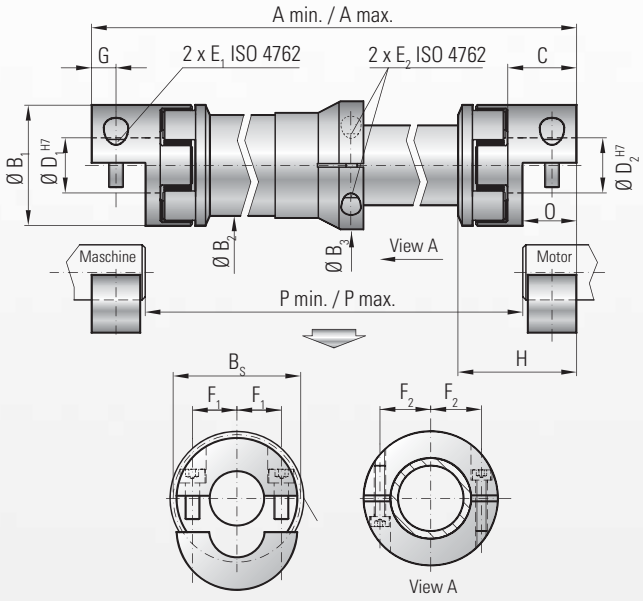
optional stainless steel

MODEL **EZV**

BACKLASH FREE LINE SHAFTS

variable length



Properties:

- Lateral mounting due to split hubs
- Spans distances of up to 4 m (13.12 ft)
- 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.

Design:

Two split coupling hubs are concentrically machined with concave driving jaws. Both coupling bodies are rigidly mounted to 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 EZV Line Shafts.

Tolerance:

On the hub/shaft connection 0.01 to 0.05 mm.

Ordering example

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

- Model
- Series
- Inserted min. 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.

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 - 2055		200 - 2075		250 - 2095		300 - 2115		350 - 2130		400 - 2150	
Extended over all length from - to	(mm)	A_{max}	190 - 4000		250 - 4000		310 - 4000		370 - 4000		440 - 4000		500 - 4000	
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 tube 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 - 16		8 - 25		14 - 32		19 - 35		19 - 45		24 - 60	
Screw ISO 4762		E_1	M4		M5		M6		M8		M10		M12	
Tighting torque of the mounting screw	(Nm)		4		8		15		35		70		120	
Distance between centers	(mm)	F_1	10.5		15.5		21		24		29		38	
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	
Measurement	(mm)	X1+X2	110		150		190		230		270		300	

* Max. transmittable torque of the clamping hub see table 3 (page 10)

Further infomation EK broschure page 16/17

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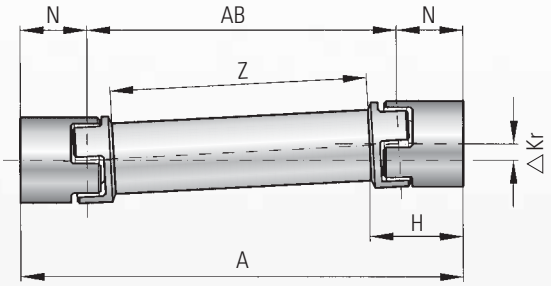
NOTES

TECHNICAL SPECIFICATIONS

Series T_{KN} (Nm)	Torsional stiffness of both coupling parts elastomer insert A C_T^B (Nm/rad)	Torsional stiffness of both coupling parts elastomer insert B C_T^B (Nm/rad)	Torsional stiffness per 1 m tube C_T^{ZWR} (Nm/rad)	Length of the coupling EZ H (mm)	Distance between center lines N (mm)	Max. axial misalignment △ Ka (mm)
10	270	825	321	34	26	2
20	1,270	2,220	1,530	46	33	4
60	3,970	5,950	6,632	63	49	4
150	6,700	14,650	11,810	73	57	4
300	11,850	20,200	20,230	86	67	4
450	27,700	40,600	65,340	99	78	4
800	41,300	90,000	392,800	125	94	4
2500	87,500	108,000	1,000,000	142	108	5
4500	168,500	371,500	2,500,000	181	137	5
9500	590,000	670,000	5,000,000	229	171	6

Table 2



A	Overall length	m
AB	Length AB = (A – 2xN)	m
Z	Tube length Z = (A – 2xH)	m
H	Length of the coupling	mm
N	Distance between center lines	mm
T_{AS}	Max. torque	Nm
φ	Angle of twist	degree
C_{Tdyn}^{E}	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

Torsional stiffness

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

Angle of twist

$$\varphi = \frac{180 \times T_{AS}}{\pi \times C_{Tdyn}{}^{EZ}} \text{ [degree]}$$

Example: Line shaft EZ2, series 150 T_{AS} = 160 Nm
To search: Angel of twist at maximal rated torque T_{AS}

Length (A) of the shaft = 1.5 m
Length (Z) of the tube = A – (2xH) = 1.354 m

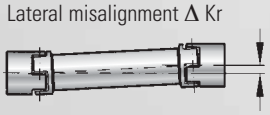
$$(C_{Tdyn}{}^{EZ}) = \frac{6700 \text{ Nm/rad} \times (11810 \text{ Nm/rad} / 1.354 \text{ m})}{6700 \text{ Nm/rad} + (11810 \text{ Nm/rad} / 1.354 \text{ m})} = 3789 \text{ [Nm/rad]}$$

$$\varphi = \frac{180 \times 160 \text{ Nm}}{\pi \times 3789 \text{ Nm/rad}} = 2.42°$$

The result with a max. torque of 160 Nm in an angel of twist of 2.42°

Max. possible misalignment

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 total

See table 2

Max. transmittable torque depends on the bore diameter (Nm)

Series	Ø 6	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	Ø 90	Ø 120	Ø 140
10	6	12	32																
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			
2500								1900	2600	2900	3200	3500	3800	4000	4300	4600	5200		
4500									5300	5800	6300	7000	7600	8200	8800	9400	10600	14100	
9500										9200	10100	11100	11900	12800	13800	14800	16700	22000	25600

Higher torque through additional key possible!

Table 3

Temperature factor S in ° Celsius

Temperature (υ)	Sh 98 A	Sh 64 D
> -30° to -10°	1.5	1.7
> -10° to +30°	1.0	1.0
> +30° to +40°	1.2	1.1
> +40° to +60°	1.4	1.3
> +60° to +80°	1.7	1.5
> +80° to +100°	2.0	1.8
> +100° to +120°	–	2.4

Please note for every design (see brochure EK). 1° C = 33,8° F

Table 4