RELIABLE | PRECISE | COMPACT

R+W®
A POPPE + POTTHOFF COMPANY

PRECISION COUPLINGS

EXACT AND BACKLASH FREE FOR PRECISION SERVO AND STEPPER DRIVE APPLICATIONS.

WHO WE ARE.

ABOVE ALL R+W IS:
THE PERFECT COUPLING.

When R+W Antriebselemente GmbH was first established in 1990 in Klingenberg, Germany, there were three people on board. The head office is still there, but we are now more than 170 people, with subsidiaries in the USA, China, Italy, Singapore, France and Slovakia, and are partnered with over 60 well established distributors in more than 40 countries throughout the world. Many developments have lead to this success, but most importantly it was brought about by our endless search for the best possible coupling solutions as well as the high esteem in which we hold all of our customers.

WE PROVIDE INSPIRED SOLUTIONS BACKED BY SOUND PLANNING AND DESIGN.

R+W stands for expertise in the development of solutions for precise torque transmission. The focus of our development is on innovative coupling systems for all sectors of precision drive technology. As a leading manufacturer of precision couplings and line shafts, we strive to maintain a permanent status of technology leadership in our field. Our central claim: R+W couplings ensure precision for process reliability and efficiency, and to that end we seek perfection.

Optimized for technology and business, our product portfolio includes:

- **Bellows couplings**
- **Elastomer insert couplings**
- **Ball-detent safety couplings**
- **Line shaft couplings**
- **High torque industrial couplings**
- **Development of customized solutions with collaboration from start to finish, including:**
  - Consultation
  - Conception
  - Engineering analysis
  - Prototyping
  - Manufacturing

DRIVE

D - DYNAMIC

Our staff is trained to always be ready and willing to provide a quick reaction to customer inquiries. Our product, the core of which is based on handling high performance, dynamic applications, is increasingly available for fast delivery.

R - RELIABLE

Many of our products are designed for infinite life with zero maintenance required. With thorough engineering processes in place, and an ISO 9001:2008 certified production facility, we continue to deliver high quality coupling products with a high level of reliability.

I - INNOVATIVE

Our business was founded on developing unique and innovative solutions to common coupling problems. Our staff in turn is constantly developing its work flows to streamline delivery and simplify the process for our customers.

V - VERSATILE

With products successfully applied and deployed in over 125 industry segments, chances are very good that we have an expert on our versatile staff that is familiar with your application requirements.

E - EXPANDING

With double digit annual growth the norm, our company is ever expanding, adding new product offerings and opening new service centers throughout the world all the time.

OTHER R+W COUPLINGS

Aside from the products detailed in this catalog, we also offer quality shaft couplings and torque limiters for high powered industrial drives.

More information on these can be found in our **industrial couplings catalog**.

SIZING AND SELECTION

According to
DIN 740 part 2

LINE SHAFTS

ZA EZ

SYMBOLS

A = Total length (mm)

AB = Distance between flextures (mm)
AB = (A – 2xN)

Z = Tube length (mm)
Z = (A – 2xH)

H = Length of coupling ends (mm)

N = Length to flexture (mm)

T_{AS} = Peak torque of the drive (Nm)

φ = Torsional deflection (degree)

C_T^B = Torsional stiffness of both flexible elements (Nm/rad)

C_T^{ZWR} = Torsional stiffness per 1m of tubing (Nm/rad)

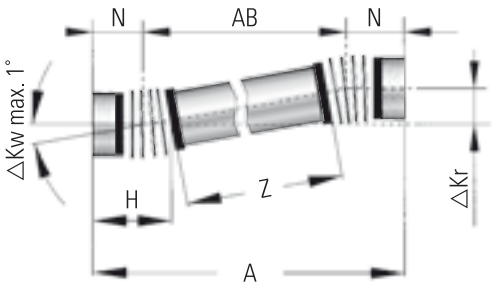
C_T^{ZA} = Total torsional stiffness (Nm/rad)

n_k = Critical speed (1/min.)

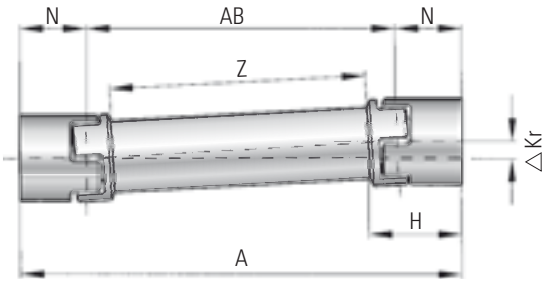
C_{Tdyn}^E = Dynamic torsional stiffness of both elastomer inserts (Nm/rad)

C_{Tdyn}^{EZ} = Total torsional stiffness (Nm/rad)

ZA



EZ



MODEL ZA

Size	Torsional stiffness of both bellows bodies C_T^B (Nm/rad)	Torsional stiffness per 1m of standard tubing C_T^{ZWR} (Nm/rad)	Torsional stiffness per 1m of CFK tubing C_T^{ZWR} (Nm/rad)	Length of coupling ends ZA H (mm)	Length of coupling ends ZAE H (mm)	Length to flexture N (mm)	Maximum Axial misalignment Δ Ka (mm)
10	4,525	1,770	3,690	44.5	39.5	25	2
30	19,500	6,440	13,390	57.5	52	34	2
60	38,000	11,500	23,850	71	64	41	3
150	87,500	24,000	50,050	78	72	47	4
200	95,500	73,000	–	86	–	52	4
300	250,500	220,000	151,510	94	83	56	4
500	255,000	297,000	204,250	110	96	66	5
800	475,000	389,000	267,620	101	89	64	6
1500	1,400,000	775,000	–	92	–	56	4
4000	4,850,000	1,160,000	–	102	–	61	4

Table 1

MODEL EZ

Size	Torsional stiffness of both flexible elements		Torsional stiffness per 1m of tubing	Working length EZ	Length to flexture	Max. axial misalignment
	Elastomer insert A C_T^B (Nm/rad)	Elastomer insert B C_T^B (Nm/rad)	C_T^{ZWR} (Nm/rad)	H (mm)	N (mm)	Δ Ka (mm)
5	150	350	503	25	18	1,5
10	270	825	727	34	26	2
20	1,270	2,220	1,770	46	33	4
60	3,970	5,950	6,440	63	49	4
150	6,700	14,650	11,500	73	57	4
300	11,850	20,200	24,000	86	67	4
450	27,700	40,600	73,000	99	78	4
800	41,300	90,000	389,000	125	94	4
2500	87,500	108,000	950,000	142	108	5
4500	168,500	371,500	2,200,000	181	137	5
9500	590,000	670,000	5,500,000	229	171	6

Table 2

MAXIMUM TRANSMITTABLE TORQUE BY BORE DIAMETER (Nm)

Size	Ø 6	Ø 8	Ø 12	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
5	4	10	15																	
10	6	12	20	32																
20		30	35	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

TEMPERATURE FACTOR S

Temperature (φ)	A Sh 98 A	B 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

ACCORDING TO TORSIONAL STIFFNESS

Condition: Line shaft ZA, size 150 T_{AS} = 150 Nm
Wanted: Total torsional stiffness C_T^{ZA}

$$(C_T^{ZA}) = \frac{87{,}500 \text{ Nm/rad} \times (24{,}000 \text{ Nm/rad} / 1.344 \text{ m})}{87{,}500 \text{ Nm/rad} + (24{,}000 \text{ Nm/rad} / 1.344 \text{ m})} = 14{,}830 \text{ [Nm/rad]}$$

$$(C_T^{ZA}) = \frac{C_T^B \cdot (C_T^{ZWR}/Z)}{C_T^B + (C_T^{ZWR}/Z)} \text{ (Nm/rad)}$$

ACCORDING TO TORSIONAL DEFLECTION

Condition: Line shaft ZA, size 150 T_{AS} = 150 Nm
Wanted: Torsional deflection at maximum acceleration torque T_{AS}

Measurement (A) of Line Shaft - 1.5m
Length (Z) of Tubing = A-(2xH) = 1.344m

$$\varphi = \frac{180 \times 150 \text{ Nm}}{\pi \times 14{,}830 \text{ Nm/rad}} = 0.579°$$

With a maximum torque of 150 Nm the torsional deflection is 0.579°

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

LINE SHAFTS

ZA EZ

ACCORDING TO MAXIMUM MISALIGNMENT

	Lateral misalignment △ Kr	Angular misalignment △ Kw	Axial misalignment △ Ka
ZA			
EZ			
	$\Delta Kr_{max} = \tan \Delta \frac{Kw}{2} \cdot AB$ $AB = A - 2xN$	$\triangle Kw_{max.} = 2°$	See table 1+2 Pages 16+17

R+W CALCULATION PROGRAM

Using proprietary software, R+W will calculate the specific mechanical details of exactly the model you plan to use. Overall length, tube materials (e.g. steel, aluminum, CFK), and other factors are used to determine a number of performance values unique to your line shaft coupling.

Critical speed	n_k	=	1/min.
Torsional stiffness of tubing	C_T^{ZWR}	=	Nm/rad
Overall stiffness	C_T^{ZA}	=	Nm/rad
Torsional deflection	φ	=	degree-min-sec
Total Weight	m	=	kg
Moment of inertia	J	=	kgm^2
Maximum misalignment	△ Kr	=	mm

ZA | EZ

SIZES FROM 9 – 25,000 Nm
LINE SHAFT COUPLINGS

Optional:

GENERAL INFORMATION **R+W LINE SHAFT COUPLINGS:**

SERVICE LIFE

R+W line shaft couplings are wear and maintenance free for an infinite service life, as long as the technical limits are not exceeded.

FIT CLEARANCE

Overall shaft / hub clearance of 0.01 – 0.05 mm

ROTATIONAL SPEED

After selecting overall length A, contact R+W for maximum speed.

SPECIAL SOLUTIONS

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

ATEX (Optional)

For use in hazardous zones 1/21 and 2/22, R+W line shaft couplings have been authorized under directive 94/9/EG and is available with certification.

ZA

BACKLASH FREE, TORSIONALLY STIFF
LINE SHAFT COUPLINGS
SIZES FROM **10 - 4,000 Nm**

MODEL | FEATURES

ZA

with clamping hub
from 10 - 800 Nm

- installation and removal possible without disturbing other machine components
- standard lengths up to 6 meters
- no intermediate support bearings required

Page 116

ZA

with conical clamping system
from 1,500 - 4,000 Nm

- installation and removal possible without disturbing other machine components
- standard lengths up to 6 meters
- no intermediate support bearings required

Page 117

ZAE

with fully split clamping hub
from 10 - 800 Nm

- complete coupling system mounts laterally for very easy installation and removal
- standard lengths up to 6 meters
- no intermediate support bearings required

Page 118

ZAL

with fully split clamping hub
from 10 - 800 Nm

- complete coupling system mounts laterally for very easy installation and removal
- standard lengths up to 6 meters, with CFK tube
- no intermediate support bearings required

Page 119

EZ

BACKLASH FREE **LINE SHAFT COUPLINGS**
SIZES FROM **9 - 25,000 Nm**

MODEL | FEATURES

EZ2

with fully split clamping hub
from 9 - 25,000 Nm

- standard lengths up to 4 meters
- no intermediate support bearings required
- complete coupling system mounts laterally for very easy installation and removal

Pages 120-121

EZV

with fully split clamping hub, adjustable length
from 12.5 - 1,200 Nm

- adjustable length ranges up to 4 meters
- no intermediate support bearings required
- complete coupling system mounts laterally for very easy installation and removal

Pages 122-123

ZA

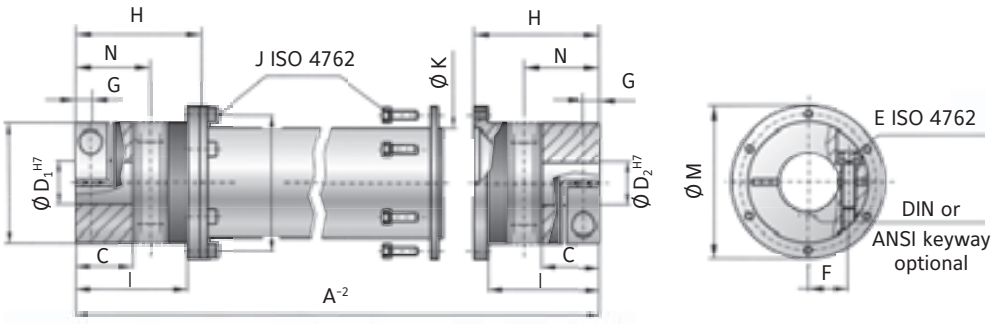
WITH CLAMPING HUB
10 - 800 Nm

ABOUT

FEATURES
- for spanning larger distances between shaft ends
- standard lengths up to 6 meters
- no intermediate support bearings required
- extremely straight and laterally stiff intermediate tube

MATERIAL
- **Bellows:** high grade stainless steel
- **Intermediate tube:** up to size 150 aluminum, size 300 and up steel, optional CFK
- **Hubs:** up to size 60 aluminum, size 150 and up steel

DESIGN
Two clamping hubs with a single clamping screw in each. A special support system carries the weight of the tube on the hubs. Operable temperature range from -30 to +100 °C.



MODEL ZA

SIZE			10	30	60	150	200	300	500	800
Rated torque	(Nm)	T_{KN}	10	30	60	150	200	300	500	800
Overall length min. to max.	(mm)	A^{-2}	110 - 6000	140 - 6000	170 - 6000	190 - 6000	210 - 6000	250 - 6000	260 - 6000	260 - 6000
Outside diameter clamping hub	(mm)	B	40	55	66	81	90	110	123	134
Fit length	(mm)	C	16	27	31	35.5	40.5	43	50	48
Inside diameter from Ø to Ø H7	(mm)	$D_{1/2}$	5 - 20	10 - 28	12 - 32	19 - 42	22 - 45	30 - 60	35 - 60	40 - 72
With keyway max. Ø H7	(mm)	$D_{1/2}$	17	23	29	36	45	60	60	66
ISO 4762 clamping screw		E	M4	M6	M8	M10	M12	M12	M16	2x M16
Tightening torque	(Nm)		5	15	40	70	110	130	200	250
Distance between centers	(mm)	F	15	19	23	27	31	39	41	48
Distance	(mm)	G	5	7.5	9.5	11	12.5	13	17	18
Length bellows body	(mm)	H	44.5	57.5	71	78	86	94	110	101
Distance	(mm)	I	38.5	51	61	69	75.5	81	96	89
ISO 4762 clamping screw		J	4x M4	6x M4	6x M5	8x M6	8x M6	8x M8	8x M8	10x M8
Tightening torque	(Nm)		3	4	7	10	12	30	30	40
Outside diameter tube section	(mm)	K	35	50	60	76	90	100	110	120
Bolt hole circle Ø	(mm)	L	45	62.5	71.5	88	100	120	132	138
Outside diameter flange	(mm)	M	52	70	80	98	110	135	148	153
Shaft average value	(mm)	N	25	34	41	47	52	56	66	64

For maximum misalignment values see page 16.

ORDERING EXAMPLE	ZA	10	1551	18	19.05	XX
Model	●					Special designation only (e.g. special bore tolerance).
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Bore D2 H7					●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. ZA / 10 / 1551 / 18 / 19.05 / XX; XX=anodized aluminum)						

ZA

WITH CONICAL CLAMPING SYSTEM

1,500 - 4,000 Nm

ABOUT

FEATURES

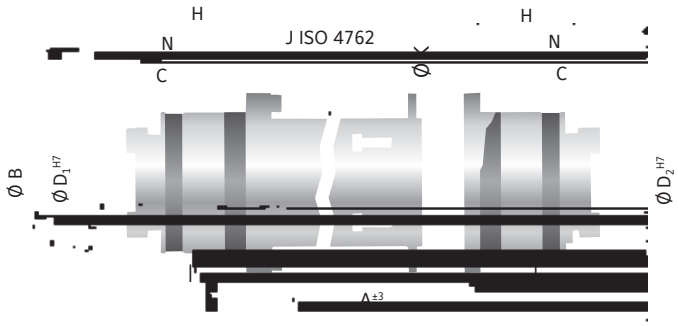
- for spanning larger distances between shaft ends
- standard lengths up to 6 meters
- no intermediate support bearings required
- extremely straight and laterally stiff intermediate tube

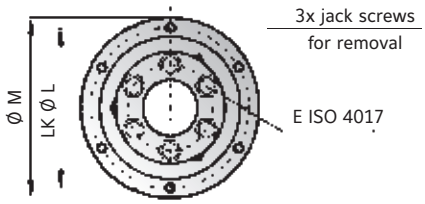
MATERIAL

- **Bellows:** high grade stainless steel
- **Intermediate tube:** steel, optional CFK
- **Hubs:** steel

DESIGN

Two conical clamping bushings with separate screws for mounting and dismounting. A special support system carries the weight of the tube on the hubs. Operable temperature range from -30 to +120 °C.





MODEL ZA

SIZE			1500	4000
Rated torque	(Nm)	T_{KN}	1500	4000
Overall length min. to max.	(mm)	$A^{\pm 3}$	280 - 6000	280 - 6000
Outside diameter	(mm)	B	157	200
Fit length	(mm)	C	61	80.5
Inside diameter from Ø to Ø H7	(mm)	$D_{1/2}$	35 - 70	40 - 100
ISO 4017 clamping screws		E	6 x M12	6 x M16
Tightening torque	(Nm)		70	120
Length bellows body	(mm)	H	98	103.5
Distance	(mm)	I	82	84
ISO 4762 clamping screws		J	10x M10	12x M12
Tightening torque	(Nm)		70	120
Outside diameter tube section	(mm)	K	150	160
Bolt hole circle Ø	(mm)	L	168	193
Outside diameter flange	(mm)	M	184	213
Shaft average value	(mm)	N	56	61

For maximum misalignment values see page 16.

ORDERING EXAMPLE	ZA	1500	2551	50.8	70	XX
Model	●					Special designation only (e.g. special bore tolerance).
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Bore D2 H7					●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. ZA / 1500 / 2551 / 50.8 / 70 / XX; XX=stainless steel)

ZAE

WITH FULLY SPLIT CLAMPING HUB

10 - 800 Nm

ABOUT

FEATURES

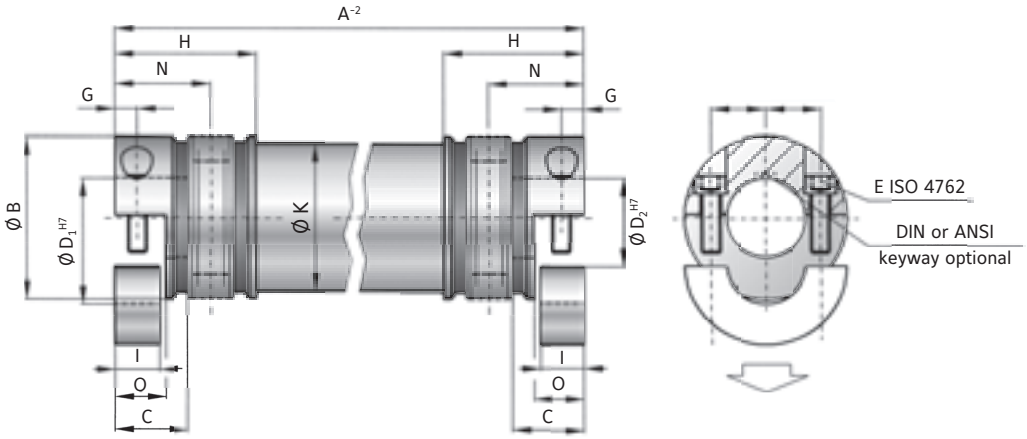
- for spanning larger distances between shaft ends
- standard lengths up to 6 meters
- no intermediate support bearings required
- extremely straight and laterally stiff intermediate tube
- **Intermediate tube:** up to size 150 aluminum, size 300 and up steel
- **Hubs:** up to size 60 aluminum, size 150 and up steel

MATERIAL

- **Bellows:** high grade stainless steel

DESIGN

Two clamping hubs with two clamping screws in each. A special support system carries the weight of the tube on the hubs. Operable temperature range from -30 to +100 °C.



MODEL ZAE

SIZE			10	30	60	150	300	500	800
Rated torque	(Nm)	T_{KN}	10	30	60	150	300	500	800
Overall length min. to max.	(mm)	A^{-2}	100 - 6000	130 - 6000	160 - 6000	180 - 6000	240 - 6000	250 - 6000	250 - 6000
Outside diameter clamping hub	(mm)	B	40	55	66	81	110	123	133
Fit length	(mm)	C	16	27	31	34.5	42	50	47
Inside diameter from Ø to Ø H7	(mm)	$D_{1/2}$	5 - 20	10 - 28	12 - 32	19 - 42	30 - 60	35 - 60	40 - 72
Max. inside diameter clamping hub	(mm)	D_{max}	24	30	32	42	60	60	75
With keyway - max Ø H7	(mm)	$D_{1/2}$	17	23	29	36	60	60	66
ISO 4762 clamping screws		E	M4	M6	M8	M10	M12	M16	M16
Tightening torque	(Nm)		5	15	40	70	130	200	250
Distance between centers	(mm)	F	15	19	23	27	39	41	48
Distance	(mm)	G	5	7.5	9.5	12	14	17	19
Length bellows body	(mm)	H	39.5	52	64	72	83	96	95
Clamping length	(mm)	I	10	15	19	22	28	33.5	37.5
Outside diameter tube section	(mm)	K	35	50	60	76	100	110	120
Length	(mm)	O	11.5	17	21	24	30	35	40
Shaft average value	(mm)	N	25	34	41	47	56	66	65

For maximum misalignment values see page 16.

ORDERING EXAMPLE	ZAE	10	1551	18	19.05	XX
Model	●					Special designation only (e.g. special bore tolerance).
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Bore D2 H7					●	
For custom features place an XX at the end of the part number and describe the special requirements (e.g. ZAE / 10 / 1551 / 18 / 19.05 / XX; XX=anodized aluminum)						

ZAL

WITH FULLY SPLIT CLAMPING HUB AND CFK INTERMEDIATE TUBE 10 - 800 Nm

ABOUT

FEATURES

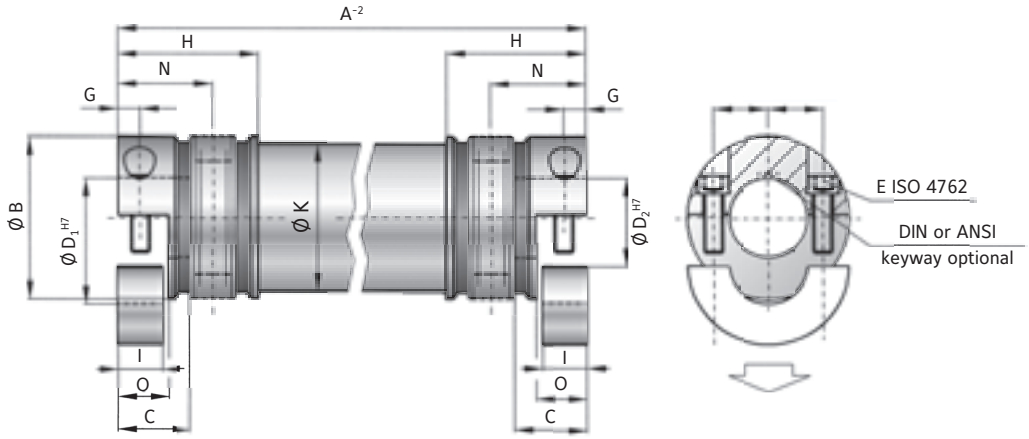
- low moment of inertia
- for spanning larger distances between shaft ends
- standard lengths up to 6 meters
- no intermediate support bearings required
- good for higher speeds

MATERIAL

- **Bellows:** high grade stainless steel
- **Intermediate tube:** CFK
- **Hubs:** up to size 60 aluminum, size 150 and up steel

DESIGN

Two clamping hubs with two clamping screws in each. A special support system carries the weight of the tube on the hubs. Operable temperature range from -30 to +100 °C.



MODEL ZAL

SIZE			10	30	60	150	300	500	800
Rated torque	(Nm)	T_{KN}	10	30	60	150	300	500	800
Overall length min. to max.	(mm)	A^{-2}	100 - 6000	130 - 6000	160 - 6000	180 - 6000	240 - 6000	250 - 6000	250 - 6000
Outside diameter clamping hub	(mm)	B	40	55	66	81	110	123	133
Fit length	(mm)	C	16	27	31	34.5	42	50	47
Inside diameter from Ø to Ø H7	(mm)	$D_{1/2}$	5 - 20	10 - 28	12 - 32	19 - 42	30 - 60	35 - 60	40 - 72
Max. inside diameter clamping hub	(mm)	D_{max}	24	30	32	42	60	60	75
With keyway - max Ø H7	(mm)	$D_{1/2}$	17	23	29	36	60	60	66
ISO 4762 clamping screws		E	M4	M6	M8	M10	M12	M16	M16
Tightening torque	(Nm)		5	15	40	70	130	200	250
Distance between centers	(mm)	F	15	19	23	27	39	41	48
Distance	(mm)	G	5	7.5	9.5	12	14	17	19
Length bellows body	(mm)	H	39.5	52	64	72	83	96	95
Clamping length	(mm)	I	10	15	19	22	28	33.5	37.5
Outside diameter tube section	(mm)	K	35	50	60	76	100	110	120
Length	(mm)	O	11.5	17	21	24	30	35	40
Shaft average value	(mm)	N	25	34	41	47	56	66	65

For maximum misalignment values see page 16.

ORDERING EXAMPLE	ZAL	10	1551	18	19.05	XX
Model	●					Special designation only (e.g. special bore tolerance).
Size		●				
Overall length mm			●			
Bore D1 H7				●		
Bore D2 H7					●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. ZAL / 10 / 1551 / 18 / 19.05 / XX; XX=anodized aluminum hubs)

EZ2

WITH FULLY SPLIT CLAMPING HUB

9 – 25,000 Nm

ABOUT

FEATURES

- easy installation and removal
- standard lengths up to 4 meters
- no intermediate support bearings required

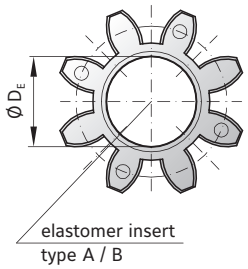
MATERIAL

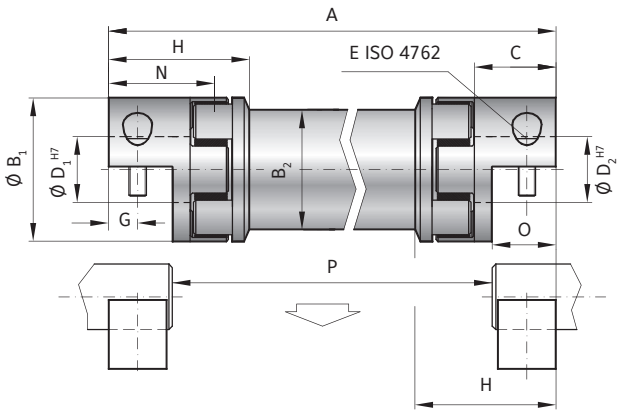
- **Hubs:** up to size 450 high strength aluminum, size 800 steel, size 2500 and up GGG40
- **Intermediate tube:** up to size 450 high strength aluminum, size 800 and up steel, optional CFK tube on request
- **Elastomer insert:** wear resistant, thermally stable TPU

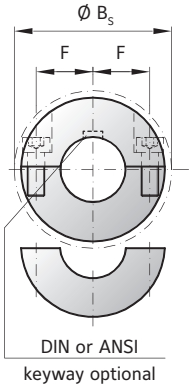
DESIGN

Two fully split clamping hubs, with two clamping screws in each, and concave driving jaws. Backlash free, vibration damping, electrically isolating elastomer inserts press fit into the hubs. Precision intermediate tube with a high level of straightness and lateral stiffness.

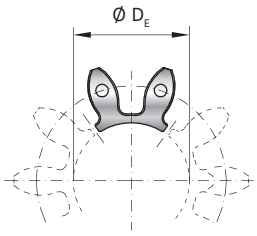
DESIGN | SIZE 10 – 800

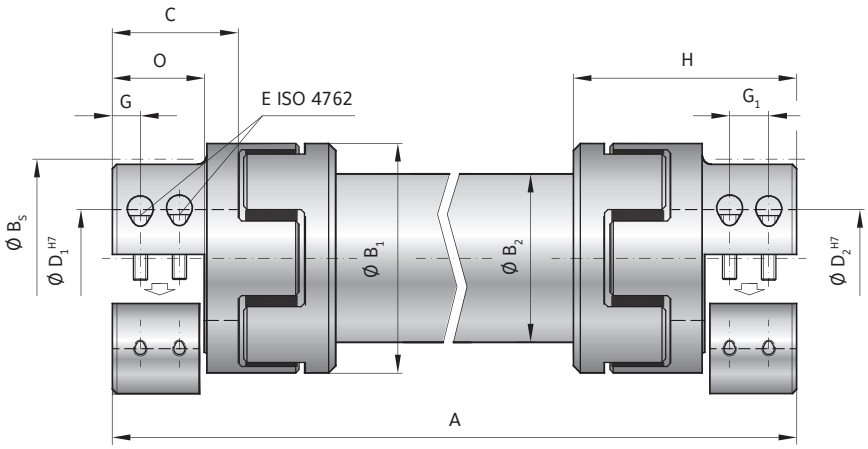






DESIGN | SIZE 2,500 – 9,500





For details on the elastomer inserts see pages 66-67.

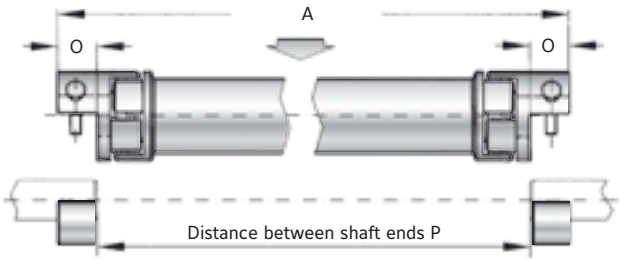
MODEL EZ2

SIZE		5		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	A	B
Rated torque (Nm)	T_{KN}	9	12	12.5	16	17	21	60	75	160	200	325	405	530	660	950	1,100	1,950	2,450	5,000	6,200	10,000	12,500
Max. torque* (Nm)	T_{Kmax}	18	24	25	32	34	42	120	150	320	400	650	810	1060	1350	1,900	2,150	3,900	4,900	10,000	12,400	20,000	25,000
Overall length (mm)	A	75 - 3,000		95 - 4,000		130 - 4,000		175 - 4,000		200 - 4,000		245 - 4,000		280 - 4,000		320 - 4,000		460 - 4,000		580 - 4,000		710 - 4,000	
Outside diameter hub (mm)	B_1	25		32		42		56		66.5		82		102		136.5		160		225		290	
Outside diameter tube (mm)	B_2	25		28		35		50		60		76		90		120		150		175		220	
Outside diameter with screwhead(mm)	B_S	25		32		44.5		57		68		85		105		139		155		190		243	
Fit length (mm)	C	8		20		25		40		47		55		65		79		85		110		140	
Inside diameter range from Ø to Ø H7 (mm)	$D_{1/2}$	5 - 12.7		5 - 16		8 - 25		14 - 32		19 - 36		19 - 45		24 - 60		35 - 80		35 - 90		40 - 120		50 - 140	
Max. inside diameter (Elastomer insert) (mm)	D_E	10.2		14.2		19.2		26.2		29.2		36.2		46.2		60.5		80		111		145	
Mounting screw ISO 4762	E	4 x M3		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 (Nm)		2		4		8		15		35		70		120		290		300		300		980	
Distance between centers (mm)	F	8		10.5		15.5		21		24		29		38		50.5		57		72.5		90	
Distance (mm)	G/G_1	5		7.5		8.5		15		17.5		20		25		30		36		24 /34		30 / 48	
Coupling length(mm)	H	25		34		46		63		73		84		97		125		142		181		229	
Moment of inertia per hub (10^{-3} kgm²)	J_1/J_2	0.004		0.01		0.02		0.15		0.21		1.02		2.3		17		30		140		450	
Inertia of tube per meter (10^{-3} kgm²)	J_3	0.049		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}	150	350	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}	503		321		1,530		6,632		11,810		20,230		65,340		392,800		1,000,000		2,500,000		5,000,000	
Shaft average value (mm)	N	18		26		33		49		57		67		78		94		108		137		171	
Length (mm)	O	11		16.6		18.6		32		37		42		52		62		67		85		105	

* Maximum transmittable torque of the clamping hub depends on the bore diameter (see pages 70-71).

INSTALLATION

The overall length A is best determined as the distance between shaft ends P plus 2x dimension O.



ORDERING EXAMPLE	EZ2	20	1200	A	24	19.05	XX
Model	●						Special designation only (e.g. special bore tolerance).
Size		●					
Overall length mm			●				
Elastomer insert type				●			
Bore D1 H7					●		
Bore D2 H7						●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. EZ2 / 20 / 1200 / A / 24 / 19.05 / XX; XX=anodized aluminum)

EZV ADJUSTABLE LENGTH WITH FULLY SPLIT CLAMPING HUB 12.5 - 1,200 Nm

ABOUT

FEATURES

- telescoping for adjustable length and rotational orientation
- very easy to install and remove
- no intermediate support bearings required
- length ranges up to 4 meters

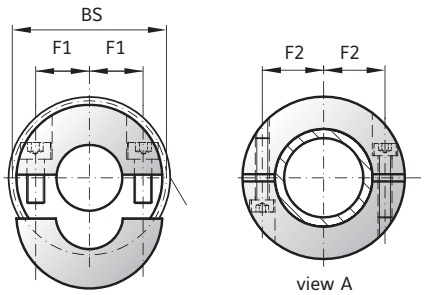
MATERIAL

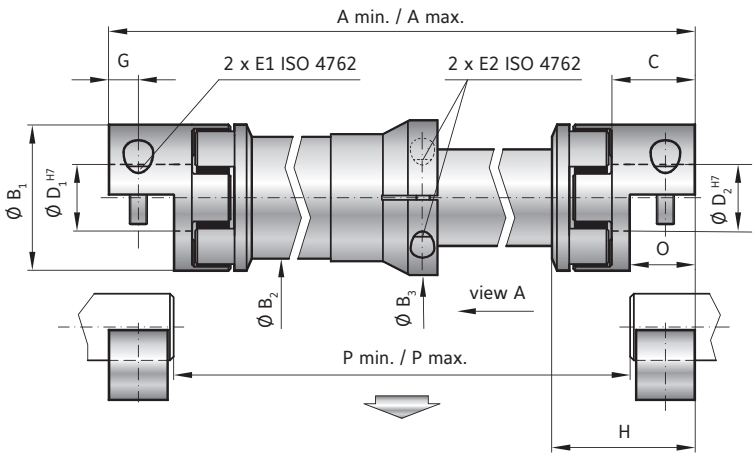
- **Hubs:** high strength aluminum
- **Intermediate tube:** highly straight and concentric aluminum tubing
- **Elastomer insert:** wear resistant, thermally stable TPU

DESIGN

Two fully split clamping hubs, with two clamping screws in each, and concave driving jaws. Backlash free, vibration damping, electrically isolating elastomer inserts press fit into the hubs. Precision intermediate tube with a high level of straightness and lateral stiffness. Outer tube clamps over inner tube to fix the overall length.

split clamping hub





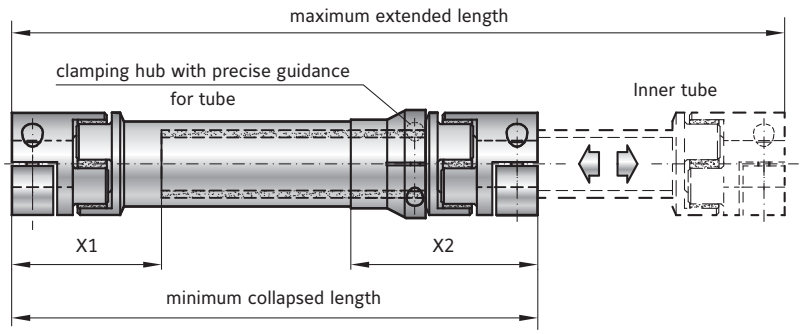
For details on the elastomer inserts see pages 66-67.

FUNCTIONAL DESCRIPTION

The maximum extended length relates to the minimum collapsed length. The formulas to the right can be used to determine the corresponding values.

Information on sizing, torsional stiffness, misalignment ratings, etc. can be found on pages 16-18.

Maximum extended length = (collapsed length x 2) - measurement (X1 + X2)



$$\text{Minimum collapsed length} = \frac{\text{maximum extended length} + \text{dimension (X1 + X2)}}{2}$$

MODEL EZV

SIZE			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 - 2,055		200 - 2,075		250 - 2,095		300 - 2,115		350 - 2,130		400 - 2,150	
Extended over all length from - to	(mm)	A_{max}	190 - 4,000		250 - 4,000		310 - 4,000		370 - 4,000		440 - 4,000		500 - 4,000	
Measurement	(mm)	X1+X2	115		156		197		240		280		312	
Outside diameter clamping hub	(mm)	B_1	32		42		56		66.5		82		102	
Outside diameter tube	(mm)	B_2	28		35		50		60		80		90	
Outside diameter center hub	(mm)	B_3	41.5		47		67		77		102		115	
Outside diameter with screwhead	(mm)	B_S	32		44.5		57		68		85		105	
Fit length	(mm)	C	20		25		40		47		55		65	
Inside diameter 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	
Tightening torque	(Nm)		4		8		15		35		70		120	
Screw ISO 4762		E_2	M4		M4		M5		M6		M8		M10	
Tightening torque	(Nm)		4		4.5		8		18		35		70	
Distance between centers	(mm)	$F_{10.5}$	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	
Coupling length	(mm)	H	34		46		63		73		86		99	
Shaft average value	(mm)	N	26		33		49		57		67		78	
Length	(mm)	O	16.6		18.6		32		37		42		52	
Moment of inertia coupling half	(10^{-3} kgm²)	J_1/J_2	0.01		0.02		0.15		0.21		1.02		2.3	
Inertia of tube per meter	(10^{-3} kgm²)	J_3	0.075		0.183		0.66		1.18		2.48		10.6	
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
Torsional stiffness of tube per meter	(Nm/rad)	C_T^{ZWR}	321		1,530		6,632		11,810		20,230		65,340	

*Maximum transmittable torque of the clamping hub depends on the bore diameter (see pages 70-71).

ORDERING EXAMPLE	EZV	20	1200	A	24	19.05	XX
Model	●						Special designation only (e.g. special bore tolerance).
Size		●					
Collapsed length			●				
Elastomer insert type				●			
Bore D1 H7					●		
Bore D2 H7						●	

For custom features place an XX at the end of the part number and describe the special requirements (e.g. EZV / 20 / 1200 / A / 24 / 19.05 / XX; XX=anodized aluminum)

ATEX

FOR USE IN HAZARDOUS AREAS

FOR USE IN HAZARDOUS AREAS
PRECISION COUPLINGS

MARKING EXAMPLE

Based on the ATEX markings the product can be certified for suitability under certain conditions.

	II	2G	c	IIA T6	X
	II	2D	c	85°C	X
	Equipment group	Category	Protection type	Explosion group / temperature class / maximum surface temperature	Additional features

Equipment group	Approval type
I	approved for underground operation
II	approved for all other applications

Category	Approved for zone	Zone description
1G	0	Area in which an explosive atmosphere consisting of a mixture of air and flammable gases, vapors, or mists, is present continuously, frequently, or for long periods of time.
2G	1	Area in which the potential exists for an explosive mixture of air and flammable gases, vapors, or mists to occur.
3G	2	Area in which the potential for an explosive mixture of air and flammable gases, vapors, or mists to occur is unlikely and only for a brief duration.
1D	20	Area with the same conditions as zone 0, with powder or dust.
2D	21	Area with the same conditions as zone 1, with powder or dust.
3D	22	Area with the same conditions as zone 2, with powder or dust.

Protection type	Definition
c	Design safety level: ignition hazard is avoided by the product design.

Example classification by occurring gases, mists and vapors according to temperature class and explosion group

Explosion group / temperature class / maximum surface temperature	IIA	IIB (includes IIA)	IIC (includes IIA + IIB)
T1 / 450°C	acetone, ammonia, methane...	natural gas	hydrogen
T2 / 300°C	ethyl alcohol, butane, cyclohexane...	ethylene, ethylene oxide	ethyne (acetylene)
T3 / 200°C	gasoline, diesel fuel, fuel oil...	ethylene glycol, hydrogen sulfide	
T4 / 135°C	acetaldehyde	ethyl ether	
T5 / 100°C			
T6 / 85°C			carbon disulphide

Additional labeling	Definition
X	Special operating conditions
U	Product is only a component in a machine. Conformity therefore shall only be declared after installation.

ATEX BELLOWS COUPLINGS

CONSTRUCTION

Dimensions and materials of the standard models remain largely intact.

PERFORMANCE RATINGS

All permitted misalignment, speed, and torque ratings of the standard models must be reduced by 30%.

OPERATION

ATEX metal bellows couplings must only be operated inside a sealed housing. Both the input and output shafts must be monitored to guarantee shut down in the case of coupling failure.

With blind mate style bellows couplings it is also necessary to guarantee electrical continuity between both shafts. This is necessary due to the electrically isolating properties of the coupling, and the need to prevent sparking from any electrostatic charges.

SAMPLE IDENTIFICATION

Type: BK2/60/EEx - 2013
II 2G c T4
II 2D c 135˚C
Ser.No.: 123456.7
Tech.Ref.No.:2003/003RW

Type: BK5/60/EEx - 2013
II 2G c T4
II 2D c 135˚C
Ser.No.: 123456.7
Tech.Ref.No.:2003/006RW

ATEX ELASTOMER COUPLINGS

CONSTRUCTION

Dimensions and materials of the standard models remain largely intact.

For ATEX elastomer couplings the inserts come in version "D" (Sh65D) which is electrically conductive to provide continuity for any potential electrostatic charges.

PERFORMANCE RATINGS

All permitted misalignment, speed, and torque ratings of the standard models must be reduced by 30%.

OPERATION

In the case of model TX thermoplastic hub elastomer couplings it is also necessary to guarantee electrical continuity between both shafts. This is necessary due to the electrically isolating properties of the coupling, and the need to prevent sparking from any electrostatic charges.

SAMPLE IDENTIFICATION

Type: EK2/60/EEx - 2013
II 2G c T4
II 2D c 135˚C
Ser.No.: 123456.7
Tech.Ref.No.:2003/001RW

Type: TX1/60/EEx - 2013
II 2G c IIA T6
II 2D c 85˚C
Ser.No.: 123456.7
Tech.Ref.No.:2003/001RW

ATEX FOR USE IN HAZARDOUS AREAS
PRECISION COUPLINGS

ATEX SAFETY COUPLINGS

CONSTRUCTION

Dimensions and materials of the standard models remain largely intact.

Generally full disengagement style safety couplings are used in ATEX environments in order to avoid high temperatures from excess friction after disengagement.

For ES2 safety couplings the inserts come in version "D" (Sh65D) which is electrically conductive to provide continuity for any potential electrostatic charges.

PERFORMANCE RATINGS

All permitted misalignment and speed ratings of the standard models must be reduced by 30%.

OPERATION

ATEX safety couplings must be used with an ATEX proximity switch. The emergency stop function in conjunction with activation of the switch must be fully tested for proper function prior to commissioning of the machine.

When bellows couplings are incorporated they must only be operated inside a sealed housing. Both the input and output shafts must be monitored to guarantee shut down in the case of bellows failure.

With blind mate style bellows couplings it is also necessary to guarantee electrical continuity between both shafts. This is necessary due to the electrically isolating properties of the coupling, and the need to prevent sparking from any electrostatic charges.

SAMPLE IDENTIFICATION

Type: SK2/60/EEx - 2013
II 2G c T3
II 2D c 200°C
Ser.No.: 123456.7
Tech.Ref.No.:2003/004RW

Type: ES2/60/(F)EEx - 2013
II 2G c T3
II 2D c 200°C
Ser.No.: 123456.7
Tech.Ref.No.:2003/002RW

ATEX LINE SHAFTS

CONSTRUCTION

Dimensions and materials of the standard models remain largely intact.

For EZ type line shafts the inserts come in version "D" (Sh65D) which is electrically conductive to provide continuity for any potential electrostatic charges.

PERFORMANCE RATINGS

All permitted misalignment, speed, and torque ratings of the standard models must be reduced by 30%.

The allowable operating speed depends on the overall length of the line shaft and is available upon request.

OPERATION

When bellows couplings are incorporated they must only be operated inside a sealed housing. Both the input and output shafts must be monitored to guarantee shut down in the case of bellows failure.

SAMPLE IDENTIFICATION

Type: EZ2/60/D/EEx - 2013
II 2G c T4
II 2D c 135°C
Ser.No.: 123456.7
Tech.Ref.No.:2003/005RW

Type: ZA/10/EEx - 2013
II 2G c T4
II 2D c 135°C
Ser.No.: 123456.7
Tech.Ref.No.:2005/007RW

ATEX DISC PACK COUPLINGS

CONSTRUCTION

Dimensions and materials of the standard models remain largely intact.

PERFORMANCE RATINGS

All permitted misalignment, speed, and torque ratings of the standard models must be reduced by 30%.

OPERATION

Both the input and output shafts must be monitored to guarantee shut down in the case of disc pack failure.

SAMPLE IDENTIFICATION

Type: LP2/300/EEx - 2013
II 2G c T4
II 2D c 135°C
Ser.No.: 123456.7
Tech.Ref.No.:2003/011RW

Prior to deviating from any of the previous safety instructions please contact R+W.

The use of devices and components in explosive areas is governed by the European directives 94/9/EC (for manufacturers) and 1992/92/EC (for operators). The presented products are non-electrical equipment of category 2. All necessary documents and certifications are stored in a known location. The conformity of these products with these guidelines is established and may be declared by the manufacturer.

According to Directive 94/9/EC, delivery of an ATEX coupling requires the inclusion of special installation and operating instructions along with the EC declaration of conformity issued by the manufacturer. All necessary values for installation, operation and removal are included.

All statements made about ATEX conforming products are based on our present knowledge and experience. R+W reserves the right to change technical specifications.

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A POPPE + POTTHOFF COMPANY

Version: 03/2014

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