

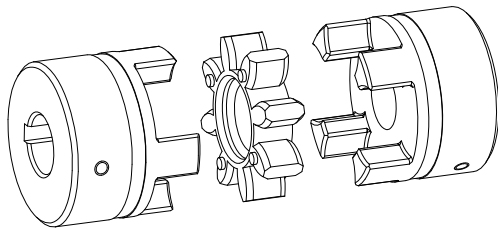


ROTEX® GS

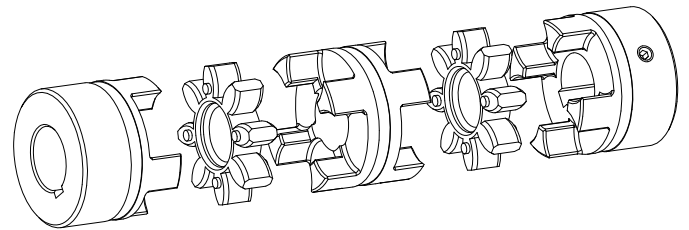
Torsionally flexible jaw-type couplings

shaft coupling, clamping hubs, clamping ring hubs, clamping ring hubs light, DKM, Compact and their combinations

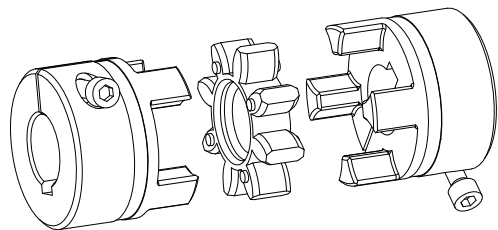
according to directive 94/9/EC (ATEX 95)
for finish bored, pilot bored and unbored couplings



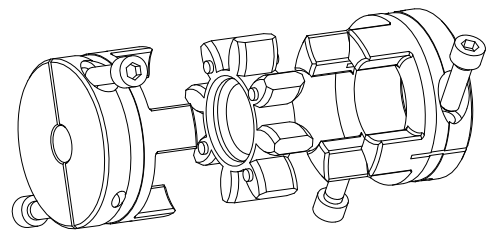
ROTEX® GS, shaft coupling



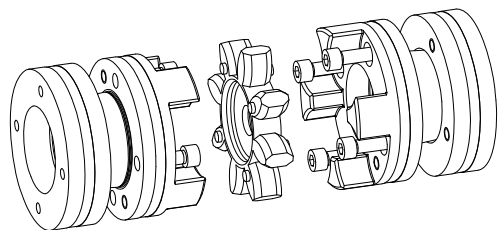
ROTEX® GS, DKM



ROTEX® GS, clamping hubs



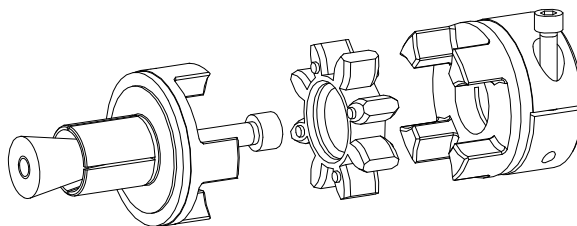
ROTEX® GS, Compact



ROTEX® GS, clamping ring hubs
ROTEX® GS, clamping ring hubs steel
ROTEX® GS, clamping ring hubs light

Expansion hubs and their combinations

for finish bored, pilot bored and unbored couplings



ROTEX® GS, expansion hubs



ROTEX® GS is a plug-in shaft coupling for measuring technology and automatic control engineering. It is able to compensate for shaft misalignment, for example caused by manufacturing inaccuracies, thermal expansion, etc.

With the designing of our **ROTEX® GS** coupling, the engineering standards and regulations, in particular DIN EN 12100, part 2 as well as DIN EN ISO 13849, part 1 and 2 „Safety of machines” have been taken into account.

Table of contents

1 Technical data

2 Advice

- 2.1 Coupling selection
- 2.2 General advice
- 2.3 Safety and advice symbols
- 2.4 General hazard warnings
- 2.5 Intended use





3 Storage

4 Assembly

- 4.1 Types of hubs
- 4.2 Components of the couplings
- 4.3 Advice for assembly
- 4.4 Advice for finish bore
- 4.5 Assembly of hubs (types 1.0, 1.1 and 1.2)
- 4.6 Assembly of clamping hubs (types 2.0, 2.1, 2.5, 2.6, 2.8, 2.9, 7.5, 7.6, 7.8 and 7.9)
- 4.7 Assembly of clamping ring hubs (types 6.0, 6.0 steel, 6.0 light and 6.5)
- 4.8 Assembly of expansion hubs (type 9.0)
- 4.9 Displacements - alignment of the couplings
- 4.10 Spares inventory, customer service addresses

5 Enclosure A

Advice and instructions regarding the use in hazardous locations

- 5.1 Intended use in  hazardous locations
- 5.2 Inspection intervals for couplings in  hazardous locations
- 5.3 Standard values of wear
- 5.4 Permissible coupling materials in  hazardous locations
- 5.5  marking of coupling for hazardous locations
- 5.6 Start-up
- 5.7 Breakdowns, causes and elimination
- 5.8 EC certificate of conformity according to the EC directive 94/9/EC dated March 23, 1994



1 Technical data

Standard shaft couplings

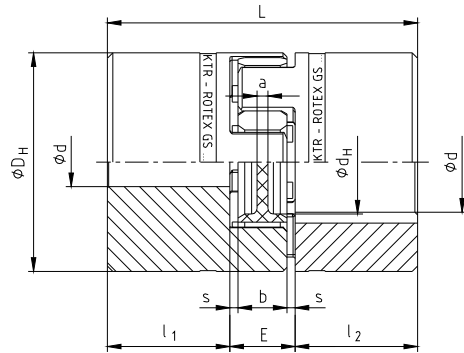


Illustration 1:
ROTEX® GS,
size 5 - 38

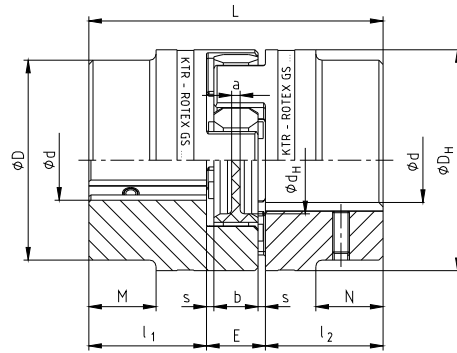


Illustration 2:
ROTEX® GS,
size 42 - 90

Table 1: Dimensions

Size	Dimensions [mm]										Setscrew ¹⁾	
	D	D _H	d _H	L	l ₁ ; l ₂	M / N	E	b	s	a	G	t
Hub material - aluminium (Al-H)												
5	-	10	-	15	5	-	5	4	0.5	4.0	M2	2.5
7	-	14	-	22	7	-	8	6	1.0	6.0	M3	3.5
9	-	20	7.2	30	10	-	10	8	1.0	1.5	M4	5.0
12	-	25	8.5	34	11	-	12	10	1.0	3.5	M4	5.0
14	-	30	10.5	35	11	-	13	10	1.5	2.0	M4	5.0
19	-	40	18	66	25	-	16	12	2.0	3.0	M5	10
24	-	55	27	78	30	-	18	14	2.0	3.0	M5	10
28	-	65	30	90	35	-	20	15	2.5	4.0	M8	15
38	-	80	38	114	45	-	24	18	3.0	4.0	M8	15
Hub material - Steel (St-H)												
42	85	95	46	126	50	28	26	20	3.0	4.0	M8	20
48	95	105	51	140	56	32	28	21	3.5	4.0	M8	20
55	110	120	60	160	65	37	30	22	4.0	4.5	M10	20
65	115	135	68	185	75	47	35	26	4.5	4.5	M10	20
75	135	160	80	210	85	53	40	30	5.0	5.0	M10	25
90	160	200	104	245	100	62	45	34	5.5	6.5	M12	30

1)



WARNING!

If used in hazardous locations the setscrews to fasten the hubs as well as all screw connections must be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).

Table 2: Torques and finish bores

Size	Spider ¹⁾ (component 2) Rated torque [Nm]					Unbo- red	Finish bore [mm] - hub design			
	80 Sh-A-GS	92 Sh-A-GS	98 Sh-A-GS	64 Sh-D-GS	72 Sh-D-GS		d _{min.}	1.0 d _{max.}	1.1, 1.2 d _{max.}	2.0, 2.1 d _{max.}
5	0.3	0.5	0.9	0.2 ²⁾	-	-	2	-	6	5
7	0.7	1.2	2.0	2.4	-	-	3	7	7	7
8	0.5	-	2.0	2.4	-	-	-	-	-	-
9	1.8	3.0	5.0	6.0	-	-	4	10	11	11
12	3.0	5.0	9.0	12.0	-	-	4	12	12	12
13	3.6	-	11.0	14.5	-	-	-	-	-	-
14	4.0	7.5	12.5	16.0	-	-	5	16	16	16
16	5.0	-	15.0	19.0	-	-	-	-	-	-
								1.0, 1.1 d _{max.}	2.5 d _{max.}	2.6 d _{max.}
19	4.9	10.0	17.0	21	-	x	6	24	24	24
24	-	35	60	75	97 ⁴⁾	x	8	28	28	28
28	-	95	160	200	260 ⁴⁾	x	10	38	38	38
38	-	190	325	405	525 ⁴⁾	x	12	45	45	45
42	-	265	450	560	728 ⁴⁾	x	14	55	50	45
48	-	310	525	655	852 ⁴⁾	x	15	62	55	55
55	-	410	685	825	1072 ⁴⁾	x	20	74	68	68
65	-	-	940 ³⁾	1175	1527 ⁴⁾	x	22	80	70	70
75	-	-	1920 ³⁾	2400	-	x	30	95	80	80
90	-	-	3600 ³⁾	4500	-	-	40	110	90	90

1) Maximum torque of the coupling T_{Kmax.} = rated torque of the coupling T_{K rated} x 2

except for clamping hubs types 2.0 and 2.5 (see table 3), for coupling selection please see company catalogue "ROTEX® GS"

2) Figures for spider 70 Sh A-GS

3) Figures for spider 95 Sh A-GS

4) When using the spider 72 Sh-D, we recommend to use hubs made of steel.

Please observe protec- tion note ISO 16016.	Drawn:	11.12.13 Pz/Rt	Replaced for:	KTR-N dated 15.10.12
	Verified:	18.12.13 Pz	Replaced by:	



1 Technical data

Clamping hubs

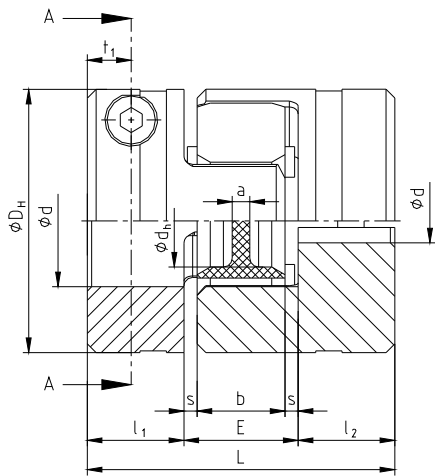


Illustration 3: ROTEX® GS, size 5 - 14 (type 2.0)

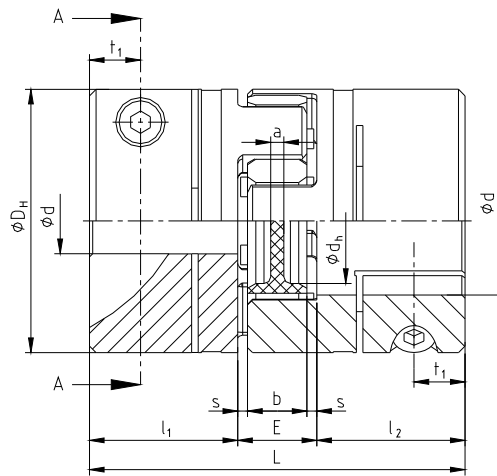


Illustration 4: ROTEX® GS, size 19 - 75 (type 2.5)

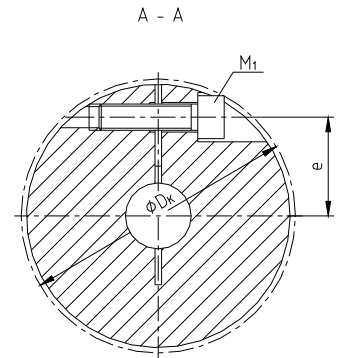


Table 3: Torques and surface pressure of clamping hubs types 2.0 / 2.5

Size	5	7	9	12	14	19	24	28	38	42	48	55	65	75	90
Clamping screw M ₁	M1.2	M2	M2.5	M3	M3	M6	M6	M8	M8	M10	M12	M12	M12	M16	M20
Dimension t ₁	2.5	3.5	5.0	5.0	5.0	11.0	10.5	11.5	15.5	18	21	26	33	36	40
Dimension e	3.5	5.0	7.5	9.0	11.5	14.5	20	25	30	32	36	42.5	45	51	60
Dimension ØD _K	11.4	16.5	23.4	27.5	32.2	46	57.5	73	83.5	93.5	105	119.5	124	147.5	192
Tightening torque T _A [Nm]	- ¹⁾	0.37	0.76	1.34	1.34	10.5	10.5	25	25	69	120	120	120	295	580
Bore Ø	Transmittable torque of clamping hub [Nm]														
	Surface pressure [N/mm ²]														
Ø2	-														
Ø3	-	0.84													
		71.02													
Ø4	-	0.91	2.07	3.65	4.48										
		43.02	68.51	109.9	134.9										
Ø5	-	0.97	2.18	3.81	4.64										
		29.50	46.15	73.5	89.5										
Ø6		1.04	2.28	3.98	4.81	23.6									
		21.85	33.65	53.3	64.4	139.3									
Ø7		1.10	2.39	4.14	4.97	24.3									
		17.06	25.90	40.8	48.9	105.2									
Ø8		1.17	2.50	4.31	5.14	25.0	32.4								
		13.83	20.73	32.5	38.7	82.8	131.0								
Ø9			2.61	4.48	5.30	25.7	33.1								
			17.09	26.6	31.6	67.2	105.7								
Ø10			2.72	4.64	5.47	26.3	33.8	74.3							
			14.42	22.4	26.4	55.9	87.3	171.3							
Ø11			2.83	4.81	5.64	27.0	34.4	75.5							
			12.40	19.2	22.5	47.4	73.6	143.9							
Ø12				4.97	5.80	27.7	35.1	76.7	89.1						
				16.7	19.4	40.8	63.1	122.9	105.9						

1) Slotted screw, tightening torque not defined



WARNING!

If used in hazardous locations the setscrews to fasten the hubs as well as all screw connections must be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).



ATTENTION!

Clamping hubs type 2.0 and 2.5 without keyway are not permissible for applications according to DIN EN ISO 13849, part 2.

Please observe protection note ISO 16016.	Drawn:	11.12.13 Pz/Rt	Replaced for:	KTR-N dated 15.10.12
	Verified:	18.12.13 Pz	Replaced by:	



1 Technical data

Continuation of table 3: Torques and surface pressure of clamping hubs types 2.0 / 2.5

Size	5	7	9	12	14	19	24	28	38	42	48	55	65	75	90
Clamping screw M ₁	M1.2	M2	M2.5	M3	M3	M6	M6	M8	M8	M10	M12	M12	M12	M16	M20
Dimension t ₁	2.5	3.5	5.0	5.0	5.0	11.0	10.5	11.5	15.5	18	21	26	33	36	40
Dimension e	3.5	5.0	7.5	9.0	11.5	14.5	20	25	30	32	36	42.5	45	51	60
Dimension ØD _K	11.4	16.5	23.4	27.5	32.2	46	57.5	73	83.5	93.5	105	119.5	124	147.5	192
Tightening torque T _A [Nm]	- ¹⁾	0.37	0.76	1.34	1.34	10.5	10.5	25	25	69	120	120	120	295	580
Bore Ø	Transmittable torque of clamping hub [Nm]														
	Surface pressure [N/mm ²]														
Ø14					6.13	29.0	36.5	79.2	91.6	216					
					15.1	31.4	48.1	93.2	80.0	172					
Ø15					6.30	29.7	37.1	80.4	92.8	219	352				
					13.5	28.0	42.7	82.5	70.6	152	225				
Ø16					6.46	30.4	37.8	81.7	94.1	221	356				
					12.2	25.2	38.2	73.6	62.9	135	200				
Ø19						32.4	39.8	85.4	97.8	230	369				
						19.0	28.5	54.6	46.3	99	149				
Ø20						33.1	40.5	86.6	99.0	232	373	425			
						17.5	26.2	50.0	42.4	91	134	128			
Ø22						30.4*	41.9	89.1	101.5	238	381	433			
						13.3*	22.4	42.5	35.9	77	113	108			
Ø24						31.59*	43.2	91.6	104.0	244	389	441	462	964	
						11.6*	19.4	36.7	30.9	66	97	92	80	150	
Ø25							43.9	92.8	105.2	246	393	446	466	972	
							18.2	34.3	28.8	61	90	86	75	140	
Ø28							45.9	96.5	108.9	255	405	458	478	995	1776
							15.2	28.4	23.8	51	74	70	61	114	167
Ø30								99.0	111.4	260	413	466	486	1010	1800
								25.4	21.2	45	66	62	54	101	147
Ø32								101.5	113.9	266	421	474	494	1025	1824
								22.9	19.0	40	59	56	48	90	131
Ø35								105.2	117.6	274	433	486	506	1048	1860
								19.8	16.4	35	51	48	41	77	112
Ø38								108.9	121.3	282	446	498	518	1071	1896
								17.4	14.4	31	44	42	36	67	97
Ø40									123.8	288	454	506	527	1086	1920
									13.2	28	41	38	33	61	88
Ø42									126.2	293	462	514	535	1102	1944
									12.2	26	38	35	30	56	81
Ø45									129.9	302	474	527	547	1125	1980
									11.0	23	34	31	27	50	72
Ø48										310	486	539	559	1148	2016
										21	30	28	24	45	64
Ø50										315	494	547	567	1163	2040
										20	28	26	23	42	60
Ø55											514	567	587	1201	2100
											24	23	19	36	51
Ø60												587	608	1239	2160
												20	17	31	44
Ø65												608	626	1278	2220
												17	15	27	39
Ø70													648	1316	2280
													13	24	34
Ø75														1354	2340
														22	31
Ø80														1392	2400
														20	28
Ø85															2460
															25
Ø90															2520
															23

1) Slotted screw, tightening torque not defined

* type 2.0 only

= 2 x clamping screw M4; T_A = 2.9 Nm



WARNING!

If used in hazardous locations the setscrews to fasten the hubs as well as all screw connections must be secured against working loose additionally, e. g. conglomerating with Loctite (average strength).



ATTENTION!

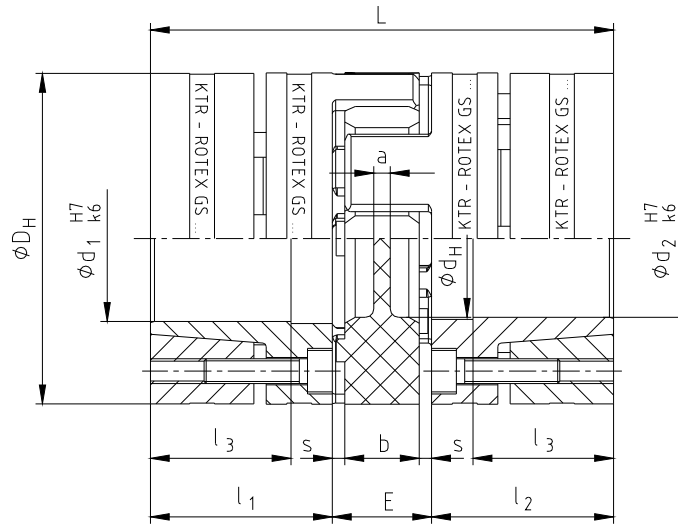
Clamping hubs type 2.0 and 2.5 without keyway are not permissible for applications according to DIN EN ISO 13849, part 2.

Please observe protection note ISO 16016.	Drawn:	11.12.13 Pz/Rt	Replaced for:	KTR-N dated 15.10.12
	Verified:	18.12.13 Pz	Replaced by:	



1 Technical data

Clamping ring hubs 6.0, 6.0 steel and 6.0 light



Pull-off thread M₁ between clamping screws.

Illustration 5: ROTEX® GS, clamping ring hubs

Table 4: Dimensions

Size	Spider ¹⁾ (component 2) Rated torque [Nm]	Dimensions [mm]									
		D _H ²⁾	d _H	L	l ₁ ; l ₂	l ₃	E	b	s	a	M ₁ ³⁾
6.0 light (size 14 - 48)		Material of hub/clamping ring - aluminium (Al-H)									
14	Figures see table 2	30	10.5	50	18.5	13.5	13	10	1.5	2.0	M3
19		40	18	66	25	18	16	12	2.0	3.0	M4
24		55	27	78	30	22	18	14	2.0	3.0	M5
28		65	30	90	35	27	20	15	2.5	4.0	M5
38		80	38	114	45	35	24	18	3.0	4.0	M6
42		95	46	126	50	35	26	20	3.0	4.0	M8
48		105	51	140	56	41	28	21	3.5	4.0	M10
6.0 steel (size 19 - 90)		Material of hub and clamping ring - steel (St-H)									
6.0 (size 14 - 38)		Hub material - aluminium (Al-H)/clamping ring material - steel (St-H)									
19	Figures see table 2	40	18	66	25	18	16	12	2.0	3.0	M4
24		55	27	78	30	22	18	14	2.0	3.0	M5
28		65	30	90	35	27	20	15	2.5	4.0	M5
38		80	38	114	45	35	24	18	3.0	4.0	M6
42		95	46	126	50	35	26	20	3.0	4.0	M8
48		105	51	140	56	41	28	21	3.5	4.0	M10
55		120	60	160	65	45	30	22	4.0	4.5	M10
65		135	68	185	75	55	35	26	4.5	4.5	M12
75		160	80	210	85	63	40	30	5.0	5.0	M12
90		200	104	245	100	75	45	34	5.5	6.5	M16

- 1) For coupling selection see company catalogue „ROTEX® GS“.
Consider transmittable torques of the clamping connection (see table 5 to 7)
- 2) Ø D_H + 2 mm with high speeds for expansion of spider



WARNING!

If used in hazardous locations the setscrews to fasten the hubs as well as all screw connections must be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).



ATTENTION!

Subject to the increased safety with the assembly (several screws are tightened) and the high friction torque of the clamping ring hub, this type is permissible for applications according to DIN EN ISO 13849, part 2.

Please observe protection note ISO 16016.	Drawn:	11.12.13 Pz/Rt	Replaced for:	KTR-N dated 15.10.12
	Verified:	18.12.13 Pz	Replaced by:	



1 Technical data

Table 5: Torques and surface pressure of clamping ring hubs 6.0 light

Size	14	19	24	28	38	42	48
Clamping screw M ¹⁾	M3	M4	M5	M5	M6	M8	M10
Number z (for each clamping ring hub)	4	6	4	8	8	4	4
Tightening torque T _A [Nm]	Hub/clamping ring material - aluminium (Al-H)						
	1.34	3	6	6	10	25	49
Bore Ø d ₁	Transmittable torque of clamping ring hub [Nm]						
	Surface pressure [N/mm ²]						
Ø6	5.4						
	49.4						
Ø10	7.5	17					
	39.3	65.9					
Ø11	11.3	20					
	49.7	67.3					
Ø14	24.5	41	47				
	57.6	87.9	80.6				
Ø15		49	57				
		92.5	85.3				
Ø16		36	67	99			
		55.3	89.4	102			
Ø19		56	98	145			
		64	96.6	109			
Ø20		64	110	133	203		
		67	99	88	102.9		
Ø22			135	165	252		
			102.8	92.4	107		
Ø24			127	201	304		
			76.3	95.7	110		
Ø25			139	219	331		
			77.9	97	110.2		
Ø28			175	248	394	444	
			81.5	86.9	104.9	113.6	
Ø30				285	452	508	572
				88.6	106.3	114.8	108
Ø32				253	453	535	638
				66.5	91	103.5	107.2
Ø35				307	543	638	762
				69.3	93.2	105.4	108.9
Ø38				329	550	692	842
				63.6	78.4	95	100
Ø40					609	763	929
					79.5	95.8	101.1
Ø42					669	754	943
					80.3	83.4	91
Ø45					634	858	1074
					63.6	84.6	91.9
Ø48						964	1208
						85.2	92.3
Ø50						976	1136
						79	77.3
Ø55							1336
							77.4

The transmittable torques of the clamping connection include the max. fitting tolerance with shaft clearance H7/k6 bore. The torque is reduced with bigger fit clearance.

1)



WARNING!

If used in hazardous locations the setscrews to fasten the hubs as well as all screw connections must be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).



CAUTION!

A calculation is necessary if hollow shafts are used!

Please observe protection note ISO 16016.	Drawn:	11.12.13 Pz/Rt	Replaced for:	KTR-N dated 15.10.12
	Verified:	18.12.13 Pz	Replaced by:	



1 Technical data

Table 6: Torques and surface pressure of clamping ring hubs 6.0 steel

Size	19	24	28	38	42	48	55	65	75	90
Clamping screw M ¹⁾	M4	M5	M5	M6	M8	M10	M10	M12	M12	M16
Number z (for each clamping ring hub)	6	4	8	8	4	4	4	4	5	5
Tightening torque T _A [Nm]	Hub and clamping ring material - steel									
	4.1	8.5	8.5	14	35	69	69	120	120	295
Bore Ø d _i	Transmittable torque of clamping ring hub [Nm]									
	Surface pressure [N/mm ²]									
Ø10	27	25								-
	160	119								
Ø11	32	30								
	160	119								
Ø14	69	70								
	211	170								
Ø15	84	87	108							
	225	184	168							
Ø16	57	56	131							
	134	104	178							
Ø19	94	97	207							
	157	127	200							
Ø20	110	114	148	208						
	166	135	129	138						
Ø22		86	197	275						
		84	142	151						
Ø24		116	253	353						
		96	154	163						
Ø25		133	285	395	358	489				
		101	159	168	152	179				
Ø28		192	315	439	398	658				
		116	141	149	135	192				
Ø30			382	531	483	616				
			148	157	143	157				
Ø32			330	463	416	704				
			79	120	108	158				
Ø35			433	603	547	899	863			
			123	131	119	168	138			
Ø38			503	593	536	896	856			
			122	118	99	142	116			
Ø40				689	625	1030	991	1446		
				114	104	147	121	140		
Ø42				793	571	962	918	1355	1710	
				119	86	125	102	119	134	
Ø45				776	704	1160	1119	1637	2053	
				102	92	131	108	125	141	
Ø48					851	1379	1110	1635	2059	
					98	137	94	110	124	
Ø50					865	1222	1247	1827	2294	3845
					92	112	97	113	127	176
Ø55						1543	1277	1887	2384	4249
						117	83	97	109	161
Ø60							1672	2429	3040	4794
							91	104	117	153
Ø65							1605	2368	2983	5858
							74	87	98	159
Ø70							2008	2930	3664	5900
							80	92	104	138
Ø80									4148	7036
									92	126
Ø90										8047
										114
Ø95										9247
										118

The transmittable torques of the clamping connection include the max. fitting tolerance with shaft clearance k6/bore H7, from Ø 55 G7/m6. The torque is reduced with bigger fit clearance.

1)



WARNING!

If used in hazardous locations the setscrews to fasten the hubs as well as all screw connections must be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).



CAUTION!

A calculation is necessary if hollow shafts are used!

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	Verified:	18.12.13 Pz	Replaced by:	



1 Technical data

Continuation of table 6: Torques and surface pressure of clamping ring hubs 6.0 steel

Size	19	24	28	38	42	48	55	65	75	90
Clamping screw M ¹⁾	M4	M5	M5	M6	M8	M10	M10	M12	M12	M16
Number z (for each clamping ring hub)	6	4	8	8	4	4	4	4	5	5
Tightening torque T _A [Nm]	Hub and clamping ring material - steel									
	4.1	8.5	8.5	14	35	69	69	120	120	295
Bore Ø d ₁	Transmittable torque of clamping ring hub [Nm]									
	Surface pressure [N/mm ²]									
Ø100										9575
										110
Ø105										10845
										113

Table 7: Torques and surface pressure of clamping ring hubs 6.0

Size	14	19	24	28	38
Clamping screw M ¹⁾	M3	M4	M5	M5	M6
Number z (for each clamping ring hub)	4	6	4	8	8
Tightening torque T _A [Nm]	Hub material – aluminium (Al-H); clamping ring material – steel				
	1.34	3	6	6	10
Bore Ø d ₁	Transmittable torque of clamping ring hub [Nm]				
	Surface pressure [N/mm ²]				
Ø6	8.6				
	225				
Ø10	13.8	41			
	130	272			
Ø11	14.7	45	48		
	118	248	214		
Ø14	22.7	62	67		
	108	211	182		
Ø15		68	74	142	
		203	175	243	
Ø16		67	72	154	
		171	148	231	
Ø19		83	90	189	
		153	132	203	
Ø20		90	97	188	269
		149	129	178	196
Ø22			99	212	307
			107	167	183
Ø24			112	237	337
			102	157	172
Ø25			120	250	356
			100	153	167
Ø28			143	280	398
			96	136	148
Ø30				307	436
				131	142
Ø32				310	442
				115	126
Ø35				353	501
				110	120
Ø38				389	533
				103	107
Ø40					572
					104
Ø42					615
					102
Ø45					644
					92

The transmittable torques of the clamping connection include the max. fitting tolerance with shaft clearance k6/bore H7, from Ø 55 G7/m6. The torque is reduced with bigger fit clearance.

1)



WARNING!

If used in hazardous locations the setscrews to fasten the hubs as well as all screw connections must be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).



CAUTION!

A calculation is necessary if hollow shafts are used!

Please observe protection note ISO 16016.	Drawn:	11.12.13 Pz/Rt	Replaced for:	KTR-N dated 15.10.12
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1 Technical data

DKM

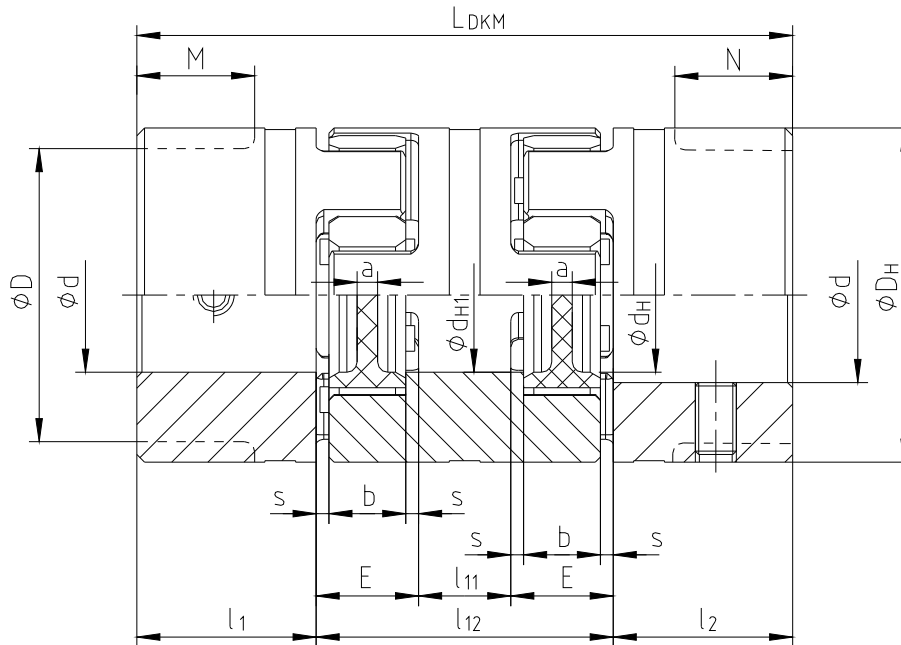


Illustration 6: ROTEX® GS, DKM

Table 8: Dimensions

Size	Finish bore $d_{max.}^{1)}$	Dimensions [mm]													
		D	D_H	d_H	d_{H1}	$l_1; l_2$	M; N	l_{11}	l_{12}	L_{DKM}	E	b	s	a	
Hub material - aluminium (Al-H); Spacer material - aluminium (Al-H)															
5	5	-	10	-	-	5	-	3	13	23	5	4	0.5	4.0	
7	7	-	14	-	-	7	-	4	20	34	8	6	1.0	6.0	
9	11	-	20	7.2	-	10	-	5	25	45	10	8	1.0	1.5	
12	12	-	25	8.5	-	11	-	6	30	52	12	10	1.0	3.5	
14	16	-	30	10.5	-	11	-	8	34	56	13	10	1.5	2.0	
19	24	-	40	18	18	25	-	10	42	92	16	12	2.0	3.0	
24	28	-	55	27	27	30	-	16	52	112	18	14	2.0	3.0	
28	38	-	65	30	30	35	-	18	58	128	20	15	2.5	4.0	
38	45	-	80	38	38	45	-	20	68	158	24	18	3.0	4.0	
Hub material - steel (St-H); Spacer material - aluminium (Al-H)															
42	55	85	95	46	46	50	28	22	74	174	26	20	3.0	4.0	
48	62	95	105	51	51	56	32	24	80	192	28	21	3.5	4.0	
55	74	110	120	60	60	65	37	28	88	218	30	22	4.0	4.5	

1) dependent on type of hub



1 Technical data

Compact

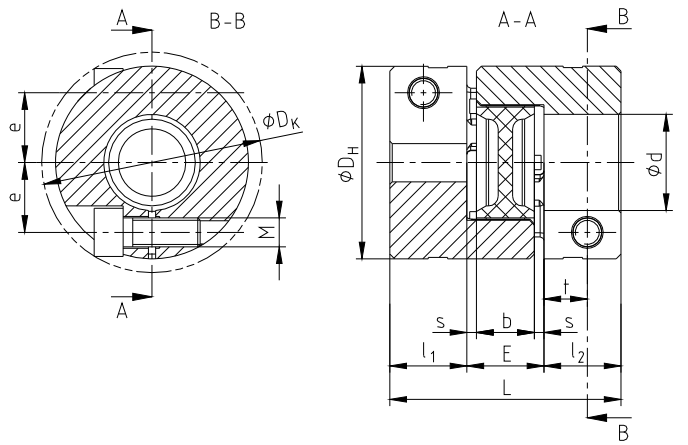


Illustration 7: ROTEX® GS 7 - 19 Compact single slotted ¹⁾ (type 2.8/2.9)

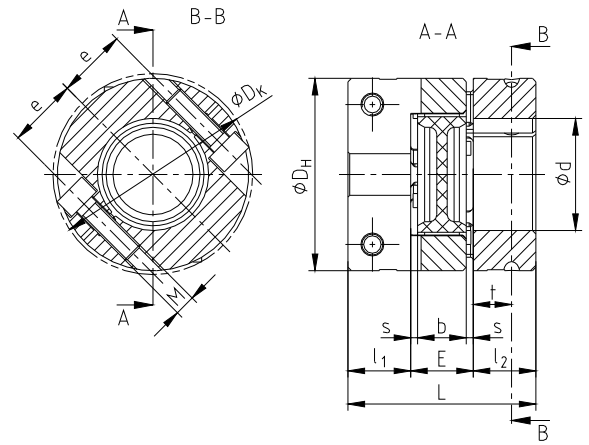


Illustration 8: ROTEX® GS 24 - 38 Compact axially slotted (type 2.8/2.9)

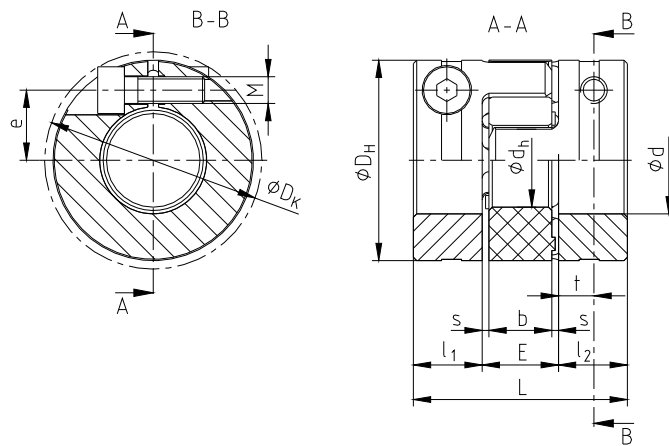


Illustration 9: ROTEX® GS 8, 13 and 16

Table 9: Dimensions

Size	Spider (component 2) Rated torque [Nm]	Dimensions [mm]											
		d _{max.}	D _H	D _K	L	l ₁ ; l ₂	E	b	s	d _h	t	e	M
7	Figures see table 2	7	14	16.6	18	5	8	6	1	-	2.5	5.0	M2
8		8	15	17.1	20	7	6	5	0.5	6.2	4.0	5.5	M2
9		9	20	21.3	24	7	10	8	1	-	3.5	6.7	M2.5
12		12	25	26.2	26	7	12	10	1	-	3.5	8.3	M3
13		12.7	25	25.7	26	8	10	8	1	10	4.0	8.0	M3
14		16 ¹⁾	30	30.5	32	9.5	13	10	1.5	-	4.5	9.6	M4
16		16	30	-	32	10.3	11.4	9.4	1	14	5.3	10.5	M4
19		24 ¹⁾	40	45.0	50	17	16	12	2	-	9.0	14.0	M6
24		32	55	57.5	54	18	18	14	2	-	11.0	20.0	M6
28		35	65	69.0	62	21	20	15	2.5	-	12.0	23.8	M8
38		45	80	86.0	76	26	24	18	3	-	16.0	30.5	M10

1) Size 14 with screw M3 and dimension e=10.4; size 19 with screw M5 and dimension e=15.5



1 Technical data

Table 10: Torques and surface pressure of short clamping hubs type 2.8 / 2.9

Size	7	8	9	12	13	14	16	19	24	28	38
Clamping screw M	M2	M2	M2.5	M3	M3	M4	M4	M6	M6	M8	M10
Dimension t	2.5	4.0	3.5	3.5	4.0	4.5	5.3	9.0	11.0	12.0	16.0
Dimension e	5.0	5.5	6.7	8.3	8.0	9.6	10.5	14.0	20.0	23.8	30.5
Dimension ØD _K	16.6	17.1	21.3	26.2	25.7	30.5	-	45.0	57.5	69.0	86.0
Tightening torque T _A [Nm]	0.37	0.52	0.76	1.34	1.9	2.9	4.1	10	10	25	49
Bore Ø	Transmittable torque of clamping hub [Nm]										
	Surface pressure [N/mm ²]										
Ø3	0.8	0.65									
	173.5	86.4									
Ø4	0.9	0.85	1.9	3.4	2.2						
	105.1	64.8	151.6	273.6	145.8						
Ø5	1.0	1.1	2.0	3.6	2.75	7.1	4.8				
	72.1	51.9	102.6	183.6	116.6	262.2	158.7				
Ø6	1.0	1.3	2.1	3.7	3.3	7.4	5.8				
	53.4	43.2	75.1	133.4	97.2	189.6	132.3				
Ø7	1.1	1.5	2.2	3.9	3.8	7.7	6.4				
	41.7	37.0	58	102.3	83.3	144.8	113.4				
Ø8		1.7	2.3	4.1	4.4	8.0	7.7	24.3			
		32.4	46.6	81.7	72.9	115.1	99.2	191.8			
Ø9			2.4	4.2	4.9	8.2	8.7	25.0			
			38.6	67.2	64.8	94.3	88.2	155.7			
Ø10				4.4	5.5	8.5	9.6	25.7	21.2		
				56.5	58.3	79.1	79.4	129.5	82.3		
Ø11				4.6	6.0	8.8	10.5	26.3	23.3		
				48.5	53.0	67.6	72.2	109.9	74.8		
Ø12				4.7	6.6	9.1	11.6	27.0	25.4		
				42.2	48.6	58.7	66.1	94.7	68.6		
Ø14						5.8	13.5	28.4	29.7	54.4	
						27.2	56.7	73.1	58.8	92.0	
Ø15						5.9	14.5	29.0	31.8	58.3	92.6
						24.4	52.9	65.2	54.9	85.9	109.6
Ø16						6.1	15.4	29.7	33.9	62.2	98.8
						22.1	49.6	58.6	51.4	80.5	102.7
Ø18								31.1	38.2	70.0	111.1
								48.4	45.7	71.5	91.3
Ø19								31.7	40.3	73.9	117.3
								44.4	43.3	67.8	86.5
Ø20								32.4	42.4	77.8	123.5
								40.9	41.1	64.4	82.2
Ø22								25.4	46.7	85.5	135.8
								26.5	37.4	58.5	74.7
Ø24								26.4	50.9	93.3	148.2
								23.1	34.3	53.7	68.5
Ø25									53.0	97.2	154.3
									32.9	51.5	65.8
Ø28									59.4	108.9	172.9
									29.4	46.0	58.7
Ø30									63.6	116.6	185.2
									27.4	42.9	54.8
Ø32									67.9	124.4	197.5
									25.7	40.2	51.4
Ø35										136.1	216.1
										36.8	47.0
Ø38											234.6
											43.3
Ø40											246.9
											41.1
Ø42											259.3
											39.1
Ø45											277.8
											36.5

■ = ROTEX® GS 14: 1 x clamping screw M3, T_A = 1.34 Nm, e = 10.4;
 ROTEX® GS 19: 1 x clamping screw M5, T_A = 6 Nm, e = 15.5



1 Technical data

Expansion hubs

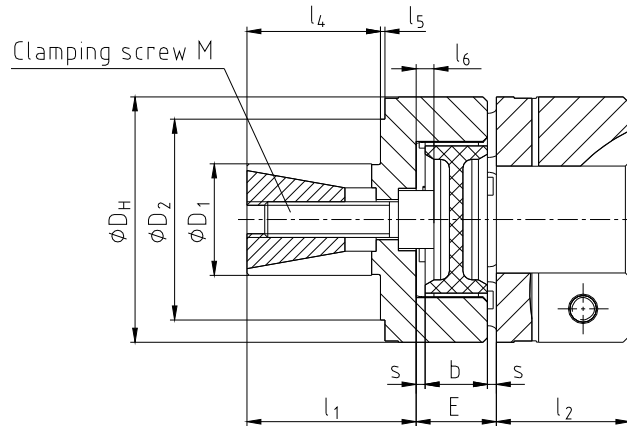


Illustration 10: ROTEX® GS, expansion hub (type 9.0) with clamping hub ¹⁾

Table 11: Dimensions

Size	Spider ²⁾ (component 2) Rated torque [Nm]	Dimensions [mm]										Clamping screw	
		D ₁	D ₂	D _H	l ₁	l ₄	l ₅	l ₆	E	b	s	M	T _A
9	Figures see table 2	10	-	20	20	11	-	0	10	8	1.0	M4	2.9
12		10	20	25	19	14	1.5	2	12	10	1.0	M4	2.9
14		12	24	30	18.5	12.5	3	2	13	10	1.5	M4	2.9
19		20	35	40	28	20	1	0	16	12	2.0	M6	10
24		25	45	55	38	30	1	4	18	14	2.0	M8	25
28		35	55	65	44	36	1	5	20	15	2.5	M10	49

- 1) The expansion hub can be combined with other types of hubs to form the opposite side, too. l₂ depends on the hub design. For further types of hubs see chapter 4.1.
- 2) For coupling selection please see company catalogue "ROTEX® GS".



ATTENTION!

Transmittable friction torques for D₁ on request (depending on the hollow shaft).



ATTENTION!

Expansion hubs without keyway are not permissible for applications according to DIN EN ISO 13849, part 2.



2 Advice

The **ROTEX® GS** coupling was developed for a backlash-free power transmission and easy plug-in assembly. This backlash-free power transmission is realized in the area of prestress (see illustration 11). The big concave surface contact results in a lower surface pressure on the involute tooth. Consequently the tooth can be overloaded many times over with no wear/deformation.

The safe operation in the range of prestress is ensured, because the coupling operates according to the principle of positive-locking rubber spring prestress with high damping features. The star-shape coupling spider is inserted in the cams of the hubs which are machined specifically accurately with a small amount of prestress, resulting in the necessary backlash-free power transmission.

The flexible teeth compensating for misalignment are radially supported in the internal diameter by means of a web. An external deformation is limited by the concave shape of the cams, ensuring a smooth operation even with bigger masses (e. g. machine tables, articulated arms, etc.).

The flexible spiders for the GS series are available in five different kinds of Shore hardness, injected in different colours, either as a torsionally soft or hard material.

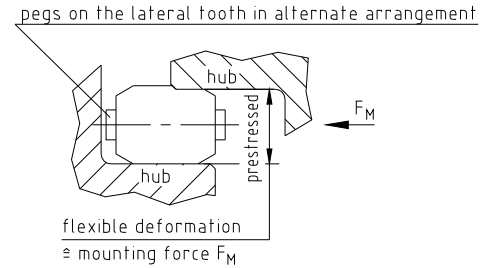


Illustration 11: Prestress of spider

2.1 Coupling selection



CAUTION!

For a long-lasting and failure-free operation of the coupling it must be selected according to the selection instructions (according to DIN 740 part 2) for the particular application (see ROTEX® GS catalogue).

If the operating conditions (performance, speed, modifications on engine and machine) change, the coupling selection must be reviewed again.

Please make sure that the technical data regarding torque refer to the spider only. The transmittable torque of the shaft/hub connection must be reviewed by the customer and is subject to his responsibility.

For drives subject to torsional vibrations (drives with cyclic stress due to torsional vibrations) it is necessary to perform a torsional vibration calculation to ensure a reliable selection. Typical drives subject to torsional vibrations are e. g. drives with diesel engines, piston pumps, piston compressors etc. If requested, KTR will perform the coupling selection and the torsional vibration calculation.

2.2 General advice

Please read through these assembly instructions carefully before you start up the coupling. Please pay special attention to the safety instructions!



The **ROTEX® GS** coupling is suitable and approved for the use in hazardous areas. When using the coupling in hazardous locations please observe the special advice and instructions regarding safety in enclosure A.

In order to ensure the operating principle of **ROTEX® GS** and avoid early wear of the coupling, a corresponding torsional stiffness factor „Sd“ has to be considered for the selection, each depending on the application (see catalogue). Temperatures and shocks are provided with the corresponding factors, too (see catalogue).

The assembly instructions are part of your product. Please keep them carefully and close to the coupling. The copyright for these assembly instructions remains with **KTR Kupplungstechnik GmbH**.

Please observe protection note ISO 16016.	Drawn:	11.12.13 Pz/Rt	Replaced for:	KTR-N dated 15.10.12
	Verified:	18.12.13 Pz	Replaced by:	



2 Advice

2.3 Safety and advice symbols



DANGER!

Danger of injury to persons.



CAUTION!

Damages on the machine possible.



ATTENTION!

Pointing to important items.



WARNING!

Hints concerning explosion protection.

2.4 General hazard warnings



DANGER!

With assembly, operation and maintenance of the coupling it has to be made sure that the entire drive train is secured against accidental switch-on. You may be seriously hurt by rotating parts. Please make absolutely sure to read through and observe the following safety indications.

- All operations on and with the coupling have to be performed taking into account "safety first".
- Please make sure to switch off the power pack before you perform your work on the coupling.
- Secure the power pack against accidental switch-on, e. g. by providing warning signs at the place of switch-on or removing the fuse for current supply.
- Do not reach into the operation area of the coupling as long as it is in operation.
- Please secure the coupling against accidental contact. Please provide for the necessary protection devices and covers.

2.5 Intended use

You may only assemble, operate and maintain the coupling if you

- have carefully read through the assembly instructions and understood them
- had technical training
- are authorized by your company

The coupling may only be used in accordance with the technical data (see table 1 to 11 in chapter 1). Unauthorized modifications on the coupling design are not admissible. We will not assume liability for any damage that may arise. In the interest of further development we reserve the right for technical modifications.

The **ROTEX® GS** described in here corresponds to the technical status at the time of printing of these assembly instructions.

3 Storage

The coupling hubs are supplied in preserved condition and can be stored at a dry and covered place for 6 - 9 months.

The features of the coupling spiders (elastomers) remain unchanged for up to 5 years with favourable stock conditions.



CAUTION!

The storage rooms may not include any ozone-generating devices like e. g. fluorescent light sources, mercury-vapour lamps or electrical high-voltage appliances.

Humid storage rooms are not suitable.

Please make sure that condensation is not generated. The best relative air humidity is less than 65 %.

Please observe protection note ISO 16016.	Drawn:	11.12.13 Pz/Rt	Replaced for:	KTR-N dated 15.10.12
	Verified:	18.12.13 Pz	Replaced by:	



4 Assembly

Generally the coupling is supplied in individual parts. Before assembly the coupling has to be inspected for completeness.

4.1 Types of hubs

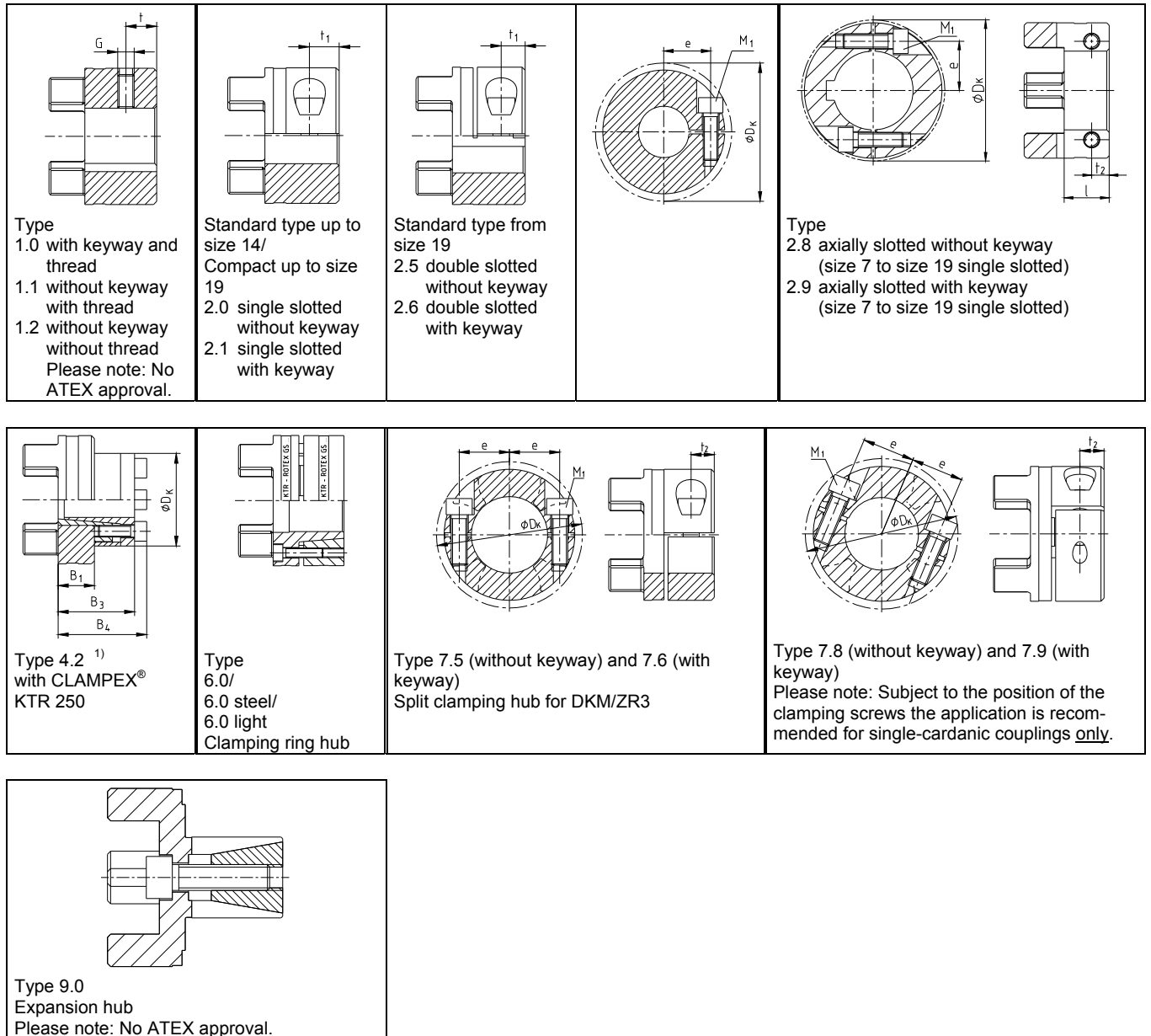


Illustration 12: Types of hubs

1)



ATTENTION!

Selection of clamping sets

With the use in hazardous locations the type and size of clamping hubs has to be selected in a way that the difference between the peak torque of the machine including all operating parameters and the rated torque of the clamping hub at least corresponds to a safety factor of $s = 2$.



WARNING!

Hub types 1.1, 2.0, 2.5, 2.8, 7.5 and 7.8 (without feather key) may only be used in category 3 and are not permissible for applications according to DIN EN ISO 13849, part 2.






Please observe protection note ISO 16016.	Drawn:	11.12.13 Pz/Rt	Replaced for:	KTR-N dated 15.10.12
	Verified:	18.12.13 Pz	Replaced by:	



4 Assembly

4.2 Components of the couplings

Features of the standard spiders

Spider hardness (Shore)	80 Sh-A-GS	92 Sh-A-GS	95/98 Sh-A-GS	64 Sh-A-GS	64 Sh-A-GS	72 Sh-A-GS	72 Sh-A-GS
Size	5 - 24	5 - 55	5 - 90	7 - 38	42 - 90	24 - 38	42 - 65
Material	Polyurethane	Polyurethane	Polyurethane	Hytrel	Polyurethane	Hytrel	Polyurethane
Marking (colour)							

Components of ROTEX® GS, backlash-free shaft couplings

Component	Quantity	Description
1	2	Hub
2	1	Spider
3	2	Setscrews DIN EN ISO 4029

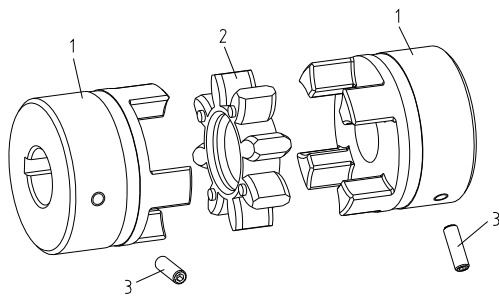


Illustration 13: ROTEX® GS, size 5 - 38

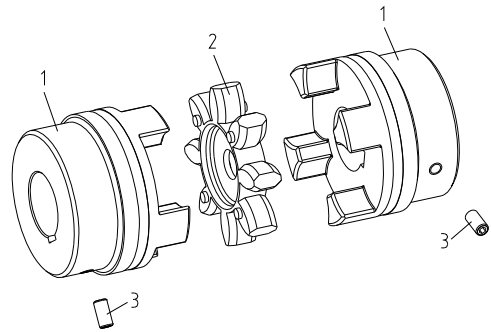


Illustration 14: ROTEX® GS, size 42 - 90

Components of ROTEX® GS, clamping hubs

Component	Quantity	Description
1	2	Clamping hub (type of hub 2.0, 2.1, 2.5 or 2.6)
2	1	Spider
3	2	Cap screws DIN EN ISO 4762

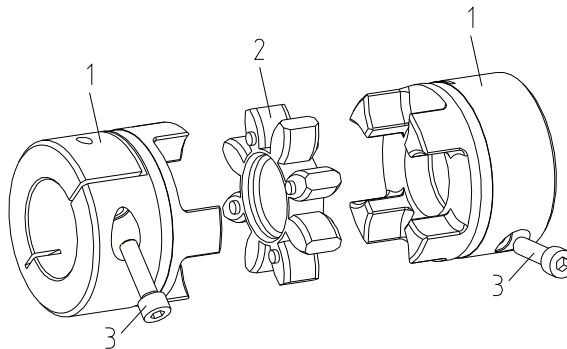


Illustration 15: ROTEX® GS, clamping hub



ATTENTION!

Clamping hubs type 2.0 and 2.5 without keyway are not permissible for applications according to DIN EN ISO 13849, part 2.

Please observe protection note ISO 16016.	Drawn:	11.12.13 Pz/Rt	Replaced for:	KTR-N dated 15.10.12
	Verified:	18.12.13 Pz	Replaced by:	



4 Assembly

4.2 Components of the couplings

Components of ROTEX® GS, clamping ring hubs (types 6.0, 6.0 steel, 6.0 light and type 6.5)

Component	Quantity	Description
1	2	Clamping ring
2	2	Clamping ring hub
3	1	Spider
4	see table 5, 6 and 7	Cap screws DIN EN ISO 4762

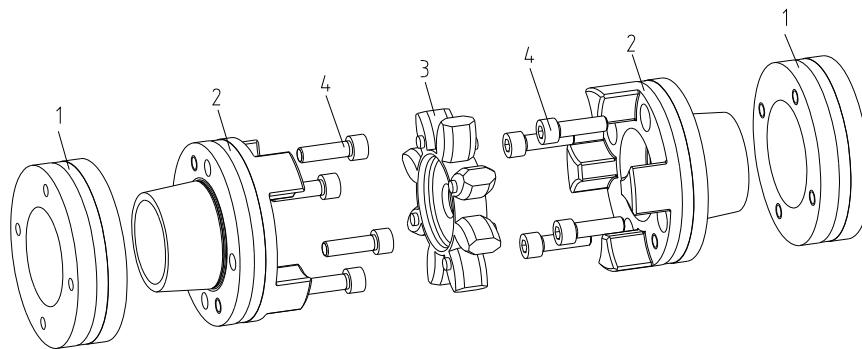


Illustration 16: ROTEX® GS, clamping ring hub



ATTENTION!

Selection of clamping ring hubs

With the use in hazardous locations the clamping ring hubs have to be selected such that there is a minimum safety factor of $s = 2$ covering the peak torque of the machine including all operating parameters and the friction torque of the clamping ring hub.



ATTENTION!

Subject to the increased safety with the assembly (several screws are tightened) and the high friction torque of the clamping ring hub, this type is permissible for applications according to DIN EN ISO 13849, part 2.

Components of ROTEX® GS, DKM

Component	Quantity	Description
1	2	Hub
2	2	Spider
3	1	DKM spacer
4	2	Setscrews DIN EN ISO 4029

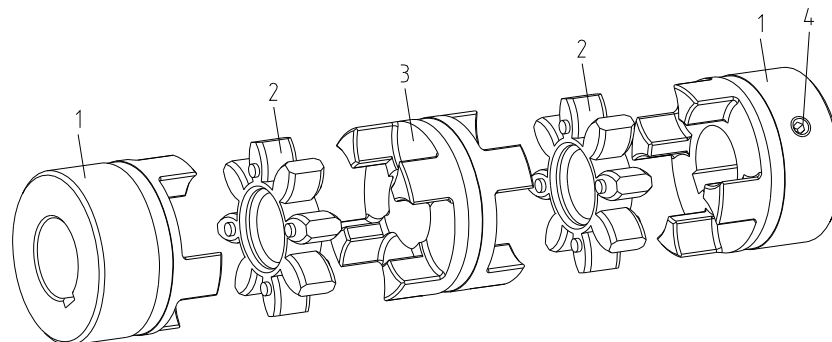


Illustration 17: ROTEX® GS, DKM



4 Assembly

4.2 Components of the couplings

Components of ROTEX® GS Compact, clamping hubs

Component	Quantity	Description
1	2	Clamping hub (type of hub 2.8 or 2.9)
2	1	Spider
3	2 / 4	Cap screws DIN EN ISO 4762

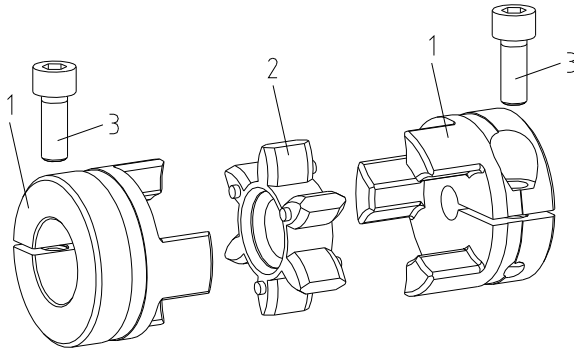


Illustration 18: ROTEX® GS Compact, size 7 - 19

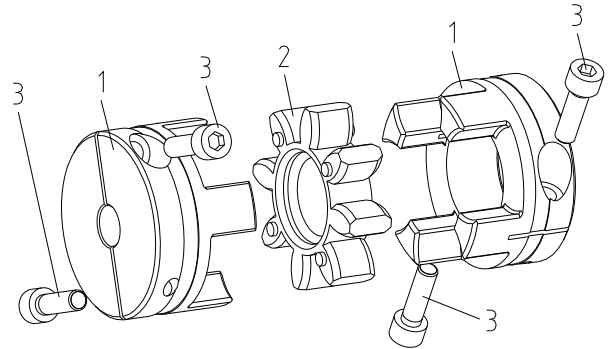


Illustration 19: ROTEX® GS Compact, size 24 - 38



WARNING!

Hub types 1.1, 2.0, 2.5, 2.8, 7.5 and 7.8 (without feather key) may only be used in category 3 and are not permissible for applications according to DIN EN ISO 13849, part 2.



ATTENTION!

Selection of clamping hubs

With the use in hazardous locations the clamping hubs have to be selected such that there is a minimum safety factor of $s = 2$ covering the peak torque of the machine including all operating parameters and the friction torque of the clamping hub.

Components of ROTEX® GS, expansion hubs

Component	Quantity	Description
1	¹⁾	Hub
2	1	Spider
3	1	Expansion hub
4	1	Clamping pin for expansion hub
5	¹⁾	Cap screws DIN EN ISO 4762
6	1	Cap screws DIN EN ISO 4762

1) The expansion hub can be combined with other hub designs to form the opposite side, too, please refer to your dimension sheet.

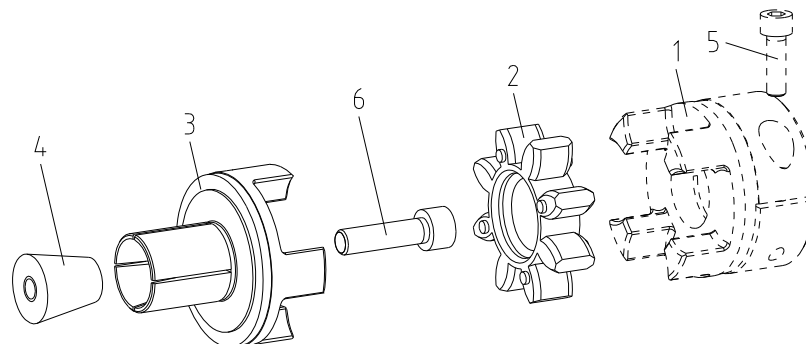


Illustration 20: ROTEX® GS, expansion hubs

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	Verified:	18.12.13 Pz	Replaced by:	



4 Assembly

4.3 Advice for assembly

Subject to its design **ROTEX® GS** allows to axially plug in the coupling having assembled the hubs onto the shaft journal. Consequently there is no need for subsequent screwing and the respective mounting holes in the housing.

The pegs on the spider arranged reciprocally prevent a contact between the spider and the hubs over the full surface. Observing the distance dimension E, the ability for displacement of the coupling is ensured in this way. All teeth are chamfered on the face which allows a blind assembly. When the coupling hubs are combined with the **ROTEX® GS** spider an axial assembly force is generated resulting from the flexible prestress of the star-shape elastomer. This assembly force varies depending on the coupling size, the spider hardness and the machining tolerances.

The axial assembly force is compensated for after assembly of the hubs and consequently does not mean any risk of axial load being applied to adjacent bearings.

The mounting force can be reduced by lightly greasing or lubricating the elastomer or the hubs. For this purpose please only use oils and greases on a mineral oil basis without any additives. Lubricants on a silicone basis (e. g. Optimol Optisit WX) or vaseline have proven their worth, too.

4.4 Advice for finish bore



DANGER!

The maximum permissible bore diameters d (see table 1 to 11 in chapter 1 - technical data) must not be exceeded. If these figures are not observed the coupling may tear. Rotating particles may cause danger to life.

- Hub bores machined by the customer have to observe concentricity or axial runout, respectively (see illustration 21).
- Please make absolutely sure to observe the figures for $\varnothing d_{max}$.
- Carefully align the hubs when the finish bores are drilled.
- Please provide for a setscrew according to DIN EN ISO 4029 with a cup point or an end plate to fasten the hubs axially.

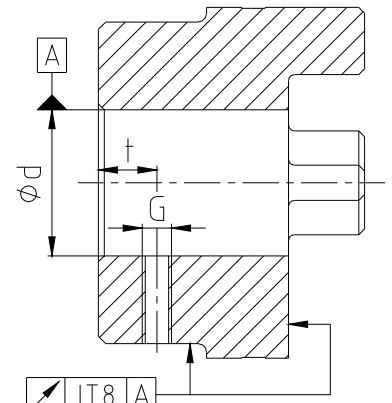


Illustration 21: Concentricity and axial runout



CAUTION!

The customer bears the sole responsibility for all machining processes performed subsequently on unbored or pilot bored as well as finish machined coupling components and spare parts. KTR does not assume any warranty claims resulting from insufficient remaining.



WARNING!

KTR supplies unbored or pilot bored coupling components and spare parts only upon explicit request of the customer. These parts are additionally labelled with the symbol

Table 12: Setscrews DIN EN ISO 4029

Size	5	7	9	12	14	19	24	28	38	42	48	55	65	75	90
Dimension G	M2	M3	M4	M4	M4	M5	M5	M8	M8	M8	M8	M10	M10	M10	M12
Dimension t	2.5	3.5	5	5	5	10	10	15	15	20	20	20	20	25	30
Tightening torque T_A [Nm]	-	-	1.5	1.5	1.5	2	2	10	10	10	10	17	17	17	40

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	Verified:	18.12.13 Pz	Replaced by:	



4 Assembly

4.5 Assembly of hubs (types 1.0, 1.1 and 1.2)



ATTENTION!

We recommend to inspect bores, shaft, keyway and feather key for dimensional accuracy before assembly.

Before starting with the assembly preserving agents have to be removed from the bores. Moreover, the shaft ends have to be cleaned carefully, too.



CAUTION!

Please note the manufacturer's instructions regarding the use of detergents.

Heating the hubs lightly (approx. 80 °C) allows for an easier mounting on the shaft.



WARNING!

Please pay attention to the ignition risk in hazardous locations!



DANGER!

Touching the heated hubs causes burns.
Please wear safety gloves.



CAUTION!

With the assembly please make sure that the distance dimension E (see table 1 to 11) is observed to allow for axial clearance of the spider when in operation.
Disregarding this advice may cause damage to the coupling.

- Assemble the hubs on the shaft of driving and driven side.
- Shift the power packs in axial direction until the distance dimension E is achieved.
- If the power packs are already firmly assembled, shifting the hubs axially on the shafts allows for adjusting the distance dimension E.
- Fasten the hubs by tightening the setscrews DIN EN ISO 4029 with a cup point (tightening torque see table 12).



ATTENTION!

If the shaft diameters with inserted feather key are smaller than the dimension d_H (see table 1 to 11) of the spider, one or two shaft ends may protude into the spider.



CAUTION!

Hub type 1.1 (without feather key) may be used in category 3 only.

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	Verified: 18.12.13 Pz	Replaced by:



4 Assembly

4.6 Assembly of clamping hubs (types 2.0, 2.1, 2.5, 2.6, 2.8, 2.9, 7.5, 7.6, 7.8 and 7.9)

The power transmission of ROTEX® GS clamping hubs (types 2.0, 2.5, 2.8, 7.5 and 7.8) is frictionally engaged. With types 2.1, 2.6, 2.9, 7.6 and 7.9 a feather key additionally provides for positive locking power transmission.

The following process should be observed with the assembly:

- Clean and degrease the hub bore and the shaft.
- Lightly detach the clamping screw.
- Slip the hub onto the shaft. Please observe the dimension l_1/l_2 .
- Tighten the clamping screws at the tightening torques mentioned in table 3.
With types 2.8, 7.5, 7.8 or 2.9, 7.6, 7.9 (with keyway) the screws have to be tightened alternately at the tightening torques mentioned in table 3.



WARNING!

If used in hazardous locations the clamping screws to fasten the hubs as well as all screw connections must be secured against working loose additionally, e. g. conglomerating with Loctite (average strength).



CAUTION!

The frictionally engaged transmittable torques of the clamping hubs depend on the bore diameter.



WARNING!

Hub types 2.0, 2.5, 2.8, 7.5 and 7.8 (without feather key) may only be used in category 3 and are not permissible for applications according to DIN EN ISO 13849, part 2.



CAUTION!

- If the clamping screws are not tightened at the correct tightening torque, there is the risk of
- a fracture of the hub and plastic deformation with a too high tightening torque T_A
 - type 6.0: a fracture of the hubs/cams and plastic deformation with a too high tightening torque T_A
 - early slipping, untightening of the screws with a too small tightening torque T_A

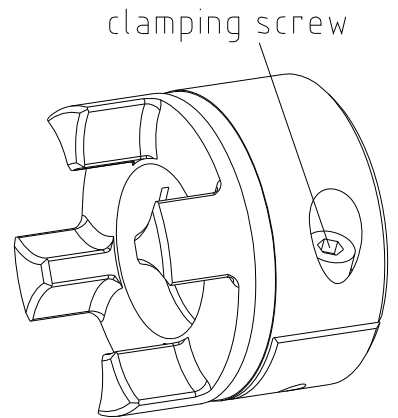


Illustration 22: Assembly of clamping hub
Please note: types 2.8, 2.9, 7.5, 7.6, 7.8 or 7.9 have 2 clamping screws

4.7 Assembly of clamping ring hubs (types 6.0, 6.0 steel, 6.0 light and 6.5)

The power transmission of ROTEX® GS clamping hubs is frictionally engaged. The necessary surface pressure is transmitted via the clamping ring with internal taper to the taper hub and consequently to the shaft. The torques mentioned in tables 5 to 7 include a fit pair H7/k6 from $\varnothing 55$ G7/m6. With a higher fit clearance the torques mentioned in tables 5 to 7 are reduced.

The stiffness and dimensions of the shafts (here specifically hollow shafts) have to be selected in a way that sufficient safety against plastic deformation is ensured. This may roughly be reviewed as per the following criterion.



WARNING!

If used in hazardous locations the setscrews to fasten the hubs as well as all screw connections must be secured against working loose additionally, e. g. conglomerating with Loctite (average strength).

Please observe protection note ISO 16016.	Drawn:	11.12.13 Pz/Rt	Replaced for:	KTR-N dated 15.10.12
	Verified:	18.12.13 Pz	Replaced by:	



4 Assembly

4.7 Assembly of clamping ring hubs (types 6.0, 6.0 steel, 6.0 light and 6.5)

For clamping connections with hollow shafts the required internal diameter of the hollow shaft d_{iW} is calculated based on the following formula:

$$d_{iW} \leq d \cdot \sqrt{\frac{R_{p0,2} - 2 \cdot p_W}{R_{p0,2}}} \quad [\text{mm}]$$

Shear stress on the internal shaft diameter for hollow shaft:

$$\sigma_{iW} \approx - \frac{2 \cdot p_W}{1 - C_W^2} \quad [\text{N/mm}^2]$$

Shear stress for solid shaft:

$$\sigma_{iW} = - p_W \quad [\text{N/mm}^2]$$

$R_{p0,2}$ = yield strength of shaft material $[\text{N/mm}^2]$
 p_W = surface pressure of hub/shaft $[\text{N/mm}^2]$

d_{iW} = internal diameter of hollow shaft $[\text{mm}]$
 d = shaft diameter $[\text{mm}]$
 C_W = d_{iW} / d

The required strength is not provided if the hollow shaft bore is bigger than the max. internal bore calculated or if the shear stress exceeds the yield strength of the material.

For a detailed calculation please contact KTR's engineering department.

- Clean the hub bore and shaft and review for dimensional accuracy, afterwards lubricate with a thin-fluid oil (e. g. Castrol 4 in 1, Klüber Quietsch-Ex or WD 40).



CAUTION!

Oils and greases containing molybdenum disulfide or other high-pressure additives as well as internal lubricants must not be used.

- Lightly untighten the clamping screw and pull the clamping ring from the hub only marginally to make sure that the clamping ring is loosened.
- Slip the clamping ring hub onto the shaft. The dimension l_3 should at least be observed (see table 4).
- Tighten the clamping screws evenly stepwise and crosswise to the tightening torque mentioned in table 6 or 7. This process has to be repeated until the tightening torque is reached with all clamping screws.

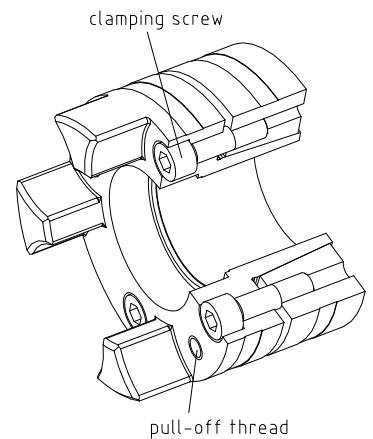


Illustration 23: Assembly of clamping ring hub with clamping ring



CAUTION!

If the clamping screws are not tightened at the correct tightening torque, there is the risk of
a) a fracture of the hub and plastic deformation with a too high tightening torque T_A
b) early slipping, untightening of the screws with a too small tightening torque T_A

- Assembly of the clamping ring hub 6.0 light:
Tighten the clamping screws evenly stepwise and crosswise at 1/3 or 2/3 tightening torque T_A , respectively (see table 5) until the ring gets in contact. Afterwards tighten the screws at the tightening torque mentioned in table 5 one after another.



WARNING!

If used in hazardous locations the setscrews to fasten the hubs as well as all screw connections must be secured against working loose additionally, e. g. conglomerating with Loctite (average strength).



ATTENTION!

Selection of clamping ring hubs

With the use in hazardous locations the clamping ring hubs have to be selected such that there is a minimum safety factor of $s = 2$ covering the peak torque of the machine including all operating parameters and the friction torque of the clamping ring hub.

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4 Assembly

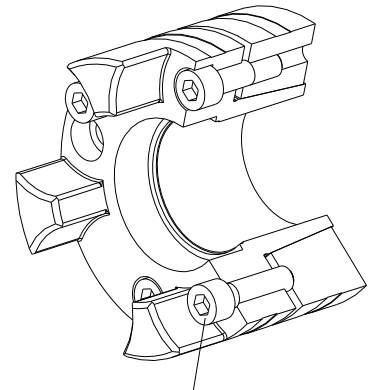
4.7 Assembly of clamping ring hubs (types 6.0, 6.0 steel, 6.0 light and 6.5)

Disassembly:

Untighten the clamping screws evenly one after the other. Each screw may only be untightened by half a revolution with each cycle. Unscrew all clamping screws by 3 - 4 pitches.

Remove the screws situated next to the pull-off threads and screw them into the respective pull-off threads until they are in contact.

The clamping ring is untightened if the screws in the pull-off threads are tightened evenly stepwise and crosswise.



clamping screw in
pull-off thread

Illustration 24: Disassembly of clamping ring hub with clamping ring



CAUTION!
If these hints are not observed, the operation of the coupling may be damaged.

If the assembly is repeated the bore of the hub and shaft have to be cleaned and afterwards lubricated with a thin-fluid oil (e. g. Castrol 4 in 1, Klüber Quietsch-Ex or WD 40). The same applies for the taper surfaces of clamping ring hub and clamping ring.



CAUTION!
Oils and greases containing molybdenum disulfide or other high-pressure additives as well as internal lubricants must not be used.

For type 6.0 light only:



ATTENTION!
If the assembly is repeated the taper surfaces, bores of the hub and the shaft have to be cleaned. The bore of the hub and shaft have to be lubricated with thin-fluid oil (e. g. Castrol 4 in 1, Klüber Quietsch-Ex or WD 40). Lightly paint the taper surfaces of the clamping ring hub or clamping ring with the grease Gleitmo 800, afterwards turn the components by one revolution in order to spread the grease evenly.

Please observe protection note ISO 16016.	Drawn: 11.12.13 Pz/Rt	Replaced for: KTR-N dated 15.10.12
	Verified: 18.12.13 Pz	Replaced by:



4 Assembly

4.8 Assembly of expansion hubs (type 9.0)

The following process should be observed with the assembly:

- Untighten clamping screw and clamping pin.
- Clean and degrease the internal diameter of the hollow shaft and the outside contact surface of the expansion hub (see illustration 25).
- Insert the expansion hub along with clamping pin and clamping screw in the hollow shaft. Tighten the clamping screw at the tightening torque mentioned in table 11.

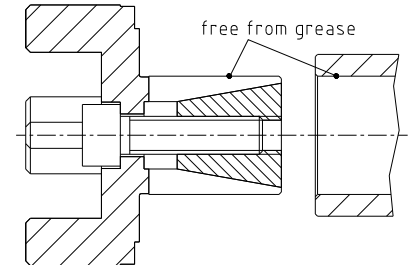


Illustration 25: Cleaning the expansion hub and hollow shaft



ATTENTION!

The tightening torques apply for the figures mentioned in table 11 only.



CAUTION!

The frictionally engaged transmittable torques of the expansion hub depend on the internal and external diameter of the hollow shaft as well as the material.



CAUTION!

If the clamping screws are not tightened at the correct tightening torque, there is the risk of
a) a fracture of the hub and plastic deformation with a too high tightening torque T_A
b) early slipping, untightening of the screws with a too small tightening torque T_A

Disassembly:

Unscrew the clamping screw only lightly so that the clamping pin loosens. If the clamping pin did not loosen, apply a light beat on the screw head. Afterwards remove the clamping screw fully.

4.9 Displacements - alignment of the couplings

The displacement figures shown in tables 13 and 14 provide for sufficient safety to compensate for external influences like, for example, thermal expansion or foundation settling.



CAUTION!

In order to ensure a long service life of the coupling and avoid dangers with the use in hazardous locations, the shaft ends must be accurately aligned.



Please absolutely observe the displacement figures indicated (see tables 13 and 14). If the figures are exceeded, the coupling will be damaged.

The more accurate the alignment of the coupling, the longer is its service life.

If used in hazardous areas for the explosion group IIC (marking II 2GD c IIC T X), only half of the displacement figures (see tables 13 and 14) are permissible.

Please note:

- The displacement figures mentioned in tables 13 and 14 are maximum figures which must not arise in parallel. If radial and angular displacements arise at the same time, the permissible displacement values may only be used proportionally (see illustration 27).
- Please inspect with a dial gauge, ruler or feeler whether the permissible displacement figures of tables 13 and 14 can be observed.

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	Verified: 18.12.13 Pz	Replaced by:



4 Assembly

4.9 Displacements - alignment of the couplings

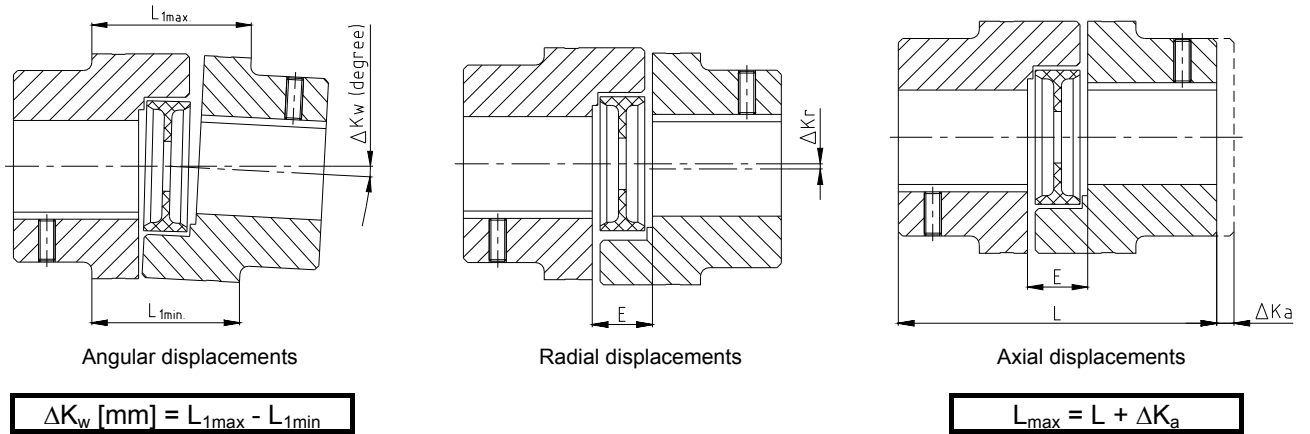


Illustration 26: Displacements

Examples for the displacement combinations shown in illustration 27:

Example 1:

$\Delta K_r = 30\%$

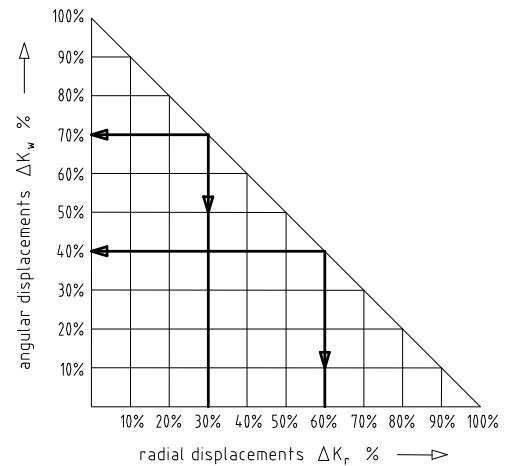
$\Delta K_w = 70\%$

Example 2:

$\Delta K_r = 60\%$

$\Delta K_w = 40\%$

Illustration 27:
Combinations of displacement



$$\Delta K_{\text{total}} = \Delta K_r + \Delta K_w \leq 100\%$$

Table 13: Displacement figures

Size	Max. axial displacement ΔK_a [mm]	Max. radial displacement ΔK_r [mm]					Max. angular displacement ΔK_w [degree]				
		80 ShA-GS	92 ShA-GS	95/98 ShA-GS	64 ShD-GS	72 ShD-GS	80 ShA-GS	92 ShA-GS	95/98 ShA-GS	64 ShD-GS	72 ShD-GS
5	+0.4 / -0.2	0.12	0.06	0.04	-	-	1.1	1.0	0.9	-	-
7	+0.6 / -0.3	0.15	0.10	0.06	0.04	-	1.1	1.0	0.9	0.8	-
8	± 1.0	0.15	-	0.08	0.06	-	1.1	-	0.9	0.8	-
9	+0.8 / -0.4	0.19	0.13	0.08	0.05	-	1.1	1.0	0.9	0.8	-
12	+0.9 / -0.4	0.20	0.14	0.08	0.05	-	1.1	1.0	0.9	0.8	-
13	± 1.0	0.20	-	0.08	0.05	-	1.1	-	0.9	0.8	-
14	+1.0 / -0.5	0.21	0.15	0.09	0.06	-	1.1	1.0	0.9	0.8	-
16	± 1.0	0.21	-	0.10	0.08	-	1.1	-	0.9	0.8	-
19	+1.2 / -0.5	0.15	0.10	0.06	0.04	-	1.1	1.0	0.9	0.8	-
24	+1.4 / -0.5	-	0.14	0.10	0.07	0.04	-	1.0	0.9	0.8	0.7
28	+1.5 / -0.7	-	0.15	0.11	0.08	0.05	-	1.0	0.9	0.8	0.7
38	+1.8 / -0.7	-	0.17	0.12	0.09	0.06	-	1.0	0.9	0.8	0.7
42	+2.0 / -1.0	-	0.19	0.14	0.10	0.07	-	1.0	0.9	0.8	0.7
48	+2.1 / -1.0	-	0.23	0.16	0.11	0.08	-	1.0	0.9	0.8	0.7
55	+2.2 / -1.0	-	0.24	0.17	0.12	0.09	-	1.0	0.9	0.8	0.7
65	+2.6 / -1.0	-	-	0.18	0.13	0.10	-	-	0.9	0.8	0.7
75	+3.0 / -1.5	-	-	0.21	0.15	-	-	-	0.9	0.8	-
90	+3.4 / -1.5	-	-	0.23	0.17	-	-	-	0.9	0.8	-



4 Assembly

4.9 Displacements - alignment of the couplings

Table 14: Displacement figures - type DKM

Size	Max. axial displacement ΔK_a [mm]	Max. radial displacement ΔK_r [mm]					Max. angular displacement ΔK_w [degree]				
		80 ShA-GS	92 ShA-GS	95/98 ShA-GS	64 ShD-GS	72 ShD-GS	80 ShA-GS	92 ShA-GS	95/98 ShA-GS	64 ShD-GS	72 ShD-GS
5	+0.4 / -0.4	0.15	0.14	0.13	-	-	1.1	1.0	0.9	-	-
7	+0.6 / -0.6	0.23	0.21	0.19	0.17	-	1.1	1.0	0.9	0.8	-
9	+0.8 / -0.8	0.29	0.26	0.24	0.21	-	1.1	1.0	0.9	0.8	-
12	+0.9 / -0.9	0.35	0.32	0.29	0.25	-	1.1	1.0	0.9	0.8	-
14	+1.0 / -1.0	0.40	0.37	0.33	0.29	-	1.1	1.0	0.9	0.8	-
19	+1.2 / -1.0	0.49	0.45	0.41	0.36	-	1.1	1.0	0.9	0.8	-
24	+1.4 / -1.0	-	0.59	0.53	0.47	0.42	-	1.0	0.9	0.8	0.7
28	+1.5 / -1.4	-	0.66	0.60	0.53	0.46	-	1.0	0.9	0.8	0.7
38	+1.8 / -1.4	-	0.77	0.69	0.61	0.54	-	1.0	0.9	0.8	0.7
42	+2.0 / -2.0	-	0.84	0.75	0.67	0.59	-	1.0	0.9	0.8	0.7
48	+2.1 / -2.0	-	0.91	0.82	0.73	0.64	-	1.0	0.9	0.8	0.7
55	+2.2 / -2.0	-	1.01	0.91	0.81	0.71	-	1.0	0.9	0.8	0.7

The permissible displacement figures of the flexible **ROTEX® GS** couplings mentioned are general standard values taking into account the load of the coupling up to the rated torque T_{KN} of the coupling and an ambient temperature of + 30 °C.

4.10 Spares inventory, customer service addresses

A basic requirement to ensure the operational readiness of the coupling is a stock of the most important spare parts on site.

Contact addresses of the KTR partners for spare parts and orders can be obtained from the KTR homepage at www.ktr.com.



ATTENTION!

KTR does not assume any liability or warranty for the use of spare parts and accessories which are not provided by KTR and for the damages which may incur as a result.

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	Verified:	18.12.13 Pz	Replaced by:	



5 Enclosure A

Advice and instructions regarding the use in  hazardous locations

Types available:

a) Hubs with feather key or CLAMPEX® clamping set or clamping ring hubs

- 1.0 Hub with feather key and thread for setscrews
- 2.1 Clamping hub single slot with feather key
- 2.6 Clamping hub double slot with feather key
- 2.9 Clamping hub with axial slot with feather key
- 4.1 with CLAMPEX® clamping set KTR 200
- 4.2 with CLAMPEX® clamping set KTR 250
- 6.0 Clamping ring hub
- 6.0 Clamping ring hub light
- 6.0 P Precision clamping ring hub
- 6.5 Clamping ring hub
(Hint: external clamping screws)
- 7.6 Split clamping hub with feather key for double-cardanic combinations
- 7.9 Split clamping hub with feather key for single-cardanic combinations
- Type DKM with hubs corresponding to the aforementioned details

b) Hubs without feather key (category 3 only)

- 1.1 Hub without feather key, with thread for setscrews
- 2.0 Clamping hub single slot without feather key
- 2.5 Clamping hub double slot without feather key
- 2.8 Clamping hub with axial slot without feather key
- 7.5 Split clamping hub without feather key for double-cardanic combinations
- 7.8 Split clamping hub without feather key for single-cardanic combinations
- Type DKM with hubs corresponding to the aforementioned details

ROTEX® GS type DKM only with spacer made of steel or aluminium wrought products with a yield stress $R_{p0.2} \geq 250 \text{ N/mm}^2$.

Please observe protection note ISO 16016.	Drawn: 11.12.13 Pz/Rt	Replaced for: KTR-N dated 15.10.12
	Verified: 18.12.13 Pz	Replaced by:



5 Enclosure A

Advice and instructions regarding the use in  hazardous locations

5.1 Intended use in hazardous locations

Conditions of operation in hazardous locations

ROTEX® GS couplings are suitable for the use according to EC directive 94/9/EC.

1. Industry (with the exception of mining)

- Equipment group II of category 2 and 3 (*coupling is not approved for equipment group 1*)
- Media class G (*gases, fogs, steams*), zone 1 and 2 (*coupling is not approved for zone 0*)
- Media class D (*dusts*), zone 21 and 22 (*coupling is not approved for zone 20*)
- Explosion group IIC (*explosion class IIA and IIB are included in IIC*)

Temperature class:

Temperature class	Ambient or operating temperature T _a	Max. surface temperature
T4, T3, T2, T1	- 30 °C to + 90 °C ¹⁾	+ 110 °C ²⁾
T5	- 30 °C to + 80 °C	+ 100 °C
T6	- 30 °C to + 65 °C	+ 85 °C

Explanation:

The maximum surface temperatures result from each the maximum permissible ambient or operating temperature T_a plus the maximum temperature increase ΔT of 20 K which has to be taken into account.

- 1) The ambient or operating temperature T_a is limited to + 90 °C due to the permissible permanent operating temperature of the elastomers used.
- 2) The maximum surface temperature of + 110 °C applies for the use in locations which are potentially subject to dust explosion, too.

2. Mining

Equipment group I of category M2 (coupling is not approved for equipment group M1).
Permissible ambient temperature - 30 °C to + 90 °C.



5 Enclosure A

Advice and instructions regarding the use in  hazardous locations

5.2 Inspection intervals for couplings in  hazardous locations

Explosion group	Inspection intervals
3G 3D	For couplings which are classified in category 3G or 3D the operating and assembly instructions that are usual for standard operation apply. During the standard operation which has to be subject to the ignition risk analysis the couplings are free from any ignition source. Merely the temperature increase produced by self-heating and depending on the coupling type has to be considered: for ROTEX® GS: $\Delta T = 20 \text{ K}$
II 2GD c IIB T4, T5, T6	An inspection of the torsional backlash and a visual inspection of the flexible spider must be performed after 3,000 operating hours for the first time, at the latest after 6 months after start-up of the coupling. If you note insignificant or no wear on the spider upon this initial inspection, further inspections can each be performed after 6,000 operating hours or at the latest after 18 months, provided that the operating parameters remain the same. If you note significant wear during the initial inspection, so that it would be recommendable to replace the spider, please find out the cause according to the table „Breakdowns“, if possible. The maintenance intervals must be adjusted to the modified operating parameters without fail.
II 2GD c IIC T4, T5, T6	An inspection of the torsional backlash and a visual inspection of the flexible spider must be performed after 2,000 operating hours for the first time, at the latest after 3 months after start-up of the coupling. If you note insignificant or no wear on the spider upon this initial inspection, further inspections can each be performed after 4,000 operating hours or at the latest after 12 months, provided that the operating parameters remain the same. If you note significant wear during the initial inspection, so that it would be recommendable to replace the spider, please find out the cause according to the table „Breakdowns“, if possible. The maintenance intervals must be adjusted to the modified operating parameters without fail.



WARNING!

Hub type 1.1, 2.0, 2.5, 2.8, 7.5 and 7.8 (without feather key) may be used in category 3 only.

ROTEX® GS backlash-free shaft couplings

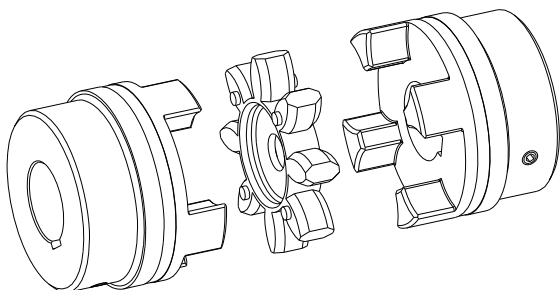


Illustration 28: ROTEX® GS backlash-free shaft coupling

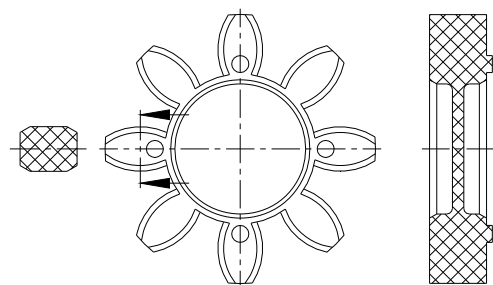


Illustration 29: ROTEX® GS spider

If the drive permits, the backlash between the cams of the coupling and the flexible spider has to be measured by means of a feeler gauge.

When reaching the wear limit **maximum friction**, the spider must be replaced immediately, irrespective of the inspection intervals.

Please observe protection note ISO 16016.	Drawn: 11.12.13 Pz/Rt	Replaced for: KTR-N dated 15.10.12
	Verified: 18.12.13 Pz	Replaced by:



5 Enclosure A

Advice and instructions regarding the use in  hazardous locations

5.3 Standard values of wear

In case of a backlash > X mm, the flexible spider must be replaced.

Reaching the limits for replacing depends on the operating conditions and the existing operating parameters.



CAUTION!

In order to ensure a long service life of the coupling and avoid dangers with the use in hazardous locations, the shaft ends must be accurately aligned.

Please absolutely observe the displacement figures indicated (see tables 13 and 14). If the figures are exceeded, the coupling will be damaged.

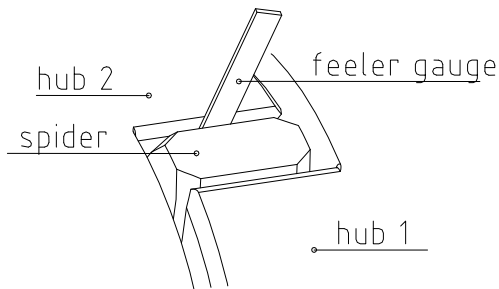


Illustration 30: Inspection of the limit of wear

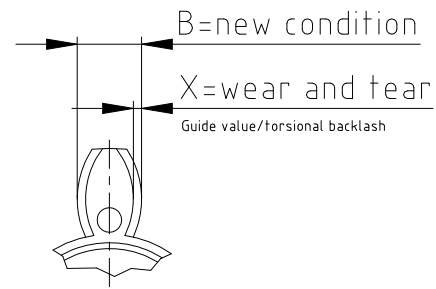


Illustration 31: Wear of spider



ATTENTION!

For backlash-free applications no wear is permitted, since otherwise the operating principle of the coupling (backlash-free condition) is no longer ensured. If a backlash-free operation is not required, the following figures apply:

Table 15:

ROTEX® GS size	Limits of wear (friction)		ROTEX® GS size	Limits of wear (friction)	
	$X_{max.}$ [mm]			$X_{max.}$ [mm]	
5	0.4		24	1.0	
7	0.5		28	1.4	
8	0.4		38	1.7	
9	0.9		42	2.0	
12	0.6		48	2.25	
13	0.5		55	2.50	
14	1.25		65	2.75	
16	0.7		75	3.00	
19	0.9		90	3.25	

5.4 Permissible coupling materials in hazardous locations

In the explosion groups IIA, IIB and IIC the following materials may be combined:

- steel
- stainless steel
- aluminium wrought products

Semifinished products of aluminium with a magnesium share of up to 7.5% and a yield point of $R_{p0.2} \geq 250 \text{ N/mm}^2$ are permitted for the use in hazardous locations.

Aluminium diecast is generally excluded for hazardous locations.



Please observe protection note ISO 16016.	Drawn:	11.12.13 Pz/Rt	Replaced for:	KTR-N dated 15.10.12
	Verified:	18.12.13 Pz	Replaced by:	



5 Enclosure A

Advice and instructions regarding the use in  hazardous locations

5.5 marking of coupling for hazardous locations

Couplings for the use in hazardous locations are marked on at least one component completely and on the remaining components by an  label on the outside diameter of the hub or on the front side each for the operating conditions permitted. The flexible spider is excluded. For reason of the limited space only the symbol  is stamped up to size 19.

Short labelling:
(standard)



II 2GD c IIC T X/I M2 c X

Category 3:



II 3G c IIC T6, T5 resp. T4 - $30\text{ °C} \leq T_a \leq +65\text{ °C}$, + 80 °C resp. + 90 °C
II 3D c T 110 °C - $30\text{ °C} \leq T_a \leq +90\text{ °C}$

Complete labelling:





II 2G c IIC T6, T5 resp. T4 - $30\text{ °C} \leq T_a \leq +65\text{ °C}$, + 80 °C resp. + 90 °C
II 2D c T 110 °C/I M2 c - $30\text{ °C} \leq T_a \leq +90\text{ °C}$

Die alte Kennzeichnung:
Behält weiterhin ihre Gültigkeit



II 2G c IIC T4/T5/T6 - $30\text{ °C} \leq T_a \leq +80/60/45\text{ °C}$
II 2D c T 110 °C/I M2 c - $30\text{ °C} \leq T_a \leq +80\text{ °C}$

The labelling with explosion group IIC includes the explosion groups IIA and IIB.

If the symbol  was stamped in addition to , the coupling component was supplied unbored or pilot bored by KTR.

5.6 Start-up

Before start-up of the coupling, please inspect the tightening of the setscrews in the hubs, the alignment and the distance dimension E and adjust, if necessary, and also inspect all screw connections for the tightening torques specified, dependent on the type of coupling.



If used in hazardous locations the setscrews to fasten the hubs as well as all screw connections must be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).

Finally, the coupling protection against accidental contact must be fitted.

The cover must be electrically conductive and included in the equipotential bonding. Bellhousings (magnesium share below 7.5 %) made of aluminium and damping rings (NBR) can be used as connecting element between pump and electric motor. The cover may only be taken off after having stopped the unit.

During operation of the coupling, please pay attention to

- different operating noise
- vibrations occurring.

If the couplings are used in locations subject to dust explosion and in mining the user must make sure that there is no accumulation of dust in a dangerous volume between the cover and the coupling. The coupling must not operate in an accumulation of dust.

For covers with unlocked openings on the top face no light metals may be used if the couplings are used as equipment of equipment group II (*if possible, from stainless steel*).

If the couplings are used in mining (equipment group I M2), the cover must not be made of light metal. In addition, it must be resistant to higher mechanical loads than if it is used as equipment of equipment group II.

Please observe protection note ISO 16016.	Drawn:	11.12.13 Pz/Rt	Replaced for:	KTR-N dated 15.10.12
	Verified:	18.12.13 Pz	Replaced by:	



5 Enclosure A

Advice and instructions regarding the use in  hazardous locations

5.6 Start-up

The minimum distance „Sr“ between the protection device and the rotating parts must at least correspond to the figures mentioned below.

If the protection device is used as cover, regular openings complying with the explosion protection demands can be made that must not exceed the following dimensions:

Openings	Cover [mm]		
	Top side	Lateral components	Distance „Sr“
Circular - max. diameter	4	8	≥ 10
Rectangular - max. lateral length	4	8	≥ 10
Straight or curved slot - max. lateral length/height	not permissible	8	≥ 20



CAUTION!

If you note any irregularities with the coupling during operation, the drive unit must be switched off immediately. The cause of the breakdown must be found out by means of the table „Breakdowns“ and if possible, be eliminated according to the proposals. The potential breakdowns mentioned can be hints only. To find out the cause all operating factors and machine components must be considered.

Coupling coating:



If coated (priming, painting etc.) couplings are used in hazardous locations, the requirements on conductivity and coating thickness must be considered. In case of paintings up to 200 µm electrostatic load does not have to be expected. Multiple coatings that are thicker than 200 µm are prohibited for explosion group IIC.

5.7 Breakdowns, causes and elimination

The below-mentioned failures can lead to a use of the **ROTEX® GS** coupling other than intended. In addition to the specifications given in these operating and assembly instructions please make sure to avoid these failures. The errors listed can only be clues to search for the failures. When searching for the failure the adjacent components must generally be included.



If used other than intended the coupling can become a source of ignition. EC directive 94/9/EC requires special care from the manufacturer and the user.

General failures with use other than intended:

- Important data for the coupling selection were not forwarded.
- The calculation of the shaft/hub connection was not considered.
- Coupling components with damage occurred during transport are assembled.
- If the heated hubs are assembled, the permissible temperature is exceeded.
- The clearance of the components to be assembled is not coordinated with each other.
- Tightening torques have been fallen below/exceeded.
- Components are exchanged by mistake/assembled incorrectly.
- A wrong or no spider are inserted in the coupling.
- No original **KTR** parts (purchased parts) are used.
- Old/already worn out spiders or spiders stored for too long are used.

Please observe protection note ISO 16016.	Drawn:	11.12.13 Pz/Rt	Replaced for:	KTR-N dated 15.10.12
	Verified:	18.12.13 Pz	Replaced by:	



5 Enclosure A

Advice and instructions regarding the use in  hazardous locations

5.7 Breakdowns, causes and elimination

Continuation:

- The coupling used/the coupling protection used is not suitable for the operation in hazardous areas and does not correspond to EC directive 94/9/EC, respectively.
- Maintenance intervals are not observed.

Breakdowns	Causes	Hazard notes for hazardous locations	Elimination
Different operating noise and/or vibrations occurring	Misalignment	Increased temperature on the spider surface; ignition risk by hot surfaces	<ol style="list-style-type: none"> 1) Set the unit out of operation 2) Eliminate the reason for the misalignment (e. g. loose foundation bolts, breaking of the engine mount, heat expansion of unit components, modification of the mounting dimension E of the coupling) 3) Inspection of wear see item inspection
	Wear of spider, short-term torque transmission due to metal contact	Ignition risk due to sparking	<ol style="list-style-type: none"> 1) Set the unit out of operation 2) Disassemble the coupling and remove remainders of the spider 3) Inspect coupling components and replace coupling components that are damaged 4) Insert spider, assemble coupling components 5) Inspect alignment, adjust if necessary
	Screws for axial fastening of hubs working loose	Ignition risk due to hot surfaces and sparking	<ol style="list-style-type: none"> 1) Set the unit out of operation 2) Inspect alignment of coupling 3) Tighten the screws to secure the hubs and secure against working loose 4) Inspection of wear see item inspection
Breaking of cam	Wear of spider, torque transmission due to metal contact	Ignition risk due to sparking	<ol style="list-style-type: none"> 1) Set the unit out of operation 2) Replace complete coupling 3) Inspect alignment
	Breaking of the cams due to high impact energy/overload		<ol style="list-style-type: none"> 1) Set the unit out of operation 2) Replace complete coupling 3) Inspect alignment 4) Find out the reason for overload
	Operating parameters do not correspond to the performance of the coupling		<ol style="list-style-type: none"> 1) Set the unit out of operation 2) Review the operating parameters and select a bigger coupling (consider mounting space) 3) Assemble new coupling size 4) Inspect alignment
	Operating error of the unit		<ol style="list-style-type: none"> 1) Set the unit out of operation 2) Replace complete coupling 3) Inspect alignment 4) Instruct and train the service staff



5 Enclosure A

Advice and instructions regarding the use in  hazardous locations

5.7 Breakdowns, causes and elimination

Breakdowns	Causes	Hazard notes for hazardous locations	Elimination
Early wear of spider or reverse backlash	Misalignment	Increased temperature on the spider surface; ignition risk by hot surfaces	<ol style="list-style-type: none"> 1) Set the unit out of operation 2) Eliminate the reason for the misalignment (e. g. loose foundation bolts, breaking of the engine mount, heat expansion of unit components, modification of the mounting dimension E of the coupling) 3) Inspection of wear see item inspection
	e. g. contact with aggressive liquids/oils, ozone influence, too high/low ambient temperatures etc. causing a physical change of the spider	Ignition risk due to sparking with metallic contact of the cams	<ol style="list-style-type: none"> 1) Set the unit out of operation 2) Disassemble the coupling and remove remainders of the spider 3) Inspect coupling components and replace coupling components that are damaged 4) Insert spider, assemble coupling components 5) Inspect alignment, adjust if necessary 6) Make sure that further physical modifications of the spider are excluded
	excessively high/low ambient/contact temperatures for the spider; max. permissible e. g. T4 = -30 °C/+ 90 °C		<ol style="list-style-type: none"> 1) Set the unit out of operation 2) Disassemble the coupling and remove remainders of the spider 3) Inspect coupling components and replace coupling components that are damaged 4) Insert spider, assemble coupling components 5) Inspect alignment, adjust if necessary 6) Inspect and adjust ambient/contact temperature (possibly remedy by using different spider materials)
Early wear of spider (liquefaction of material inside the spider cam)	Vibrations of drive		<ol style="list-style-type: none"> 1) Set the unit out of operation 2) Disassemble the coupling and remove remainders of the spider 3) Inspect coupling components and replace coupling components that are damaged 4) Insert spider, assemble coupling components 5) Inspect alignment, adjust if necessary 6) Find out the reason for the vibrations (possibly remedy by spider with lower or higher shore hardness)



If you operate with a worn spider (see item 5.2) and the subsequent contact of metal parts a proper operation meeting the explosion protection requirements and acc. to directive 94/9/EC is not ensured.



5 Enclosure A

Advice and instructions regarding the use in  hazardous locations

5.8 EC Certificate of conformity

EC Certificate of conformity

corresponding to EC directive 94/9/EC dated 23 March 1994
and to the legal regulations

The manufacturer - KTR Kupplungstechnik GmbH, D-48432 Rheine - states that the

ROTEX® GS backlash-free shaft couplings

in an explosion-proof design described in these assembly instructions correspond to article 1 (3) b) of directive 94/9/EC and comply with the general safety and health requirements according to enclosure II of directive 94/9/EC.

The ROTEX® GS coupling is in accordance with the specifications of the directive 94/9/EC. One or several directives mentioned in the corresponding EC type examination certificate IBExU03ATEXB002_05 X were in part replaced by updated versions. KTR Kupplungstechnik GmbH being the manufacturer confirms that the product mentioned above is in accordance with the specifications of the new directives, too.


According to article 8 (1) of directive 94/9/EC the technical documentation is deposited with the institution:

IBExU
Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7

09599 Freiberg

Rheine,
Place

15.10.2012
Date

i. V. 
Reinhard Wibbeling
Head of Engineering

i. V. 
Johannes Deister
Product Manager