SIBRE – the world of industrial brakes

COUPLINGS

SIBRE -

The SIBRE Siegerland Bremsen GmbH is a worldwide operating, medium-sized company of traditions with meanwhile over 60 years of company history. From the very first the company engages in the development and production of brake systems for the industry. Right from the start value was set on technical innovation, the most modern manufacturing technology and high customer use. Production procedures are continuously supervised by a quality management system. The aim of the product development is an optimum combination of a top-quality product, the easiest use and market-driven price both for plant engineers and plant operators.

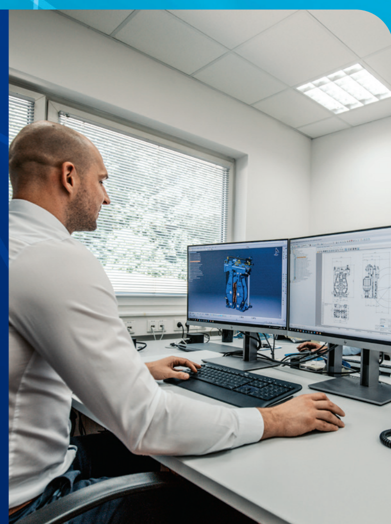
the world of industrial brakes

CONCEPTION

With a Team of experienced engineers and service technicians we have the knowledge to stand behind our slogan "Sure to be Safe". Through this knowledge and experience the SIBRE Team has a complete understanding of Braking System requirements, and the consequences of an inferior or flawed product. SIBRE has the flexibility to design, build, and test in our own facility, allowing free thinking ideas and concepts to be realized.

ENGINEERING

Based on the collective decades of experience, our engineers, technicians, and input from our customers, the SIBRE R & D department, can develop, manufacture and test products heavy industry can rely on. Using state of the art software and the latest innovative hardware, the SIBRE Team can achieve optimal products. From innovative concepts to detailed construction plans, our R & D department consistently develops reliable SIBRE Products.



PRODUCTION

With a well-trained, long-standing team, and a newly expanded modern production hall, SIBRE is producing quality. From individual components and parts to final assembly, SIBRE stands firm on sustainable product quality.

QUALITY

Being ISO 9001 certified, SIBRE is guaranteeing the highest quality of each individual part and the entire brake assembly. With the most currently available measuring and testing equipment, the SIBRE Team has the capability to check for raw material properties and dimensional accuracy, on each critical component. These capabilities ensure the functional reliability customers have come to depend on from SIBRE.

from **conception** to **high quality** brakes

INTERNATIONAL PRESENCE

With 11 offices strategically placed on all continents, SIBRE is truly a renowned Global Player.

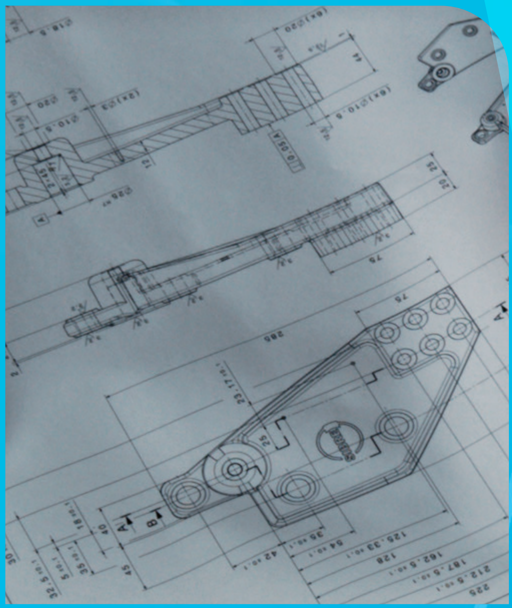
We pride ourselves in being a reliable partner for safety relevant components. Through our well-established sales and service locations, we have created solid cooperation, that often exceed customer expectations. Among the industries we support, Container and Material Handling, Mining and Metals, Forestry, Oil and Gas, Wastewater Treatment, Movable Bridges, and Hydropower to name a few, SIBRE's well-situated locations allow for responsive action to serve our customers.

CONCEPTION & ENGINEERING

for **innovative** brake-systems

CONCEPTION

Sure to Be Safe. The SIBRE slogan and motto.
Realizing People's lives depend on the safest working environments, in some of the most inhospitable places, the SIBRE Team is consistently discussing, consulting, analyzing, and verifying ideas to create new components and systems.
Sure to Be Safe. The lives of real people depend on it.
This ever-flowing conversation is not just an internal practice; we actively seek input from industry. We engage industry leaders, engineering and consulting firms, and the all-important persons responsible for maintaining equipment.
These cooperative discussions create a true partnership between manufacturer and user. The ability of our product developers to engage dynamic thinkers allow the best possible solutions.



ENGINEERING

Implementing ideas and concepts belong to the dynamic engineering team at SIBRE.

This energizing team is always on the mission to safeguard people and equipment. The redesigning of our products is as important as bringing to life new concepts.

With the availability of the most modern hardware and software the engineering team has made the tried and true SIBRE range more efficient and maintenance friendly.

This dynamic group of engineers is an important part of SIBRE being a global supplier in the world of industrial brakes, couplings and crane wheels.

Made in Germany, standing behind the heritage of German Engineering.

PRODUCTION & QUALITY

made in **Germany**

PRODUCTION

With a steadily expanding product offering, the extending global network of offices and activities, so to the SIBRE production facilities grow. Our machining facility in Haiger/Germany and our assembly plant, just up the road in Eschenburg/Germany, have also been growing. Both facilities have seen significant modernization and expansion to accommodate the demand for highly engineered integral products. Since 2018 several new lines have been installed. Our central production plant located in Haiger, Germany boasts several state-of-the-art CNC machines. These additions allow for tighter control of production and faster response times to customer requirements. This growth has afforded SIBRE the honor of being a good steward to our local communities, and continuing the solid reputation Made in Germany has been known for the world over for.

QUALITY

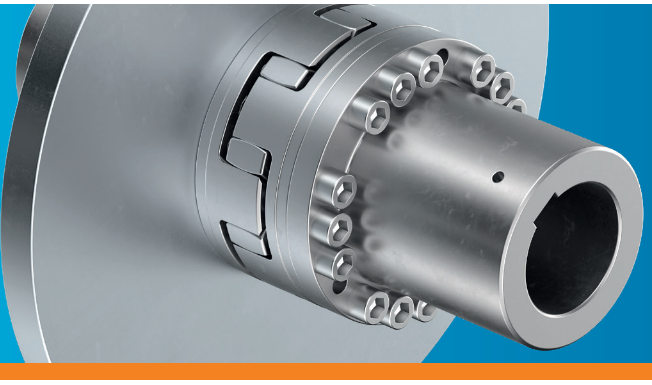
High-quality, reliable braking systems and drive components require a consistent quality standard.

With our internal development and simulation laboratory, both individual components and fully assembled systems are put through their paces.

In addition to function and load simulation, we also focus on checking, reaction times, material properties and dimensional accuracy.

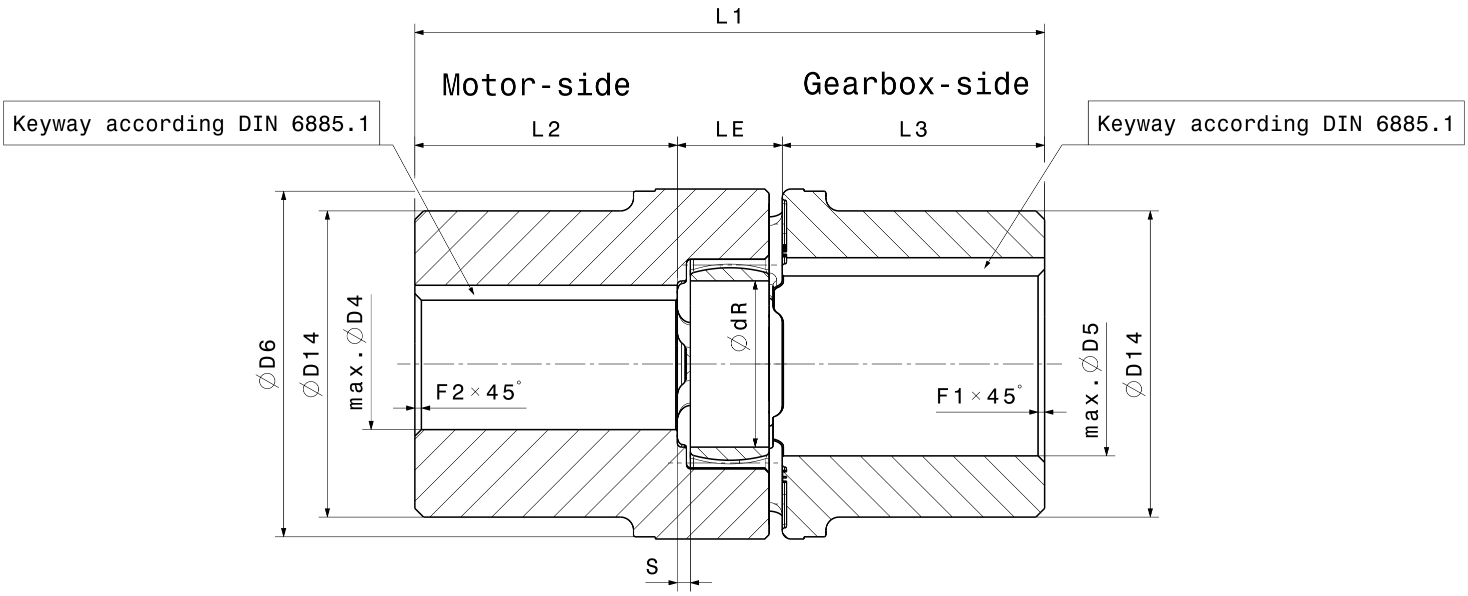
SIBRE quality
– made in Germany

FLEXIBLE COUPLING



FLEXIBLE COUPLING
ALC-A

M 1501 338 E-EN-2008-02



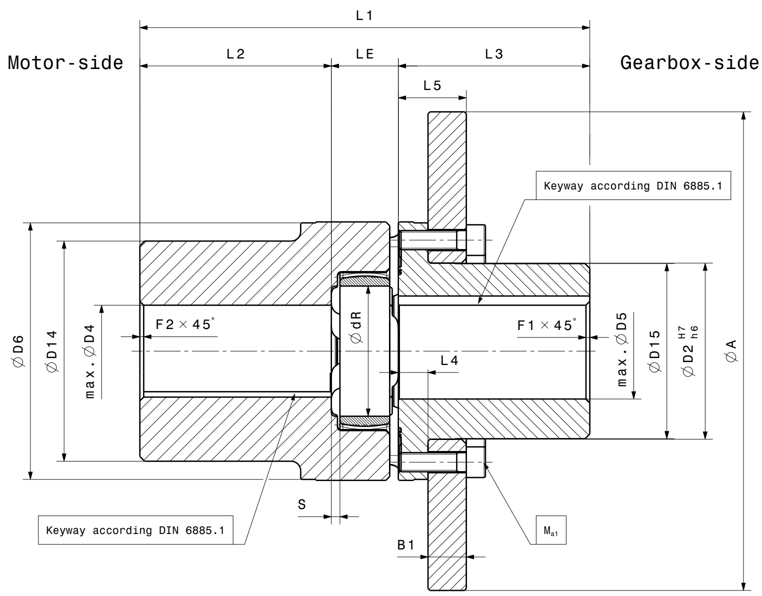
Type ALC-A	T_{kn} Nm	T_{kmax} Nm	n_{max} min^{-1}	ØD4 ØD5 pilot bore	ØD4 max	ØD5 max	ØD6	ØD14	ØdR	L1	L2	L3	LE	S	F1 F2 x45°	I_{ges} kgm^2	G_{ges} kg
38	325	650	8300	-	42	42	80	70	38	144	60	60	24	3	1,5	0,002	2,4
42	450	900	7000	-	50	50	95	80	46	166	70	70	26	3	1,5	0,004	3,8
48	525	1050	6400	-	55	55	105	90	51	178	75	75	28	3,5	2	0,008	5,8
55	685	1370	5600	18	65	65	120	105	60	200	85	85	30	4	2	0,014	7,7
65	940	1880	4950	18	70	70	135	115	68	235	100	100	35	4,5	2,5	0,027	11,5
75	1920	3840	4200	28	80	80	160	135	80	270	115	115	40	5	2,5	0,059	18,7
90	3600	7200	3350	38	100	100	200	160	100	315	135	135	45	5,5	3	0,152	32
100	4950	9900	3000	38	110	110	225	180	113	350	150	150	50	6	3	0,270	45
110	7200	14400	2600	48	125	125	255	200	127	375	160	160	55	6,5	3	0,471	62
125	10000	20000	2300	48	140	140	290	230	147	430	185	185	60	7	3	0,916	93

When selecting the coupling assembly, setting and maintenance instructions have to be observed. Other dimensions upon request. Individual balancing of coupling components available upon request. Axial fixing of coupling hub possible with set- screw above the key upon request. Weight and inertia indicated for max. bore ØD4 and Ø D5.

FLEXIBLE COUPLING

ALC-AS

M 1501 339 E-EN 2008-02



Brake Disc	Absolute dimension L5 in regard to coupling- and disc- size									
	38	42	48	55	65	75	90	100	110	125
Ø D1xB1	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5
Ø 200x20	29,5									
Ø 250x20	29,5	31,5	31,5							
Ø 315x20		31,5	31,5	35,5	35,5	38,5				
Ø 400x20				35,5	35,5	38,5	39,5			
Ø 500x30				45,5	45,5	48,5	49,5	54,5	55,5	59,5
Ø 630x30						48,5	49,5	54,5	55,5	59,5
Ø 710x30								54,5	55,5	59,5
Ø 800x30									55,5	59,5

Brake Disc	Weight, moment of inertia and max. allowed braking torque in regards to coupling- and disc size										
	38	42	48	55	65	75	90	100	110	125	
$TB_{r\,max}$ Nm	430	790	890	1000	1800	3840	7200	9900	14400	20000	
ØD1xB1	kg / kgm²	kg / kgm²	kg / kgm²	kg / kgm²	kg / kgm²	kg / kgm²	kg / kgm²	kg / kgm²	kg / kgm²	kg / kgm²	max rot. speed n_{max} in min-1
Ø 200x20	4,6										5200
	0,024										
Ø 250x20	7,4	7,4	7,1								4200
	0,060	0,060	0,060								
Ø 315x20		11,8	11,7	11,5	11,2	10,8					3300
		0,152	0,152	0,151	0,151	0,149					
Ø 400x20				19,0	18,7	18,3	17,3				2600
				0,394	0,394	0,392	0,388				
Ø 500x30				45,0	44,6	44,2	42,6	41,8	40,5	38,5	2100
				1,440	1,441	1,443	1,435	1,433	1,422	1,403	
Ø 630x30						71,3	69,8	68,9	67,6	65,7	1650
						3,643	3,633	3,633	3,616	3,601	
Ø 710x30								88,7	87,5	85,5	1450
								5,866	5,846	5,832	
Ø 800x30									112,6	110,7	1300
									9,444	9,432	

Type ALC-AS	T_{kn} Nm	T_{kmax} Nm	ØD4 ØD5 pilot bore	Ø D4 max	Ø D5 max	ØD6	ØD2 H7/ h6	Ø D14	Ø D15	Ø dR	L1	L2	L3	L4	LE	S	F1 F2 x45°	DIN 912 -10.9	Z	Ma1	I kgm² w/o brake disc	G kg w/o brake disc
38	325	650	-	42	30	80	50	70	49,5	38	144	60	60	9,5	24	3	1,5	M8	8	35	0,002	2,3
42	450	900	-	50	38	95	60	80	59,5	46	166	70	70	11,5	26	3	1,5	M8	12	35	0,004	3,5
48	525	1050	-	55	42	105	68	90	67,5	51	178	75	75	11,5	28	3,5	2	M8	12	35	0,007	5
55	685	1370	18	65	48	120	78	105	77,5	60	200	85	85	15,5	30	4	2	M10	8	69	0,012	7,5
65	940	1880	18	70	55	135	92	115	91,5	68	235	100	100	15,5	35	4,5	2,5	M10	12	69	0,025	11
75	1920	3840	28	80	65	160	106	135	105,5	80	270	115	115	18,5	40	5	2,5	M12	15	120	0,055	18
90	3600	7200	38	100	85	200	140	160	139,5	100	315	135	135	19,5	45	5,5	3	M16	15	295	0,146	32
100	4950	9900	38	110	95	225	156	180	155	113	350	150	150	24,5	50	6	3	M16	15	295	0,256	44
110	7200	14400	48	125	110	255	176	200	175	127	375	160	160	25,5	55	6,5	3	M20	15	580	0,454	61
125	10000	20000	48	140	125	290	204	230	203	147	430	185	185	29,5	60	7	3	M20	15	580	0,885	91

When selecting the coupling assembly, setting and maintenance instructions have to be observed. Other disc diameters upon request. Other dimensions upon request. Individual balancing of coupling components available upon request. Axial fixing of coupling hub possible with set- screw above the key upon request. Weight and inertia indicated for max. bore ØD4 and Ø D5.

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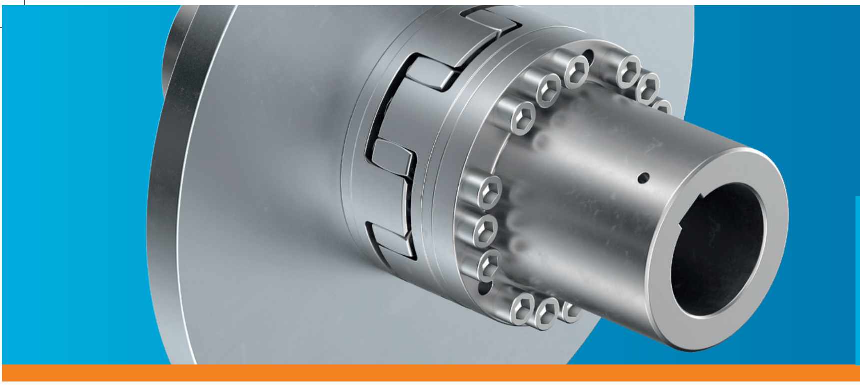
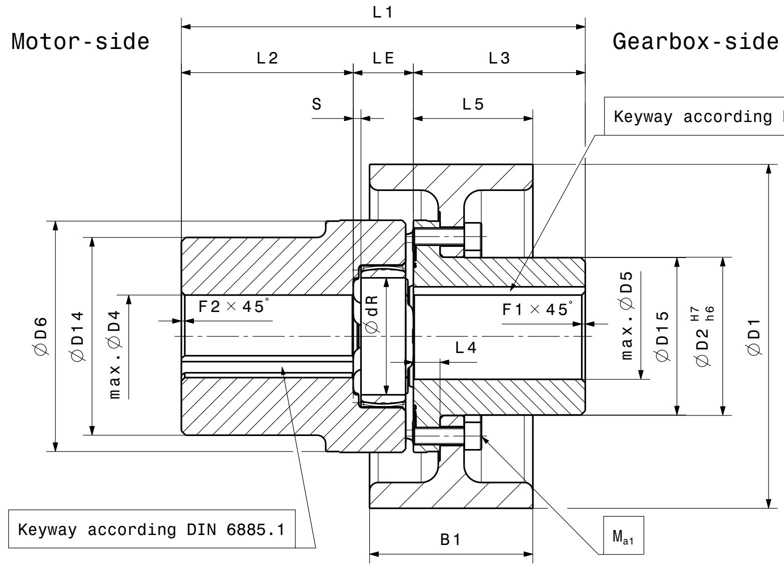


FLEXIBLE COUPLING
ALC-AT

M 1501 340 E-EN-2008-09



Brake Drum	Absolute dimension L5 in regards to coupling and drum size									
	38	42	48	55	65	75	90	100	110	125
ØD1xB1	L5	L5	L5	L5	L5	L5	L5	L5	L5	L5
Ø 160x60	44,5									
Ø 200x75	52,0	54,0	54,0	58,0						
Ø 250x95	60,5	65,5	65,5	69,5	69,5	72,5				
Ø 315x118		75,5	75,5	81,5	81,5	84,5	85,5			
Ø 400x150				96,5	96,5	99,5	100,5	105,5	106,5	
Ø 500x190						123,5	124,5	129,5	130,5	134,5
Ø 630x236							145,5	150,5	151,5	155,5
Ø 710x265									169,0	173,0

Brake Disc	Weight, moment of inertia and max. allowed braking torque in regards to coupling- and disc size										
	38	42	48	55	65	75	90	100	110	125	
$TB_{r\,max}$ Nm	430	790	890	1000	1800	3840	7200	9900	14400	20000	
ØD1xB1	kg kgm²	kg kgm²	kg kgm²	kg kgm²	kg kgm²	kg kgm²	kg kgm²	kg kgm²	kg kgm²	kg kgm²	max rot. speed n_{max} in min-1
Ø 160x60	3,4 0,016										4650
Ø 200x75	6,3 0,046	6,2 0,046	6,2 0,046	6,0 0,045							3750
Ø 250x95	12,4 0,141	12,3 0,141	12,2 0,141	12,1 0,140	11,9 0,140	11,6 0,139					3000
Ø 315x118		21,6 0,384	21,5 0,384	21,4 0,385	21,0 0,382	20,8 0,383	19,8 0,375				2350
Ø 400x150				40,5 1,182	40,2 1,182	39,8 1,180	38,8 1,175	38,2 1,173	37,0 1,167		1850
Ø 500x190						72,0 3,349	71,0 3,349	70,4 3,346	69,0 3,335	68,0 3,325	1450
Ø 630x236							139,0 10,336	138,0 10,321	136,0 10,280	135,0 10,280	1150
Ø 710x265									206,0 19,550	203,0 19,400	1050

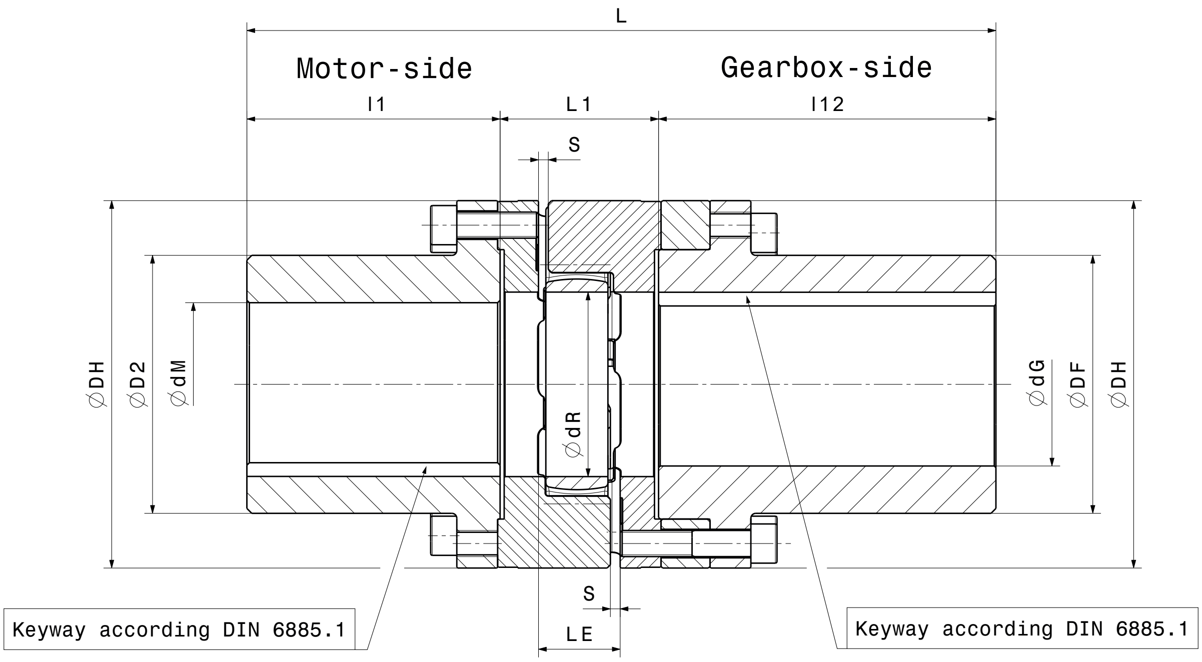
Type ALC-AT	T_{kn} Nm	T_{kmax} Nm	ØD4 ØD5 pilot bore	Ø D4 max	Ø D5 max	Ø D6	ØD2 H7/ h6	Ø D14	Ø D15	Ø dR	L1	L2	L3	L4	LE	S	F1 F2 x45°	DIN 912 -10.9	Z	Ma1	I kgm² w/o brake disc	G kg w/o brake disc
38	325	650	-	42	30	80	50	70	49,5	38	144	60	60	9,5	24	3	1,5	M8	8	35	0,002	2,3
42	450	900	-	50	38	95	60	80	59,5	46	166	70	70	11,5	26	3	1,5	M8	12	35	0,004	3,5
48	525	1050	-	55	42	105	68	90	67,5	51	178	75	75	11,5	28	3,5	2	M8	12	35	0,007	5
55	685	1370	18	65	48	120	78	105	77,5	60	200	85	85	15,5	30	4	2	M10	8	69	0,012	7,5
65	940	1880	18	70	55	135	92	115	91,5	68	235	100	100	15,5	35	4,5	2,5	M10	12	69	0,025	11
75	1920	3840	28	80	65	160	106	135	105,5	80	270	115	115	18,5	40	5	2,5	M12	15	120	0,055	18
90	3600	7200	38	100	85	200	140	160	139,5	100	315	135	135	19,5	45	5,5	3	M16	15	295	0,146	32
100	4950	9900	38	110	95	225	156	180	155	113	350	150	150	24,5	50	6	3	M16	15	295	0,256	44
110	7200	14400	48	125	110	255	176	200	175	127	375	160	160	25,5	55	6,5	3	M20	15	580	0,454	61
125	10000	20000	48	140	125	290	204	230	203	147	430	185	185	29,5	60	7	3	M20	15	580	0,885	91

When selecting the coupling assembly, setting and maintenance instructions have to be observed. Other drum diameters upon request. Other dimensions upon request. Individual balancing of coupling components available upon request. Axial fixing of coupling hub possible with set- screw above the key upon request. Weight and inertia indicated for max. bore ØD4 and Ø D5.

FLEXIBLE COUPLING

AFC-A

M 1501 337 E-EN-2007-09



Coupling Size		AFC-65	AFC-75	AFC-90	AFC-100	AFC-110	AFC-125	AFC-140	AFC-160
T_{kn}	Nm	940	1920	3600	4950	7200	10000	12800	19200
T_{kmax}	Nm	1880	3840	7200	9900	14400	20000	25600	38400
n_{max}	rpm	3450	3250	3000	2800	2600	2250	1800	1500
ØdG/ØdM pilot bore	mm	28	28	38	48	48	58	58	78
max. bore	mm	65	75	100	110	125	145	165	190
Ø DH	mm	135	160	200	225	255	290	320	370
Ø D2	mm	94	108	142	158	178	206	235	270
Ø DF	mm	92	108	140	158	176	206	235	270
Ø dR	mm	68	80	100	113	127	147	165	190
l1	mm	113.5	133	165.5	155	203.5	200.5	247	229
l12	mm	166	166.5	206.5	206.5	212.0	212.0	252.5	252.5
lG1	mm	150	150	190	190	195	195	235	235
L1	mm	65	75	82	97	103	116	128	146
L	mm	344.5	374.5	454	458.5	518.5	528.5	627.5	627.5
LE	mm	35	40	45	50	55	60	65	75
S	mm	4.5	5	5.5	6	6.5	7	7.5	9
Cylinder bolt	Qty.	12xM10x30	15xM12x40	15xM16x40	15xM16x50	15xM20x50	15xM20x60	15xM20x60	15xM24x70
DIN912-12.9		12xM10x60	15xM12x70	15xM16x70	15xM16x80	15xM20x80	15xM20x90	15xM20x90	15xM24x100
Ma	Nm	83	120	295	295	580	580	580	1000

When selecting the coupling assembly, setting and maintenance instructions have to be observed. Other disc diameters upon request. Other dimensions upon request. Individual balancing of coupling components available upon request. Axial fixing of coupling hub possible with set- screw above the key upon request. Weight and inertia indicated for max. bore ØdG and Ø dM.

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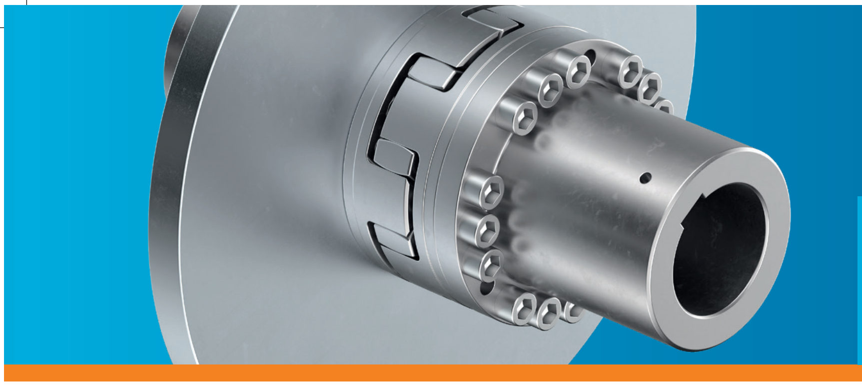
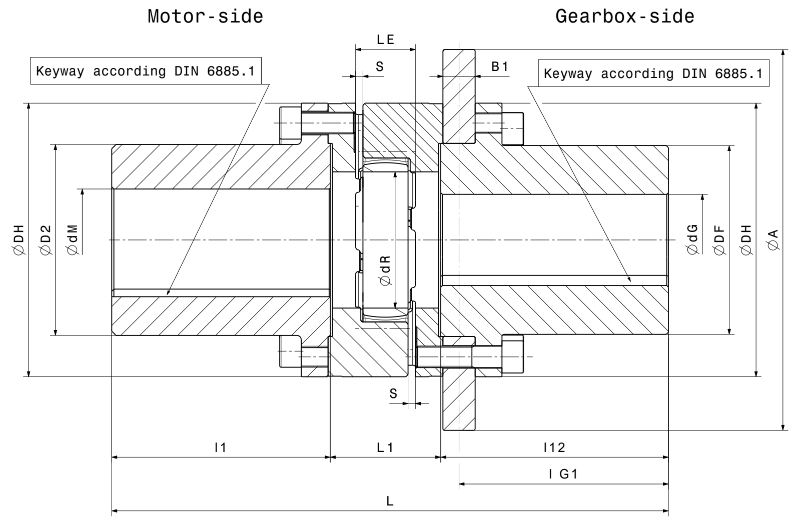


FLEXIBLE COUPLING
AFC-AS

M 1501 336 E-EN-2007-09



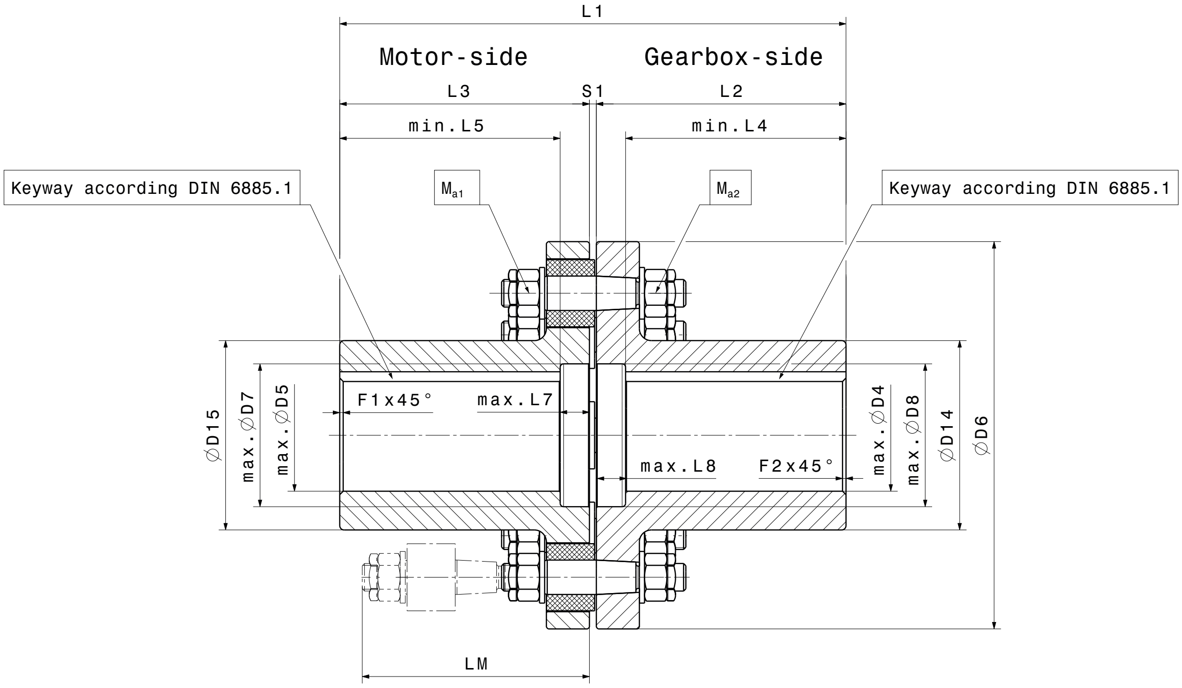
When selecting the coupling assembly, setting and maintenance instructions have to be observed. Other disc diameters upon request. Other dimensions upon request. Individual balancing of coupling components available upon request. Axial fixing of coupling hub possible with set-screw above the key upon request. Weight and inertia indicated for max. bore ØdG and Ø dM.

Coupling Size		AFC-65	AFC-75	AFC-90	AFC-100	AFC-110	AFC-125	AFC-140	AFC-160
T_{kn}	Nm	940	1920	3600	4950	7200	10000	12800	19200
T_{kmax}	Nm	1880	3840	7200	9900	14400	20000	25600	38400
n_{max}	rpm	3450	3250	3000	2800	2600	2250	1800	1500
Ø dG/Ø dM pilot bore	mm	28	28	38	48	48	58	58	78
max. bore	mm	65	75	100	110	125	145	165	190
Ø DH	mm	135	160	200	225	255	290	320	370
Ø D2	mm	94	108	142	158	178	206	235	270
Ø DF	mm	92	108	140	158	176	206	235	270
Ø dR	mm	68	80	100	113	127	147	165	190
l1	mm	113.5	133	165.5	155	203.5	200.5	247	229
l12	mm	166	166.5	206.5	206.5	212.0	212.0	252.5	252,5
lG1	mm	150	150	190	190	195	195	235	235
L1	mm	65	75	82	97	103	116	128	146
L	mm	344.5	374.5	454	458.5	518.5	528.5	627.5	627,5
LE	mm	35	40	45	50	55	60	65	75
S	mm	4.5	5	5.5	6	6.5	7	7.5	9
Cylinder bolt DIN912-12.9	Qty.	12xM10x30	15xM12x40	15xM16x40	15xM16x50	15xM20x50	15xM20x60	15xM20x60	15xM24x70
		12xM10x60	15xM12x70	15xM16x70	15xM16x80	15xM20x80	15xM20x90	15xM20x90	15xM24x100
Ma	Nm	83	120	295	295	580	580	580	1000
Ø Axb1 brake disc		* Design, weight m, moment of inertia J							
Ø 315x30	kg	30,7							
	kgm²	0,254							
Ø 355x30	kg	36							
	kgm²	0,393							
Ø 400x30	kg	42,3	50.5	64.4					
	kgm²	0,616	0.627	0,759					
Ø 450x30	kg	50,1	58.3	72					
	kgm²	0,969	0.978	1.104					
Ø 500x30	kg		67.1	80.8	94.3	113.4			
	kgm²		1.472	1.595	1.773	1.97			
Ø 560x30	kg		78.9	92.6	106.1	124.9	150.5		
	kgm²		2.297	2.417	2.6	2.776	3.268		
Ø 630x30	kg			108	121.5	140.3	165.9	208.2	
	kgm²			3.774	3.968	4.127	4.622	5.411	
Ø 710x30	kg			127.8	141.3	160.1	185.5	228	281
	kgm²			5.992	6.18	6.32	6.842	7.62	9.434
Ø 800x30	kg					185.3	210.9	253.2	306.2
						9.909	10.412	11.193	13.02

PIN COUPLING

PIN COUPLING
APC-A

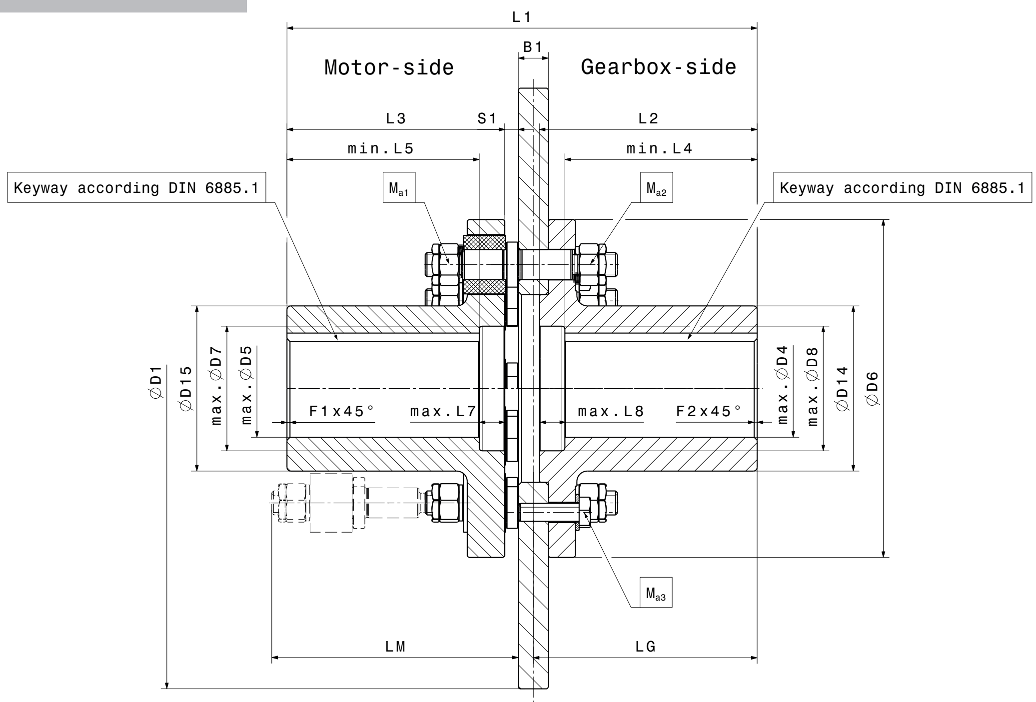
M 1501 330 E-EN-2009-05



Coupling Type		APC160A	APC200A	APC250A	APC315A	APC400A	APC500A
T_{KN}	Nm	270	550	1000	2000	3500	6500
T_{Kmax}	Nm	540	1100	2000	4000	7000	13000
n_{max}	min-1	4800	3900	3200	2500	2000	1600
pilot bore Ø D4+D5	mm	20	23	23	35	45	55
Max Ø D4	mm	48	55	65	90	100	120
Max Ø D5	mm	48	55	65	90	100	120
Ø D6	mm	150	185	225	280	335	410
Max Ø D7	mm	58	66	83	104	120	140
Max Ø D8	mm	58	66	83	104	120	140
Ø D14	mm	75	90	110	145	170	200
Ø D15	mm	75	90	110	145	170	200
L1	mm	170	224	294	311	355	386
L2	mm	83	110	145	153	175	190
L3	mm	83	110	145	153	175	190
Min L4	mm	73	95	128	130	145	160
Min L5	mm	73	95	128	130	145	160
Max L7	mm	10	15	17	23	30	30
Max L8	mm	10	15	17	23	30	30
LM	mm	85	110	130	155	175	190
S1	mm	4	4	4	5	5	6
F1 / F2x45°		2	2	2	2	2,5	2,5
Ma 1	Nm	20	30	40	80	120	160
Ma 2	Nm	25	45	80	160	240	320
I_{ges}	kgm2	0,016	0,047	0,113	0,328	0,778	1,965
G_{ges}	kg	7	14	24	42	70	115

PIN COUPLING
APC-AS

M 1501 362 E-EN 2009-05



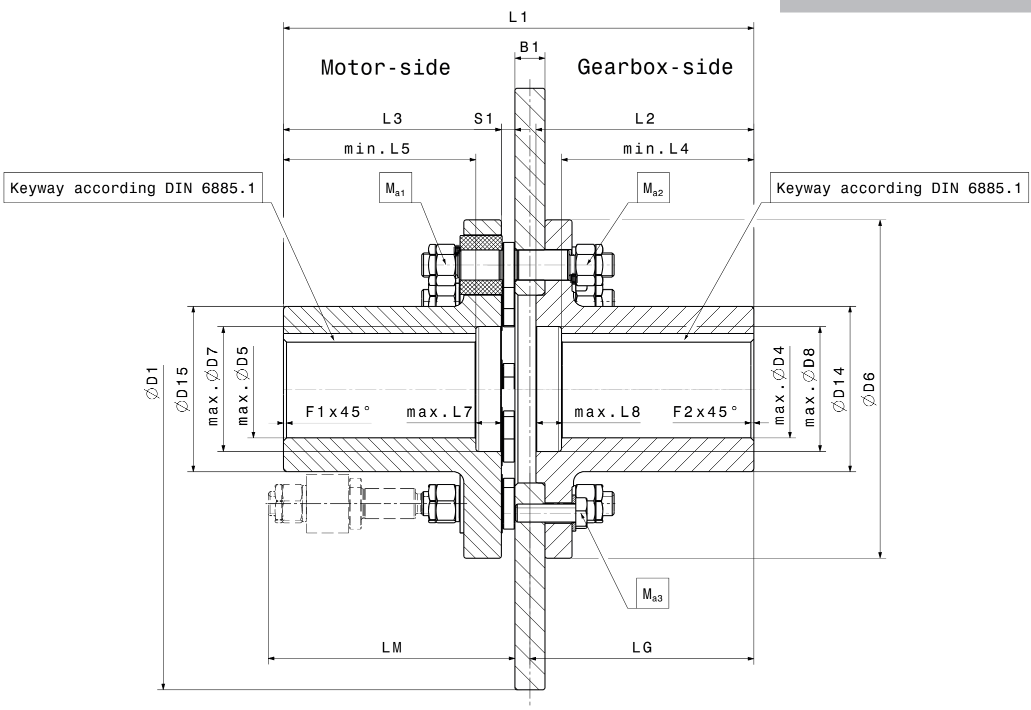
Coupling Type		APC 160	APC 200	APC 250	APC 315	APC 400	APC 500
T_{KN}	Nm	270	550	1000	2000	3500	6500
T_{Kmax}	Nm	540	1100	2000	4000	7000	13000
n_{max}	min-1	4800	3900	3200	2500	2000	1600
pilot bore Ø D4 + Ø D5	mm	20	23	23	35	45	55
Max Ø D4	mm	48	55	65	90	100	120
Max Ø D5	mm	48	55	65	90	100	120
Ø D6	mm	150	185	225	280	335	410
Max Ø D7	mm	58	66	83	104	120	140
Max Ø D8	mm	58	66	83	104	120	140
Ø D14	mm	75	90	110	145	170	200
Ø D15	mm	75	90	110	145	170	200
B1	mm	20	20	20	30	30	30
L1	mm	189	243	313	341	385	415
L2	mm	83	110	145	153	175	190
L3	mm	83	110	145	153	175	190
Min L4	mm	73	95	128	130	145	160
Min L5	mm	73	95	128	130	145	160
Max L7	mm	10	15	17	23	30	30
Max L8	mm	10	15	17	23	30	30
LG	mm	87	114	149	160	180	195
LM	mm	160	175	195	220	250	290
S1	mm	9	9	9	13	15	15
F1 / F2x45°	mm	2	2	2	2	2,5	2,5
Ma 1	Nm	20	30	40	80	120	160
Ma 2	Nm	25	45	85	150	320	600
Ma 3	Nm	49	49	85	210	210	410
I_{ges} *	kgm2	0,016	0,047	0,113	0,328	0,778	1,965
G_{ges} *	kg	7	14	24	42	70	115

* weight and inertia indicated for coupling with max. bore ØD4+ØD5

PIN COUPLING

APC-AS

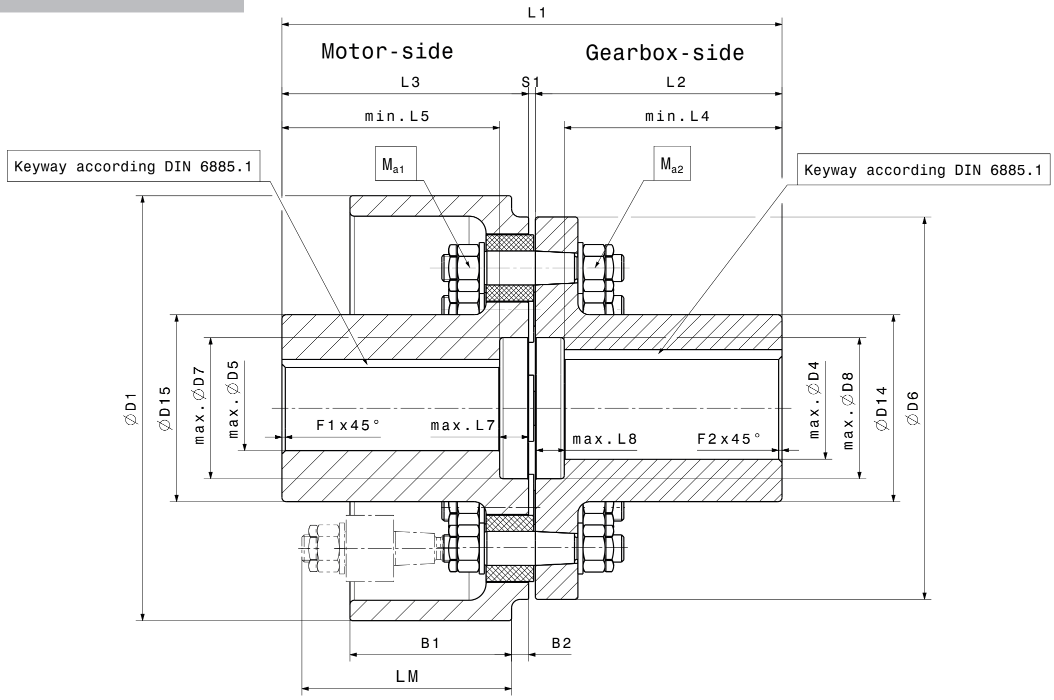
M 1501 362 E-EN 2009-05



Weigth and moment of inertia for coupling- and disc size							
Disc D1xB1		APC 160 AS	APC 200 AS	APC 250 AS	APC 315 AS	APC 400 AS	APC 500 AS
280x20	kg	17,9					
	kgm^2	0,119					
315x20	kg	20,4	28,0				
	kgm^2	0,176	0,225				
355x20	kg	23,8	31,3	43,6			
	kgm^2	0,269	0,318	0,443			
400x20	kg	27,9	35,5	47,8			
	kgm^2	0,419	0,468	0,593			
450x20	kg	33,2	40,7	53,0			
	kgm^2	0,656	0,706	0,830			
500x20	kg	39,0	46,6	58,9			
	kgm^2	0,988	1,037	1,162			
560x20	kg			66,7			
	kgm^2			1,714			
450x30	kg				87,3		
	kgm^2				1,544		
500x30	kg				96,1	137,2	
	kgm^2				2,041	3,176	
560x30	kg				107,8	149,0	
	kgm^2				2,870	4,004	
630x30	kg				123,2	164,4	62,8
	kgm^2				4,238	5,373	8,449
710x30	kg					184,2	82,6
	kgm^2					7,606	10,683
800x30	kg						107,7
	kgm^2						14,277

PIN COUPLING
APC-AT

M 1501 329 E-EN-2009-05



coupling type		APC160AT	APC200AT	APC250AT	APC315AT	APC400AT	APC500AT
T_{KN}	Nm	270	550	1000	2000	3500	6500
T_{Kmax}	Nm	540	1100	2000	4000	7000	13000
n_{max}	min^{-1}	4800	3900	3200	2500	2000	1600
pilot bore Ø D4 + D5	mm	20	23	23	35	45	55
Max Ø D4	mm	48	55	65	90	100	120
Max Ø D5	mm	48	55	65	90	100	120
Ø D1	mm	160	200	250	315	400	500
Ø D6	mm	150	185	225	280	335	410
Max Ø D7	mm	58	66	83	104	120	140
Max Ø D8	mm	58	66	83	104	120	140
Ø D14	mm	75	90	110	145	170	200
Ø D15	mm	75	90	110	145	170	200
B1	mm	60	75	95	118	150	190
B2	mm	8	10	10	15	0	0
L1	mm	170	224	294	311	355	386
L2	mm	83	110	145	153	175	190
L3	mm	83	110	145	153	175	190
Min L4	mm	73	95	128	130	145	160
Min L5	mm	73	95	128	130	145	160
Max L7	mm	10	15	17	23	30	30
Max L8	mm	10	15	17	23	30	30
LM	mm	160	175	195	220	250	290
S1	mm	4	4	4	5	5	6
F1 / F2x45°		2	2	2	2	2,5	2,5
Ma 1	Nm	20	30	40	80	120	160
Ma 2	Nm	25	45	80	160	240	320
I_{ges}	kgm2	0,025	0,075	0,202	0,608	1,755	4,884
G_{ges}	kg	9	17	30	54	97	167

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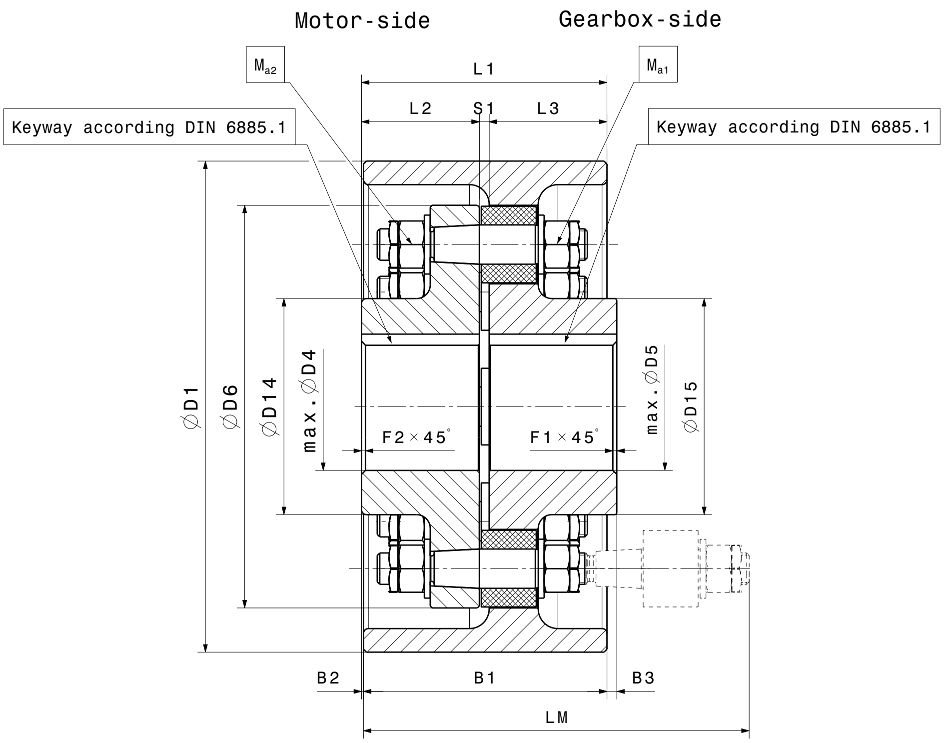
PIN COUPLING
APC-BT

M 1501 365 E-EN-2009-05



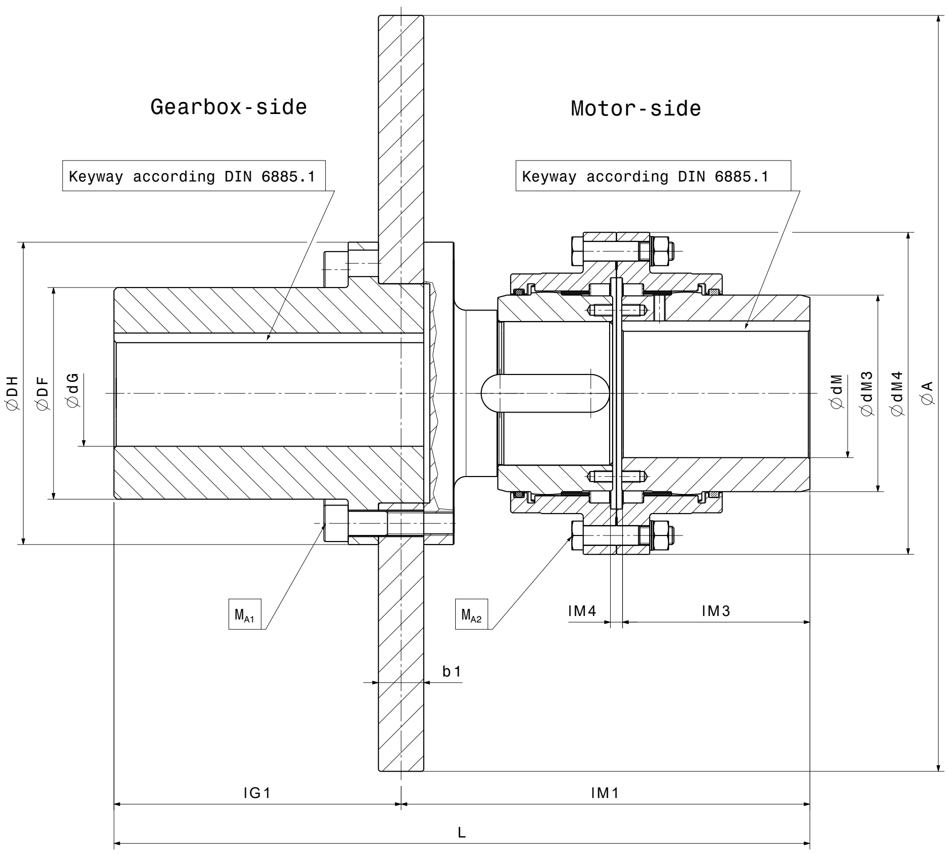
coupling type		APC160BT	APC200BT	APC250BT	APC315BT	APC400BT	APC500BT
T_{KN}	Nm	270	500	850	1850	2950	6000
T_{Kmax}	Nm	540	1000	1700	3700	5900	12000
n_{max}	min^{-1}	4800	3900	3200	2500	2000	1600
pilot bore Ø D4 + D5	mm	20	23	23	35	45	55
Max Ø D4	mm	48	55	65	90	100	120
Max Ø D5	mm	48	55	65	90	100	120
Ø D1	mm	160	200	250	315	400	500
Ø D6	mm	135	170	205	265	325	410
Ø D14	mm	75	90	110	145	170	200
Ø D15	mm	75	90	110	145	170	200
B1	mm	92	105	124	140	184	241
B2	mm	0	0	1	16	2	13
B3	mm	0	0	0	0	0	13
L1	mm	92	105	125	156	186	267
L2	mm	44	50	60	75	90	130
L3	mm	44	50	60	75	90	130
LM	mm	150	180	200	230	290	340
S1	mm	4	5	5	6	6	7
F1 / F2x45º	mm	1,5	2	2	2	2,5	2,5
Ma 1	Nm	20	30	40	80	120	160
Ma 2	Nm	25	45	80	160	240	320
I_{ges}	kgm2	0,032	0,086	0,168	0,657	1,962	5,703
G_{ges}	kg	7,8	14,5	25	47,5	85,5	167

NOTES

GEAR COUPLING

GEAR COUPLING
ZKES

M 1501 388 E-EN-10-2012



INFORMATION

- The coupling combination is designed for the drive with electric motors, medium impacts, irregular load such as conveyors, lifting systems, pumps, blowers etc.
- Finish bores according ISO tolerance H7 (DIN 7161 page 2). Other tolerances by arrangement.
- Keyway according DIN 6885 page 1. Keyway width tolerance P9.
- Axial securing of the coupling hub with threaded pin above keyway is possible on request.
- Balancing of the coupling components is possible on request.
  Necessary order data: balance quality, operating speed, keyway arrangement.
- It is recommended to check the tightening torque of MA1 and MA2 regularly.
- Wearing parts: brake disc.
  Grease filling should be checked according operating instructions, refill if necessary.
- Observe permitted shaft displacement, coupling alignment according operating instructions.

COUPLING COMBINATION ZKES WITH BRAKE DISC OFFERS FOLLOWING ADVANTAGES

- Brake disc change possible without axial displacement of the motor.
- Compact design, high torque, simple assembly.
- Low-wear interlocking and small tooth clearance.
- High temperature resistance.

DETERMINATION OF THE COUPLING SIZES

- Determine system torque and motor rated torque.
- Determine breaking torque and brake disc diameter.
- Coupling rated torque TKN must be higher than system torque and motor rated torque.
- Available breaking torque must be smaller than TKNmax.
- Examine if shaft diameter matches into hub connection.
- Check torque transmission of shaft connection and hub connection.
- Check max. permitted speed and max. permitted displacement.
- Check if flange diameter dM4 of selected coupling is suitable for the provided disc brake.

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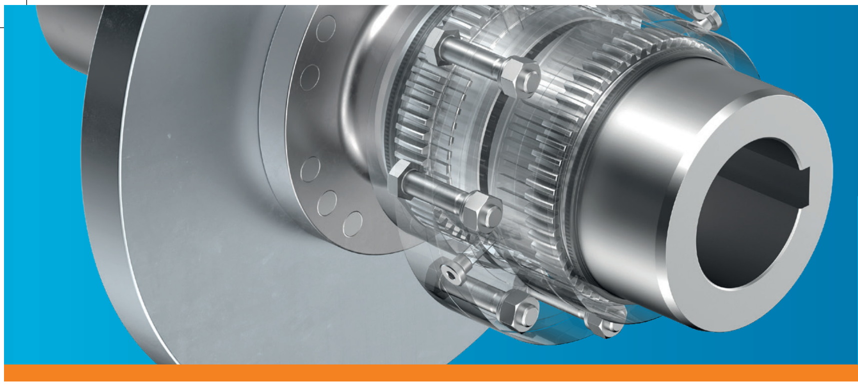


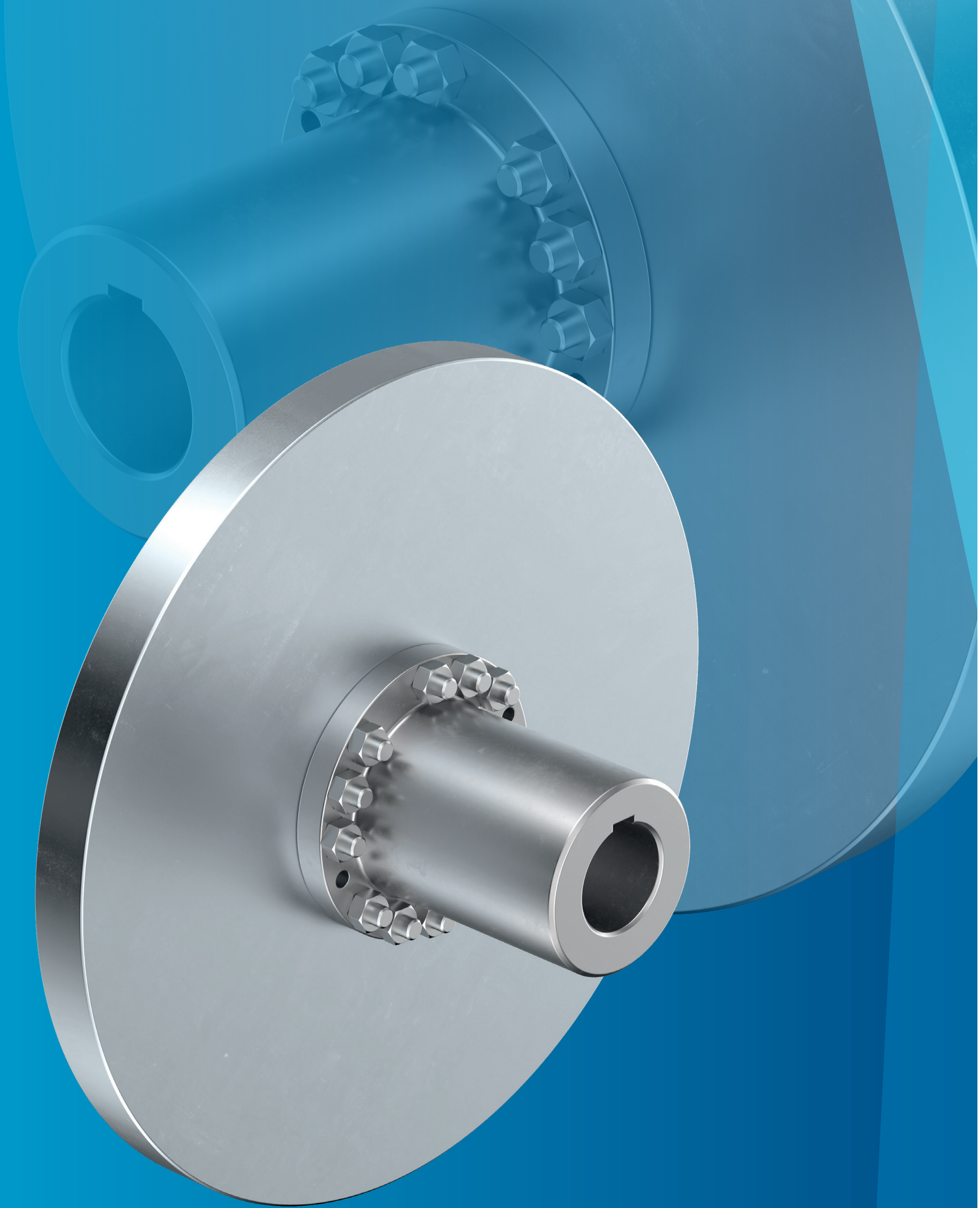
GEAR COUPLING
ZKES

M 1501 388 E-EN-10-2012

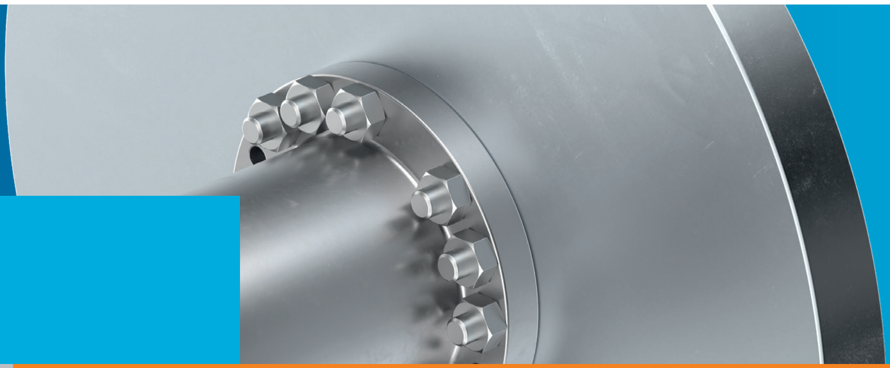
Coupling Type			ZKES 02	ZKES 04	ZKES 06	ZKES 08	ZKES 10	ZKES 13	ZKES 15	ZKES 17	ZKES 19
T_{KN}		Nm	500	1000	1850	3150	5000	8000	13000	18000	24000
T_{KNmax}		Nm	1000	1800	3150	5300	8500	10500	21500	24000	40000
n_{max}		1/min	3500	3000	2500	2500	2300	2300	2000	1800	1400
L		mm	260	300	387,5	460,5	482,5	507,5	552,5	644	708
Ø dG	pilot boring	mm	-	28	28	38	38	48	58	58	78
	max. boring	mm	50	65	75	100	100	110	145	165	190
ØDF		mm	72	92	108	140	140	158	206	235	270
ØDH		mm	110	135	160	200	200	225	290	320	370
lG1		mm	88	108	150	190	190	190	195	235	235
M_{A1} at μ=0,14		Nm	35	69	120	295	295	295	580	580	1000
Ø dM	Pilot boring	mm	-	-	28	38	38	48	58	80	90
	max. boring	mm	48	60	75	95	105	125	150	165	180
	max. boring at dyn. balancing	mm	42	54	70	85	95	115	140	155	170
Ø dM2		mm	67	86	108	130	151	179	213	232	261
Ø dM3		mm	86	108	129,5	159	184	220	255	282	312
Ø dM4		mm	117	152	178	213	240	280	318	347	390
lM1		mm	172	192	237,5	270,5	292,5	317,5	357,5	409	473
lM3		mm	80	85	106	124,5	133,5	141	164	186	225
lM4		mm	5	5	6	6	6	6	6	8	8
M_{A2} at μ=0,14		mm	12	25	45	80	80	125	125	125	190
Ø A x b1 brake disc			* design, weight m, moment of inertia J								
Ø 200x20		kg	11,5								
		kgm²	0,034								
Ø 250x20		kg	14,3	20,2							
		kgm²	0,070	0,091							
Ø 315x20		kg	18,7	24,8							
		kgm²	0,159	0,181							
Ø 355x20		kg		28,2							
		kgm²		0,271							
Ø 355x30		kg			52,0						
		kgm²			0,437						
Ø 400x30		kg			58,2	79,8					
		kgm²			0,658	0,775					
Ø 450x30		kg			65,9	87,4	104,4				
		kgm²			1,007	1,119	1,232				
Ø 500x30		kg			74,6	96,2	113,2	152,3			
		kgm²			1,497	1,611	1,723	2,090			
Ø 560x30		kg			86,3	107,8	125,0	164,0	223,3		
		kgm²			2,316	2,424	2,545	2,910	3,686		
Ø 630x30		kg				123,0	140,1	179,4	238,7	295,3	
		kgm²				3,774	3,887	4,269	5,040	5,875	
Ø 710x30		kg				142,9	159,9	199,3	258,6	315,1	415,1
		kgm²				5,988	6,100	6,495	7,261	8,076	10,067
Ø 800x30		kg							283,7	340,1	440,2
		kgm²							10,830	11,628	13,621

Special version an other disc diameter on request. All dimensions in mm.
* Weight and moment of inertia in reference to max. boring ØdG and ØdM
Design modifications reserved

NOTES

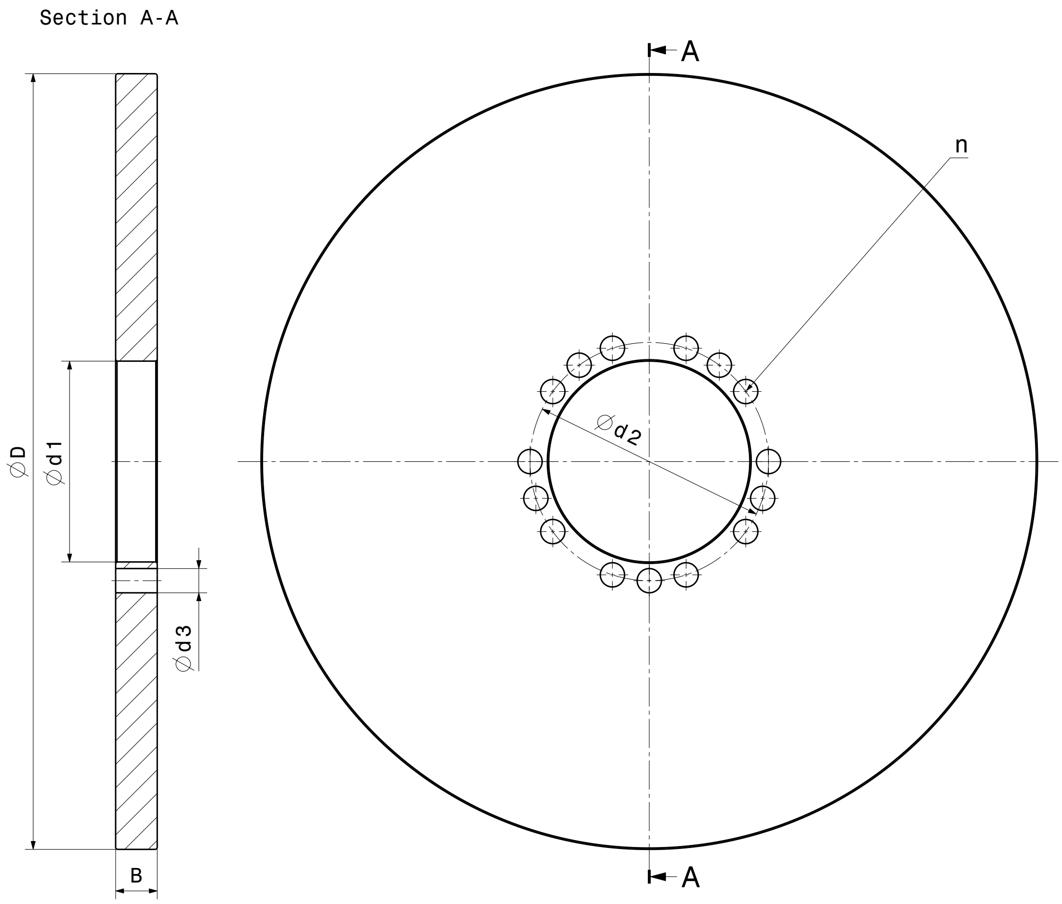


BRAKE DISCS



BRAKE DISCS
TYPE BS

M 1501 98 E-EN-2001-08



Diameter x Thickness D x B	f	Ø d2	Ø d3	Ø d4	n
200 x 20	20				
250 x 20	20				
315 x 30	30				
400 x 30	30				
500 x 30	30				
560 x 30	30				
630 x 30	30				
710 x 30	30				
800 x 30	30				
900 x 30	30				
1000 x 30	30				
1100 x 30	30				

Other dimensions (diameter, thickness or materials) upon request

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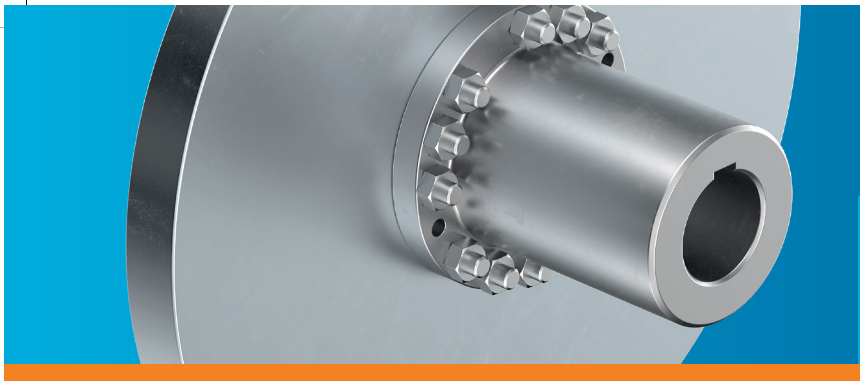
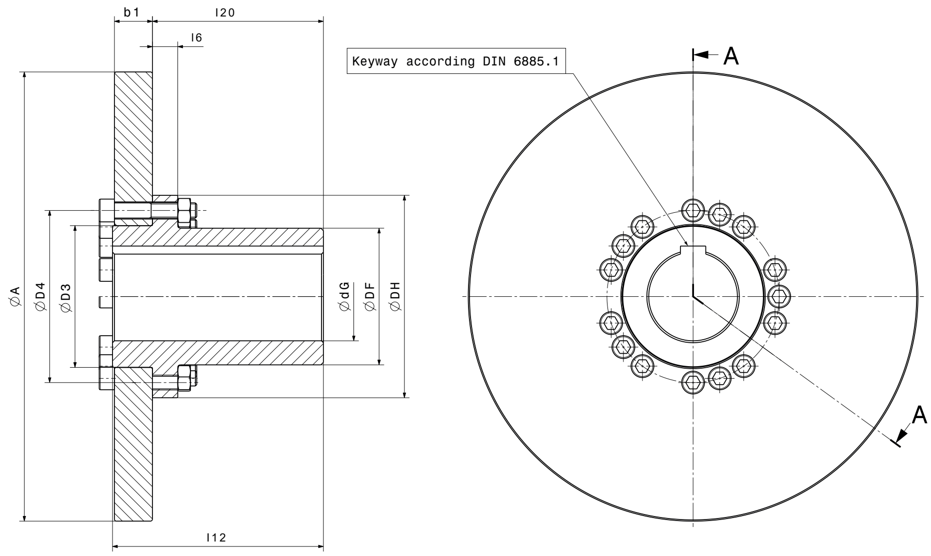


HUB
WITH BOLTED DISC

Section A-A



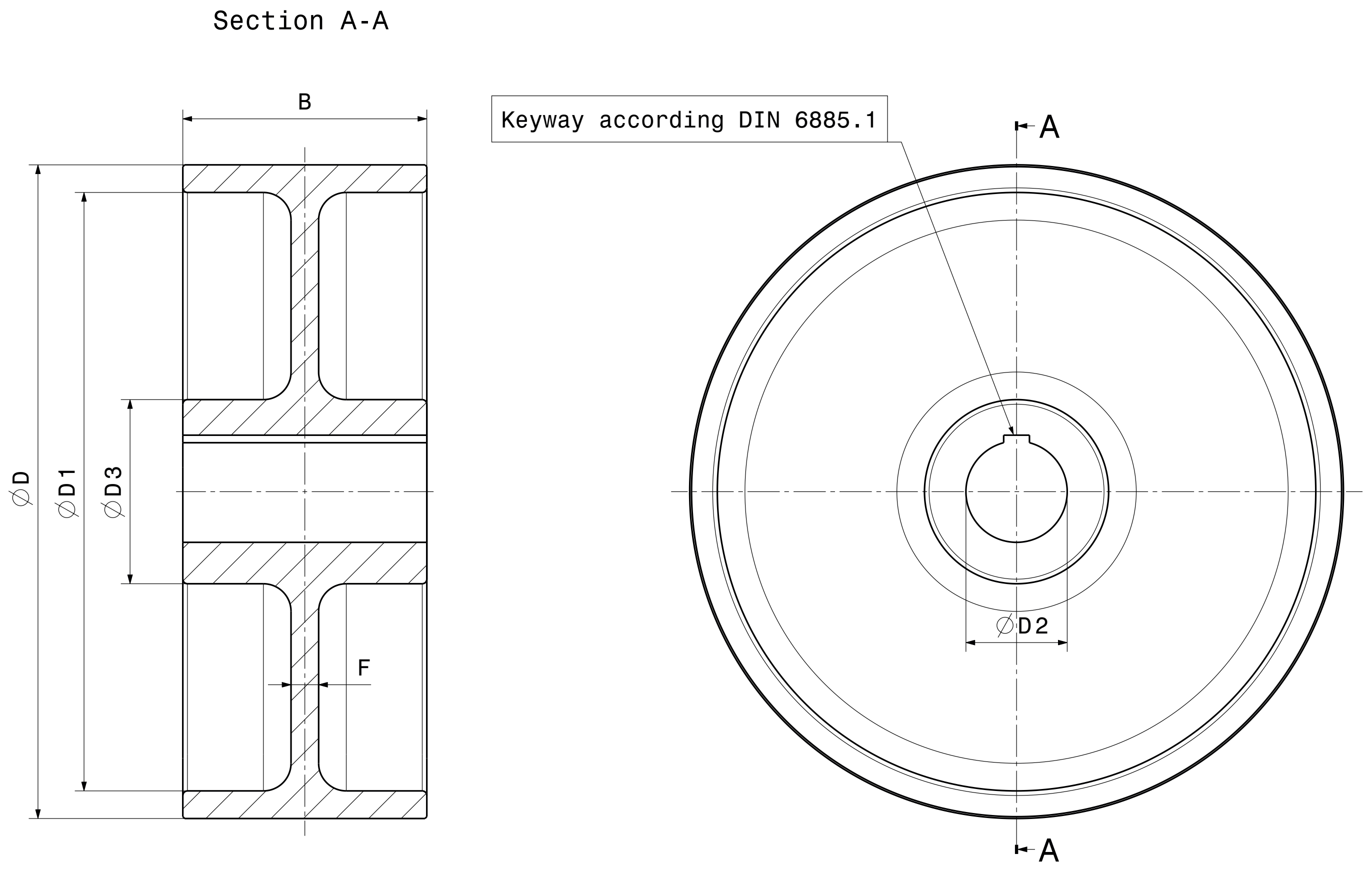
Type of Hub			N 1800	N 3800	N 9000	N 17000	N 24000	N 39000
max. braking torque of hub		Nm	1800	3800	9000	17000	24000	39000
max. rpm		1/min	4000	3200	2600	2000	1800	1400
Ø dG	pilot bore	mm	28	28	38	48	58	78
	max. final bore	mm	65	75	100	125	165	190
Ø DF_{h9}		mm	92	108	140	176	235	270
Ø DH		mm	135	160	200	255	320	370
Ø $D3_{H7/h6}$		mm	96	112	145	180	245	280
Ø D4		mm	116	136	172	218	282	325
l6		mm	15	20	20	25	30	34
l12		mm	166	166,5	206,5	212	252,5	252,5
l20		mm	135	135	175	180	220	220
n cylinder bolts DIN 912-10.9		pcs	12xM10x60	15xM12x65	15xM16x70	15xM20x80	15xM20x90	15xM24x100
bolt tightening torque		Nm	69	120	295	580	580	1000

Brake Disc Ø A x b1		Weight & Inertia					
Ø 315 x 30	kg	21,5					
	Kgm²	0,231					
Ø 355 x 30	kg	26,5					
	Kgm²	0,370					
Ø 400 x 30	kg	32,8	34,4	39,2			
	Kgm²	0,594	0,597	0,600			
Ø 450 x 30	kg	40,6	42,2	46,8			
	Kgm²	0,947	0,948	0,969			
Ø 500 x 30	kg		51,0	55,6	63,2		
	Kgm²		1,442	1,460	1,542		
Ø 560 x 30	kg		62,8	67,4	74,7		
	Kgm²		2,267	2,282	2,348		
Ø 630 x 30	kg			82,8	90,0	112,4	
	Kgm²			3,640	3,700	4,077	
Ø 710 x 30	kg			102,6	109,9	132,2	144,8
	Kgm²			5,857	5,892	6,287	6,655
Ø 800 x 30	kg				135,1	157,4	169,9
	Kgm²				9,481	9,859	10,208

BRAKE DRUM

BRAKE DRUM
DIN 15 431

M 1501 94 E-EN-2001-10

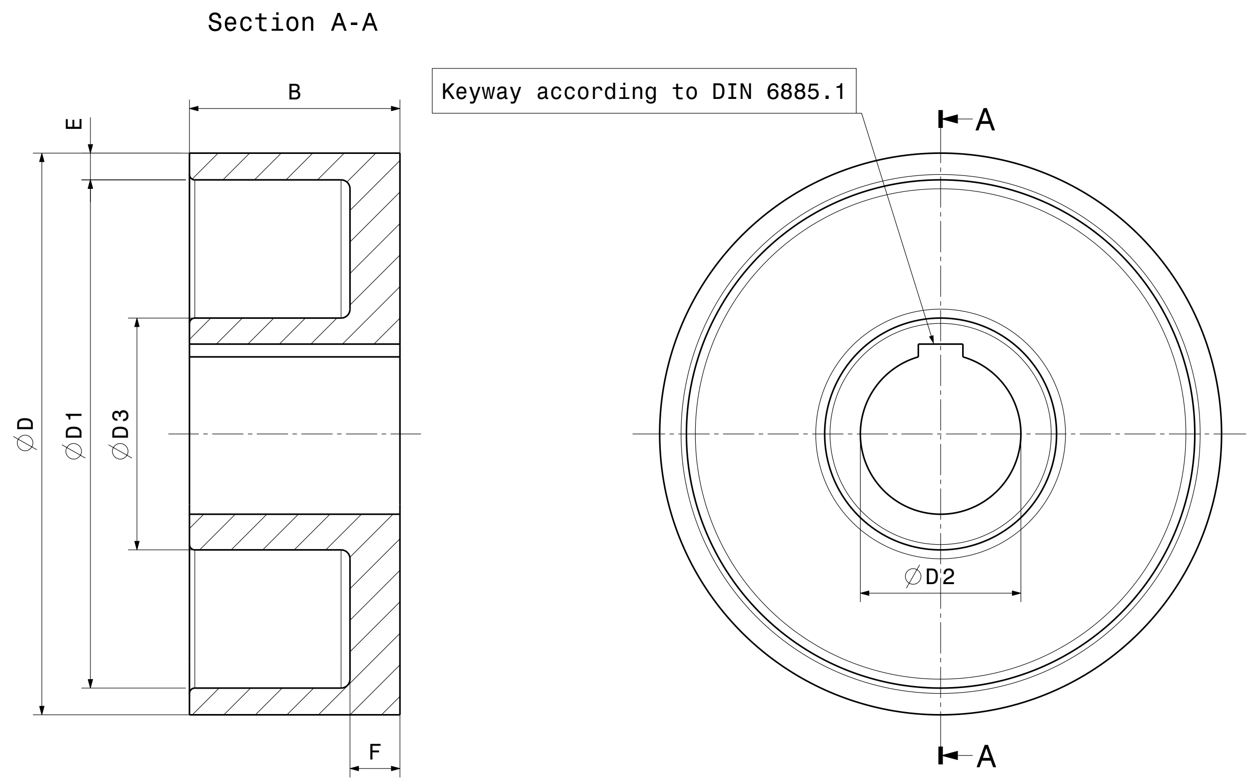


D x B mm	dyn. balancing req. from r.p.m.	Ød2 trial bore mm	max. final bore Ød2			Ø d3	Ø d1	e	f	weight at trial bore kg		inertia kg m²	
			GG mm	GGG GS mm	St 52-3 mm					GG	St	GG	St
Ø 200x75	2500	20	50	55	55	80	176	12	12	8,1	8,7	0,04357	0,04792
Ø 250x95	2000	25	62	68	68	100	220	15	15	16,0	17,3	0,13183	0,15213
Ø 315x118	1570	30	80	90	90	130	285	15	15	28,3	30,7	0,40066	0,44072
Ø 400x150	1240	35	90	100	100	145	365	17,5	17,5	51,0	55,2	1,1311	1,24421
Ø 500x190	990	50	100	110	110	160	460	20	20	87,7	95,0	3,2467	3,57137
Ø 630x236	790	50	110	120	120	180	580	25	25	165,4	179,1	9,288	10,2168
Ø 710x265	700	70	125	135	135	200	650	30	30	241,4	261,4	16,733	18,4063

Other dimensions upon request.

BRAKE DRUM
DIN 15 431

M 1501 95 E-EN-2001-10

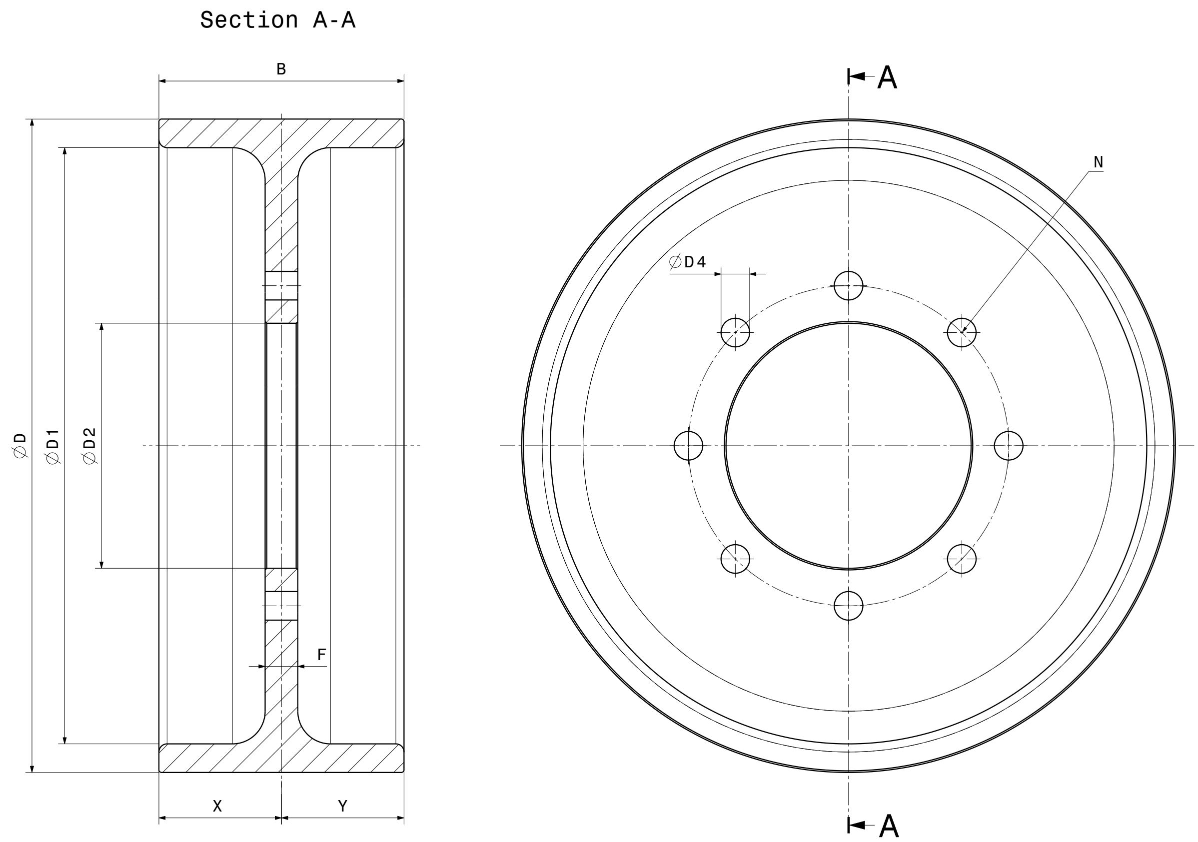


D x B mm	dyn. balancing req. from r.p.m.	Ø d_2 trial bore mm	max. final bore Ød_2			Ø d3	Ø d1	e	f	weight at trial bore kg		inertia kg m²	
			GG mm	GGG GS mm	St 52-3 mm					GG	St	GG	St
Ø 200x75	2500	20	50	55	55	80	176	12	12	8,1	8,7	0,0436	0,0479
Ø 250x95	2000	25	62	68	68	100	220	15	15	16,0	17,3	0,1318	0,1521
Ø 315x118	1570	30	80	90	90	130	285	15	28	33,2	35,8	0,4233	0,4574
Ø 400x150	1240	35	90	100	100	145	365	17,5	60	78,1	84,6	1,6248	1,7564
Ø 500x190	990	50	100	110	110	160	460	20	20	87,7	95,0	3,2467	3,5714
Ø 630x236	790	50	110	120	120	180	580	25	25	165,4	179,1	9,2880	10,2168
Ø 710x265	700	70	125	135	135	200	650	30	30	241,4	261,4	16,7330	18,4063

Other dimensions upon request.

BRAKE DRUM
DIN 15 431

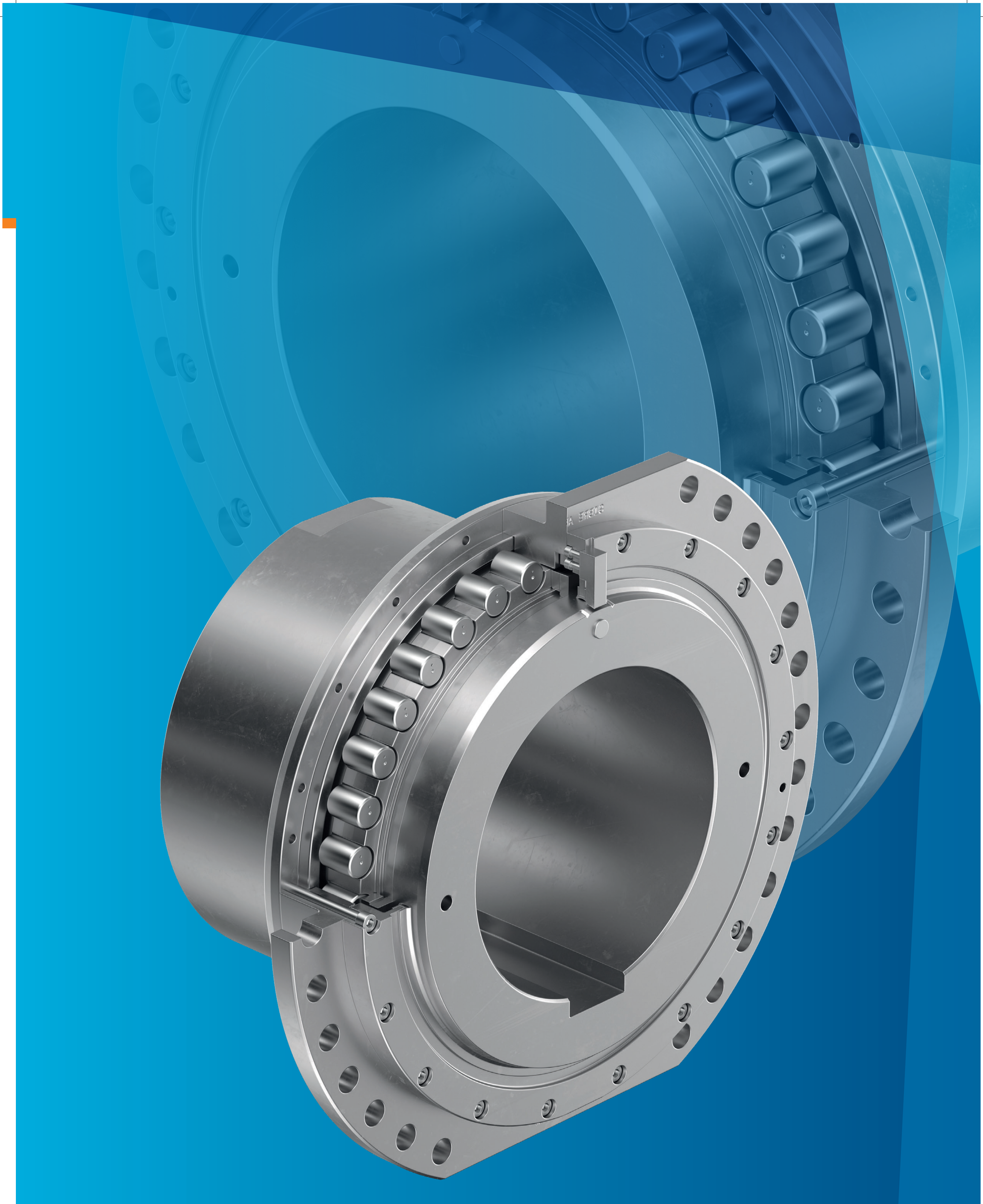
M 1501 135 E-EN-2016-10



D x B mm	dyn. Balancing req. from rpm	Ø D_1	ØD_2 trial bore mm	ØD_2	ØD_3	ØD_4	n	X	Y	E	F	weight at trial bore kg (steel)	inertia kgm² (steel)
Ø 200x75	2500	176	20							12	12	8,7	0,04792
Ø 250x95	2000	220	25							15	15	16,8	0,15213
Ø 315x118	1570	285	30							15	18	28,5	0,44072
Ø 400x150	1240	365	35							17,5	20	51,8	1,24421
Ø 500x190	990	460	50							20	22	91,7	3,57137
Ø 630x236	790	580	50							25	26	173,8	10,2168
Ø 710x265	700	650	70							30	30	261,4	18,4063

Other dimensions upon request.

NOTES



DRUM COUPLING

DRUM COUPLING
ABC-V

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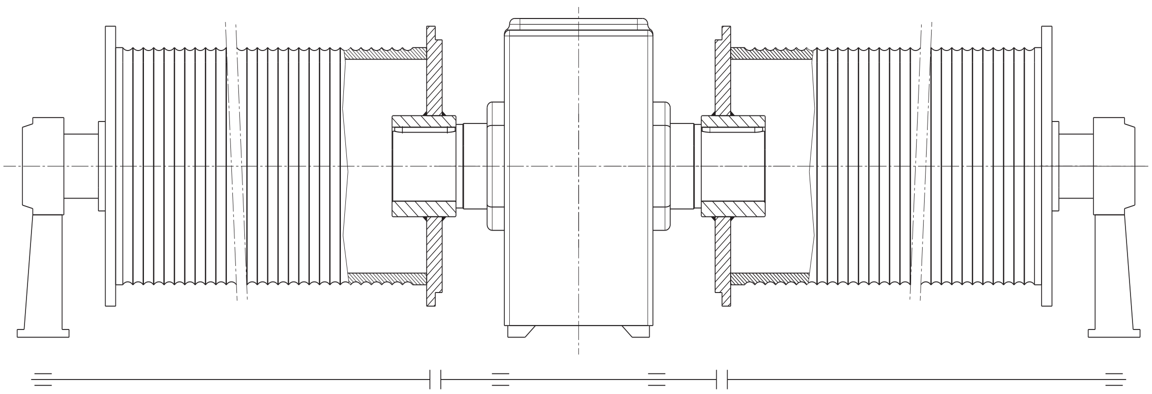
APPLICATION

The Sibre ABC-V drum coupling of the series is especially designed for the use in rope drum drives.
It is used for the transfer of medium and high torques as rope drum couplings in crane hoisting gear, conveyance, stackers, ship unloaders, container cranes as well as in heavy, rough smelting works.
Torques of up to 1025 kNm and radial loads of up to 550 kN can be transferred with a maximum coupling diameter of 1025 mm.

The design of the SIBRE drum coupling is performed on the basis of the steel-iron-guidelines (Stahl-Eisen-Betriebsblatt) SEB 666 212.
The exchangeability regarding connection dimensions with series on the market is ensured.
The following drawings 1 and 2 show the typical arrangement of a rope drum drive in a crane installation.

Drawing 1 shows the direct displacement of the rope drum over a rigid hub on the drive output shaft. This unrecommended construction leads to a structurally undefined suspension.
In practice such a connection requires a difficult to achieve precision in assembly and alignment.

Misalignment during assembly or dending of the foundation with this hub causes significant additional loads in the drive shaft, which in turn leads to damage in the drive gearing or in the bearings, or to fatigue failure on the shaft.



Drawing 1: Double drum drive with quadruple supported shaft (structurally undefined case).

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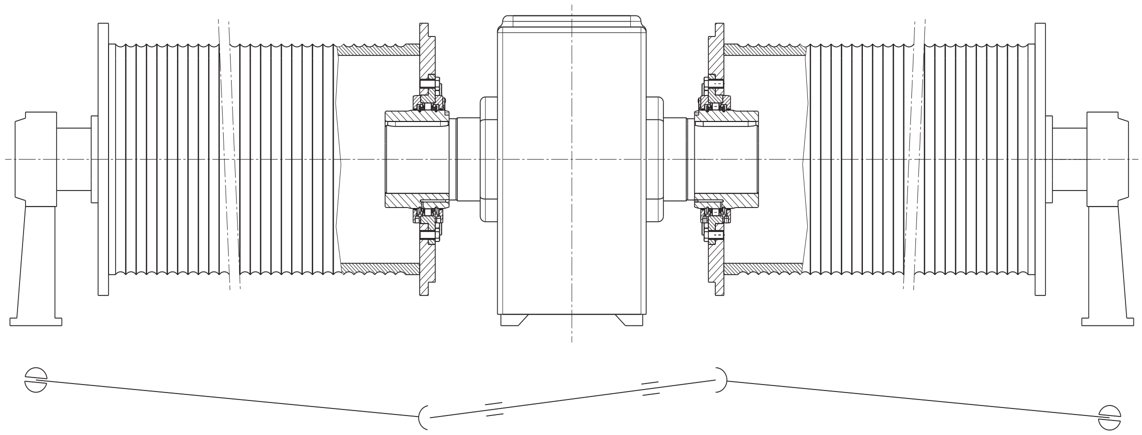
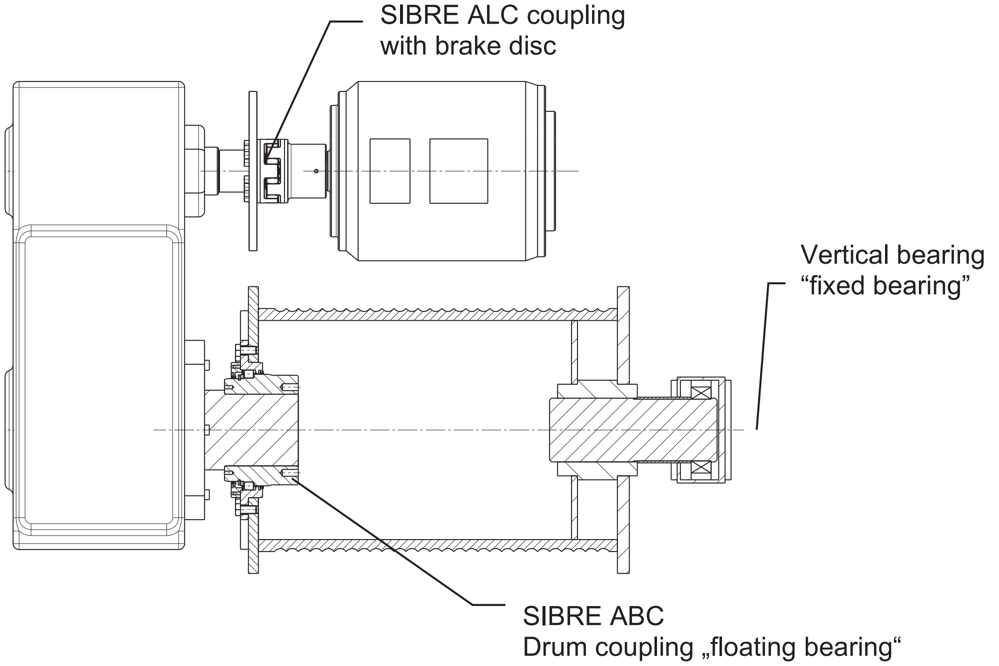
Drawing 2 shows the standard support of a rope drum via a drum coupling on the gearbox output shaft. The drum coupling is working as a joint, that also allows limited axial displacements. As a result, the connection is structurally defined and the side load on the drive shaft is significantly reduced.



Drawing 2: Double drum drive with drum couplings. The driven shaft and the rope drum are supported in a structurally defined way.

Drawing 3 shows the use of a drum coupling in a single drum drive. The drum coupling is designed as a loose bearing with length compensation. The axial forces accured due to the inertial forces and rope flow have to be absorbed by the oppositely lying vertical bearing of the rope drum. The vertical bearing is usually constructed with a spherical roller bearing as a “fixed bearing”.



Drawing 3: Single drum drive

DRUM COUPLING

ABC-V

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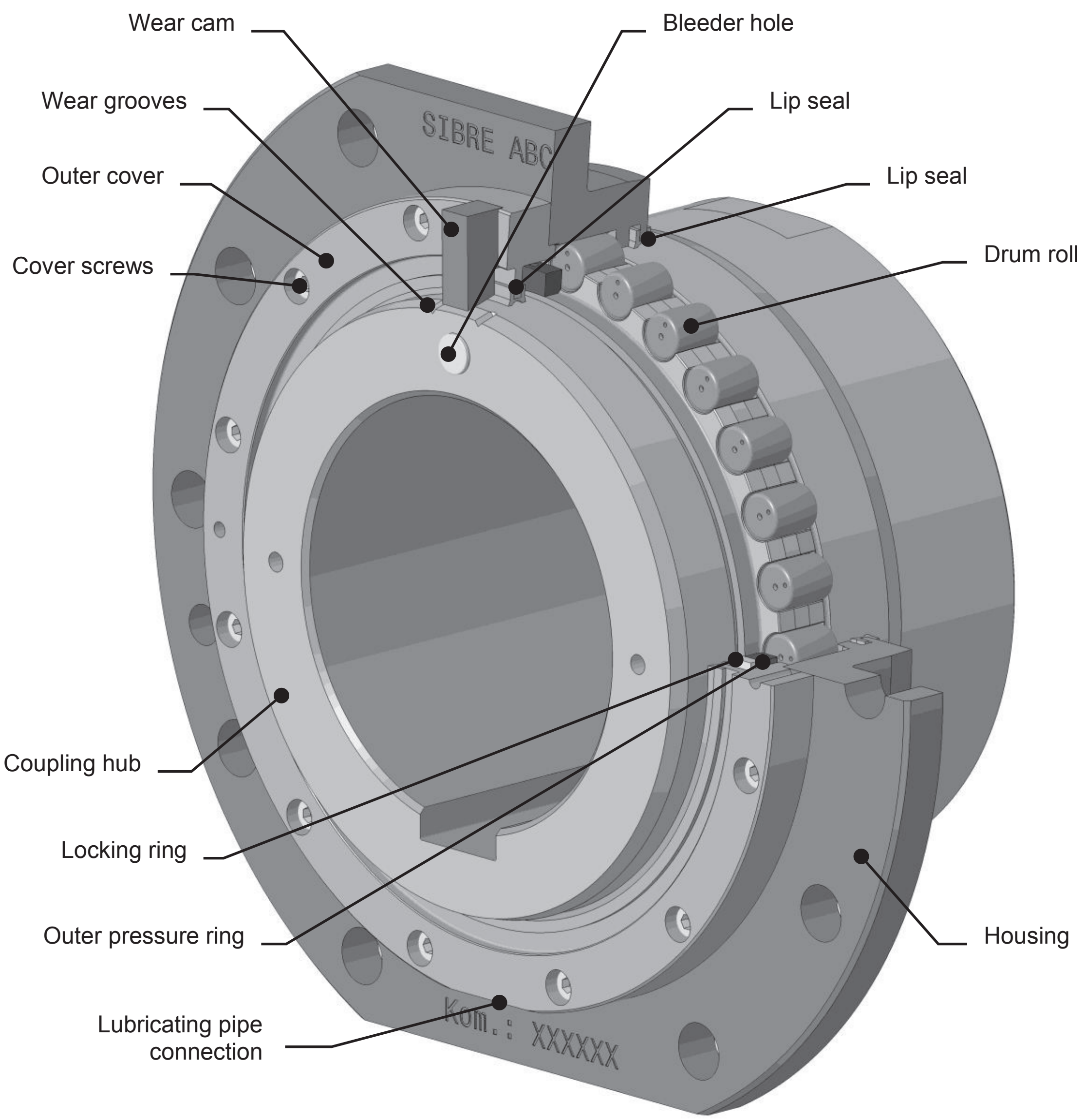
DESCRIPTION AND CHARACTERISTICS



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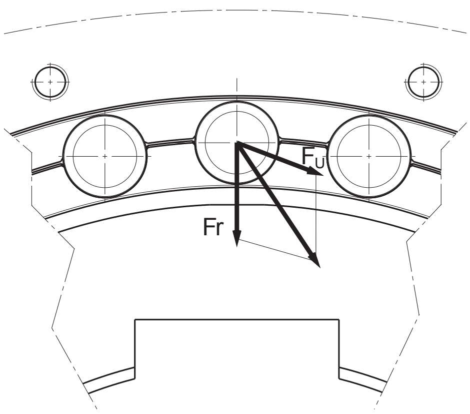
The drum coupling largely consists of a hub part and a housing part, fitted above each other axially. Drill holes are arranged in the parting plane throughout the diameter of both parts. The power transmission of the hub part onto the housing part occurs with positive locking. Hardened barrel rollers are fit into the drill holes, which are formed from the two circular gearings, as power transmission elements. The sealing of the coupling is achieved through double-sided covers with lip seals. This prevents escape of lubricant from the coupling, as well as intrusion of dirt from outside. The semicircular gearing of the hub over the outer diameter is crowned.
Together with the arched drum roll it is possible for the hub to oscillate relative to the housing part, therefore angular and axial displacement can be compensated.
The coupling housing has an attachment flange which is fixed to the front flange of the drum. The transmission between the coupling and the drum roll occurs partially by friction torque, and partially by positive locking by the oppositely lying camming surfaces on the housing.
Grade 10.9 high-tension bolts are to be used as connection bolts.
The coupling is built with visual wear and position display. Using a wear cam on the housing part and wear grooves on the hub part, the wear on the coupling gearing can be easiliy checked from the side of the coupling.

The wear cam also can be used for checking the axial position of the coupling housing to the coupling hub.
The drum couplings of the ABC-V series, that transfers high radial loads in addition to high torques, are characterized by the following features:

- Compensation of angular displacement up to +/- 1°
- Depending on the size of the coupling axial shifting from up to +/- 4mm to up to +/- 10mm.
  The max. angular displacement and max. axial shifting must not be fully exploited simultaneously (see information in the OM).
  The standard drum coupling is not suitable fortransfer of axial loads.
- Due to the adjustability of the arched drum roll the sliding within the gearing at an angular displacement is limited, which significantly reduces wear due to relative movements.
- A high overload safety is the result of the robust design.
- The power transmission between the coupling hub, the drum roll, and the coupling housing additionally leads to smoothed tooth flanks. There is a strain hardening of the material structure which improves the wear resistance.
- Due to the convex and concave fit of the drum rolls to the coupling hub and the coupling's housing, the forces are spread across a large contact surface which leads to favourable compressive stresses (drawing 4).



Drawing 4

DRUM COUPLING
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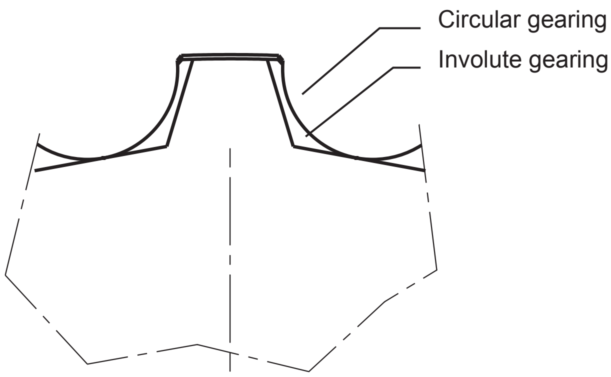
The circular gearings of the drum coupling have a much more favourable tooth flow load compared to the involute gearing of a tooth coupling. Due to the wide tooth base of the drum coupling the tooth flow bending stress is much lower than a comparable tooth coupling (see drawing 5).



Drawing 5

CALCULATORY BASES / DIMENSIONING

Required design parameters:
- max. drive torque $T_{A\,max}$ [Nm]
- max. radial load $F_{R\,max}$ [N]
- Dimensions of the gear box output shaft

MAX. DRIVE TORQUE $T_{A\,MAX}$

The determined torque $T_{A\,max}$, intended to be transferred by the coupling due to the installed or used power must be less than the max. torque $T_{k\,max}$ of the drum coupling (according to the dimension sheet).

(1) $$T_{A\,max} = \frac{P_i \cdot 9550}{n_{Tr}} \cdot C_{erf} \leq T_{k\,max}$$

or

(2) $$T_{A\,max} = \frac{P_e \cdot 9550}{n_{Tr}} \cdot C_{erf} \leq T_{k\,max}$$

or

(3) $$T_{A\,max} = S_{Tr} \cdot \frac{D_{Tr}}{2} \cdot C_{erf} \leq T_{k\,max}$$

P_i	= max. installed drive power	[kW]
P_e	= max. used power	[kW]
S_{Tr}	= rope tensile force at the rope drum (including load of the suspension elements)	[N]
n_{Tr}	= rotation speed of the rope drum	[1/min]
D_{Tr}	= diameter to the drum roll in respect of the midpoint of the rope	[m]
C_{erf}	= required operating coefficient for engine groups by operating time group and load collective	[-]

Table 1 operating coefficient C_{erf}

Engine group		C_{erf} *)
DIN 15020	FEM 1.001	
1Bm	M1; M2; M3	1.25
1Am	M4	1.25
2m	M5	1.40
3m	M6	1.60
4m	M7	1.80
5m	M8	2.00

*) To increase the lifetime of the coupling concerning the wear especially at crane systems with high lift heights and high speeds, e.g. cable cranes but also production cranes working in three shifts it is recommended to raise the operating coefficient Cerf seen in table 1 by 20% up to 40%.

(4) $$P_e = \frac{S_{Tr} \cdot V_{Tr}}{60000}$$

V_{Tr} = rope speed at the drum roll in respect to the midpoint of the rope [m/min]

(5) $$V_{Tr} = D_{Tr} \cdot \pi \cdot n_{Tr}$$

MAX. RADIAL LOAD $F_{R\ MAX}$

The support of the rope drum occurs by the vertical bearing (fixed bearing) on one side, and by the drum coupling (floating bearing) on the other side.
The radial load FR max is the proportion of the rope tensile force that has to be absorbed by the drum coupling. The rope tensile force in turn includes the max. payload as well as the load of the suspension elements.

(6) $$S_{Tr} = \frac{(m_1 + m_2) \cdot 9.81}{i_F \cdot \eta_F}$$

m_1 = max. payload [kg]

m_2 = dead weight of the suspension elements [kg]

i_F = ratio of reeving

$$i_F = \frac{\text{Number of load bearing rope lines}}{\text{Number of rope lines arriving on the drum}}$$

η_F = efficiency of reeving (table 2)

Table 2 efficiency ηF

iF	Efficieny ηF	
	Slide bearing	Roller bearing
2	0.92	0.97
3	0.90	0.96
4	0.88	0.95
5	0.86	0.94
6	0.84	0.93
7	0.83	0.92
8	0.81	0.91

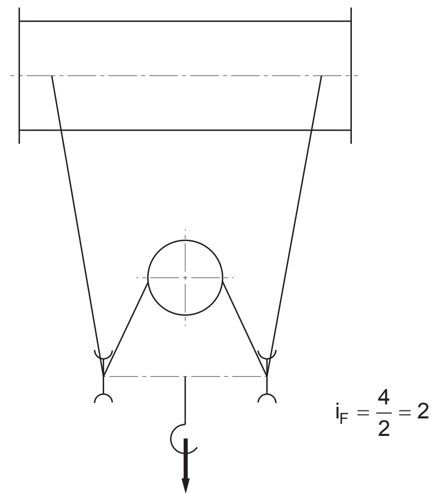
CALCULATION OF RADIAL LOAD $F_{R\,MAX}$ WITH MULTIPLE ROPE LINES TO THE ROPE DRUM

(7) $$F_{R\,max} = \frac{S_{Tr}}{2} + \frac{m_{Tr} \cdot 9.81}{2}$$

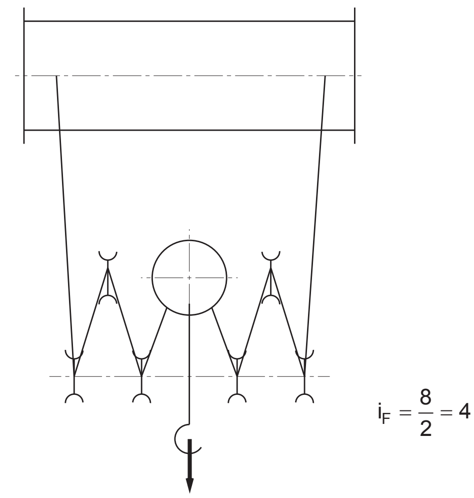
S_{Tr} = rope tensile force at the rope drum (including load of the suspension elements) [N]

m_{Tr} = dead weight of the rope drum [kg]

Case study drawing 6:
4 load bearing rope lines
2 rope lines arriving on the drum



Case study drawing 7:
8 load bearing rope lines
2 rope lines arriving on the drum



CALCULATION OF RADIAL LOAD F_{RMAX} WITH ONE ROPE LINE TO THE ROPE DRUM

(8) $$F_{R\,max} = \left[S_{Tr} \cdot \left(1 - \frac{b}{l} \right) \right] + \frac{m_{Tr} \cdot 9.81}{2}$$

S_{Tr} = rope tensile force at the rope drum (including load of the suspension elements) [N]

m_{Tr} = dead weight of the rope drum [kg]

b = minimum distance from rope to middle of drum roll [mm]

l = distance between middle of fixed bearing to middle of drum roll [mm]

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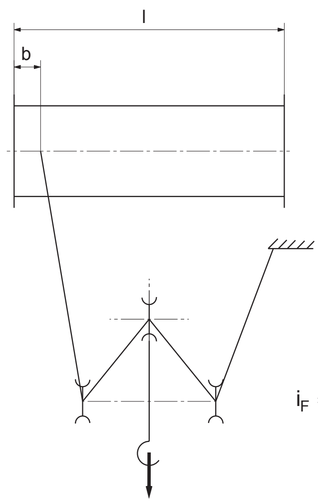
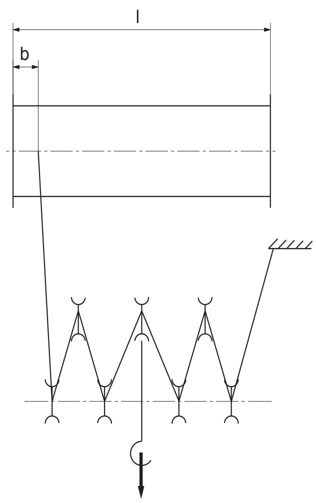
Case study drawing 8:
4 load bearing rope lines
1 rope line arriving on the drum



$$i_F = \frac{4}{1} = 4$$

Case study drawing 9:
8 load bearing rope lines
1 rope lines arriving on the drum



$$i_F = \frac{8}{1} = 8$$

The max. radial load $F_{R\,max}$ must be less than than the max. approved coupling radial load $F_{R\,max}$ given in the dimension sheet of the drum coupling.

$$F_{R\,max} \leq F_{r\,max} \quad (9)$$

CORRECTED RADIAL LOAD F_{KKORR}

A correction/increase of the max. approved radial load $F_{r\,max}$ can occur if the max. drive torque T_A is lower than T_{kmax}. of the selected coupling.

The unused torque can be converted to increase the max. approved radial load $F_{r\,max}$ as follows:

$$F_{Kkorr} = \frac{(T_{k\,max} - T_{A\,max})}{C_{erf}} + F_{r\,max} \quad (10)$$

If not all radial load is used, a correction of the max. approved torque is not permitted!

DIMENSIONS OF THE GEAR BOX OUTPUT SHAFT

- Confirming that the diameter of the shaft of the gearbox output shaft is less than the max. approved drilling diameter according to the dimensions sheet of the chosen drum coupling.
- Confirming that the shaft/hub connection is dimensioned sufficiently for the transmitted torque.

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CALCULATION EXAMPLES

A.) Closed Winch Grab Unloader

- Installed motor power : Pi = 515 kW
- Rated motor speed : n_M = 1230 min^{-1}
- Gear ratio : i_G = 31.5
- Radial load that acts on the drum coupling : $F_{R\,max}$ = 145000 N
- Engine group : FEM 1.001 = M8
- Operating coefficient : C_{erf} = 2.0

Rotation speed of the rope drum

$$n_{Tr} = \frac{n_M}{i_G} = \frac{1230\ \min^{-1}}{31{,}5} \qquad \underline{\underline{= 39\ \min^{-1}}}$$

Max. output torque

$$T_{A\,max} = \frac{P_i \cdot 9550}{n_{Tr}} \cdot C_{erf} = \frac{515 \cdot 9550}{39} \cdot 2 \qquad \underline{\underline{= 252200\ Nm}}$$

Chosen drum coupling

ABC-V-545	T_{kmax}	= 320000 Nm
	F_{rmax}	= 260000 N

$$T_{Amax} = 252200\ Nm \leq T_{kmax}\ 320000\ Nm$$

$$F_{Rmax} = 145000\ N \leq F_{rmax}\ 260000\ N$$

B.) Main Hoist

• Max. payload	:	m_1	= 20000 kg
• Dead weight of the suspension elements	:	m_2	= 7000 kg
• Dead weight of the rope drum	:	m_{Tr}	= 3000 kg
• Installed motor power	:	P_i	= 450 kW
• Rated motor speed	:	n_M	= 900 min-1
• Gear ratio	:	i_G	= 20
• Rope drum diameter	:	D_{Tr}	= 1.4 m
• Lifting speed	:	v_H	= 90 m/min
• Ratio of reeving	:	i_F	= 2 (see drawing 6)
• Efficiency of reeving	:	η_F	= 0.97
• Engine group	:	FEM 1.001	= M7
• Operating coefficient	:	C_{erf}	= 1.8

Rotation speed of the rope drum

$$n_{Tr} = \frac{n_M}{i_G} = \frac{900\ \text{min}^{-1}}{20}$$ = 45 min^{-1}

Max. drive torque based on installed power

$$T_{A\,max} = \frac{P_i \cdot 9550}{n_{Tr}} \cdot C_{erf} = \frac{450 \cdot 9550}{45} \cdot 1{,}8$$ = 171900 Nm

Max. drive torque based on used power

$$T'_{A\,max} = \frac{P_e \cdot 9550}{n_{Tr}} \cdot C_{erf}$$

$$P_e = \frac{S_{Tr} \cdot V_{Tr}}{60000}$$

$$S_{Tr} = \frac{(m_1 + m_2) \cdot 9{,}81}{i_F \cdot \eta_F} = \frac{(20000 + 7000) \cdot 9.81}{2 \cdot 0{,}97}$$ = 136500 N

$$v_{Tr} = v_H \cdot i_F = 90\ \frac{m}{min} \cdot 2$$ = 180 m/min

$$P_e = \frac{136500 \cdot 180}{60000}$$ = 410 kW

$$T'_{A\,max} = \frac{410 \cdot 9550}{45} \cdot 1{,}8$$ = 156600 Nm

Chosen drum coupling

ABC-V-450 — T_{kmax} = 180000 Nm, F_{rmax} = 150000 N

Max. radial load

$$F_{R\,max} = \frac{S_{Tr}}{2} + \frac{m_{Tr} \cdot 9{,}81}{2} = \frac{136500}{2} + \frac{3000 \cdot 9.81}{2}$$ = 83000 N

$T'_{A\,max} = 156600\ \text{Nm} \le T_{kmax}\ 180000\ \text{Nm}$

$T'_{A\,max} = 156600\ \text{Nm} \le T_{kmax}\ 180000\ \text{Nm}$

Dimension sheet ABC-V

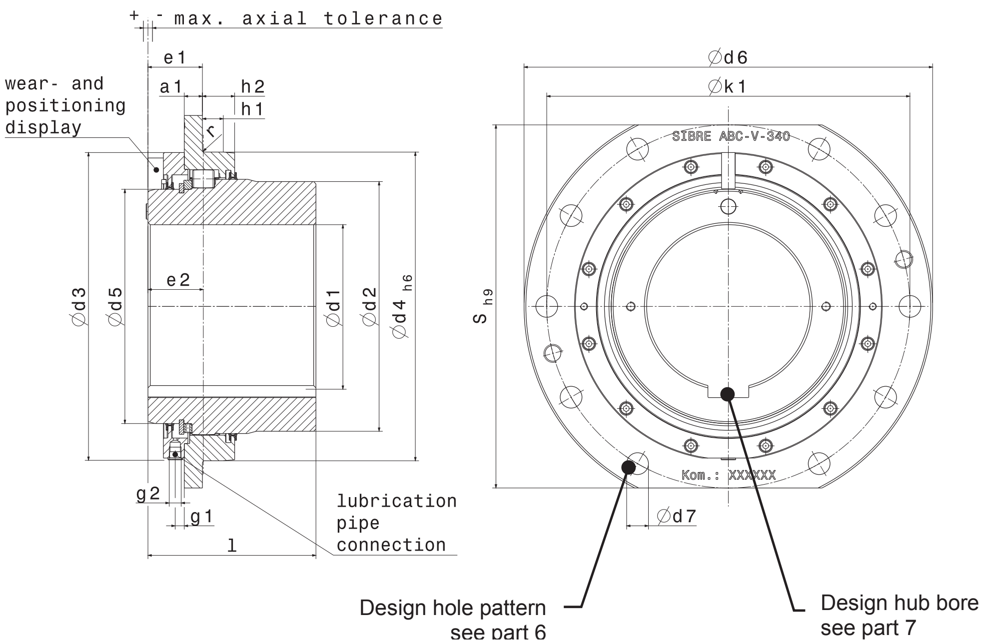

Table 3

Size		260	280	310	340	400	420	450	530	545	560	600	670	730	800	860
Torque[1] $T_{k\ max}$	[Nm]	27000	35000	45000	55000	80000	120000	180000	250000	320000	410000	500000	600000	770000	950000	1025000
Radial load $F_{r\ max}$	[N]	41000	45000	55000	75000	115000	130000	150000	200000	260000	315000	340000	400000	475000	525000	550000
Weight[3]	[kg]	37	44	54	71	108	135	164	260	294	329	415	549	697	960	1097
Moment of inertia[3]	[kgm²]	0,43	0,54	0,82	1,35	2,67	3,7	5,2	11,0	13,2	15,6	22,3	36,3	56,2	105,5	118,4
Finish bore[2] Ø $d1_{min}^{H7}$	[mm]	80	100	100	100	120	120	140	160	160	170	200	230	260	290	330
Finish bore[2] Ø $d1_{max}^{H7}$	[mm]	125	140	155	180	210	215	245	290	300	310	330	370	420	450	470
Ø d2	[mm]	195	215	235	275	315	330	370	430	450	465	500	560	620	680	715
Ø d3	[mm]	259	279	309	339	399	419	449	529	544	558	598	668	728	798	835
Ø $d4_{h6}$	[mm]	260	280	310	340	400	420	450	530	545	560	600	670	730	800	860
Ø d5	[mm]	180	198	218	258	298	310	350	410	430	440	470	530	590	650	680
Ød6	[mm]	380	400	420	450	510	550	580	650	665	680	710	780	850	940	1025
Ø d7	[mm]	19	19	19	24	24	24	24	24	24	24	28	28	28	28	34
a1	[mm]	15	15	15	20	20	20	20	25	25	25	35	35	35	40	40
e1	[mm]	45	45	45	60	60	60	60	65	65	65	81	81	81	86	86
e2	[mm]	48	48	50	61	61	65	67	69	78	78	88	88	90	92	92
g1	[mm]	7.5	7.5	7.5	10	10	10	10	10	10	10	10	10	10	10	10
g2	[In]	G1/8	G1/8	G1/8	G1/4	G1/4	G1/4	G1/4	G1/4	G1/4	G1/4	G1/4	G1/4	G1/4	G1/4	G1/4
h1	[mm]	27,5	27,5	27	23	24,5	30	32	35	45	45	40	40	50	50	50
h2	[mm]	34,5	34,5	37	35,5	37	45	47	50	60	65	60	60	70	70	70
S_{h9}	[mm]	340	360	380	400	460	500	530	580	590	600	640	700	760	830	900
Ø k1	[mm]	340	360	380	400	460	500	530	600	615	630	660	730	800	875	945
l	[mm]	145	170	175	185	220	240	260	315	330	350	380	410	450	500	500
r	[mm]	2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	4	4	4	4	4	4	4
Axial tolerance max +/-	[mm]	4	4	4	5	6	6	6	6	6	6	8	8	8	10	10

(1) The given torques do not refer to the shaft-hub connection. These must be checked if necessary.
(2) Other tolerances possible by arrangement.
(3) With respect to max. finish bore Ød1.

DRUM COUPLING
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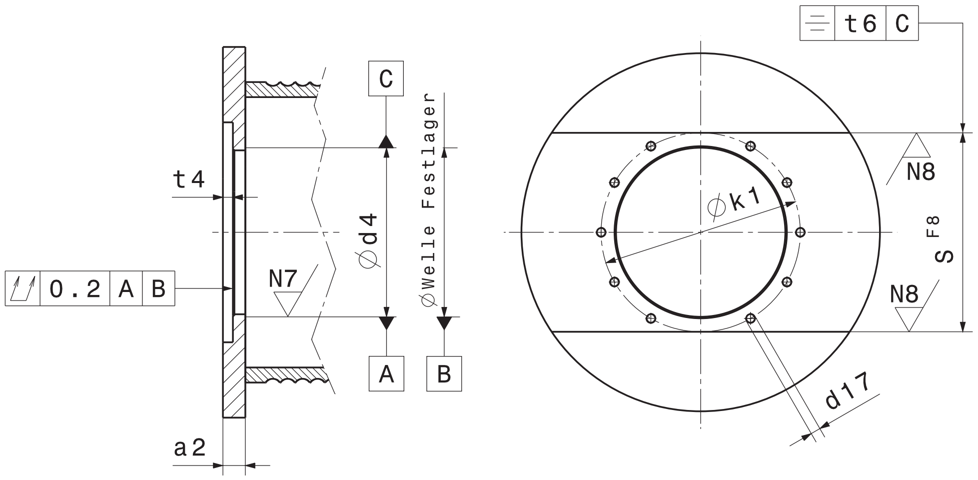
CONNECTION COUPLING ROPE DRUM

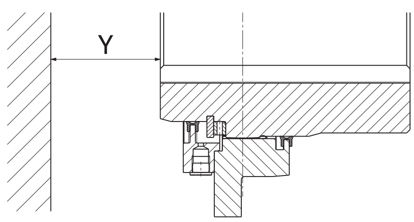
The material of the drum flange should have a min. yield strength of 320 N/mm².
We recommend the use of screws in accordance with DIN931, 933 with strength class 10.9 with washers in accordance with DIN125-300HV or screws in accordance with DIN6914 with high tensile washers in accordance with DIN6916 for attaching the SIBRE drum coupling to the rope drum. Screws in accordance with DIN912 with strength class 8.8 are to be used as cover screws.

Table 4

Size	S F8/h9	a2 min.	Ø d4 F8	Ø d17		Ø k1	t4 min.	t6	y min.
	[mm]	[mm]	[mm]	Thread	Quantity	[mm]	[mm]	[mm]	[mm]
280	360	30	280	M16	10	360	15	0.10	60
310	380	30	310	M16	10	380	15	0.10	60
340	400	40	340	M20	10	400	20	0.10	70
400	460	40	400	M20	10	460	20	0.10	70
420	500	40	420	M20	10	500	20	0.15	80
450	530	40	450	M20	14	530	20	0.15	80
530	580	50	530	M20	14	600	25	0.20	80
545	590	50	545	M20	26	615	25	0.20	100
560	600	50	560	M20	26	630	25	0.20	100
600	640	60	600	M24	26	660	35	0.20	120
670	700	60	670	M24	26	730	35	0.20	120
730	760	60	730	M24	26	800	35	0.20	120
800	830	70	800	M24	32	875	40	0.20	120
860	900	70	860	M30	32	945	40	0.20	120



Drawing 6



Drawing7

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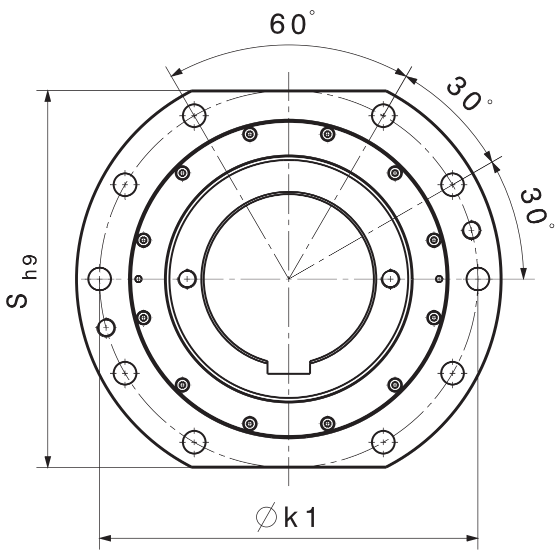
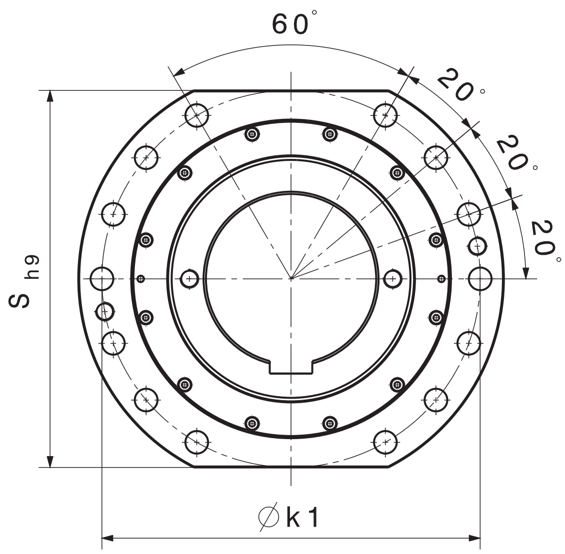
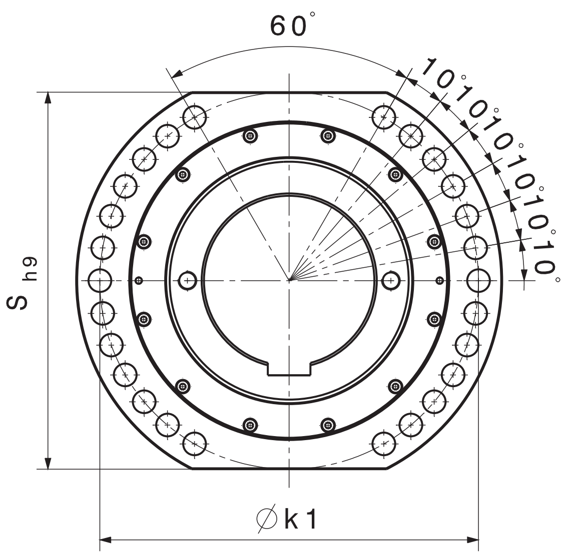


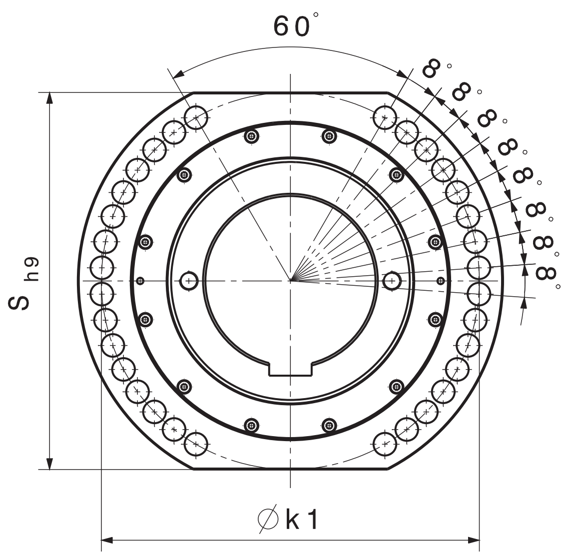
Hole pattern size 280-420



Hole pattern size 450-530



Hole pattern size 545-730



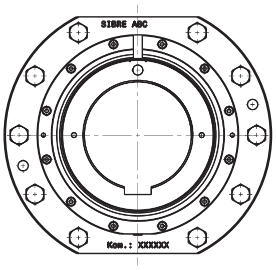
Hole pattern size 800-860

Drawing 8

DRUM COUPLING
ABC-V

B06 20 246 E-EN

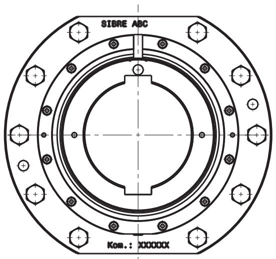
KEY WAY CONNECTION



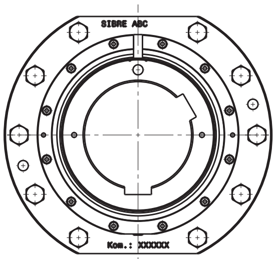
1 Key way

The given values are valid for drillings in accordance with DIN6885-1. In principle every feather key connection must be checked for surface pressure.

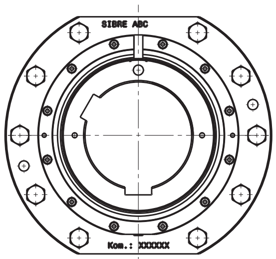
Feather keyways in accordance with BS 46, ANSI B17.1 or other standards are also possible.
We request consultation for other connection methods such as involute splines in accordance with DIN5480



2x key way 180°



2x key way 120° right

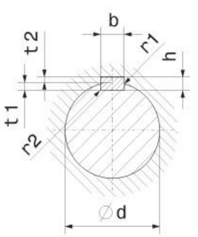


2x key way 120° left

Table 5 key ways in accordance with DIN 6885 part 1

Drill hole Ød1	across	44	50	58	65	75	85	95	110	130
	up to	50	58	65	75	85	95	110	130	150
Key	Width b:	14	16	18	20	22	25	28	32	36
	Height h:	9	10	11	12	14	14	16	18	20
Shaft key way	Width b:	14	16	18	20	22	25	28	32	36
	Depth t1	5.5	6	7	7.5	9	9	10	11	12
	Tolerance	+0.2								+0.3
Hub key way	Width b:	14	16	18	20	22	25	28	32	36
	Depth t2	3.8	4.3	4.4	4.9	5.4	5.4	6.4	7.4	8.4
	Tolerance	+0.2								+0.3
r2	max.	0.4		0.6						1
	min.	0.25		0.4						0.7

Drill hole Ød1	across	150	170	200	230	260	290	330	380	440
	up to	170	200	230	260	290	330	380	440	500
Key	Width b:	40	45	50	56	63	70	80	90	100
	Height h:	22	25	28	32	32	36	40	45	50
Shaft key way	Width b:	40	45	50	56	63	70	80	90	100
	Depth t1	13	15	17	20	20	22	25	28	31
	Tolerance	+0.3								+0.3
Hub key way	Width b:	40	45	50	56	63	70	80	90	100
	Depth t2	9.4	10.4	11.4	12.4	12.4	14.4	15.4	17.4	19.5
	Tolerance	+0.3								
r2	max.	1			1.6			2.5		
	min.	0.7			1.2			2		



Drawing 9

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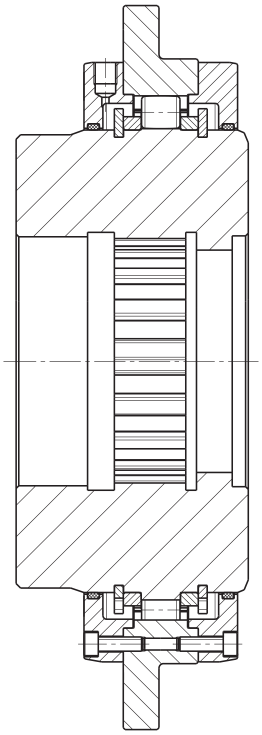
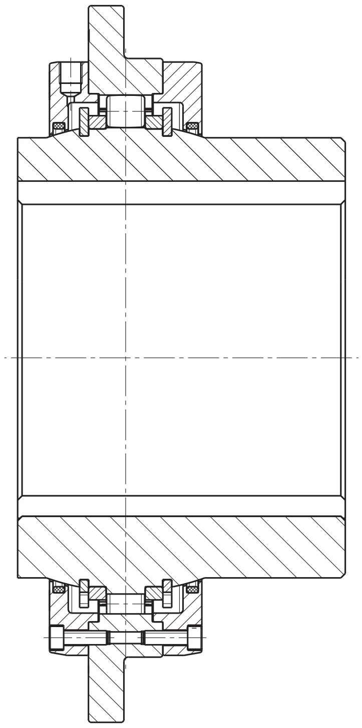
SPECIAL MODELS

ABC-AZ



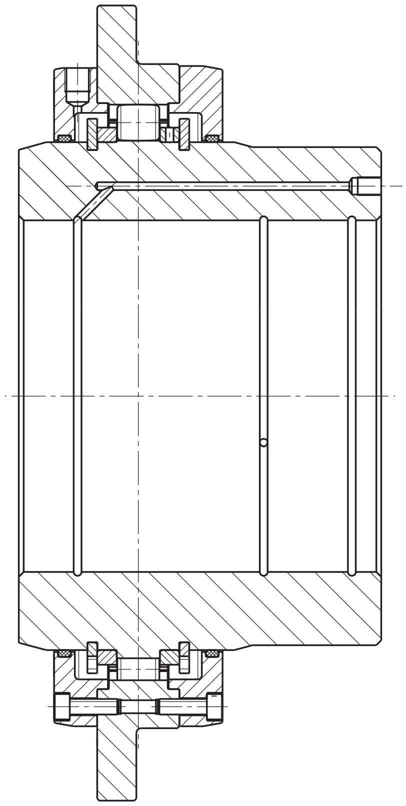
Drawing 10

ABC-B



Drawing 12

ABC-AS



Drawing 11

DRUM COUPLING
ABC-V

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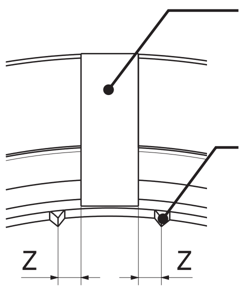
WEAR DISPLAY

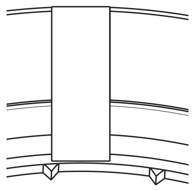
The wear display serves to detect the wear at the gearing. With increasing wear the wear cam will cover the wear groove more and more caused by the torsion of the coupling hub in relation to the housing.
If the wear cam is centrically covered, the max. wear is reached and the drum coupling has to be replaced.

The layout of the wear display simplifies a lateral check.

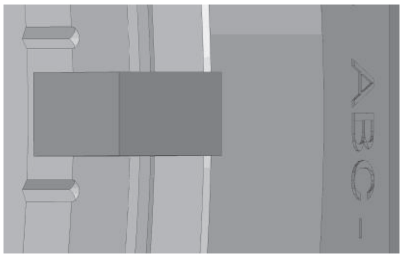
The max. permitted wear is shown in Table 6. In applications with two load directions the max. permitted wear has to be halved. This must be indicated during ordering so that the appropriate wear grooves are produced.



without wear
Drawing 13



with max. wear
Drawing 14



without wear
Drawing 15

with max. wear
Drawing 16

Table 6 coupling wear

Coupling size	Max. permitted wear
280-400	6 mm
420-860	8 mm

NOTES

NOTES

NOTES

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