

Coupling selection

Normally the RADEX®-NC is selected according to the nominal torque (T_{KN}) shown in the list of technical data, like all other coupling systems. In all cases the torque (T_{KN}) must exceed the maximum torque to be transmitted (accelerating or peak torque). This should mainly be considered in connection with servo motors because their accelerating torques both positive and negative can exceed the nominal torque of the coupling by a significant amount. In case of values exceeding T_{KN} (collision, trouble) only limited alternating load figures are possible. In this torque range there can be permanent deformation of the bellow and fatigue fractures can occur.

Description	Symbol	Definition or explanation
Rated torque of coupling	T_{KN}	Torque that can continuously be transmitted over the entire permissible speed range
Peak torque of machine	T_S	Peak torque on the coupling
Peak torque on the driving side	T_{AS}	Peak torque with torque shock on the driving side, e. g. breakdown torque of the electric motor
Peak torque of load side	T_{LS}	Peak torque with torque shock on load side, e. g. braking
Moment of inertia	$J_{A/L}$	Total of moments of inertia existing on the driving or load side referring to the coupling speed
Rotational inertia coefficient of driving side	m_A	Factor taking into account the mass distribution with shocks and vibrations produced on the driving side
Rotational inertia coefficient of load side	m_L	Factor taking into account the mass distribution with shocks and vibrations produced on the load side

Description	Symbol	Definition or explanation
max. engine performance	$P_{max.}$	max. power in kW which the engine may produce
engine speed	n	Rated speed in rpm of the engine
Torsional angle	φ	Transmission error of the metal bellow due to torsional strain
Torsional stiffness	C_T	Torsional stiffness of the coupling in Nm/rad. For data see tables shown on the following pages
Frequency of the 2-mass-system	f_e	in s^{-1}
Exciting frequency of the drive	f_r	in s^{-1}
Operating factor	k	$k = 1.5$ with uniform movement $k = 2.0$ with ununiform movement $k = 2.5 - 4$ with shocking movement For drives in machine tools (servo motors) k values of $1.5 - 2$ must be used.

Judgement calculation

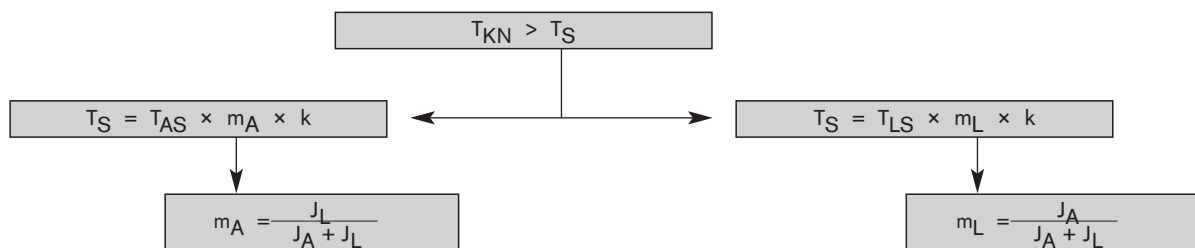
The size of the coupling must be selected so that the following conditions are met.

$$T_{KN} \geq T_{AS/LS} \times k$$

$$T_{KN} \text{ [Nm]} = 9550 \times \frac{P_{max} \text{ [kW]}}{n \text{ [rpm]}}$$

When selecting servo motors the calculations are made with the torque values of the engine suppliers and not with P_{max} . When dimensioning the coupling please use the respective data of the manufacturer considering the servo controller to be used.

Accelerating torque (drive side / load side)



Inspection of torsional stiffness

$$\varphi = \frac{180 \times T_{AS}}{\pi \times C_T}$$


Inspection of resonance frequency

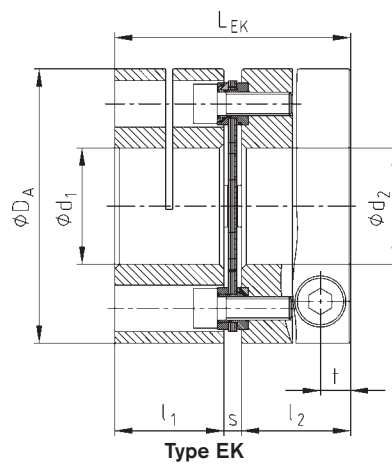
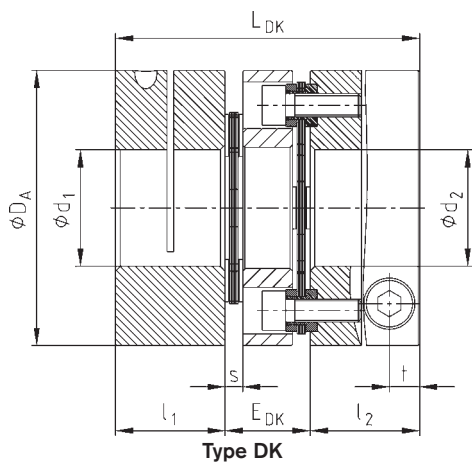
The natural frequency of the coupling must be above or below the frequency of the unit. Valid for the mechanical spare model of the 2-mass-system:

$$f_e = \frac{1}{2 \times \pi} \times C_T \cdot \frac{J_L + J_A}{J_L \times J_A} \text{ [Hz]} \quad \text{Valid in practice: } f_e \geq 2 \cdot f_r$$

Standard types



- Backlash-free torque transmission
- Higher torsional rigidity
- Backlash-free shaft-hub-connection
- Low mass moment of inertia
- High speeds
- Operating temperature up to 200 °C
- Compact type
- Finish bore from Ø 6 mm also available with feather key acc. To DIN 6885 sheet 1 – JS9
-  Approved according to EC Standard 94/9/EC (Explosion Certificate ATEX 95) (without feather key only for category 3)



RADEX®-NC types DK and EK

Size	Dimensions [mm]								Clamping screw		Mass moment of inertia	
	max. d ₁ /d ₂	D _A	l ₁ /l ₂	L _{DK}	E _{DK}	L _{EK}	s	t	M	T _A [Nm]	DK [kgm ²]	EK [kgm ²]
5	10	26	12	34	10	26,5	2,5	3,5	M2,5	0,8	0,000004	0,000003
10	15	35	16	44	12	35	3	5,0	M4	3	0,000016	0,000012
15	20	47	21	55	13	45	3	6,8	M6	10	0,000065	0,000053
20	25	59	24	67	19	52	4	6,5	M6	10	0,000199	0,000154
25	35	70	32	88	24	69	5	9,0	M8	25	0,000508	0,000393
35	40	84	35	98	28	77	7	10,5	M10	49	0,001153	0,000911
42	55	104	40	116	36	91	11	10,5	M10	69	0,007458	0,006153

Technical data

Size	T _{KN} [Nm]	T _{K max.} [Nm]	max. speed [rpm]	Torsional rigidity [Nm/rad]		Displacement type DK			Displacement type EK		
				Type EK	Type DK	Radial [mm]	Axial [mm]	Angular [°] ¹⁾	Radial [mm]	Axial [mm]	Angular [°] ¹⁾
5	2,5	5	25000	2400	1200	0,10	0,4	1	—	0,2	1
10	7,5	15	20000	5600	2800	0,14	0,8	1	—	0,4	1
15	20	40	16000	12000	6000	0,16	1,0	1	—	0,5	1
20	30	60	12000	30000	15000	0,25	1,2	1	—	0,6	1
25	60	120	10000	60000	30000	0,30	1,6	1	—	0,8	1
35	100	200	9000	72000	36000	0,40	2,0	1	—	1,0	1
42	180	360	7000	120000	60000	0,50	2,8	1	—	1,4	1

Transmittable torque of the RADEX®-NC clamping hub [Nm] for standard bores

Size	Pilot bore	Ø3	Ø5	Ø8	Ø10	Ø12	Ø14	Ø15	Ø16	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø45	Ø50	Ø55
5	2,5	2,2	2,3	2,4	2,5																	
10	4,5		8	9	10	10	11	11														
15	5,5				28	30	31	32	32	34	35											
20	7,5					36	37	38	39	40	41	44	45									
25	9,5							82	83	87	88	93	94	98	100	103	106					
35	11,5									155	157	165	167	173	177	181	187	193	197			
42	15,0											285	287	296	301	307	315	323	329	343	357	370

¹⁾ for each laminae

Order form:

RADEX®-NC 20	DK	Ø20	Ø25
Coupling size	Type	Finish bore	Finish bore