KWD
KUPPLUNGSWERK DRESDEN

Gear couplings with crowned toothing ZAKU-N

KWN 21017

Couplings from Dresden/Germany

By specialists – for specialists

TYMA®

řemeny, převody a lineární technika

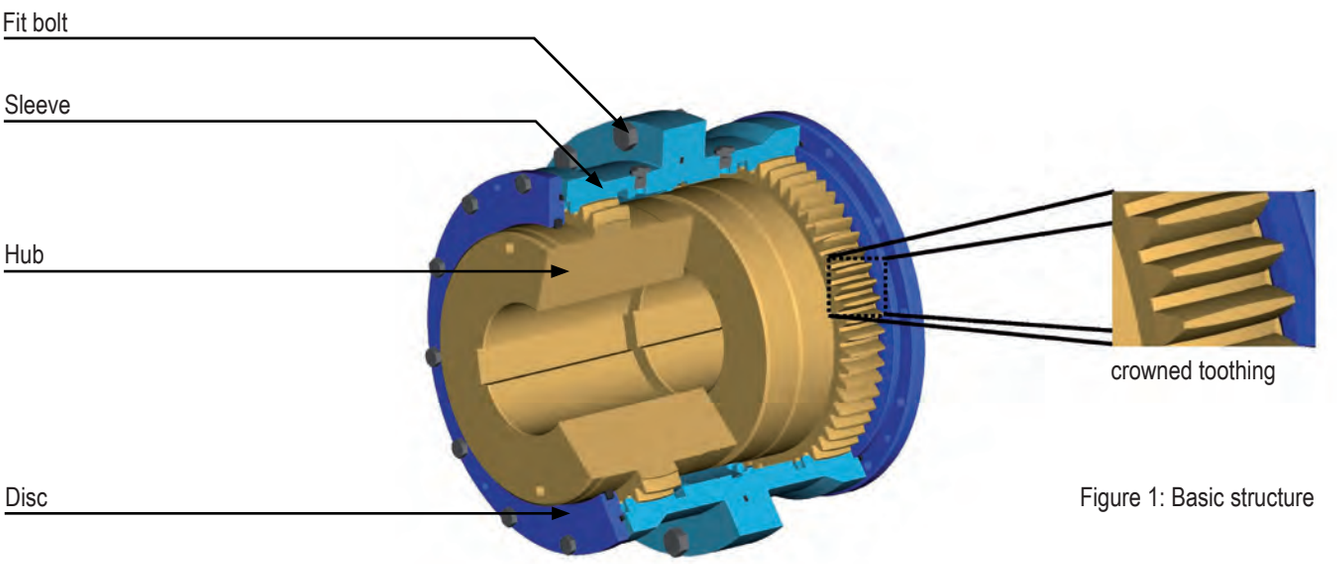


Figure 1: Basic structure

Technical features

Gear couplings are positive locking and torsional stiff couplings for the torque transmission. The hubs are linked by fitting keys, toothed shafts or interference fit assemblies with the work machines. The toothing of hubs is achieved by crowned toothing. The thickness of the teeth decreases with increasing tooth width. Thanks to the crowned toothing, the swivel range is implemented with a small tooth flank clearance. The combination of small tooth flank clearance and centering in the toothing allows a smooth running over the entire speed and torque range.

The couplings in a double cardanic design (two hinge planes) are able to compensate radial, angular and axial shaft displacements. The grease lubrication ensures a low maintenance effort and a long durability. O-rings or double lip seals are inserted to seal the coupling space filled with grease.

The gear couplings are available in different lines and models.

Kupplungswerk Dresden has many years of experience in the sector of development and manufacturing of special gear couplings for many different applications. Examples for special gear couplings are shown on pages 12 to 15.

The line ZAKU-N is distinguished by:

- high power density
- torque range from 12 500 to 1 250 000 Nm
- permissible angular displacement up to $\Delta Kw = 1.25°$
- realisation of three different hub distances by shifting one or both hubs
- low maintenance effort
- simple design (refer to coupling design page 10 or 11)

We also offer special models:

- design with spacer or floating shaft
- design with brake disc or brake drum
- design with axial clearance limitation
- design with safety elements
- design with radially replaceable seal (model WD)
- design with toothing on one side
- design for explosive surroundings

II 2 GD 120 °C (T4)
-20 °C ≤ T_a ≤ +60 °C

- special designs for highest speeds with oil injection lubrication
- special designs for the vertical fitting
- heavy design for increased torques
- design of gear couplings according to KWN 21006 and 21007
- other designs on request

characteristic values of the gear couplings

Table 1	characteristics			
Nominalsize	Nominal torque[1)] T_{KN} [Nm]	Maximum torque T_{Kmax} [Nm]	Speed[2)] n_{max} [min^{-1}]	Axial displacement ΔK_a [mm]
1 250	12 500	25 000	5 500	±2
2 000	20 000	40 000	4 700	±2
2 500	25 000	50 000	4 100	±3
4 000	40 000	80 000	3 700	±3
5 000	50 000	100 000	3 300	±3
6 300	63 000	126 000	3 200	±3
10 000	100 000	200 000	2 700	±3
16 000	160 000	320 000	2 200	±4
25 000	250 000	500 000	2 000	±4
31 500	315 000	630 000	1 800	±4
40 000	400 000	800 000	1 700	±4
50 000	500 000	1 000 000	1 600	±4
63 000	630 000	1 260 000	1 450	±4
80 000	800 000	1 600 000	1 350	±4
100 000	1 000 000	2 000 000	1 250	±6
125 000	1 250 000	2 500 000	1 150	±6

1) Torques apply with compliance with the permissible shaft displacement depending on the speed (refer to diagram 1)
2) Maximum speeds apply depending on the permissible shaft displacement (refer to diagram 1)

Nominal values apply to the following operating conditions:

- impact free operation
- number of start up processes: up to 30 times per hour with maximum torque
- ambient temperatures from -20 °C to +80 °C
- angular displacements up to 0.2° per hinge plane

By choosing the size, the information of part “coupling design“ shall be considered.

The permissible axial displacement applies to the hub distances s_1, s_2 and s_3.

The maximum angular displacement per hinge plane amounts $\Delta K_{w\,max} = 1{,}25°$.

The maximum permissible radial displacement is calculated from: $\Delta K_{r\,max} = \tan(1{,}25°) \cdot l_{0\,model}$

The torques stated in Table 1 do not refer to the shaft hub connections. They shall be checked separately.

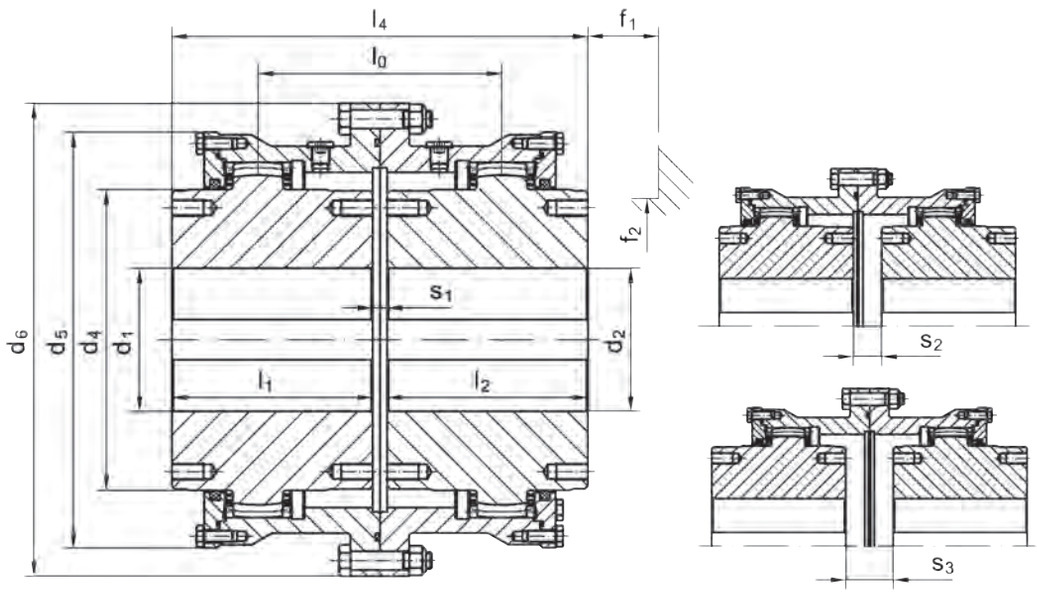
For a professional coupling design and determination of size, the user can contact our technical staff.

Models

Model A Standard design
Model B Design for holding disc
Model C Design axial clearance limited
Model S Design with centrally located brake disc
Model H Design with spacer
Model U Design with undivided sleeve

Model A

Toothed on both sides for the horizontal fitting



order example: ZAKU-N A 40000 – 310 H7 P1[3] (x310)[4] x 220 H7 P2[3] (x310)[4] – KWN 21017

Designation of a gear coupling with crowned toothing in model A in the nominal size 40 000 with bore d_1 = 310 mm, fit H7, a keyway according to DIN 6885 sheet 1 (hub length l_1 = 310 mm) and bore d_2 = 220 mm, fit H7, two keyways turned at 120° according to DIN 6885 sheet 1 (with hub length l_2 = 310 mm).

dimensions Table 2

Nominal size	Pilot-bore[1]	d_1,d_2 min[2]	d_1,d_2 max[2]	d_4	d_5	d_6	s_1	s_2	s_3	l_1, l_2	l_4 at s_1	l_4 at s_2	l_4 at s_3
1 250	-	-	95	135	195	234	8	19	30	100	208	219	230
2 000	-	-	115	160	226	263	8	20	32	110	228	240	252
2 500	-	-	130	185	251	292	10	25	40	125	260	275	290
4 000	65	70	150	210	288	329	10	30	50	140	290	310	330
5 000	75	80	165	230	312	363	10	30	50	160	330	350	370
6 300	85	90	185	255	337	389	12	42	72	180	372	402	432
10 000	95	100	210	290	375	429	12	42	72	200	412	442	472
16 000	135	140	260	360	465	528	16	96	176	240	496	576	656
25 000	155	160	285	400	502	567	16	106	196	260	536	626	716
31 500	175	180	310	440	542	620	16	126	236	280	576	686	796
40 000	205	210	340	480	584	660	20	150	280	310	640	770	900
50 000	225	230	370	520	637	734	20	149	278	330	680	809	938
63 000	245	250	400	560	685	788	20	166	312	350	720	866	1 012
80 000	265	275	425	600	717	828	20	180	340	380	780	940	1 100
100 000	290	300	460	650	780	900	25	176	327	400	825	976	1 127
125 000	315	325	500	710	845	965	25	185	345	420	865	1 025	1 185

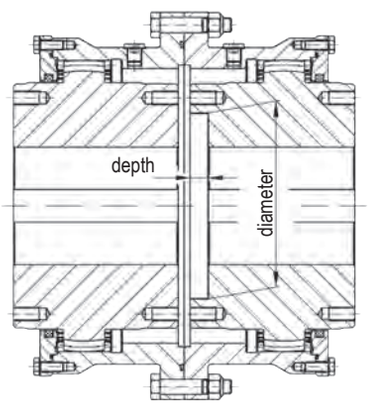
Main dimensions in mm

1) Pilot bores are executed with tolerance „medium“ according to ISO 2768
2) Finish bores according to ISO fit H7, keyways according to DIN 6885 sheet 1, fit P9
3) Refer to table 7 „Type of the hub bore“ (page 9)
4) Dissenting hub lengths are possible after consulting the manufacturer; please specify the lengths in brackets

Model B

Design for holding disc

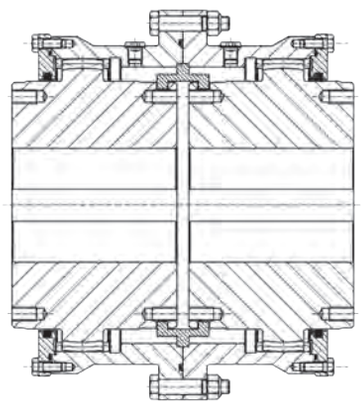
- for hub distance s_1 and s_2
- declaration of the milled channel required (diameter, depth)



Model C

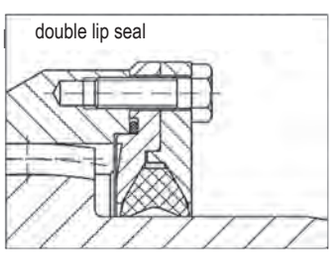
Design axial clearance limited

- divided bar ring to limit the axial clearance



Design WD
(radially replaceable seal)

All models are also available with radially replaceable double lip seal (WDD) or o-ring seal (WDR).
In case of displacements > 1° we recommend the use of the double lip seal (model WDD).



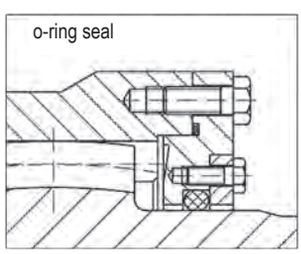


Table 3 — main dimensions / characteristic values

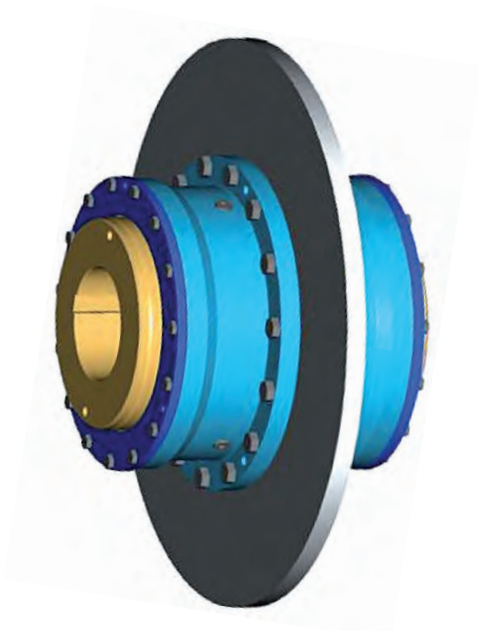
Nominal size	l_0	f_1 [1] min	f_2 [1] max	Radial displacement $\Delta K_{r\,max}$ [mm]	Mass [2] m [kg]	Mass moment of inertia [2] J [kgm²]	Torsional spring stiffness c_t [10^6 Nm/rad]	Lubricant amount Grease [kg]
1 250	119	30	115	2,6	27	0,17	20,6	0,2
2 000	130	35	140	2,8	38	0,31	30,6	0,3
2 500	150	35	165	3,3	54	0,54	39,4	0,4
4 000	170	40	185	3,7	77	1,01	58,5	0,6
5 000	190	40	205	4,1	104	1,66	78,7	0,8
6 300	222	45	230	4,8	132	2,45	91,8	1,0
10 000	242	45	260	5,3	184	4,25	141	1,7
16 000	336	60	330	7,3	330	11,7	182	3,0
25 000	366	60	370	8,0	420	17,2	209	3,6
31 500	406	65	410	8,9	550	26,7	307	4,4
40 000	460	65	450	10,0	700	39,6	344	6,9
50 000	479	70	490	10,5	895	60,6	480	7,9
63 000	516	75	530	11,3	1 090	85,6	624	9,4
80 000	560	80	570	12,2	1 335	117	744	10,6
100 000	576	85	620	12,6	1 680	174	1 091	11,2
125 000	605	85	680	13,2	2 080	251	1 407	12,5

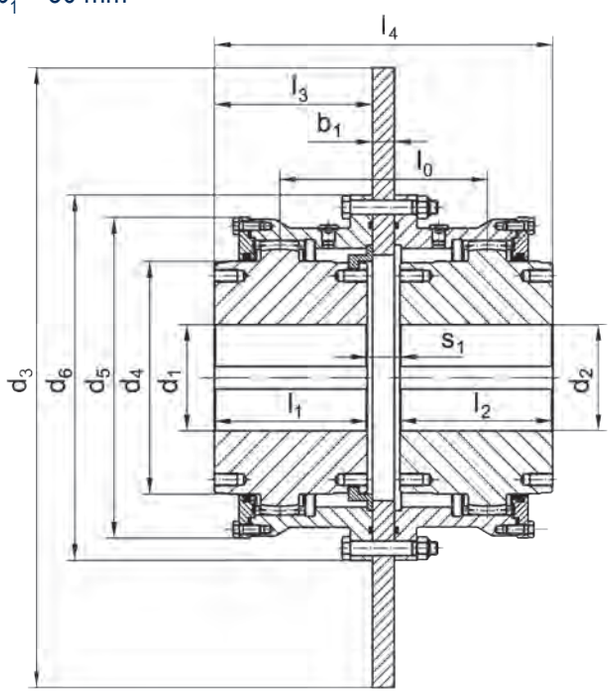
Main dimensions in mm

1) f_1 and f_2 – required assembly dimensions to adjust hubs, to replace seals (O-rings) and during shrink fitting to place down the lid with seal
2) Masses and mass moments of inertia apply for bores $d_{1,2\,max}$ and without lubricant

Model S

- centrally located brake disc
- brake disc according to DIN 15432 with brake disc width b_1 = 30 mm





A limited movement of brake disc and sleeve is achieved by an axial clearance limitation on one side. At this design, the possible axial displacement halves according to Table 1. Furthermore, the free hinge has a possible angular displacement of max. 1.25°.

The width between supports l_0 increases at this model S by the brake disc width b_1 = 30 mm. The hub distance s_1 or s_2 is achieved by changing the free hub. Other models of brakes discs are available by request.

order example: ZAKU-N S 4000 – 630 (x30)[6] – 150 H7 P1[3] (x140)[4] x 65 v[3] (x140)[4] – KWN 21017

Designation of a gear coupling with crowned toothing in model S in the nominal size 4 000,
diameter of the brake disc d_3 = 630 mm, width of the brake disc b_1 = 30 mm with
bore d_1 = 150 mm, fit H7, a keyway according to DIN 6885 sheet 1 (with hub length l_1 = 140 mm) and
bore d_2 = 65 mm pilot bored, without keyway (with hub length l_2 = 140 mm).

main dimensions / characteristic values — Table 4

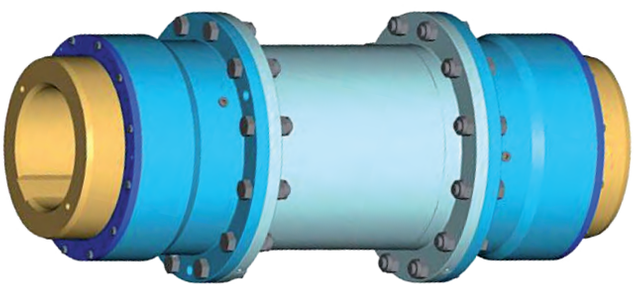
Nominal size	Pilot bore [1]	d_1, d_2 min [2]	d_1, d_2 max [2]	d_3	d_4	d_5	d_6	b_1	s_1	s_2	l_1, l_2	l_3	l_4 at s_1	l_4 at s_2	l_0	Radial displacement $\Delta K_{r\,max}$ [mm]	Speed n_{max} [min^{-1}]	Mass [5] m [kg]	Mass moment of inertia [5] J [kgm²]
1 250	-	-	95	400	135	195	234	30	38	49	100	104	238	249	149	2,6	2 800	55	0,77
2 000	-	-	115	500	160	226	263	30	38	50	110	114	258	270	160	2,8	2 250	83	1,76
2 500	-	-	130	500	185	251	292	30	40	55	125	130	290	305	180	3,3	2 250	99	1,99
4 000	65	70	150	630	210	288	329	30	40	60	140	145	320	340	200	3,7	1 800	148	4,67
5 000	75	80	165	630	230	312	363	30	40	60	160	165	360	380	220	4,1	1 800	175	5,32
6 300	85	90	185	710	255	337	389	30	42	72	180	186	402	432	252	4,8	1 600	223	8,36
10 000	95	100	210	710	290	375	429	30	42	72	200	206	442	472	272	5,3	1 600	275	10,16
16 000	135	140	260	800	360	465	528	30	46	126	240	248	526	606	366	7,3	1 400	445	21,22

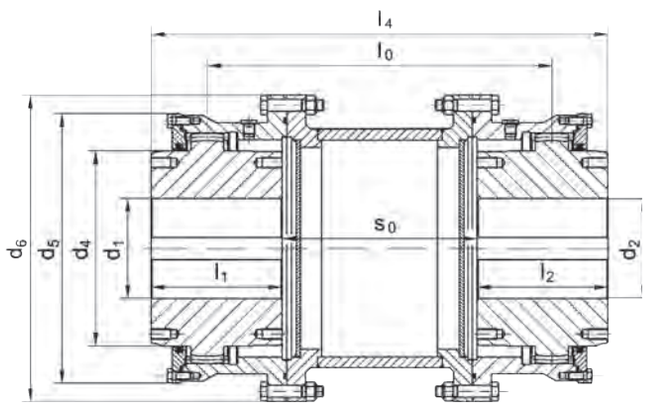
Main dimensions in mm

1) Pilot bores are executed with tolerance „medium“ according to ISO 2768
2) Finish bores according to ISO fit H7, keyways according to DIN 6885 sheet 1, fit P9
3) Refer to table 7 „Type of the hub bore“ (page 9)
4) Dissenting hub lengths are possible after consulting the manufacturer; please specify the lengths in brackets
5) Masses and mass moments of inertia apply for bores $d_{1,2\,max}$ and without lubricant
6) Dissenting brake disc widths are possible after consulting the manufacturer; please specify the lengths in brackets

Model H

- spacer for large hub distances
- different torsional spring stiffnesses realizable





order example: ZAKU-N H 31500 – 350 – 300 H7 P1[3] (x280)[4] x 250 H7 P3[3] (x280)[4] – KWN 21017

Designation of a gear coupling with crowned toothing in model H in the nominal size 31 500 with shaft mirror distance s_0 = 350 mm with bore d_1 = 300 mm, fit H7, a keyway according to DIN 6885 sheet 1 (with hub length l_1 = 280 mm) and bore d_2 = 250 mm, fit H7, two keyways turned at 180° according to DIN 6885 sheet 1 (with hub length l_2 = 280 mm).

Table 5 — **main dimensions / characteristic values**

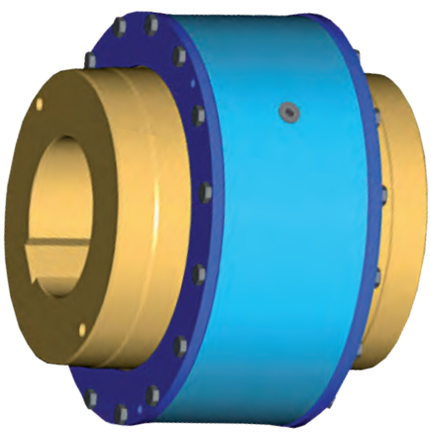
Nominal size	Pilot bore [1]	d_1,d_2 min [2]	d_1,d_2 max [2]	d_4	d_5	d_6	s_0 min	l_1,l_2	l_4 min	l_0 min	Radial displacement $\Delta K_{r\,max}$ [mm]	Speed n_{max} [min^{-1}]	Mass [5] m [kg]	Mass moment of inertia [5] J [kgm²]
1 250	-	-	95	135	195	234	138	100	338	249	5,4	Check of the critical bending speed required	37	0,25
2 000	-	-	115	160	226	263	138	110	358	260	5,7		51	0,45
2 500	-	-	130	185	251	292	150	125	400	290	6,3		72	0,80
4 000	65	70	150	210	288	329	150	140	430	310	6,8		104	1,4
5 000	75	80	165	230	312	363	190	160	510	370	8,1		146	2,5
6 300	85	90	185	255	337	389	192	180	552	402	8,8		180	3,6
10 000	95	100	210	290	375	429	192	200	592	422	9,2		250	6,1
16 000	135	140	260	360	465	528	216	240	696	536	11,7		430	16,0
25 000	155	160	285	400	502	567	216	260	736	566	12,4		530	22,8
31 500	175	180	310	440	542	620	236	280	796	626	13,7		710	36,4
40 000	205	210	340	480	584	660	240	310	860	680	14,8		870	51,5
50 000	225	230	370	520	637	734	270	330	930	729	15,9		1 130	80,6
63 000	245	250	400	560	685	788	270	350	970	766	16,7		1 360	113
80 000	265	275	425	600	717	828	270	380	1 030	810	17,7		1 640	147
100 000	290	300	460	650	780	900	305	400	1 105	856	18,7		2 180	231
125 000	315	325	500	710	845	965	305	420	1 145	885	19,3		2 670	324

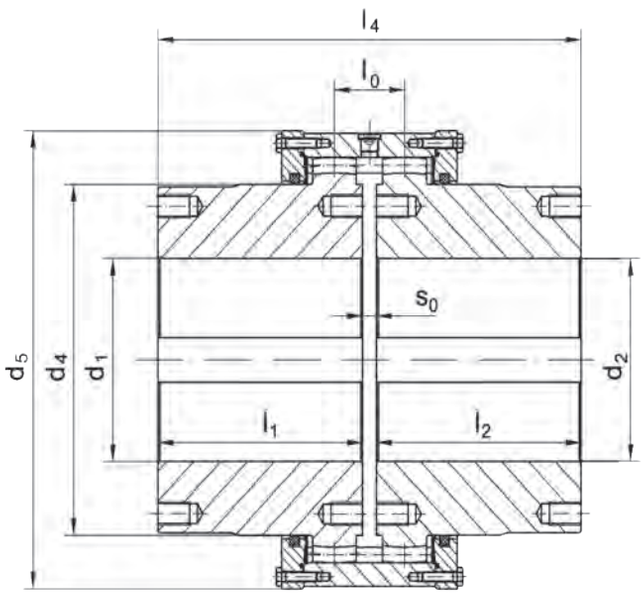
Main dimensions in mm

1) Pilot bores are executed with tolerance „medium“ according to ISO 2768
2) Finish bores according to ISO fit H7, keyways according to DIN 6885 sheet 1, fit P9
3) Refer to table 7 „Type of the hub bore“ (page 9)
4) Dissenting hub lengths are possible after consulting the manufacturer; please specify the lengths in brackets
5) Masses and mass moments of inertia apply for bores $d_{1,2\,max}$ and without lubricant

Model U

- undivided sleeve
- for small fitting space
- for low radial displacements





order example: **ZAKU-N U 16000 – 210 H7 P1[3] (x240)[4] x 220 H7 P1[3] (x200)[4] – KWN 21017**

Designation of a gear coupling with crowned toothing in model U in the nominal size 16 000 with bore d_1 = 210 mm, fit H7, a keyway according to DIN 6885 sheet 1 (with hub length l_1 = 240 mm) and bore d_2 = 220 mm, fit H7, a keyway according to DIN 6885 sheet 1 (with shortened hub length l_2 = 200 mm).

main dimensions / characteristic values — Table 6

Nominal size	Pilot bore[1]	d_1,d_2 min[2]	d_1,d_2 max[2]	d_4	d_5	s_0	l_1,l_2	l_4	l_0	Radial-displacement $\Delta K_{r\,max}$ [mm]	Mass[5] m [kg]	Mass moment of inertia[5] J [kgm²]	Lubricant amount Grease [kg]
1 250	-	-	95	135	195	8	100	208	48	1	21	0,11	0,2
2 000	-	-	115	160	226	8	110	228	50	1,1	30	0,22	0,2
2 500	-	-	130	185	251	10	125	260	55	1,2	44	0,39	0,2
4 000	65	70	150	210	288	10	140	290	58	1,3	64	0,75	0,3
5 000	75	80	165	230	312	10	160	330	62	1,4	81	1,1	0,4
6 300	85	90	185	255	337	12	180	372	70	1,5	104	1,7	0,4
10 000	95	100	210	290	375	12	200	412	72	1,6	147	3,0	0,4
16 000	135	140	260	360	465	16	240	496	90	2	270	8,5	1
25 000	155	160	285	400	502	16	260	536	92	2	345	12,7	1,1
31 500	175	180	310	440	542	16	280	576	96	2,1	440	18,8	1,2
40 000	205	210	340	480	584	20	310	640	102	2,2	565	28,5	1,4
50 000	225	230	370	520	637	20	330	680	104	2,3	705	42,1	1,7
63 000	245	250	400	560	685	20	350	720	106	2,3	855	59,0	2,3
80 000	265	275	425	600	717	20	380	780	118	2,6	1 050	80,9	2,1
100 000	290	300	460	650	780	25	400	825	125	2,7	1 300	118	3,7
125 000	315	325	500	710	845	25	420	865	135	2,9	1 640	176	4,1

Main dimensions in mm

1) Pilot bores are executed with tolerance „medium“ according to ISO 2768
2) Finish bores according to ISO fit H7, keyways according to DIN 6885 sheet 1, fit P9
3) Refer to table 7 „Type of the hub bore“ (page 9)
4) Dissenting hub lengths are possible after consulting the manufacturer; please specify the lengths in brackets
5) Masses and mass moments of inertia apply for bores $d_{1,2\,max}$ and without lubricant

ordering informations

Table 7 type of the hub bore

Hub bore	pilot bored	Tolerancefield H7			
		without keyway	one keyway	two keyways 120° turned	two keyways 180° turned
Abbreviation	v	-	P1	P2	P3

Attention:

The bore diameters d_1 and d_2 are executed according to ISO-fit H7. The design „pilot bored“ with tolerance „medium“ is executed according to ISO 2768 and is intended for adjustments by the customer.

The keyways are executed according to DIN 6885 sheet 1, fit P9. Interference fitting assemblies shall be coordinated with the manufacturer.

Other shaft hub connections are available on request.

Materials

Hub: Tempering steel $R_e \geq 380$ MPa
Sleeve: Tempering steel $R_e \geq 350$ MPa
Body-fit bolts: Strength class 8.8

Lubrication

We recommend EP rolling bearing and/or EP gear grease as lubricant:

- Consistency according to DIN 51 818:
  NLGI class 0 and/or 1
- Designation according to DIN 51 502:
  KP 0, (1) and/or GP 0, (1)

Balancing

Balancing quality: grade Q16 for the components without keyway
The reference speed for the balancing quality amounts 1500 min^{-1}.

Finer balancing qualities are available on request.

The balancing on finer balancing qualities requires a declaration of the operating speed and the balancing agreement to keyway according DIN ISO 8821 (half keyway agreement preferred).

Table 8 lubricant recommendations

Manufacturer	Designation	Manufacturer	Designation
ARAL	ARALUB HLP	FUCHS	RENOLIT DURAPLEX EP
BP	Energrease LS-EP	KLÜBER	GRAFLOSCON C SG
CASTROL	TRIBOL 3020/1000	MOBIL	Mobilux EP
ESSO	FIBRAX EP	SHELL	Alvania EP

We recommend a grease of the NLGI class 00 for operating speeds ≥ 60 % of the maximum speeds stated in Table 1.

To ensure a favourable lubrication of the gear couplings, depending on conditions of use, minimum radial or angular displacements are necessary.

Lubricants are not included in the scope of deliveries.

Coupling design

The choice of the coupling size is determined by the torque which shall be transmitted, the speed, the existing displacement and the connection geometry.

The application factors according to DIN 3990-1 and ISO 6336-6 stated in Table 9 shall be seen as orientation. Some instructions, regulations and experiences may be considered.

Application factors K_A (Extract DIN 3990-1, ISO 6336-6) — Table 9

Working characteristic of driven machine \ Working characteristic of driving machine	**uniform** electric motor steam or gas turbine at uniform operation (low, rarely appearing starting torques)	**light shocks** electric or hydraulic motor steam or gas turbine (larger, often appearing starting torques	**moderate shocks** multi cylinder internalcombustion engine	**heavy shocks** single cylinder internalcombustion engine
uniform generator, ventilator, packing machinery, light-weight centrifuges, shears, presses, worm conveyors, light lifts, uniformly loaded conveyor belts, agitators and mixers for light liquids or uniform density materials	1,00	1,10	1,25	1,50
light shocks heavy lifts, heavy centrifuges, rotating kilns, crane slewing gear, industrial and mine ventilators, extruders (general), centrifugal pumps, calendars non-uniform loaded conveyor belts, multi-cylinder piston pumps, agitators and mixers for viscous liquids or substances of non-uniform density	1,25	1,35	1,50	1,75
moderate shocks single cylinder piston pumps, lifting gear, ball mills (light), extruders for rubber, wood-working machines (gang saws, lathes), continuously operating mixers for rubber and plastics	1,50	1,60	1,75	2,00
heavy shocks excavators (bucket wheel drives), power shovels, sieve drives, bucket chain drives, rubber kneaders, crushers (stone, ore), brick presses, briquette presses, breaker mills, ball mills (heavy), foundry machines, rotary drills, peeling machines, de-barking mills	1,75	1,85	2,00	2,25 or higher

Check of the coupling for the nominal torque T_{KN}

The nominal torque of the coupling T_{KN} is the torque, which the coupling is able to transmit under ideal loads and conditions. The design factors shall describe the real loads.

$$T_{system} = 9\,550 \cdot P_{output} / n_{system} \cdot K_A$$

$$T_{system} \leq T_{KN} \qquad (T_{KN} \text{ according to table 1})$$

The nominal size with the next higher nominal torque shall be selected.

Symbol	T (torque)	P (power)	n (speed)
Unit	Nm	kW	min^{-1}

Check of the coupling for the maximum torque T_{Kmax}

The maximum torque of the system ($T_{system\ max}$) is the highest load for the coupling during the operation. These are, for example, temporary starting and stopping processes.

$$T_{system\ max} \leq T_{Kmax} \qquad (T_{Kmax} \text{ according to table 1})$$

If the maximum torques ($T_{system\ max}$) appear more than 30 times per hour, they shall be compared with the nominal torque of the coupling (T_{KN}).

$$T_{system\ max} \leq T_{KN} \qquad (T_{KN} \text{ according to table 1})$$

Check of maximum speed n_{max}

For all operating conditions must be guarnteed:

$$n_{system} \leq n_{max}$$

(n_{max} according to table 1 and/or the respective model)

Check of the permissable displacement

Radial angular displacements influence the transmissible power of the gear coupling. For this reason, the permissible displacement is reduced via the speed.

The maximum permissible angular displacements are depending on the system speed and shall be taken from Diagram 1.

For all operating conditions, the present displacement must not be higher than the perissible maximum displacement according to Diagram 1.

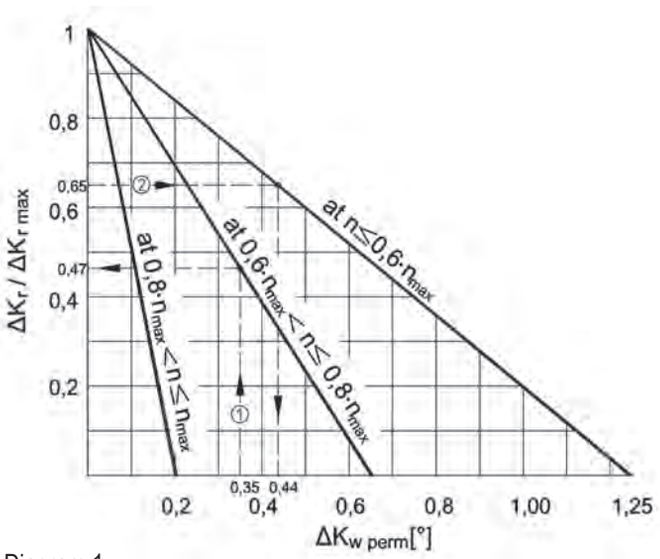
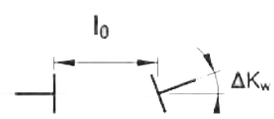
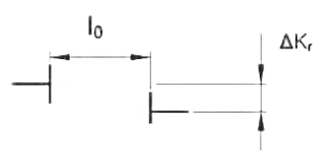


Diagram 1:
Permissible angular displacement depending on the speed

Net angular displacement:
$\Delta K_{w\,pres} \leq \Delta K_{w\,perm}$

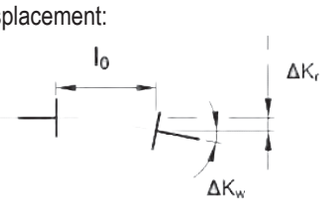


Net radial displacement:
$\Delta K_{r\,pres} \leq \tan(\Delta K_{w\,prm}) \cdot l_{0\,model}$



Combined angular and radial displacement:

The combined displacements shall be checked according Diagram 1.



Exemple 1

$\Delta K_{w\,pres} = 0{,}35°$; $n = 0{,}7 \cdot n_{max}$

$\rightarrow \Delta K_{r\,perm} = 0{,}47 \cdot \Delta K_{r\,max}$

Exemple 2

$\Delta K_{r\,pres} / \Delta K_{r\,max} = 0{,}65$; $n = 0{,}5 \cdot n_{max}$

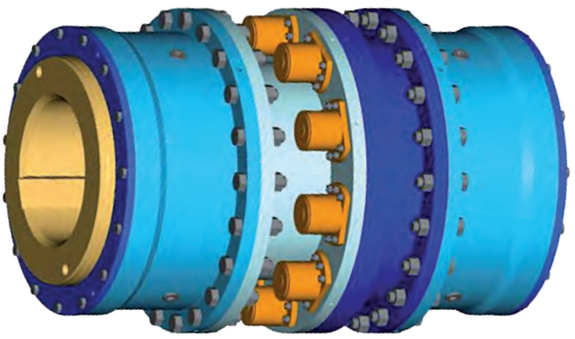
$\rightarrow \Delta K_{w\,perm} = 0{,}44\,°$

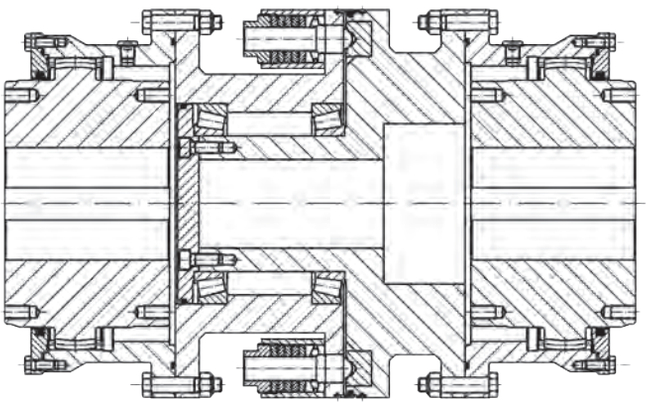
Check of the hub bores

After selecting the nominal size of the coupling, the maximum permissible bore diameters shall be checked. The diameters d_1 and d_2 apply for the the designs with keyway according to DIN 6885 sheet 1. The shaft hub connection shall be checked separately.

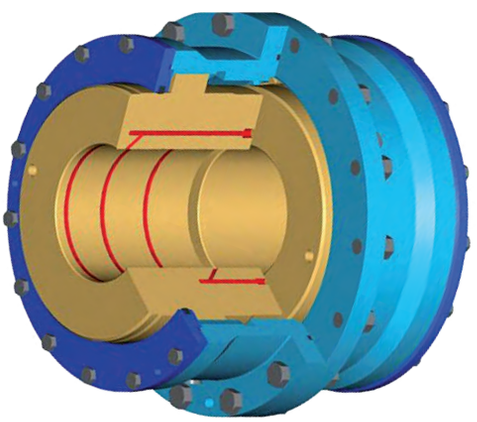
Check of the bending critical speed at model H

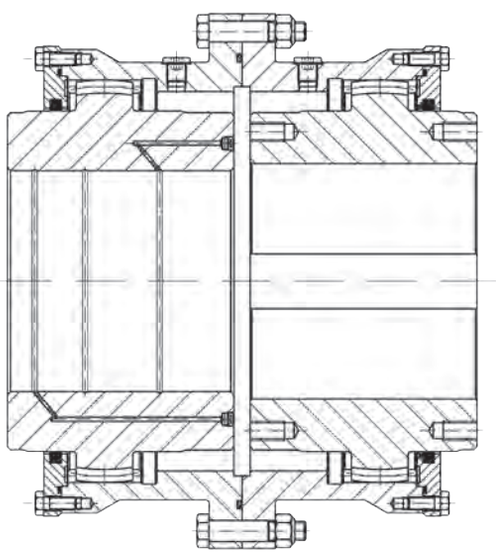
At the model H a check of the bending critical speed shall be exe-cudet. Our technical staff is available for all user questions.



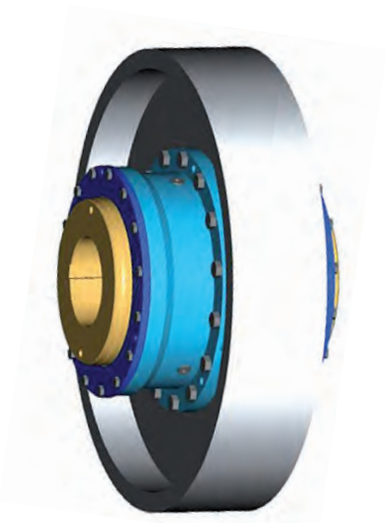


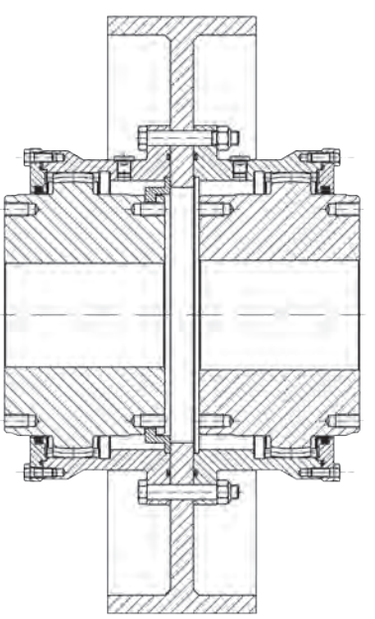
ZAKU-N: Gear Couplings with torque limitation
(adjustable activate elements)



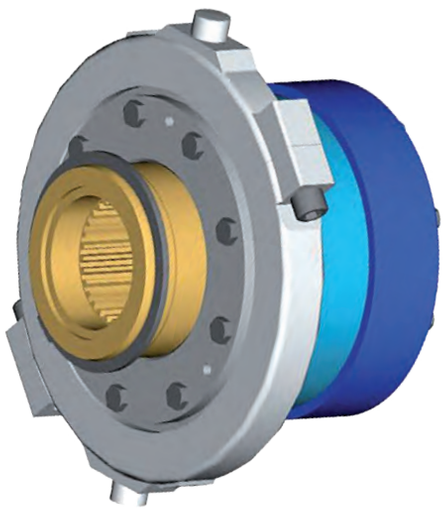


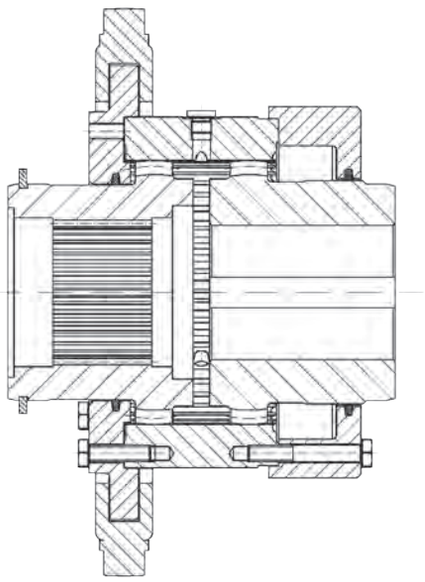
ZAKU-N: Gear Couplings with shaft hub connections as hydraulic interference fit assembly



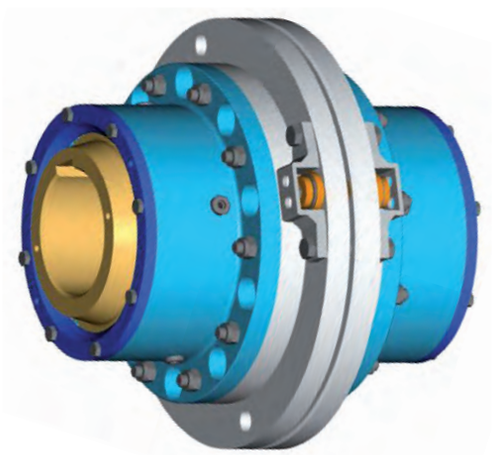


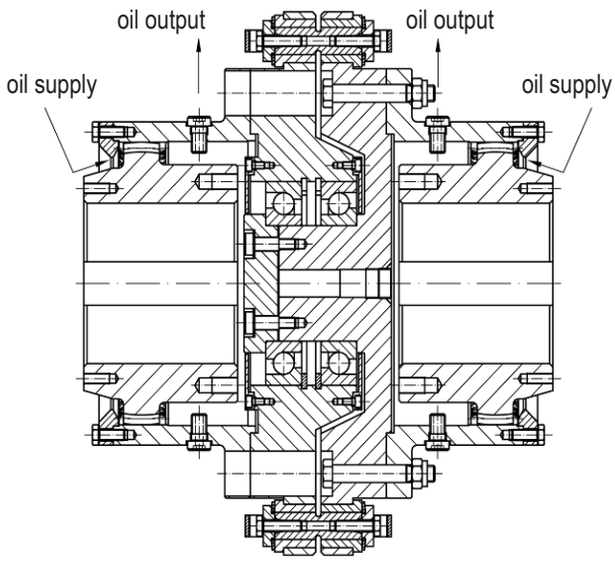
ZAKU-N: Gear Couplings with centrally located brake drum and axial limitation



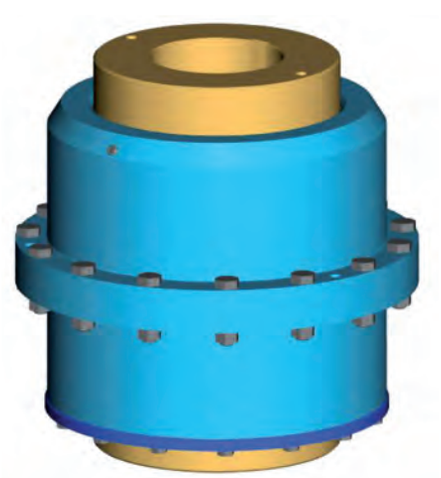


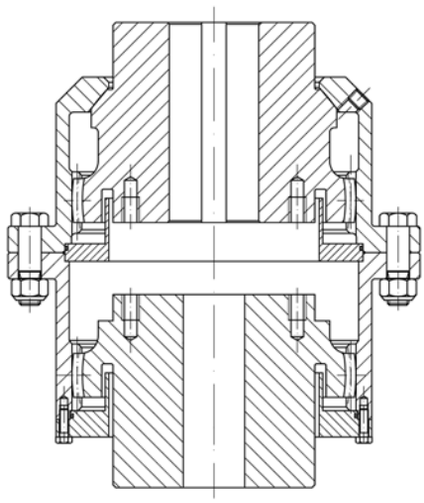
Gear Couplings switchable in stop condition



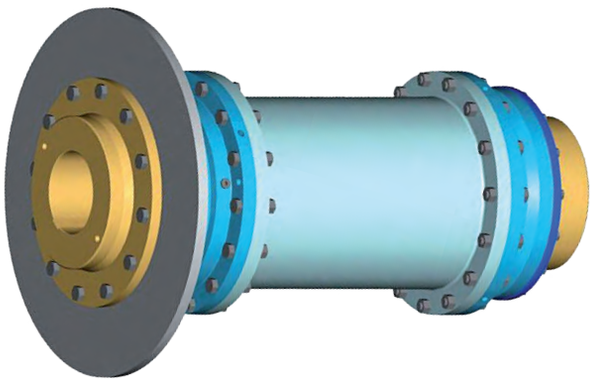


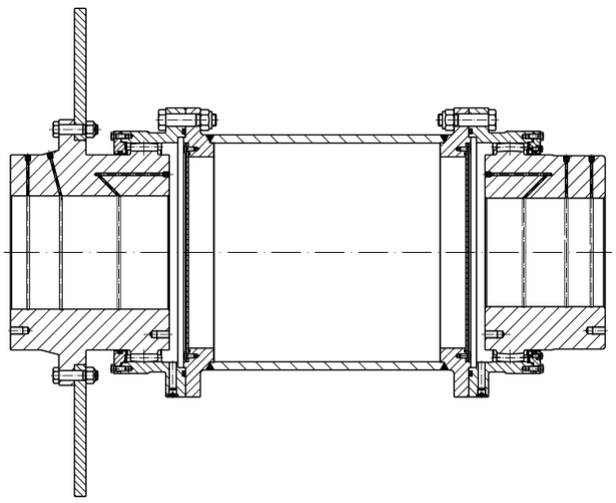
Gear Couplings with crush bolt and continuous oil lubrication



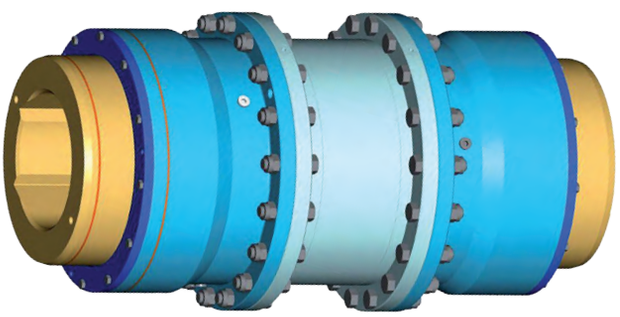


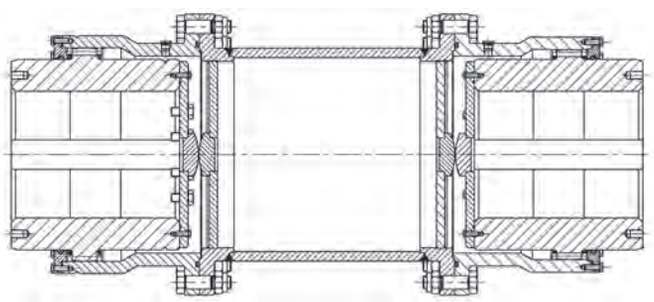
Gear Couplings with crowned toothing for vertical fitting (according to KWN 21008)



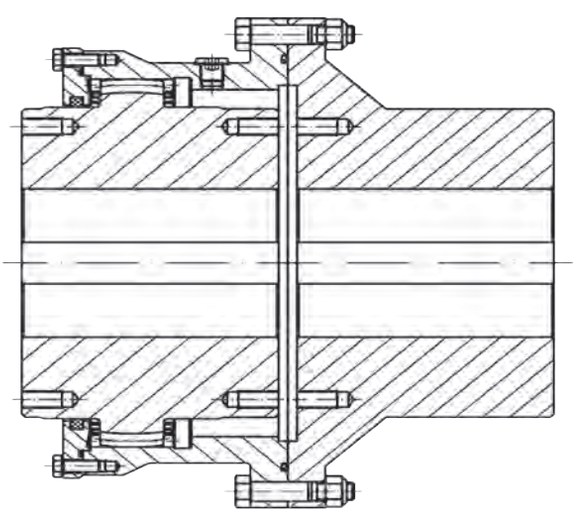


ZAKU-N H: Gear Couplings with brake disc arranged at the hub for rolling mill drive laterally

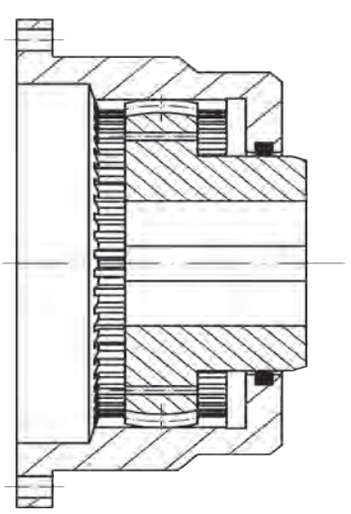




ZAKU-N H: Gear Couplings with different numbers of teeth per coupling half for the reduction of vibrations at parallel drives

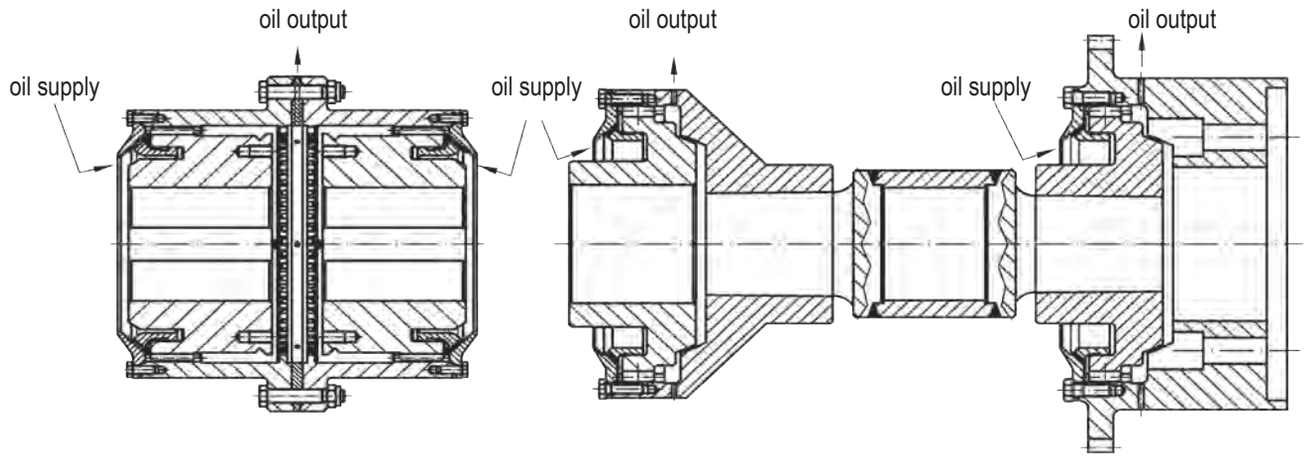


ZAKU-N: Gear Couplings toothed on one side



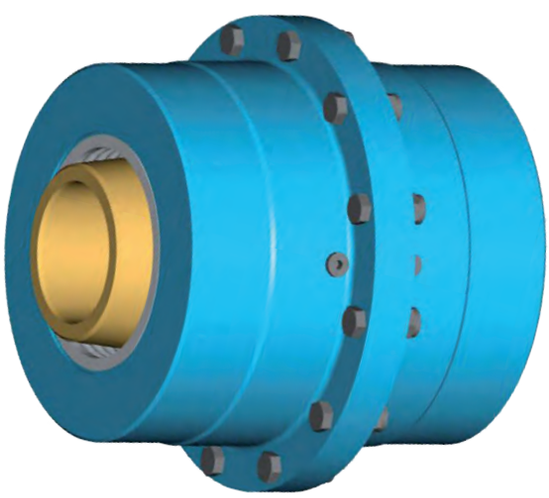
Gear Coupling hinges:

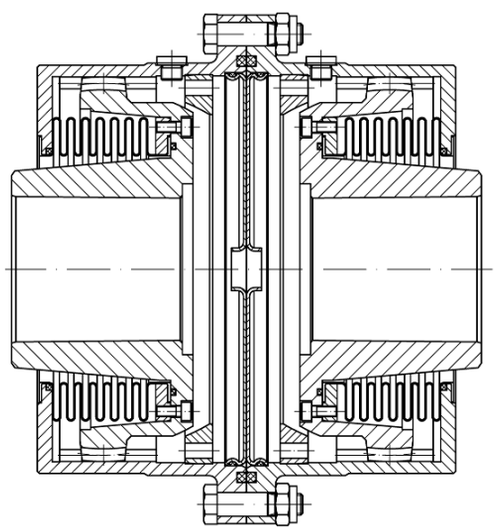
- easy axial flange assembly
- for the reception of radial forces



Fast-Turbo-Couplings for highest speeds with oil injection lubrication

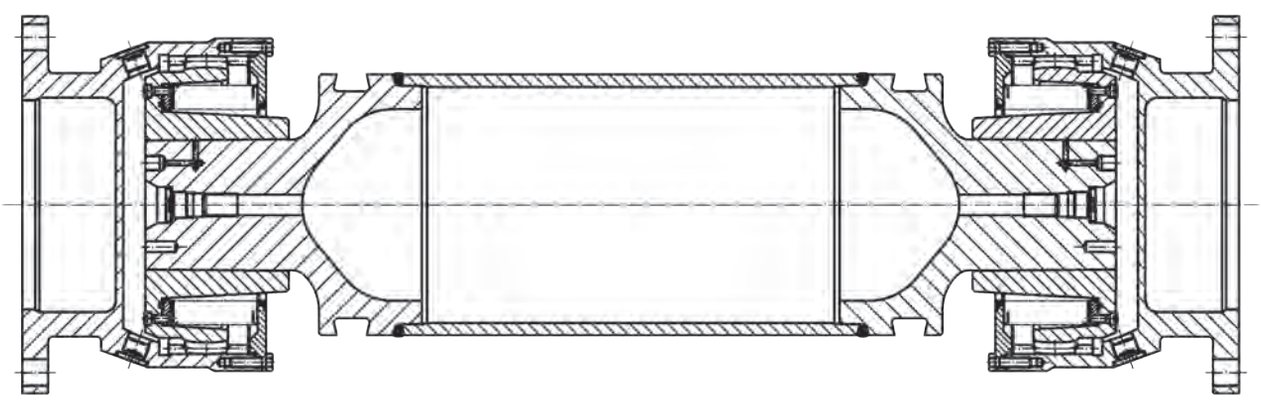
(according to KWN 21000 , once DWN 910 and 940)





Gear Couplings with patented metal bellow seal

(high shaft displacement – long lubricant change intervals – oil lubrication possible – leakage free)



Gear Couplings with patented metal bellow seal as an alternative to hinge shafts

(long lubricant change intervals – oil lubrication possible – leakage free)

KWD
KUPPLUNGSWERK DRESDEN

TYMA®

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