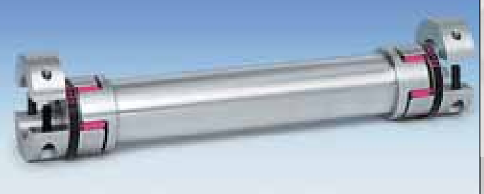
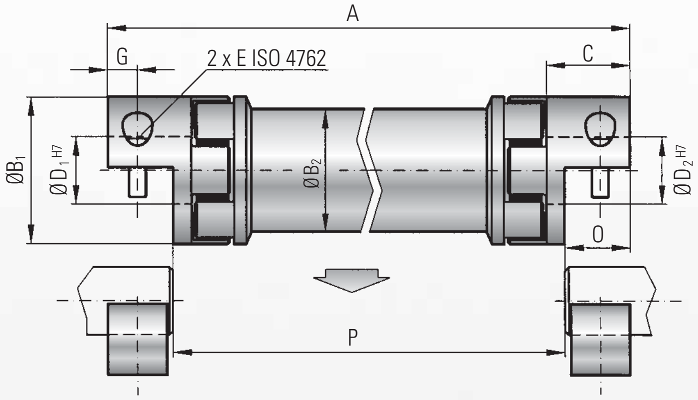
optional stainless steel

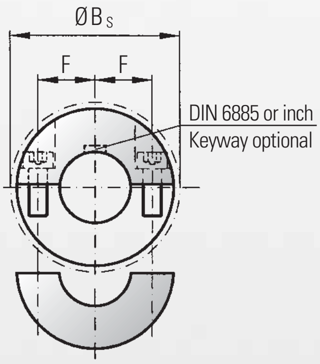
MODEL **EZ2**

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

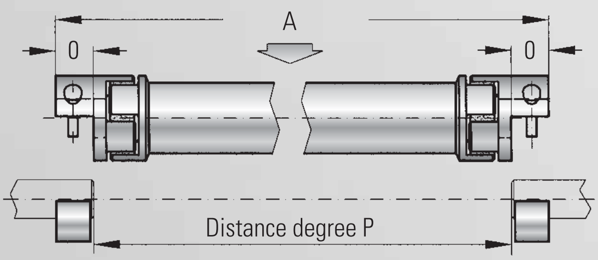
Ordering example

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

- 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.

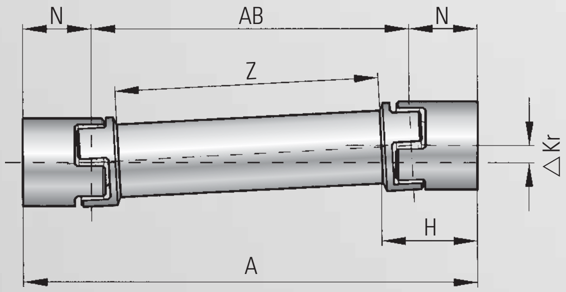
Critical resonant speed	n_k	=	1/min.
Torsional stiffness tube	C_T^{ZWR}	=	Nm/rad
Total stiffness EZ 2	C_{Tdyn}^{EZ}	=	Nm/rad
Torsional deflection	φ	=	Degree-Min-Sec
Weight of total axes	m	=	kg
Critical resonance speed	n_e	=	1/min
Mass moment of inertia	J	=	kgm²
Permissible lateral misalignment	Δ Kr	=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

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 - 4 000		130 - 4 000		175 - 4 000		200 - 4 000		245 - 4 000		280 - 4 000		320 - 4 000	
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} kgm²)	J_1/J_2	0.01		0.02		0.15		0.21		1.02		2.3		17	
Inertia of tube per meter (10^{-3} kgm²)	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	1 270	2 220	3 970	5 950	6 700	14 650	11 850	20 200	27 700	40 600	41 300	90 000
Torsional stiffness of tube per meter (Nm/rad)	C_T^{ZWR}	321		1 530		6 632		11 810		20 230		65 340		392 800	
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
AB	Length AB = (A – 2xN)	m
Z	Tube length Z = (A – 2xH)	m
C_{Tdyn}^{E}	Dynamic torsional stiffness of both elastomer inserts	Nm/rad
C_T^{ZWR}	Torsional stiffness of tube per meter	Nm/rad
C_{Tdyn}^{EZ}	Torsional stiffness of entire coupling	Nm/rad
H	Length of the coupling	mm
N	Distance between center lines	mm
M_{max}	Max. torque	Nm
φ	Angle of twist	degree



According to torsional stiffness

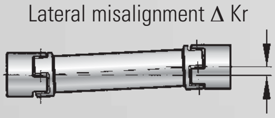
$$C_{Tdyn}^{EZ} = \frac{C_{Tdyn}^{E} \times (C_T^{ZWR}/Z)}{C_{Tdyn}^{E} + (C_T^{ZWR}/Z)} \quad \text{(Nm/rad)}$$

According to angle of twist

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

Max. possible misalignments

Lateral misalignment Δ Kr

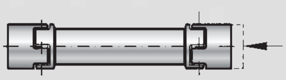


$$\Delta Kr_{max} = \tan \Delta \frac{Kw}{2} \cdot AB$$
$$AB = A - 2xN$$

Angular misalignment Δ Kw

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

Axial misalignment Δ Ka



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