

BoWex[®]

Curved-tooth gear couplings[®], shaft couplings

BoWex[®] FLE-PA

U.S. Patent 5,586,938

Torsionally rigid flange couplings

BoWex - ELASTIC[®]

Highly flexible flange couplings

MONOLASTIC[®]

EP 0853203 U.S. Patent 6,117,017

Single parted, flexible flange couplings

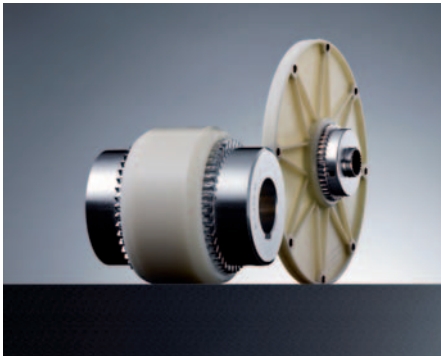
Pump mounting flanges

according to SAE and special dimensions

Made for Motion

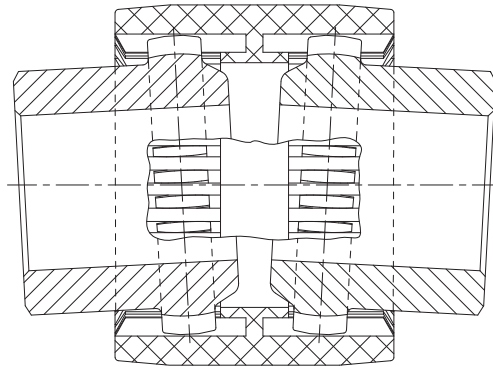


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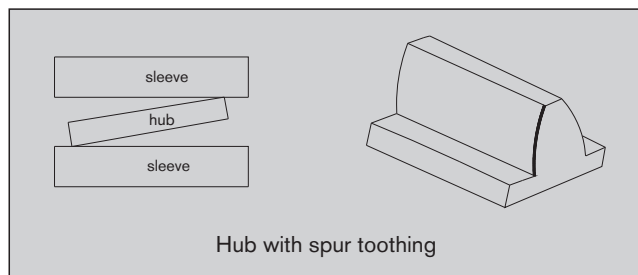
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Operating description

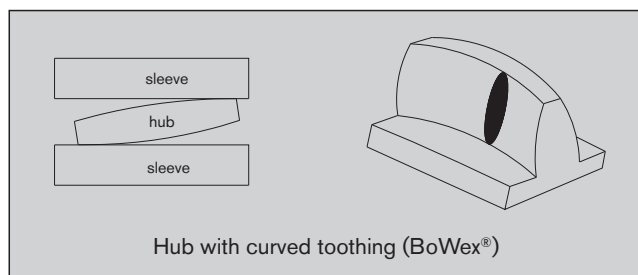


BoWex® Curved-tooth gear couplings® are flexible shaft connections for a positive torque transmission and specifically suitable to compensate for axial, radial and angular shaft misalignment.

According to the well-known effect of curved-tooth gear couplings any edge pressure in the spline in case of angular and radial displacements is avoided so that BoWex couplings are almost free from wear.



On couplings with spur toothings high edge pressure along with considerable wear arises at the contact surfaces in case of misalignment.



The curved teeth avoid any edge pressure on the coupling in case of angular and radial misalignment.

The material combination of steel hubs and polyamide sleeves allows for maintenance-free continuous operation with very low friction on the teeth.

Due to the double cardanic operation of BoWex® couplings restoring forces may be neglected in case of angular and radial displacements and periodic fluctuations in angular velocity do not arise.

BoWex® couplings can be assembled both vertically or horizontally with no need for any special assembly tools.

The standard polyamide material is characterized by the following positive features:

- high mechanical consistency
- high stiffness
- high thermal stability (+ 100 °C)
- good viscosity even in case of low temperatures
- favourable slide-friction behaviour
- very good electrical insulating property
- good resistance to chemicals
- good dimensional accuracy

Behaviour of friction and wear of the BoWex® sleeve

The smooth and hard surface (crystalline structure) and the high thermal stability and resistance to lubricants, fuels, hydraulic fluids, dissolvents, etc. make polyamide an ideal material for components stressed by sliding, particularly for the coupling production. While any metallic materials tend to "corrode" in case of dry running, slide combinations with polyamide and steel are operative without any lubrication and maintenance.

Explosion protection use

BoWex® couplings type M until size 65 including an electrically conductive nylon sleeve (PA-CF) are suitable for power transmission in drives in hazardous areas. The couplings are certified and confirmed according to EC standard 94/9/EC (ATEX 95) as units of category 2G/2D and thus suitable for the use in hazardous areas of zone 1, 2, 21 and 22. Please read through our information included in the respective Type Examination Certificate and the operating and mounting instructions at www.ktr.com.



Technical data

Power, Torque and Speed							
Design and size		Power $\frac{P [kW]}{n [1/min]}$		Torque T_K [Nm]			Max. speed [1/min]
		Rated	Maximum	T_{KN}	$T_{K max.}$	T_{KW}	
Type plug-in coupling / junior M	junior 14 / M-14	0,0005	0,010	5	10	2,5	6000
	junior 19 / M-19	0,0008	0,0017	8	16	4	6000
	junior 24 / M-24	0,0013	0,0025	12	24	6	6000
Type M I AS Spez.-I SG SSR	14	0,0010	0,003	10	30	5	14000
	19	0,0017	0,005	16	48	8	11800
	24	0,0021	0,006	20	60	10	10600
	28	0,0047	0,014	45	135	23	8500
	32	0,0063	0,019	60	180	30	7500
	38	0,0084	0,025	80	240	40	6700
	42	0,010	0,031	100	300	50	6000
	45 / 48	0,015	0,044	140	420	70	5600
	65	0,040	0,119	380	1140	190	4000
	80	0,073	0,22	700	2100	350	3150
	100	0,13	0,38	1200	3600	600	3000
	125	0,26	0,78	2500	7500	1250	2120
Type M...C	14	0,0015	0,0047	15	45	7,5	14000
	19	0,0025	0,0075	24	72	12	11800
	24	0,003	0,009	30	90	15	10600
	28	0,007	0,022	70	210	35	8500
	32	0,009	0,028	90	270	45	7500
	38	0,013	0,038	120	360	60	6700
	48	0,021	0,063	200	600	100	5600
	65	0,058	0,18	560	1680	280	4000
Type FLE-PA	28	0,0078	0,014	75	185	37,5	6000
	32	0,014	0,028	135	335	67,5	6000
	48	0,025	0,050	240	600	120	5000
	T 48	0,030	0,078	300	750	150	5000
	T 55	0,047	0,12	450	1125	225	4500
	65	0,068	0,140	650	1600	325	3600
	T 65	0,084	0,210	800	2000	400	3600
	T 70	0,105	0,262	1000	2500	500	3400
	80	0,13	0,250	1200	3000	600	3000
	T 80	0,16	0,039	1500	3750	750	3000
	100	0,21	0,43	2050	5150	1025	2500
	T 100	0,26	0,65	2500	6250	1250	2500
	125	0,44	0,89	4250	10700	2125	2500
Type ELASTIC HE HEW HEW-ZS HE-ZS HEG	40Sh	0,014	0,041	130	390	36	
	42 HE 50Sh	0,016	0,047	150	450	45	6200
	65Sh	0,019	0,057	180	540	54	
	40Sh	0,021	0,063	200	600	60	
	48 HE 50Sh	0,024	0,072	230	690	69	5600
	65Sh	0,029	0,088	280	840	84	
	40Sh	0,037	0,110	350	1050	105	
	65 HE 50Sh	0,042	0,126	400	1200	120	4500
	65Sh	0,052	0,157	500	1500	150	
	40Sh	0,045	0,135	430	1290	129	
	G 65 HE 50Sh	0,052	0,157	500	1500	150	4300
	65Sh	0,065	0,195	620	1860	186	
	40Sh	0,089	0,267	750	2250	225	
	80 HE 50Sh	0,096	0,298	950	2850	285	3600
	65Sh	0,126	0,372	1200	3600	360	
	40Sh	0,130	0,39	1250	3750	375	
	G 80 HE 50Sh	0,16	0,50	1600	4800	480	3000
	65Sh	0,21	0,62	2000	6000	600	
	40Sh	0,21	0,62	2000	6000	600	
	100 HE 50Sh	0,26	0,78	2500	7500	750	2700
	65Sh	0,36	1,00	3200	9600	960	
	40Sh	0,31	0,942	3000	9000	900	
	125 HE 50Sh	0,41	1,256	4000	12000	1200	2300
	70Sh	0,52	1,570	5000	15000	1500	
	40Sh	0,42	1,26	4000	12000	1200	
	G 125 HE 50Sh	0,54	1,63	5200	16000	1600	2100
	70Sh	0,68	2,04	6500	20000	2000	
	40Sh	0,58	1,73	5500	16500	1650	
	150 HE 50Sh	0,73	2,20	7000	21000	2100	1800
	70Sh	0,94	2,83	9000	27000	2700	

Coupling selection

The BoWex® coupling is selected in accordance with DIN 740 part 2. The coupling has to be dimensioned in a way that the permissible coupling load is not exceeded in any operating condition. For this purpose the actual loads have to be compared to the permissible parameters of the coupling.

1 Drives without periodical load

The coupling has been selected by checking the rated torques T_{KN} and maximum torque $T_{K \max}$:

2 Load produced by rated torque

$$T_{KN} \geq T_N \cdot S_t$$

Taking into consideration the ambient temperature, the permissible rated torque T_{KN} of the coupling has to correspond at least to the rated torque T_N of the machine.

$$T_N [\text{Nm}] = 9550 \cdot \frac{P_{AN/LN} [\text{kW}]}{n [1/\text{min}]}$$

3 Load produced by torque shocks

$$T_{K \max} \geq T_S \cdot S_Z \cdot S_t + T_N \cdot S_t$$

The permissible maximum torque of the coupling has to correspond at least to the total of peak torque T_S and the rated torque T_N of the machine, taking into account the shock frequency Z and the ambient temperature.

$$\text{Drive-sided shock } T_S = T_{AS} \cdot M_A \cdot S_A$$

$$\text{Load-sided shock } T_S = T_{LS} \cdot M_L \cdot S_L$$

$$M_A = \frac{J_L}{J_A + J_L} \quad M_L = \frac{J_A}{J_A + J_L}$$

This applies in case if the rated torque T_N of the machine is at the same time subject to shocks.

Knowing the mass distribution, shock direction and shock mode, the peak torque T_S can be calculated.

For drives with A. C.-motors with high masses on the load side we would recommend to calculate the peak driving torque with the help of our simulation programme.

Service factor S_t for temperature

Material of sleeve	-40 °C +60 °C	+70 °C	+80 °C	+90 °C	+100 °C	+110 °C	+120 °C
PA 6.6	1,0	1,2	1,4	1,6	1,8	-	-
PA-CF	1,0	1,1	1,2	1,4	1,6	1,9	2,2

Service factor S_Z for starting frequency

starting frequency/h	100	200	400	800
S_Z	1,0	1,2	1,4	1,6

Service factor S_A/S_L for shocks

	S_A/S_L
gentle shocks	1,5
average shocks	1,8
heavy shocks	2,5

Permissible load on feather key of the coupling hub

The shaft-hub-connection has to be verified by the customer.

Permissible surface pressure according to DIN 6892 (method C).

Polyamide	30 N/mm ² (up to + 40 °C)
Powder metal steel	180 N/mm ²
Material steel S355J2G3 (St 52.3)	250 N/mm ²
for other steel materials $p_{\text{perm.}} =$	$0,9 \cdot R_e (R_{p0.2})$

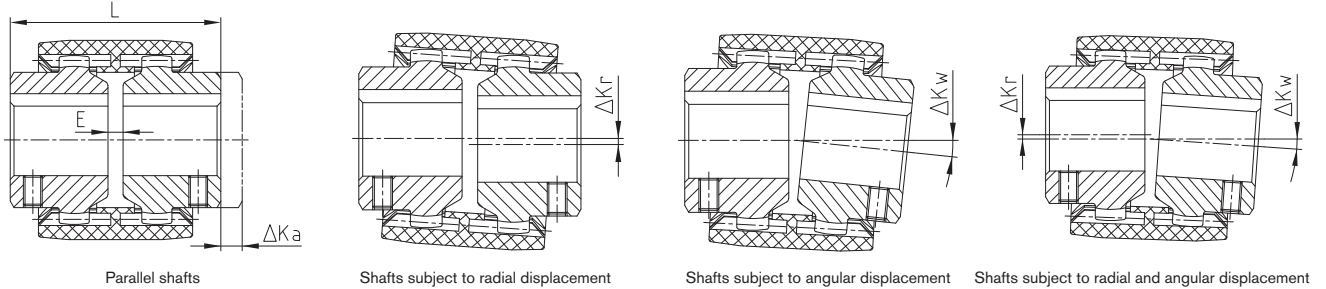
Description	Symbol	Definition or explanation
Rated torque of coupling	T_{KN}	Torque that can continuously be transmitted over the entire permissible speed range.
Maximum torque of coupling	$T_{K \max}$	Torque that can be transmitted as dynamic load $\geq 10^5$ times or 5×10^4 as vibratory load, respectively, during the entire operating life of the coupling.
Vibratory torque of coupling	T_{KW}	Torque amplitude of the permissible periodical torque fluctuation with a frequency of 10 Hz and a basic load of T_{KN} or dynamic load up to T_{KN} , respectively.
Damping power of coupling	P_{KW}	Permissible damping power with an ambient temperature of + 30 °C.
Rated torque of machine	T_N	Stationary rated torque on the coupling
Peak torque of machine	T_S	Peak torque on the coupling
Peak torque on the driving side	T_{AS}	Peak torque with torque shock on the driving side, e. g. breakdown torque of the electric motor.

Description	Symbol	Definition or explanation
Peak torque of load side	T_{LS}	Peak torque with torque shock on load side, e. g. braking.
Vibratory torque of machine	T_W	Amplitude of the vibratory torque effective on the coupling.
Damping power of the machine	P_W	Damping power which is effective on the coupling due to the load produced by the vibratory torque.
Moment of inertia of driving side	J_A	Total of moments of inertia existing on the driving or load side referring to the coupling speed.
Moment of inertia of load side	J_L	
Rotational inertia coefficient of driving side	M_A	Factor taking into account the mass distribution with shocks and vibrations produced on the driving or load side.
Rotational inertia coefficient of load side	M_L	$M_A = \frac{J_L}{J_A + J_L} \quad M_L = \frac{J_A}{J_A + J_L}$

Displacements and threads for setscrews

Displacements

BoWex® couplings are double cardanic and in addition to transmitting the power compensate for axial, radial and angular shaft displacements in a way to prevent damages from the driving or driven machine, respectively.



Displacements						
Type and size	Overall length L of the coupling assembled (standard design) 2) [mm]	Can the coupled power pack be disassembled vertically without axial displacement?	Shift distance dimension E 1) [mm]	Max. axial displacement ΔKa [mm]	Max. permissible displacements ΔKr radial or ΔKw angular [mm] or [°]	
junior 14 (plug-in coupling)	48					
junior 19 (plug-in coupling)	52	no	2	± 1	± 0,1	
junior 24 (plug-in coupling)	54					
junior M-14; M-14	50				± 0,3	
junior M-19; M-19	54	no				
junior M-24; M-24; Special I-24	56					
24 AS; 24 SSR						
24 SG	76	yes				
M-28; Special I-28		no				
28 AS; 28 SG; 28 SSR		yes				
M-32; Special I-32	84	no			± 0,4	
32 AS; 32 SG; 32 SSR		yes	4			
M-38		no				
M-42		no		± 1		± 1° each hub
45 AS; 45 SG; 45 SSR	88	yes				
Special I-45						
M-48	104	no				
M-65; Special I-65		no			± 0,6	
65 AS; 65 SG; 65 SSR	114					
80 AS; 80 SSR		yes			± 0,7	
I-80; Special I-80; 80 SG	186	no	6			
100 AS; 100 SSR		yes			± 0,8	
I-100; Special I-100; 100 SG	228	no	8			
125 AS; 125 SSR		yes			± 1,1	
I-125; Special I-125; 125 SG	290	no	10			

The assembled hubs must in every case be flush with the shaft ends. If it is difficult to determine the distance dimension E, reference may be made to the overall assembled length.

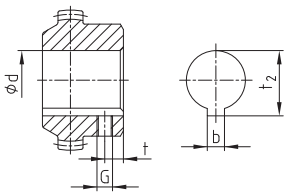
The shaft ends to be connected should be supported close to each coupling half.

- 1) The listed distance dimension E for the different couplings must be observed in every case, particularly for radial and angular misalignments.
- 2) If the coupling hubs have been shortened or lengthened on the outside, the overall length of the coupling assembled will be reduced by the corresponding figure.
- 3) The permissible displacement figures depend on speed and performance. We shall be glad to send you a displacement diagramme if required.

Prior to operation of the BoWex® coupling please make sure that the coupling sleeves are readily capable of axial movement.

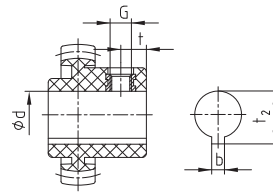
The customer must provide guards in order to ensure that rotating parts cannot cause injury (Safety of Machines, DIN EN 292 part 2).

Threads for setscrews (Thread dimensions for setscrews. BoWex® coupling hubs with cylindrical bores.)



Position of the thread for setscrews
BoWex® M-14 to M-24 opposite to the keyway

BoWex® M-28 to I-125 on the keyway



Position of the thread for BoWex®

junior plug-in coupling and junior M-coupling

BoWex® – coupling hubs							
Size	14	28	42	65	80	100	125
Dimensions	19	32	45	65	80	100	125
Thread G	M5	M8	M10	M10	M12	M16	
Distance t	6	10	15 1)	20	30	40	
Tightening torque TA [Nm]	2	10	17	17	40	80	

BoWex® junior – coupling hubs			
Size	14	19	24
Dimensions	14	19	24
Thread G	M5	M5	M5
Hub 1b - Distance t	6	6	6
Plug-in sleeve 2b - Distance t	8	10	10
Tightening torque TA [Nm]	1,4	1,4	1,4

1) Hub length 55 mm t = 15 mm, 70 mm t = 20 mm

Cylindrical bores, taper/inch bores and selection of standard IEC motors

Stock programme cylindrical finish bores [mm] H7 keyway to DIN 6885 sheet 1 [JS9] with thread for setscrew																																
BoWex® size	un-/pilot bored	Ø8	Ø9	Ø10	Ø11	Ø12	Ø13	Ø14	Ø15	Ø16	Ø17	Ø18	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø60	Ø65	Ø70	Ø75
14	●■	●	●	●	●	●	●	●■	●																							
19	●■			●	●	●		●	●	●	●	●	●■	●																		
24	●■			●	●	●		●■	●	●	●	●	●■	●	●	●■																
28	●■							●	●	●	●	●	●	●	●	●■	●	●■														
32	●■											●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
38	●■											●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
42	●■												●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
48	●■													●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
65	●■																●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
80	●																															

● standard length ■ standard lengthened

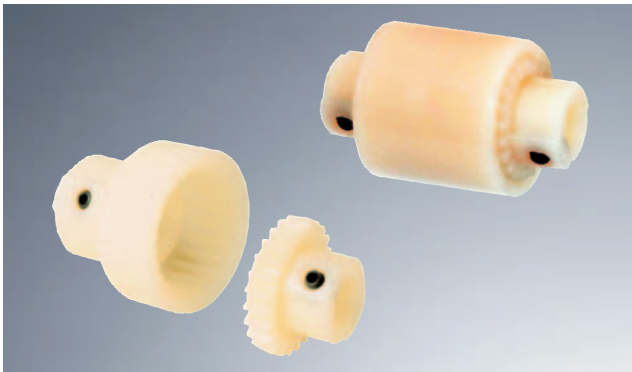
Stock programme taper and inch bores																			
Code d ^{+0,05} b ^{JS9} t ^{+0,2}	Taper 1:5					Taper 1:8					Inch bores								
	A-10 9,85 2	B-17 16,85 3	C-20 19,85 4	D-25 24,85 5	E-30 29,85 6	N/1 9,7 2,4	N1d 14 3	N/2 17,28 3,2	N/2a 17,28 4	N/3 22 3,99	Ta 12,7 3,17 14,3	DNC 13,45 3,17 14,9	Ed 15,87 4,75 18,1	A 19,05 4,78 21,3	G 22,22 4,75 24,7	F 22,22 6,38 25,2	Bs 25,38 6,37 28,3	Hs 25,4 6,35 28,3	K 31,75 7,93 35,4
14	●					●							●						
19		●				●							●						
24	●	●				●	●	●	●		●		●	●					
28	●	●	●			●	●	●	●				●				●		
32		●	●	●															
38		●	●					●	●	●							●		●
42		●	●	●				●	●	●							●		●
48																	●		●
65										●									●

Further dimensions on request.

BoWex®-couplings for standard IEC-motors, protection type IP 54/IP 55										
A. C. motor size	Motor output with 50 Hz n = 3000 [1/min]			Motor output with 50 Hz n = 1500 [1/min]			Motor output with 50 Hz n = 1000 [1/min]			Cylindric shaft end d x l [mm] 3000 ≤ 1500
	kW	T [Nm]	BoWex®-coupling	kW	T [Nm]	BoWex®-coupling	kW	T [Nm]	BoWex®-coupling	
56	0,09 0,12	0,32 0,41		0,06 0,09	0,43 0,64		0,037 0,045	0,43 0,52		9 x 20
63	0,18 0,25	0,62 0,86	14	0,12 0,18	0,88 1,3	14	0,06 0,09	0,72 1,1	14	11 x 23
71	0,37 0,55	1,3 1,9		0,25 0,37	1,8 2,5		0,18 0,25	2,0 2,7		14 x 30
80	0,75 1,1	2,5 3,7	19	0,55 0,75	3,7 5,1	19	0,37 0,55	3,9 5,8	19	19 x 40
90 S	1,5	5,0		1,1	7,5		0,75	8,0		24 x 50
90 L	2,2	7,4		1,5	10		1,1	12		
100 L	3	9,8		2,2	15		1,5	15		28 x 60
112 M	4	13		4	27		2,2	22		
132 S	5,5 7,5	18 25		5,5	36		3	30		
132 M			38	7,5	49	38	4 5,5	40 55	38	38 x 80
160 M	11 15	36 49	42	11	72	42	7,5	75	42	42 x 110
160 L	18,5	60		15	98		11	108		
180 M	22	71		18,5	121					48 x 110
180 L			48	22	144	48	15	148	48	
200 L	30 37	97 120		30	196		18,5 22	181 215		55 x 110
225 S				37	240	65			65	
225 M	45	145		45	292		30	293		55 x 110 60 x 140
250 M	55	177	65	55	356		37	361		60 x 140 65 x 140
280 S	75	241		75	484		45	438		
280 M	90	289		90	581	80	55	535	80	75 x 140
315 S	110	353		110	707		75	727		
315 M	132	423		132	849		90	873		
	160	513		160	1030	100	110	1070	100	65 x 140 80 x 170
315 L	200	641	80	200	1290		132 160	1280 1550		
	250	801		250	1610		200	1930		
315	315	1010	100	315	2020	125	250	2420		85 x 170
	355	1140		355	2280					
355	400	1280	125	400	2560		315	3040		75 x 140 95 x 170

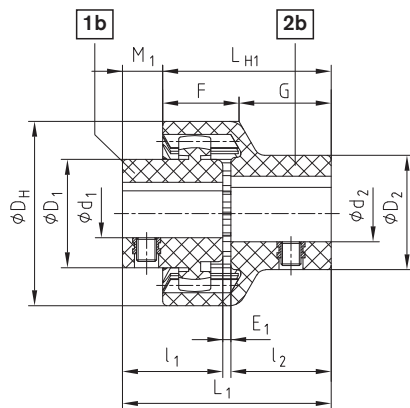
Torque T ≙ rated torque according to Siemens catalogue.

Type junior plug-in coupling and type junior M from nylon

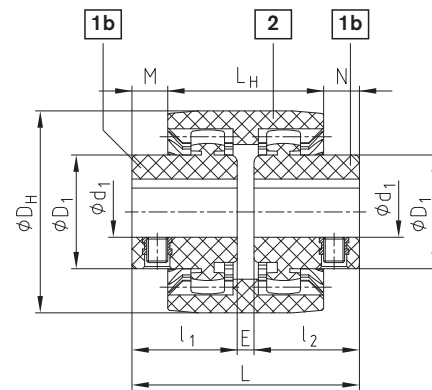


- Curved-tooth gear coupling plug-in type (2 parts) from nylon
- Double cardanic curved-tooth gear coupling type M (3 parts) from nylon
- Maintenance-free due to material combination nylon
- Compensating for axial, radial and angular shaft misalignment
- Low weight and small flywheel effect
- Axial plug-in – easy assembly
- Operating range - 25 °C to + 100 °C
- Available from stock with finish bore for standard shafts including keyway to DIN 6885 sheet 1 and thread for set-screws, bore tolerance + 0,05 - 0,1 keyway tolerance ± 0,08, H7 fit for steel hubs only

Components



Type junior plug-in coupling (2 parts)



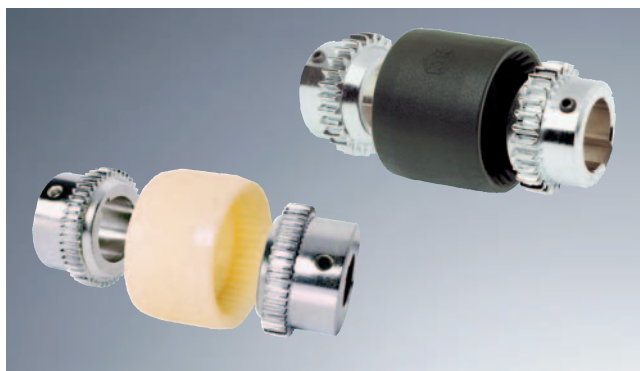
Type junior M coupling (3 parts)

BoWex® junior plug-in coupling (2 parts) and BoWex® junior M (3 parts)																			
Size	Torque TK [Nm]		Finish bore			Dimensions [mm]													Max. speed [1/min]
	TKN	TKmax.	Hub part 1b d1	D1	Plug-in-sleeve part 2b d2	D2	DH	l1, l2	E1	L1	LH1	M1	F	G	E	L	LH	M, N	
14	5	10	Ø6, Ø7, Ø8, Ø9	22	Ø8	22	40	23	2	48	40	8	18,5	21,5	4	50	37	6,5	6000
M-14			Ø10, Ø11	25	Ø10, Ø11	25													
			Ø12, Ø14	26	Ø12, Ø14	26													
19	8	16	Ø12, Ø14	27	Ø14, Ø15	29	47	25	2	52	42	10	19,0	23,0	4	54	37	8,5	6000
M-19			Ø16	30	Ø19	35													
			Ø19	32	Ø19	35													
24	12	24	Ø10, Ø11, Ø12	26	Ø14, Ø16	32	53	26	2	54	45	9	21,5	23,5	4	56	41	7,5	6000
M-24			Ø14, Ø15, Ø16	32															
			Ø18, Ø19, Ø20	36	Ø19, Ø20	36													
			Ø24	38	Ø24	40													

Order form:

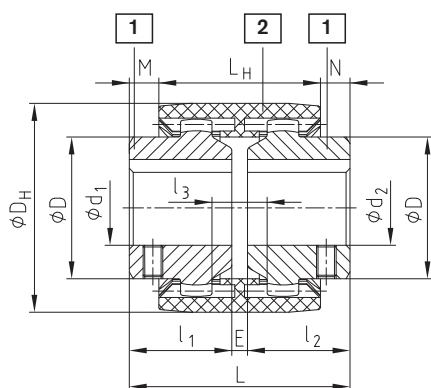
BoWex® junior 19	d1 Ø 19	d2 Ø 14
Coupling size 2-parted type or BoWex® junior M-19 3-parted type	Finish bore	Finish bore

Type M, type I and type M...C

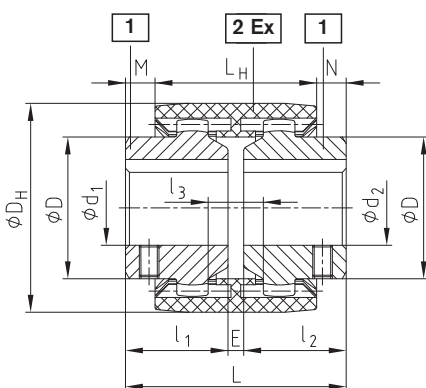


- For all applications in the range of general engineering and hydraulics
- Maintenance-free due to the material combination nylon/steel
- Compensating for axial, radial and angular shaft misalignment
- Axial plug-in - easy assembly
- Available with finish bore to ISO fit H7, keyway to DIN 6885 sheet 1 - JS9 as well as taper and inch bores
- Type M...C with carbon fiber reinforced PA, low backlash, higher torques and approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)
- Finish bores see stock programme on page 75
- For performance data see page 72

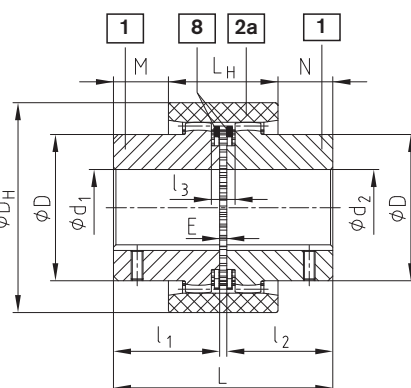
Components



Type M



Type M...C



Type I

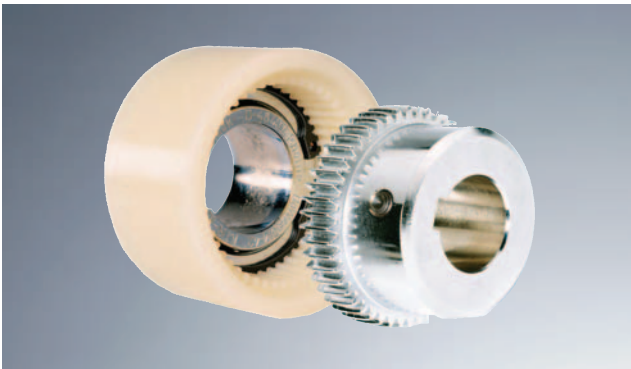
BoWex® type M, type I and type M...C

Size	Finish bore d ₁ , d ₂	Dimensions [mm]											Weight with max. bore-Ø			Massmoment of inertia J with max. bore-Ø			
		Pilot bored 	max.	l ₁ , l ₂	E	L	L _H	M, N	l ₃	D	D _H	Tip circle ØD _Z of hub	Len- thened l ₁ , l ₂ max.	Sleeve [kg]	Hub [kg]	Total [kg]	Sleeve [kgcm ²]	Hub [kgcm ²]	Total [kgcm ²]
M-14	M-14C	-	15	23	4	50	37	6,5	10	25	40	33	40	0,03	0,07	0,10	0,08	0,09	0,26
M-19	M-19C	-	20	25	4	54	37	8,5	10	32	47	39	40	0,03	0,10	0,23	0,15	0,16	0,47
M-24	M-24C	-	24	26	4	56	41	7,5	14	36	53	45	50	0,04	0,14	0,32	0,21	0,36	0,93
M-28	M-28C	-	28	40	4	84	46	19	13	44	65	54	55	0,08	0,33	0,74	0,65	1,22	3,09
M-32	M-32C	-	32	40	4	84	48	18	13	50	75	63	55	0,09	0,43	0,95	1,14	2,17	5,48
M-38	M-38C	-	38	40	4	84	48	18	13	58	83	69	60	0,13	0,55	1,23	1,58	3,55	8,68
M-42		-	42	42	4	88	50	19	13	65	92	78	60	0,14	0,68	1,50	2,32	5,98	14,28
M-48	M-48C	-	48	50	4	104	50	27	13	68	95	78	60	0,23	0,79	1,81	3,90	7,22	18,34
M-65	M-65C	26 70 lg.	65	55	4	114	68	23	16	96	132	110	70	0,55	1,90	4,35	21,2	31,8	84,8
I-80		31	80	90	6	186	93	46,5	20	124	175	145	-	1,13	5,20	11,53	68,9	150,8	370,5
I-100		35	100	110	8	228	102	63	22	152	210	176	-	1,78	9,37	20,52	158,6	401,3	961,2
I-125		45	125	140	10	290	134	78	30	192	270	225	-	3,88	19,44	42,76	562,9	1362,3	3287,5

Order form:

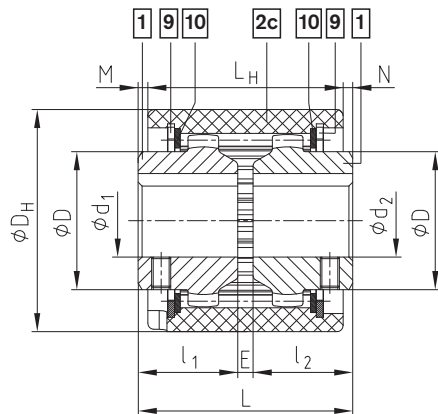
BoWex® M-28	d ₁ Ø 20	d ₂ Ø 28
Size and type of coupling	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)

Type AS and type Spec.-I

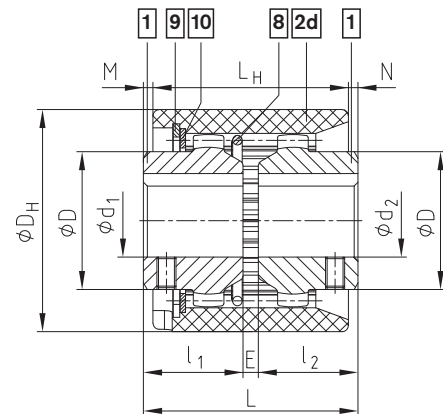


- Double cardanic curved-tooth gear coupling
- Maintenance-free due to the material combination nylon/steel
- Compensating for axial, radial and angular shaft misalignment
- Type AS – separable coupling design - axially movable sleeve when assembled
- Type Spec.-I – axial plug-in for blind assembly
- Application range from - 25 °C to + 100 °C
- Available with finish bore acc. to ISO fit H7, keyway to DIN 6885, sheet 1 - JS9 and thread for setscrews (page 74)
- Finish bores see stock programme on page 75
- For performance data see page 72

Components



Type AS



Type Spez. - I

BoWex® type AS and type Spez.-I

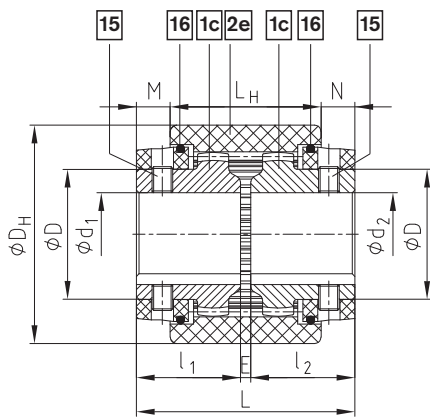
Size	Pilot bore		Finish bore d ₁ , d ₂ max.	Dimensions [mm]									Weight with max. bore-Ø			Massmoment of inertia J with max. bore-Ø		
	Un-bored	Pilot bored		l ₁ , l ₂	E	L	L _H	M, N	D	D _H	Leng- thened l ₁ , l ₂ max.	Sleeve [kg]	Hub [kg]	Total [kg]	Sleeve [kgcm ²]	Hub [kgcm ²]	Total [kgcm ²]	
24	x	-	Finish bores see stock programme	24	26	4	56	51	2,5	36	58	50	0,11	0,14	0,39	0,38	0,36	1,10
28	x	-		28	40	4	84	56	14	44	70	55	0,16	0,33	0,82	1,54	1,22	3,98
32	x	-		32	40	4	84	58	13	50	84	55	0,21	0,43	1,07	2,75	2,17	7,09
45	x	-		45	42	4	88	60	14	65	100	60	0,27	0,63	1,53	5,49	5,66	16,81
65	x	26 70 lg.		65	55	4	114	84	15	96	140	70	0,84	2,10	5,00	29,83	43,96	117,8
80	-	31		80	90	6	186	93	46,5	124	175	-	1,30	5,20	11,70	83,20	150,8	384,8
100	-	35		100	110	8	228	102	63	152	210	-	2,05	9,40	20,80	184,4	401,3	987,0
125	-	45	125	140	10	290	134	78	192	270	-	4,32	19,44	43,10	620,0	1362,3	3344,6	

Order form:

BoWex® 32 AS	d ₁ Ø 32	d ₂ Ø 32
Size and type of coupling AS or Spec.-I	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)

Type SG, type SSR and type Spec.-I/CD

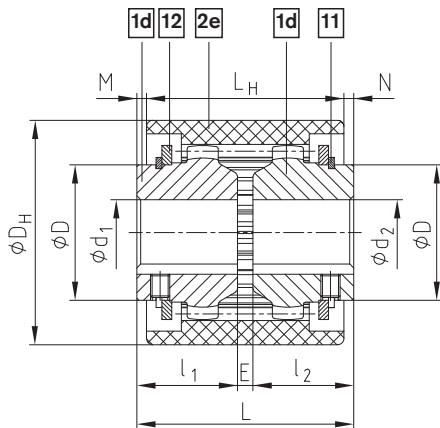
Type SG with dust protection circlips



BoWex® type SG												
Size	Pilot bore		Finish bore		Dimensions [mm]							
	Un-bored	Pilot bored	min.	max.	l_1, l_2	E	L	L_H	M, N	D	D_H	Lengthened l_1, l_2 max.
24 SG	x	-	10	24	36	4	76	51	12,5	36	58	50
28 SG	x	-	10	28	40	4	84	56	14	44	70	55
32 SG	x	-	12	32	40	4	84	58	13	50	84	55
45 SG	x	-	20	45	42	4	88	60	14	65	100	60
65 SG	-	26	30	65	70	4	144	84	30	96	140	-
80 SG	-	31	35	80	90	6	186	93	46,5	122	175	-
100 SG	-	35	40	100	110	8	228	102	63	150	210	-
125 SG	-	45	50	125	140	10	290	134	78	190	270	-

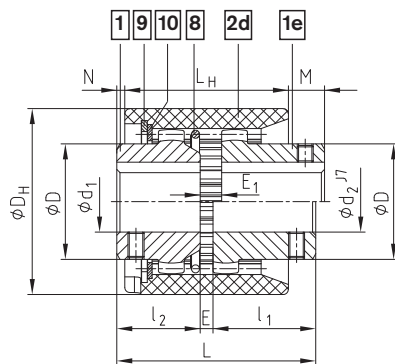
Thread for setscrews only for finish bored hubs.

Type SSR with supporting circlips



BoWex® type SSR												
Size	Pilot bore		Finish bore		Dimensions [mm]							
	Un-bored	Pilot bored	min.	max.	l_1, l_2	E	L	L_H	M, N	D	D_H	Lengthened l_1, l_2 max.
24 SSR	x	-	10	22	26	4	56	51	2,5	35	58	50
28 SSR	x	-	10	26	40	4	84	56	14	42	70	55
32 SSR	x	-	12	30	40	4	84	58	13	48	84	55
45 SSR	x	-	20	42	42	4	88	60	14	63	100	60
65 SSR	x	26 70 lg.	30	65	55	4	114	84	15	95	140	70
80 SSR	-	31	35	80	90	6	186	93	46,5	120	175	-
100 SSR	-	35	40	100	110	8	228	102	63	150	210	-
125 SSR	-	45	50	125	140	10	290	134	78	190	270	-

Type Spec.-I/CD



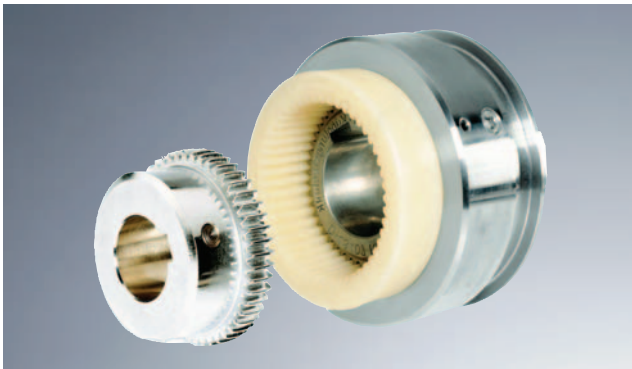
driven side driving side

BoWex® type Spec.-I/CD															
Size	Pilot bore		Finish bore		Dimensions [mm]										
	Un-bored	Pilot bored	min.	max.	L	L_1	L_H	E	E_1	l_2	l_1	D_H	D	M	N
24 CD	x	-	10	24	70	73,5	51	4	7,5	26	40	58	36	20	2,5
28 CD	x	-	10	28	94,5	98	56	4	8,5	40	50,5	70	44	28	14
32 CD	x	-	12	32	94,5	-	58	4	8,5	40	50,5	84	50	27	13
45 CD	x	-	20	45	101,5	-	60	4	8,5	42	55,5	100	65	32	14
65 CD	-	26	30	65	123	-	84	4	10	55	64	140	96	28,5	15
80 CD	-	31	35	80	179	-	93	6	13	90	83	175	124	44	46,5

Please order dimension sheet of type Spec.-I/CDB with shear pins.

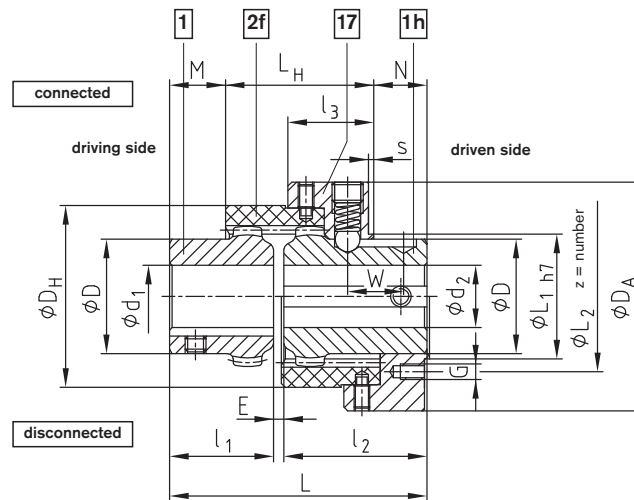
Order form:	BoWex® 45 SG	d_1 Ø 22	d_2 Ø 40
	Size and type of coupling SG, SSR or Spec.-I/CD	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)

Type SD



- For all applications in the range of general engineering to quickly connect or disconnect power packs at standstill
- Maintenance-free due to the material combination nylon/steel
- Application range from - 25 °C to + 100 °C
- Available with finish bore according to ISO fit H7, keyway to DIN 6885 sheet 1 - JS9, thread for setscrews see on page 74
- For performance data please see page 72, compare to design M/I
- max. circumferential speed $v = 20$ m/s, referring to $\varnothing D_A$

Components



BoWex® type SD																						
Size	Pilot bore		Finish bore d_1, d_2		Dimensions [mm]													Weight with max. bore-Ø		Massmoment of inertia J with max. bore-Ø		Shifting force [N]
	Un-bored	Pilot bored	d_1	d_1 max. / d_2 max.	E	l_1	l_2	L	L_H	l_3	M	W	N	D	D_H	D_A	Shifting hub with sleeve [kg]	Driving hub [kg]	Shifting hub with sleeve [kgcm²]	Driving hub [kgcm²]		
24 SD	x	-	24	24	4	26	50	80	52	31	10	19	18	36	58	78	1,08	0,14	8,23	0,36	140	
28 SD	x	-	28	28	4	40	55	99	57	33	21,5	21,5	20,5	44	70	88	1,50	0,33	15,62	1,22	180	
32 SD	x	-	32	32	4	40	55	99	58	33	20,5	21,5	20,5	50	84	100	1,85	0,43	22,87	2,17	180	
45 SD	x	-	45	45	4	42	60	106	63	37	21,5	22,5	21,5	65	100	125	2,56	0,68	46,07	5,66	250	
65 SD	x	26 / 70 lg.	65	65	4	55	70	129	77	37	28	25	24	95	140	156	5,07	2,30	158,99	43,96	350	
80 SD	-	31	80	80	6	90	90	186	96	47	56	35	34	124	175	195	10,60	5,20	523,7	150,8	350	
100 SD	-	35	100	100	8	110	110	228	113	55	72	43	43	152	210	235	18,87	9,37	1350	401,3	400	
125 SD	-	45	125	125	10	140	140	290	149	70	89	52	52	192	270	298	40,40	9,44	4919	1362,3	450	

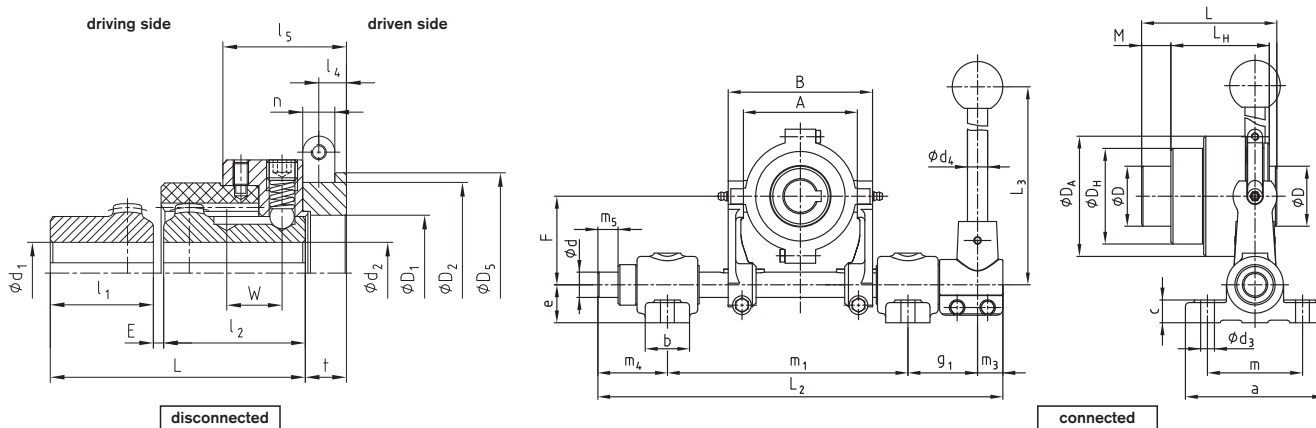
Connection dimensions of BoWex® SD shifting ring (part 17) for mounting of: slip ring SD1 (s. catalogue page 81), shifting disk etc.				
Size	Dimensions [mm]			
	L_1	L_2	$z \times G$	s
24 SD	48	58	4 x M6	2
28 SD	48	58	4 x M6	2
32 SD	64	75	4 x M6	2
45 SD	75	90	4 x M8	2
65 SD	100	114	4 x M8	2
80 SD	130	145	4 x M8	3
100 SD	180	196	6 x M10	4
125 SD	220	236	6 x M10	4

Order form:	BoWex® 32 SD	d_1 Ø 32	d_2 Ø 32
Size and type of coupling		Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)

Type SD



- For all applications in the range of general engineering to quickly connect or disconnect power packs at standstill
- Maintenance-free due to the material combination nylon/steel
- Application range from - 25 °C to + 100 °C
- Available with finish bore according to ISO fit H7, keyway to DIN 6885 sheet 1 - JS9, thread for setscrews see on page 74
- Available with slip ring and shiftable linkage for manual operation
- For performance data please see page 72, compare to design M/I
- max. circumferential speed $v = 20$ m/s, referring to $\varnothing D_A$



BoWex® type SD1 and slip ring																					
Size	Finish bore			Dimensions [mm]																	Shifting force [N]
	d ₁	d ₁ max.	d ₂ max.	E	l ₁	l ₂	L	L _G	l ₄	l ₅	M	W	t	D	D _H	D _A	D ₁	D ₂ ^{±0,1} (keyway)	D ₅	n ^{±0,1} (keyway)	
24 SD1	24	24	24	4	26	50	80	67	11	46	10	19	16	36	58	78	45	70,5	78	12,5	140
28 SD1	28	28	28	4	40	55	99	72	11	48	21,5	21,5	16	44	70	88	45	70,5	78	12,5	180
32 SD1	32	32	32	4	40	55	99	78	13,5	53	20,5	21,5	21	50	84	100	60	89,5	100	17,5	180
45 SD1	45	45	45	4	42	60	106	84	14	58	21,5	22,5	22	65	100	125	70	112,5	125	18	250
	48	48	48	50	114	29,5															
65 SD1	65	65	65	4	55	70	129	103	16	61	26	25	25	96	140	156	96	130,5	145	20,5	350
80 SD1	80	80	80	6	90	90	1186	124	18,5	75	56	35	29	124	175	195	125	164,5	182	25,5	350
100 SD1	100	100	100	8	110	110	228	152	28	94	72	43	39	152	210	235	174	210,5	230	30,5	400
125 SD1	125	125	125	10	140	140	290	193	30,5	114	89	52	44	192	270	298	214	250,5	275	35,5	450

BoWex® Bauart SD1 – shiftable linkage																						
Size	Shiftable linkage size	Slip ring size	Dimensions [mm]																	Dimensions with m ₁ max.		
			a	b	c	d	d ₃	d ₄	e	F	g ₁	L ₂	L ₃	m	m ₁ min.	m ₁ max.	A	B	m ₃	m ₄	m ₅	
24 SD1	1	1,1																				
28 SD1	1	1,1	110	35	18	20	11	16	30	70	55	320	400	75	180	190	90	114		55	16	
32 SD1	2	2,2				25				97,5	60	430	450		240	270	111	151	20	80	34	
45 SD1	3	3,3	140	40		30		20	40	120		70	490	600	100	280	310	140	180		90	44
65 SD1	3	4,4															170	210				
80 SD1	4	5,5			25	35	13,5										200	244		100	54	
100 SD1	5	6,6	160	45				30	50	147,5		565	750		120	365	250	300	30			
125 SD1	5	7,7				40			50 ¹⁾	190	80	630	1068				300	350		110	62	

1) = For a continuous base plate the dimension "e" has to be increased by at least 10 mm.
The brackets have to be adapted to the driving and driven sides accordingly.

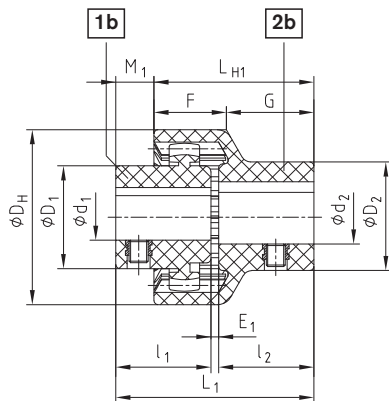
Order form:	BoWex® 65 SD1	d ₁ Ø 32	d ₂ Ø 32	4,4	3
	Size and type of coupling	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)		Slip ring size	Shiftable linkage size

made from corrosion-proof material

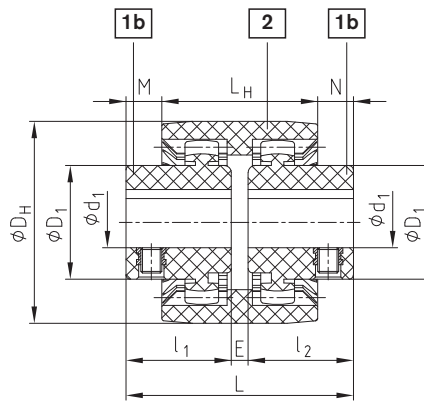


- BoWex® shaft couplings made from polyamid or stainless steel (material-no. 1.4571 and V4A respectively)
- BoWex® junior plug-in coupling (2 parts)
- BoWex® junior M (3 parts) from polyamide
- BoWex® M with sleeve made from polyamide and hubs from stainless steel (1.4571), available with finish bore acc. to ISO fit H7, keyway to DIN 6885, sheet 1 - JS9 and thread for setscrews (page 74)
- For performance data please see page 72

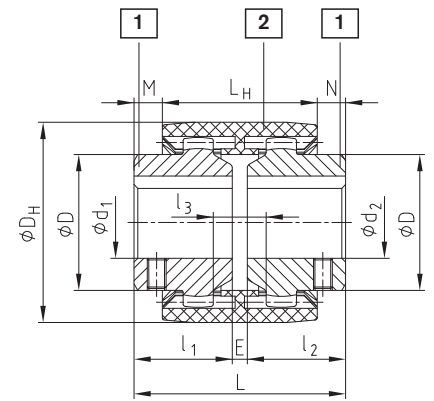
Components



Type junior plug-in coupling (2 parts)



Type junior M coupling (3 parts)



Type M

BoWex® junior plug-in coupling (2 parts) and BoWex® junior M (3 parts)

Size	Finish bore				Dimensions [mm]											
	Hub part 1b d ₁	D ₁	Plug-in-sleeve part 2b d ₂	D ₁	D _H	l ₁ , l ₂	E ₁	E	L _{H1}	L _H	L ₁	L	M ₁	M, N		
14	Ø6, Ø7, Ø8, Ø9	22	Ø8	22	40	23	2	4	40	37	48	50	8	6,5		
M-14	Ø10, Ø11	25	Ø10, Ø11	25												
	Ø12, Ø14	26	Ø12, Ø14	26												
19	Ø12, Ø14	27	Ø14, Ø15	29	48	25	2	4	42	37	52	54	10	8,5		
M-19	Ø16	30													Ø19	35
	Ø19	32														
24	Ø10, Ø11, Ø12	26	Ø14, Ø16	32	53	26	2	4	45	41	54	56	9	7,5		
M-24	Ø14, Ø15, Ø16	32													Ø19, Ø20	36
	Ø18, Ø19, Ø20	36														
	Ø24	38	Ø24	40												

BoWex® type M

Size	Finish bore d _{1max.} , d _{2max.}	Dimensions [mm]							
		D _H	D	l ₁ , l ₂	E	L _H	L	M, N	
M-24	24	53	36	26	4	41	56	7,5	
M-38	38	83	58	40	4	48	84	18	
M-48	48	95	68	50	4	50	84	18	

Further sizes on request.

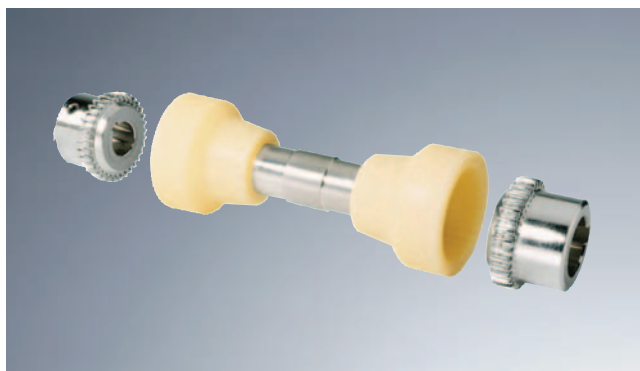
Application areas:

Food processing industry, print and paper, textile industry, sewage technology, wash-mobiles, chemical and pharmaceutical industry, offshore units ...

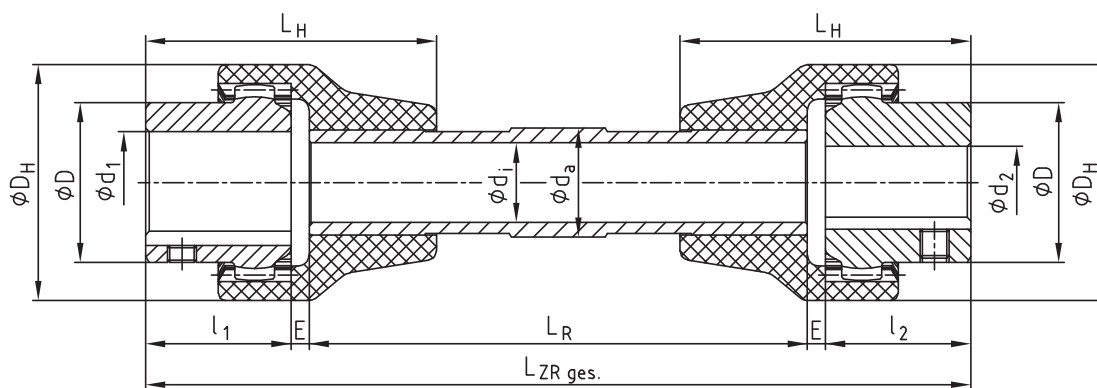
For applications in aggressive atmospheres (air, water, chemicals etc.).

Order form:	BoWex® M-24 V4A	d ₁ Ø 20	d ₂ Ø 24
	Size and type of coupling	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)	Finish bore H7 keyway to DIN 6885 sheet 1 (JS9)

Type ZR and type Spec.-I for connection of larger shaft distances

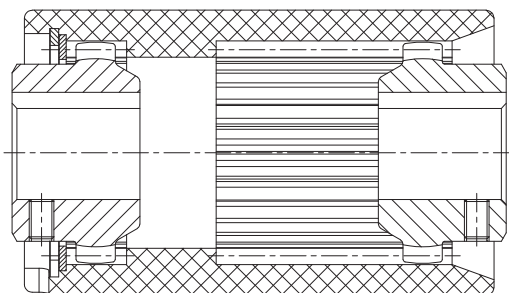


- Double cardanic curved-tooth gear coupling
- For all applications to connect larger shaft distances
- Low-cost for serial production
- Compensating for larger shaft displacements
- Axial plug-in
- Intermediate tubes variable in length (max. 2000 mm; on consultation with KTR)
- Hubs available with finish bores acc. to ISO fit H7 as well as taper and inch bores
- Application range from - 25 °C to + 100 °C



Type ZR

BoWex® type ZR															
Size	Pilot bore	Finish bore	Dimensions [mm]										Torque T _K [Nm]		
		d _{1max.} , d _{2max.}	l ₁ , l ₂	Lengthened l ₁ , l ₂ max.	L _H	E	L _{ZR ges.}	L _R	D	D _H	d _i	d _a	T _{KN}	T _{K max.}	T _{KW}
14	-	14	23	40	40	3			25	40	21	25	10	20	5
28	-	28	40	55	60	3	as indicated by		44	66	30	26	45	90	23
42	-	42	42	60	85	3	the customer		65	95	40	50	100	200	50
48	-	48	50	60	85	3			68	95	40	50	140	280	70



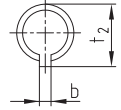
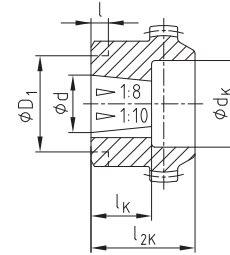
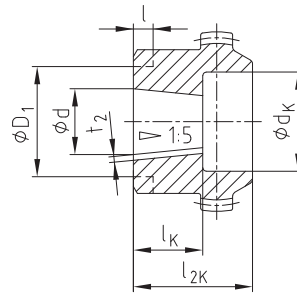
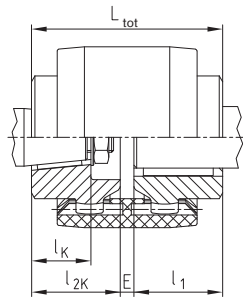
Type Spec.-I with a long PA-sleeve

- Lengthened special sleeves available on request
- Connecting larger shaft distances
- Axial shifting of driving and driven shaft at standstill
- Maintenance-free
- Compensating for larger displacements
- Axial plug-in
- Application range from - 25 °C to + 100 °C

- BoWex® ZR couplings are available up to a length of 2000 mm only for serial applications (n_{max} = 1000 1/min)
- BoWex® Spec.-I with lengthened sleeve on request

Taper bores

BoWex® with taper bores



$L_{tot} = l_1 + E + l_{2K}$

For stock parts please see page 75

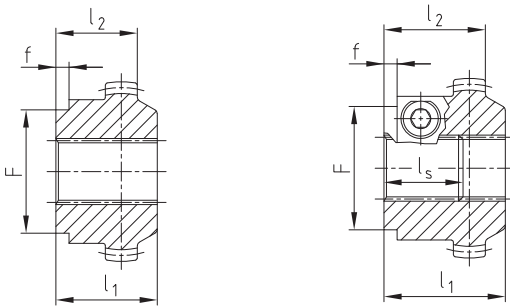
Taper bores 1:5																							
Dimensions [mm]					Counterbore d_K and hub length l_{2K} [mm]																		
Code	Details of bores				Recess on hub collar $D_1 \times l$ [mm]																		
	$d^{+0,05}$	b^{IS9}	$t_2^{+0,1}$	l_K	14		19		24		28		32		38		42		48		65		
					d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	
A-10	9,85	2	1,0	11,5	18	23	18	25	25	26	25	26	25	26	25	26							
B-17	16,85	3	1,8	18,5			25	30	28	30	36	40	36	40	36	40	45	42	45	42	45	50	
C-20	19,85	4	2,2	21,5					28	36	36	40	36	40	36	40	45	42	45	42	45	50	
Cs-22	21,95	3	1,8	21,5					28	36	36	40	36	40	36	40	45	42	45	42			
D-25	24,85	5	2,9	26,5							36	40	36	40	36	40	45	42	45	42	45	50	
E-30	29,85	6	2,6	31,5											45	55	45	55	45	55	45	55	
F-35	34,85	6	2,6	36,5																52	60	55	60
G-40	39,85	6	2,6	41,5																52	60	65	70

Taper bores 1:8																						
Dimensions [mm]					Counterbore d_K and hub length l_{2K} [mm]																	
Code	Details of bores				Recess on hub collar $D_1 \times l$ [mm]																	
	$d^{+0,05}$	b^{IS9}	$t_2^{+0,1}$	l_K	14		19		24		28		32		38		42		48		65	
					d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}
N/1	9,7	2,4	10,85	17	18	26	18	25	25	26	25	30	25	30	25	30						
	$\pm 0,015$				23 x 8		23 x 8		23 x 8		23 x 8		-		23 x 8							
N/1c	11,6	3 ^{IS9}	12,90	16,5	18	23			25	26	25	30										
N/1e	13	2,4	13,80	21					25	30	25	30			25	30						
N/1d	14	3 ^{IS9}	15,50	17,5	20	23	25	30	28	30	28	30	28	40								
N/2	17,287	3,2	18,24	24					28	35	36	40	36	40	36	40	45	42	45	42	45	50
											35 x 12											
N/2a	17,287	4 ^{IS9}	18,94	24					28	35	36	40	36	40	36	40	45	42	45	42	45	50
N/2b	17,287	3 ^{IS9}	18,34	24					28	35					36	40	45	42	45	42		
											35 x 12											
N/3	22,002	4 ^{IS9}	23,40	28							36	40	36	40	36	40	45	42	45	42	45	50
											-										48 x 14	
N/4	25,463	4,78	27,83	36							36	50	36	50	36	50	45	50	45	50	45	62
											-						58 x 10		58 x 10			
N/4b	25,463	5 ^{IS9}	28,23	36							36	50					45	50	45	50	45	62
N/4a	27	4,78	28,80	32,5											36	50						
N/4g	28,45	6 ^{IS9}	29,32	38,5											36	60	45	60	45	60		
N/5	33,176	6,38	35,39	44											45	60	45	60	45	60	45	62
N/5a	33,176	7 ^{IS9}	35,39	44											45	60	45	60	45	60	45	62

Taper bores 1:10																						
Dimensions [mm]					Counterbore d_K and hub length l_{2K} [mm]																	
Code	Details of bores				Recess on hub collar $D_1 \times l$ [mm]																	
	$d^{+0,05}$	b^{IS9}	$t_2^{+0,1}$	l_K	14		19		24		28		32		38		42		48		65	
					d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}	d_K	l_{2K}
CX-20	19,85	5	22,08	32							36	50			36	50	45	50	45	50	45	60
DX-25	24,95	6	26,68	45									36	50			45	60	45	60	45	60
EX-30	29,75	8	31,88	50													45	60	45	60	45	70

Spline hubs and inch bores

Basic programme of BoWex® spline hubs



Spline hub (N)

Clamping hub (K)

If it is not possible to secure the hubs of pump shafts with involute spline by means of an end plate and a screw, we recommend our spline clamping hub. The radial clamping ensures a backlash-free tight fit on the pump shaft.

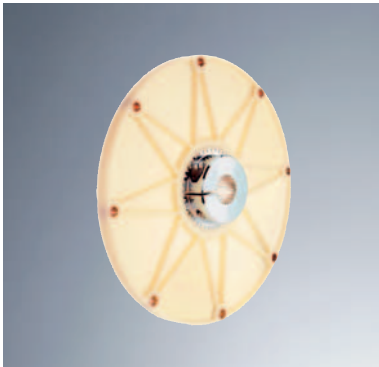
Spline and clamping hubs to DIN 5480								
Size	Dimensions [mm]						Order designation Indicate coupling size	
	Type	Spline size	l ₁	l ₂	l _s	F		f
42	N	25x1,25x18	42	-	-	-	-	P000205
	K	25x1,25x18	42	-	-	-	-	P500202
48	K	30x2x14	42	-	-	60	6	P500203
	N	30x2x14	50	-	-	60	6	P000206
65	K	30x2x14	50	-	-	60	6	P500203
	N	35x2x16	55	-	-	60	6	P000303
65	K	35x2x16	60	-	-	60	6	P500301
	N	40x2x18	55	-	-	78	6	P000304
65	K	40x2x18	60	-	-	78	6	P500302
	K	45x2x21	55	-	-	78	6	P500401

Spline and clamping hubs to SAE J498								
Size	Dimensions [mm]						Order designation Indicate coupling size	
	Type	Spline size	l ₁	l ₂	l _s	F		f
42	K	PH-S 5/8" 16/32DP, z=9	42	-	-	-	-	P558101
	K	PI-S 3/4" 16/32DP, z=11	-	35	-	-	-	P559101
48	K	PB-S 7/8" 16/32DP, z=13	42	-	-	60	3	P567101
	K	PB-BS 1" 16/32DP, z=15	42	-	27	50	6	P660201
48	K	PA-S 3/8" 16/32DP, z=21	50	-	45	52	7	P663301
	K	PA-S 3/8" 16/32DP, z=21	55	-	48	52	5	P663301
65	K	PC-S 1 1/4" 16/32DP, z=14	55	-	44	52	5	P656201

Inch bores – For the stock parts please see the stock programme on page 75														
Code	Dimensions [mm]				Code	Dimensions [mm]				Code	Dimensions [mm]			
	Ød	Ød [inch]	b ^{+0.05}	t ₂ ^{+0.2}		Ød	Ød [inch]	b ^{+0.05}	t ₂ ^{+0.2}		Ød	Ød [inch]	b ^{+0.05}	t ₂ ^{+0.2}
Tb	9,5 ^{+0.03}	3/8	3,17	11,1	F	22,22 ^{+0.03}	7/8	6,38	25,2	M	34,92 ^{+0.03}	1 3/8	7,93	38,6
DNB	11,11 ^{M7}	7/16	2,4	12,5	Gd	22,225 ^{M7}	7/8	4,76	24,7	RH1	34,93 ^{M7}	1 3/8	9,55	37,8
T	12,69 ^{H7}	1/2	4,75	14,6	Gf	23,80 ^{+0.03}	15/16	6,35	26,8	Cb	36,50 ^{+0.03}	1 7/16	9,55	40,9
Ta	12,7 ^{+0.03}	1/2	3,17	14,3	B	25,37 ^{+0.03}	1	4,78	27,8	Ca	38,07 ^{+0.03}	1 1/2	7,93	42,0
DNC	13,45 ^{M7}	17/32	3,17	14,9	Ba	25,37 ^{+0.03}	1	6,35	27,6	C	38,07 ^{+0.03}	1 1/2	9,55	42,5
E	15,87 ^{+0.03}	5/8	3,17	17,5	Bs	25,38 ^{+0.03}	1	6,37	28,3	N	41,25 ^{+0.03}	1 5/8	9,55	45,6
S	15,87 ^{+0.03}	5/8	3,97	17,9	H	25,40 ^{+0.03}	1	4,78	27,8	Nb	41,275 ^{M7}	1 5/8	9,55	45,8
Es	15,88 ^{+0.03}	5/8	4,0	17,7	DNF	25,38 ^{H7}	1	6,35	28,4	Ls	44,42 ^{+0.03}	1 3/4	9,55	48,8
DND	15,852 ^{H7}	5/8	4,75	18,1	Hs	25,40 ^{+0.03}	1	6,35	28,7	L	44,45 ^{K7}	1 3/4	11,11	49,4
Ed	15,87 ^{+0.03}	5/8	4,75	18,1	Sa	28,575 ^{M7}	1 1/8	6,35	31,7	Lu	47,625 ^{M7}	1 7/8	12,7	53,5
DNH	17,465 ^{H7}	11/16	4,75	19,6	Sb	28,58 ^{+0.03}	1 1/8	6,35	31,5	Da	49,20 ^{+0.03}	1 15/16	12,7	55,0
Ad	19,02 ^{+0.03}	3/4	3,17	20,7	Sd	28,58 ^{+0.03}	1 1/8	7,93	32,1	Ds	50,77 ^{+0.03}	2	12,7	56,4
As	19,02 ^{+0.03}	3/4	4,78	21,3	Ja	31,70 ^{H7}	1 1/4	7,93	34,4	D	50,80 ^{+0.03}	2	12,7	55,1
A	19,05 ^{+0.03}	3/4	4,78	21,3	Jc	31,71 ^{+0.03}	1 1/4	7,93	35,3	P	53,95 ^{+0.03}	2 1/8	12,7	59,6
Fa	22,20 ^{+0.03}	7/8	6,35	25,2	Js	31,75 ^{+0.03}	1 1/4	6,35	34,6	Pa	53,975 ^{M7}	2 1/8	12,7	60,0
Ga	22,21 ^{H7}	7/8	4,75	24,8	J	31,75 ^{+0.03}	1 1/4	7,93	34,4	Ub	60,325 ^{M7}	2 3/8	15,875	67,6
DNI	22,228 ^{H7}	7/8	6,35	25,0	K	31,75 ^{K7}	1 1/4	7,93	35,5	Wa	73,025 ^{M7}	2 7/8	19,05	81,7
Gs	22,22 ^{+0.03}	7/8	4,78	24,4	DNK	31,755 ^{H7}	1 1/4	7,93	35,3	Wd	85,725 ^{M7}	3 3/8	22,225	95,8
G	22,22 ^{+0.03}	7/8	4,75	24,7	Ma	34,925 ^{M7}	1 3/8	7,93	38,7	Wf	92,075 ^{M7}	3 5/8	22,225	101,9

Operating description

BoWex® FLE-PA



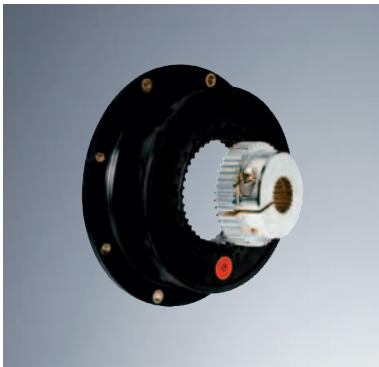
BoWex® FLE-PA couplings are torsionally rigid curved-tooth flange couplings, made from a combination of nylon and steel, for diesel engine drives in combination with hydraulic pumps.

The FLE-PA mounting flange is made from glass fiber reinforced polyamide with high mechanical stability and thermal strength.

The coupling hub with external curved teeth is made from steel.

The BoWex® FLE-PA allows an extremely short installation space. Apart from that it is easy to assemble without any additional tools for alignment.

BoWex-ELASTIC®



BoWex-ELASTIC® is highly flexible, combining the benefits of the well-approved BoWex® system with the suppleness of a highly flexible coupling in compact design. Torsional vibrations and shock loads that may occur are dampened and reduced.

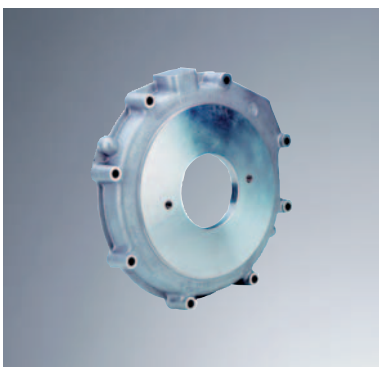
The BoWex-ELASTIC® consists of a highly flexible, annular rubber element from temperature-resistant natural caoutchouc, stressed for torque-to-bore ratio, and a BoWex® coupling hub to be plugged-in axially.

MONOLASTIC®



MONOLASTIC® is a single-piece, flexible coupling with torque-to-bore volume ratio from natural rubber. The hub from steel with a hardened internal spline already assembled by the manufacturer allows an axial plug-in connection of the hydraulic pump. These couplings are available with all usual involute splines to SAE or DIN.

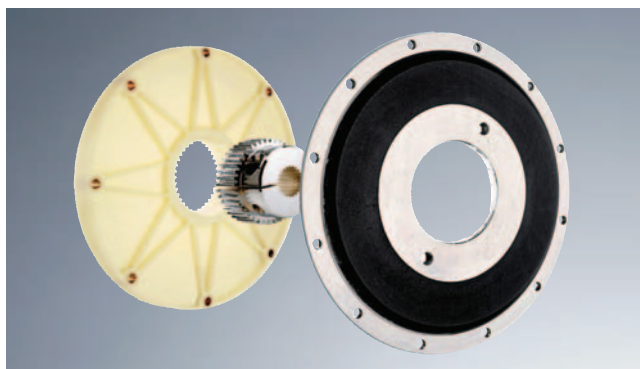
Pump mounting flanges



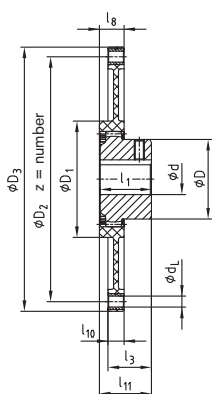
For connecting hydraulic pumps to the diesel engine KTR supplies mounting flanges sizes SAE 6 to SAE 1 in accordance with the SAE mounting dimensions. The flanges are made from steel for hydraulic pumps with flange connections to SAE-A, B, C, D and E both in a 2-hole or 4-hole design.

Pump connection housings from EN-GJL-250 (GG 25) to be mounted directly to the back plate of the engine.

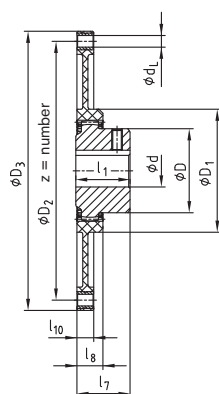
Type FLE-PA



- Flange coupling for connection to I. C.-engines and hydraulic pumps
- Applicable to all hydrostatic drives of construction machines, harvesting machines, etc.
- High torsional stiffness – operation free from resonance
- Maintenance-free due to the material combination nylon/steel
- Nylon flange with high mechanical resistance and thermal strength (+ 130 °C)
- Extremely short assembly
- Easy assembly by axial mounting
- Special mounting flanges available



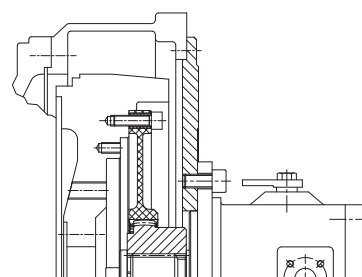
mounting short



mounting long

Flange dimensions according to SAE J 620 [mm]				
Size	D ₃	D ₂	z	d _L
6 1/2"	215,9	200,02	6	9
7 1/2"	241,3	222,25	8	9
8"	263,52	244,47	6	11
10"	314,32	295,27	8	11
11 1/2"	352,42	333,37	8	11
14"	466,72	438,15	8	14

Example of installation

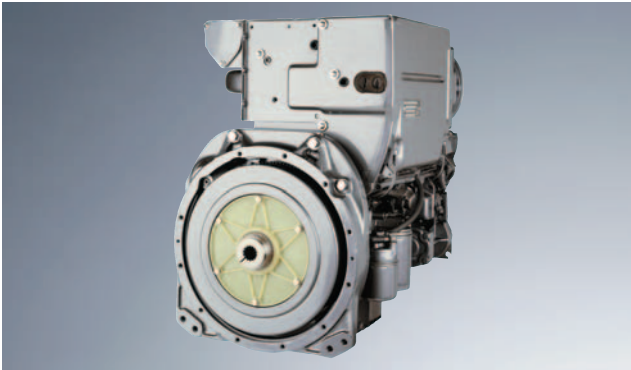


BoWex® FLE-PA for diesel engines with SAE connection; fixing of hub by means of end plate and screw.

BoWex®-FLE-PA – Dimensions/Dimension to SAE																			
Size	Pilot bore	Finish bore d		Dimensions [mm]								Special length l ₁ max.	Dimension to SAE (D ₃)					Max. axial displacement [mm]	
		min.	max.	D	D ₁	l ₁	l ₃	l ₇	l ₈	l ₁₀	l ₁₁		6 1/2"	7 1/2"	8"	10"	11 1/2"		14"
48	-	20	48	68	100	50	41	50	20	13	48	up to 60	●	●	●	●			± 2
T 48	13	20	48	68	100	50	38	45	20	13	46	-	●	●	●	●			± 1
T 55	17	20	55	85	115	50	37	48	24	13	48	-	●	●	●	●			± 2
65 / T 65	26	30	65	96	132	55	45	54	27	21	51	up to 70			●	●	●		± 2
T 70	26	30	70	100	153	60	48	56	30	21	57	-				●			± 2
80 / T 80	31	35	80	124	170	90	78	87	30	21	87	-					●		± 2
100 / T 100	35	40	100	152	265	110	78	108	35	21	110	-					●	●	± 2
125	45	50	125	192	250	140	37	133	50	28	97	-					●	●	± 2

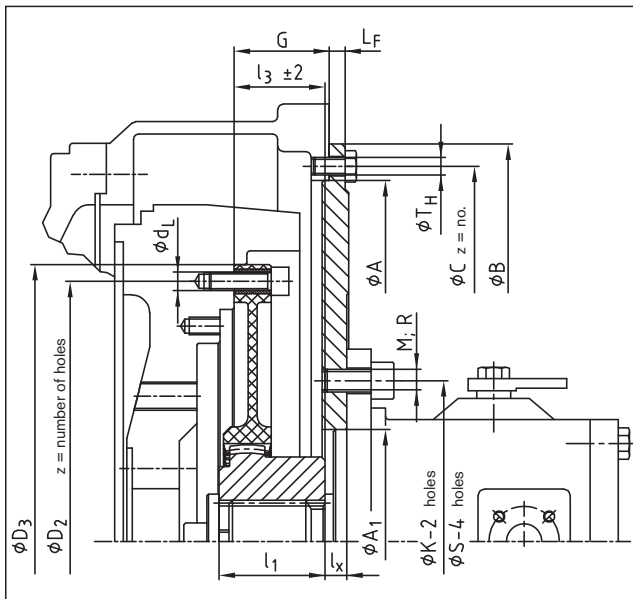
Technical data of BoWex® FLE-PA – Torques/Weight/Mass moments of inertia/Torsion spring stiffness															
Size	Torque T _K [Nm]			Weight / Mass moment of inertia J	Hub with max. bore Ø	FLE-PA flanges according to SAE						Dynamic torsion spring stiffness with + 60 °C / ψ = 0,4 [Nm/rad]			
	T _{KN}	T _{K max.}	T _{KW}			6 1/2"	7 1/2"	8"	10"	11 1/2"	14"	0,30 T _{KN}	0,50 T _{KN}	0,75 T _{KN}	1,00 T _{KN}
48	240	600	120	[kg]	0,79	0,32	0,43	0,51	0,64	-	-	35 x 10 ³	75 x 10 ³	105 x 10 ³	125 x 10 ³
				[kgm ²]	0,0007	0,0021	0,0035	0,0049	0,0085	-	-				
T 48	300	750	150	[kg]	0,79	0,32	0,43	0,51	0,64	-	-	40 x 10 ³	86 x 10 ³	120 x 10 ³	143 x 10 ³
				[kgm ²]	0,0007	0,0021	0,0035	0,0049	0,0085	-	-				
T 55	450	1125	225	[kg]	1,12	0,34	0,62	0,45	0,646	-	-	90 x 10 ³	140 x 10 ³	170 x 10 ³	195 x 10 ³
				[kgm ²]	0,0016	0,0022	0,0053	0,0044	0,0086	-	-				
65	650	1600	325	[kg]	2,30	-	-	0,63	0,64	0,89	-	110 x 10 ³	160 x 10 ³	200 x 10 ³	230 x 10 ³
				[kgm ²]	0,0044	-	-	0,0064	0,0065	0,012	-				
T 65	800	2000	400	[kg]	2,40	-	-	0,63	0,64	0,89	-	130 x 10 ³	190 x 10 ³	240 x 10 ³	280 x 10 ³
				[kgm ²]	0,0044	-	-	0,0064	0,0065	0,012	-				
T 70	1000	2500	500	[kg]	2,60	-	-	-	0,941	-	-	230 x 10 ³	345 x 10 ³	440 x 10 ³	517 x 10 ³
				[kgm ²]	0,0059	-	-	-	0,0132	-	-				
80	1200	3000	600	[kg]	5,20	-	-	-	-	1,12	-	200 x 10 ³	410 x 10 ³	580 x 10 ³	700 x 10 ³
				[kgm ²]	0,0151	-	-	-	-	0,022	-				
T 80	1500	3750	750	[kg]	5,20	-	-	-	-	1,12	-	240 x 10 ³	450 x 10 ³	638 x 10 ³	770 x 10 ³
				[kgm ²]	0,0151	-	-	-	-	0,022	-				
100	2050	5150	1025	[kg]	9,37	-	-	-	-	1,16	8,45	500 x 10 ³	700 x 10 ³	856 x 10 ³	950 x 10 ³
				[kgm ²]	0,0401	-	-	-	-	0,021	0,234				
T 100	2500	6250	1250	[kg]	9,37	-	-	-	-	1,16	8,45	600 x 10 ³	830 x 10 ³	960 x 10 ³	1070 x 10 ³
				[kgm ²]	0,0401	-	-	-	-	0,021	0,234				
125	4250	10700	2125	[kg]	19,73	-	-	-	-	2,09	9,85	4200 x 10 ³	5000 x 10 ³	5600 x 10 ³	6200 x 10 ³
				[kgm ²]	0,1359	-	-	-	-	0,043	0,306				

Selection according to SAE standard



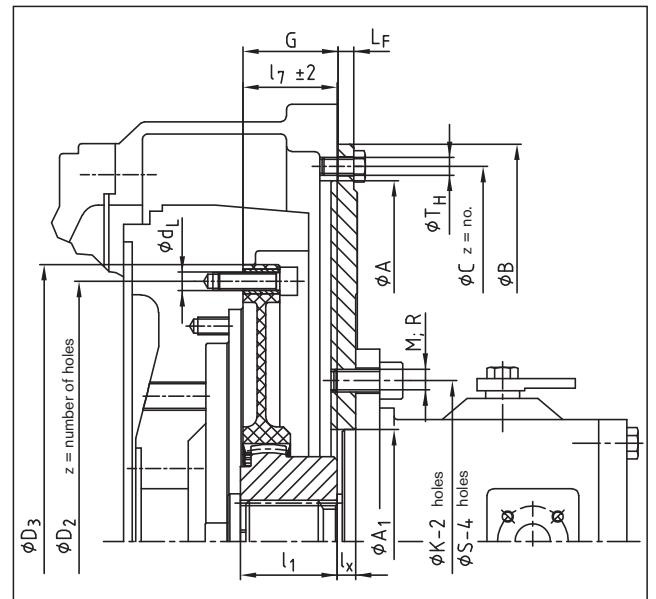
Selection of the coupling

Determination of coupling size	Table 1
Connection dimension of coupling	Table 2
Hub design/Mounting length	Table 3
SAE - pump mounting flange	
Flange size according to SAE 617	Table 4
Mounting flange of hydraulic pump	Table 5



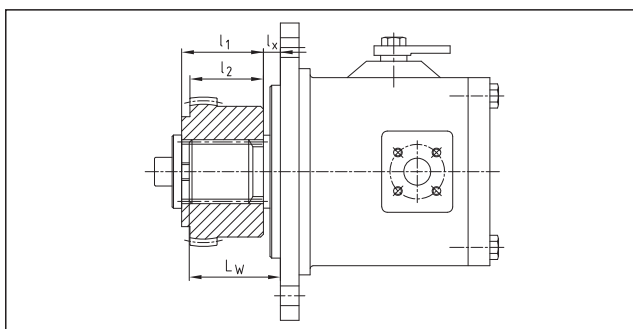
Coupling-mounting short (l_3)

Marking on PA flange

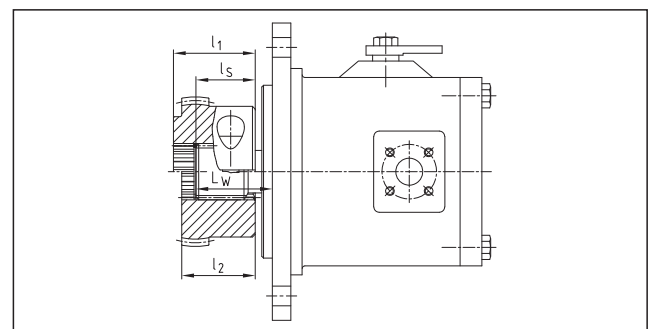


Coupling-mounting long (l_7)

Marking on PA flange



Spline hub



Clamping hub

Determination of mounting length l_3 oder l_7

SAE shaft	$l_3 / l_7 = G + L_F - L_W + l_3$
DIN shaft	$l_3 / l_7 = G + L_F - l_x$

If axial fixing of the hub by means of an end plate and a screw is not possible for a pump shaft with involute spline, we would recommend to use our clamping hub.

Mounting instructions:

The flange can be fastened to the engine flywheel by means of socket head cap screws according to DIN EN ISO 4762 quality 8.8 or by hexagon head screw quality 8.8. We recommend screws are loctited in position.

Screw tightening torque of FLE-PA flange to flywheel

M8	25 Nm
M10	49 Nm
M12	86 Nm

Screw tightening torque of spline clamping hubs DIN EN ISO 4762

42/48	M10	49 Nm
65	M12	86 Nm
80/100	M16	210 Nm

Mounting dimensions according to SAE standard

1. Selection of coupling for diesel engine									
⊗	Diesel engine power		Coupling size	Flywheel to SAE			Pump mounting flange		Driving shaft of pump
	kW	HP		G			LF		
up to 30 kW	up to 40 PS	48 FLE-PA	6 1/2"	30,15	1,19"	Dimensions to SAE see tables 3 and 4	9,5	0,375"	See table 3 Hub design SAE J 498 / DIN 5480
			7 1/2"	30,15	1,19"				
			8"	62	2,44"				
up to 90 kW	up to 120 PS	65 FLE-PA	8"	62	2,44"	Dimensions to SAE see tables 3 and 4	9,5	0,375"	See table 3 Hub design SAE J 498 / DIN 5480
			10"	54	2,12"				
			11 1/2"	39,6	1,56"				
up to 180 kW	up to 240 PS	80 FLE-PA	11 1/2"	39,6	1,56"	Dimensions to SAE see tables 3 and 4	12,7	0,5"	See table 3 Hub design SAE J 498 / DIN 5480

2. Dimensions of coupling flange acc. to SAE J 620 [mm]					
⊗	Size	D ₃	D ₂	z=number	d _L
	6 1/2"	215,90	200,02	6	9
	7 1/2"	241,30	225,25	8	9
	8"	263,52	244,47	6	11
	10"	314,32	295,27	8	11
	11 1/2"	352,42	333,37	8	11

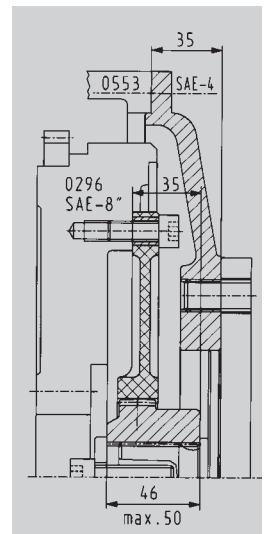
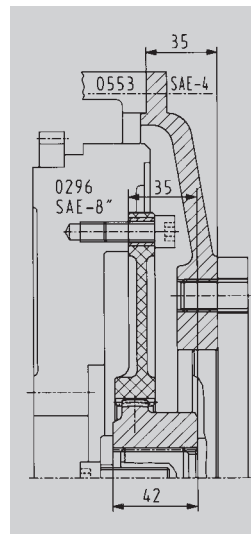
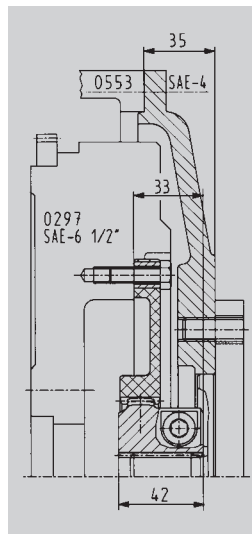
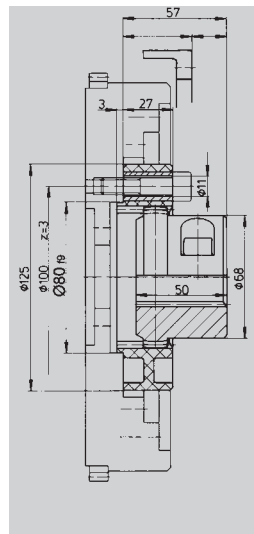
3. Selection of coupling hub - Determination of mounting length l ₃ or l ₇																	
⊗ Please mention type	BoWex® coupling size	Pump shaft to SAE J 498 and DIN 5480	Spline hub	Clamping hub	Dimensions of coupling size [mm]			Mounting length of coupling l ₃ or l ₇								Code to order coupling hub	
								Flange size 6 1/2" and 7 1/2"		Flange size 8"		Flange size 10"		Flange size 11 1/2"			
					l ₁	l ₂	l _S	K	L	K	L	K	L	K	L	Please mention coupling size	
					l ₃	l ₇	l ₃	l ₇	l ₃	l ₇	l ₃	l ₇	l ₃	l ₇	l ₃	l ₇	
	42	SAE-16/32 DP PI-S 3/4" z=11	x	x	42	-	33	33	42								P559101
	42	SAE-16/32 DP PB-S 7/8" z=13	x	x	42	-	-	33	42								P567101
	42	SAE-16/32 DP PB-BS 1" z=15	x	x	42	-	27	33	42								P660201
	48	SAE-16/32 DP	x	x	50	-	45	41	50	50	41	50					P660301
	65	PA-S 1 3/8" z=21	x	x	50	-	48		54	45	54	41					P660301
	65	SAE-12/24 DP PC-S 1 1/4" z=14	x	x	55	-	44		54	45	54	41					P656201
	65	SAE-16/32 DP PD-S 1 1/2" z=23	x	x	-	49	45					53	41				P664301
	80	SAE-16/32 DP PE-S 1 3/4" z=27	x	x	55	-	-						44	33			P565402
	42	25 x 1,25 x 18 DIN 5480	x	x	42	-	-	33	42								P000205
	42		x	x	42	-	-	33	42								P500202
	42	30 x 2 x 14 DIN 5480	x	x	42	-	-	33	42								P500203
	48		x	x	50	-	-	41	50								P000206
	48	35 x 2 x 16 DIN 5480	x	x	50	-	-	41	50	50		50					P500203
	48		x	x	46	-	-	37	46								P000303
	65	40 x 2 x 18 DIN 5480	x	x	55	-	-					54	39				P000303
	65		x	x	60	-	-		50	59	50	59	39				P500301
	65	45 x 2 x 21 DIN 5480	x	x	55	-	-					54	39				P000304
	65		x	x	55	-	-		54	45	54	39					P500302
	65	50 x 2 x 24 DIN 5480	x	x	-	64	-		60	69	60	69	39				P000403
	65		x	x	55	-	-		54	45	54	39					P500401
	80		x	x	55	-	-					42	37				P500405

↑ Please photocopy dimension sheet and highlight all details required for design.

Order form: FLE-PA coupling			SAE pump mounting flange	
BoWex® 48 FLE-PA	7 1/2"	P663301	SAE-4	B-2L
Coupling size	SAE connection of coupling	Code of coupling hub	Pump mounting flange for engine housing	Pump mounting to SAE 2 holes/4 holes standard - metric fastening thread
Table 1	Table 2	Table 3	Table 4	Table 5

Special flange programme, deviations from the SAE standard

Fitting to
Deutz
2011
diesel
engines



Coupling size
Engine type

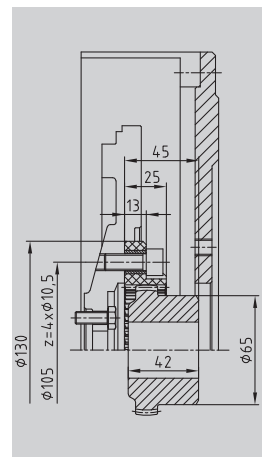
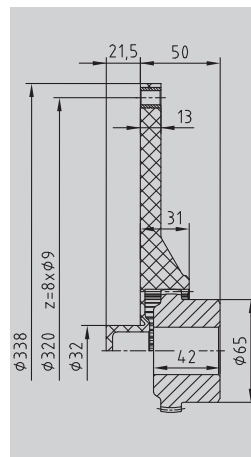
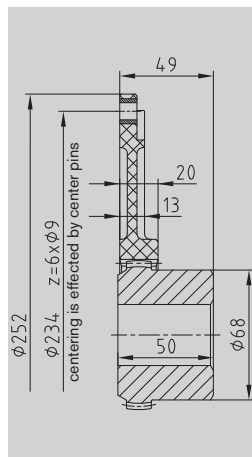
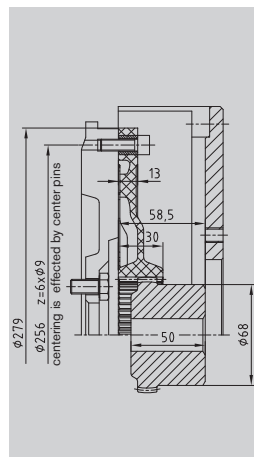
BoWex® 48 FLE-PA,
Ø 125
F2L511 – kit 1338

BoWex® 48 FLE-PA,
Ø 215,9
F2-4L 2011

BoWex® 48 FLE-PA,
Ø 263,52
F2-4L 2011

BoWex® T 48 FLE-PA,
Ø 263,52
BF 4L 2011

Fitting to
VW
Mitsubishi
diesel
engines



Coupling size
Engine type

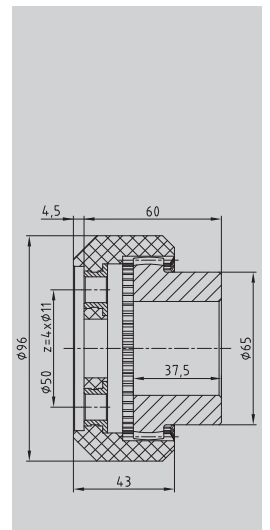
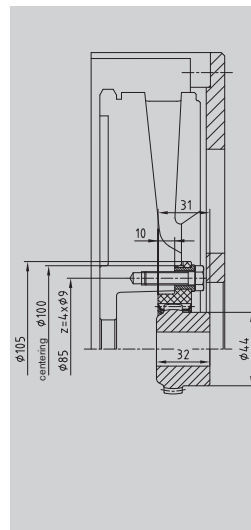
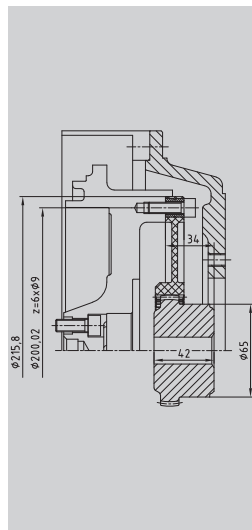
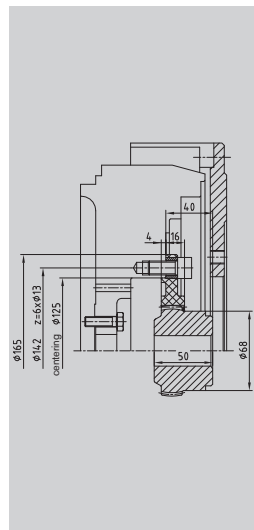
BoWex® 48 FLE-PA, Ø 279
VW
028.B / M344

BoWex® 48 FLE-PA, Ø 252
VW
062.2 / 068.5 / 6 / A / D

BoWex® 48 FLE-PA
Mitsubishi
Ø 338-32

BoWex® 48 FLE-PA, Ø 130
Mitsubishi
L-series / K-series

Fitting to
Hatz
diesel
engines



Coupling size
Engine type

BoWex® 48 FLE-PA, Ø 165
Hatz
2L/3L/4L41C 2M/3M/4M41

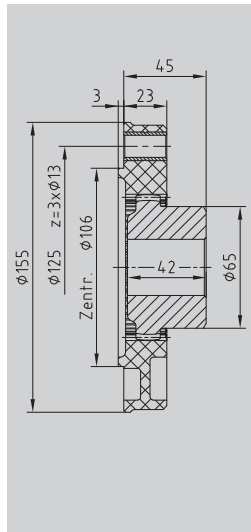
BoWex® 48 FLE-PA, 6,5
Hatz
W35

BoWex® 28 FLE-PA, Ø 105
Hatz
1D81 / 1D90

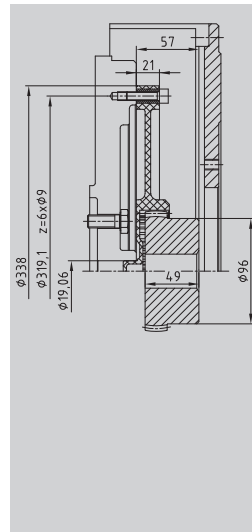
BoWex® 48 FLE-PA, Ø 96
Hatz
Z788 / Z789 / Z790

Special flange programme, deviations from the SAE standard

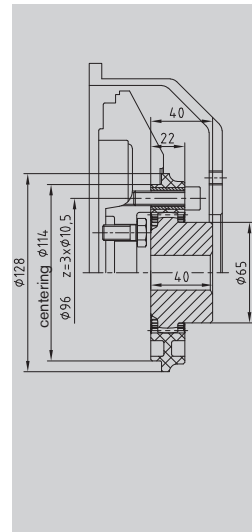
Fitting to
Perkins
Lombardini
diesel
engines



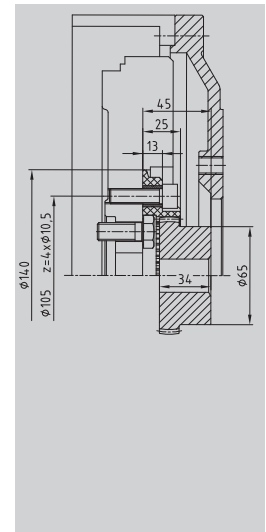
BoWex® 48 FLE-PA, Ø 152/1
Perkins
4.108



BoWex® 65 FLE-PA, Ø 338
Perkins 1104C-44T
Flywheel-No. D0014



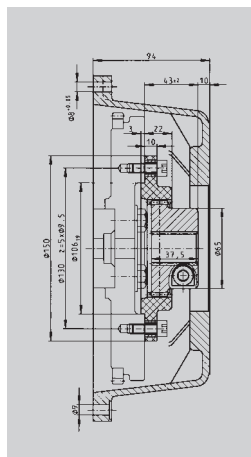
BoWex® 48 FLE-PA, Ø 128
Lombardini
FOCS-Serie



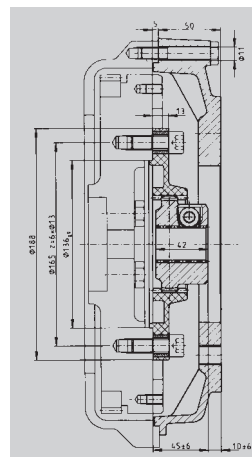
BoWex® 48 FLE-PA, Ø 140
Lombardini
LDW 1303/1503/2004

Coupling size
Engine type

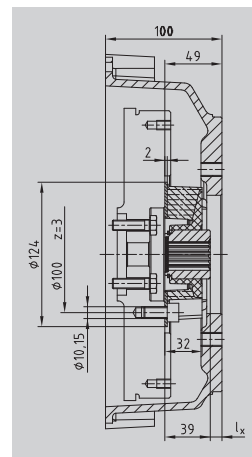
Fitting to
Kubota
diesel
engines



BoWex® 48 FLE-PA, Ø 150
Super mini Serie



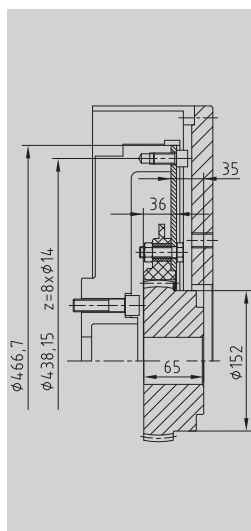
BoWex® 48 FLE-PA, Ø 188
Super 3 Serie



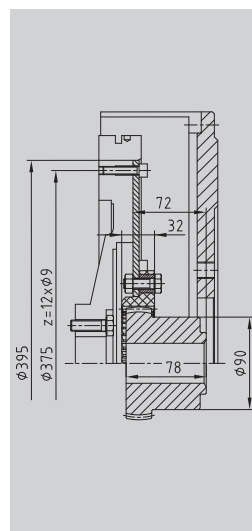
MONOLASTIC® 28, Ø 124
Super 5 Serie

Coupling size
Engine type

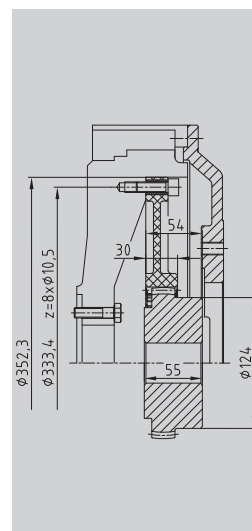
Fitting to
Caterpillar
Daimler-
Chrysler
Cummins
John-Deere
diesel
engine



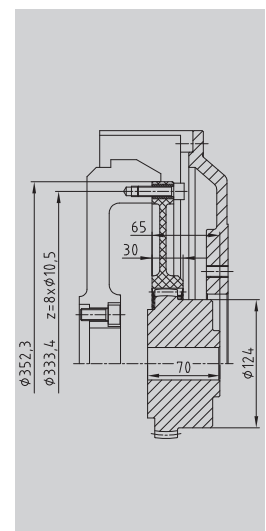
BoWex® T100 FLE-PA, 14"
Caterpillar
C 10 / C 12



BoWex® T65 FLE-PA, Ø 395
Daimler-Chrysler
OM904



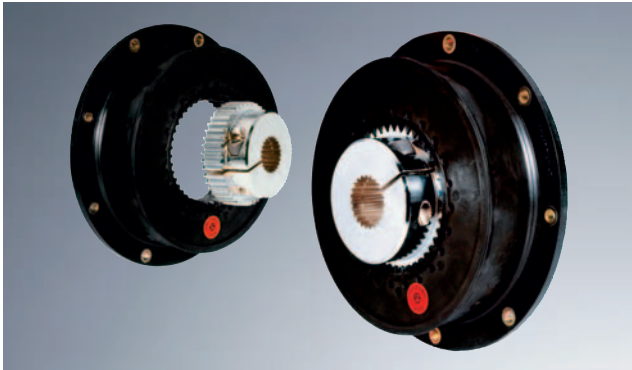
BoWex® 80 FLE-PA, 11 1/2"
Cummins
6BTA5.9



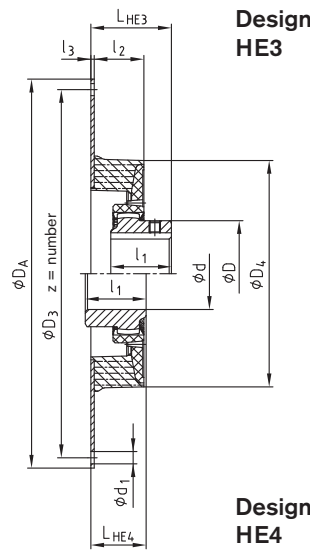
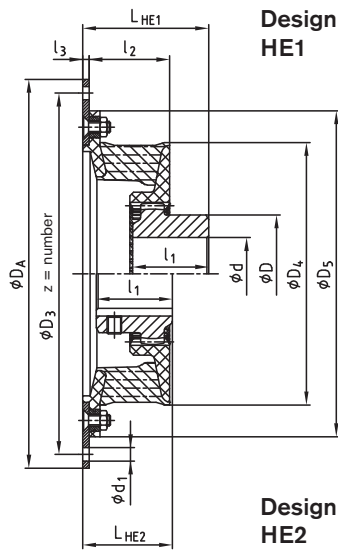
BoWex® 80 FLE-PA 11 1/2"
John Deere
1010D / 1110D / 1400D

Coupling size
Engine type

Type HE



- Flange coupling with flanges according to SAE and special dimensions for mounting to I. C.-engines
- Easy assembly by axial plug-in
- Compensation of misalignment on driving and driven side
- Use of coupling hubs from the BoWex standard programme
- Finish bore according to ISO fit H7, keyway to DIN 6885, sheet 1 (JS9) - inch bores, taper bores, spline clamping hub
- Available in the hardness 40, 50 and 65 Shore A
- Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95) until size 80 including



Flange dimensions according to SAE J 620 [mm]				
Size	DA	D3	z	d1
6 1/2"	215,90	200,02	6	9
7 1/2"	241,30	222,25	8	9
8"	263,52	244,47	6	11
10"	314,32	295,27	8	11
11 1/2"	352,42	333,37	8	11
14"	466,72	438,15	8	14
16"	517,50	489,00	8	14
18"	571,50	542,90	6	18

BoWex-ELASTIC® Type HE																									
Size	Design		Bore d [mm]	Flange connection according to SAE - J 620	Dimensions [mm]											Weight with pilot bored coupling [kg]	Mass moment of inertia with pilot bored coupling								
	HE1	HE2			Pilot bored	max.	6 1/2"	7 1/2"	8"	10"	11 1/2"	14"	16"	18"	l3		l2	D4	D5	D	l1	L HE1	L HE2	L HE3	L HE4
42 HE	●		-	42	●	●							4	45	146	180	65	42	70	50			2,7	0,0061	0,0014
	●						●																2,9	0,0083	0,0014
48 HE	●		-	48	●	●							4	45	164	198	68	50	78	50			3,1	0,0148	0,0019
	●						●																3,9	0,0298	0,0019
65 HE	●		-	65					●				5	55	205	244	96	55	85	62			6,4	0,0377	0,0064
	●								●														7,2	0,0594	0,0064
G 65 HE		●	-	65						●			3	45	205	-	96	55	73	50			5,3	0,0242	0,0076
		●								●													5,7	0,0372	0,0076
80 HE	●		31	80									-	70	266	-	124	90	126	74			10,9	0,0211	0,0283
	●												6	70	266	316	124	90	132	80			13,0	0,0726	0,0283
G 80 HE		●	31	80									-	80	302	-	124	90	136	84			12,5	0,0402	0,0428
		●											6	80	302	356	124	90	142	90			17,3	0,2251	0,0428
100 HE		●	35	100									4	80	350	-	152	110	150	82			24,1	0,1951	0,1019
125 HE		●	45	125									-	98	416	-	192	140	186	103			45,8	0,3013	0,2861
		●											6	98	416	-	192	140	192	109			47,7	0,4123	0,2861
G 125 HE		●	45	125									6	89	440	-	192	140	179	91			48,4	0,4781	0,2916
		●											6	89	440	-	192	140	179	91			50,5	0,6380	0,2916
150 HE		●	50	150									6	134	470	-	225	150	205	157			66,7	0,6918	0,5192

Order form:	BoWex-ELASTIC® 42	HE 1	40	8	70	U
	Coupling size	Design	Elastomer hardness	Flange diameter DA acc. to SAE or special	Mounting length LHE	Unbored or with finish bore

Technical data

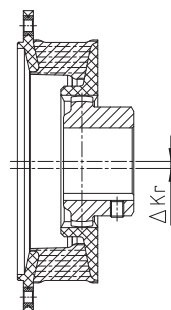
Coupling sizes		Technical Data																				
		42 HE			48 HE			65 HE			80 HE			100 HE			125 HE			150 HE		
		G 65 HE			G 80 HE						G 125 HE											
Elastomer hardness [Shore A]	Shore A	40 Sh	50 Sh	65 Sh	40 Sh	50 Sh	65 Sh	40 Sh	50 Sh	65 Sh	40 Sh	50 Sh	65 Sh	40 Sh	50 Sh	65 Sh	40 Sh	50 Sh	70 Sh	40 Sh	50 Sh	70 Sh
Rated torque	T _{KN} [Nm]	130	150	180	200	230	280	350	400	500	750	950	1200	2000	2500	3200	3000	4000	5000	5500	7000	9000
Maximum torque	T _{K max.} [Nm]	390	450	540	600	690	840	1050	1200	1500	2250	2850	3600	6000	7500	9600	9000	12000	15000	16500	21000	27000
Vibratory torque with 10 Hz	T _{KW} [Nm]	36	45	54	60	69	84	105	120	150	225	285	360	600	750	960	900	1200	1500	1650	2100	2700
Permissible damping power 60 °C	P _{KW} [W]	20			27			45			90			160			180			225		
Permissible damping power 80 °C	P _{KW} [W]	6,5			9			15			30			53			60			75		
Max. perm. operating speed	n _{max.} [min ⁻¹]	6200			5600			4500			3600			2700			2300			1800		
Twisting angle with rated torque	φ _{TKN} [°]	16	13	8	16	13	8	16	13	8	14	13	6	12	10	6	12	10	6	10	8	5
Dynamic torsion spring stiffness	C _{dyn} [Nm/rad]	550	850	2700	850	1300	3500	1600	2200	6000	4500	6500	18000	12000	19000	48000	19000	30000	75000	42000	67000	166000
Relative damping	ψ	0,6	0,8	1,2	0,6	0,8	1,2	0,6	0,8	1,2	0,6	0,8	1,2	0,6	0,8	1,2	0,6	0,8	1,2	0,6	0,8	1,2
Resonance-factor V _R ≈	$\frac{2 \cdot \pi}{\psi}$	10,5	7,9	5,2	10,5	7,9	5,2	10,5	7,9	5,2	10,5	7,9	5,2	10,5	7,9	5,2	10,5	7,9	5,2	10,5	7,9	5,2
Radial spring stiffness	C _r [N/mm]	142	219	697	176	269	724	209	288	784	351	507	1404	366	570	1200	617	974	2434	714	1200	2500
Perm. rad. coupling misalignment with n = 1500 min ⁻¹	ΔK _r [mm]	1,1	1,0	0,5	1,2	1,1	0,5	1,6	1,5	0,7	1,8	1,7	0,8	2,2	2,0	1,0	2,5	2,3	1,1	2,8	2,5	1,3
Max. perm. rad. coupl. misalignment for short-term start	ΔK _{r max.} [mm]	3,6	3,3	1,5	3,8	3,5	1,7	5,1	4,7	2,2	5,7	5,3	2,4	6,5	6,0	3,0	7,5	6,9	3,3	8,0	7,5	4,0
Perm. angular coupl. misalignment with n = 1500 min ⁻¹	ΔK _w [°]	1,0	0,75	0,5	1,0	0,75	0,5	1,0	0,75	0,5	1,0	0,75	0,5	1,0	0,75	0,5	1,0	0,75	0,5	1,0	0,75	0,5
Perm. angular coupl. misalignment with n = 3000 min ⁻¹	ΔK _w [°]	0,5	0,4	0,25	0,5	0,4	0,25	0,5	0,4	0,25	0,5	0,4	0,25	0,5	0,4	0,25	0,5	0,4	0,25	0,5	0,4	0,25
Max. perm. angular coupl. misalignment for short-term start	ΔK _{w max.} [mm]	1,5			1,5			1,5			1,5			1,5			1,5			1,5		
Perm. axial coupling misalignment	ΔK _a [mm]	± 2			± 2			± 2			± 2			± 3			± 3			± 5		

The technical data mentioned apply for an ambient temperature of T = 60 °C.

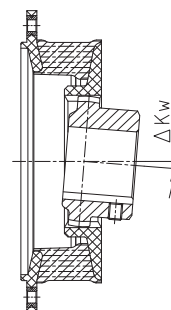
Displacements

For other operating speeds or higher operating temperatures the permissible radial displacement is calculated as follows:

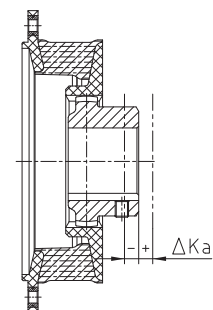
$$\Delta K_{r \text{ perm.}} = \Delta K_r \cdot S_t \cdot \sqrt{\frac{1500}{n_x}}$$



Radial displacement ΔK_r



Angular displacement ΔK_w



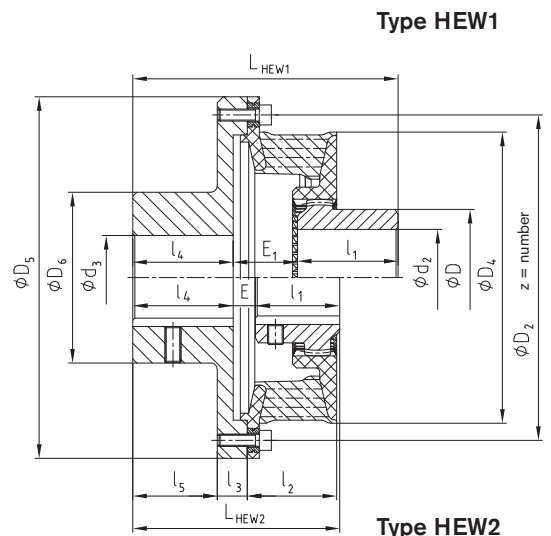
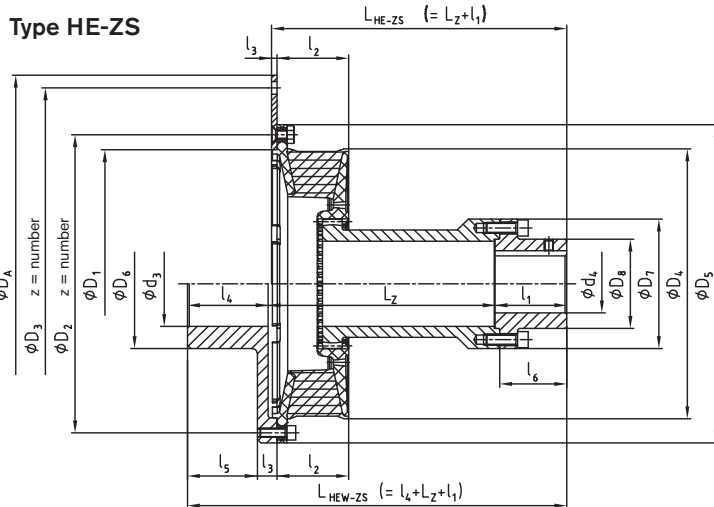
Axial displacement ΔK_a

Process of assembly, screw type with quality, tightening torques according to KTR assembly instructions (see www.ktr.com).

Type HE-ZS, Type HEW-ZS and Type HEW



- Highly flexible coupling to be mounted to combustion engines and electric motors
- Elastomer parts available as hardness 40, 50 and 65 Shore A
- High degree of compensation of errors in alignment
- Type HE-ZS with flange connection according to SAE-J 620 and removable part for pump drives
- Type HEW-ZS for shaft connections with removable part
- Type HEW1/HEW2 highly flexible shaft coupling
- Finish bore according to ISO fit H7, feather key according to DIN 6885 sheet 1 - JS9
- Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)



Type HEW-ZS

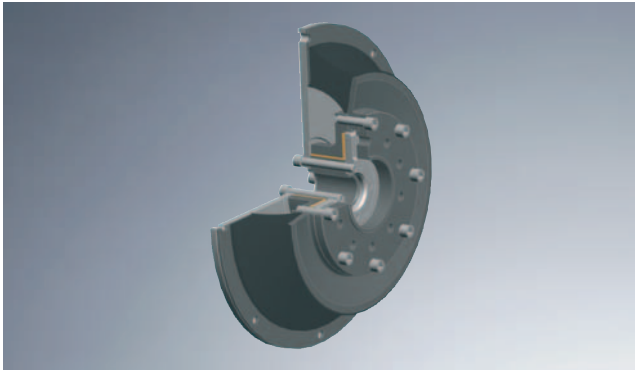
Type HEW2

BoWex-ELASTIC® Type HE-ZS																										
Size	max. finish bore d ₄	Flange connection to SAE-J 620 D _A for HE-ZS						Dimensions [mm]							Removable part HE-ZS L _Z [mm]					Weight with max. bore [kg]	Mass moment of inertia [kgm ²]					
		6 1/2"	7 1/2"	8"	10"	11 1/2"	14"	D ₁	D ₄	D ₅	D ₇	D ₈	l ₁	l ₂	l ₃	l ₆	100	120	140		180	250	J _A	J _L		
48	28	●												48	10		●	●					2,9	0,0028	0,0050	
			●					160	164	200	78	45	40			37	4	45	●	●				3,6	0,0106	0,0050
				●														●	●					3,9	0,0148	0,0050
					●													●	●					4,6	0,0298	0,0050
G 65	45				●		198	205	245	110	72	60	45	3	56		●	●				7,7	0,0242	0,0223		
80	65				●									11				●	●	●			13,7	0,0211	0,0701	
					●		265	266	318	145	100	80	70	6	75			●	●				15,9	0,0726	0,0701	
G 80	65				●									11				●	●	●			17,4	0,0402	0,1412	
					●		300	302	358	145	100	80	80	6	75				●	●			22,3	0,2251	0,1412	

BoWex-ELASTIC® Type HEW-ZS																						
Size	max. finish bore		Dimensions [mm]											Removable part HEW-ZS L _Z [mm]					Weight with max. bore [kg]	Mass moment of inertia [kgm ²]		
	d ₃	d ₄	D ₂	z x M	D ₄	D ₅	D ₆	l ₁	l ₂	l ₃	l ₄	l ₅	100	120	140	180	250	J _A		J _L		
48	55	28	180	8	M6	164	200	92	50	45	17	55	45	●	●					6,9	0,0203	0,0050
65	75	45	224	8	M8	205	245	125	55	55	28	75	63		●	●				16,0	0,0747	0,0160
80	80	65	295,3	8	M10	266	318	130	90	70	17	80	70			●	●			25,5	0,1447	0,0699
G 80	95	65	333,4	8	M10	302	358	145	90	80	22	90	78				●	●		34,2	0,2752	0,1412

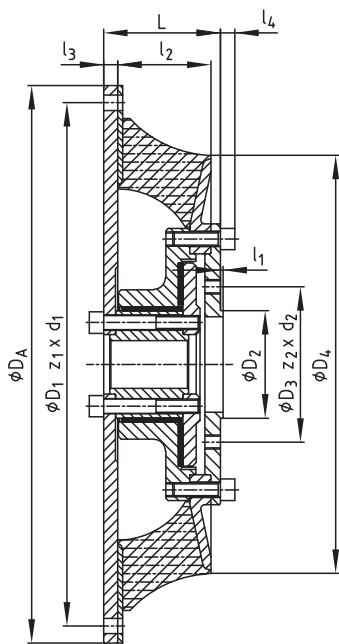
BoWex-ELASTIC® Type HEW																					
Size	max. finish bore		Dimensions [mm]														Weight with max. bore [kg]		Mass moment of inertia [kgm ²]		
	d ₂	d ₃	D	D ₂	z x M	D ₄	D ₅	D ₆	l ₁	l ₂	l ₃	l ₄	l ₅	E	E ₁	L _{HEW1}	L _{HEW2}	J _A	J _L		
42	48	50	68	162	6	M6	146	180	85	50	45	15	50	42	4	32	132	104	4,3	0,0121	0,0015
48	48	55	68	180	8	M6	164	200	92	50	45	17	55	45	4	32	137	109	5,5	0,0204	0,0019
65	65	75	96	224	8	M8	205	245	125	70	55	28	75	63	5	42	187	150	13,2	0,0752	0,0071
80	80	80	124	295,27	8	M10	266	318	130	90	70	17	80	70	5	45	215	160	19,7	0,1449	0,0285
G 80	85	95	124	333,4	8	M10	302	358	145	90	80	22	90	78	5	55	235	185	25,9	0,2748	0,0422

Type HEG for cardan shaft connections

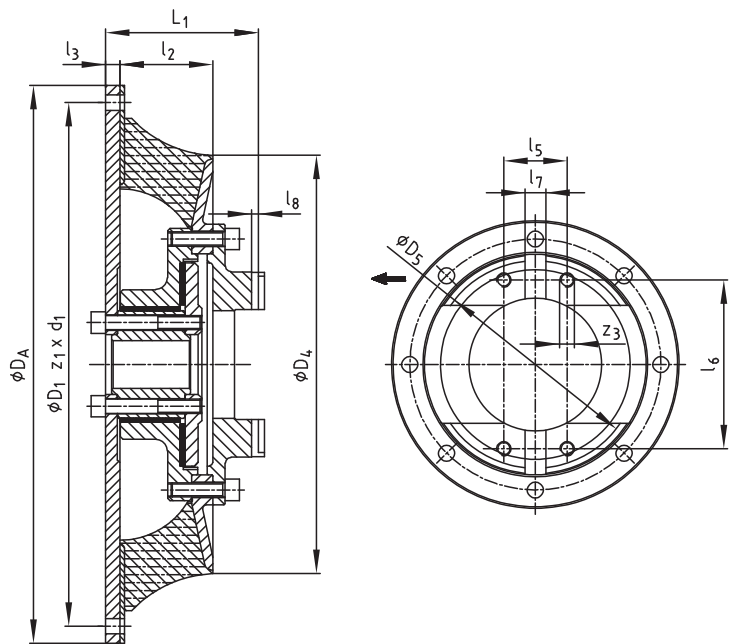


- Highly-flexible cardan shaft auxiliary coupling for I. C. engines
- Available in different elastomer hardness's
- High torsional flexibility
- Excellent damping properties due to additional friction damping
- Reduction of torque peaks in the elastomer part
- Radial plain bearing in maintenance-free design
- Cardan shaft connection for usual designs

Type HEG1



Type HEG2



BoWex-ELASTIC® Type HEG1 and Type HEG2

Size	Flywheel connection to SAE-J 620					Metric cardan shaft connection HEG1 dimensions [mm]								MECHANICS cardan shaft connection HEG2 dimensions [mm]								Dimensions [mm]			Weight [kg]	Mass moment of inertia				
	8"	10"	11 1/2"	14"	16"	58	65	75	90	100	120	150	180	l4	L	2 C	4 C	5 C	6 C	7 C	8,5 C	8 C	L1	D4		l2	l3	J _A [kgm²]	J _L [kgm²]	
48	●					●	●	●						8	58,5		●	●	●						163	43,5	8	7	0,03	0,006
		●				●	●	●																			8	0,06	0,006	
G 65		●					●	●	●					8	66	●	●	●						71	205	48,0	10	12	0,07	0,02
			●				●	●	●							●	●	●								23	14	0,10	0,02	
80		●					●	●	●					10	88,5		●	●	●					104	265	68,5	12	21	0,11	0,06
			●				●	●	●								●	●	●							12	23	0,17	0,06	
G 80			●				●	●	●					10	96			●	●	●				110	302	74,0	23	26	0,18	0,09
				●			●	●	●								●	●	●							12	33	0,48	0,09	
100				●			●	●	●					12	98						●			128	350	78,0	16	41	0,63	0,19
125				●			●	●	●					12	111						●	●		135	416	96,0	18	56	0,74	0,42
					●		●	●	●												●	●				12	59	0,97	0,42	

Flywheel connection to SAE-J 620 [mm]				
Size	D _A	D ₁	z ₁	d ₁
8"	263,52	244,47	6	11
10"	314,32	295,27	8	11
11 1/2"	352,42	333,37	8	11
14"	466,72	438,15	8	14
16"	517,50	489,00	8	14

Metric cardan shaft connection HEG1 [mm]					
Size	D ₂	l ₁	D ₃	z ₂	d ₂
58	30	1,0	47,0	4	M5
65	35	1,0	52,0	4	M6
75	42	1,5	62,0	6	M6
90	47	2,0	74,5	4	M8
100	57	2,0	84,0	6	M8
120	75	2,0	101,5	8	M10
150	90	2,5	130,0	8	M12
180	110	2,5	155,5	8	M14

MECHANICS cardan shaft connection HEG2 [mm]						
Size	D ₅	l ₅	l ₆	l ₇	l ₈	z ₃
2 C	79,35	33,3	59,5	9,50	3,8	M8
4 C	107,92	36,5	87,3	9,50	3,8	M8
5 C	115,06	42,9	88,9	14,26	5,1	M10
6 C	140,46	42,9	114,3	14,26	5,1	M10
7 C	148,39	49,2	117,5	15,85	6,0	M12
8,5 C	165,08	71,4	123,8	15,85	6,0	M12
8 C	206,32	49,2	174,6	15,85	6,0	M12

Coupling selection

1. BoWex-ELASTIC® couplings should be selected in accordance with DIN 740 part 2. The coupling must be sufficiently sized to ensure that the maximum permissible coupling load is not exceeded in any operating condition. It is therefore necessary to compare the actual loads with the permissible rated parameters of the coupling according to tables 1.1 - 1.4 listed below.

For drives subject to dangerous torsional vibrations it is necessary for a safe operation to review the drive by means of a torsional vibration calculation.

1.1 Load by rated torque

The permissible rated torque T_{KN} of the coupling must, at all operating temperatures, be at least as high as the rated torque T_N of the machine.

$$T_{KN} \geq T_N \cdot S_t$$

$$T_N \text{ [Nm]} = 9550 \cdot \frac{P_{AN/LN} \text{ [kW]}}{n \text{ [1/min]}}$$

1.2 Load by torque shocks

The maximum permissible torque of the coupling must, at all operating temperatures, be as high as the operational peak torque T_S , taking into account the shock factor S_Z .

$$T_{K \max} \geq T_S \cdot S_Z \cdot S_t$$

$$\begin{aligned} \text{Shock on driving side} \\ T_S &= T_{AS} \cdot M_A \cdot S_A \\ \text{Shock on driven side} \\ T_S &= T_{LS} \cdot M_L \cdot S_L \end{aligned}$$

$$M_A = \frac{J_L}{J_A + J_L} \quad M_L = \frac{J_A}{J_A + J_L}$$

With knowledge of mass distribution, direction and type of shock it is possible to calculate the peak torque T_S . If the moments of inertia are unknown, M_A or $M_L = 1$.

1.3 Passing through resonance range

The peak torque T_S arising when the resonance range is passed through must not exceed the maximum torque $T_{K \max}$ of the coupling, taking into account the temperature.

$$T_{K \max} \geq T_S \cdot S_Z \cdot S_t$$

1.4 Load by vibratory torque shocks

The permissible vibratory torque T_{KW} of the coupling, at the operating speed and ambient temperature, must not be exceeded by the biggest periodical vibratory torque T_W .

$$T_{KW} \geq T_W \cdot S_t$$

With operating frequencies $f > 10$ Hz the heat produced by damping in the elastomer is considered as damping power P_{KW} . The permissible damping power P_{KW} of the coupling depends on the ambient temperature and must not be exceeded by the actual damping power produced.

$$P_{KW} \geq P_W$$

Temperature factor S_t

	- 40 °C + 60 °C	+ 70 °C	+ 80 °C
S_t	1,0	1,2	1,6

Table No. 1

Starting factor S_Z

Starting frequency/h	< 10	> 10 < 60	> 60 < 120	> 120
S_Z	1,0	1,5	2,0	on request

Table No. 2

Shock factor S_A/S_L

Moderate shocks		1,5
Average shocks	S_A/S_L	1,8
Heavy shocks		2,5

Table No. 3

Technical data for coupling selection / Torsional vibration calculation

Driving side

diesel gas engine-type

straight-type engine V-engine/angle stroke mm

2-cycles 4-cycles piston Ø mm no. of cylinders

nominal torque T_{AN} Nm speed range n: idle speed 1/min.

peak torque T_{AS} Nm $n_{\min. \text{ operational}}$ $n_{\max. \text{ operational}}$ 1/min.

mass moment of inertia J_A or flywheel effect GD^2_A for

flywheel J_A kgm² or GD^2_A kgm²

driving gear J_A kgm² or GD^2_A kgm²

Driven side

hydraulic pump splitterbox generator screw compressor

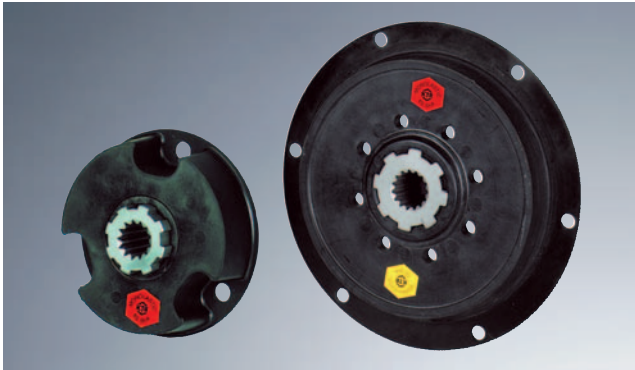
piston compressor no. of cylinders order of cylinder tangential force diagram

manufacturer/type

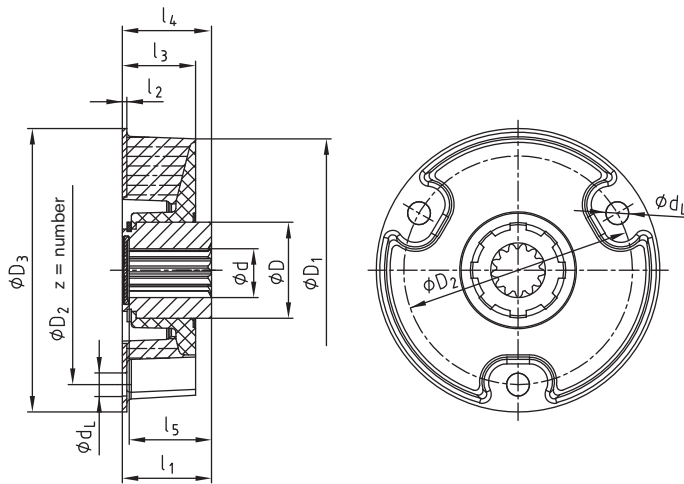
nominal torque T_{LN} Nm peak torque Nm

mass moment of inertia J_L kgm² or flywheel effect GD^2_L kpm²

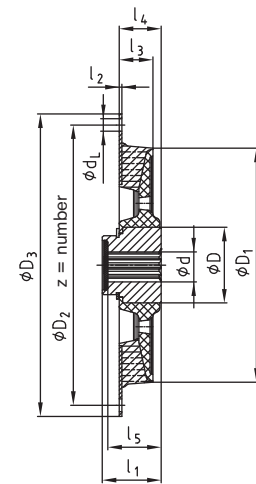
for I. C.-engines (EP 0853203/U.S. Patent 6,117,017)



- MONOLASTIC® – for the drive of diesel engine/hydraulic pump up to 100 kW
- Single-part design with flange fastening by three bolts (sizes 22, 28, 32, 50-140, 50-165, 50-170)
- Flange connection according to SAE 6 1/2" to 11 1/2" (size 30, 50, 65)
- Easy assembly of coupling
- Axial plug-in in combination with the pump shaft
- Compensation for high radial and angular displacements
- Available for pump shafts according to SAE and DIN



Size 22, 28, 32, 50-140, 50-165, 50-170



Size 30, 50, 65

MONOLASTIC®																
Size	Elastomer hardness [Shore A]	Torque [Nm]			Dimension [mm]											
		T _{KN}	T _{K max.}	T _{KW}	d	D	D ₁	D ₂	z	d _L	D ₃	l ₁	l ₂	l ₃	l ₄	l ₅
22	65	40	100	20	20	34	93	80	3	8,10	100	33	1,5	32	34	30
	70	70	175	35	25	42	115	100	3	10,10	124	40	2	32	40	38
28	65	100	300	50	32	50	140	125	3	12,10	150	42	2	42	43	38
	70	225	675	112	32	50	175	165	3	16,15	200	46	3	35	46	43
32	70	300	750	150	32	50	175	170	3	16,15	200	46	3	35	46	43
50-140	70	260	650	130	32	50	167	140	3	14,10	175	46	3	35	46	43
50-165	70	300	750	150	32	50	175	165	3	16,15	200	46	3	35	46	43
50-170	70	300	750	150	32	50	175	170	3	16,15	200	46	3	35	46	43
30	65	160	400	80	25	42	120	SAE-connection 6 1/2", 7 1/2"				39	2	21	30	36
50	65	300	750	150	32	50	167	SAE-connection 6 1/2", 7 1/2", 8", 10"				42	2	24	30	38
65	65	600	1600	180	48	68	200	SAE-connection 10", 11 1/2"				45	3	32	45	42

Technical data											
Size	Elastomer hardness [Shore A]	C _{dyn.} 60°C [Nm/rad]	Perm. damping power with 60°C P _{KW} [W]	Permissible radial displacement with 2200 min ⁻¹ ΔK _r [mm]	Permissible angular displacement with 2200 min ⁻¹ ΔK _w [°]	Radial spring stiffness C _r [N/mm]	Mass moment of inertia [kgm ²]		Max. permissible operating speed n _{max} [min ⁻¹]		
							J _A	J _L			
22	65	600	10	0,6		200	0,00017	0,00010	6000		
28	65	900	15	0,6		300	0,00054	0,00033	6000		
	70	1300	0,5			400					
32	65	1800	25	0,6		400	0,00120	0,00081	6000		
	70	2400	0,5			500					
50-140	70	4200	35	0,5		1365	0,00210	0,00130	6000		
50-165	70	5600	40	0,5	1	1550	0,00250	0,00130	6000		
50-170	70	5600	40	0,5		1550		0,00130	6000		
30	65	3750	25	0,6		1150		6,5"	0,0038	0,00030	6000
								7,5"	0,0057		
								8"	0,0078		
50	65	9000	35	0,6		1300		10"	0,0153	0,00120	6000
								10"	0,0238		
								11,5"	0,0368		
65	65	14000	45	0,6		1900		0,00380	6000		

Applications - BoWex® FLE-PA, BoWex-ELASTIC® and MONOLASTIC®

Applications for BoWex® FLE-PA couplings and MONOLASTIC®

wheel loaders	K 1,6
compact loaders	K 1,6
hydraulic excavators	K 1,4
mobile cranes	K 1,6
graders	K 1,5
vibration rollers	K 1,4
fork lift trucks	K 1,6
concrete mixer trucks	K 1,3
concrete pumps	K 1,4
asphalt finishers	K 1,4
concrete cutters	K 1,4
road mortisers	K 1,4

For a selection according to the engine driving torque T_{AN} a service factor $K = 1,3 - 1,6$ should be considered, depending on the load.

$$T_{KN} \geq T_{AN} \cdot K$$

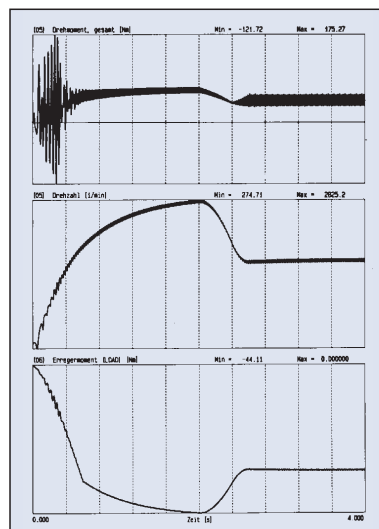
Applications for BoWex-ELASTIC® couplings

screw compressors
generators
piston compressors
splitterboxes
suction pumps
high-pressure pumps
reversing gears
sifting gears
hydrodynamic converters

Coupling selection by means of torsional vibration calculation.

Additional Information

Use of PC with special software for coupling selection



Application:
3-cylinder diesel engine - screw compressor

Use:
BoWex-ELASTIC®
42 HE - 50 Shore A

Calculation:
Acceleration
from 300 min⁻¹
to 2700 min⁻¹

KTR makes use of special simulation calculation programs for the coupling selection and the torsional vibration determination of the drive system.

This ensures a resonance-free operation of the machine, along with a safe, long-lasting operation of the drive components.

This is part of the usual KTR standard service.