HIGHLY FLEXIBLE COUPLINGS ELPEX-B SERIES

ELPEX-B
FLENDER

GENERAL

ELPEX-B couplings are highly flexible and free of torsional backlash. Because of their low torsional stiffness and damping capacity, ELPEX-B couplings are especially suitable for coupling machines with a highly non uniform torque pattern. ELPEX-B couplings are also suitable for connecting machines with high shaft misalignment.

Standard ELPEX-B coupling types are designed as shaft-shaft connections. Application-related types can be implemented on request.

Benefits

The ELPEX-B coupling is suitable for horizontal and vertical mounting positions or mounting positions at any required angle.

The elastic tire is slit at the circumference and can be changed without having to move the coupled machines.

The elastic tire is fitted without backlash and gives the coupling linear torsional stiffness, thus the torsional rigidity remains constant as the load on the coupling increases.

The ELPEX-B coupling is especially suitable for reversing operation or operation with changing directions of load. The coupling parts can be arranged as required on the shafts to be connected.

If the elastic tire is irreparably damaged or worn, the metal parts can rotate freely against one another because they are not in contact with one another.

Application

The ELPEX-B coupling is available as a catalog standard in 15 sizes with a rated torque of between 24 Nm and 14500 Nm. The coupling can be fitted with elastic tires made of natural rubber for ambient temperatures of -50 °C to +50 °C and with elastic tires made of chloroprene rubber for -15 °C to +70 °C.

The chloroprene rubber tire is marked FRAS, "Fire-resistant and Antistatic".

GENERAL

Design and configurations

The ELPEX-B coupling's transmission characteristic is determined essentially by the elastic tire. The elastic tire is manufactured from a natural rubber or a chloroprene rubber mixture with a multiply fabric insert. The elastic tire is fastened to the hubs with bolts and two clamping rings.

In type EBWT, the shaft-hub connection is achieved with Taper clamping bushes, in type EBWN with finish-drilled hubs and parallel keys. The type EBWZ connects the machine shafts additionally via a detachable adapter.

Metal part materials

- EN-GJL-250 grey cast iron or steel.

Elastic tire material

Material	Hardness	Marking	Ambient temperature
Natural rubber	70 ShoreA	48	-50 ... +50 °C
Chloroprene rubber	70 ShoreA	068 FRAS	-15 ... +70 °C

ELPEX-B coupling types

Type	Description
EBWN	Coupling as a shaft-shaft connection with drilled and grooved hubs
EBWT	Coupling as a shaft-shaft connection with Taper clamping bushes
EBWZ	Coupling as shaft-shaft connection with detachable adapter

Further application-specific coupling types are available; dimension sheets for and information on these are available on request.

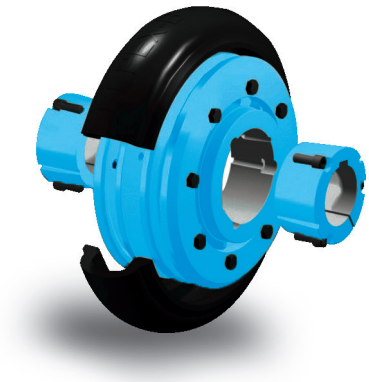
The coupling types set up for shaft-hub connections with Taper clamping bushes are designated as follows:

- Variant A: Coupling with part 3 – part 3
- Variant B: Coupling with part 4 – part 4
- Variant AB: Coupling with part 3 – part 4

In the case of part 3, the Taper clamping bush is screwed in from the shaft end face side. The coupling half must be fitted before the machines to be connected are pushed together.

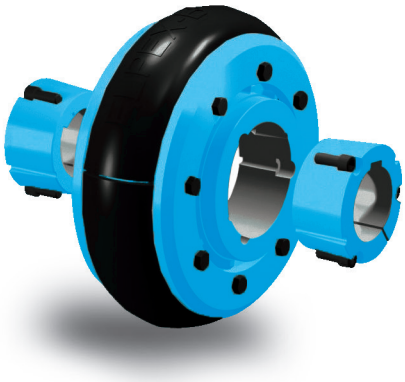
In the case of part 4, the Taper clamping bush is screwed in from the machine-housing side. If there is insufficient room, the Taper clamping bushes cannot be fitted from this side. Besides fitting space for the Taper clamping bush bolts, space for the fitting tool (offset screwdriver) must be taken into account.

In the case of coupling type EBWT, part 3 and part 4 can be combined as required. Furthermore, the variant with a Taper clamping bush can be combined with the finish-drilled hub.



Unfitted coupling

Fitted coupling
(shown without connecting shafts)



Fitted elastic tire

The elastic tire can simply be slipped over the hub parts. The elastic tire is held firmly in place by fitting the clamping ring. The connection transmits the torque by frictional engagement.

GENERAL

Technical specifications

Power ratings

Size	Rated torque T_{KN} Nm	Maximum torque T_{Kmax} Nm	Overload torque T_{KOL} Nm	Fatigue torque T_{KW} Nm	Maximum speed n_{Kmax} rpm	Dynamic torsional stiffness C_{Tdyn} Nm/rad	Permitted shaft misalignment at n = 1500 rpm [1] Axial ΔK_a mm	Radial ΔK_r mm	Angle ΔK_w Degree
105	**24**	48	72	7	4500	285	1.3	1.1	4
135	**66**	132	200	20	4500	745	1.7	1.3	4
165	**125**	250	375	38	4000	1500	2	1.6	4
190	**250**	500	750	75	3600	2350	2.3	1.9	4
210	**380**	760	1140	114	3100	3600	2.6	2.1	4
235	**500**	1000	1500	150	3000	5200	3	2.4	4
255	**680**	1360	2040	204	2600	7200	3.3	2.6	4
280	**880**	1760	2640	264	2300	10000	3.7	2.9	4
315	**1350**	2700	4050	405	2050	17000	4	3.2	4
360	**2350**	4700	7050	705	1800	28000	4.6	3.7	4
400	**3800**	7600	11400	1140	1600	44500	5.3	4.2	4
470	**6300**	12600	18900	1890	1500	78500	6	4.8	4
510	**9300**	18600	27900	2790	1300	110000	6.6	5.3	4
560	**11500**	23000	34500	3450	1100	160000	7.3	5.8	4
630	**14500**	29000	43500	4350	1000	200000	8.2	6.6	4

Torsional stiffness and damping

The damping coefficient is Ψ = 0.9

The technical data for the elastic tires made of natural rubber and chloroprene rubber are virtually identical.

Torsional stiffness depends on the ambient temperature and the frequency and amplitude of the torsional vibration excitation. More precise torsional stiffness and damping parameters on request.

With flexible couplings the manufacturing process of the rubber elements and their aging primarily influence the stiffness value C_{Tdyn}. For this reason calculation must be made with a tolerance for the dynamic stiffness of ± 20 %. The specified damping coefficient Ψ is a minimum value with the result that the damping performance of the coupling corresponds at least to the specified value.

Permitted shaft misalignment

The permitted shaft misalignment depends on the operating speed. As the speed increases, lower shaft misalignment values are permitted. The correction factors for different speeds are specified in the following table. The maximum speed for the respective coupling size must be noted.

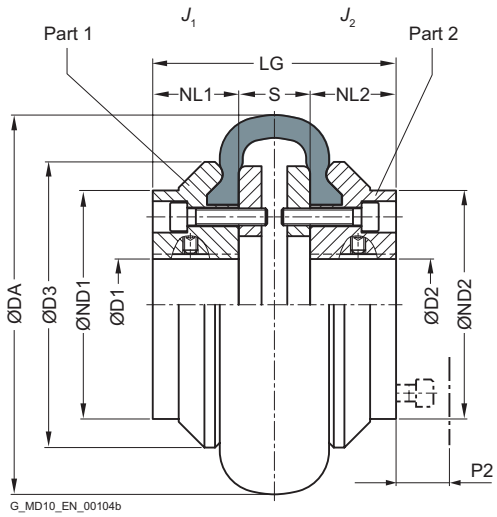
$$\Delta K_{perm} = \Delta K_{1500} \cdot FKV$$

	Speed in rpm			
	500	1000	1500	3000
Correction factor FKV	1.2	1.1	1.0	0.7

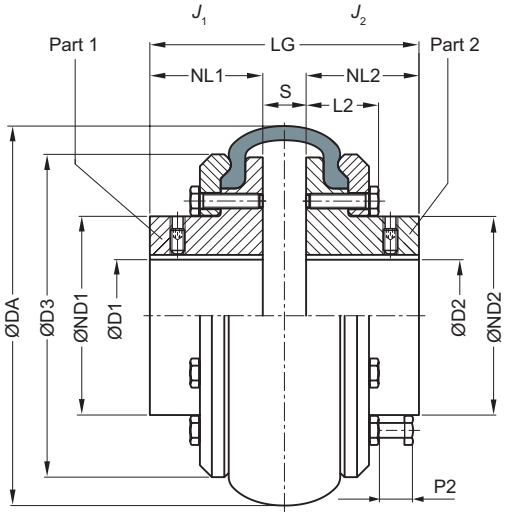
The restorative force (including in the axial direction) depends on speed, system torque and shaft misalignment. Restorative forces on request.

[1] The maximum speed for the respective type must be noted. For additional information on the allowable shaft misalignment, please refer to the operating instructions.

TYPE EBWN



Sizes 105 ... 165



Sizes 190 ... 630

Size	Rated torque	Dimensions in mm										Mass moment of inertia	↗ Article no. [1]	Weight
	T_{KN}	D1, D2 Keyway DIN 6885-1		DA	ND1/ ND2	NL1/ NL2	D3	L2	S	P2	LG	J_1/J_2		m
	Nm	min.	max.									kgm²		kg
105	24	–	30	104	70	30	82	–	22	35	82	0.0011	2LC0210-0AA	2.2
135	66	–	38	134	80	40	100	–	25	35	105	0.0025	2LC0210-1AA	3.6
165	125	–	45	165	70	50	125	–	33	35	133	0.0056	2LC0210-2AA	5.4
190	250	–	50	187	80	55	145	36	23	35	133	0.0095	2LC0210-3AA	6.9
210	380	–	60	211	98	65	168	40	25	35	155	0.02	2LC0210-4AA	11
235	500	–	70	235	111	70	188	45	27	35	167	0.023	2LC0210-5AA	14.8
255	680	–	80	254	130	75	216	44	27	35	177	0.06	2LC0210-6AA	20
280	880	–	90	280	145	80	233	45	25	35	185	0.083	2LC0210-7AA	24.5
315	1350	–	95	314	155	90	264	50	29	35	209	0.129	2LC0210-8AA	35
360	2350	–	125	359	200	100	311	50	32	35	232	0.32	2LC0211-0AA	54
400	3800	–	135	402	216	125	345	59	30	35	280	0.55	2LC0211-1AA	78
470	6300	–	160	470	260	140	398	67	46	35	326	1.12	2LC0211-2AA	120
510	9300	–	140	508	250	150	429	73	48	35	348	1.6	2LC0211-3AA	146
		140	180		290							1.7		154
560	11500	–	140	562	250	165	474	82	55	35	385	2.5	2LC0211-4AA	200
		140	180		300							2.7		206
630	14500	80	140	629	250	195	532	82	59	35	449	4.1	2LC0211-5AA	258
		140	180		300							4.4		265

Configurable variants [1]

- ØD1 Without finished bore / With finished bore
- ØD2 Without finished bore / With finished bore

Notes

- Weight and mass moments of inertia apply to maximum bore diameters.
- The article no. applies to elastic tires made of natural rubber.
- P2 = fitting space for dismounting the elastic tire

Ordering example

- ELPEX-B EBWN coupling, size 210
- Part 1: Bore 40H7mm, keyway to DIN 6885-1 and set screw
- Part 2: Bore 45H7 mm, keyway to DIN 6885-1 and set screw

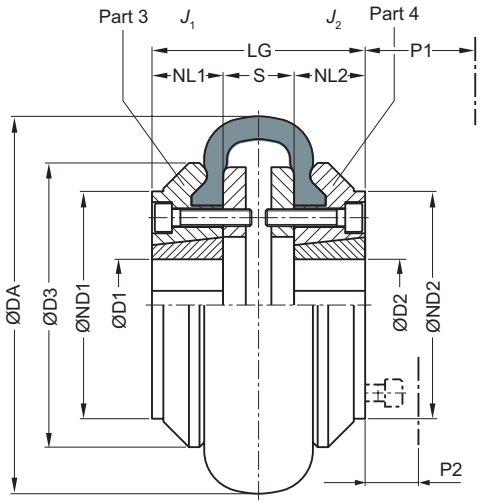
Article no.: 2LC0210-4AA99-0AA0-Z L0W+M1A

[1] To identify complete item numbers specifying the available finish boring options and – if necessary – further order options, please use our configurators on **flender.com**.

↗ For online configuration on **flender.com**, click on the item no.

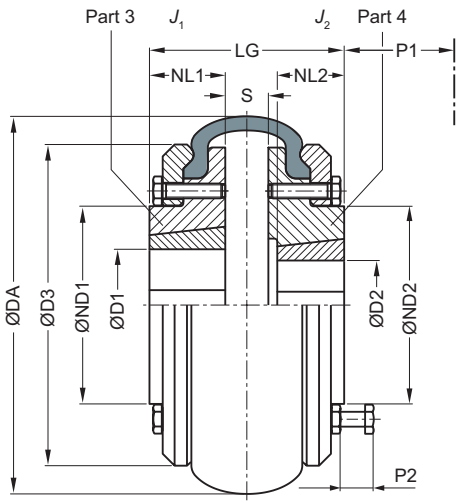
TYPE EBWT

Sizes 105 ... 165



Variant AB

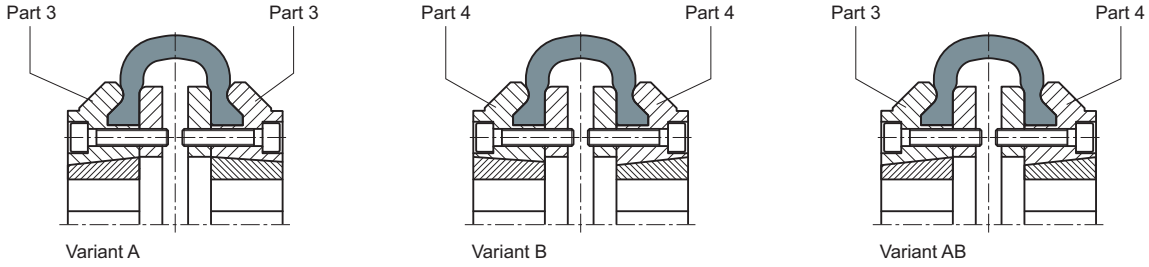
Sizes 190 ... 560



Variant AB

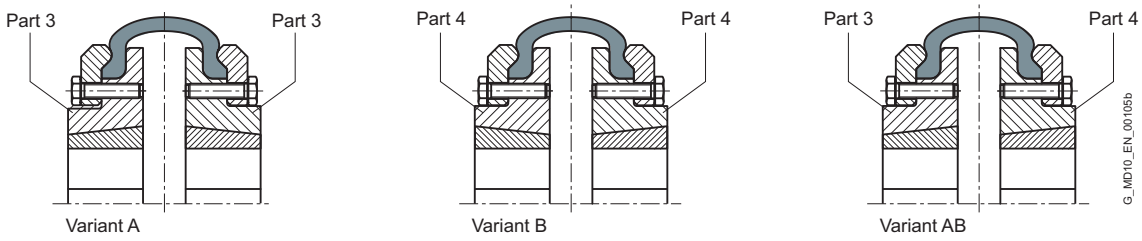
10

Sizes 105 ... 165



Variant A | Variant B | Variant AB

Sizes 190 ... 560



Variant A | Variant B | Variant AB

Part 3: Screw connection for Taper clamping bush from the shaft end face side

Part 4: Screw connection for Taper clamping bush from the machine-housing side

Size	Rated torque T_{KN} Nm	Part no.	Taper Clamping Bush Size	Dimensions in mm D1, D2 Keyway DIN 6885-1 min.	max.	DA	ND1/ ND2	NL1/ NL2	D3	S	P1	P2	LG	Mass moment of inertia J_1/J_2 kgm²	↗ Article no. [1] Type A	B	AB	Weight m kg
105	24	3	1008	10	25	104	–	22	82	22	29	35	66	0.0009	2LC0210-0AB	2LC0210-0AC	2LC0210-0AD	1.8
135	66	3	1210	11	32	134	80	25	100	25	38	35	75	0.0019	2LC0210-1AB	2LC0210-1AC	2LC0210-1AD	2.4
165	125	3	1610	14	42	165	103	25	125	33	38	35	83	0.0049	2LC0210-2AB	2LC0210-2AC	2LC0210-2AD	4
190	250	3	2012	14	50	187	80	32	145	23	42	35	87	0.0085	2LC0210-3AB	2LC0210-3AC	2LC0210-3AD	5.4
		4	1610	14	42			25			38							
210	380	3	2517	16	60	211	98	45	168	25	48	35	115	0.017	2LC0210-4AB	2LC0210-4AC	2LC0210-4AD	8
		4	2012	14	50			32			42		89					
235	500	3	2517	16	60	235	108	46	188	27	48	35	119	0.019	2LC0210-5AB	2LC0210-5AC	2LC0210-5AD	12
255	680	3	3020	25	75	254	120	51	216	27	55	35	129	0.05	2LC0210-6AB	2LC0210-6AC	2LC0210-6AD	14
		4	2517	16	60		113	45			48		117					
280	880	3	3020	25	75	280	134	52	233	25	55	35	129	0.075	2LC0210-7AB	2LC0210-7AC	2LC0210-7AD	22
315	1350	3	3525	35	100	314	140	66	264	29	67	35	161	0.11	2LC0210-8AB	2LC0210-8AC	2LC0210-8AD	23
		4	3020	25	75			51			55		131					
360	2350	3	3525	35	100	359	178	65	311	32	67	35	162	0.26	2LC0211-0AB	2LC0211-0AC	2LC0211-0AD	38
400	3800	3	4030	40	115	402	200	77	345	30	80	35	184	0.44	2LC0211-1AB	2LC0211-1AC	2LC0211-1AD	54
470	6300	3	4535	55	125	470	210	89	398	46	89	35	224	0.8	2LC0211-2AB	2LC0211-2AC	2LC0211-2AD	72
510	9300	3	4535	55	125	508	208	89	429	48	89	35	226	1.5	2LC0211-3AB	2LC0211-3AC	2LC0211-3AD	120
560	11500	3	5040	70	125	562	224	102	474	55	92	35	259	2	2LC0211-4AB	2LC0211-4AC	2LC0211-4AD	120

Configurable variants [1]

- ØD1 Without finished bore
  With finished bore
- ØD2 Without finished bore
  With finished bore

Notes

- Weights and mass moments of inertia apply to couplings with Taper clamping bushes with maximum bore diameter.
- The article no. applies to elastic tires made of natural rubber.
- P1 = fitting space for offset screwdriver and ejector bolt for dismounting the Taper clamping bush
- P2 = fitting space for dismounting the elastic tire.

Ordering example

- ELPEX-B EBWT coupling, size 210, variant AB, including Taper clamping bushes
- Part 3: with Taper clamping bush, bore 60 mm
- Part 4: with Taper clamping bush, bore 40 mm

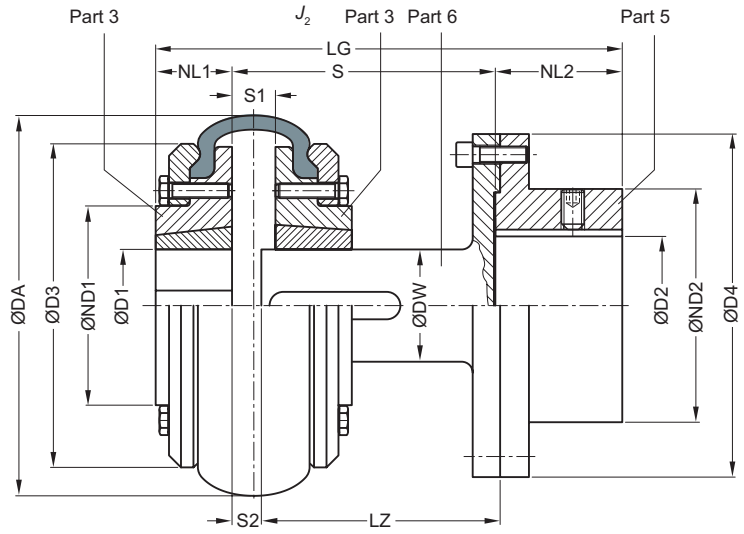
Article no.: 2LC0210-4AD99-0AA0-Z L1E+M0W

[1] To identify complete item numbers specifying the available finish boring options and – if necessary – further order options, please use our configurators on **flender.com**.

↗ For online configuration on **flender.com**, click on the item no.

TYPE EBWZ

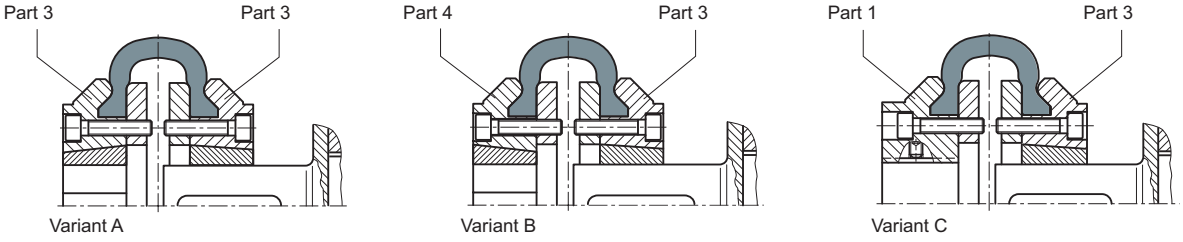
Sizes 190 ... 470



Variant A

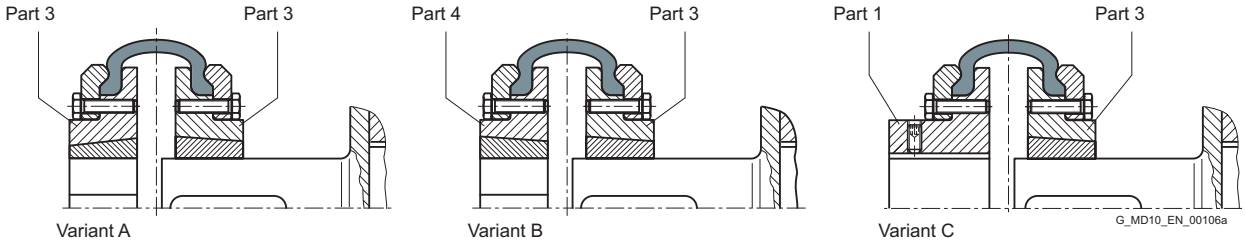
10

Sizes 105 ... 165



Variant A | Variant B | Variant C

Sizes 190 ... 470



Variant A | Variant B | Variant C

Part 3: Screw connection for Taper clamping bush from the shaft end face side

Part 4: Screw connection for Taper clamping bush from the machine-housing side

Size	Rated torque	Dimensions in mm												Mass moment of inertia	↗ Article no. [1]			Weight
	T_{KN}	D1, D2 Keyway DIN 6885-1		DA	ND2	D4	DW	NL2	LZ	S		S1	S2	J_2	Type			m
	Nm	min.	max.							min.	max.		min.	kgm²	A	B	C	kg
105	24	–	42	104	70	95	25	45	96	100	116	22	6	0.0027	2LC0210-0AG	2LC0210-0AH	2LC0210-0AJ	3.3
									133	140	156							
135	66	–	55	134	90	125	32	50	93	100	116	25	9	0.0085	2LC0210-1AG	2LC0210-1AH	2LC0210-1AJ	5.4
									133	140	156							
165	125	–	55	165	90	125	32	50	93	100	124	33	9	0.012	2LC0210-2AG	2LC0210-2AH	2LC0210-2AJ	6.2
									133	140	164							
190	250	–	75	187	125	180	48	80	93.5	100	114	23	9	0.046	2LC0210-3AG	2LC0210-3AH	2LC0210-3AJ	16
									133.5	140	154							
									173.5	180	194							
210	380	–	75	211	125	180	48	80	133.5	140	156	25	9	0.053	2LC0210-4AG	2LC0210-4AH	2LC0210-4AJ	17
									173.5	180	196							
235	500	–	75	235	125	180	48	80	133.5	140	158	27	9	0.056	2LC0210-5AG	2LC0210-5AH	2LC0210-5AJ	25
									173.5	180	198							
255	680	–	90	254	150	225	60	100	133.5	140	158	27	9	0.15	2LC0210-6AG	2LC0210-6AH	2LC0210-6AJ	29
									173.5	180	198							
280	880	–	90	280	150	225	60	100	133.5	140	156	25	9	0.17	2LC0210-7AG	2LC0210-7AH	2LC0210-7AJ	33
									173.5	180	196							
315	1350	46	100	314	165	250	80	110	134.5	140	160	29	9	0.28	2LC0210-8AG	2LC0210-8AH	2LC0210-8AJ	40
									174.5	180	200							
360	2350	46	100	359	165	250	80	110	134.5	140	163	32	9	0.43	2LC0211-0AG	2LC0211-0AH	2LC0211-0AJ	48
									174.5	180	203							
400	3800	51	110	402	180	280	90	120	223.5	230	250	30	10	0.88	2LC0211-1AG	2LC0211-1AH	2LC0211-1AJ	73
470	6300	51	120	470	200	315	100	140	207.5	214	250	46	10	0.97	2LC0211-2AG	2LC0211-2AH	2LC0211-2AJ	104

Configurable variants [1]

- ØD1 Without finished bore
  With finished bore
- ØD2 Without finished bore
  With finished bore
- S min. 100 mm
  140 mm
  180 mm

Notes

- Dimensions D1, ND1, NL1, J1 and fitting space for dismounting elastic tire and Taper clamping bush, see types EBWN or EBWT, **Page 10/7** or **Page 10/8**
- The article no. applies to elastic tires made of natural rubber.
- Mass moment of inertia J_2 and weight m as total of part 3, part 5 and part 6 with maximum bore diameter.

Ordering example

- ELPEX-B EBWZ coupling, size 360
- variant C, for fitting length S min. = 190 mm
- Part 1: Bore 65H7 mm, keyway to DIN 6885-1 and set screw
- Part 5: Bore 70H7 mm, keyway to DIN 6885-1 and set screw

Article no.: 2LC0211-0AJ99-0AC0-Z L1F+M1G

[1] To identify complete item numbers specifying the available finish boring options and – if necessary – further order options, please use our configurators on **flender.com**.

↗ For online configuration on **flender.com**, click on the item no.

SPARE AND WEAR PARTS

Elastic tire

Size	Article No. Natural rubber Identification 048	Weight kg	Chloroprene rubber Identification 068 FRAS	Weight kg
105	2LC0210-0WA00-0AA0	0.1	2LC0210-0WA00-0AA0-Z K01	0.1
135	2LC0210-1WA00-0AA0	0.2	2LC0210-1WA00-0AA0-Z K01	0.2
165	2LC0210-2WA00-0AA0	0.4	2LC0210-2WA00-0AA0-Z K01	0.4
190	2LC0210-3WA00-0AA0	0.5	2LC0210-3WA00-0AA0-Z K01	0.5
210	2LC0210-4WA00-0AA0	0.8	2LC0210-4WA00-0AA0-Z K01	0.8
235	2LC0210-5WA00-0AA0	1	2LC0210-5WA00-0AA0-Z K01	1
255	2LC0210-6WA00-0AA0	1.2	2LC0210-6WA00-0AA0-Z K01	1.2
280	2LC0210-7WA00-0AA0	1.4	2LC0210-7WA00-0AA0-Z K01	1.4
315	2LC0210-8WA00-0AA0	2.6	2LC0210-8WA00-0AA0-Z K01	2.6
360	2LC0211-0WA00-0AA0	2.9	2LC0211-0WA00-0AA0-Z K01	2.9
400	2LC0211-1WA00-0AA0	3.1	2LC0211-1WA00-0AA0-Z K01	3.1
470	2LC0211-2WA00-0AA0	5.3	2LC0211-2WA00-0AA0-Z K01	5.3
510	2LC0211-3WA00-0AA0	7.8	2LC0211-3WA00-0AA0-Z K01	7.8
560	2LC0211-4WA00-0AA0	10.8	2LC0211-4WA00-0AA0-Z K01	10.8
630	2LC0211-5WA00-0AA0	12.4	2LC0211-5WA00-0AA0-Z K01	12.4

Note

- The elastic tires are wear parts.
  The service life depends on the operating conditions.