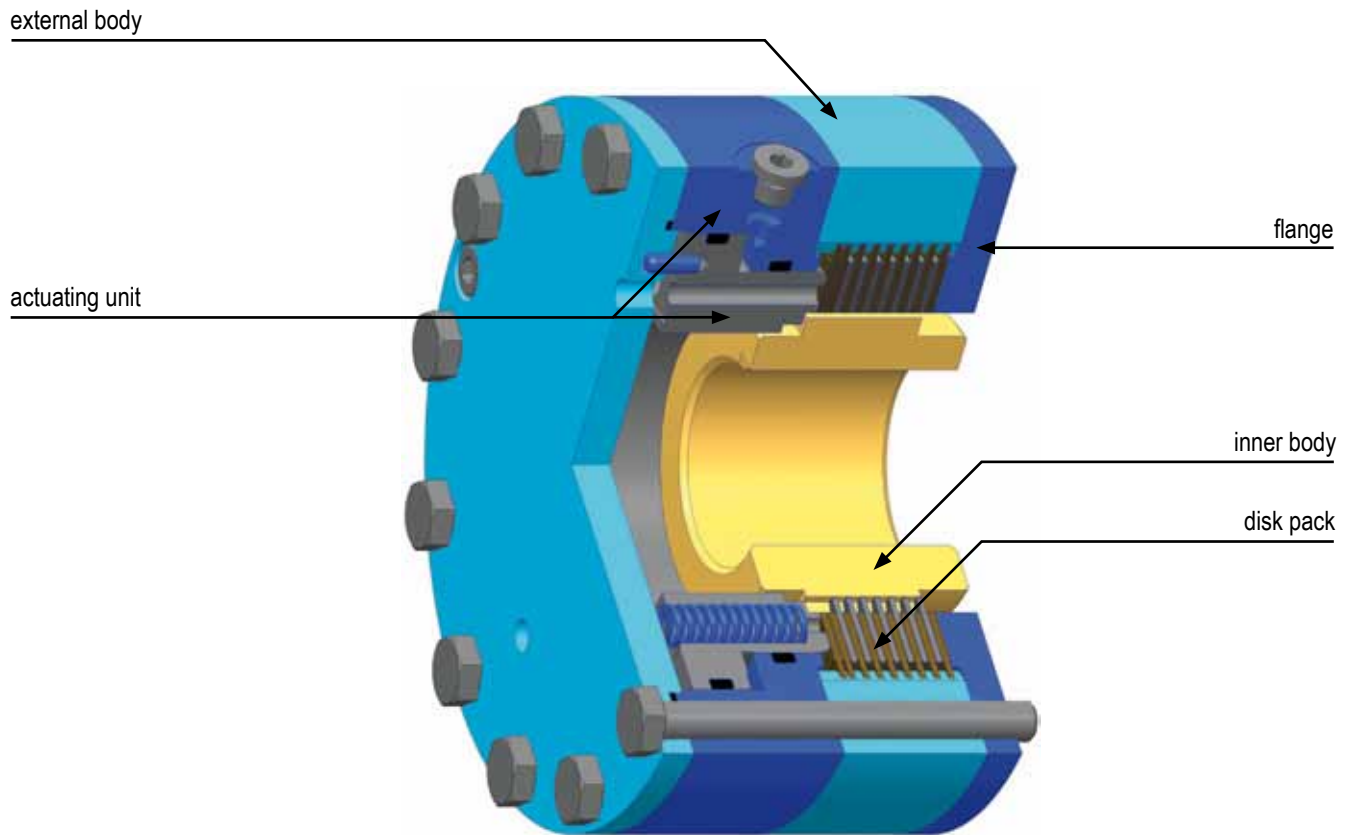


# Hydraulically released and spring operated multiple-disk brakes FDLB, LB

KWN 24001



Couplings from  
Dresden/Germany  
By specialists – for specialists



### technical features

Hydraulically released spring loaded multiple-disk brakes see as holding- and operating brakes diverse application in the drive technology. Brakes are positively. The braking force is compression springs generated. The loosening effected hydraulically by airing of the piston. They are suited for both wet and dry operation. At pressure loss is a mechanical brake for locking emergency opening system provided. They are low maintenance and assembly of number of individual panels is the condition for a safety brake met. They have a high operating safety the lamellas steel / sintered bronze. For detailed technical statements the manual request.

### applications

Hydraulically released spring loaded multiple-disk brakes are in the stationary and mobile versatile range whether or not combined with hydraulic motors. The brakes can lie in oil circuit of the engine. When starting of the hydromotor, the lift brakes in oil pressing of 15 - 38 bar. Thereafter, the full system pressure applied to 320 bar. When using fire-resistant fluids and bio-oils please feedback.

### types

#### type A

- cover plate closed, with flange

#### type B

- cover plate open, with flange

#### type C

- cover plate closed, without flange

#### type D

- cover plate open, without flange

#### type E

- no cover plate, without flange

#### type I

- inner body

- 1 cover plate
- 2 piston housing
- 3 piston
- 4 disk pack housing
- 5 mounting flange
- 6 outside disks
- 7 inside disks
- 8 hub
- 9 pressure spring
- 10 fastening screw
- 11 plug screw
- 12 plug screw with gasket
- 13 dowel pin
- 14 small O-ring
- 15 large O-ring
- 16 assembly bolts
- 17 assembly bolts

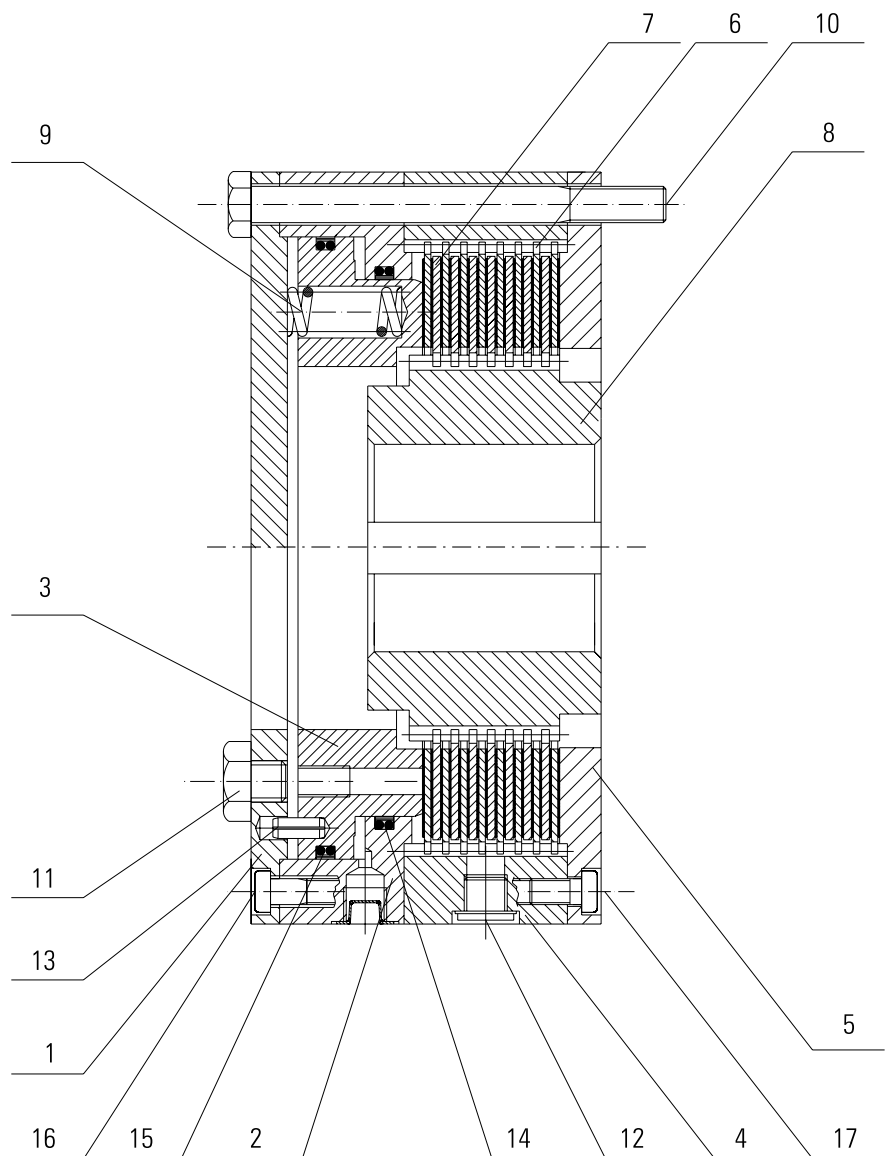


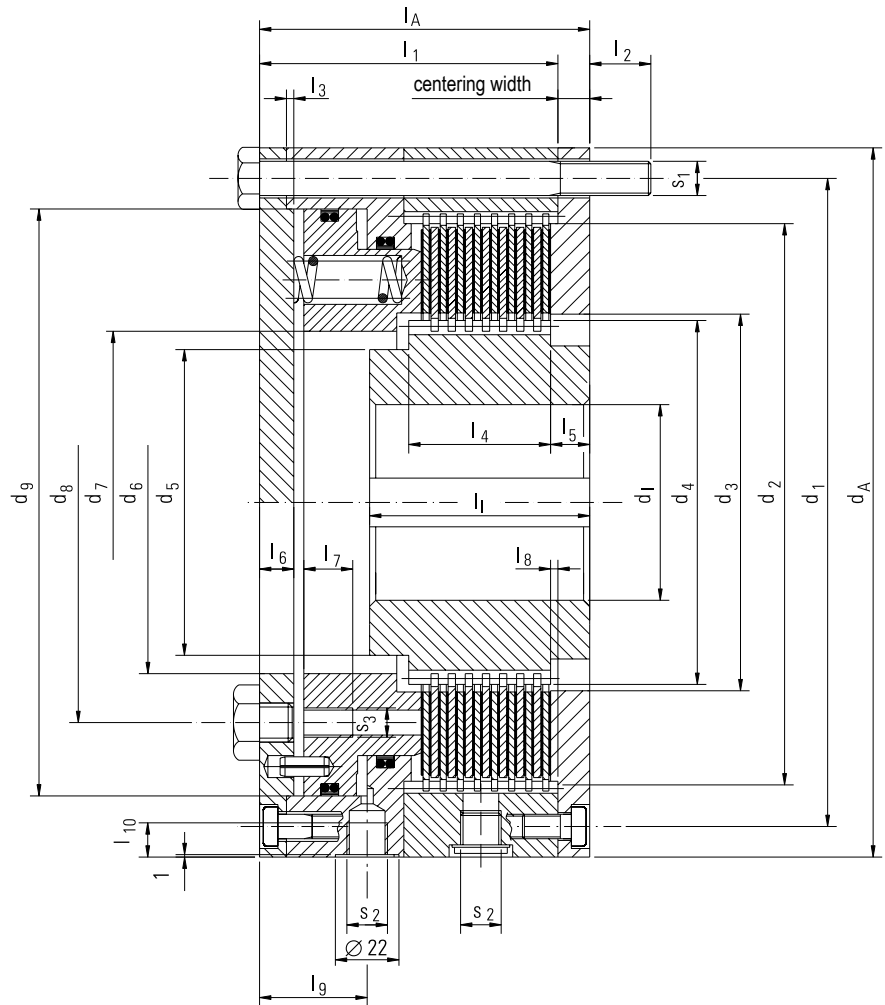
Table 1		type of hub bore			
hub bore	pilot bored	without hub keyway	tolerance H7		fit JS9
			with hub keyway per DIN 6885 sheet 1		
symbol	v	-	for one keyway	for two keyways 120° staggered	for two keyways 180° staggered
			P1	P2	P3

1) finished bore per ISO fit H7, keyway according to DIN 6885, sheet 1, fit JS 9  
 2) pilot bore  $\pm 0,2$  without keyway, other pilot bores upon request  
 3) the given torques apply to double springs in case of dry running: with oiled disks wet running: splash lubrication (oil type: ADDINOL gear oil CLP 68, temperature 60 °C)

4) specification without backpressure of the system. The release pressure relates to the given moment and is proportional to it.  
 5) relates to the rotating parts (hub with  $d_{max}$  and inside disks)  
 6) relates to design A1 (pilot bored)  
 7) more sizes on request

characteristic values												Table 2		
size <sup>7)</sup>	6,3	10	16	25	40	63	100	160	250	400	630	1 000	1 600	2 500
torque dry <sup>3)</sup>														
T <sub>S</sub> [Nm]	75	195	275	320	610	865	1 430	2 800	3 950	6 750	9 100	15 800	24 000	44 800
T <sub>Ü</sub> [Nm]	90	235	350	410	780	1 100	1 750	3 600	5 100	8 600	11 500	21 000	30 500	57 000
torque wet <sup>3)</sup>														
T <sub>S</sub> [Nm]	47	145	200	235	440	620	1 000	2 050	2 900	4 800	7 050	11 050	17 500	34 000
T <sub>Ü</sub> [Nm]	70	180	260	305	570	805	1 250	2 675	3 750	6 150	8 900	14 700	22 300	43 300
min. release pressure <sup>4)</sup>														
p [bar]	18	23	23	21	16	17	19	24	16	18	19	27	24	19
max. speed														
n [min <sup>-1</sup> ]	7 000	5 000	4 500	4 200	3 600	3 000	2 500	2 000	1 600	1 300	1 100	900	800	600
mass moment of inertia <sup>5)</sup>														
J [kg cm <sup>2</sup> ]	0,595	1,85	3,625	8,213	14,13	30,77	68,14	184,8	572,5	1 233	2 697	6 993	12 494	45 587
mass <sup>6)</sup>														
m [kg]	2,4	4,0	6,5	7,5	11,5	16	22	30,5	45,5	66	135	234	320	560
driving spline														
basic profile per DIN	5 480	5 480	5 480	5 480	5 480	867	5 480	867	867	867	867	867	867	867

main dimensions												Table 3		
size <sup>7)</sup>	6,3	10	16	25	40	63	100	160	250	400	630	1 000	1 600	2 500
overall dimensions														
d <sub>A</sub> f7	83	105	120	135	155	180	205	245	290	345	400	480	555	710
l <sub>A</sub>	59	67	77	81	90	95	100	110	135	145	165	195	220	250
hub														
d <sub>1max</sub> H7 <sup>1)</sup>	18	30	30	40	45	55	65	85	105	125	150	165	200	300
l <sub>1</sub>	35	38	44	45	52	55	60	68	90	95	110	127	147	155
d <sub>1pilot bore</sub> <sup>2)</sup>	-	15	15	20	20	20	30	40	60	70	80	90	100	150
mounting														
d <sub>1</sub>	73	90	100	115	135	160	185	220	265	315	370	440	510	665
s <sub>1</sub> 6x/12x	M6	M6	M8	M8	M8	M10	M10	M12	M14	M16	M16	M20	M24	M24
l <sub>2</sub>	11	13	13	14	20	15	20	20	25	25	25	25	40	50
hydraulic connection														
l <sub>9</sub>	21	24	27	30	34	32	33	37	44	46	56	60	65	85
l <sub>10</sub>	9	9	13	13	13	13	13	13	13	13	13	13	13	15
s <sub>2</sub>	M10x1	M10x1	M12x1,5	M12x1,5	M12x1,5	M12x1,5	M12x1,5	M12x1,5	M12x1,5	M12x1,5	M16x 1,5	M16x 1,5	M16x 1,5	M22x1,5
emergency release														
d <sub>8</sub>	42	56	58	68	85	103	120	152	180	220	280	330	380	460
s <sub>3</sub>	M4	M6	M6	M6	M8	M8	M8	M10	M12	M12	M12	M16	M16	M20
l <sub>7</sub>	10	16	16	16	20	20	20	20	20	20	20	30	30	35
centering dimensions														
d <sub>3</sub> H7	61	78	86	100	115	142	163	192	242	290	345	412	472	622
l <sub>3</sub>	2	2	2	2	2	2	2	3	3	3	3	3	3	3
d <sub>2min</sub> H7	55	69	72,2	82,2	100,2	126	144	180,5	228	279	328	390	440	584
l <sub>8</sub>	2	2	2	2	2	2	2	3	3	3	3	3	3	3
d <sub>5</sub> H7	27	45	45	52	65	80	95	120	140	180	205	240	270	390
l <sub>6</sub>	7	8	8	10	14	10	9	12	14	18	20	25	25	25
other dimensions														
d <sub>3</sub>	34	52	58	62	85	92	110	122	143	167	209	230	270	405
d <sub>4</sub> / d <sub>9</sub>	32	50	56	60	76	89	108	119	140	164	206	227	267	400
d <sub>5</sub>	25	43	43	50	63	78	93	107	128	152	192	210	260	375
d <sub>7</sub>	27	45	45	52	65	80	95	120	140	180	205	240	270	390
l <sub>1</sub>	54	61	69	73	82	86	91	99	122	130	148	173	198	228
l <sub>4</sub>	21	22	24	25	32	33	38	40	58	59	70	77	97	105
l <sub>5</sub>	7	8	10	10	10	11	11	14	16	18	20	25	25	25



### installation and operating conditions

All component parts must be axially fixed and fastened. A precise centering of the brake is to be guaranteed. If two shaft ends are accommodated inside the hub, the bearings of the drive have to be brought as close as possible to the brake.

The brakes are functionally subject to slight brake-in wear, whereby the full torque is also guaranteed. Due to the automatic compensation by the piston, a readjustment is not necessary. Fully worn-out disks can only be exchanged as a package. In the event of any leakages the complete actuating unit has to be exchanged or work up.

The standard brakes are intended for horizontal installation. A deviation of up to  $\pm 15^\circ$  is permissible. Other conditions require the manufacturers approval. The oil pipes should be as short as possible and without sharp bends or restrictions of diameter. The backflow system is to be laid out in such a way that no backpressure greater than 3 - 4 bar results. Also in the case of dry running, the connection of an overflow oil pipe is recommendable for safety reasons. Accessibility to the emergency release screws has to be assured. In released state, idle running torques exist (functionally). These can amount up to 2 % of the nominal torque..

### size selection

For a professional coupling selection and the size determination available to the user our engineering staff.

### ordering example: LB-AI - 25 - 32 P1 - KWN 24001

Designation of a hydraulically released, spring located multiple-disk brake, type A with hub (type I), nominal size 25, hub with finished bore  $d_1 = 32$  mm, tolerance H7, keyway according to DIN 6885 sheet 1.

### cooling and lubrication

#### types of lubrication:

- flow through
- splash lubrication - maximum submersion up to friction diameter (1/10 of the disk outside diameter)
- oil spray

Following requirements are to be observed regarding the lubricants:

- high heat resistance and aging stability
- low tendency to settle
- good heat conducting and cooling characteristics
- compatibility with steel and neutral behaviour with copper (max. degree of corrosion 2 per DIN 51759)
- low alloying ingredients



**standard values for safety factors**

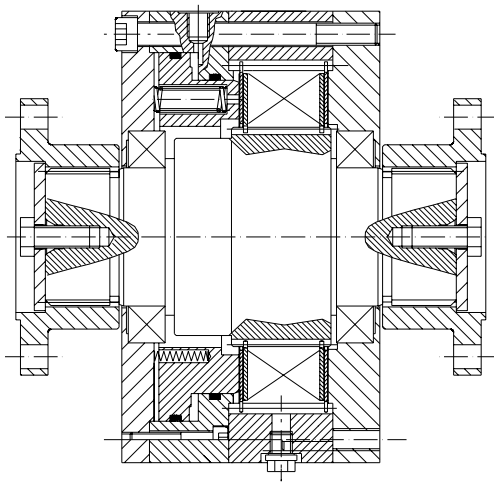
Table 4

use	s
fans, conveyors, textile machines, generators	1,5
lifts, mixers, cranes, machine tools, winches	2,0
drilling rigs, excavators, lifts, mills, vibrators	2,5
ball mills, piston compressors, rolling mills, centrifugal machines	3,0

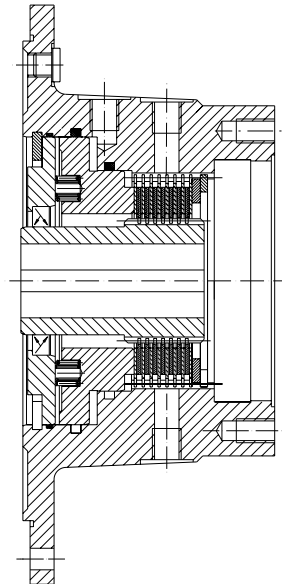
compare here also the F.E.M. guide lines 1.001

**special designs**

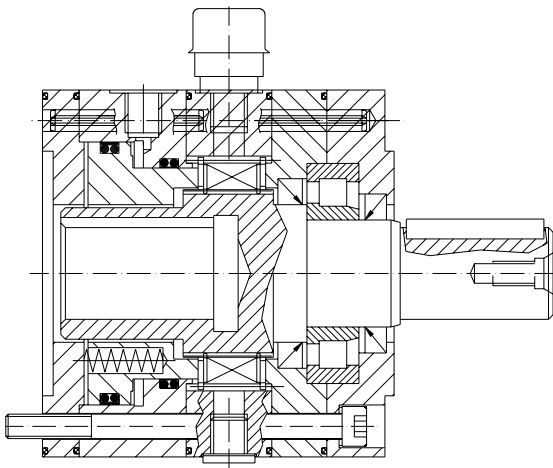
There are also multiple-disk brakes with special design available. These brakes can meet special requirements. On the following pages you see some requirements.



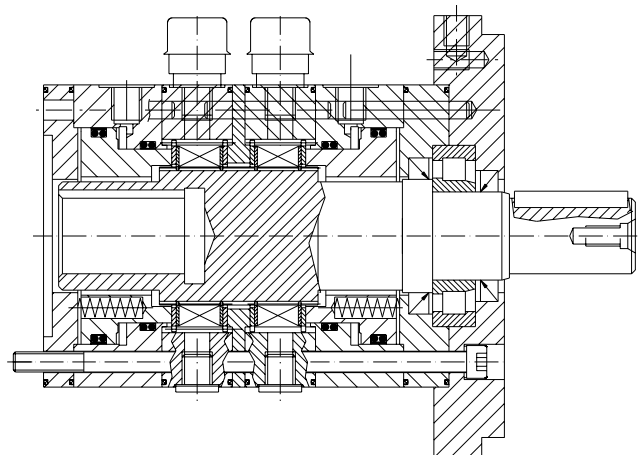
**multiple disk brake**  
with two joint shaft connections and insidebody storage



**multiple disk brake**  
with through flood disk package for running brake



**multiple disk brake**  
with insidebody storage



**multiple disk brake**  
in double design with insidebody storage

company	[ ]		[ ]
	contact person		date
	[ ]	[ ]	
	phone	fax	
	E-mail		
	[ ]	[ ]	[ ]
	inquiry no.	project	pieces

<p><b>drive unit</b> [ ]</p> <p><b>machine type</b> [ ]</p> <p>nominal torque [ ] Nm</p> <p>maximum torque<sup>1)</sup> [ ] Nm</p> <p>with nonuniform torque (if available, enclose torque-speed curve)</p> <p>maximum torque<sup>2)</sup> [ ] Nm</p> <p>minimum torque<sup>2)</sup> [ ] Nm</p> <p>nominal power [ ] kW</p> <p>nominal speed or speed range [ ] rpm</p> <p>mass moment of inertia on brake shaft [ ] kgm<sup>2</sup></p> <p>required safety factor [ ]</p> <p><b>use</b></p> <p><input type="checkbox"/> in a housing<sup>3)</sup>    <input type="checkbox"/> without housing<sup>3)</sup></p> <p><input type="checkbox"/> horizontal<sup>3)</sup>    <input type="checkbox"/> vertical<sup>3)</sup></p> <p>temperature range from [ ] to [ ] °C</p> <p><b>in the case of wet running</b></p> <p><input type="checkbox"/> oil spray lubrication<sup>3)</sup>    <input type="checkbox"/> splash lubrication<sup>3)</sup></p> <p><input type="checkbox"/> centrifugal lubrication<sup>3)</sup>    <input type="checkbox"/> circulation system lubrication<sup>3)</sup></p> <p style="padding-left: 100px;"><input type="checkbox"/> external lubrication<sup>3)</sup>    <input type="checkbox"/> internal lubrication<sup>3)</sup></p> <p><b>oil type</b></p> <p>oil quantity [ ] l/min    oil viscosity at 40°C [ ] mm<sup>2</sup>/s</p> <p><b>in the case of dry running</b></p> <p><input type="checkbox"/> dry running<sup>3)</sup> any coefficient of friction reducing influences</p> <p><input type="checkbox"/> operation in rooms<sup>3)</sup> with high relative air humidity conditional dry running<sup>3)</sup></p> <p><input type="checkbox"/> splash water<sup>3)</sup>    <input type="checkbox"/> steam<sup>3)</sup>    <input type="checkbox"/> oil spray<sup>3)</sup>    <input type="checkbox"/> splash oil<sup>3)</sup>    <input type="checkbox"/> overflow oil<sup>3)</sup></p>	<p><b>type of engaging operation</b></p> <p><input type="checkbox"/> engagement when stopped<sup>3)</sup> holding brake</p> <p><input type="checkbox"/> engagement during operation<sup>3)</sup> operating brake</p> <p><b>parameters (as operating brake)</b></p> <p>max. speed at the beginning (of the braking operation) [ ] rpm</p> <p>maximum idle-running speed [ ] rpm</p> <p>at a percentage of [ ] %</p> <p>maximum load torque during the braking operation [ ] Nm</p> <p>at a speed of [ ] rpm</p> <p>shortest time between two engagements [ ] s</p> <p>number of engagements [ ] h<sup>-1</sup></p> <p>desired slipping time [ ] s</p> <p>has the user already selected a brake?    <input type="checkbox"/> yes<sup>3)</sup>    <input type="checkbox"/> no<sup>3)</sup></p> <p>exact designation of the selected brake</p> <p>[ ]</p> <p><b>geometric configuration</b></p> <p>cover plate (side A)    <input type="checkbox"/> yes<sup>3)</sup>    <input type="checkbox"/> no<sup>3)</sup>    <input type="checkbox"/> closed<sup>3)</sup>    <input type="checkbox"/> open<sup>3)</sup></p> <p>flange (side B)    <input type="checkbox"/> yes<sup>3)</sup>    <input type="checkbox"/> no<sup>3)</sup></p> <p>hub    <input type="checkbox"/> yes<sup>3)</sup>    <input type="checkbox"/> no<sup>3)</sup>    <input type="checkbox"/> pilot bored<sup>3)</sup>    <input type="checkbox"/> finished<sup>3)</sup></p> <p><b>other dimensions or conditions</b></p> <p>d<sub>1</sub> (H7) = [ ]</p> <p>keyway per DIN 6885 sheet 1</p> <p><input type="checkbox"/> yes<sup>3)</sup>    <input type="checkbox"/> no<sup>3)</sup></p> <p>[ ]</p>
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<sup>1)</sup> e.g. stalling torque with three-phase asynchronous motors  
<sup>2)</sup> torque fluctuations during one revolution (e.g. in the case of diesel engines)  
<sup>3)</sup> mark where applicable

remarks	date / sign
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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