POLY-NORM®

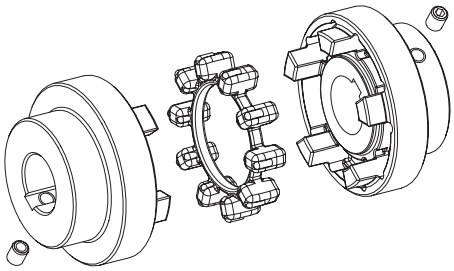
Short torsionally flexible shaft couplings

Coupling description

General description

The POLY-NORM® coupling is a torsionally flexible, shear type shaft coupling. It has an axial plug-in design with a unique short over all length. The POLY-NORM® can be used in nearly all types of machinery and is ideal for the pump industry.

The POLY-NORM® coupling compensates for shaft misalignment of all kinds and safely transmits the torque.



Function/Design

The coupling consists of two hubs, with fingers separated by elastomeric elements. The hubs are assembled blindly plugging the hub fingers into each other axially and the elastomer ring is trapped in a groove between both coupling hubs. The compact POLY-NORM® coupling transmits torque with the elastomer in compression.

Shaft misalignments, vibrations and shock loads are effectively absorbed by the POLY-NORM®.

The coupling is maintenance-free and used in general machinery, the pump industry and in compressors. Torques of up to 11,000 Nm are stocked in 14 different sizes and 7 designs. In addition to the standard coupling models, flange drop out center and spacer options are available in many variations.

Explosion-proof use

POLY-NORM® Couplings are for use in hazardous environments. The coupling is approved according to the European EC Standard 94/9/EC (ATEX 95) (appliance category 2 and 3) and can be used in drives of this hazard class. (Click on www.ktr.com to review the Certificate of Compliance and the operation and assembly instructions).

Variety of Options

The coupling can be adapted to many applications due to the many options that are possible with the building block arrangement. The POLY-NORM® components of a given model can be mixed and matched with each other to obtain different shaft distances using the same basic component.

On request, we can provide customized variations of the POLY-NORM® to fit your needs – for example, our POLY-NORM® overload coupling with RUFLEX® torque limiter. Just ask us!

Coupling selection

Selection of the POLY-NORM® coupling meets the DIN 740 part 2 specification. The coupling must be sized such that the coupling rated nominal torque is not exceeded in any operating condition. A comparison must be made between the application torque vs. the rating of the coupling. The selection process for torsionally flexible shaft couplings is described in detail in the ROTEX® catalogue which can be used for POLY-NORM® couplings as well.

Temperature factor S_t

	–30 °C +30 °C	+40 °C	+60 °C	+80 °C
S_t	1,0	1,2	1,4	1,8

Starting factor S_Z

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

Shock factor S_A/S_L

	S_A/S_L
mild shocks	1,5
medium shocks	1,8
heavy shocks	2,5

Example of calculation – Coupling selection according to DIN 740

Pump drive with three-phase motor

Driver power data:
Power P = 75 kW
Speed n = 1480 1/min
Mass moment of inertia J_A = 1,06 kgm²

Performance data of pump:
Nominal torque T_{LN} = 400 Nm
Peak torque 1) T_{LS} = 300 Nm
Mass moment of inertia J_L = 2,3 kgm²

1) Peak value with shock load

General data:
Ambient temperature t = +60 °C thus S_t = 1,4
Starting frequency z = 6 1/h thus S_Z = 1,0
Normal operation with mild shocks thus S_A or S_L = 1,5

Calculation engine torque T_{AN}:

$$T_{AN}\,[Nm] = 9550 \cdot \frac{P}{n}$$

$$T_{AN}\,[Nm] = 9550 \cdot \frac{75\ kW}{1480\ 1/min} = 484\ Nm$$

Calculation engine peak torque T_{AS}:
T_{AS} [Nm] = 2 · T_{AN}
T_{AS} [Nm] = 2 · 484 Nm = 968 Nm

Factor 2: Peak value with drive-side shock load, e. g. as in full voltage motor starting

Calculation nominal torque of coupling T_{KN}:
T_{KN} [Nm] ≥ $T_{AN} \cdot S_t$
T_{KN} [Nm] ≥ 484 Nm · 1,4 = 678 Nm

Selected coupling:
POLY-NORM® AR Size 75
Transmittable torques of the coupling: Nominal torque T_{KN} = 850 Nm (≥ 678 Nm)
Maximum torque $T_{K\,max}$ = 1700 Nm

Checking of the maximum torque $T_{K\,max}$ / drive side:

Calculation mass factor of the drive side M_A:

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

$$M_A = \frac{2{,}3\ kgm^2}{1{,}06\ kgm^2 + 2{,}3\ kgm^2} = 0{,}68$$

Calculation of the peak torque of the unit – drive-side T_{SA}:
T_{SA} [Nm] = $T_{AS} \cdot M_A \cdot S_A$
T_{SA} [Nm] = 968 Nm · 0,68 · 1,5 = 987 Nm

Calculation of the maximum permissible torque $T_{K\,max}$:
$T_{K\,max}$ [Nm] ≥ $T_{SA} \cdot S_Z \cdot S_t + T_{LN} \cdot S_t$
$T_{K\,max}$ [Nm] = 987 Nm · 1,0 · 1,4 + 0 Nm · 1,4 = 1381 Nm
$T_{K\,max}$ of selected coupling ≥ $T_{K\,max}$ of the drive side
(mathematically) 1700 Nm ≥ 1382 Nm

T_{LN} = 0: when motor is switched on the pump has no load torque

Checking of the maximum torque $T_{K\,max}$ / driven-side:

Calculation of mass factor of the driven side M_L:

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

$$M_L = \frac{1{,}06\ kgm^2}{2{,}3\ kgm^2 + 1{,}06\ kgm^2} = 0{,}32$$

Calculation of peak torque of the unit – load side T_{SL}:
T_{SL} [Nm] = $T_{LS} \cdot M_L \cdot S_L$
T_{SL} [Nm] = 300 Nm · 0,32 · 1,5 = 144 Nm

Calculation of the maximum permissible torque $T_{K\,max}$:
$T_{K\,max}$ [Nm] ≥ $T_{SL} \cdot S_Z \cdot S_t + T_{LN} \cdot S_t$
$T_{K\,max}$ [Nm] = 144 Nm · 1,0 · 1,4 + 400 Nm · 1,4 = 762 Nm
$T_{K\,max}$ of selected coupling ≥ $T_{K\,max}$ of the drive side
(mathematically) 1700 Nm ≥ 761 Nm

Technical data

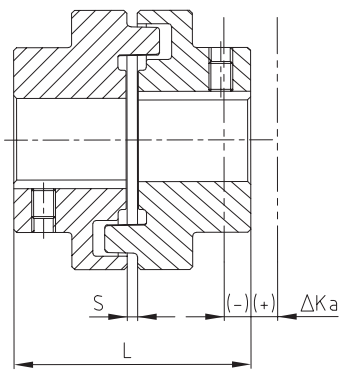
POLY-NORM®	Torque [Nm]			Max. speed [1/min] at V = 30 m/s	Twisting angle with		Torsion spring stiffness C_{dyn} [Nm/rad]				Max. permissible misalignment [mm] 1)		
Sizes for all types	Nominal T_{KN}	Max. $T_{Kmax.}$	Alternating T_{KW}		T_{KN}	T_{Kmax}	1,0 T_{KN}	0,75 T_{KN}	0,5 T_{KN}	0,25 T_{KN}	Axial ΔKa	Radial ΔKr	Angular ΔKw
28	40	80	16	8300	4,5	6,0	5200	3318	1867	897	± 1	0,20	1,2
32	60	120	24	7300			7820	4989	2821	1349	± 1	0,25	1,4
38	90	180	36	6500			13540	8639	4885	2336	± 1	0,25	1,5
42	150	300	60	5900			26250	16748	9471	4528	± 1	0,25	1,7
48	220	440	88	5400			29896	19074	10786	5157	± 1,5	0,30	1,8
55	300	600	120	4800			38500	24563	13891	6641	± 1,5	0,30	2,0
60	410	820	164	4400	4,0	5,5	67600	43129	23200	11661	± 1,5	0,30	2,2
65	550	1100	220	4100			81800	52188	26994	14111	± 1,5	0,35	2,4
75	850	1700	340	3600			122900	78410	40557	21200	± 1,5	0,40	2,7
85	1350	2700	540	3150			243045	155063	74858	41925	± 1,5	0,40	3,0
90	2000	4000	800	2900			361571	230682	111364	62371	± 1,5	0,45	3,4
100	2900	5800	1160	2600	2,5	3,5	548200	349752	168846	94565	± 3	0,50	3,9
110	3900	7800	1560	2300			792300	505487	244028	136672	± 3	0,60	4,3
125	5500	11000	2200	2050			1023240	652827	315158	176509	± 3	0,60	4,8

1) Misalignment at n = 1500 1/min.

Angular and radial misalignment can occur at the same time. The sum of all misalignments must not exceed the figures set forth in the table.
Couplings may be dynamically balanced on request

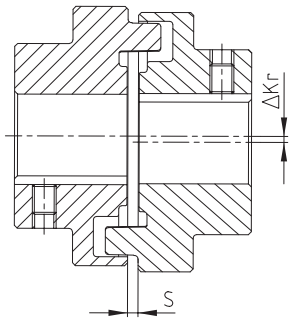
Misalignment

Axial misalignment ΔKa

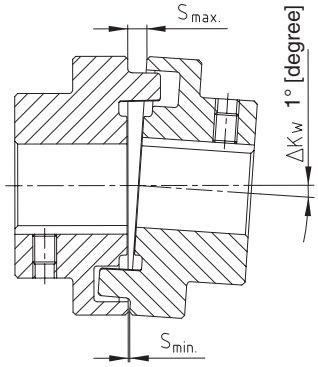


$L_{max./min} = L + \Delta Ka$ [mm]

Radial misalignment ΔKr



Angular misalignment ΔKw



$\Delta Kw = S_{max.} - S_{min.}$ [mm]

Assembly Guidelines

During assembly, the coupling halves must be mounted in a way that the coupling hub faces are flush to the end of the shafts. The alignment of the shafts must be adjusted that radial and the angular misalignments are minimal. The life of the coupling and bearings is extended by precise alignment. Steps must be taken to ensure that the alignment will not change during all operating conditions. Shaft misalignments which cannot be avoided must not exceed the figures indicated in the table. Angular and radial misalignments can occur at the same time but the sum of these misalignments must not exceed the figures set forth in the table above. See the KTR mounting instructions, KTR standard 49510 at our homepage www.ktr.com.

General information about the elastomer

Material/Hardness	Perbunan [NBR]/78 Shore A
Permanent temperature range [°C]	- 30 to + 80
Max. temperature (short time) [°C]	- 50 to + 120
Applications	General machine construction Pump industry ATEX applications Chemical industry Applications of average elasticity
Resistant to	Gasoline, diesel Acids, bases Tropics (Salt-) Water (hot/cold) Oils, greases Propane, butane Natural gas, city gas

Elastomer ring (Standard)

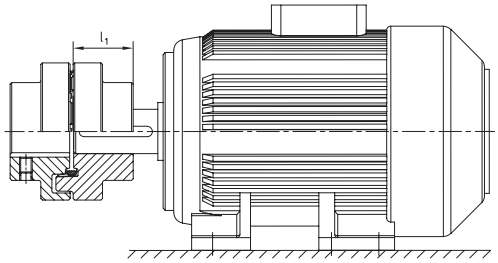
Single elastomer packages (special)

Supplement to our programme: elastomeres for the high-temperature range

POLY-NORM® Torsionally flexible couplings

For advanced drive technology KTR

Selection of standard IEC motors



POLY-NORM® Couplings for IEC norm motor protection IP 54 / IP 55 (elastomer ring 78 Shore A)

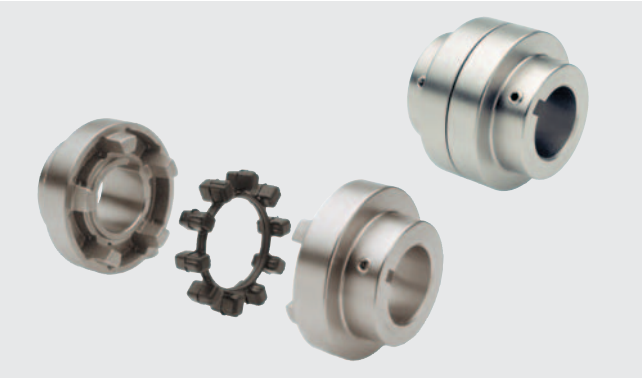
Three-phase motor 50 Hz			Motor power n = 3000 1/min 2 poles		Coupling POLY-NORM®	Motor power n = 1500 1/min 4 poles		Coupling POLY-NORM®	Motor power n = 1000 1/min 6 poles		Coupling POLY-NORM®	Motor power n = 750 1/min 8 poles		Coupling POLY-NORM®
Size	Shaft end dxl [mm]		Power P [kW]	Torque T [Nm]	Size	Power P [kW]	Torque T [Nm]	Size	Power P [kW]	Torque T [Nm]	Size	Power P [kW]	Torque T [Nm]	Size
	2 poles	4,6,8 pol												
56	9 x 20		0,09	0,32		0,06	0,43		0,037	0,43				
			0,12	0,41		0,09	0,64		0,045	0,52				
63	11 x 23		0,18	0,62		0,12	0,88		0,06	0,7				
			0,25	0,86		0,18	1,3		0,09	1,1				
71	14 x 30		0,37	1,3		0,25	1,8		0,18	2		0,09	1,4	
			0,55	1,9		0,37	2,5		0,25	2,8		0,12	1,8	
80	19 x 40		0,75	2,5	**28/32**	0,55	3,7	**28/32**	0,37	3,9	**28/32**	0,18	2,5	**28/32**
			1,1	3,7		0,75	5,1		0,55	5,8		0,25	3,5	
90S	24 x 50		1,5	5		1,1	7,5		0,75	8		0,37	5,3	
90L			2,2	7,4		1,5	10		1,1	12		0,55	7,9	
100L	28 x 60		3	9,8		2,2	15		1,5	15		0,75	11	
						3	20					1,1	16	
112M			4	13		4	27		2,2	22		1,5	21	
132S	38 x 80		5,5	18		5,5	36		3	30		2,2	30	
			7,5	25	**38**			**38**			**38**			**38**
132M						7,5	49		4	40		3	40	
									5,5	55				
160M	42 x 110		11	36		11	72		7,5	75	**42**	4	54	**42**
			15	49	**42**			**42**				5,5	74	
160L			18,5	60		15	98		11	109		7,5	100	
180M	48 x 110		22	71	**48**	18,5	121	**48**			**48**			**48**
180L						22	144		15	148		11	145	
200L	55 x 110		30	97		30	196	**55**	18,5	181	**55**	15	198	**55**
			37	120	**55**				22	215				
225S	55 x 110	60 x 140				37	240	**60**			**60**	18,5	244	**60**
225M			45	145		45	292		30	293		22	290	
250M	60 x 140	65 x 140	55	177	**60**	55	356	**65**	37	361	**65**	30	392	**65**
280S	65 x 140	75 x 140	75	241		75	484	**75**	45	438	**75**	37	483	**75**
280M			90	289	**65**	90	581		55	535		45	587	
315S		80 x 170	110	353		110	707	**85**	75	727	**85**	55	712	**85**
315M			132	423	**75**	132	849		90	873		75	971	
			160	513		160	1030		110	1070	**90**	90	1170	**90**
315L			200	641		200	1290	**90**	132	1280		110	1420	
					85				160	1550	**100**	132	1710	**100**
315		85 x 170	250	802		250	1600	**100**	200	1930		160	2070	
			315	1010		315	2020		250	2410	**110**	200	2580	**110**
			355	1140	**90**	355	2280	**110**	315	3040	**125**	250	3220	**125**
355	75 x 140	95 x 170	400	1280		400	2570		400	3850		315	4060	
			500	1600		500	3210							
			560	1790	**100**	560	3580	**125**						
400	80 x 170	110 x 210	630	2020		630	4030							
			710	2270	**110**									
			800	2560										
450	90 x 170	120 x 200	900	2880	**125**									
			1000	3200										

The arrangement of couplings is valid for an ambient temperature of up to + 30° C. For the selection there is a minimum safety factor of 2 of the max. coupling torque ($Tk_{max.}$).
A detailed arrangement is possible according to catalogue, page 47. Drives with periodical torque curves must be selected according to DIN 740 part 2.
If requested, KTR will make the selection.

The coupling selection assumes normal operating conditions. Torque T = nominal torque according to Siemens catalogue M 11 · 1994/95.

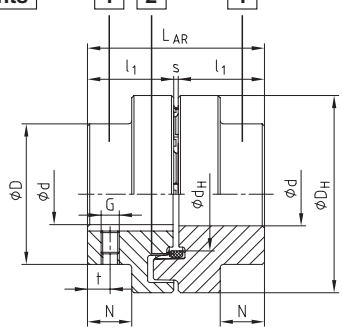
POLY-NORM® Torsionally flexible couplings

Standard shaft coupling type AR

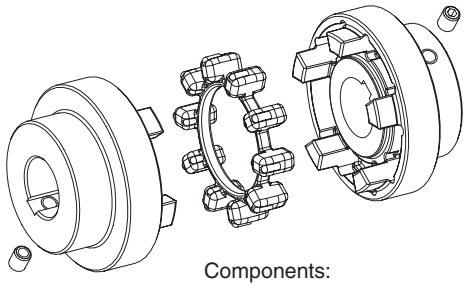


- Torsionally flexible, reduces vibrations
- Failsafe
- Maintenance-free
- Very short design
- Axial plug-in
- According to DIN 740
- Ⓔx Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)
- Detailed mounting instructions and further information available at www.ktr.com

Components 1 2 1



Drawing type AR cross section



Components:

Type AR

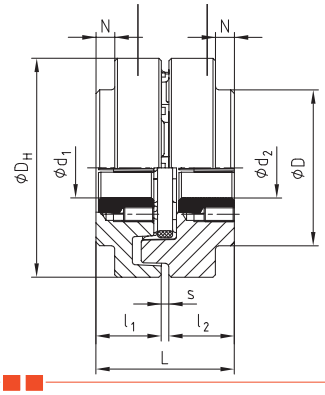
1 = Standard hub (EN-GJL-250)
2 = Elastomer ring (NBR 78 ShA)

POLY-NORM® AR Grey cast iron (EN-GJL-250)													Mass moment of inertia 3)	AR 3) Weight
Size	Elastomer ring (part 2) 1) Torque [Nm]		Finish bore	Dimensions [mm] General							Thread for setscrew 2)			
	T_{KN}	$T_{K\,max.}$	Ø d_{max} 2)	L_{AR}	l_1	s	D_H	D	d_H	N	G	t	[kgm²]	[kg]
28	40	80	28	59	28	3	69	46	36,5	12	M 5	7	0,0004	0,9
32	60	120	32	68	32	4	78	53	41,5	14	M 8	7	0,0008	1,4
38	90	180	38	80	38	4	87	62	50	19,5	M 8	10	0,0016	2,0
42	150	300	42	88	42	4	96	69	55,5	20	M 8	10	0,0026	2,7
48	220	440	48	101	48	5	106	78	64	24	M 8	15	0,0042	3,7
55	300	600	55	115	55	5	118	90	73	29	M 8	14	0,0070	5,5
60	410	820	60	125	60	5	129	97	81	33	M 8	15	0,0112	6,9
65	550	1100	65	135	65	5	140	105	86	36	M10	20	0,0174	8,8
75	850	1700	75	155	75	5	158	123	100	42,5	M10	20	0,028	13,5
85	1350	2700	85	175	85	5	182	139	116	48,5	M10	25	0,052	19,5
90	2000	4000	90	185	90	5	200	148	128	49	M12	25	0,090	23,2
100	2900	5800	100	206	100	6	224	165	143	55	M12	25	0,160	31,9
110	3900	7800	50-110	226	110	6	250	185	158	60	M16	30	0,317	38,0
125	5500	11000	55-125	256	125	6	280	210	178	70	M16	35	0,570	55,2

1) Standard material Perbunan (NBR) 78 Shore-A
2) Bore H7 with keyway DIN 6885 sheet 1 [JS9] and threads for setscrews on the feather keyway.
3) Refer to medium bore

Basic programme: Please ask for our standard KTR-N 39580, sheet 1.

Components TB1 TB2



POLY-NORM® with taper clamping sleeve

Coupling design TB 1 Cam-sided screwing
TB 2 Collar-sided screwing

Combination possible!

POLY-NORM® Size	Taper clamping sleeve	Dimensions [mm] d_1, d_2 max.	l_1, l_2	s	L	D	D_H	N	fixing screws *2 for taper sleeves Size *1 [inch]	Length [mm]	number	T_A [Nm]
32	1108	25	25,5	4	55	53	78	7,5	1/4“	13	3	5,7
48	1610	40	30,0	5	65	78	106	6,0	3/8“	16	5	20
	1615	40	42,5	5	90	78	106	18,5	3/8“	16	5	20
60	2012	50	38,5	5	80	97	129	10,5	7/16“	22	6	31
75	2517	60	52,5	5	110	123	158	20	1/2“	25	6	49
85	2517	60	46,5	5	98	139	182	10	1/2“	25	6	49
90	3020	75	52,0	5	109	148	200	11	5/8“	32	8	92
100	3535	90	98,0	6	202	165	224	53	1/2“	38	10	115

*1 BSW thread *2 2 fixing screws each except for taper clamping sleeve 3535: 3 fixing screws

• Please ask for our separate data sheet M407045

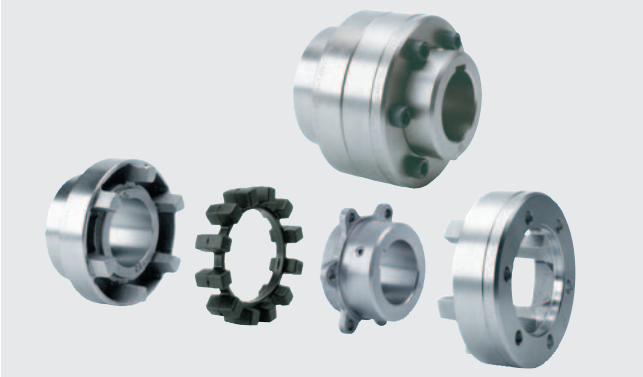
Order form:

POLY-NORM® 38	AR	Ø 38	Ø 30
Coupling size	Design	Finish bore A	Finish bore B

POLY-NORM® Torsionally flexible couplings

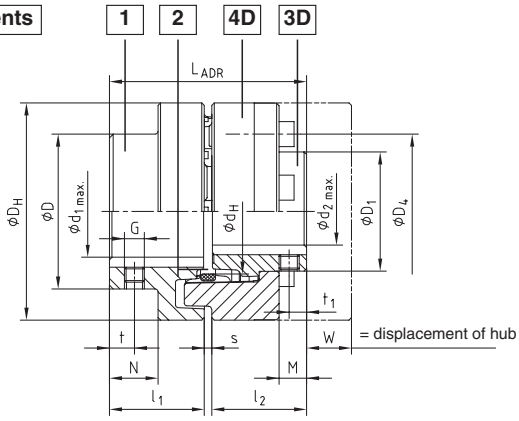
For advanced drive technology KTR

3-part design ADR

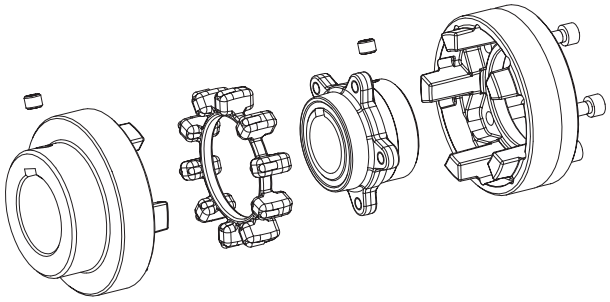


- Torsionally flexible, reduces vibrations
- Elastomer ring can be exchanged in assembled condition
- Failsafe
- Maintenance-free
- Short design
- Axial plug-in
- According to DIN 740
- Ex Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)
- Detailed mounting instructions and further information available at www.ktr.com

Components



Type ADR (3-part)



Components:

Type ADR (3-part)

1	=	Standard hub	(EN-GJL-250)
2	=	Elastomer ring	(NBR 78 ShA)
3D	=	Flange hub	(EN-GJS-400-15)
4D	=	Cam ring	(EN-GJL-250)

POLY-NORM® ADR

Size	Elastomer ring torque [Nm] 1)		Dimensions [mm]															
			Finish bore 2)		General										Thread for setscrew			
	T_{KN}	$T_{Kmax.}$	$d_{1\,max.}$	$d_{2\,max.}$	L_{ADR}	l_1/l_2	s	D_H	D	D_1	d_H	N	M	W	G	t	t_1	T_A [Nm]
38	90	180	38	32	80	38	4	87	62	48	50	19,5	11	12	M 8	10	7	10
42	150	300	42	35	88	42	4	96	69	54	55,5	20	12	16	M 8	10	7	10
48	220	440	48	42	101	48	5	106	78	62	64	24	13,7	16	M 8	15	7	10
55	300	600	55	48	115	55	5	118	90	72	73	29	18,7	15	M 8	14	14	10
60	410	820	60	55	125	60	5	129	97	80	81	33	22,2	14	M 8	15	15	10
65	550	1100	65	60	135	65	5	140	105	86	86	36	26,7	11	M10	20	20	17
75	850	1700	75	65	155	75	5	158	123	98	100	42,5	27,8	16	M10	20	20	17
85	1350	2700	85	75	175	85	5	182	139	112	116	48,5	33,7	18	M10	25	25	17
90	2000	4000	90	85	185	90	5	200	148	122	128	49	31,5	26	M12	25	25	40
100	2900	5800	100	90	206	100	6	224	165	136	143	55	37,5	28	M12	25	25	40
110	3900	7800	110	100	226	110	6	250	185	150	158	60	39,5	30	M16	30	30	80
125	5500	11000	125	110	256	125	6	280	210	168	178	70	48,0	35	M16	35	35	80

1) Standard material Perbunan (NBR)
2) Bore H7 with keyway to DIN 6885 sheet 1(JS9) with thread for set screws

Classification of cap crews DIN EN ISO 4762–12.9											
Size	M x l [mm]	Number z	Separation z x angle	D_4 [mm]	T_A [Nm] 3)	Size	M x l [mm]	Number z	Separation z x angle	D_4 [mm]	T_A [Nm] 3)
38	M6x16	5	5x72	62	10	75	M10x25	6	6x60	120	49
42	M8x16	5	5x72	69	25	85	M12x25	6	6x60	138	86
48	M8x20	6	6x60	78	25	90	M16x30	6	6x60	149	210
55	M8x20	6	6x60	88	25	100	M16x30	6	6x60	163	210
60	M8x20	6	6x60	98	25	110	M16x40	8	8x45	183	210
65	M10x20	6	6x60	104	49	125	M20x40	8	8x45	202	410

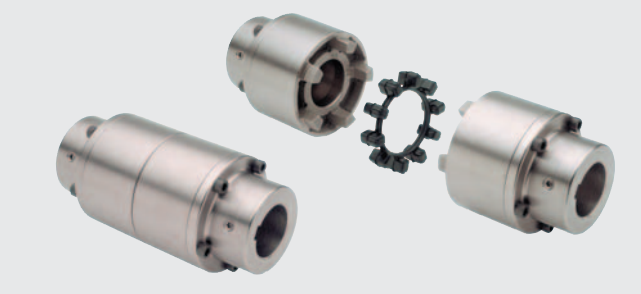
Basic programme: Please ask for our standard KTR-N 39581, sheet 1.

Order form:

POLY-NORM® 65	ADR	d_1 - Ø55	d_2 - Ø 60
Coupling size	Design	Finish bore part 1	Finish bore part 3D

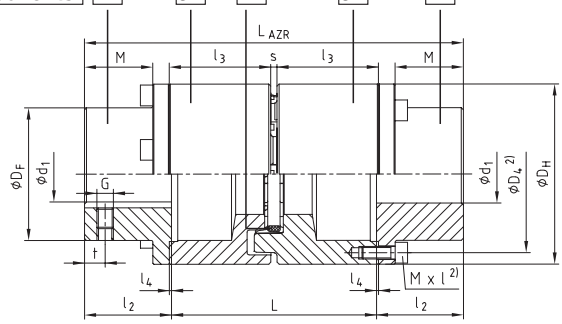
POLY-NORM® Torsionally flexible couplings

Drop-out center design couplings type AZR

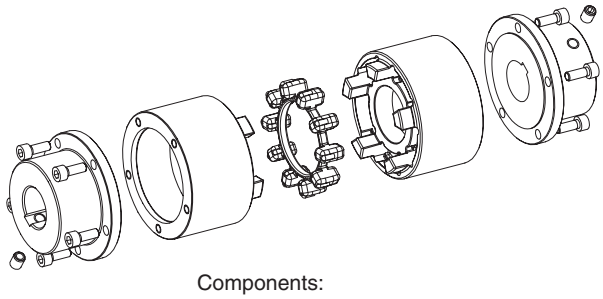


- Connection of long shaft gaps with spacers
- Enables a change of the elastomer without disassembly of the drive and the driven components.
- No movement of driver and driven components is necessary for disassembly of pump thrust bearing.
- Custom designs are available (AZVR)
- Ex Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)
- Detailed mounting instructions and further information available at www.ktr.com

Components 4N 3N 2 3N 4N



Design AZR



Components:

Design AZR

2	=	Elastomer ring	(NBR 78 ShA)
3N	=	Driving flange	(EN-GJS-400-15)
4N	=	Coupling flange	(S355J2G3)

POLY-NORM® AZR

Size	Drop out center length L [mm]	Elastomer ring (p. 2) [1] torque [Nm]		Finish bore [3] Ø d_{max}	Dimensions [2] [mm]										Mass moment of inertia [4] [kgm²]	AZR Weight [4] [kg]
					General								Thread for setscrew [3]			
		T_{KN}	T_{Kmax}		L_{AZR}	l_2	l_3	s	l_4	D_H	D_F	M	G	t		
28	100	40	80	30	170	35	49,5	3	1	69	46	26	M5	7	0,0020	2,4
	140				210		69,5								0,0030	2,9
32	100	60	120	35	170	35	49	4	1	78	53	26	M8	7	0,0042	3,2
	140				210		69								0,0062	3,9
38	100	90	180	40	184	42	49	4	1	87	62	33	M8	10	0,0048	4,3
	140				224		69								0,0068	5,1
42	100	150	300	45	190	45	49	4	1	96	69	35	M8	10	0,0094	5,1
	140				230		69								0,0128	6,0
48	100	220	440	50	204	52	49	5	1,5	106	78	41,5	M8	15	0,0170	6,6
	140				244		69								0,0216	7,5
	100				210		49								0,0188	9,4
55	140	300	600	60	250	55	69	5	1,5	118	88	43,5	M8	14	0,0240	10,8
	180				290		89								0,0292	12,2
	100				220		49								0,0326	11,2
60	140	410	820	65	260	60	69	5	1,5	129	97	47,5	M8	15	0,0414	13,0
	180				300		89								0,0504	14,6
	100				230		49								0,0564	14,0
65	140	550	1100	70	270	65	69	5	1,5	140	105	51,5	M10	20	0,0730	15,8
	180				310		89								0,0894	17,5
	140				290		69								0,0824	23,2
75	180	850	1700	80	330	75	89	5	1,5	158	123	60,5	M10	20	0,1008	25,6
	250				400		124								0,1332	29,8
	140				310		69								0,1570	32,1
85	180	1350	2700	90	350	85	89	5	1,5	182	139	69,5	M10	25	0,1658	35,2
	250				420		124								0,1812	40,7
	140				320		69								0,2466	38,2
90	180	2000	4000	100	360	90	89	5	1,5	200	148	73,5	M12	25	0,2880	42,2
	250				430		124								0,3566	49,3
	140				340		69								0,3988	50,0
100	180	2900	5800	110	380	100	89	6	2	224	165	83	M12	25	0,4450	54,8
	250				450		124								0,5465	63,2

1) Standard material Perbunan (NBR) 78 Shore-A
2) For screw specification see POLY-NORM® AZR short
3) Bore H7 with keyway DIN 6885 sheet 1 [JS9] and threads for setscrews on the feather keyway.
4) Refer to medium bore

Basic programme:
Please ask for our standard KTR-N 39582, sheet 1.

Further type:

POLY-NORM® combined with RUFLEX® overload coupling.
Please ask for our separate data sheet (M412784).

Still available:

POLY-NORM® type AZVR for limited assembly space:
Screw access from the shaft side

Order form:

POLY-NORM® 42	AZR	140	Ø 38	Ø 42
Coupling size	Design	Drop out center length L	Finish bore A	Finish bore B

POLY

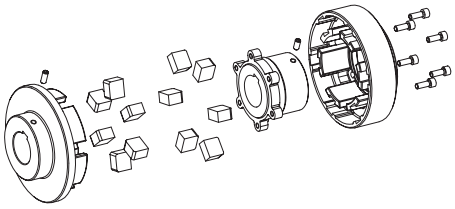
Torsionally flexible couplings, not failsafe

Coupling description

General description:

The POLY coupling is a torsionally flexible, shear shaft coupling for general machinery. It is assembled by axially pluging the hubs into each other and has excellent dampening characteristics. Its unique features are the flexible elastomeric elements that are located in both coupling halves.

The POLY advantage – A much greater number of flexible elements and thus a larger effective mass of the elastomer to accept vibration and to dissipate the heat caused by torsional vibrations when compared to similar competitive couplings with elements only in one half.



Coupling selection

The coupling selection must be done on the base POLY-NORM® or ROTEX®.

Function/Design

The coupling consists of 2 hubs with fingers that are separated by elastomeric elements which are assembled by axial blind plug-in to each other. Elastomer elements are placed into the slots of both coupling hubs. Torque is transmitted in a compact design. Shaft misalignments, vibrations and shock loads are effectively absorbed by the POLY coupling.

The coupling is maintenance-free and used in general machinery, the pump industry and in compressors. The Poly coupling handles torque ranges of up to 63,000 Nm and is stocked in 21 different sizes and 4 designs for immediate availability. In addition to our standard coupling models, a variety of flange, drop out center and spacer options are available.

Explosion-proof use

POLY Couplings are for use in hazardous environments. The coupling is approved according to the European EC Standard 94/9/EC (ATEX 95) and thereby can be used in drives of this hazard class (appliance category 2 and 3). Click on www.ktr.com to read the Certificate of Compliance, along with the operation and assembly instructions.

Variation of components

The coupling can be adapted to many applications due to the many options that are possible with the building block arrangement. The POLY components of a given model can be mixed and matched with each other to obtain different shaft distances using the same basic component.

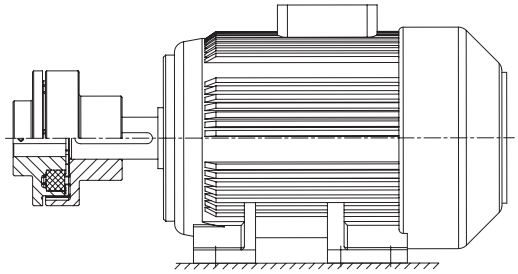
General information about the elastomer packing

Material/Hardness	Perbunan [NBR] / 92 Shore A
Permanent temperature range [°C]	- 30 to + 80
Max. temperature (short time) [°C]	- 50 to + 120
Applications	ATEX applications Chemical industry Mining General machine construction Applications of average elasticity
Resistant to	Gasoline, diesel Acids, bases Tropics (Salt-) Water (hot/cold) Oils, greases Propane, butane Natural gas, city gas

POLY Torsionally flexible couplings

For advanced drive technology KTR

Selection of standard IEC motors



POLY-Couplings for IEC norm motor protection IP 54 / IP 55

Three-phase motor 50 Hz			Motor power n = 3000 1/min 2 poles		Coupling POLY	Motor power n = 1500 1/min 4 poles		Coupling POLY	Motor power n = 1000 1/min 6 poles		Coupling POLY	Motor power n = 750 1/min 8 poles		Coupling POLY
Size	Shaft end dxl [mm]		Power P [kW]	Torque T [Nm]	Size	Power P [kW]	Torque T [Nm]	Size	Power P [kW]	Torque T [Nm]	Size	Power P [kW]	Torque T [Nm]	Size
	2 poles	4,6,8 pol												
56	9 x 20		0,09	0,32		0,06	0,43		0,037	0,43				
			0,12	0,41		0,09	0,64		0,045	0,52				
63	11 x 23		0,18	0,62		0,12	0,88		0,06	0,7				
			0,25	0,86	8	0,18	1,3	8	0,09	1,1	8			8
71	14 x 30		0,37	1,3		0,25	1,8		0,18	2		0,09	1,4	
			0,55	1,9		0,37	2,5		0,25	2,8		0,12	1,8	
80	19 x 40		0,75	2,5		0,55	3,7		0,37	3,9		0,18	2,5	
			1,1	3,7		0,75	5,1		0,55	5,8		0,25	3,5	
90S	24 x 50		1,5	5		1,1	7,5		0,75	8		0,37	5,3	
90L			2,2	7,4		1,5	10		1,1	12		0,55	7,9	
100L	28 x 60		3	9,8	9	2,2	15	9	1,5	15	9	0,75	11	9
						3	20					1,1	16	
112M			4	13		4	27		2,2	22		1,5	21	
132S	38 x 80		5,5	18		5,5	36		3	30		2,2	30	
			7,5	25	10			10			10			10
132M						7,5	49		4	40		3	40	
									5,5	55				
160M	42 x 110		11	36		11	72		7,5	75		4	54	
			15	49	12			12				5,5	74	
160L			18,5	60		15	98		11	109	14	7,5	100	14
180M	48 x 110		22	71		18,5	121	14						
180L						22	144		15	148		11	145	
200L	55 x 110		30	97		30	196	15	18,5	181	15	15	198	15
			37	120	15				22	215				
225S	55 x 110	60 x 140				37	240	17				18,5	244	17
225M			45	145		45	292	19	30	293	19	22	290	19
250M	60 x 140	65 x 140	55	177	17	55	356		37	361		30	392	
280S	65 x 140	75 x 140	75	241		75	484	20	45	438	20	37	483	20
280M			90	289	19*	90	581		55	535		45	587	
315S		80 x 170	110	353		110	707	22	75	727	22	55	712	22
315M			132	423	20*	132	849	25	90	873	25	75	971	25
			160	513		160	1030		110	1070		90	1170	
315L			200	641		200	1290		132	1280	28	110	1420	28
					22*			28	160	1550		132	1710	
315		85 x 170	250	802		250	1600		200	1930		160	2070	30
			315	1010		315	2020		250	2410	30	200	2580	
			355	1140		355	2280	30						35
355	75 x 140	95 x 170	400	1280		400	2570		315	3040		250	3220	
			500	1600		500	3210		400	3850	35	315	4060	
400	80 x 170	110 x 210	560	1790		560	3580	35	450	4330		355	4570	
			630	2020		630	4030		500	4810		400	5150	40
			710	2270		710	4540		560	5390	40	450	5790	
			800	2560		800	5120	40	630	6060		500	6420	
450	90x170	120x210	900	2880		900	5760		710	6830	45	560	7190	45
			1000	3200		1000	6400		800	7590		530	8090	

The coupling is selected for an ambient temperature of up to + 30 °C. The coupling was selected for the normal operation. The respective couplings have a minimum operating factor of f min. = 1,35. Drives with periodical torque courses must be selected according to DIN 740 part 2. On request the selection is made by KTR.

Torque T = nominal torque according to Siemens catalogue M 11 · 1994/95.

* dynamical balancing is necessary

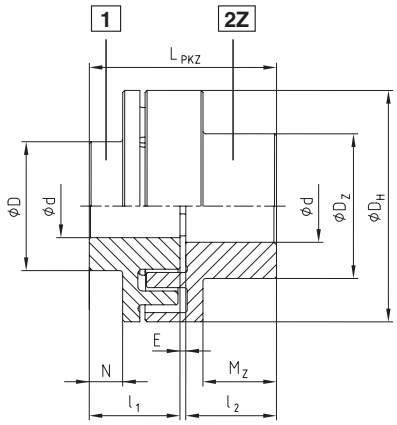
POLY Torsionally flexible couplings

2-part design type PKZ

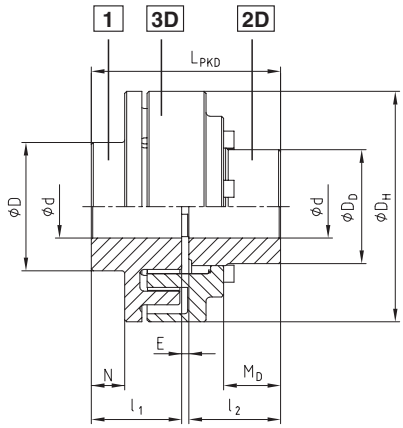
3-part design type PKD

- Torsionally flexible / maintenance-free
- Reduced vibrations
- Shear type
- Axial plug-in assembly
- Short overall length / minimum distance between shafts
- In PKD the elastomer elements can be changed without moving driver or driven
- Ⓔx Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)
- Detailed mounting instructions and further information available at www.ktr.com

Components



Type PKZ (Z) – (Size 8 to 30)



Type PKD (D) – (Size 15 to 40)

Size	Nominal torque [1] T_{KN} [Nm]	Max. speed [2] n [1/min]	Max. finish bore $Ød_{max.}$ [mm]			Dimensions [mm]										Weight [3] [kg]
			part 1	part 2Z	part 2D	D_H	D	D_Z	D_D	$l_1; l_2$	M_Z	M_D	N	E	$L_{PKZ/PKD}$	
8 (Z)	42	5000	20	28	–	86	43	50	–	35	25	–	3	3	73	1,7
9 (Z)	72	5000	28	38	–	97	55	65	–	41	30	–	7	3	85	2,7
10 (Z)	100	5000	32	42	–	107	60	70	–	46	35	–	10	4	96	3,5
12 (Z)	170	5000	38	48	–	131	70	80	–	55	43	–	12	4	114	5,4
14 (Z)	210	4800	44	55	–	142	80	93	–	60	46	–	17	4	124	7,6
15 (Z;D)	320	4300	50	60	45	157	90	100	75	65	52	35	22	4	134	8,6
17 (Z;D)	400	3800	60	65	50	176	100	110	90	70	56	40	25	4	144	12
19 (Z;D)	660	3500	75	75	65	195	125	125	107	75	64	45	30	4	154	18
20 (Z;D)	820	3300	65	75	60	205	115	127	105	80	65	45	23	4	164	20
22 (Z)	1100	3000	85	85	75	224	140	140	129	90	75	59	39	4	184	25
25 (Z;D)	1600	2700	90	90	85	257	150	150	140	100	84	60	44	5	205	35
28 (Z;D)	2500	2350	100	100	95	288	165	165	160	110	90	65	45	5	225	53
30 (Z;D)	3950	2200	110	110	100	308	180	180	170	130	108	75	58,5	5	265	66
35 (D)	6100	1850	130	–	130	373	210	–	210	160	–	95	69	5	325	125
40 (D)	9000	1600	145	–	145	423	240	–	240	180	–	115	85	5	365	180
45 (D)	14300	1400	160	-	160	473	270	-	270	180	-	110	74	6	366	220

1) Maximal torque $T_{Kmax} = T_{KN} \times 2$; Standard material Perbunan (NBR) 92 Shore-A; Standard hub material: EN-GJL-250
2) For v = 30 m/sec. For peripheral speeds exceeding v = 30 m/sec. we recommend a dynamical balancing; hub material EN-GJS-400-15
3) Refer to medium bore

Components:
Type PKZ (Z)
1 = Cam section
2Z = Pocket section *

* To be preferably used drive-sided

Components:
Type PKD (D)
1 = Cam section *
2D = Flange hub
3D = Cam ring

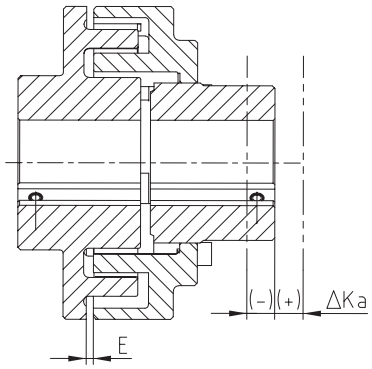
* To be preferably used drive-sided

Order form:

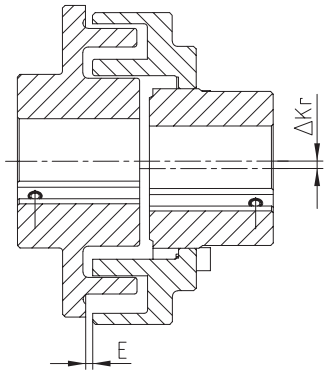
POLY	PKD	28	Ø 90	Ø 80
Coupling size	Design	Size	Finish bore part 1	Finish bore part 2

POLY Torsionally flexible couplings

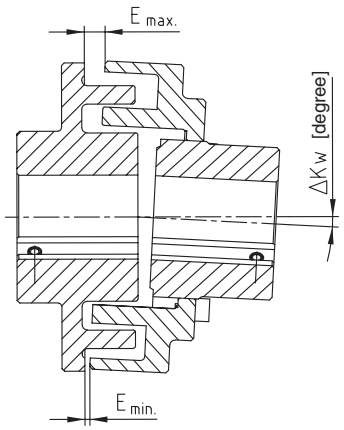
Displacements · Threads for setscrews · Elastomer elements



Axial displacement



Radial displacement



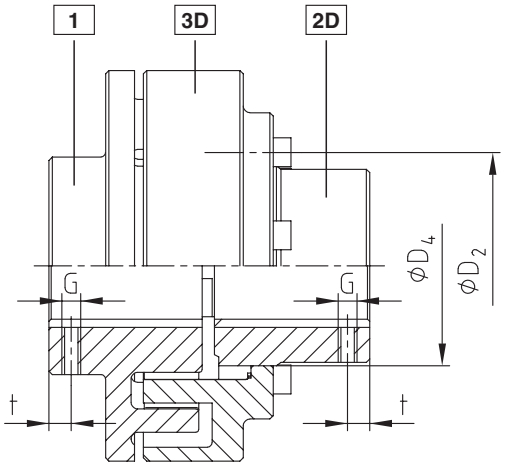
Angular displacement

Radial and angular displacements can occur simultaneously.
The combined sum $V = \Delta K_R + (E_{max.} - E_{min.})$ must not exceed the values listed in table 1.

Coupling type		Type PKZ					Type PKZ and PKD								Type PKD		
		8	9	10	12	14	15	17	19	20	22	25	28	30	35	40	45
Displacements [mm]																	
Max. axial displacement ΔK_A		± 1	± 1	± 1	± 2	± 2	± 2	± 2	± 2	± 2	± 2	± 2	± 2	± 2	± 3	± 3	± 3
Max. radial displacement	n = 750 1/min	0,8	0,8	0,8	0,8	0,8	1	1	1	1	1	1	1	1,2	1,2	1,2	1,2
ΔK_R or max. angular	n = 1000 1/min	0,7	0,7	0,7	0,7	0,7	0,9	0,9	0,9	0,9	0,9	0,9	0,9	1,1	1,1	1,1	1,1
displacement ΔK_W	n = 1500 1/min	0,5	0,5	0,5	0,5	0,5	0,7	0,7	0,7	0,7	0,7	0,7	0,7	0,7	0,9	0,9	0,9
Threads for setscrew [mm]																	
Dimension G		M5	M8	M8	M8	M8	M8	M8	M8	M8	M10	M12	M12	M16	M16	M16	M16
Dimension t		18	23	27	30	10	15	15	15	15	20	20	20	20	25	25	30
Tightening torque T_A [Nm]		2	10	10	10	10	10	10	10	10	17	40	40	80	80	80	80
NBR Elastomer elements (rectangular) 92 Sh-A																	
Element size		1			2		3		3a	4	3b	4	5	6Ü	7Ü	8	9
Number of elements		8	10	10	10	10	12	12	12	12	16	16	16	16	20	20	20
Dimensions of elastomer elements b x t x h [mm]	b	18,4			24,9		27,2		27,7	34,9	29,6	34,9	40	43,3	45,7	52,1	58,1
	t	10			15,3		16,1		18,4	19,6	18,4	19,6	22,2	28,6	24,1	28,6	29,3
	h	18,9			23,9		24,6		26,8	34,6	29,6	34,6	40,6	41,1	60,0	59,7	69
Cyl. screw DIN EN ISO 4762 – Dimension [mm]																	
Screw size	M	-	-	-	-	-	M8	M8	M8	M10	M8	M10	M10	M12	M12	M16	M16
M x l	l	-	-	-	-	-	30	25	25	30	30	30	40	40	55	55	60
Number		-	-	-	-	-	6	6	6	6	8	8	8	8	10	10	10
Tightening torque T_A [Nm]		-	-	-	-	-	25	25	25	25	25	49	49	86	86	295	210
$\varnothing D_2$		-	-	-	-	-	92	106	126	123	150	162	178	202	240	275	308
$\varnothing D_{4\ (H7/h7)}$		-	-	-	-	-	75	90	107	105	130	140	160	170	210	240	270

Standard bore H7 with keyway DIN 6885 sheet 1 [JS9] and threads for setscrews on the feather keyway.
Please see our detailed mounting instructions at our website www.ktr.com.

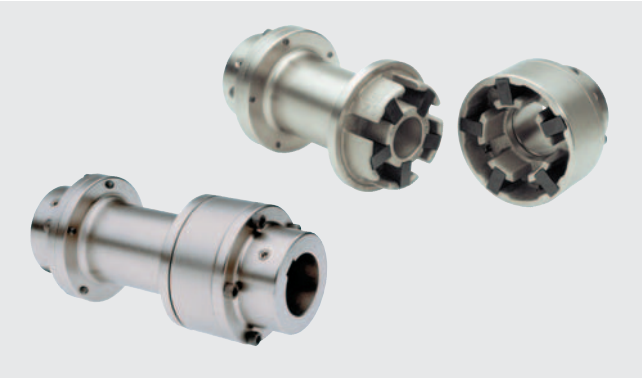
Components **1** **3D** **2D**



Components
Type PKD
1 = Cam section *
2D = Flange hub
3D = Cam ring

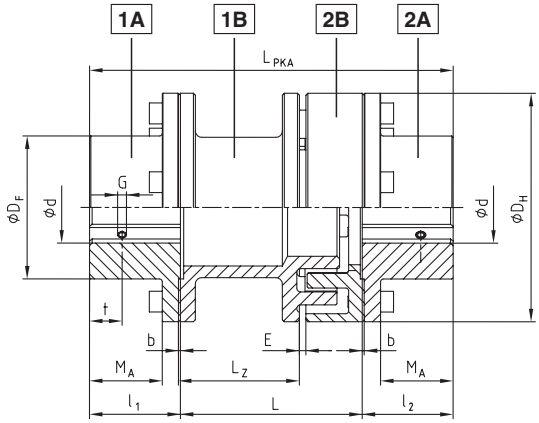
* To be preferably used drive-sided

Design PKA (dismountable coupling)



- Torsionally flexible, maintenance-free
- Vibration-reducing
- Not failsafe
- Axial plug-in
- Short design / low shaft distance dimension
- In the PKD the elastomer packages can be exchanged in exembled state
- Ⓔx Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95)
- Detailed mounting instructions and further information at www.ktr.com

Components



Type PKA

Components:

Type PKA

1A/2A = Coupling flange

1B = Spacer

2B = Driving flange

1A and 1B to be preferably used drive-sided

POLY Size	Nominal torque T_{KN} [Nm]	Max. speed n [1/min]	Finish bore $d_{max.}$ [mm] Part 1a / 2a	Dimensions [mm]											
				General									Thread of setscrew		
				D_H	D_F	$l_1; l_2$	b	M_A	E	L	L_{PKA}	L_Z	G	t	Tightening torque T_A [Nm]
8	42	5000	38	86	55	35	1,5	25,5	3	100	170	66	M5	15	2
9	72	5000	45	97	70	41	1,5	30,5	3	100	182	63	M8	15	10
										140	222	103			
10	100	5000	50	107	78	46	1,5	35,5	4	100	192	61	M8	20	10
										140	232	101			
12	170	5000	60	131	95	55	1,5	43	4	100	210	55	M8	20	10
										140	250	95			
										180	290	135			
14	210	4800	70	142	105	60	1,5	48	4	100	220	54	M8	25	10
										140	260	94			
										180	300	134			
15	320	4300	70	157	110	65	1,5	49,5	4	100	230	53	M8	25	10
										140	270	93			
										180	310	133			
										250	380	203			
17	400	3800	80	176	125	70	1,5	54,5	4	100	240	53	M8	25	10
										140	280	93			
										180	320	133			
										250	390	203			
19	660	3500	90	195	135	75	1,5	59,5	4	140	290	91	M8	30	10
										180	330	131			
										250	400	201			
20	820	3300	100	205	150	80	2	61	4	140	300	81	M8	30	10
										180	340	121			
										250	410	191			
22	1100	3000	105	224	160	90	2	71	4	180	360	127	M10	35	17
										250	430	197			
25	1600	2700	125	257	195	100	2	81	5	140	340	81	M12	40	40
										180	380	121			
										250	450	191			
28	2500	2350	140	288	215	110	2	91	5	140	360	74	M12	45	40
										180	400	114			
										250	470	184			

Order form:

POLY	PKA	28	140	Ø 38	Ø 40
Coupling type	Type	Size	Dismount-able L	Finish bore part 1a	Finish bore part 2a

POLY Torsionally flexible couplings

Displacements · Threads for setscrews · Elastomer elements

Coupling type		Type PKA											
		8	9	10	12	14	15	17	19	20	22	25	28
		Displacements [mm]											
Max. axial displacement ΔK_A		±1	±1	±1	±2	±2	±2	±2	±2	±2	±2	±2	±2
Max. radial displacement ΔK_R or max. angular displacement ΔK_W	n = 750 1/min	0,8	0,8	0,8	0,8	0,8	1	1	1	1	1	1	1
	n = 1000 1/min	0,7	0,7	0,7	0,7	0,7	0,9	0,9	0,9	0,9	0,9	0,9	0,9
	n = 1500 1/min	0,5	0,5	0,5	0,5	0,5	0,7	0,7	0,7	0,7	0,7	0,7	0,7
		Threads for setscrew [mm]											
Dimension G		M5	M8	M8	M8	M8	M8	M8	M8	M8	M10	M12	M12
Dimension t		15	15	20	20	25	25	25	30	30	35	40	45
Tightening torque T_A [Nm]		2	10	10	10	10	10	10	10	10	17	40	40
		NBR Elastomer elements (rectangular) 92 Sh-A											
Element size		1			2		3		3a	4	3b	4	5
Number of elements		8	10	10	10	10	12	12	12	12	16	16	16
Dimensions of elastomer elements b x t x h [mm]	b	18,4			24,9		27,2		27,7	34,9	29,6	34,9	40
	t	10			15,3		16,1		18,4	19,6	18,4	19,6	22,2
	h	18,9			23,9		24,6		26,8	34,6	29,6	34,6	40,6
Flange connection		**Cyl. screw DIN EN ISO 4762 – Dimension [mm]**											
Screw size M x l	M	M6	M6	M6	M8	M8	M10	M10	M10	M10	M10	M10	M12
	l	16	18	18	20	20	25	25	25	30	30	30	30
Number		4	5	5	5	5	6	6	6	6	8	8	8
Tightening torque T_A [Nm]		10	10	10	25	25	49	49	49	49	49	49	86
$ØD_2$		70	85	93	113	125	135	150	160	175	190	225	250
$ØD_3$		60	70	80	90	100	110	110	120	130	140	150	170

Radial and angular displacements can occur simultaneously.
The combined sum $V = \Delta K_R + (E_{max.} - E_{min.})$ must not exceed the values listed in table 1.

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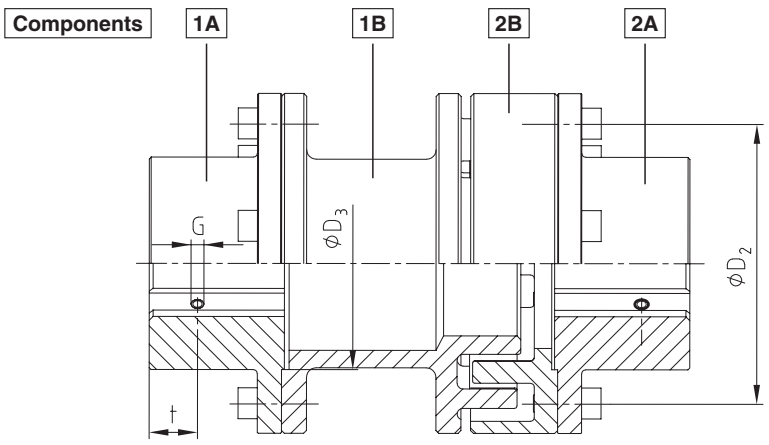

Components
Type PKA
1A/2A = Coupling flange
1B = Spacer
2B = driving flange

1A and 1B to be preferably used drive-sided

Quality Approval

Development

Partnership

Research

Service

www.ktr.com

INDUSTRIE FORUM
DESIGN HANNOVER