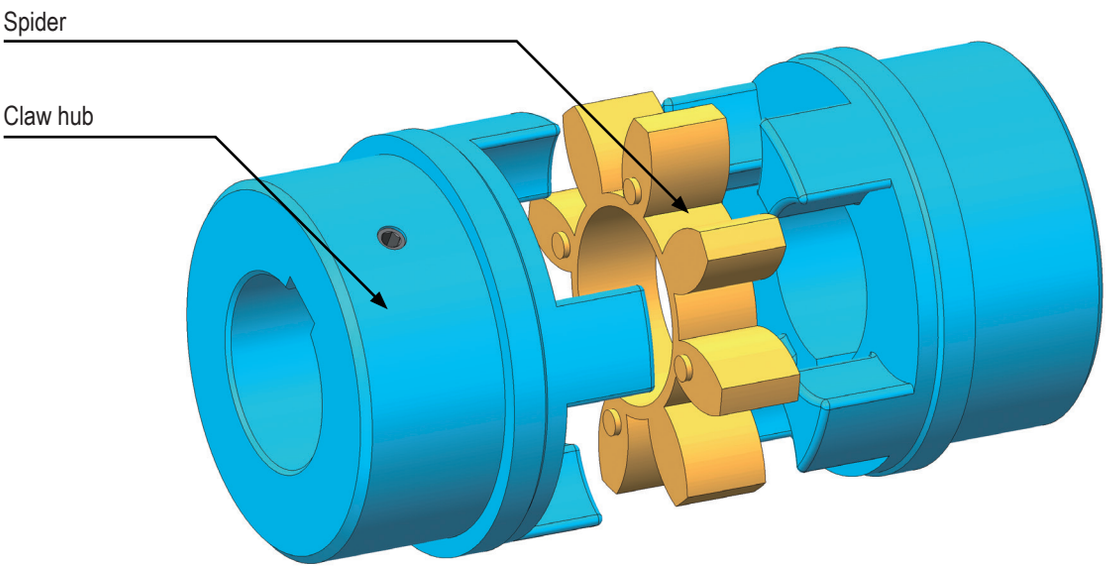
KWD
KUPPLUNGSWERK DRESDEN

Flexible jaw couplings EZK

KWN 22006

Couplings from Dresden/Germany

By specialists – for specialists



technical features

A flexible jaw coupling is a positive, torsionally flexible coupling which also permits radial, axial and angular displacements between the driving and driven parts. It is failsafe.

Two coupling halves with concave claws are located opposite each other, offset circumferentially by half a pitch division. An involute elastomeric with crowned tooth profile is located in the space between the claws.

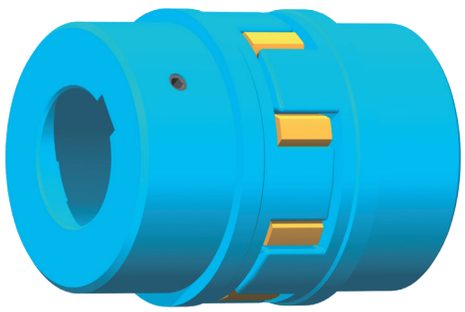
The spider insert is extremely wear resistant, to oil, ozone and ageing, and notable for its resistance to tropical conditions. The high internal damping protects the drive motor from dynamic overload.

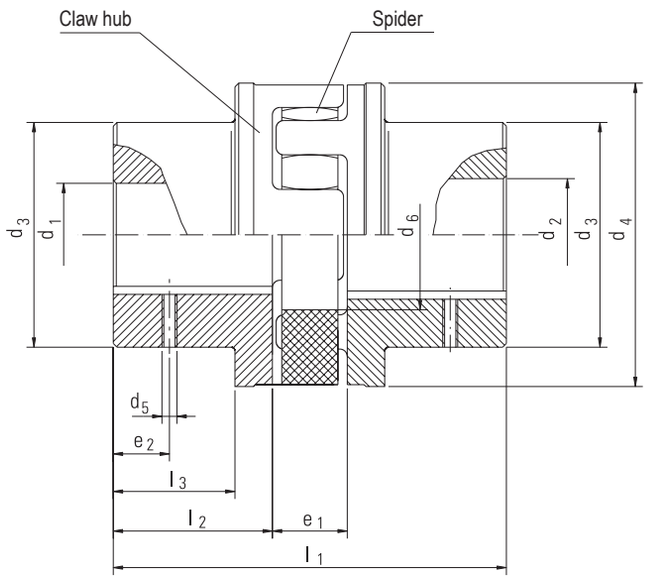
At an operating temperature of -30 °C to +80 °C (-22 °F to +175 °F) [including short term temperature peaks up to +120 °C (248 °F)], perfect operation is guaranteed.

The progressively rising spring characteristic ensures that vibration energy is rapidly reduced and limits the vibration amplitude. In contrast to other flexible couplings, the elastomeric teeth of the spider insert are not subjected to bending stresses, but only to pressure, thus resulting in lower wear and a higher load capacity for the teeth.

Manufacturing of the couplings from high quality precision castings reduces imbalance and has a positive influence on running characteristics and service life.

Flexible jaw coupling can be installed both horizontally and vertically. The specially machined surfaces facilitate rapid and reliable alignment of the coupling on installation.





order example: EZK 38 - 92[3] - 32G (x45)[4] - 35G - 35 KWN 22006

Designation of a flexible jaw coupling size 38, spider hardness 92 Shore A (Standard), finished bore d_1 = 32 mm, with thread, (hub length l_2 = 45 mm), finished bore d_2 = 35 mm, with thread, hub length 35 mm (shortened).

Table 1 main dimensions

size	version	pilot bore	d_1, d_2 finished bore [1] min	d_1, d_2 finished bore [1] max	d_3	d_4 h9	d_5	d_6	e_1	e_2	l_1	l_2	l_3	mass m [2] [kg]	moment of inertia J [2] [kgcm²]
19	19.3	-	6	24	41	41	M4	18	16	10	66	25	-	0,18	0,53
24	24.3	-	8	28	56	56	M5	27	18	12	78	30	-	0,35	2,29
28	28.3	-	10	38	66	66	M5	30	20	15	90	35	-	0,66	5,15
38	38.1	-	12	38	61	82	M5	38	24	15	114	45	33	0,80	5,81
	38.2		38	45	72		M6							1,01	9,38
42	42.1	-	14	42	68	97	M5	46	26	18	126	50	36	1,19	12,87
	42.2		42	55	88		M8							1,62	22,85
48	48.1	-	15	48	77	107	M6	51	28	20	140	56	41	1,69	22,53
	48.2		48	60	96		M8							2,17	36,95
55	55.1	-	20	55	88	122	M6	60	30	22	160	65	49	2,45	41,28
	55.2		55	70	112		M10							3,28	74,15
65	65.1	-	22	65	104	137	M6	68	35	25	185	75	57	3,32	70,28
	65.2		65	75	120		M10							4,56	123,50
75	75.1	-	30	75	120	162	M8	80	40	30	210	85	65	5,77	176,00
	75.2		75	90	144		M10							7,54	290,33
90	90.1	-	40	90	144	202	M10	100	45	35	245	100	78	9,80	453,92
	90.2		90	100	160		M12							12,25	651,26

1) finished bore to ISO-fit H7, keyway to DIN 6885 sheet 1, fit JS 9
2) mass and moment of inertia refer to the maximum finished bore and to one coupling half
3) see page 4 „remarks“
4) see page 4 „remarks“

characteristic values

Table 2

size	speed max. [1]	torsion angle at		spider hardness	torque [Nm]			torsional spring stiffness C_{dyn} [kNm/rad]				rel. damping
	n [rpm]	T_{KN} ϕ_{KN}	T_{Kmax} ϕ_{Kmax}	[Shore]	rated T_{KN}	max T_{Kmax}	alterning T_{KW}	1,0 T_{KN}	0,75 T_{KN}	0,5 T_{KN}	0,25 T_{KN}	Ψ
19	14 000	3,2°	5°	64	21	42	5,5	5,35	4,39	3,23	1,97	0,75
				92	10	20	2,6	1,28	1,05	0,80	0,47	0,80
				98	17	34	4,4	2,92	2,39	1,81	1,07	0,80
24	10 600			64	75	150	19,5	15,11	12,39	9,37	5,55	0,75
				92	35	70	9,1	4,86	3,98	3,01	1,79	0,80
				98	60	120	16	9,93	8,14	6,16	3,65	0,80
28	8 500			64	200	400	52	27,52	22,57	17,06	10,12	0,75
				92	95	190	25	10,90	8,94	6,76	4,01	0,80
				98	160	320	42	26,77	21,95	18,80	9,84	0,80
38	7 100			64	405	810	105	70,15	57,52	43,49	25,78	0,75
				92	190	380	49	21,05	17,26	13,05	7,74	0,80
				98	325	650	85	48,57	39,83	30,11	17,85	0,80
42	6 000			64	560	1 120	146	79,86	65,49	49,52	29,35	0,75
				92	265	530	69	23,74	19,47	14,72	8,73	0,80
				98	450	900	117	54,50	44,69	33,79	20,03	0,80
48	5 600			64	655	1 310	170	95,51	78,32	59,22	35,10	0,75
				92	310	620	81	36,70	30,09	22,75	13,49	0,80
				98	525	1 050	137	65,29	53,54	40,48	24,00	0,80
55	4 750			64	825	1 650	215	107,92	88,50	66,91	39,66	0,75
				92	410	820	107	50,72	41,59	31,45	18,64	0,80
				98	685	1 370	178	94,97	77,88	58,88	34,90	0,80
65	4 250			64	1 175	2 350	306	151,09	123,90	93,68	55,53	0,75
				92	625	1 250	163	97,13	79,65	60,22	35,70	0,80
				95	940	1 880	244	129,51	106,20	80,30	47,60	0,80
75	3 550			64	2 400	4 800	624	248,22	203,54	153,90	91,22	0,75
				92	1 280	2 560	333	113,32	92,92	70,26	41,65	0,80
				95	1 920	3 840	499	197,50	161,95	122,45	72,58	0,80
90	2 800			64	4 500	9 000	1170	674,52	553,11	418,20	247,89	0,75
				92	2 400	4 800	624	190,09	155,87	117,86	69,86	0,80
				95	3 600	7 200	936	312,20	256,00	193,56	114,73	0,80

1) The maximum speeds quoted correspond to a circumferential speed of v = 30 m/s (98 Ft/s) at the outer diameter.

remarks:

If the spider hardness and the hub length are not stated in the order we supply the spider with 92 Shore A and standard hub length.

special versions are, as below stated, available on request:

- finished bore with two keyways,
- conical finished bore with and without keyway,
- version with puller bores,
- version without set screw thread,
- finished bore without keyway (for clamping sets)

or

- centred

material

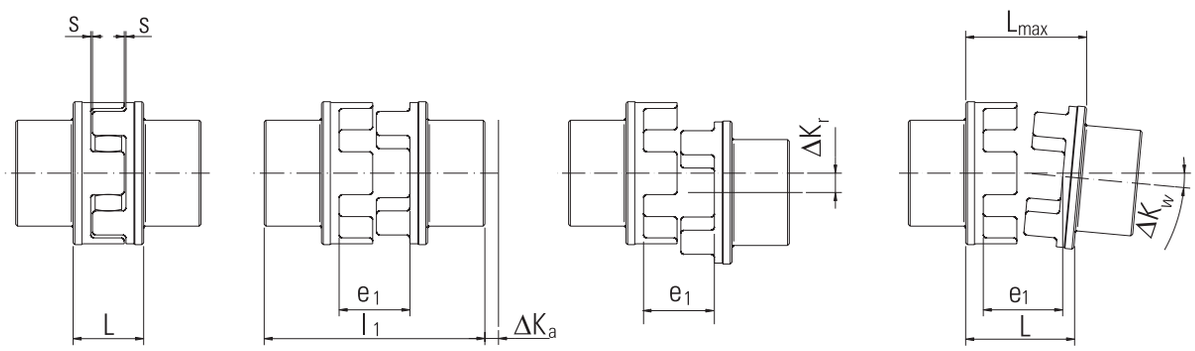
- Claw hub: high quality precision casting GG 25
- Spider: Polyurethane
- Materials can be substituted by the manufacturer
- the different Shore hardnesses are indicated by spider colour

shore-hardness	colour	permissible temperature range in °C (°F)	
		continuous temperature	max. short term temperature
64 Shore D	green	-30 bis +110	-30 bis +130
92 Shore A	nature	-40 bis +90	-50 bis +120
95/98 Shore A	red	-30 bis +90	-40 bis +120

Different spider grades can be supplied for different operating conditions, subject to availability from the manufacturer.

permissible shaft misalignment

axial displacement radial misalignment angular misalignment



$\Delta K_w^* = L_{max} - L$

Table 3 permissible shaft misalignment and alignment dimension

coupling size		19	24	28	38	42	48	55	65	75	90
distance e_1 [mm]		16	18	20	24	26	28	30	35	40	45
dimension s [mm]		2,0	2,0	2,5	3,0	3,0	3,5	4,0	4,5	5,0	5,5
dimension L [mm]		34	36	38	48	54	58	62	71	80	89
dimension l_1 [mm]		66	78	90	114	126	140	160	185	210	245
max. axial displacement											
ΔK_a [mm]		1,2	1,4	1,5	1,8	2,0	2,1	2,2	2,6	3,0	3,4
	n [min^{-1}]										
perm. radial misalignment	1 000	0,2	0,2	0,2	0,3	0,3	0,3	0,4	0,4	0,5	0,6
ΔK_r [mm] at speed n	1 500	0,2	0,2	0,2	0,3	0,3	0,3	0,2	0,3	0,4	0,5
perm. angular misalignment	3 000	0,1	0,1	0,1	0,2	0,2	0,2	0,2	0,2	0,3	
ΔK_w* [mm] at speed n	4 500	0,1	0,1	0,1	0,2	0,2	0,2	0,2			
	≥ 6 000	0,1	0,1	0,1	0,1	0,1					
	n [min^{-1}]										
perm. angular misalignment	1 000	0,3	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
ΔK_w [°] at speed n	1 500	0,3	0,2	0,2	0,2	0,1	0,1	0,2	0,1	0,1	0,1
	3 000	0,2	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	
	4 500	0,2	0,1	0,1	0,1	0,1	0,1	0,1			
	≥ 6 000	0,1	0,1	0,1	0,1	0,1					

installation and operating conditions

On installation of the coupling, it is to be ensured that the distance e_1 is precisley maintained so that the coupling can float axially in service. In order to prevent pressure on the face of the flexible spider dimensions L, l_1 and e_1 have to be regarded as minimum dimensions.

The ΔK_a values quoted are to be added to the lengths L and l_1 for axial displacement. The permissible misalignment values quoted represent general guideline values under the following boundary conditions:

- loading up to rated torque
- operating speed n = 1 500 rpm
- ambient temperature +30 °C (+86 °F)

The values may only be applied individually, and proportionally in cases of simultaneous misalignment in different directions. Either radial or angular misalignment is allowable. Under different operating conditions, different permissible values for radial and angular misalignment apply.

balancing

The balance quality of the couplings when delivered corresponds to the guideline values of KWN 49003. Any different values required must be agreed separately.

choice of sizes - in conformity with DIN 740 sheet 2

The dimensioning of couplings is governed by the laws of physics.

The coupling must be sufficiently dimensioned for the loads occuring not to exceed the permissable values in any operating condition.

explanation of the concepts relating to the selection of the coupling

1. Load from rated torque
The permissible rated torque of the coupling T_{KN} must be at least as the rated torque on the load side at all operating temperatures.

(Drive side) (Load side)
$$-T_{AN} \cdot S_\vartheta \leq T_{KN} \geq T_{LN} \cdot S_\vartheta$$

2. Load from torque shocks
The maximum permissible torque of the coupling T_{Kmax} must be at least as great as the torque shocks occuring in operation at all operating temperatures, taking account of the shock factor S_A or S_L and start-up factor S_Z.

(Drive side) (Load side)
$$T_{AS} \cdot M_A \cdot S_A \cdot S_Z \cdot S_\vartheta \leq T_{Kmax} \geq T_{LS} \cdot M_L \cdot S_L \cdot S_Z \cdot S_\vartheta$$

If M_A and M_L are unknown, the following applies: $M_A = 1$, $M_L = 1$.

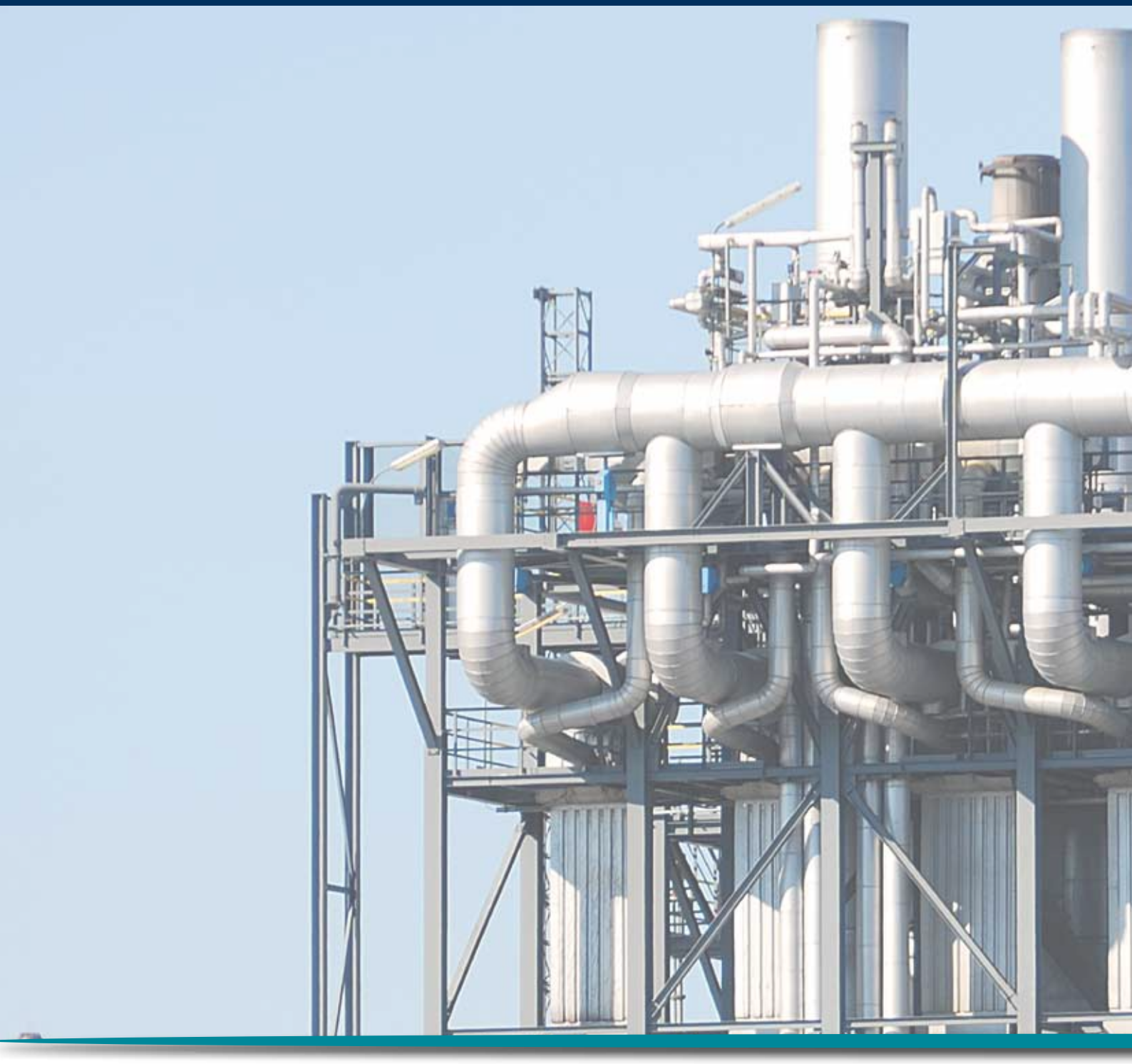
temperature factor	S_ϑ	numerical values for polyurethane				
		S_ϑ	1	1,2	1,4	1,8
		°C	-30	+40	+60	+80
			+30			
start-up factor	S_z	number of start-ups per hour				
		start-up frequency/h	100	200	400	800
		S_Z	1	1,2	1,4	1,6
		for more than 800 start-ups/h please enquire				
shock factor	S_A bzw. S_L					
			S_A bzw. S_L			
		light start-up shocks	1,5			
		medium start-up shocks	1,8			
		heavy start-up shocks	2,2			

Table 4 **IEC-standard motors coordination /** EZK for IEC-standard motors protective system IP 54

three-phase-motor	motor output at 50 Hz n = 3 000 rpm		coupling		motor output at 50 Hz n = 1 500 rpm		coupling		motor output at 50 Hz n = 1 000 rpm		coupling		coupling bei 50 Hz n = 750 rpm		coupling		cyl. shaft end d x l [mm]	
frame size	P [kW]	T [Nm]	size	max. safety factor at T_{Kmax}	P [kW]	T [Nm]	size	max. safety factor at T_{Kmax}	P [kW]	T [Nm]	size	max. safety factor at T_{Kmax}	P [kW]	T [Nm]	size	max. safety factor at T_{Kmax}	≤ 1 500 / 3 000 [rpm]	
63	0,18	0,62	19	32	0,12	0,88	19	23	0,06	0,72	19	27			19		11x23	
63	0,25	0,86	19	23	0,18	1,3	19	15	0,09	1,1	19	18			19		11x23	
71	0,37	1,3	19	15	0,25	1,8	19	11	0,18	2	19	10	0,09	1,4	19	14	14x30	
71	0,55	1,9	19	10	0,37	2,5	19	8	0,25	2,7	19	7,4	0,12	1,8	19	11	14x30	
80	0,75	2,5	19	8	0,55	3,7	19	5,4	0,37	3,9	19	5,1	0,18	2,5	19	8	19x40	
80	1,1	3,7	19	5,4	0,75	5,1	19	3,9	0,55	5,8	19	3,4	0,25	3,5	19	5,7	19x40	
90S	1,5	5	19	4	1,1	7,5	19	2,7	0,75	8	19	2,5	0,37	5,3	19	3,8	24x50	
90L	2,2	7,4	19	2,7	1,5	10	19	2	1,1	12	24	5,8	0,55	7,9	19	2,5	24x50	
100L	3	9,8	24	7,1	2,2	15	24	4,7	1,5	15	24	4,7	0,75	11	24	6,4	28x60	
100L	3	9,8	24	7,1	3	20	24	3,5	1,5	15	24	4,7	1,1	16	24	4,4	28x60	
112M	4	13	24	5,4	4	27	24	2,6	2,2	22	24	3,2	1,5	21	24	3,3	28x60	
132S	5,5	18	28	10,6	5,5	36	28	5,3	3	30	28	6,3	2,2	29	28	6,6	38x80	
132S	7,5	25	28	7,6	5,5	36	28	5,3	3	30	28	6,3	2,2	29	28	6,6	38x80	
132M			28		7,5	49	28	3,9	4	40	28	4,8	3	40	28	4,8	38x80	
132M			28		7,5	49	28	3,9	5,5	55	28	3,5	3	40	28	4,8	38x80	
160M	11	36	38	10,6	11	72	38	5,3	7,5	74	38	5,1	4	54	38	7	42x110	
160M	15	49	38	7,8	11	72	38	5,3	7,5	74	38	5,1	5,5	74	38	5,1	42x110	
160L	18,5	60	38	6,3	15	98	38	3,9	11	108	38	3,5	7,5	100	38	3,8	42x110	
180M	22	71	42	7,5	18,5	121	42	4,4			42				42		48x110	
180L			42		22	144	42	3,7	15	148	42	3,6	11	145	42	3,7	48x110	
200L	30	97	42	5,5	30	196	42	2,7	18,5	181	42	2,9	15	198	42	2,7	55x110	
200L	37	120	42	4,4	30	196	42	2,7	22	215	42	2,5	15	198	42	2,7	55x110	
225S			42		37	240	48	2,6			48		18,5	244	48	2,5	60x140	55x110
225M	45	145	42	3,7	45	292	48	2,1	30	293	48	2,1	22	290	48	2,1	60x140	55x110
250M	55	177	48	3,5	55	356	55	2,1	37	361	55	2,1	30	392	65	2,2	65x140	60x140
280S	75	241	55	3,1	75	484	75	4	45	438	75	4,4	37	483	75	4	75x140	65x140
280M	90	289	55	2,6	90	581	75	3,4	55	535	75	3,6	45	587	75	3,3	75x140	65x140
315S	110	353	55	2,1	110	707	75	2,8	75	727	75	2,7	55	712	75	2,7	80x170	65x140
315M	132	423	75	4,6	132	849	75	2,3	90	873	75	2,3	75	971	90	4,9	80x170	65x140
315L	160	513	75	3,8	160	1 030	90	4,7	110	1 070	90	4,5	90	1 170	90	4,1	80x170	65x140
315L	200	641	75	3	200	1 290	90	3,7	132	1 280	90	3,8	110	1 420	90	3,4	80x170	65x140
355L	250	801	75	2,4	250	1 610	90	3	160	1 550	90	3,1	132	1 710	90	2,8	95x170	75x140
355L	250	801	75	2,4	250	1 610	90	3	200	1 930	90	2,5	160	2 070	90	2,3	95x170	75x140
355L	315	1 010	90	4,8	315	2 020	90	2,4									95x170	75x140
400L	355	1 140	90	4,2	355	2 280	90	2,1									100x210	80x170
400L	400	1 280	90	3,8													100x210	80x170

The design of the couplings was made for standard operation. If the safety factor for shock loads is too small, it must be used the next larger coupling or the same coupling with a harder spider.

KWD
KUPPLUNGSWERK DRESDEN



Löbtauer Straße 45, D-01159 Dresden
Postfach 27 01 44, D-01171 Dresden
Tel.: +49 (0) 351/49 99-0, Fax: +49 (0) 351/49 99-2 33
E-mail: kwd@kupplungswerk-dresden.de

www.kupplungswerk-dresden.de

Certified in accordance with ISO 9001: 2008
Scope development, manufacture, sale and servicing of couplings in the drive technology field

Certified Welding Company / GSI SLV

Ausgabe: 10/2015