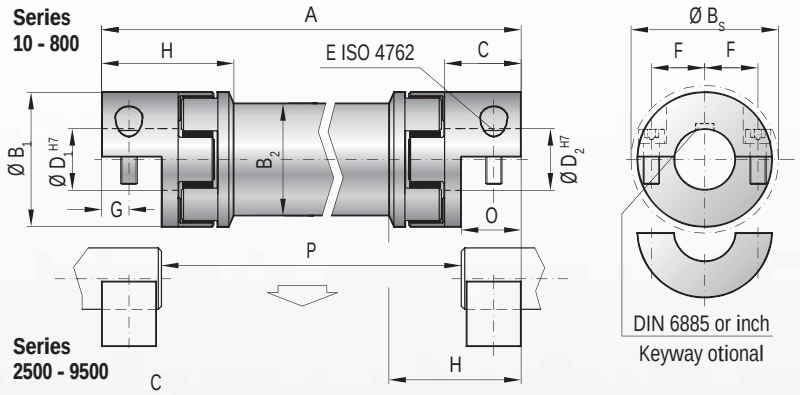
optional stainless steel

MODEL **EZ2**

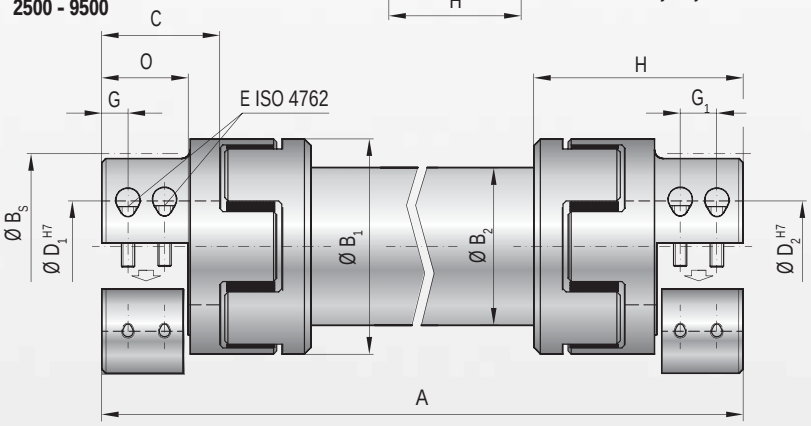
BACKLASH FREE LINE SHAFTS

with split clamping hubs

Series 10 - 800



Series 2500 - 9500



Properties:

- lateral mounting with split clamping hubs
- lengths up to 4 meters
- no intermediate support bearing required
- low moment of inertia
- vibration damping
- press fit design
- backlash free

Material:

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

Design:

Two coupling hubs are concentrically machined with curved 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:

Overall clearance between shaft and hub 0.01 to 0.05 mm

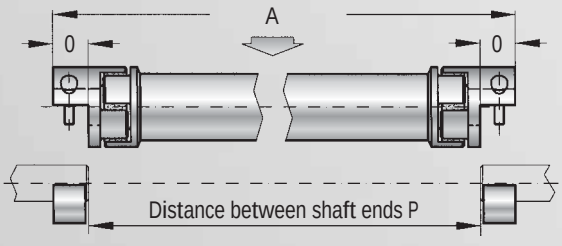
Ordering example

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

- Model
- Series
- Overall length
- 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.

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_{kb}	=	rpm
Maximum speed	n_B	=	rpm
Torsional deflection	φ	=	Degree-Min-Sec
Total stiffness EZ 2	C_{Tdyn}^{EZ}	=	Nm/rad
Permissible lateral misalignment	Δ Kr	=	mm
Weight of total axis	m	=	kg
Mass moment of inertia	J	=	kgm²

optional stainless steel

MODEL **EZ2**

BACKLASH FREE LINE SHAFTS

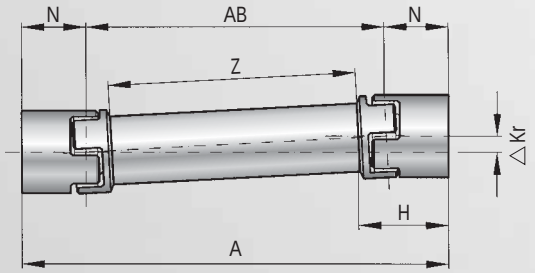
Model EZ 2			Series																			
			10		20		60		150		300		450		800		2500		4500		9500	
Type (Elastomer insert)			A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Rated torque	(Nm)	T_{KN}	12.5	16	17	21	60	75	160	200	325	405	530	660	950	1100	1950	2450	5000	6200	10000	12500
Max. torque*	(Nm)	T_{Kmax}	25	32	34	42	120	150	320	400	650	810	1060	1350	1900	2150	3900	4900	10000	12400	20000	25000
Overall length	(mm)	A	95 - 4000		130 - 4000		175 - 4000		200 - 4000		245 - 4000		280 - 4000		320 - 4000		460 - 4000		580 - 4000		710 - 4000	
Outside diameter of clamping hub	(mm)	B_1	32		42		56		66,5		82		102		136,5		160		225		290	
Outside diameter of tube	(mm)	B_2	28		35		50		60		76		90		120		150		175		220	
Outside diameter with screw head	(mm)	B_S	32		44,5		57		68		85		105		139		155		190		243	
Fit length	(mm)	C	20		25		40		47		55		65		79		85		110		140	
Inside diameter range H7	(mm)	$D_{1/2}$	5 - 16		8 - 25		14 - 32		19 - 36		19 - 45		24 - 60		35 - 80		35 - 90		40 - 120		50 - 140	
Claming screw (ISO 4762)		E	4 x M4		4 x M5		4 x M6		4 x M8		4 x M10		4 x M12		4 x M16		4 x M16		8 x M16		8 x M24	
Tightening torque of the clamping screw	(Nm)		4		8		15		35		70		120		290		290		290		980	
Distance between centers	(mm)	F	10.5		15.5		21		24		29		38		50,5		57		72,5		90	
Distance	(mm)	G/G_1	7.5		8.5		15		17.5		20		25		30		36		24 / 56		28 / 74	
Length of the couplings	(mm)	H	34		46		63		73		86		99		125		147		186		233	
Moment of inertia per coupling hub	(10^{-3} kgm²)	J_1/J_2	0.01		0.02		0.5		0.21		1.02		2.3		17		30		140		450	
Inertia of tube per meter	(10^{-3} kgm²)	J_3	0.075		0.183		0.66		1.18		2.48		10.6		38		360		750		1,800	
Combined dynamic torsional stiffness of the inserts	(Nm/rad)	C_{Tdyn}^{E}	270	825	1,270	2,220	3,970	5,950	6,700	14,650	11,850	20,200	27,700	40,600	41,300	90,000	87,500	108,000	168,500	371,500	590,000	670,000
Torsional stiffness of tube per meter	(Nm/rad)	C_T^{ZWR}	321		1,530		6,632		11,810		20,230		65,340		392,800		1,000,000		2,500,000		5,000,000	
Distance between centers	(mm)	N	26		33		49		57		67		78		94		108		137		171	
Mounting length	(mm)	O	16.6		18.6		32		37		42		52		62		67		84		105	

* Max. transmittable torque of the clamping hub depends on the bore diameter; see EKH (page 8)

1 Nm = 8.85 in lbs

Selection process for servo insert couplings, EZ2 / EZV

A	Overall length	m	C_{Tdyn}^{E}	Combined dynamic torsional stiffness of the 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 to center of flexible element	mm
Z	Tube length Z = (A – 2xH)	m	C_{Tdyn}^{EZ}	Torsional stiffness of the entire coupling assembly	Nm/rad	TK_{max}	Max. torque	Nm
						φ	Angle of twist	degree



According to torsional stiffness

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

According to angle of twist

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

Max. possible misalignments

Lateral misalignment Δ Kr

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

Angular misalignment Δ Kw

$$\Delta Kw_{max} = \text{ca. } 2^{\circ}$$

Axial misalignment Δ Ka

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