

RADEX®-NC

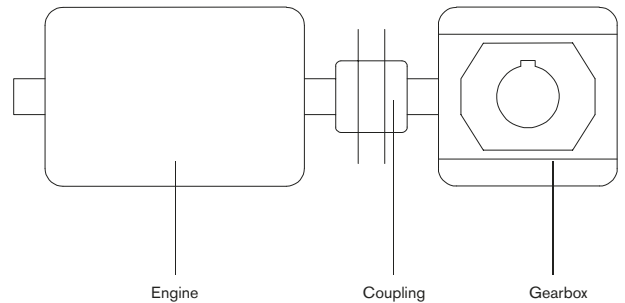
Servo lamina couplings

Technical description

RADEX®-NC is a line specifically developed for servo technology. With this coupling a set of torsionally rigid steel laminae that are soft in bending ensures a reliable compensation for axial, angular and radial shaft displacements. As an all-metal coupling - the laminae are made of stainless steel - RADEX®-NC can even be used with high temperatures (up to 200 °C) and under aggressive ambient conditions. The RADEX®-NC is manufactured in 14 sizes from size 5 to 61 for max. torques of up to 3000 Nm. In addition to the two different types (EK = single-cardanic and DK = double-cardanic) it is available in five different types of hubs.



A typical application of RADEX®-NC are backlash-free worm gear pairs with low gear ratios. For reason of the gear ratio of the gearbox the rigidity of the coupling must be converted from the drive side into the driven side. Here the gear ratio itself has a decisive influence because it is squarely included in the calculation. This converted rigidity is added in line with the gearbox stiffness in order to get the total rigidity. In case of gear ratios that are smaller than $i = 8$ we recommend to use the RADEX®-NC due to the loss of rigidity of the total system arising with the use of flexible couplings.



Use in potentially explosive atmospheres

RADEX®-NC couplings are suitable for power transmission in drives in potentially explosive atmospheres. The couplings are assessed and approved according to EU directive 2014/34/EU as units of category 2G/2D and thus suitable for the use in potentially explosive atmospheres of zone 1, 2, 21 and 22. Please read through our information included in the respective Type Examination Certificate and the operating and assembly instructions at www.ktr.com.

Selection:

If used in potentially explosive atmospheres, the clamping ring hubs (clamping hubs without feather keyway only for use in category 3 (with feather keyway for cat. 2) must be selected such that there is a minimum safety factor of $s = 2$ between the peak torque (including all operating parameters) and the nominal torque and frictional torque of engagement of the coupling.



Types of hubs



Type 2.5 clamping hub
double slotted, without feather keyway

Frictionally engaged, backlash-free shaft-hub-connection. Transmittable torques depending on bore diameter.

Type 2.6 clamping hub
double slotted, with feather keyway

Positive-locking power transmission with additional friction fit. The friction fit avoids or reduces reverse backlash. Surface pressure of the keyway connection is reduced.



Type 3.5 clamping hub
triple slotted, without feather keyway

Frictionally engaged, backlash-free shaft-hub-connection, good properties of concentric running and reduced imbalance. Transmittable torques depending on bore diameter. Type 3.5 from size 43 standard

Type 3.6 clamping hub
triple slotted, with feather keyway

Positive-locking power transmission with additional friction fit. The friction fit avoids or reduces reverse backlash. Surface pressure of the keyway connection is reduced. Type 3.6 from size 43 standard



Type 6.5 clamping ring hub

Integrated frictionally engaged shaft-hub-connection for the transmission of higher torques. Suitable for high speeds.

RADEX®-NC DK and EK Servo lamina couplings

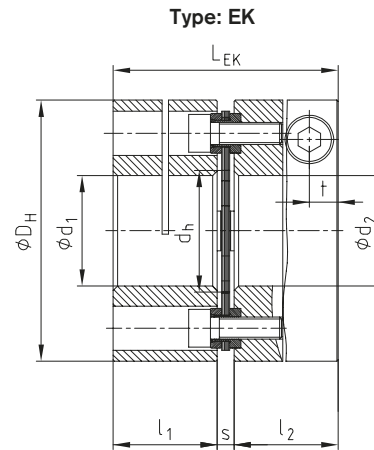
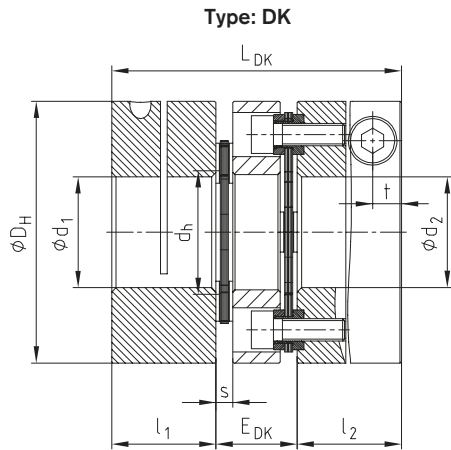
Double- and single-cardanic types



For legend of pictogram please refer to fiapper on the cover



Hub design 2.5/2.6



RADEX®-NC Types DK and EK - Hub and spacer material aluminium (size 42 steel)/laminas stainless steel

Size	Dimensions [mm]										Clamping screw		Mass moments of inertia	
	Max. d1, d2	DH	l1, l2	LDK	EDK	LEK	dh	s	t	M	TA [Nm]	DK [kgm²]	EK [kgm²]	
5	12	26	12	34	10	26.5	12	2.5	3.5	M2.5	0.8	0.000004	0.000003	
10	15	35	16	44	12	35	14.5	3	5.0	M4	3	0.000016	0.000012	
15	20	47	21	55	13	45	19.5	3	6.8	M6	10	0.000065	0.000053	
20	25	59	24	67	19	52	24	4	6.5	M6	10	0.000199	0.000154	
25	35	70	32	88	24	69	30	5	9.0	M8	25	0.000508	0.000393	
35	42	84	35	98	28	77	38	7	10.5	M10	49	0.001153	0.000911	
42	55	104	40	116	36	91	48	11	10.5	M10	69	0.007458	0.006153	

Technical data

Size	TKN ¹⁾ [Nm]	TK max ¹⁾ [Nm]	Max. speed [rpm]	Torsion spring stiffness [Nm/rad]		Displacements of type DK			Displacements of type EK		
				Type EK	Type DK	Radial [mm]	Axial [mm]	Angular each lamina [°]	Radial [mm]	Axial [mm]	Angular each lamina [°]
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	300	600	7000	240000	120000	0.50	2.8	1	—	1.4	1

¹⁾ see page 18 et seqq.

Review of shaft-hub-connection: Friction torques TR [Nm] for hub design 2.5

Size	Pilot bored	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	

Ordering example:

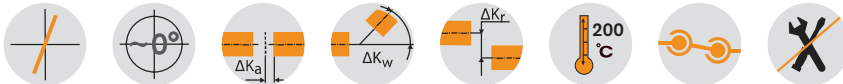
RADEX®-NC 20	DK	2.5 - Ø20		2.5 - Ø25	
Coupling size	Type	Hub design	Finish bore	Hub design	Finish bore

RADEX®-NC High-Torque DK and EK Servo lamina couplings

Double- and single-cardanic types



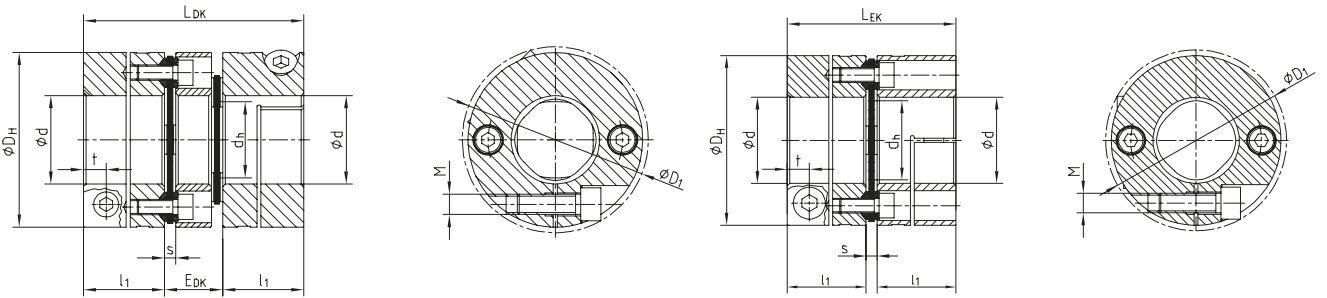
For legend of pictogram please refer to fiapper on the cover



Hub design 2.5/2.6

Type: DK

Type: EK



RADEX®-NC HT Types DK and EK - Hub and spacer material aluminium/laminas stainless steel

Size	Dimensions [mm]										Clamping screw		Mass moments of inertia	
	Max. d1, d2	D _H	D ₁	l ₁ , l ₂	L _{DK}	E _{DK}	L _{EK}	d _h	s	t	M	T _A [Nm]	DK [kgm ²]	EK [kgm ²]
16	20	46	48.9	22	58.0	14.0	47.0	19.5	3.0	6.5	M6	10	0.000063	0.00005
21	30	58	59.2	25	68.0	18.0	53.0	24.0	3.0	6.2	M6	10	0.00018	0.00014
26	38	69	73.4	32	87.0	23.0	68.5	30.0	4.5	8.15	M8	25	0.00046	0.00036
36	45	84	86.8	35	93.6	23.6	74.8	48.0	4.8	10.0	M10	49	0.0011	0.00091

Technical data

Size	T _{KN} ¹⁾ [Nm]	T _{K max} ¹⁾ [Nm]	Max. speed [rpm]	Torsion spring stiffness [Nm/rad]		Lamina shape	Displacements of type DK			Displacements of type EK		
				Type EK	Type DK		Radial [mm]	Axial [mm]	Angular each lamina [degree]	Radial [mm]	Axial [mm]	Angular each lamina [degree]
				Type EK	Type DK		Radial [mm]	Axial [mm]	Angular each lamina [degree]	Radial [mm]	Axial [mm]	Angular each lamina [degree]
16	35	53	10,500	20,000	10,000	4 holes	0.16	1.00	1	—	0.50	1
21	70	105	8,500	40,000	20,000	4 holes	0.25	1.20	1	—	0.60	1
26	120	180	7,000	63,000	31,500	4 holes	0.30	1.60	1	—	0.80	1
36	340	510	6,700	250,000	125,000	6 holes	0.40	2.00	1	—	1.00	1

¹⁾ see page 18 et seqq.

Review of shaft-hub-connection: Friction torques T_R [Nm] for hub design 2.5

Size	Pilot bored	Ø10	Ø12	Ø14	Ø15	Ø16	Ø19	Ø20	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45
16	5.5	28	30	31	32	32	34	35										
21	7.5		36	37	38	38	41	41	44	45	47	48						
26	9.5				82	83	87	88	93	94	98	100	103	106	110			
36	11.5						156	158	166	168	174	178	181	187	193	197	200	206

Types of hubs



Type 2.5 clamping hub
double slot without feather keyway

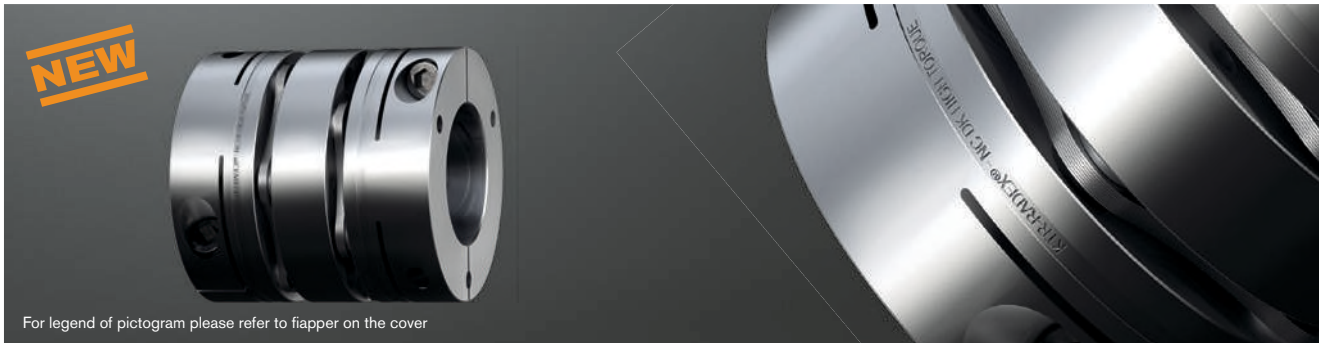
Type 2.6 clamping hub
double slot with feather keyway

Ordering example:

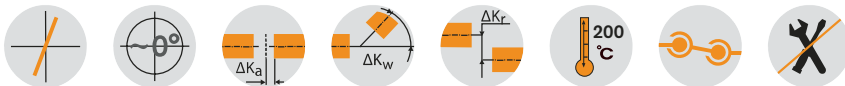
RADEX®-NC 21 HT	DK	2.5 - Ø20		2.5 - Ø25	
Coupling size	Type	Hub design	Finish bore	Hub design	Finish bore

RADEX®-NC High-Torque DK and EK Servo lamina couplings

Double- and single-cardanic types



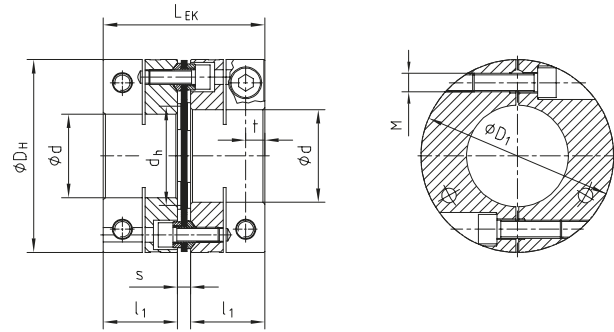
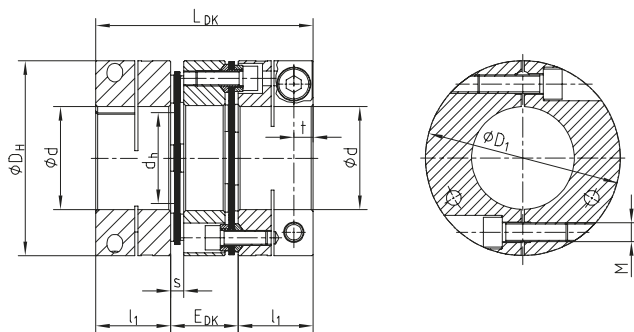
For legend of pictogram please refer to flapper on the cover



Hub design 3.5/3.6

Type: DK

Type: EK



RADEX®-NC HT Types DK and EK - Hub and spacer material aluminium/laminas stainless steel

Size	Dimensions [mm]											Clamping screw		Mass moments of inertia	
	Max. d1, d2	D _H	D ₁	l ₁ , l ₂	L _{DK}	E _{DK}	L _{EK}	d _h	s	t	M	T _A [Nm]	DK [kgm ²]	EK [kgm ²]	
43	55	104	104	40	112.0	32.0	87.0	61.0	7.0	10.25	M10	49	0.0033	0.0025	
51	70	124	126.2	50	138.0	38.0	108.0	73.0	8.0	13.00	M14	135	0.0082	0.006	
61	80	144	148.5	54	150.0	42.0	118.0	88.0	10.0	15.75	M16	210	0.016	0.012	

Technical data

Size	T _{KN} ¹⁾ [Nm]	T _{K max} ¹⁾ [Nm]	Max. speed [rpm]	Torsion spring stiffness [Nm/rad]		Lamina shape	Displacements of type DK			Displacements of type EK		
				Type EK	Type DK		Radial [mm]	Axial [mm]	Angular each lamina [degree]	Radial [mm]	Axial [mm]	Angular each lamina [degree]
				43	600		900	8,100	310,000	155,000	6 holes	0.50
51	1,300	1,950	6,700	1,200,000	600,000	6 holes	0.60	2.50	1	—	1.25	1
61	2,000	3,000	6,100	1,550,000	775,000	6 holes	0.73	2.60	1	—	1.30	1

¹⁾ see page 18 et seqq.

Review of shaft-hub-connection: Friction torques T_R [Nm] for hub design 3.5

Size	Pilot bored	Ø24	Ø25	Ø28	Ø30	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45	Ø48	Ø50	Ø55	Ø58	Ø60	Ø65	Ø70	Ø75	Ø80	
43	15.0	149	155	174	186	198	217	235	248	260	279	297	310	341							
51	28.0		226	253	271	290	317	344	362	380	407	434	452	498	525	543	588	633			
61	30.0										557	594	619	680	717	742	804	866	928	990	

Types of hubs



Type 3.5 clamping hub
triple slotted, without feather keyway

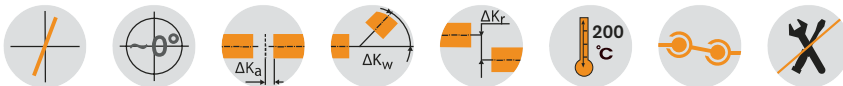
Type 3.6 clamping hub
triple slotted, with feather keyway

Ordering example:

RADEX®-NC 43 HT	DK	3.5 - Ø25			3.5 - Ø35	
Coupling size	Type	Hub design	Finish bore	Hub design	Finish bore	

RADEX®-NC High-Torque DK and EK Servo lamina couplings

Double- and single-cardanic types



RADEX®-NC HT Types DK and EK - Hub and spacer material aluminium/laminas stainless steel														
Size	Dimensions [mm]										Clamping screw		Mass moments of inertia	
	Max. d1, d2	D _H	l ₁ , l ₂	LDK	L _{total} DK	EDK	LEK	L _{total} EK	d _h	s	M	T _A [Nm]	DK [kgm ²]	EK [kgm ²]
16	20	46	24	62.0	68.0	14.0	51.0	57.0	19.5	3.0	M5	6	0.000122	0.000110
21	28	58	28	74.0	80.6	18.0	59.0	65.6	24.0	3.0	M6	10	0.000353	0.000312
26	35	69	32	87.0	96.8	23.0	68.5	78.3	30.0	4.5	M8	25	0.000850	0.000747
36	45	84	40	103.6	113.2	27.6	84.4	94.4	48.0	4.8	M8	25	0.022000	0.002000
43	60	104	45	122.0	131.6	32.0	97.0	106.6	61.0	7.0	M8	25	0.005906	0.005133
51	70	124	50	138.0	149.2	38.0	108.0	119.4	73.0	8.0	M10	49	0.013597	0.011873
61	80	144	55	152.0	165.2	42.0	120.0	133.2	88.0	10.0	M12	85	0.027853	0.024340

Technical data												
Size	T _{KN} ¹⁾ [Nm]	T _K max ¹⁾ [Nm]	Max. speed [rpm]	Torsion spring stiffness [Nm/rad]		Lamina shape	Displacements of type DK			Displacements of type EK		
				Type EK	Type DK		Radial [mm]	Axial [mm]	Angular each lamina [degree]	Radial [mm]	Axial [mm]	Angular each lamina [degree]
16	35	53	31,150	20,000	10,000	4 holes	0.16	1.00	1.00	—	0.50	1
21	70	105	24,700	40,000	20,000	4 holes	0.25	1.20	1.20	—	0.60	1
26	120	180	20,800	63,000	31,500	4 holes	0.30	1.60	1.60	—	0.80	1
36	340	510	17,100	250,000	125,000	6 holes	0.40	2.00	2.00	—	1.00	1
43	600	900	13,800	310,000	155,000	6 holes	0.50	2.20	2.20	—	1.10	1
51	1300	1950	11,600	1,200,000	600,000	6 holes	0.60	2.50	2.50	—	1.25	1
61	2000	3000	10,000	1,550,000	775,000	6 holes	0.73	2.60	2.60	—	1.30	1

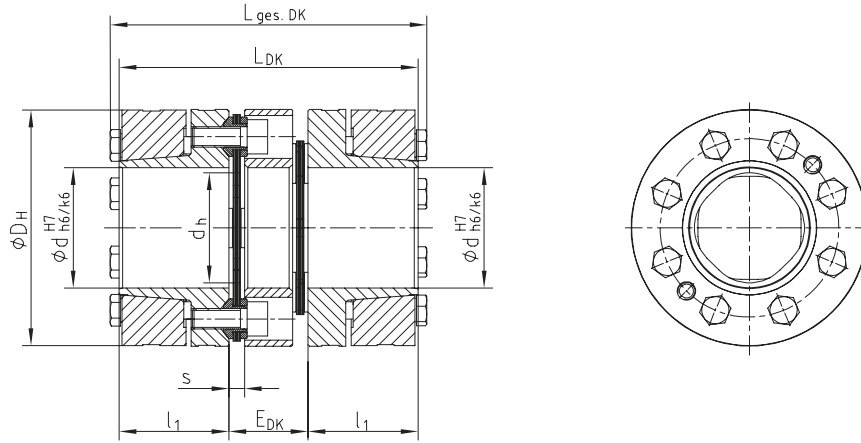
¹⁾ see page 18 et seqq.

Review of shaft-hub-connection: Friction torques T _R [Nm] for hub design 6.5																								
Size	Tolerance fit	Ø10	Ø12	Ø15	Ø16	Ø19	Ø20	Ø25	Ø28	Ø30	Ø32	Ø35	Ø40	Ø42	Ø45	Ø50	Ø55	Ø60	Ø65	Ø70	Ø75	Ø80		
16	H7/h6	22	45	65	79	83	98																	
	H7/k6	30	51	73	85	103	117																	
21	H7/h6		70	70	85	100	118	163	225															
	H7/k6		83	83	97	119	135	182	237															
26	H7/h6			90	110	143	166	237	319	271	311	399												
	H7/k6			106	124	165	186	260	335	300	341	419												
36	H7/h6						249	400	449	533	609	627	664	753	897									
	H7/k6						280	430	489	568	643	674	721	803	932									
43	H7/h6							439	577	646	736	813	964	1081	1265	1370	1275	1578						
	H7/k6							479	609	682	771	862	1023	1132	1302	1418	1354	1628						
51	H7/h6									488	553	702	883	996	1059	1013	1250	1563	1581	1904				
	H7/k6									546	616	754	941	1044	1123	1118	1352	1636	1668	1956				
61	H7/h6											792	1108	1148	1356	1603	1779	1952	2361	2477	2520	2934		
	H7/k6											868	1158	1222	1413	1667	1870	2058	2431	2564	2623	2997		

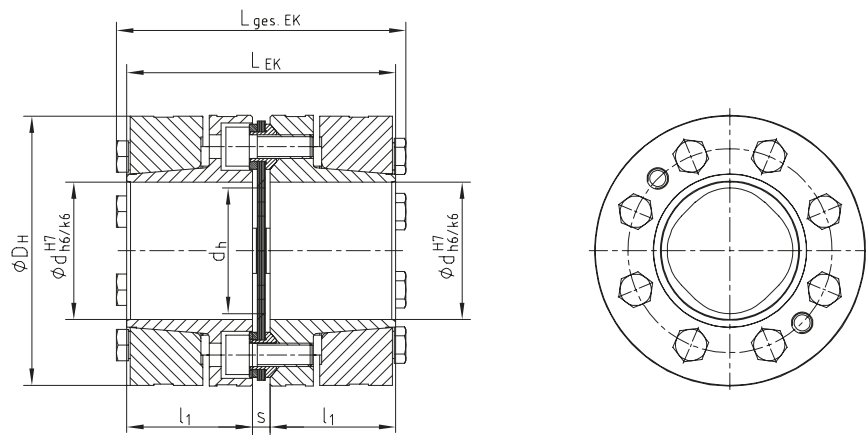
Ordering example:	RADEX®-NC 26 HT	DK	6.5 - Ø24		6.5 - Ø35	
	Coupling size	Type	Hub design	Finish bore	Hub design	Finish bore

Hub design 6.5

Type: DK



Type: EK



ROTEX® GS

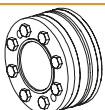
Backlash-free
jaw couplings

TOOLFLEX®

RADEX®-NC

COUNTEX®

Types of hubs



Type 6.5
Clamping ring hub