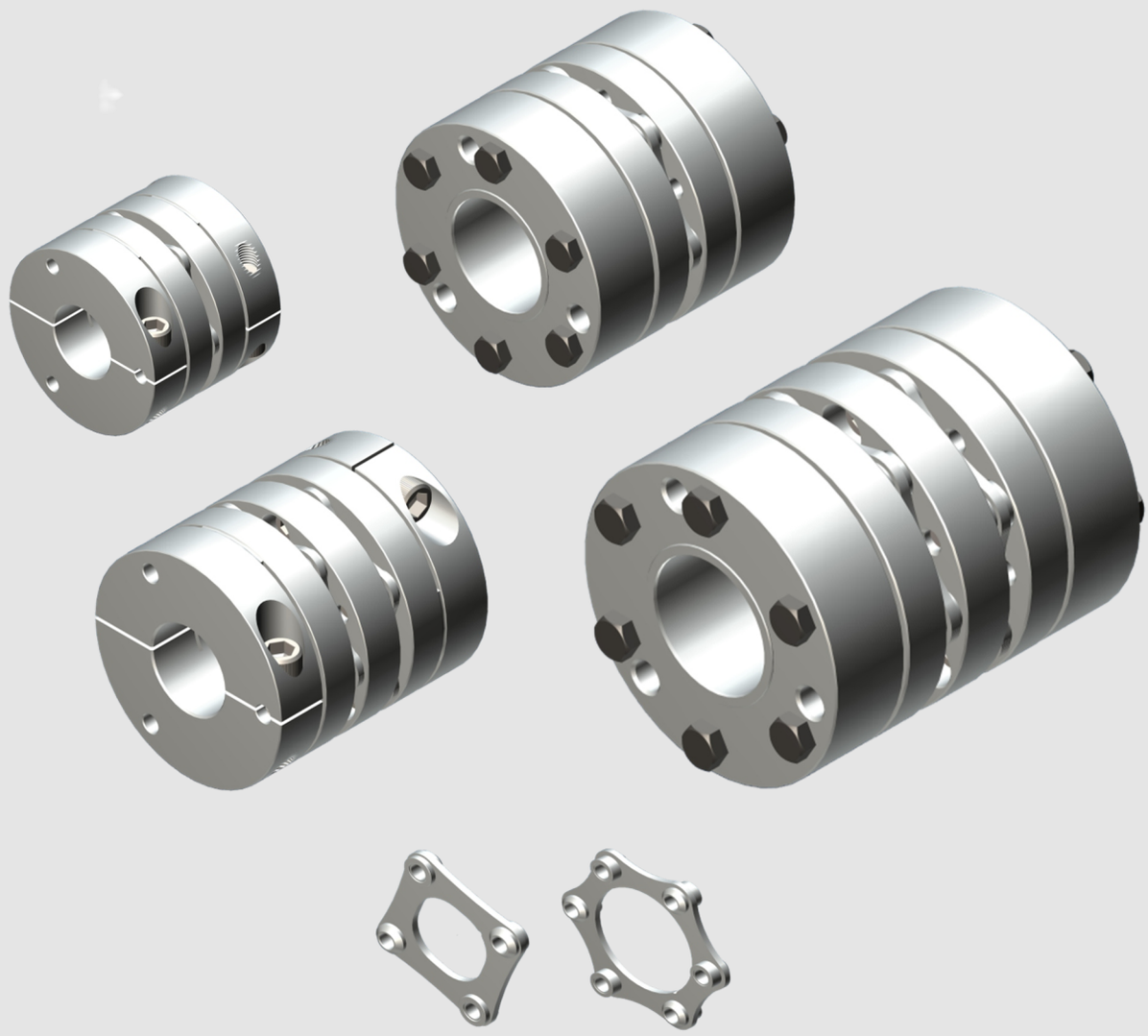
APEX DYNAMICS, INC.

Backlash-Free Servo Coupling

Disc Type



5 Years Warranty !

Coupling - Disc Type

Features:

- High Precision / Backlash Free
- High Torque / High Torsional Rigidity
- High Speed / Low Inertia
- Permissible Eccentric Angle
- Shock Absorption for Motor High Gain
- High Frequency Reciprocating
- Multiple Choice of Hubs for Input and Output Shaft
- Easy Axial Installation

Ordering Code - Disc Type

D - 36 - I - BK - 42 - B - 45

D - 61 - II - C - 58 - H - 60

- Bore of Output Hub
- Type of Output Hub
- Bore of Input Hub
- Type of Input Hub*
- I : 1-Stage / II : 2-Stage
- Size
- Disc Coupling

* K for Keyway

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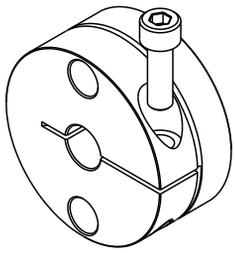
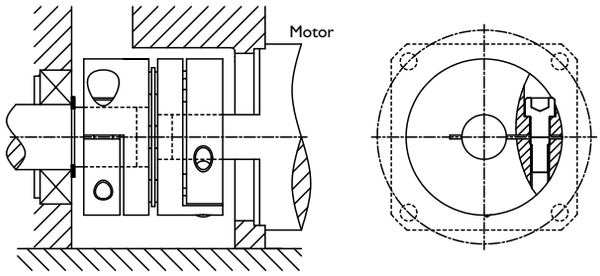
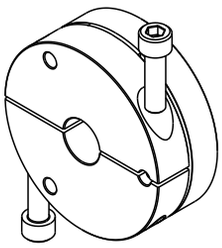
Type of Hubs

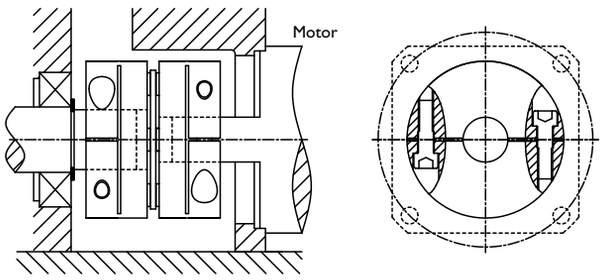
B Type



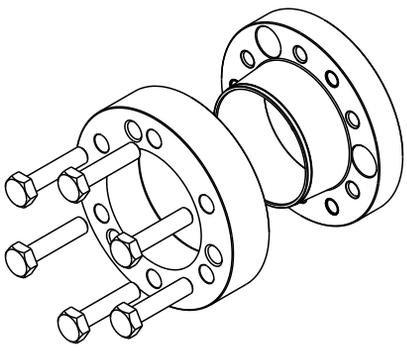


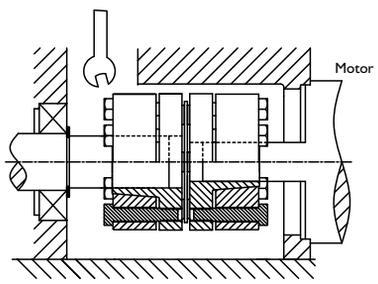
C Type





H Type

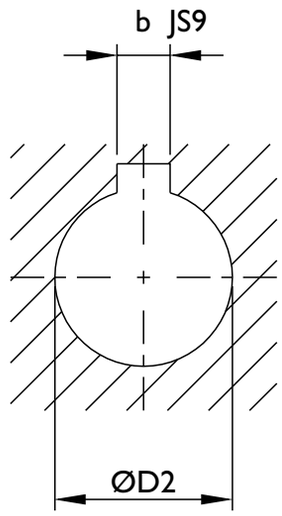




Keyway Dimension

b	Dimension
2	6 ≦ ØD2 ≦ 8
3	8 < ØD2 ≦ 10
4	10 < ØD2 ≦ 12
5	12 < ØD2 ≦ 17
6	17 < ØD2 ≦ 22
8	22 < ØD2 ≦ 30
10	30 < ØD2 ≦ 38
12	38 < ØD2 ≦ 44

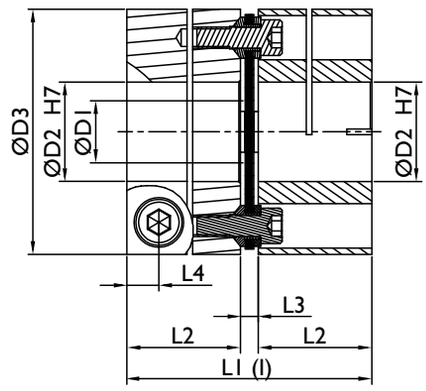
b	Dimension
14	44 < ØD2 ≦ 50
16	50 < ØD2 ≦ 58
18	58 < ØD2 ≦ 65
20	65 < ØD2 ≦ 75
22	75 < ØD2 ≦ 85
25	85 < ØD2 ≦ 95
28	95 < ØD2 ≦ 110
32	110 < ØD2 ≦ 130

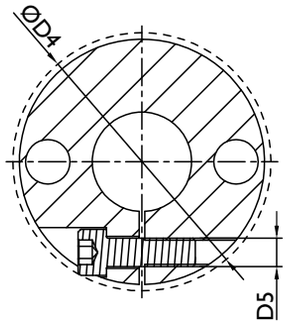


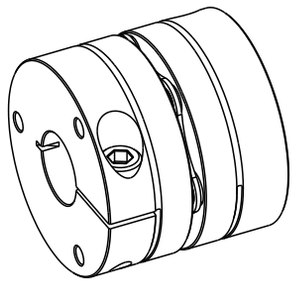
* Finish bore with keyway which >Ø6, acc. to DIN 6685/1 JS9.

B Type Hub

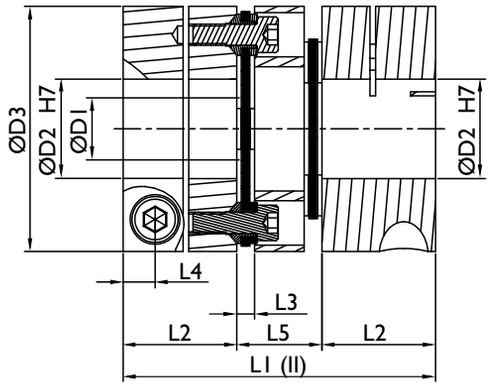
Type I : 1 Stage

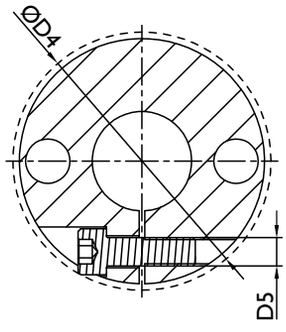


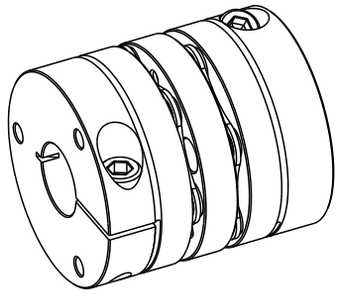




Type II : 2 Stage







Material:
Hub: Aluminum.
Spacer: Aluminum.
Disc: Stainless Steel.

SIZE	Dimensions [mm]										Clamping Screws ISO 4762		Mass moment of inertia [$\times 10^{-3}$ kgm^2]	
	D1	D2 max	D3	D4	L1 1-Stg.	L1 2-Stg.	L2	L3	L4	L5	D5	T_A [Nm]	Type I 1-Stg.	Type II 2-Stg.
05	12	12	26	26	26.5	34	12	2.5	3.5	10	M2.5	0.8	0.003	0.004
10	14.5	15	35	35	35	44	16	3	5	12	M4	3	0.013	0.016
16	19.5	20	46	49	47	58	22	3	6.8	14	M6	10	0.052	0.064
21	24	30	58	59	53.5	69	25	3.5	6.8	19	M6	10	0.150	0.191
26	30	38	69	73	69	88	32	5	9	24	M8	25	0.390	0.493
36	48	45	84	87	74.8	93.6	35	4.8	10.5	23.6	M10	49	0.969	1.203

B Type Hub

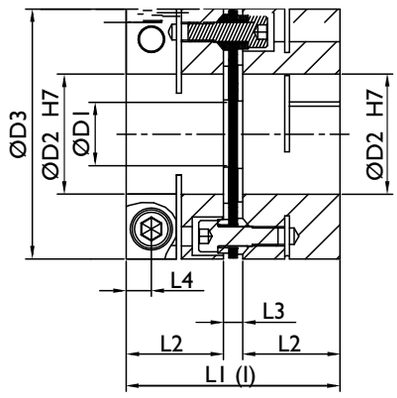
SIZE	T_{KN} [Nm]	T_K max [Nm]	Max Speed [rpm]	Torsional Rigidity [Nm/rad]		Displacements of Type I / 1-Stg.			Displacements of Type II / 2-Stg.		
				1-Stg.	2-Stg.	Radial [mm]	Axial [mm]	Angular [degree]	Radial [mm]	Axial [mm]	Angular [degree]
05	2.5	5	18,300	2,400	1,200	-	±0.2	1	0.13	±0.4	2
10	7.5	15	13,600	5,600	2,800	-	±0.4	1	0.16	±0.8	2
16	35	53	10,500	20,000	10,000	-	±0.5	1	0.19	±1.0	2
21	70	105	8,500	40,000	20,000	-	±0.6	1	0.27	±1.2	2
26	120	180	7,000	84,000	42,000	-	±0.8	1	0.33	±1.6	2
36	340	510	5,700	280,000	140,000	-	±1.0	1	0.32	±2.0	2

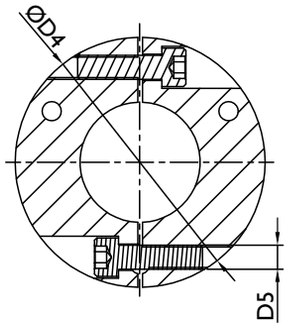
Bore and Transmittable Torques TR [Nm]																						
SIZE	HOLE	Ø3	Ø5	Ø8	Ø10	Ø12	Ø14	Ø15	Ø16	Ø19	Ø20	Ø22	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45
05	2.5	1.2	1.9	2.8	3.5	4.1																
10	4.5		4.9	7.5	9.1	10	12	12.7														
16	5.5				26	30	34	36	38	44	46											
21	7.5					37	40	42	44	50	52	56	60	61	69	71						
26	9.5							80	84	97	100	108	115	119	129	136	142	154	160			
36	11.5									164	171	183	196	201	219	230	241	260	269	274	280	288

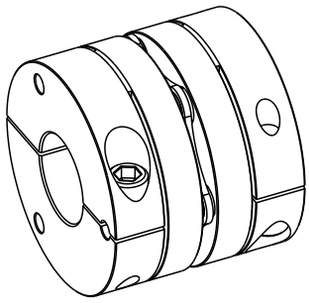
* When the ØD2<6, keyway type is not supported.

C Type Hub

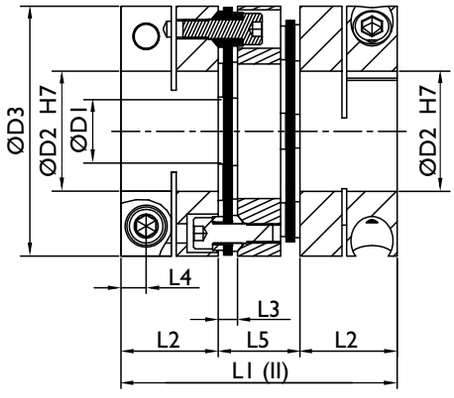
Type I : 1 Stage

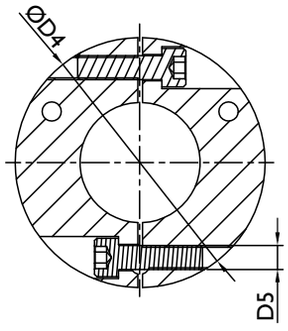


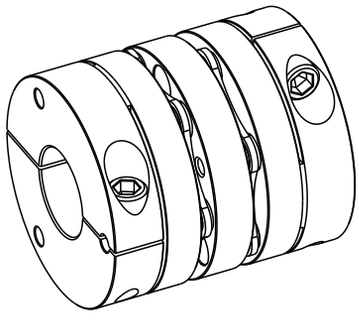




Type II : 2 Stage







Material:
Hub: Aluminum.
Spacer: Aluminum.
Disc: Stainless Steel.

SIZE	Dimensions [mm]										Clamping Screws ISO 4762		Mass moment of inertia [$\times 10^{-3}$ kgm^2]	
	D1	D2 max	D3	D4	L1 1-Stg.	L1 2-Stg.	L2	L3	L4	L5	D5	T_A [Nm]	Type I 1-Stg.	Type II 2-Stg.
43	61	55	104	104	89	115	40.5	8	10.5	34	M10	49	2.762	3.538
51	73	70	124	130	108	138	50	8	14	38	M14	135	6.973	8.845
61	88	80	144	148.5	118	150	54	10	16	42	M16	210	13.612	17.108

C Type Hub

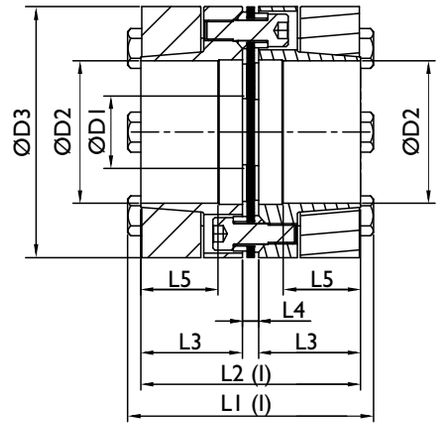
SIZE	T_{KN} [Nm]	T_K max [Nm]	Max Speed [rpm]	Torsional Rigidity [Nm/rad]		Displacements of Type I / 1 Stg.			Displacements of Type II / 2 Stg.		
				1-Stg.	2-Stg.	Radial [mm]	Axial [mm]	Angular [degree]	Radial [mm]	Axial [mm]	Angular [degree]
43	600	900	8,100	510,000	255,000	-	±1.1	1	0.45	±2.2	2
51	1,300	1,950	6,700	920,000	460,000	-	±1.25	1	0.52	±2.5	2
61	2,000	3,000	6,100	1,500,000	750,000	-	±1.3	1	0.62	±2.6	2

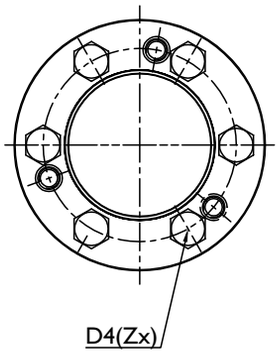
Bore and Transmittable Torques TR [Nm]																						
SIZE	HOLE	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø58	Ø60	Ø65	Ø70	Ø75	Ø80	Ø85	Ø90
43	15	255	264	292	311	329	355	381	398	415	440	465	481	521								
51	28				651	689	746	802	839	875	928	981	1016	1101	1152	1185	1266	1360				
61	30							1096	1147	1198	1271	1346	1394	1512	1583	1630	1743	1856	1964	2073		

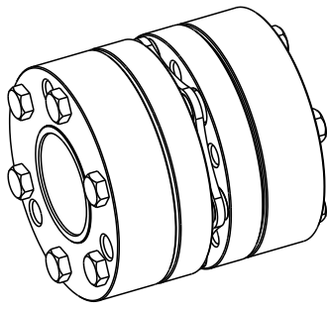
* Finished bore diameter >Ø6 keyway, according to DIN 6885/1, dimensional tolerance is JS9, dimensions see Page 7.

H Type Hub

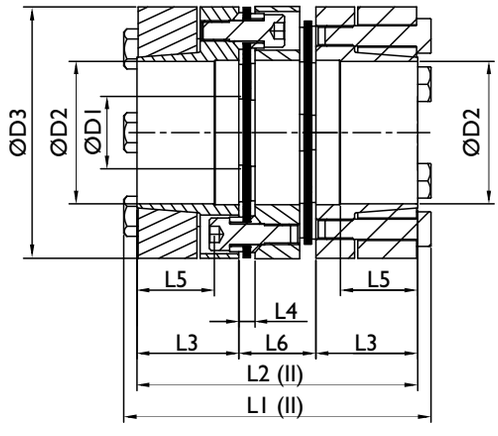
Type I : 1 Stage

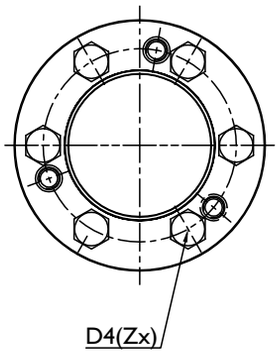


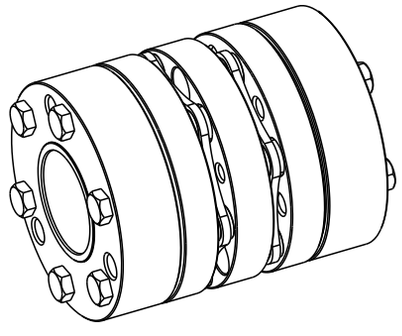




Type II : 2 Stage







Material:
Hub: Aluminum.
Spacer: Aluminum.
Disc: Stainless Steel.

SIZE	Dimensions [mm]											Clamping Screws ISO 4017			Mass moment of inertia [$\times 10^{-3}$ kgm^2]	
	D1	D2 max	D3	L1 1-Stg.	L1 2-Stg.	L2 1-Stg.	L2 2-Stg.	L3	L4	L5	L6	D4	z	T_A [Nm]	Type I 1-Stg.	Type II 2-Stg.
16	19.5	20	46	57	68	51	62	24	3	18	14	M5	4	6	0.062	0.074
21	24	28	58	65.7	81.2	59.5	75	28	3.5	22	19	M6	4	10	0.180	0.221
26	30	35	69	81.8	100.8	77	96	36	5	28	24	M5	8	6	0.465	0.568
36	48	42	84	100.8	119.6	90.8	109.6	43	4.8	35	23.6	M8	6	25	1.290	1.523
43	61	60	104	110	136	100	126	46	8	35	34	M8	6	25	3.257	4.056
51	73	70	124	121	151	108	138	50	8	38	38	M10	6	49	7.327	9.205
61	88	80	144	135	167	120	152	55	10	43	42	M12	6	85	14.345	17.785

H Type Hub

SIZE	T_{KN} [Nm]	T_K max [Nm]	Max Speed [rpm]	Torsional Rigidity [Nm/rad]		Displacements of Type I / 1 Stg.			Displacements of Type II / 2 Stg.		
				1-Stg.	2-Stg.	Radial [mm]	Axial [mm]	Angular [degree]	Radial [mm]	Axial [mm]	Angular [degree]
16	35	53	31,150	20,000	10,000	-	±0.5	1	0.19	±1.0	2
21	70	105	24,700	40,000	20,000	-	±0.6	1	0.27	±1.2	2
26	120	180	20,800	84,000	42,000	-	±0.8	1	0.33	±1.6	2
36	340	510	17,100	280,000	140,000	-	±1.0	1	0.32	±2.0	2
43	600	900	13,800	510,000	255,000	-	±1.1	1	0.45	±2.2	2
51	1,300	1,950	11,600	920,000	460,000	-	±1.25	1	0.52	±2.5	2
61	2,000	3,000	10,000	1,500,000	750,000	-	±1.3	1	0.62	±2.6	2

Bore and Transmittable Torques TR [Nm]																										
SIZE	Tolerance	Ø10	Ø12	Ø14	Ø15	Ø16	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø60	Ø65	Ø70	Ø75	Ø80
16	H7/h6	29	33	57	70	50	83	97																		
	H7/k6	34	42	64	76	62	96	109																		
21	H7/h6	27	45	75	91	79	125	145	127	144	201															
	H7/k6	36	56	83	99	93	139	157	169	187	245															
26	H7/h6				104	126	194	169	279	311	338	404	273	357												
	H7/k6				124	145	214	200	305	334	382	444	355	441												
36	H7/h6							241	395	438	521	616	523	664	647	741	841									
	H7/k6							284	430	471	558	646	640	779	778	875	974									
43	H7/h6									426	595	705	647	814	946	1073	980	1163	1360	1200	1072	1372				
	H7/k6									517	684	789	784	916	1096	1219	1144	1332	1534	1376	1370	1669				
51	H7/h6											750	818	1020	1085	1228	1166	1377	1605	1450	1607	2283	2255	2704		
	H7/k6											822	927	1117	1254	1392	1348	1568	1803	1652	1960	2387	2447	2842		
61	H7/h6													880	1074	1211	1264	1480	1597	1750	1911	2097	2542	2669	2718	3168
	H7/k6													951	1131	1258	1333	1534	1668	1810	2032	2239	2635	2785	2855	3252

* If ØD2≧55 and the tolerance is G7/h6,G7/m6.

COUPLING SELECTION ACCORDING TO DIN 740 PART II WITH SPECIFIC FACTORS

Glossary

Rated torque of coupling T_{KN}	Nm	Torque to be continuously transmitted over the entire permissible speed range, taking into account the factors.
Friction torque T_R	Nm	The torque transmitted when the shaft is securely connected to the sleeve.
Rated torque of driving side T_{AN}	Nm	Constant driving torque from the motor.
Peak torque of machine T_S	Nm	Peak torque on the coupling.
Peak torque of driving side T_{AS}	Nm	The peak torque generated when the motor starts or stops.
Mass moment inertia of driving side J_A	kgm^2	Total of moments of inertia existing on the driving side referring to the coupling speed
Mass moment inertia of load side J_L	kgm^2	Total of moments of inertia existing on the load side referring to the coupling speed.
Rotational inertia coefficient of driving side M_A		Factor considering the mass distribution with shocks and vibrations generated on the driving or load side.
Temperature factor St		Temperature requirements for the couplings.
Operating factor S_B		Factor for different application.
Starting factor S_Z		The number of start-ups per hour.

COUPLING SELECTION ACCORDING TO DIN 740 PART II WITH SPECIFIC FACTORS

Coefficient / Factor

Temperature Factor St	
≦ 120°C	1.0
≦ 200°C	1.1

Operating Factor S_B	
Uniform Motion	1.5
Unequal Motion	2.0
Shock Motion	2.5~4.0
For servo motor	1.5~2.0

Starting Factor S_Z	
Starting Frequency / Hour	
< 20	1.0
< 60	1.2
< 120	1.4
< 180	1.6
< 240	1.8
≧ 240	2.0

Calculation

The rated torque T_{KN} of the coupling must be greater than or equal to the rated torque of the equipment T_{AN}, taking into account the temperature coefficient S_t and the operating coefficient S_B.

$$T_{KN} \geqq T_{AN} \times S_t \times S_B$$

The rated torque T_{KN} of the coupling must be greater than or equal to the maximum torque T_S applied to the coupling, taking into account the temperature coefficient S_t and the operating coefficient S_B.

$$T_{KN} \geqq T_S \times S_t \times S_B$$

Rotational inertia coefficient at the drive side M_A

$$M_A = J_L / (J_A + J_L)$$

Maximum torque at the drive side T_S

$$T_S = T_{AS} \times M_A \times S_Z$$

Under any operation conditions, the fricion torque on the coupling bore may not be exceeded.

$$T_R > T_{AS}$$

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