- high concentricity
- axial mounting of the expanding shaft hub
- backlash-free
- electrical insulating

Material: Clamping hub: up to series 450 high strength aluminum, from series 800 and up steel
Expanding shaft & cone: steel
Elastomer insert: precision molded, wear resistant, and thermally stable polymer

Design: Two coupling hubs are concentrically machined with concave driving jaws
One side with clamping hub and a radial screw ISO 4762
One side with an expanding shaft and tapered clamping element
Suggested bore tolerance for the shaft: H7

Speed:** Over 4,000 rpm a finely balanced version is available

Tolerance: On the hub/shaft connection 0.01 to 0.05 mm

Model EK7			Series																						
			5			10			20			60			150			300			450			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}	9	12	2	12.5	16	4	17	21	6	60	75	20	160	200	42	325	405	84	530	660	95	950	1100	240
Max. torque*	(Nm)	T_{Kmax}	18	24	4	25	32	6	34	42	12	120	150	35	320	400	85	650	810	170	1060	1350	190	1900	2150	400
Overall length	(mm)	A	22			28			40			46			51			68			76			94		
Outer diameter	(mm)	B	25			32			42			56			66.5			82			102			135		
Outer diameter with screwhead	(mm)	B_S	25			32			44.5			57			68			85			105			139		
Mounting length	(mm)	C_1	8			10.3			17			20			21			31			34			46		
Mounting length	(mm)	C_2	12			20			25			27			32			45			55			60		
Inner diameter range H7	(mm)	D_1	4 - 12.7			5 - 16			8 - 25			12 - 32			19 - 36			20 - 45			28 - 60			35 - 80		
Outer diameter range h7	(mm)	D_2	10 - 16			13 - 25			14 - 30			23 - 38			26 - 42			38 - 60			42 - 70			42 - 80		
Inner diameter max. (elastomer)	(mm)	D_E	10.2			14.2			19.2			26.2			29.2			36.2			46.2			60.5		
Mounting screw (ISO 4762/12.9)		E_1	M3			M4			M5			M6			M8			M10			M12			M16		
Tightening torque	(Nm)		2			4			8			15			35			70			120			290		
Mounting screw (ISO 4762/12.9)		E_2	M4			M5			M6			M8			M10			M12			M16			M16		
Tightening torque	(Nm)		4			9			12			32			60			110			240			300		
Distance between centers	(mm)	F	8			10.5			15.5			21			24			29			38			50.5		
Distance	(mm)	G	4			5			8.5			10			11			15			17.5			23		
Length	(mm)	H	7			7			10			11			16			20			27			27		
Moment of inertia	(10^{-3} kgm^2)		0.002			0.01			0.04			0.08			0.15			0.4			1.3			9.5		
Approx. weight	(kg)		0.04			0.05			0.12			0.3			0.5			0.9			1.5			7.6		
Speed**	(rpm)		22000			20000			19000			14000			11500			9500			8000			4000		

Information about static and dynamic torsional stiffness as well as max. possible misalignment see page 5

1 Nm = 8.85 in lbs

* Maximum transferable torque of the clamping hub depends on the bore diameters (bore/shaft clearance 0.01 mm to 0.05 mm shaft oiled)

optional stainless steel

TECHNICAL INFORMATION EK7

Series	Ø 3	Ø 4	Ø 5	Ø 8	Ø 16	Ø 19	Ø 25	Ø 30	Ø 32	Ø 35	Ø 45	Ø 50	Ø 55	Ø 60	Ø 65	Ø 70	Ø 75	Ø 80
5		1,5	2	8														
10			4	12	32													
20				20	35	45	60											
60					50	80	100	110	120									
150						120	160	180	200	220								
300						200	230	300	350	380	420							
450								420	480	510	600	660	750	850				
800										700	750	800	835	865	900	925	950	1000

Higher torque through additional keyway possible.

Ordering example

EK7 / 20 / A / 24/19.05 /XX

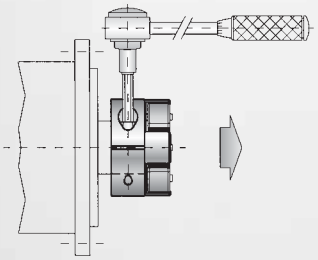
- Model
- Series
- Type Elastomer insert
- Bore Ø D1 H7
- Shaft Ø D2 h7
- Non standard e.g. finely balanced

All data is subject to change without notice.

Mounting instructions

Mounting of the clamping hub:
Slide the coupling onto the shaft end, to the correct axial position. Tighten the mounting screw to the specified tightening torque E_1.

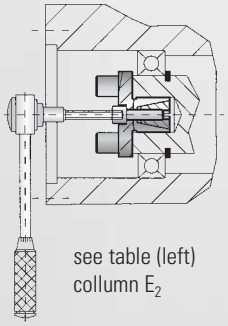
See page 16/collumn E_1.



Dismounting of the clamping hub:
For dismounting loosen the mounting screw E_1.

Mounting of the expanding shaft:
Push the shaft hub into the bore, at the right axial position thighten the mounting screw to the specified tightening torque E_2.

See page 16/collumn E_2



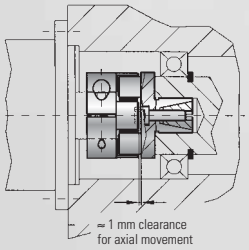
see table (left)
collumn E_2

Dismounting of the expanding shaft:
For dismounting loosen the screw E_2 a few turns.

By putting pressure on the screwhead, the inner cone slides out of its sleeve.

The shaft is now loose.

Advantage:
No access holes in the intermediate flange are neccessary in order to mount the coupling.



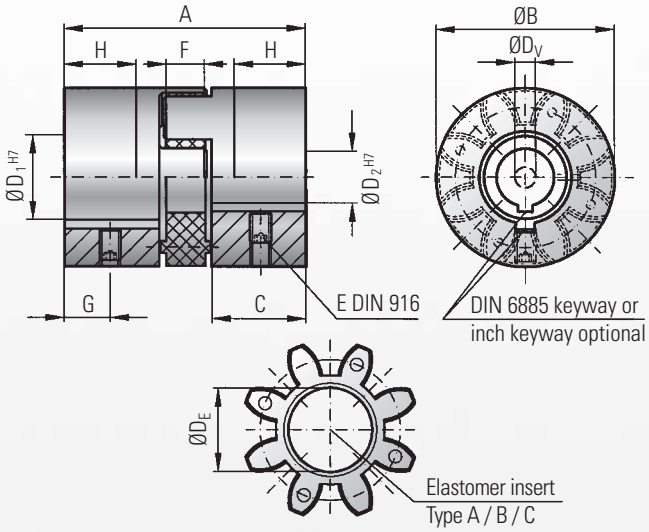
CAUTION:
The elastomer insert has to be able to axially move in order to compensate for axial mis-alignment.

optional stainless steel

MODEL **EK1**

BACKLASH FREE ELASTOMER COUPLINGS

with keyway connection



Properties:
- economically priced
- concentrically machined
- damps vibrations
- electrical insulating
- press-fit design
- low backlash, due to keyway connection

Material: Clamping hub: up to series 450 high strength aluminum, from series 800 and up steel
Elastomer insert: precision molded, wear resistant, and thermally stable polymer

Design: Two coupling hubs are concentrically machined with concave driving jaws
Bore tolerance H7 + keyway + set screw
DIN 916 or optional pilot bored (D_V)

***Speeds:** Over 10,000 rpm a finely balanced version is available

Tolerance: On the hub/shaft connection 0.01 to 0.05 mm

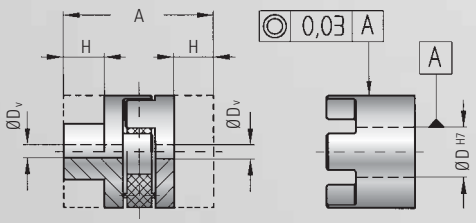
Model EK 1			Series																									
			2			5			10			20			60			150			300			450			800		
Type (Elastomer insert)			A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Rated torque	(Nm)	T_{KN}	2	2.4	0.5	9	12	2	12.5	16	4	17	21	6	60	75	20	160	200	42	325	405	84	530	660	95	950	1100	240
Max. torque	(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	1060	1350	190	1900	2150	400
Overall length	(mm)	A	20			34			35			66			78			90			114			126			162		
Outer diameter	(mm)	B	15			25			32			42			56			66.5			82			102			136.5		
Mounting length	(mm)	C	6.5			12			12			25			30			35			45			50			65		
Inner diameter pilot bored	(mm)	D_V	3			4			6			7			9			14			18			22			29		
Inner diameter range H7	(mm)	$D_{1/2}$	3 - 9			6 - 15			6 - 18			8 - 25			12 - 32			19 - 38			20 - 45			28 - 60			32 - 80		
Inner diameter max. (elastomer)	(mm)	D_E	6.2			10.2			14.2			19.2			26.2			29.2			36.2			46.2			60.5		
Set screws (DIN 916)		E	see table (depending on bore Ø)**																									
Width Elastomer insert	(mm)	F	5			8			9.5			12			14			15			18			20			25		
Distance	(mm)	G	3			5			6			9			11			12			15			17			30		
Possible shortening length	(mm)	H	4			6			6			19			22			26			32			37			43		
Moment of inertia per Hub	(10^{-3} kgm^2)	J_1/J_2	0.0003			0.001			0.01			0.02			0.09			0.2			0.6			1.5			11.4		
Approx. weight	(kg)		0.008			0.03			0.08			0.15			0.35			0.6			1.1			1.7			11		
Speed*	(rpm)		28000			22000			20000			19000			14000			11500			9500			8000			4000		

Information about static and dynamic torsional stiffness as well as max. possible misalignment see page 5

1 Nm = 8.85 in lbs

** Set screws	
D_1/D_2	E
- Ø 10	M3
Ø 11-12	M4
Ø 13-30	M5
Ø 31-58	M8
Ø 59-80	M10

Details of pilot bored coupling hubs (D_V)



It´s critical that modifications of the hub are machined concentrically and perpendicular to the through bore.

EK1 hubs can be modified to customer specifications.

The coupling hub may be shortened by measurement H.

Ordering example

EK1 / 60 / A / 19.05 /D_V / XX

- Model
- Series
- Type Elastomer insert
- Bore Ø D1 H7
- Bore Ø D2 prebored
- Non standard e.g. anodized

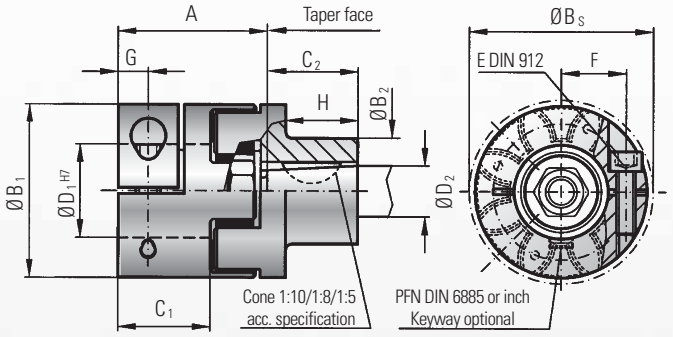
All data is subject to change without notice.

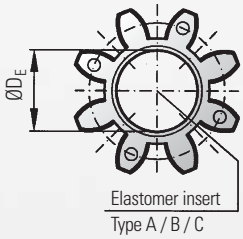
optional stainless steel

MODEL **EK4**

BACKLASH FREE ELASTOMER COUPLINGS

for conical shaft ends





Caution: The measurement C2 / M / an Ø B2 are depending on final design of the tapper shaft.

Properties:
- short compact design
- easy assembly
- high concentricity
- backlash-free
- electrically insulating

Material: Clamping hubs: high strength aluminum
Conical hub: steel
Elastomer insert: precision molded, wear resistant, and thermally stable polymer

Design: Two coupling hubs are concentrically machined with concave driving jaws
One side with clamping hub and a radial screw ISO 4762
One side with a hub conically bored with keyway according to customer equirement

Speed: Over 10,000 rpm a finely balanced version is available

Tolerance: On the hub/shaft connection 0.01 to 0.05 mm

Model EK 4			Series								
			20			60			150		
Type (Elastomer insert)			A	B	C	A	B	C	A	B	C
Rated torque	(Nm)	T_{KN}	17	21	6	60	75	20	160	200	42
Max. torque*	(Nm)	T_{Kmax}	34	42	12	120	150	35	320	400	85
Overall length	(mm)	A	42			50			57		
Outer diameter hub	(mm)	B_1	42			56			66.5		
Outer diameter conical hub	(mm)	B_2	variable			variable			variable		
Outer diameter with screwhead	(mm)	B_S	44.5			57			68		
Mounting length	(mm)	C_1	25			30			35		
Mounting length	(mm)	C_2	variable			variable			variable		
Inner diameter range H7	(mm)	D_1	8-25			12-32			19-36		
Possible conical diameter	(mm)	D_2	Acc. to customer requirement								
Inner diameter max (elastomer)	(mm)	D_E	19.2			26.2			29.2		
Mounting screw (ISO 4762/12.9)		E_1	M5			M6			M8		
Tightening torque of the mounting screw	(Nm)		8			15			35		
Distance between centers	(mm)	F	15.5			21			24		
Distance	(mm)	G	8.5			10			12		
Length	(mm)	H	variable			variable			variable		

Information about static and dynamic torsional stiffness as well as max. possible misalignment see page 5

1 Nm = 8.85 in lbs

** Maximum transferable torque of the clamping hub depends on the bore diameters (bore/shaft clearance 0.01 mm to 0.05 mm shaft oiled)

Series	Ø 8	Ø 16	Ø 19	Ø 25	Ø 30	Ø 32	Ø 35
20	20	35	45	60			
60		50	80	100	110	120	
150			120	160	180	200	220

Higher torque through additional key possible.

Ordering example

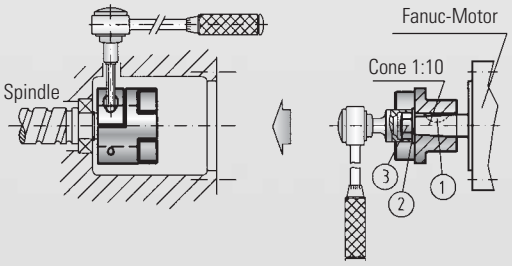
EK4 / 20 / A / 24 / 1:10 Ø11 / XX

- Model
- Series
- Type Elastomer insert
- Bore Ø D1 H7
- Cone/ Ø D2
- Non standard e.g. finely balanced

All data is subject to change without notice.

Installation instruction

Mounting of the clamping hub: Slide the coupling on the shaft ends, at the right axial position thighten the mounting screw to the specified tightening torque as shown in the table (column E1).



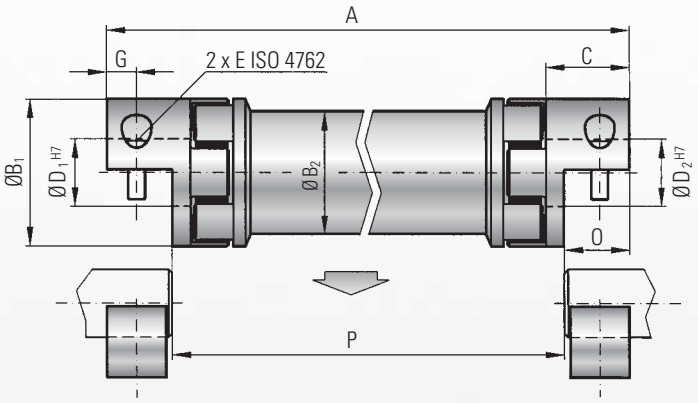
Mounting of the conical hub: After inserting the key into the key-way of the motor shaft slide the coupling hub on the shaft. Check if the conical hub has a proper seat on the shaft. Now the nut (3) can be tightened on the motor shaft using the exact tightening torque specified by the motor manufacturer.

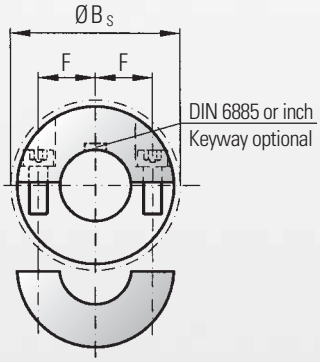
optional stainless steel

MODEL **EZ2**

BACKLASH FREE LINE SHAFTS

with split clamping hubs





Properties:

- radial mounting possible with split hubs
- Spans distances of up to 4 m
- No intermediate support bearing required
- Low moment of inertia
- damps vibrations
- press-fit design
- backlash-free

Material:

Clamping hub: up to series 450 high strength aluminum, from series 800 and up steel
Elastomer insert: precision molded, wear resistant, and thermally stable polymer
Intermediate tube: precision machined aluminum tube; **steel and composite tubes are also available**

Design:

Two coupling hubs are concentrically machined with concave driving jaws
Elastomer inserts are available in type A or B
The two coupling elements are connected with a precise and concentrically machined aluminum tube

Speed:

Please advise the application speed when ordering or inquiring about EZ Line shafts

Tolerance:

On the hub/shaft connection 0.01 to 0.05 mm

Torsional stiffness:

To optimize the application different elastomer inserts with different shore hardnesses are available

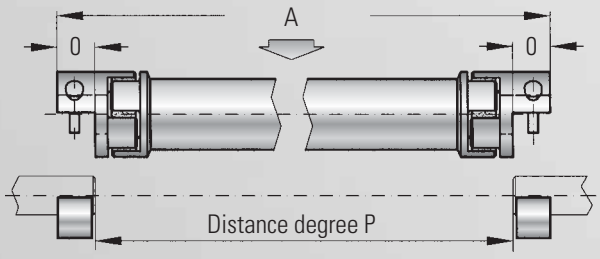
Ordering example

EZ2 / 020 / 1200 / A / 24 / 19.05 / XX

- EZ2 — Model
- 020 — Series
- 1200 — Overall length
- A — Type Elastomer insert
- 24 — Bore Ø D1 H7
- 19.05 — Bore Ø D2 H7
- XX — Non standard e.g. finely balanced

All data is subject to change without notice.

Assembly instructions



The total length of the axis is defined by the distance P + 2x0.

R+W calculation program

With specially developed sofware R+W can calculate the critical resonant speeds for each application.

Results of a calculation are shown below.

The critical speed can be altered by changing the tube material and/or other parameters.

Critical resonant speed	n_k	=	1/min.
Torsional stiffness tube	C_T^{ZWR}	=	Nm/rad
Total stiffness EZ 2	C_{Tdyn}^{EZ}	=	Nm/rad
Torsional deflection	φ	=	Degree-Min-Sec
Weight of total axes	m	=	kg
Critical resonance speed	n_e	=	1/min
Mass moment of inertia	J	=	kgm²
Permissible lateral misalignment	Δ Kr	=	mm

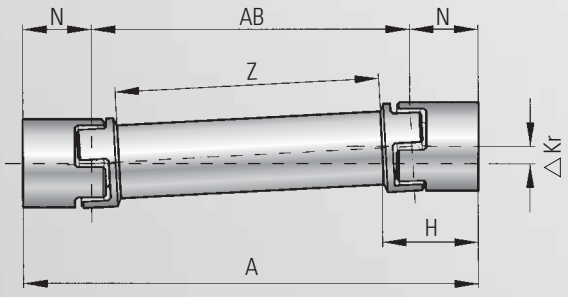
optional stainless steel

Model EZ 2		Series													
		10		20		60		150		300		450		800	
Type (Elastomer insert)		A	B	A	B	A	B	A	B	A	B	A	B	A	B
Rated torque (Nm)	T_{KN}	12,5	16	17	21	60	75	160	200	325	405	530	660	950	1100
Max. torque** (Nm)	T_{Kmax}	25	32	34	42	120	150	320	400	650	810	1060	1350	1900	2150
Overall length (mm)	A	95 - 4000		130 - 4000		175 - 4000		200 - 4000		245 - 4000		280 - 4000		320 - 4000	
Outer diameter hub (mm)	B_1	32		42		56		66.5		82		102		136.5	
Outer diameter tube (mm)	B_2	28		35		50		60		76		90		120	
Outer diameter with screwhead (mm)	B_S	32		44.5		57		68		85		105		139	
Fit length (mm)	C	20		25		40		47		55		65		79	
Inner diameter range H7 (mm)	$D_{1/2}$	5 - 16		8 - 25		14 - 32		19 - 36		19 - 45		24 - 60		35 - 80	
Mounting screw (ISO 4762/12.9)	E	M4		M5		M6		M8		M10		M12		M16	
Tightening torque of the mounting screw (Nm)		4		8		15		35		70		120		290	
Distance between centers (mm)	F	10.5		15.5		21		24		29		38		50.5	
Distance (mm)	G	7.5		8.5		15		17.5		20		25		30	
Mounting length (mm)	O	16.6		18.6		32		37		42		52		62	
Moment of inertia per Hub half (10^{-3} kgm^2)	J_1/J_2	0.01		0.02		0.15		0.21		1.02		2.3		17	
Inertia of tube per meter (10^{-3} kgm^2)	J_3	0.075		0.183		0.66		1.18		2.48		10.6		38	
Dynamic torsional stiffness of the couplings (Nm/rad)	C_{Tdyn}^{E}	270	825	1270	2220	3970	5950	6700	14650	11850	20200	27700	40600	41300	90000
Torsional stiffness of tube per meter (Nm/rad)	C_T^{ZWR}	321		1530		6632		11810		20230		65340		392800	
Distance between centers (mm)	N	26		33		49		57		67		78		94	
Length of the couplings (mm)	H	34		46		63		73		86		99		125	

** Max. transferable torque of the clamping hub see EKH (page 8) 1 Nm = 8.85 in lbs

The selection process for Servo-Insert-Couplings EZ 2

A	Overall length	m	C_{Tdyn}^{E}	Dynamic torsional stiffness of both elastomer inserts	Nm/rad	H	Length of the coupling	mm
AB	Length AB = (A – 2xN)	m	C_T^{ZWR}	Torsional stiffness of tube per meter	Nm/rad	N	Distance between center lines	mm
Z	Tube length Z = (A – 2xH)	m	C_{Tdyn}^{EZ}	Torsional stiffness of entire coupling	Nm/rad	M_{max}	Max. torque	Nm
						φ	Angle of twist	degree



According to torsional stiffness

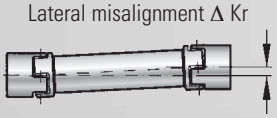
$$C_{Tdyn}^{EZ} = \frac{C_{Tdyn}^{E} \times (C_T^{ZWR}/Z)}{C_{Tdyn}^{E} + (C_T^{ZWR}/Z)} \text{ (Nm/rad)}$$

According to angle of twist

$$\varphi = \frac{180 \times M_{max}}{\pi \times C_{Tdyn}^{EZ}} \text{ (degree)}$$

Max. possible misalignments

Lateral misalignment Δ Kr

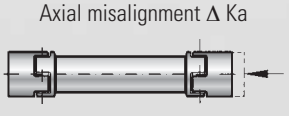


$$\Delta Kr_{max} = \tan \Delta \frac{Kw}{2} \cdot AB$$
$$AB = A - 2xN$$

Angular misalignment Δ Kw

$$\Delta Kw_{max} = \text{ca. } 2°$$

Axial misalignment Δ Ka

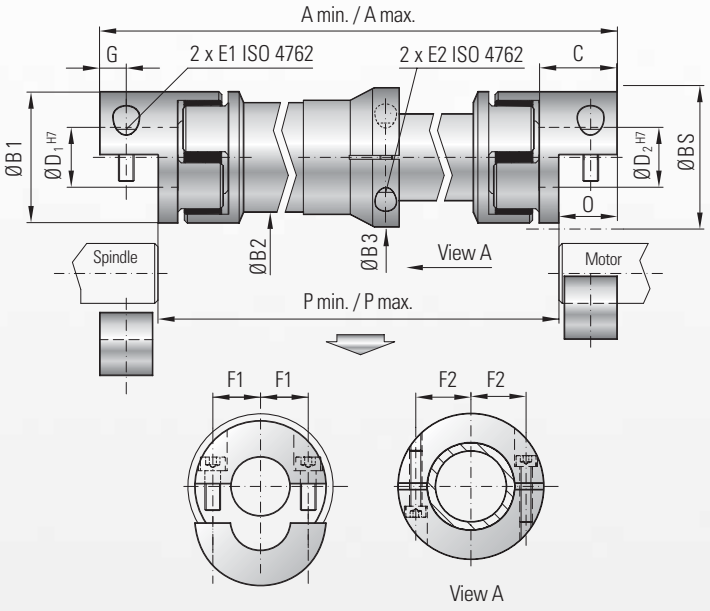


$$\Delta Ka_{max} = \text{ca. } \pm 2$$

MODEL **EZV**

BACKLASH FREE LINE SHAFTS

variable length



Properties:

- Lateral mounting due to split hubs
- Spans distances of up to 4 m
- Low moment of inertia
- Vibration damping
- Press fit designs
- Backlash free Line Shaft

Material:

Clamping hub: high strength aluminum.
Elastomer insert: precision molded wear resistant, and thermally stable polymer.
Intermediate tubes: precision machined aluminum tube, steel or composite tube are upon request available.

Design:

Two split coupling hubs are concentrically machined with concave driving jaws.
Both coupling bodies are solid joint by two tubes with high concentricity. While loosening the tube clamping, a length variation is possible within the given range. Elastomer inserts are available in type A or B.

Speed:

To control the critical resonant speed please advise the application speed when ordering or inquiring about EZ Line Shafts.

Tolerance:

On the hub/shaft connection 0.01 to 0.05 mm.

Torsional stiffness:

To optimize the application different elastomer inserts with different shore values are available

Ordering example

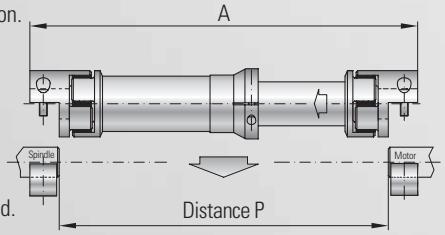
EZV / 020 / 1200 / A / 24 / 19 / XX

- EZV — Model
- 020 — Series
- 1200 — inserted min. length
- A — Type Elastomer insert
- 24 — Bore Ø D1 H7
- 19 — Bore Ø D2 H7
- XX — Non standard e.g. finely balanced

All data is subject to change without notice.

Assembly instructions

After loosening the clamping screws E2, the axial moveable tube can be adjusted to the proper position. After reaching the axial position, the clamping bolts must be fastened under notification of the given tightning torque. A high concentricity of the line shaft is guaranteed.



R+W calculation program

With specially developed sofware R+W can calculate the critical resonant speeds for each application.

Results of a calculation are shown below.

The critical speed can be altered by changing the tube material and/or other parameters.

Critical resonant speed	n_k	=	1/min.
Torsional stiffness tube	C_T^{ZWR}	=	Nm/rad
Total stiffness EZV	C_{Tdyn}^{EZ}	=	Nm/rad
Torsional deflection	φ	=	Degree-Min-Sec
Weight of total axes	m	=	kg
Critical resonance speed	n_e	=	1/min
Mass moment of inertia	J	=	kgm²
Permissible lateral misalignment	Δ Kr	=	mm

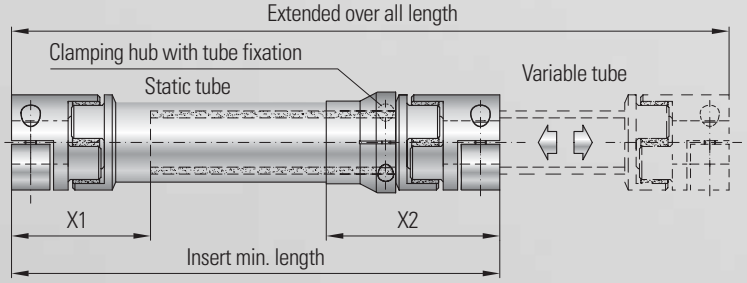
Model EZV			Series											
			10		20		60		150		300		450	
Type (Elastomer insert)			A	B	A	B	A	B	A	B	A	B	A	B
Rated torque	(Nm)	T_{KN}	12.5	16	17	21	60	75	160	200	325	405	530	660
Max. torque**	(Nm)	T_{Kmax}	25	32	34	42	120	150	320	400	650	810	1060	1200
Inserted min. length from - to	(mm)	A_{min}	150 to 2055		200 to 2075		250 to 2095		300 to 2115		350 to 2130		400 to 2150	
Extended over all length from - to	(mm)	A_{max}	190 to 4000		250 to 4000		310 to 4000		370 to 4000		440 to 4000		500 to 4000	
Measurement	(mm)	X1+X2	110		150		190		230		270		300	
Outer diameter hub	(mm)	B_1	32		42		56		66,5		82		102	
Outer diameter tube	(mm)	B_2	28		35		50		60		80		90	
Outer diameter middle hub	(mm)	B_3	41,5		47		67		77		102		115	
Outer diameter with screwhead	(mm)	B_S	32		44,5		57		68		85		105	
Fit length	(mm)	C	20		25		40		47		55		65	
Inner diameter possible from Ø to Ø H7	(mm)	$D_{1/2}$	5 to 16		8 to 25		14 to 32		19 to 35		19 to 45		24 to 60	
Screw (ISO 4762/12.9)		E_1	M4		M5		M6		M8		M10		M12	
Tighting torque of the mounting screw(Nm)			4		8		15		35		70		120	
Screw (ISO 4762/12.9)		E_2	M4		M4		M5		M6		M8		M10	
Tighting torque of the mounting screw(Nm)			4		4,5		8		18		35		70	
Distance between centers	(mm)	F_1	10,5		15,5		21		24		29		38	
Distance between centers	(mm)	F_2	15		18		26		31		41		45	
Distance	(mm)	G	7,5		8,5		15		17,5		20		25	
Mounting length	(mm)	O	16,6		18,6		32		37		42		52	
Moment of inertia coupling half	(10^{-3} kgm^2)	J_1/J_2	0,01		0,02		0,15		0,21		1,02		2,3	
Inertia of tube per meter	(10^{-3} kgm^2)	J_3	0,075		0,183		0,66		1,18		2,48		10,6	
Dynamic torsional stiffness of coupling hubs	(Nm/rad)	$C_{Tdyn}{}^E$	270	825	1270	2220	3970	5950	6700	14650	11850	20200	27700	40600
Torsional stiffness of tube per meter	(Nm/rad)	$C_T{}^{ZWR}$	321		1530		6632		11810		20230		65340	
Distance between centers	(mm)	N	26		33		49		57		67		78	
Length of the couplings	(mm)	H	34		46		63		73		86		99	

** (Max. transferable torque of the clamping hub see Elastomer Coupling EKH (Page 8))

1 Nm = 8.85 in lbs

Function

Extended all over length = Inserted min. length x 2 - Measurement (X1 + X2)



$$\textbf{Inserted min. length} = \frac{(\text{Extended all over length} + \text{Measurement (X1+ X2)})}{2}$$

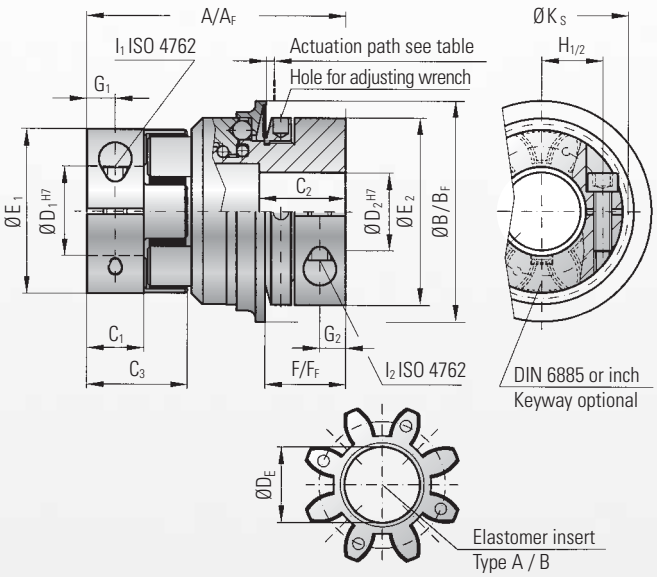
The extended over all length and the inserted min. length are related on engineering aspects and design. Depending on the requirements, the coupling can be calculated while using the here shown two formulas to receive its min. and max. dimensions. For Information regarding the design under considerarion of axial-, angular-, and lateral torsional stiffness of the EZV, refer to page 15.

optional stainless steel

MODEL **ES2**

BACKLASH FREE TORQUE LIMITERS

with clamping hubs



Properties:

- reliable torque overload protection
- short compact design
- backlash-free due to patented R+W design
- disengagement within msecs.
- large actuatuion path when disengaging
- electrically insulating
- press-fit design

Material:

Torque limiter: high strength hardened steel with rust protected surface (oxidized)
Clamping hub D_1: up to series 450 high strength aluminum, from series 800 and up steel
Clamping hub D_2: up to series 60 high strength aluminum, from series 150 and up steel
Elastomer insert: precision molded, wear resistant, and thermally stable polymer

Design:

Two coupling hubs are concentrically machined with concave driving jaws
One side with an integrated torque limiter
The torque limiter is available in single position, multi position or full-disengagement versions.

Tolerance:

On the hub/shaft connection 0.01 to 0.05 mm

For table see right page.

W = single position re-engagement

- After the overload has been eliminated, the coupling will automatically reengage precisely 360° from the original disengagement position
- Achivement of the precise synchronus re-engagement due to patented R+W design
- Signal at overload with mechanical switch or proximity sensor

D = Multi position re-engagement

- Coupling re-engages at multiple set angular intervals.
- Immediate availability of the machine as soon as the overload has been eliminated.
- Signal at overload with mechanical switch or proximity sensor
- Standard engagement every 60°
- Engagement at 30, 45, 90 and 120 degrees are optional.

F = Full disengagement

- Permanent separation of drive and driven loads in the event of a torque overload.
- No residual friction
- Signal at overload
- Rotating elements slow down freely
- Coupling can be re-engaged manually (Engagement every 60°)

Ordering example

ES2 / 10 / A / W / 14 /12.7/ 8 /4-12 / XX

- Model
- Series
- Type Elastomer insert
- Function system (see page 14)
- Bore Ø D1 H7
- Bore Ø D2 H7
- Disengagement torque
- Adjustable range
- Non standard e.g. VA-Material

All data is subject to change without notice.

The selection of torque limiters

In general the torque limiters are sized according to the necessary disengagement torque. This torque must exceed the nominal torque of the application.

For more information see page 22.

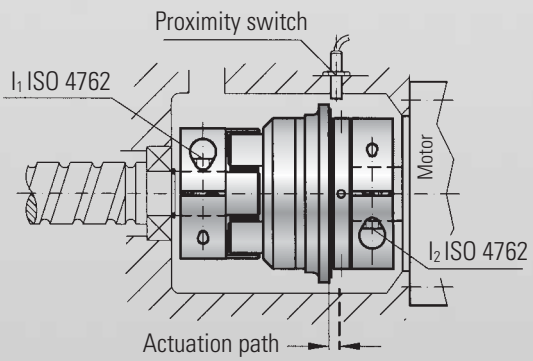
optional stainless steel

Model ES 2		Series						
		10	20	60	150	300	450	800
Adjustment range possible from -to (approx. values) (Nm)	T_{KN}	2 - 6 or 4 - 12	10 - 25 or 20 - 40	10 - 30 or 25 - 80	20-70 45-150 80-180	100 - 200 150 - 240 200 - 320	80 - 200 200 - 350 300 - 500	400 - 650 500 - 800 600 - 900
Adjustment range (full disengagement) possible from -to (approx. values) (Nm)	T_{KN}^F	2-5 or 5-10	8 - 20 or 16 - 30	20 - 40 or 30 - 60	20-60 40-80 80-150	120 - 180 or 180 - 300	60 - 150 100 - 300 250 - 500	200 - 400 or 450 - 800
Overall length (mm)	A	60	86	96	106	140	164	179
Overall length (full disengagement) (mm)	A_F	60	86	96	108	143	168	190
Outer diameter of actuation ring (mm)	B	45	65	73	92	120	135	152
Outer diameter of actuation ring (mm)	B_F	51.5	70	83	98	132	155	177
Fit length (mm)	C_1	10.3	17	20	21	31	34	46
Fit length (mm)	C_2	16	27	31	35	42	51	45
Length of hub (mm)	C_3	20.7	31	36	39	52	57	74
Inner diameter from Ø to Ø H7 (mm)	D_1	5 - 16	8 - 25	12 - 32	19 - 36	20 - 45	28 - 60	35 - 80
Inner diameter from Ø to Ø H7 (mm)	D_2	6 - 20	12 - 30	15 - 32	19 - 42	30 - 60	35 - 60	40 - 75
Diameter of the hub (mm)	E_1	32	42	56	66.5	82	102	136.5
Diameter of the hub (mm)	E_2	40	55	66	81	110	123	132
Distance (mm)	F	17	24	30	31	35	45	50
Distance full disengagement (mm)	F_F	16	22	29	30	35	43	54
Distance (mm)	G_1	5	8.5	10	11	15	17.5	23
Distance (mm)	G_2	5	7.5	9.5	11	13	17	18
Distance between centers (mm)	H_1	10.5	15	21	24	29	38	50.5
Screws (ISO 4762/12.9)	I_1	M4	M5	M6	M8	M10	M12	M16
Tightening torque of the mounting screw (Nm)	I_1	4	8	15	35	70	120	290
Distance between centers SK-side (mm)	H_2	15	19	23	27	39	41	48
Screws (ISO 4762/12.9)	I_2	M4	M6	M8	M10	M12	M16	2x M16
Tightening torque of the mounting screw (Nm)	I_2	4.5	15	40	70	130	200	250
Diameter with screwhead (mm)	K_S	32	44.5	57	68	85	105	139
Approx. weight (kg)		0.3	0.6	1.0	2.4	5.8	9.3	14.3
Moment of inertia (10^{-3} kgm^2)	J_{ges}	0.06	0.25	0.7	2.3	11	22	33.5
Actuation path (mm)		1.2	1.5	1.7	1.9	2.2	2.2	2.2
Type (Elastomer insert)		A B	A B	A B	A B	A B	A B	A B
Inner diameter (Elastomer insert) (mm)	D_E	14.2	19.2	27.2	30.2	38.2	46.2	60.5

Information about static and dynamic torsional stiffness as well as max. possible misalignment see page 5

1 Nm = 8.85 in lbs

Mounting instructions



Mounting: Slide the coupling on the shaft ends to the proper axial position. Using a torque wrench, tighten the clamp screws to the correct tightening torque as indicated (in the table page 12)

CAUTION! Both clamping hubs have different screws and different tightening torques.

Dismounting: Simply loosen the clamp screw I1, I2 and remove the safety coupling.

Emergency cut off: The axial path of the actuation ring activates the mechanical switch or the proximity sensor .

CAUTION! Upon assembly, it is absolutely necessary to test the function of the switch 100%

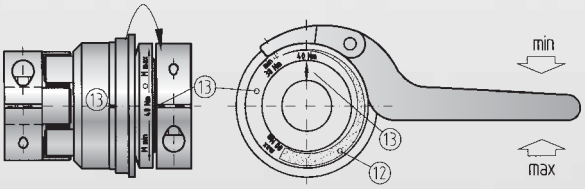
optional stainless steel

FUNCTION SYSTEMS ES2

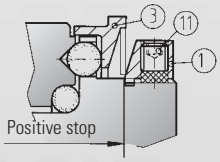
R+W torque limiting couplings are ball detent style overload couplings. They protect drive and driven mechanical components from damage associated with torque overloads.

- Backlash free torque transmission is accomplished by a series of steel balls (4) nested in hardened detents (5).
- Disc springs push against an actuation ring (3) keeping the balls nested.
- The disengagement torque is adjustable by means of an adjustment nut (1).
- In the event of an overload, the actuation ring (3) moves axially allowing the balls to come of the detents separating the drive and driven elements.
- The movement of the actuation ring (3) can be sensed by means of a mechanical switch or proximity sensor (6) triggering the drive to shut down.

Disengagement torque setting



On ES 2 couplings, the slot of the clamping hub serves as a reference point (13).

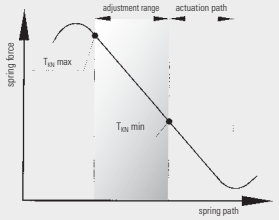


1 adjustment nut
11 locking screw
3 steel actuation ring
12 adjustment range
13 marking

R+W torque limiters are factory set to the customer specified disengagement torque, which is marked on the coupling. The adjustment range (min/max) is also marked on the adjustment nut (1).
The customer can adjust the disengagement torque as long as it is in the range (12) indicated on the adjustment nut.

The adjustment range must not be exceeded while re-adjusting.

To adjust the disengagement torque, loosen the locking screws (11) and rotate the adjustment ring using a spanner wrench to the desired new setting. Tighten the 3 locking screws (11) and test the coupling.

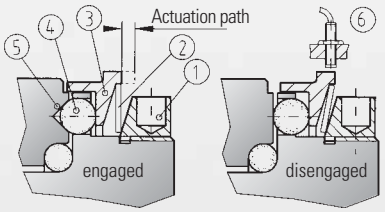


CAUTION:

R+W torque limiters incorporate disc springs that exhibit a special spring characteristic. It is important to stay in the max-min range of the coupling.

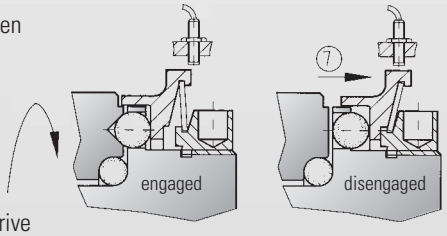
Single-position / Multi-position

In a torque overload, with the single-position design (standard) and multi-position design, the spring disengages to allow the balls to come out of their detents, separating the drive and driven elements. Very low residual spring pressure remains so that the coupling will re-engage once the torque is reduced below the overload setting.



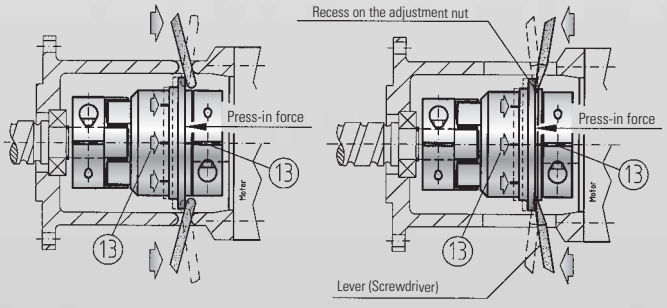
Full-disengage

With this design, when a torque overload is detected, the disc spring completely flips over and places no residual spring pressure on the actuation ring. The drive and driven elements are completely separated.



Re-engagement of the coupling is not automatic and must be performed manually (Picture 3a, 3b).

CAUTION:
Re-engagment should only be performed when the coupling stands still and not rotating!



Picture 3a **Picture 3b**

The R+W full-disengage torque limiting coupling can be re-engaged in six different positions or every 60 degrees with low „press-in" force (E). Marks on the actuation ring and body (13) of the coupling must line up and indicate the re-engagement points.

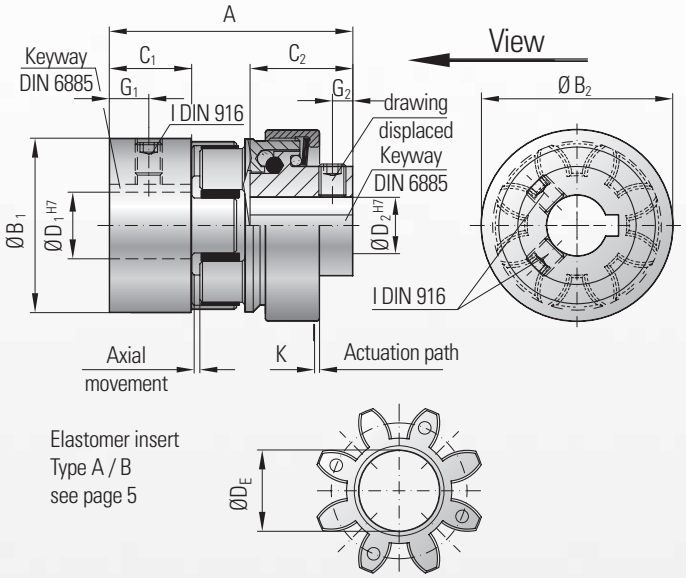
As of size 150 and up the re-engagement can be done with 2 lever which will be supported at a recess on the adjustment nut (picture 3b). Screwdrivers can be used as a lever.

optional stainless steel

MODEL **ESL**

BACKLASH FREE TORQUE LIMITERS

„Economy Class“



Elastomer insert
Type A / B
see page 5

Properties:
- reliable torque overload protection
- compact simple design
- multi position engagement
- low wear
- economically priced

Material: Torque limiter: high strength steel.
Detent balls made of hardened steel.
Clamping hubs: high strength aluminum.
Elastomer insert: precision molded, wear resistant and thermally stable polymer.

Design: Our zero backlash elastomer coupling incorporated with a torque limter. Available function system for all series: multi-position.

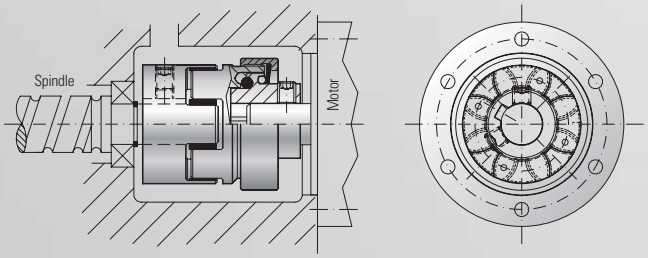
Speed: Negligible abrasion with disengagement speeds of up to 200 rpm.
Higher speeds upon request.

Fit tolerance: On the hub/shaft connection 0.01 to 0.05 mm.

Model ESL			Series									
			5		10		20		60		150	
Type (Elastomer insert)			A	B	A	B	A	B	A	B	A	B
Rated torque	(Nm)	T_{kn}	9	12	12.5	16	17	21	60	75	160	200
Adjustment range*	(Nm)	Nm	1-6		1-12		3-19		5-60		20-150	
Overall length	(mm)	A	34		45		64		82		90	
Diameter of the hub	(mm)	B_1	25		32		42		56		66.5	
Diameter of the hub	(mm)	B_2	28		32		46		59		75	
Fit length	(mm)	C_1	12		12		25		30		35	
Fit length	(mm)	C_2	11		20		22		31		35	
Inner diameter from Ø to Ø H7	(mm)	D_1	6-15		6-18		8-25		12-32		19-38	
Inner diameter from Ø to Ø H7	(mm)	D_2	6-10		6-12		8-19		12-28		19-32	
Inner diameter max. (elastomer)	(mm)	D_E	10.5		14.2		19.2		26.2		29.2	
Distance	(mm)	G	5		6		9		11		12	
Distance	(mm)	G_2	3		3.5		3.5		4		4	
Screews DIN 916		I	depending on bore diameter see page 12									
Approx. weight	(kg)		0.08		0.15		0.2		0.5		1	
Moment of inertia	(10^{-3} kgm^2)	J_1/ J_2	0.01		0.02		0.08		0.15		0.5	
Actuation path	(mm)	K	0.8		1		0.6		1.2		1.5	

* Adjustment range preset by R+W / fixed disengagement torque.
Information about static and dynamic torsional stiffness as well as max. possible misalignment **see page 5**

Installation instruction



Ordering example

ESL / 10 / A / 14 / 12 / 10 / XX

- Model
- Series
- Type elastomer insert
- Bore Ø D1 H7 with keyway
- Bore Ø D2 H7 with keyway
- Disengagement torque Nm
- Non standard e.g. stainless steel

All data is subject to change without notice.

optional stainless steel

FACTORS AND SIZING CALCULATIONS

Temperature factor S_υ	A	B	C
Temperature (υ)	**Sh 98 A**	**Sh 64 D**	**Sh 80 A**
> -30° to -10°	1,5	1,7	1,4
> -10° to +30°	1,0	1,0	1,0
> +30° to +40°	1,2	1,1	1,3
> +40° to +60°	1,4	1,3	1,5
> +60° to +80°	1,7	1,5	1,8
> +80° to +100°	2,0	1,8	2,1
> +100° to +120°	–	2,4	–

Start factor S_Z

Z_h	up to 120	120 - 240	above 240
S_Z	1,0	1,3	on request

Shock and load factor S_A

Uniform load	S_A = 1,0
Non-uniform load	S_A = 1,8
High dynamics, frequent reversing loads	S_A = 2,5

T_{KN} = Rated torque of the coupling (Nm)
T_{Kmax} = Max. torque of the coupling (Nm)
T_S = Existing peak torque of the coupling (Nm)
T_{AS} = Peak torque of the drive element (Nm)
T_{AN} = Rated torque of the drive element (Nm)
T_{LN} = Rated torque of the driven element (Nm)
P_{LN} = Power of the driven element (KW)
n = Speed (rpm)
J_A = Motor´s moment of inertia (kgm^2)
J_L = Machine´s moment of inertia (kgm^2) (Spindle + slide + workpiece)
J_1 = Moment of inertia of a coupling half at the driving end (kgm^2)
J_2 = Moment of inertia of a coupling half at the driven end (kgm^2)
m = Ratio of the moments of inerta driving to driven element
υ = Temperature of the area around the coupling (observe radiant heat)
S_υ = Temperature factor
S_A = Shock or load factor
S_Z = Start factor (factor for the number of starts/hour)
Z_h = Cycle of starts (1/h)

Sizing of a Servomax® Elastomer Coupling

1. Calculation example without shock or reversing loads

The rated torque of the coupling (T_{KN}) needs to be higher than the rated torque of the driven element (T_{LN}) times the temperature factor S_υ at the coupling for the application. If T_{LN} is not known, T_{AN} can be used for the calculation instead.

Condition: $T_{KN} > T_{LN} \times S_\upsilon$

Auxiliary calculation: $T_{LN} = \frac{9550 \times P_{LN}}{n}$

Calculation example: (No loads and shocks)

Drive face: DC - motor
T_{AN} = **119 Nm**

Coupling conditons:
υ = **70°** C
S_υ = 1,7 (for 70°/Type A)

Driven face: Pump
T_{LN} = **85 Nm**

Condition: $T_{KN} > T_{LN} \times S_\upsilon$
$T_{KN} > 85 \text{ Nm} \times 1{,}7$
$T_{KN} >$ **144,5 Nm** → **Result:** A coupling type **EK 2/150/A** (T_{KN} = 160 Nm) is selected.

2. Calculation example with shock loads

In all cases the maximum rated torque (T_{Kmax}). of the coupling can not be exceeded. First calculate the rated torque (T_{KN}) of the coupling same as above. Compare this result to the peak torque (T_S) times the start factor (S_Z) times the temperature factor (S_υ) for the application. The greater of the two values must be less than (TKmax) of the coupling.

Condition: $T_{KN} > T_{LN} \times S_\upsilon$

Auxiliary calculation: $T_{LN} = \frac{9550 \times P_{LN}}{n}$

Condition: $T_{Kmax} > T_S \times S_Z \times S_\upsilon$

Auxiliary calculation: $T_S = \frac{T_{AS} \times S_A}{m + 1}$

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

optional stainless steel

MODEL **ATEX**

FOR USE IN HAZARDOUS AREAS AND EXPLOSIVE ATMOSPHERE

AT mosphere EX plosible

ATEX 95 is regulated by the new European directive. Generally the explosive atmosphere is classified in 3 different zones.

Zone 0:
A place in which an explosive atmosphere consists out of a mixture of air and flammable substances in the form of gas, vapor or mist, and **is present frequently, continuously** or for **extended periods**.
Zone 20:
Is relevant for an explosive atmosphere in the form of clouds of combustible dust in air under the same conditions as above.

Zone 1:
Described as a place in which an explosive atmosphere consists of a mixture of air and flammable substances in the form of gas, vapor or mist, and is **likely to occur** in normal operation occasionally.
Zone 21:
Is relevant for an explosive atmosphere in the form of clouds of combustible dust in air under the same conditions as above.

Zone 2:
A place in which an explosive atmosphere consists out of mixture of air with flammable substances in the form of gas, vapor or mist, and is **not likely to occur** in normal operation but, if it does occur, it will persist **for a short period only.**
Zone 22:
Relevant for an explosive atmosphere in the form of a cloud of combustible dust in air under the same conditions as above.

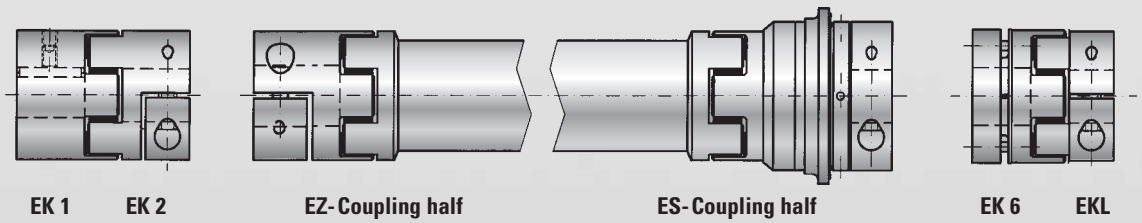
For the classified zones 1/21 and 2/22 the Servomax couplings EK-EEX do have an accreditation according to ATEX 95/a

Design of the Servomax EX:	No dimensional change from the EK standard series, only the material of the inserts will change.
Hubs:	In general the standard material will be used.
Elastomer insert:	A special elastomer insert (Type D/92 Sh A), which is able to conduct electricity is used. This prevents the possibility of electrostatic loads and sparks.
Mounting, Sizing:	All misalignment values and the transmittable torques must be reduced by 30%. Technical datas on request.
Maintanance:	A routine inspection of the coupling must be performed.
Mounting manuals:	Mounting and maintanance manuals are provided with every EEx coupling.

R+W solutions with standard components

All standards hubs and elastomer inserts are interchangable in the same sizes.

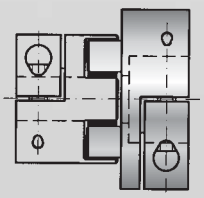
Example:



EK 1 **EK 2** **EZ-Coupling half** **ES-Coupling half** **EK 6** **EKL**

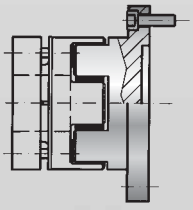
R+W non standard solutions with special hubs

EK 2 Non standard hub



Non standard hubs for bigger bores

EK 6 Non standard hub

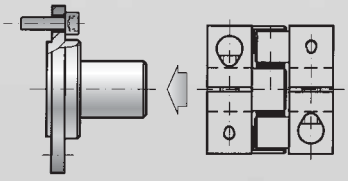


Non-standard hubs with flange

EK 2 **EK 2**
Non standard hub

Intermediate piece for higher lateral misalignment

EKL



Adapter flange for planetery gearboxes acc. to ISO 9409

THE R+W-PRODUCT RANGE

R+W®
COUPLING TECHNOLOGY

Experience and Know-how for your special requirements.

TORQUE LIMITERS
Series SK

From 0,1 – 2.800 Nm, Bore diameters 4 – 100 mm
Available as a single position, multi-position, load holding, or full disengagement version
Single piece or press-fit design

BELLOWS COUPLINGS
Series BK

From 15 – 10.000 Nm
Bore diameters 10 – 180 mm
Single piece or press-fit design

BELLOWS COUPLINGS
ECONOMY CLASS
Series BKC / BKL

From 2 – 500 Nm
Bore diameters 4 – 75 mm

LINE SHAFTS
Series ZA/ZAE

From 10 – 4.000 Nm
Bore diameters 10 – 100 mm
Available up to 6 mtr. length

MINIATURE BELLOWS COUPLINGS
Series MK

From 0,05 – 10 Nm
Bore diameters 1 – 28 mm
Single piece or press-fit design

SERVOMAX®
ELASTOMER COUPLINGS
Series EK

From 2 – 2.000 Nm
Shaft diameters 5 – 80 mm
backlash-free, press-fit design

LINEAR COUPLINGS
Series LK

From 70 – 2.000 N
Thread M5 – M16

POLYAMID COUPLINGS
MICROFLEX
Series FK 1

Rated torque 1 Ncm
Bore diameters 1 – 1,5 mm

R+W Antriebselemente GmbH
Alexander-Wiegand-Straße 8
D-63911 Klingenberg/Germany

Tel. +49-(0)9372 – 9864-0
Fax +49-(0)9372 – 9864-20

info@rw-kupplungen.de
www.rwcouplings.com

QUALITY MANAGEMENT
We are certified
according to ISO 9001-200

TGA-ZM-05-91-00
Registration No. 9605022

396/01/06/3.000