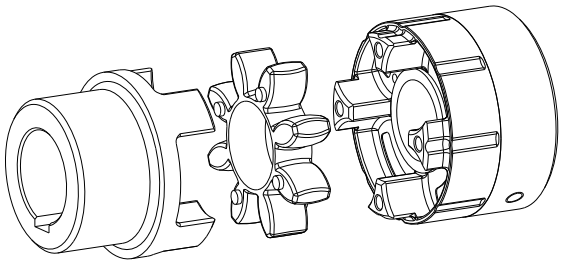
ROTEX® SP "Non Sparking"

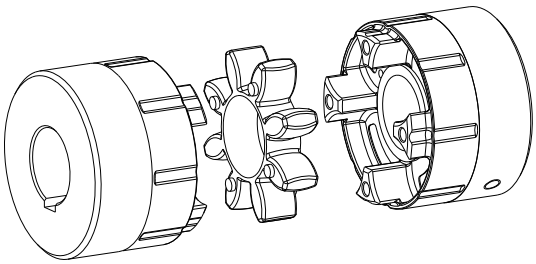
Single-cardanic

Torsionally flexible jaw couplings type GN, GND, EN and their combinations

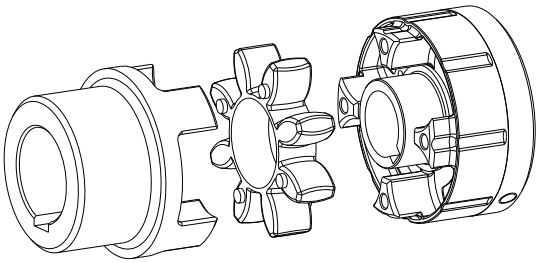
according to directive 2014/34/EU and UK directive SI 2016 No. 1107



Type GN (No. 080)



Type GND (No. 082)

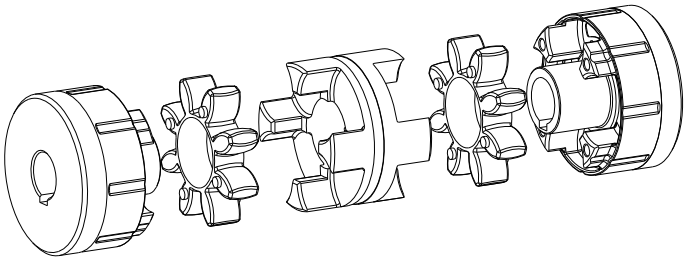


Type EN (No. 081)

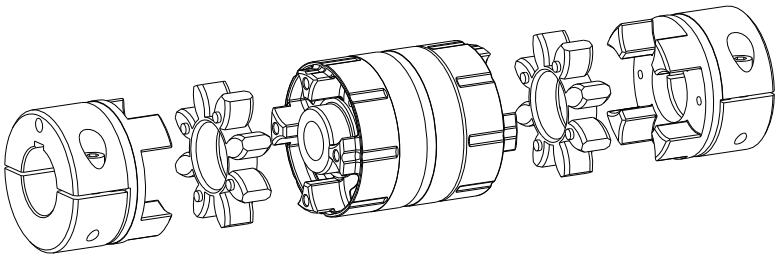
Double-cardanic

Torsionally flexible jaw couplings type E4-DKM, ZS-DKM-C and their combinations

according to directive 2014/34/EU and UK directive SI 2016 No. 1107



Type E4-DKM (No. 086)



Type ZS-DKM-C (No. 085)

ROTEX® SP „Non Sparking“ is part of the product line of torsionally flexible jaw couplings. Subject to its design it is furthermore a shear type system providing for emergency operating features. Moreover, **ROTEX® SP „Non Sparking“** is a non-sparking/electrically conductive coupling system. Type ZS-DKM-C (No. 085) is characterized by its ability for radial disassembly.

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1 Technical data

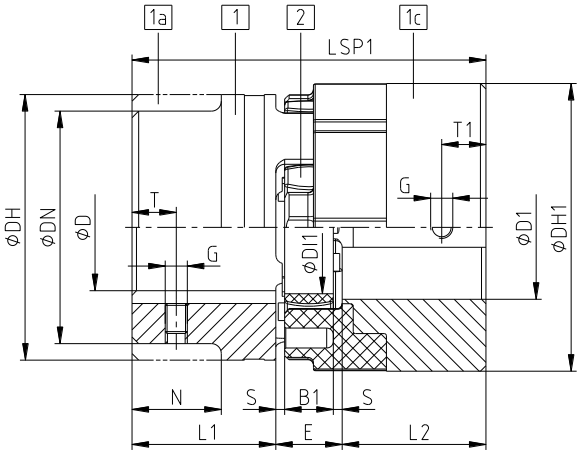


Illustration 1: Type GN (No. 080) - component 1, 1a, 1b: steel (St)

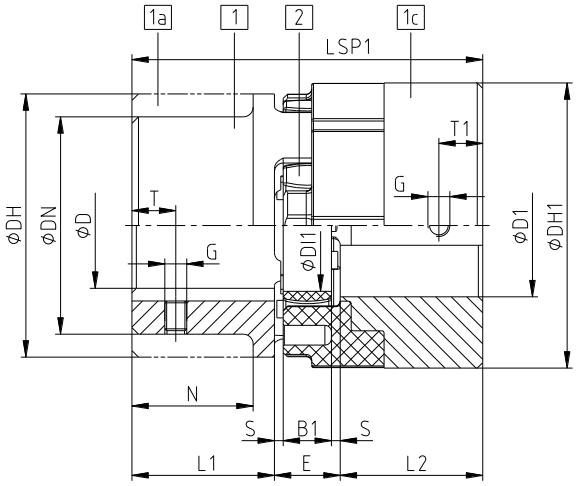


Illustration 2: Type GN (No. 080) - component 1, 1a, 1b: cast iron (GJL)

Table 1: Type GN (No. 080) - component 1, 1a, 1b: steel (St)

Size	Spider [1] (component 2) Rated torque [Nm]	Com-po-nent (St)	Dimensions [mm] [3] Component 1, 1a, 1b steel (St)										Com-po-nent	Dimensions [mm] [3] Component 1c		
			Max. finish bore D [2]	LSP1	L1	E	B1	S	DH	DI1	DN, DN1	N		Max. finish bore D1 [2]	L2	DH1
24	35	1a	35	78	30	18	14	2.0	55	27	55	-	1c	28	30	61
		1b		98	50											
28	95	1a	40	90	35	20	15	2.5	65	30	65	-	1c	32	35	72
		1b		115	60											
38	190	1	48	114	45	24	18	3.0	80	38	70	27	1c	42	45	87
		1b		139	70						80	-				
42	265	1	55	126	50	26	20	3.0	95	46	85	28	1c	48	50	103
		1b		151	75						995	-				
48	310	1	62	140	56	28	21	3.5	105	51	95	32	1c	55	56	114
		1b		164	80						105	-				
55	410	1	74	160	65	30	22	4.0	120	60	110	37	1c	65	65	130
		1b		185	90						120	-				
65	625	1	80	185	75	35	26	4.5	135	68	115	47	1c	75	75	146
		1b		210	100						135	-				

Table 2: Type GN (No. 080) - component 1, 1a, 1b: cast iron (GJL)

Size	Spider [1] (component 2) Rated torque [Nm]	Com-po-nent (GJL)	Dimensions [mm] [3] Component 1, 1a, 1b: cast iron (GJL)										Com-po-nent	Dimensions [mm] [3] Component 1c		
			Max. finish bore D [2]	LSP1	L1	E	B1	S	DH	DI1	DN, DN1	N		Max. finish bore D1 [2]	L2	DH1
38	190	1	40	114	45	24	18	3.0	80	38	66	37	1c	42	45	87
		1a	48								78					
		1b		139	70							62				
42	265	1	45	126	50	26	20	3.0	95	46	75	40	1c	48	50	103
		1a	55								94					
		1b		151	75							65				
48	310	1	52	140	56	28	21	3.5	105	51	85	45	1c	55	56	114
		1a	62								104					
		1b		164	80							69				
55	410	1	60	160	65	30	22	4.0	120	60	98	52	1c	65	65	130
		1a	74								118					
65	625	1	70	185	75	35	26	4.5	135	68	115	61	1c	75	75	146

1) Maximum torque of the coupling $T_{Kmax.}$ = Rated torque of the coupling T_{KN} x 2
2) Bores H7 with keyway to DIN 6885 sheet 1 [JS9] and setscrew
3) Dimensions G, T and T1 see table 9

1 Technical data

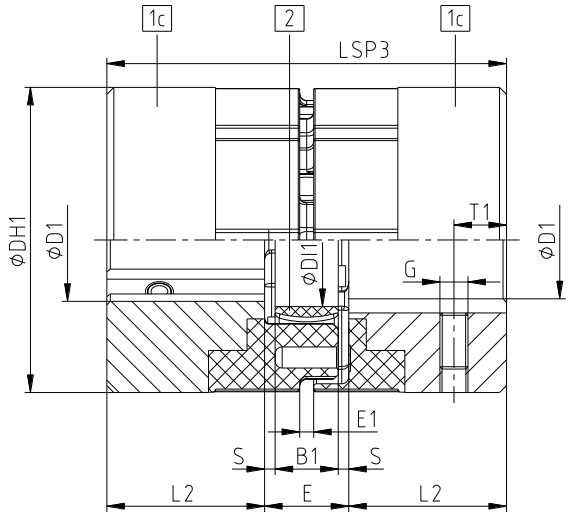


Illustration 3: Type GND (No. 082)

Table 3: Type GND (No. 082)

Size	Spider [1] (component 2) Rated torque [Nm]	Dimensions [mm] [3] Component 1c								
		Max. finish bore D1 [2]	LSP3	L2	E	B1	S	DH1	DI1	E1
24	35	28	78	30	18	14	2.0	61	27	4.0
28	95	32	90	35	20	15	2.5	72	30	
38	190	42	114	45	24	18	3.0	87	38	
42	265	48	126	50	26	20	3.0	103	46	
48	310	55	140	56	28	21	3.5	114	51	
55	410	65	160	65	30	22	4.0	130	60	
65	625	75	185	75	35	26	4.5	146	68	

1) Maximum torque of the coupling $T_{Kmax.}$ = Rated torque of the coupling T_{KN} x 2
2) Bores H7 with keyway to DIN 6885 sheet 1 [JS9] and setscrew
3) For dimensions G and T1 see table 9

1 Technical data

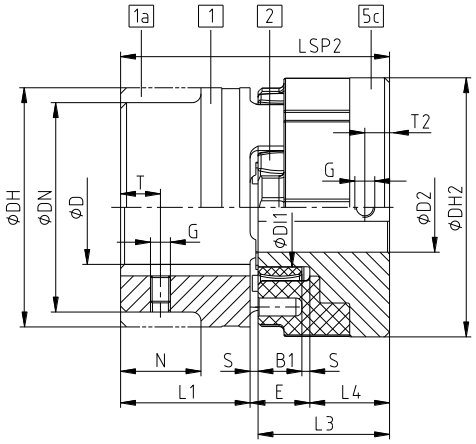


Illustration 4: Type EN (No. 081) - component 1, 1a, 1b: steel (St)

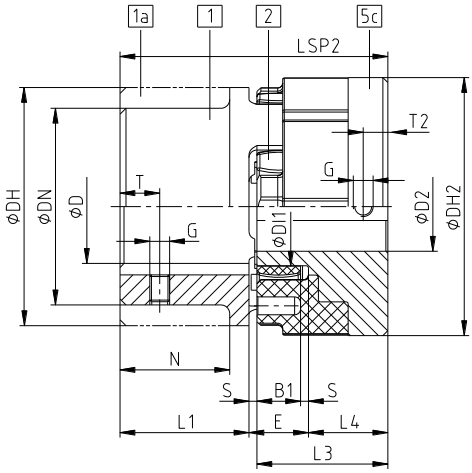


Illustration 5: Type EN (No. 081) - component 1, 1a, 1b: cast iron (GJL)

Table 4: Type EN (No. 081) - component 1, 1a, 1b: steel (St)

Size	Spider [1] (component 2) Rated torque [Nm]	Component (St)	Dimensions [mm] [3] Component 1, 1a, 1b steel (St)										Component	Dimensions [mm] [3] Component 5c			
			Max. finish bore D [2]	LSP2	L1	E	B1	S	DH	DI1	DN, DN1	N		Max. finish bore D2 [2]	L3	L4	DH2
24	35	1a	35	78	30	18	14	2.0	55	27	55	-	5c	19	36	22	61
		1b		98	50												
28	95	1a	40	90	35	20	15	2.5	65	30	65	-	5c	22	42	26	72
		1b		115	60												
38	190	1	48	114	45	24	18	3.0	80	38	70	27	5c	28	50	30	87
		1b		139	70						80	-					
42	265	1	55	126	50	26	20	3.0	95	46	85	28	5c	35	56	34	103
		1b		151	75						995	-					
48	310	1	62	140	56	28	21	3.5	105	51	95	32	5c	40	60	36	114
		1b		164	80						105	-					
55	410	1	74	160	65	30	22	4.0	120	60	110	37	5c	45	66	40	130
		1b		185	90						120	-					
65	625	1	80	185	75	35	26	4.5	135	68	115	47	5c	55	75	44	146
		1b		210	100						135	-					

Table 5: Type EN (No. 081) - component 1, 1a, 1b: cast iron (GJL)

Size	Spider [1] (component 2) Rated torque [Nm]	Component (GJL)	Dimensions [mm] [3] Component 1, 1a, 1b: cast iron (GJL)										Component	Dimensions [mm] [3] Component 5c			
			Max. finish bore D [2]	LSP2	L1	E	B1	S	DH	DI1	DN, DN1	N		Max. finish bore D2 [2]	L3	L4	DH2
38	190	1	40	114	45	24	18	3.0	80	38	66	37	5c	28	45	30	87
		1a	48								78						
		1b		139	70							62					
42	265	1	45	126	50	26	20	3.0	95	46	75	40	5c	35	50	34	103
		1a	55								94						
		1b		151	75							65					
48	310	1	52	140	56	28	21	3.5	105	51	85	45	5c	40	56	36	114
		1a	62								104						
		1b		164	80							69					
55	410	1	60	160	65	30	22	4.0	120	60	98	52	5c	45	65	40	130
		1a	74								118						
65	625	1	70	185	75	35	26	4.5	135	68	115	61	5c	55	75	44	146

1) Maximum torque of the coupling $T_{Kmax.}$ = Rated torque of the coupling T_{KN} x 2
2) Bores H7 with keyway to DIN 6885 sheet 1 [JS9] and setscrew
3) For dimensions G, T and T2 see table 9

1 Technical data

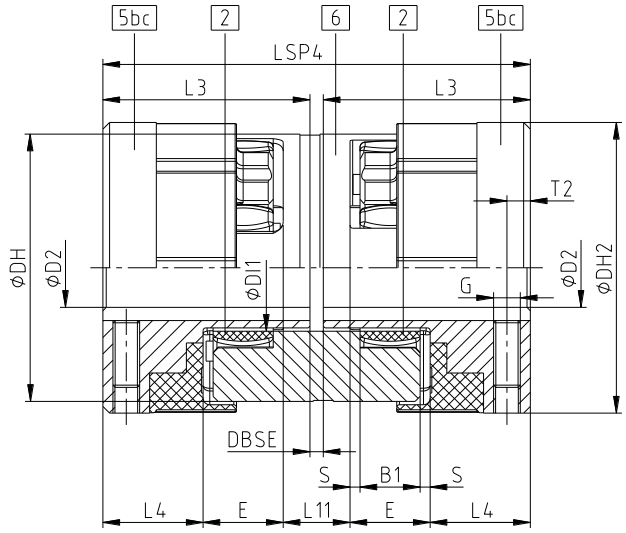


Illustration 6: Type E4-DKM (No. 086)

Table 6: Type E4-DKM (No. 086)

Size	Spider [1] (component 2) Rated torque [Nm]	Dimensions [mm] [3] Component 5bc					Dimensions [mm] Component 6						
		Max. finish bore D2 [2]	L3	L4	D_A	DBSE	LSP4	DH	DI1	L11	E	B1	S
24	35	20	46	22	61	4.0	96	55	27	16	18	14	2.0
28	95	22	53	26	72	4.0	110	65	30	18	20	15	2.5
38	190	28	62	30	87	4.0	128	80	38	20	24	18	3.0
42	265	38	69	34	103	4.0	142	95	46	22	26	20	3.0
48	310	42	74	36	114	4.0	152	105	51	24	28	21	3.5
55	410	45	82	40	130	4.0	168	120	60	28	30	22	4.0
65	625	55	93	44	146	4.0	190	135	68	32	35	26	4.5

1) Maximum torque of the coupling $T_{Kmax.}$ = Rated torque of the coupling T_{KN} x 2
2) Bores H7 with keyway to DIN 6885 sheet 1 [JS9] and setscrew
3) For dimensions G and T2 see table 9

1 Technical data

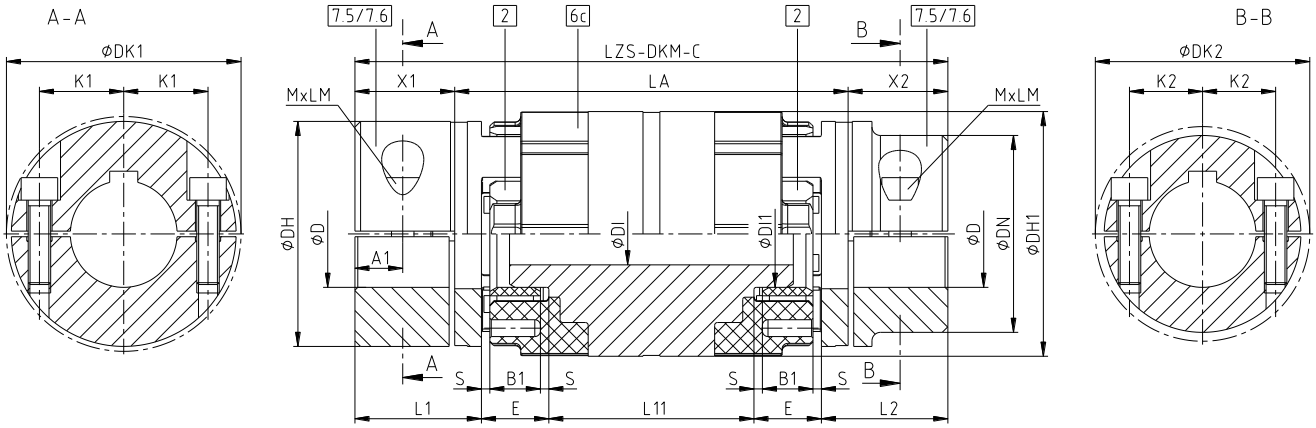


Illustration 7: Type ZS-DKM-C (No. 085)

Table 7: Type ZS-DKM-C (No. 085)

Size	Drop-out center length LA [mm]	Spider [1] (component 2) Rated torque [Nm]	Dimensions [mm] Component 7.5/7.6 steel (St)												Dimensions [mm] Component 6c Al-H [3]	
			Max. finish bore D [2]	LZS-DKM-C	L1, L2	X1, X2	E	B1	S	DH	DN	DH1	DI1	N	DI	L11
24	100	35	28	145	30	22.5	18	14	2.0	55	-	61	27	-	14	49
	140			185												89
28	100	95	38	151	35	25.5	20	15	2.5	65	-	72	30	-	16	41
	140			191												81
38	100	190	45	171	45	35.5	24	18	3.0	80	-	87	38	-	22	33
	140			211												73
42	100	265	55	178	50	39	26	20	3.0	95	85	103	46	28	30	26
	140			218												66
48	140	310	60	230	56	45	28	21	3.5	105	95	114	51	32	35	62
55	140	410	70	240	65	50	30	22	4.0	120	110	130	60	37	40	50
	180			280												90
	200			300												110
65	140	625	80	260	75	60	35	26	4.5	135	115	146	68	47	48	40
	180			300												80

1) Maximum torque of the coupling $T_{Kmax.}$ = rated torque of the coupling T_{KN} x 2; transmittable torque as per 92 ShA-GS
2) Bores H7 with keyway to DIN 6885 sheet 1 [JS9] and setscrew
3) Size 42 with drop-out center length L=100 mm made of steel

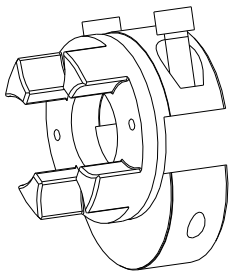


Illustration 8: Hub type

Type 7.5 clamping hub type DH without feather keyway for double-cardanic combination

Type 7.6 clamping hub type DH with feather keyway for double-cardanic combination

Hubs, clamping hubs or similar types (type 7.5) without feather keyways may be used in category 3 only and are marked with category 3 accordingly.

ROTEX® couplings with attachments that can generate heat, sparks and static charging (e. g. combinations with brake drums, brake disks, overload systems such as torque limiters, fan impellers etc.) are not permitted for the use in potentially explosive atmospheres.
A separate analysis must be performed.

1 Technical data

Table 8: Type ZS-DKM-C - Friction torques and surface pressure of DH clamping hubs type 7.5

Size	24	28	38	42	48	55	65
Clamping screw MxLM	M6x20	M8x25	M8x30	M10x30	M12x35	M12x40	M12x40
Dimension A1	10.5	12	17	18	21	26	33
Dimension K1	20	25	30	34	38	44	50
Dimension ØDK1	57.5	72.6	83.2	96.7	108.4	121.8	132.4
Dimension K2	-	-	-	32	36	42.5	45
Dimension ØDK2	-	-	-	93.3	105.0	119.2	123.5
Tightening torque T_A [Nm]	14	35	35	69	120	120	120
Bore Ø	Transmittable friction torque T_R of clamping hub [Nm] surface pressure [N/mm²]						
Ø10	37.1	68.3					
	75.0	123.4					
Ø11	40.8	75.2					
	68.2	112.2					
Ø12	44.5	82.0					
	62.5	102.8					
Ø14	52.0	95.7	95.7	152.2			
	53.6	88.1	61.8	90.3			
Ø15	55.7	102.5	102.5	163.0	238.6		
	50.0	82.3	55.7	84.2	105.9		
Ø16	59.4	109.3	109.3	173.9	254.5		
	46.9	77.1	54.1	79.0	99.3		
Ø18	66.8	123.0	123.0	195.6	286.3		
	41.7	68.6	48.1	70.2	88.2		
Ø19	70.5	129.8	129.8	206.5	302.2		
	39.5	64.9	45.6	66.5	83.6		
Ø20	74.2	136.7	136.7	217.4	318.1	318.1	
	37.5	61.7	43.3	63.2	79.4	71.1	
Ø22	81.6	150.3	150.3	239.1	349.9	349.9	
	34.1	56.1	39.3	57.4	72.2	64.6	
Ø24	89.1	164.0	164.0	260.8	381.7	381.7	381.7
	31.3	51.4	36.1	52.7	66.2	59.2	49.3
Ø25	92.8	170.8	170.8	271.7	397.6	397.6	397.6
	30.0	49.4	34.6	50.5	63.5	56.8	47.4
Ø28	103.9	191.3	191.3	304.3	445.3	445.3	445.3
	26.8	44.1	30.9	45.1	56.7	50.8	42.3
Ø30		205	205	326	477	477	477
		41.1	28.9	42.1	52.9	47.4	39.5
Ø32		219	219	348	509	509	509
		38.6	27.1	39.5	49.6	44.4	37.0
Ø35		239	239	380	557	557	557
		35.3	24.7	36.1	45.4	40.6	33.8
Ø38		260	260	413	604	604	604
		32.5	22.8	33.3	41.8	37.4	31.2
Ø40			273	435	636	636	636
			21.6	31.6	39.7	35.5	29.6
Ø42			287	456	668	668	668
			20.6	30.1	37.8	33.8	28.2
Ø45			307	489	716	716	716
			19.2	28.1	35.3	31.6	26.3
Ø48				522	763	763	763
				26.3	33.1	29.6	24.7
Ø50				543	795	795	795
				25.3	31.8	28.4	23.7
Ø55				598	875	875	875
				23.0	28.9	25.8	21.5
Ø60					954	954	954
					26.5	23.7	19.7
Ø65						1034	1034
						21.9	18.2
Ø70						1113	1113
						20.3	16.9
Ø75							1193
							15.8
Ø80							1272
							14.8

2 Advice

2.1 General advice

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

The **ROTEX®** coupling is suitable and approved for the use in potentially explosive atmospheres. When using the coupling in potentially explosive atmospheres, observe the special advice and instructions regarding safety in enclosure A.

The operating/assembly instructions are part of your product. Please store them carefully and close to the coupling. The copyright for these operating/assembly instructions remains with KTR.

2.2 Safety and advice symbols

Warning of potentially explosive atmospheres	This symbol indicates notes which may contribute to preventing bodily injuries or serious bodily injuries that may result in death caused by explosion.
Warning of personal injury	This symbol indicates notes which may contribute to preventing bodily injuries or serious bodily injuries that may result in death.
Warning of product damages	This symbol indicates notes which may contribute to preventing material or machine damage.
General advice	This symbol indicates notes which may contribute to preventing adverse results or conditions.
Warning of hot surfaces	This symbol indicates notes which may contribute to preventing burns with hot surfaces resulting in light to serious bodily injuries.

2.3 General hazard warnings

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. 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".
- 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 operating area of the coupling as long as it is in operation.
- Secure the coupling against accidental contact. Provide for the necessary protection devices and covers.

2 Advice

2.4 Intended use

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

- have carefully read through the operating/assembly instructions and understood them
- are technically qualified and specifically trained (e. g. safety, environment, logistics)
- are authorized by your company

The coupling may only be used in accordance with the technical data (see 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® SP „Non Sparking“** described in here corresponds to the state of the art at the time of printing of these operating/assembly instructions.

2.5 Coupling selection

For a permanent 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 catalogue drive technology "ROTEX®").
If the operating conditions (performance, speed, modifications on engine and machine) change, the coupling selection must be reviewed.
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.

2.6 Reference to EC Machinery Directive 2006/42/EC

The couplings supplied by KTR should be considered as components, not machines or partly completed machines according to EC Machinery Directive 2006/42/EC. Consequently KTR does not have to issue a declaration of incorporation. For details about safe assembly, start-up and safe operation refer to the present operating/assembly instructions considering the warnings.

3 Storage, transport and packaging

3.1 Storage

The coupling hubs are supplied in preserved condition and can be stored in a dry and roofed place for 6 - 9 months.
The features of the coupling spiders (elastomers) remain unchanged for up to 5 years with favourable storage conditions.

The storage rooms must 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.
Make sure that condensation is not generated. The best relative air humidity is less than 65 %.

3.2 Transport and packaging

In order to avoid any injuries and any kind of damage always make use of proper transport and lifting equipment.

The couplings are packed differently each depending on size, number and kind of transport. Unless otherwise contractually agreed, packaging will follow the in-house packaging specifications of KTR.

4 Assembly

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

4.1 Components of the couplings

Components of ROTEX®, type GN (No. 080)

Component	Quantity	Description
1	1	Hub
1c	1	GN hub SP
2	1	Spider (92 ShA)
3	2	Setscrews DIN EN ISO 4029

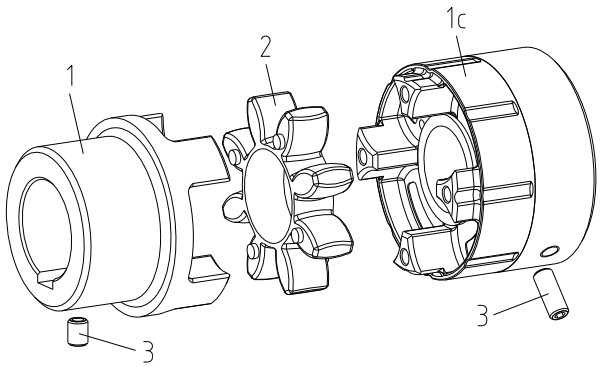


Illustration 9: Type GN (No. 080)

4 Assembly

4.1 Components of the couplings

Components of ROTEX®, type GND (No. 082)

Component	Quantity	Description
1c	2	GN hub SP
2	1	Spider (92 ShA)
3	2	Setscrews DIN EN ISO 4029

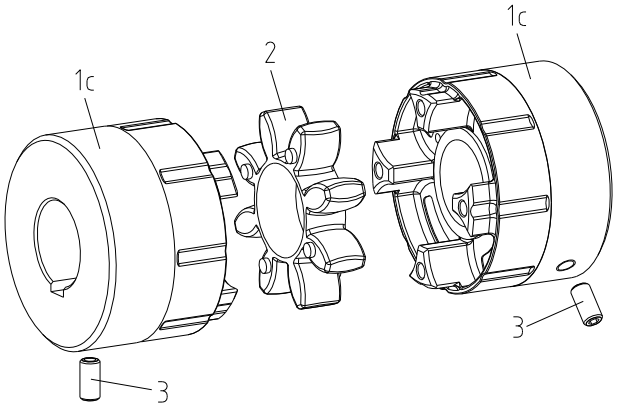


Illustration 10: Type GND (No. 082)

Components of ROTEX®, type EN (No. 081)

Component	Quantity	Description
1	1	Hub
2	1	Spider (92 ShA)
3	2	Setscrews DIN EN ISO 4029
5c	1	EN hub SP

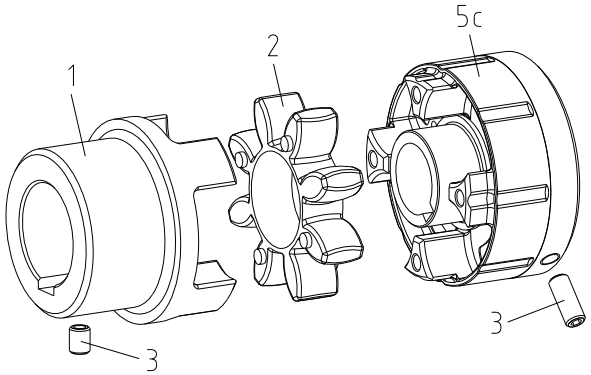


Illustration 11: Type EN (No. 081)

4 Assembly

4.1 Components of the couplings

Components of ROTEX®, type E4-DKM (No. 086)

Component	Quantity	Description
2	2	Spider (92 ShA)
3	2	Setscrews DIN EN ISO 4029
5bc	2	E4 hub SP
6	1	DKM spacer

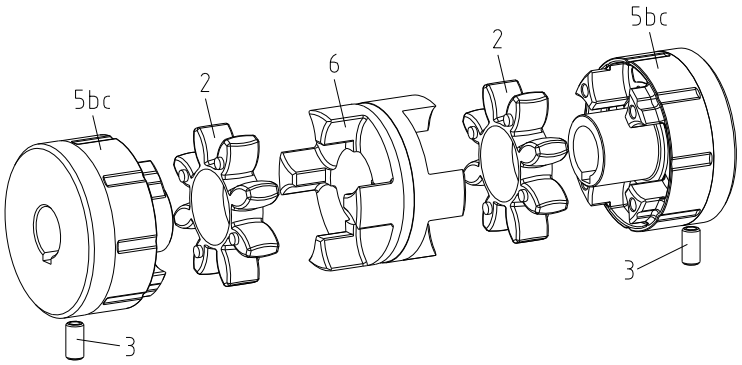


Illustration 12: Type E4-DKM (No. 086)

Components of ROTEX®, type ZS-DKM-C (No. 085)

Component	Quantity	Description
2	2	Spider (98 ShA-GS)
4	2 [1)]	Cap screws DIN EN ISO 4762
6c	1	DKM spacer SP
7.5/7.6	2	Clamping hub type DH with half length tapered groove pin DIN EN ISO 8745 (2 pieces)

1) each clamping hub type DH

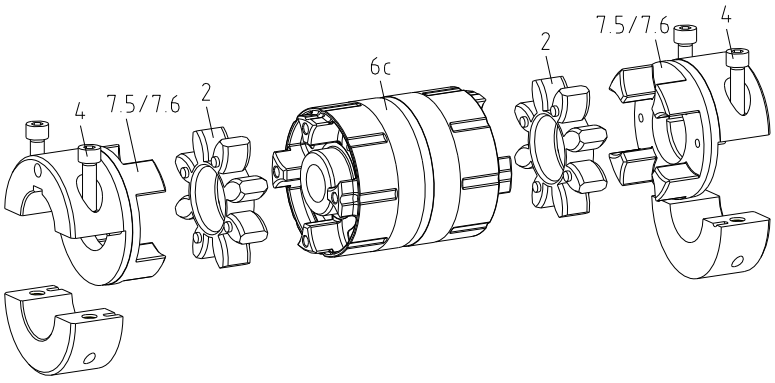


Illustration 13: Type ZS-DKM-C (No. 085)

Hubs, clamping hubs or similar types without feather keyway may be used in category 3 only and are marked with category 3 accordingly.

4 Assembly

4.1 Components of the couplings

Features of standard spiders

Spider hardness (Shore)	92 Shore A [1]	98 Shore A-GS [2]
	T-PUR® (orange)	PUR (red)
Marking (colour)		

1) Use of spiders applies with all types except for type ZS-DKM-C (No. 085)
2) Use of spiders applies with type ZS-DKM-C (No. 085) only

4.2 Advice for finish bore

STOP

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

- Hub bores machined by the customer have to observe concentricity resp. axial runout (see illustration 14).
- Make absolutely sure to observe the figures for ØD.
- Carefully align the hubs when the finish bores are drilled.
- **Valid with all types except for type ZS-DKM-C:**
  Provide for a setscrew according to DIN EN ISO 4029 with a cup point or an end plate to fasten the hubs axially.
- **Only valid with type ZS-DKM-C:**
  Provide for a setscrew or an end plate to fasten the hubs axially.

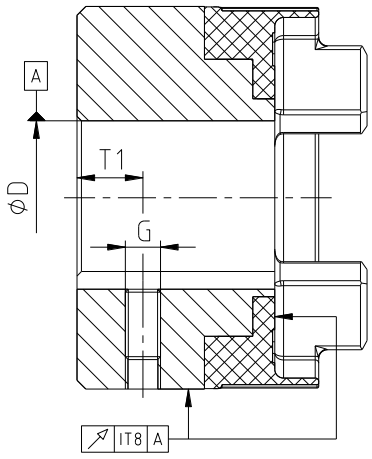


Illustration 14: Concentricity and axial runout (example: hub type 1c)

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 remachining.

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

<u>Reference to unbored resp. pilot bored coupling components with explosion protection marking:</u>
Basically the company KTR Systems GmbH supplies couplings resp. coupling hubs with explosion protection marking as an unbored or pilot bored type only on explicit request of the customer. The prerequisite is a declaration of exemption submitted by the customer assuming any responsibility and liability for respective remachining performed on the product of KTR Systems GmbH.

4 Assembly

4.2 Advice for finish bore

Table 9: Setscrew DIN EN ISO 4029

Size	24	28	38	42	48	55	65
Dimension G	M5	M8	M8	M8	M8	M10	M10
Dimension T and T1	10	15	15	20	20	20	20
Dimension T2	6	7	7	10	10	12	12
Tightening torque T_A [Nm]	2	10	10	10	10	17	17

Table 10: Recommended fit pairs acc. to DIN 748/1

Bore [mm]		Shaft tolerance	Bore tolerance
above	up to		
	50	k6	H7 (KTR standard)
50		m6	

If a feather keyway is intended to be used in the hub, it should correspond to the tolerance ISO JS9 (KTR standard) with standard operating conditions or ISO P9 with sophisticated operating conditions (frequently alternating torsional direction, shock loads, etc.). The keyway should preferably be located between the cams. With axial fastening by the setscrew the tapped hole should be located on the keyway.

The transmittable torque of the shaft-hub-connection must be reviewed by the customer and is subject to his responsibility.

4.3 Assembly of the coupling (general)

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

Heating the hubs lightly (approx. 80 °C) allows for an easier mounting on the shafts. Not necessary with type ZS-DKM-C.

Pay attention to the ignition risk in potentially explosive atmospheres!

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

With the assembly make sure that the distance dimension E resp. E1 (see table 1 to 7) is observed to allow for axial clearance of the spider when in operation.
Disregarding this advice may cause damage to the coupling.

If used in potentially explosive atmospheres 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).

4 Assembly

4.4 Assembly of types GN, GND and EN

- Mount the hubs on the shaft of driving and driven side (see illustration 15).
- The internal sides of the hubs must be flush with the front sides of the shafts.

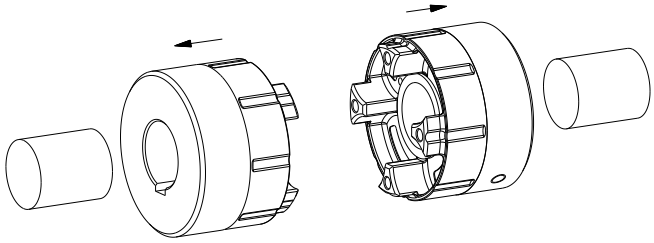


Illustration 15: Assembly of hubs (example: type GND)

- Insert the spider in the cam section of the hubs on the driving or driven side (see illustration 16).

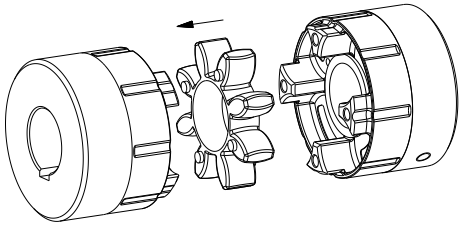


Illustration 16: Assembly of spider (example: type GND)

- Shift the power packs in axial direction until the dimension E resp. LSP is achieved (see chapter 1 of the respective type).
- If the power packs are already firmly assembled, shifting the hubs axially on the shafts allows for adjusting the dimension E or LSP.
- Fasten the hubs by tightening the setscrews DIN EN ISO 4029 with a cup point (tightening torque see table 9).

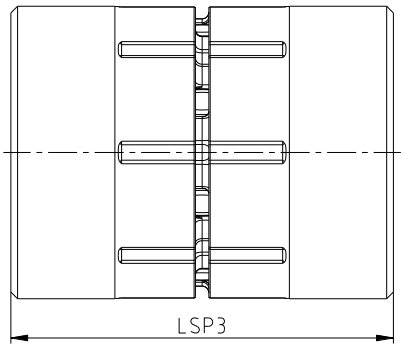


Illustration 17: Assembly of coupling (example: type GND)

☞ **If the shaft diameters with inserted feather key are smaller than dimension DI1 (see table 1 to 5) of the spider, one or two shaft ends may protrude into the spider.**

⚠ **Having started up the coupling, the wear of spider has to be inspected at regular maintenance intervals and the spider has to be replaced, if necessary.**

4 Assembly

4.5 Assembly of type E4-DKM

- Mount the E4 hubs on the shaft of driving and driven side (see illustration 18).
- The internal sides of the E4 hubs must be flush with the front sides of the shafts.

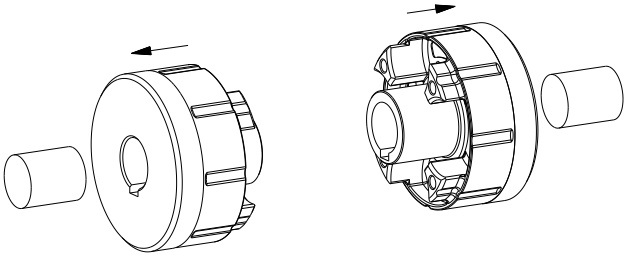


Illustration 18: Assembly of the E4 hubs

- Insert the spiders in the cam section of the E4 hubs (see illustration 19).

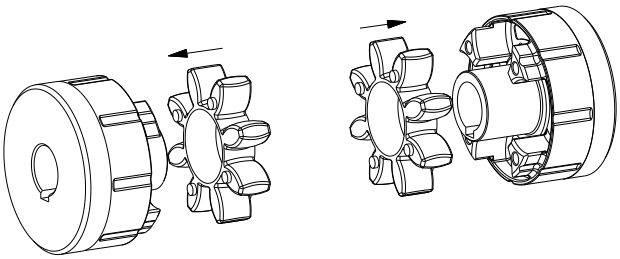


Illustration 19: Assembly of spiders

- Insert the DKM spacer in the spider of the driving or driven side E4 hub (see illustration 20).

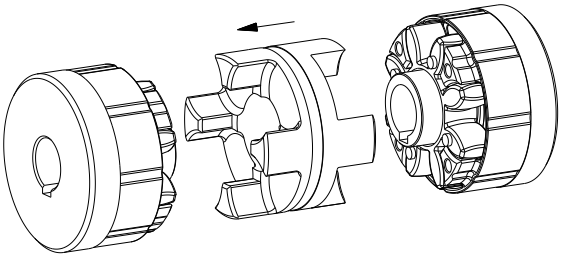


Illustration 20: Assembly of the DKM spacer

- Shift the power packs in axial direction until the distance dimension E is achieved (see illustration 21).
- If the power packs are already firmly assembled, shifting the hubs axially on the shafts allows for setting the distance dimension E.
- Fasten the hubs by tightening the setscrews DIN EN ISO 4029 with a cup point (tightening torque see table 9).
- Centre the spider between the hubs and check the dimension E (see illustration 21 and table 6).

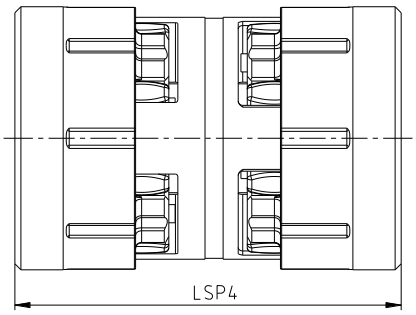


Illustration 21: Assembly of coupling

If the shaft diameters with inserted feather key are smaller than dimension DI1 (see table 6) of the spider, one or two shaft ends may protude into the spider.

Having started up the coupling, the wear of spider has to be inspected at regular maintenance intervals and the spider has to be replaced, if necessary.

4 Assembly

4.6 Assembly of type ZS-DKM-C

- Remove the half shells from the hub body (see illustration 22).

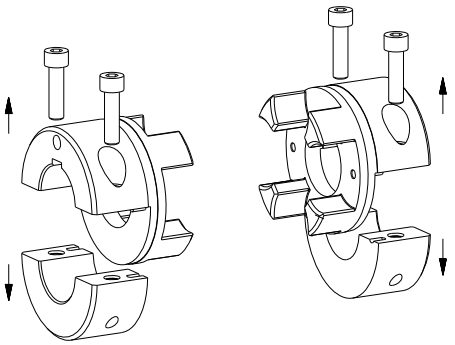


Illustration 22: Disassembly of half shells

- Fit the hub bodies together with the spiders and DKM spacer SP (see illustration 23).

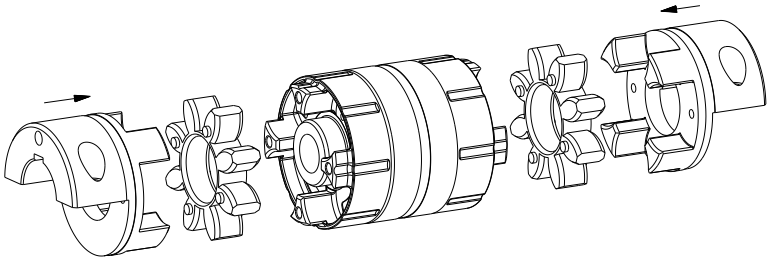


Illustration 23: Assembly of hub bodies, spiders and DKM spacer SP

- Mount the fitted unit along with the half shells and the clamping screws on the shaft ends of the driving and driven machine (see illustration 24).
- Hand-tighten the components first until the hub bodies with the half shells fit closely to the shaft.
- Shift the clamping hubs type DH in axial direction until the dimension LZS-DKM-C resp. LA specified in table 7 is achieved.
- Fasten the clamping hubs type DH by tightening the clamping screws reciprocally. The screws have to be tightened at the tightening torques T_A specified in table 8 by means of a suitable torque wrench.
- Center the spiders between the clamping hubs type DH and DKM spacer SP and check the dimension E and S (see illustration 7 as well as 25 and table 7).

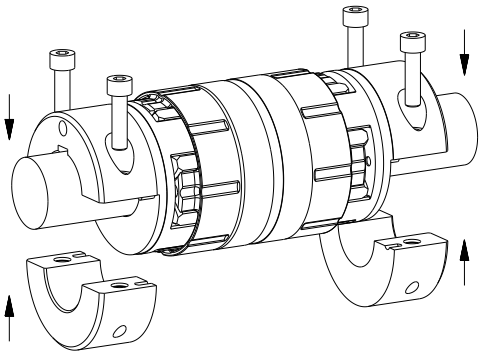


Illustration 24: Assembly of component assembly on the shafts

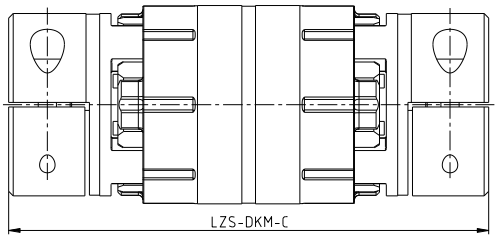


Illustration 25: Assembly of coupling

Having started up the coupling, the wear of spider has to be inspected at regular maintenance intervals and the spider has to be replaced, if necessary.

Clamping hubs without feather keyway may be used in category 3 only and are marked with category 3 accordingly.

4 Assembly

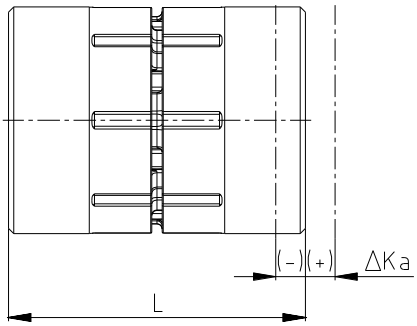
4.7 Displacements - alignment of the couplings

The displacement figures specified in table 11 to 13 provide for sufficient safety to compensate for external influences like, for example, heat expansion or foundation settling.

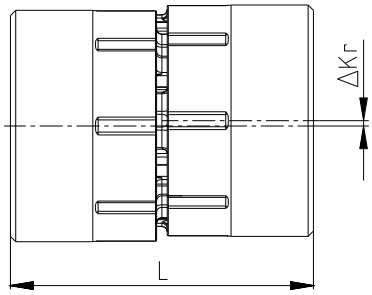
In order to ensure a long service life of the coupling and avoid dangers with the use in potentially explosive atmospheres, the shaft ends must be accurately aligned.
Please absolutely observe the displacement figures specified (see table 11 to 13). If the figures are exceeded, the coupling will be damaged.
The more accurate the alignment of the coupling, the longer is its service life.
If used in potentially explosive atmospheres for explosion group IIC, only half of the displacement figures (see table 11 to 13) are permissible.

Please note:

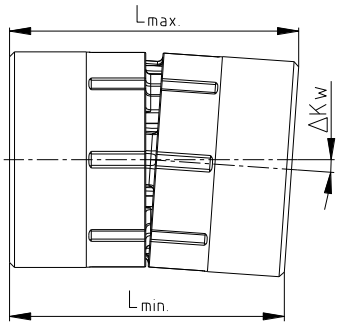
- The displacement figures specified in table 11 to 13 are maximum figures which must not arise in parallel. If radial and angular displacements arise simultaneously, the permissible displacement values may only be used proportionally (see illustration 28).
- Inspect with a dial gauge, ruler or feeler whether the permissible displacement figures of tables 11 to 13 can be observed.



Axial displacements



Radial displacements

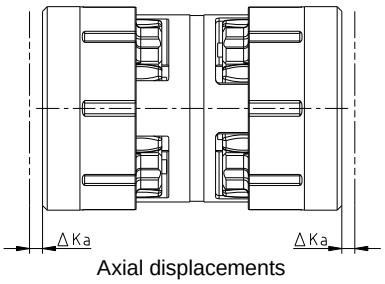


Angular displacements

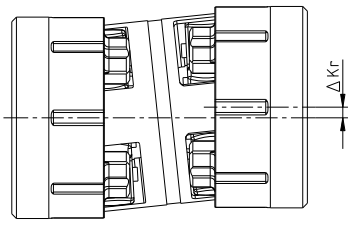
$L_{max} = L + \Delta K_a$ [mm]

$\Delta K_w = L_{1max.} - L_{1min.}$ [mm]

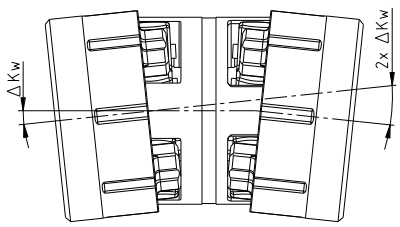
Illustration 26: Displacements (single-cardanic)



Axial displacements



Radial displacements



Angular displacements

Illustration 27: Displacements (double-cardanic)

4 Assembly

4.7 Displacements - alignment of the couplings

Examples of the displacement combinations specified in illustration 28:

Example 1:
ΔK_r = 30 %
ΔK_w = 70 %

Example 2:
ΔK_r = 60 %
ΔK_w = 40 %

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

Illustration 28: Combinations of displacement

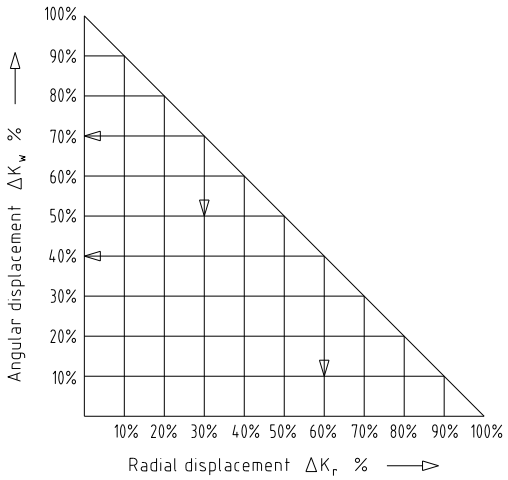


Table 11: Displacement figures for 92 Shore A

Size		24	28	38	42	48	55	65
Max. axial displacement ΔK_a [mm]		-0.5	-0.7	-0.7	-1.0	-1.0	-1.0	-1.0
		+1.4	+1.5	+1.8	+2.0	+2.1	+2.2	+2.6
Max. radial displacement ΔK_r [mm] with n =	1500 rpm	0.22	0.25	0.28	0.32	0.36	0.38	0.42
	3000 rpm	0.15	0.17	0.19	0.21	0.25	0.26	0.28
Max. angular displacement ΔK_w with n=1500 rpm	[degree]	0.9	0.9	1.0	1.0	1.1	1.1	1.2
	[mm]	0.85	1.05	1.35	1.70	2.00	2.30	2.70
Max. angular displacement ΔK_w with n=3000 rpm	[degree]	0.8	0.8	0.9	0.9	1.0	1.0	1.1
	[mm]	0.75	0.85	1.10	1.40	1.60	2.00	2.30

Table 12: Displacement figures - type E4-DKM (No. 086)

Size		24	28	38	42	48	55	65
Max. axial displacement ΔK_a [mm]		-1.0	-1.4	-1.4	-2.0	-2.0	-2.0	-2.0
		+1.4	+1.5	+1.8	+2.0	+2.1	+2.2	+2.6
Max. radial displacement ΔK_r [mm] with n =	1500 rpm	0.59	0.66	0.77	0.84	0.91	1.01	1.17
	3000 rpm	0.53	0.60	0.70	0.75	0.82	0.81	1.05
Max. angular displacement ΔK_w [degree] with n=	1500 rpm	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	3000 rpm	0.9	0.9	0.9	0.9	0.9	0.9	0.9

Table 13: Displacement figures for 98 Shore A-GS - Type ZS-DKM-C (No. 085)

Size	Max. axial displacement ΔK_a [mm]	Max. axial displacement ΔK_r [mm] with drop-out center design length LA with n=								Max. angular displacement ΔK_w [degree] with n=	
		1500 rpm				3000 rpm					
		100	140	180	250	100	140	180	250	1500 rpm	3000 rpm
24	-1.0/+1.4	1.17	1.87	-	-	0.87	1.40	-	-	1.0	0.75
28	-1.4/+1.5	1.06	1.76	-	-	0.80	1.32	-	-	1.0	0.75
38	-1.4/+1.8	0.99	1.69	-	-	0.74	1.27	-	-	1.0	0.75
42	-2.0/+2.0	0.91	1.60	-	-	0.68	1.20	-	-	1.0	0.75
48	-2.0/+2.1	0.87	1.57	-	-	0.65	1.18	-	-	1.0	0.75
55	-2.0/+2.2	0.70	1.40	2.09	-	0.52	1.05	1.57	-	1.0	0.75
65	-2.0/+2.6	-	1.31	2.00	-	-	0.98	1.50	-	1.0	0.75

5 Start-up

Before start-up of the coupling, inspect the tightening of the setscrews in the hubs, the alignment and the distance dimension E or E1 and adjust, if necessary, and also inspect all screw connections for the tightening torques specified.

If used in potentially explosive atmospheres 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. It is required in accordance with DIN EN ISO 12100 (Safety of Machinery) and directives 2014/34/EU and SI 2016 No. 1107 and must protect against

- access with the little finger
- falling down of solid foreign objects.

The coupling protection is not part of KTR's scope of delivery and is the customer's responsibility. It must have sufficient distance to the rotating components to avoid contact safely. Depending on the outside diameter DH of the coupling, we recommend the following minimum distance:
ØDH to 50 mm = 6 mm, ØDH 50 mm to 120 mm = 10 mm, ØDH from 120 mm = 15 mm.

Please check if a proper enclosure (ignition protection, coupling protection, contact protection) has been mounted and the operation of the coupling is not affected by the enclosure. The same applies for test runs and rotational direction inspections.

The cover may provide for openings intended for necessary heat dissipation. These openings have to comply with DIN EN ISO 13857.
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 with standstill of the unit.

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 must 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 with use as equipment of equipment group II.

During operation of the coupling, please pay attention to

- different operating noise
- vibrations occurring.

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 specified by means of the table „Breakdowns“ and, if possible, be eliminated according to the proposals. The potential breakdowns specified can be hints only. To find out the cause all operating factors and machine components must be considered.

5 Start-up

Coating of coupling:

If coated (priming, paintings, etc.) couplings are used in potentially explosive atmospheres, the requirements on conductibility and coating thickness must be considered. With paintings up to 200 µm electrostatic load does not have to be expected. If thicker paintings resp. coatings up to a layer thickness of a maximum of 2.0 mm are applied, the couplings are not permissible for gases and vapours of category IIC in potentially explosive areas, but only for gases and vapours of category IIA and IIB.
This also applies for multiple coatings exceeding an overall thickness of 200 µm. Make sure with painting or coating that the coupling components are conductively connected with the device/devices to be connected so that the equipotential bonding is not impeded by the paint or coat applied. Basically painting of the spider is not admitted to ensure an equipotential bonding.
In addition, make sure that the marking of the coupling remains legible.

6 Breakdowns, causes and elimination

The below-mentioned failures can lead to improper use of the **ROTEX®** coupling. In addition to the specifications given in these operating/assembly instructions make sure to avoid such failures.
The errors listed can only be clues to search for the failures. When searching for the failure the adjacent components must generally be considered.

The coupling can become a source of ignition by improper use.
Directive 2014/34/EU and UK directive SI 2016 No. 1107 require special care by the manufacturer and the user.

General failures with improper use:

- Important data for the coupling selection are not forwarded.
- The calculation of the shaft-hub-connection is 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 one another.
- Tightening torques have been fallen below/exceeded.
- Components are mixed up by mistake/assembled incorrectly.
- A wrong or no spider is inserted in the coupling.
- No original **KTR** components (purchased parts) are used.
- Old/already worn out spiders or spiders stored for too long are used.
- Maintenance intervals are not observed.

6 Breakdowns, causes and elimination

Breakdowns	Causes	Hazard notes for potentially explosive atmospheres	Elimination
Different operating noise and/or vibrations occuring	Misalignment	Increased temperature on the spider surface; ignition risk by hot surfaces	1) Set the unit out of operation 2) Eliminate the reason for the misalignment (e. g. loose foundation bolts, fracture of the engine mount, heat expansion of unit components, modification of the installation dimension E of the coupling) 3) For inspection of wear see chapter 10.2
	Screws for axial fastening of hubs working loose	Ignition risk due to hot surfaces and sparking	1) Set the unit out of operation 2) Inspect alignment of coupling 3) Tighten the screws to fasten the hubs and secure against working loose 4) For inspection of wear see chapter 10.2
Fracture of cams	Fractures of the cams due to high impact energy/overload	Danger by rotating cam fragments	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 meet with the performance of the coupling		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		1) Set the unit out of operation 2) Replace complete coupling 3) Inspect alignment 4) Instruct and train the service staff
Early wear of spider	Misalignment	Increased temperature on the spider surface; ignition risk by hot surfaces	1) Set the unit out of operation 2) Eliminate the reason for the misalignment (e. g. loose foundation bolts, fracture of the engine mount, heat expansion of unit components, modification of the installation dimension E of the coupling) 3) For inspection of wear see chapter 10.2
	e. g. contact with aggressive liquids/oils, ozone influence, too high/low ambient temperatures etc. causing physical modification of the spider	Danger by rotating cam fragments	1) Set the unit out of operation 2) Disassemble the coupling and remove residues of the spider 3) Inspect coupling components and replace coupling components that have been 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
	Ambient/contact temperatures which are too high for the spider, max. permissible -30 °C/+90 °C		1) Set the unit out of operation 2) Disassemble the coupling and remove residues of the spider 3) Inspect coupling components and replace coupling components that have been damaged 4) Insert spider, assemble coupling components 5) Inspect alignment, adjust if necessary 6) Inspect and adjust ambient/contact temperature (correct by using other spider materials, if necessary)

6 Breakdowns, causes and elimination

Breakdowns	Causes	Hazard notes for potentially explosive atmospheres	Elimination
Early wear of spider (liquefaction of material inside the spider cam)	Vibrations of drive	Danger by rotating cam fragments	1) Set the unit out of operation 2) Disassemble the coupling and remove residues of the spider 3) Inspect coupling components and replace coupling components that have been damaged 4) Insert spider, assemble coupling components 5) Inspect alignment, adjust if necessary 6) Find out the reason for the vibrations (possibly corrective by spider with lower or higher Shore hardness)

When operating with a worn spider (see chapter 10.3) proper operation is not ensured.

7 Disposal

In respect of environmental protection we would ask you to dispose of the packaging resp. products on termination of their service life in accordance with the legal regulations resp. standards that apply.

- **Metal**
  Any metal components have to be cleaned and disposed of by scrap metal.
- **Nylon materials**
  Nylon materials have to be collected and disposed of by a waste disposal company.

8 Maintenance and service

ROTEX® is a low-maintenance coupling. We recommend to perform a visual inspection on the coupling **at least once a year**. Please pay special attention to the condition of the coupling spiders.

- Since the flexible machine bearings of the driving and driven side settle during the course of load, inspect the alignment of the coupling and re-align the coupling, if necessary.
- The coupling components have to be inspected for damages.
- The screw connections have to be inspected visually.

With the use in potentially explosive atmospheres observe chapter 10.2 "Inspection intervals for couplings in potentially explosive atmospheres".

9 Spares inventory, customer service addresses

We recommend to store major spare parts on site to ensure the readiness for use of the machine in case if a coupling fails.

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

☞ **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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10 Enclosure A

Advice and instructions regarding the use in potentially explosive atmospheres

Applicable hub designs/types:

a) Hubs that may be used in group II, category 2 and 3 :
(hubs with feather keyway and hubs with CLAMPEX® clamping set or clamping ring hubs)

- 1.0 Hub with feather keyway and setscrew
- 7.6 Half shell hub (DH) with feather keyway
- Type GN, EN, GND, ZS-DKM-C and E4-DKM with hubs corresponding to the specifications above

b) Hubs which may be used in group II, category 3 only:
(hubs without feather keyway)

- 7.5 Half shell hub (DH) without feather keyway
- Type GN, EN, GND, ZS-DKM-C and E4-DKM with hubs corresponding to the specifications above

ROTEX® type E4-DKM (No. 086) only with spacer made of steel or aluminium wrought products with a yield strength $R_{p0.2} \geq 250$ N/mm².

Hubs, clamping hubs or similar types (type 7.5) without feather keyways may be used in category 3 only and are marked with category 3 accordingly.

10 Enclosure A

Advice and instructions regarding the use in potentially explosive atmospheres

10.1 Intended use in potentially explosive atmospheres

Conditions of operation in potentially explosive atmospheres

The **ROTEX®** couplings are suitable for the use according to directives 2014/34/EU and SI 2016 No. 1107.

- Protection against hazards arising from lightning must follow the lightning protection concept of the machine or plant. The relevant regulations and policy for lightning protection must be observed.
- The equipotential bonding of the couplings is made by metal contact between coupling hub and shaft. This equipotential bonding must not be affected.

1. Industry (with the exception of mining)

- Equipment group II of category 2 and 3 (*coupling is not approved/not suitable for equipment group 1*)
- Substance group G (*gases, fogs, vapours*), zone 1 and 2 (*coupling is not approved/not suitable for zone 0*)
- Substance group D (*dusts*), zone 21 and 22 (*coupling is not approved/not suitable for zone 20*)
- Explosion group IIC (*gases, fogs, vapours*) *(explosion groups IIA and IIB are included in IIC)* and explosion group IIIC (*dusts*) *(explosion groups IIIA and IIIB are included in IIIC)*

Temperature class:

Temperature class	PUR / T-PUR®	
	Ambient or operating temperature T_a 1)	Max. surface temperature 2)
T4	-30 °C to +90 °C	+110 °C
T5	-30 °C to +75 °C	+95 °C
T6	-30 °C to +60 °C	+80 °C

Explanation:
The maximum surface temperatures each result from the maximum permissible ambient or operating temperature T_a plus the maximum temperature increase ΔT of 20 K to be considered. For the temperature class a safety margin subject to standard of 5 K is added.

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.

In potentially explosive atmospheres

- the ignition temperature of dusts generated must at least be 1.5 times the surface temperature to be considered
- the glow temperature must at least be the surface temperature to be considered plus a safety distance of 75 K.
- the gases and vapours generated must amount to the temperature class specified.

2. Mining

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

10 Enclosure A

Advice and instructions regarding the use in potentially explosive atmospheres

10.2 Inspection intervals for couplings in potentially explosive atmospheres

Equipment category	Inspection intervals
3G 3D	For couplings operated in zone 2 or zone 22 the inspection and maintenance intervals of the usual operating/assembly instructions for standard operation apply. During the standard operation which has to be taken as a basis of the ignition risk analysis the couplings are free from any ignition source. For gases, vapours and dusts generated the permissible glow and ignition temperatures specified in chapter 10.1 have to be considered and observed.
M2 2G 2D No gases and vapours of explosion group IIC	The torsional backlash of the coupling (see chapter 10.3) according to directive 2014/34/EU only has to be inspected if a failure of the coupling and consequently a standstill of the drive causes danger of explosion. We recommend a preventive inspection of torsional backlash and a visual inspection of the flexible spiders. This should be performed after 3,000 operating hours for the first time, at the latest 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.
M2 2G 2D Gases and vapours of explosion group IIC	The torsional backlash of the coupling (see chapter 10.3) according to directive 2014/34/EU only has to be inspected if a failure of the coupling and consequently a standstill of the drive causes danger of explosion. We recommend a preventive inspection of torsional backlash and a visual inspection of the flexible spiders. This should be performed after 2,000 operating hours for the first time, at the latest 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.

Hubs, clamping hubs or similar types (type 7.5) without feather keyways may be used in category 3 only and are marked with category 3 accordingly.

10 Enclosure A

Advice and instructions regarding the use in potentially explosive atmospheres

10.2 Inspection intervals for couplings in potentially explosive atmospheres

ROTEX® SP coupling

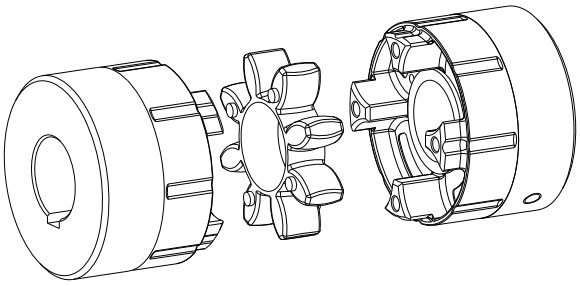

Illustration 29: ROTEX® SP coupling (example: type GND)

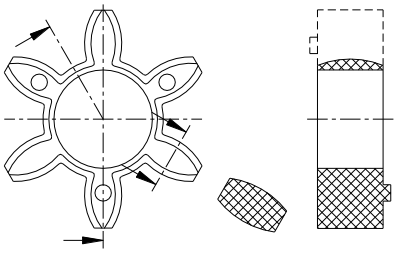

Illustration 30: ROTEX® spider

Here the backlash between the cams of the coupling and the flexible spider must be inspected by means of a feeler gauge.
When reaching the wear limit ***maximum friction***, the spider must be replaced immediately, irrespective of the inspection intervals.

10 Enclosure A

Advice and instructions regarding the use in potentially explosive atmospheres

10.3 Standard values of wear

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

Monitoring of the general condition of the coupling can be done both at standstill and during operation. If the coupling is tested during operation, the operator must ensure an appropriate and proven test procedure (e. g. stroboscopic lamp, high-speed camera, etc.) which is definitely comparable to testing at standstill. If any distinctive features occur, an inspection must be made with the machine stopped.

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

In order to ensure a long service life of the coupling and avoid dangers with the use in potentially explosive atmospheres, the shaft ends must be accurately aligned.
Please absolutely observe the displacement figures specified (see table 11 to 13). If the figures are exceeded, the coupling will be damaged.

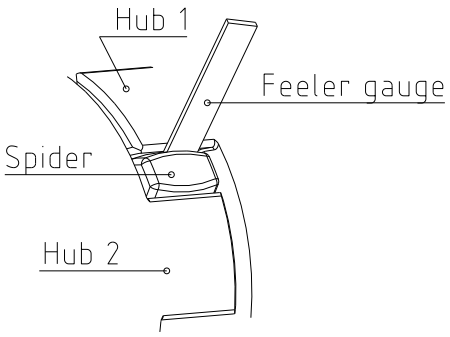

Illustration 31: Inspection of the limit of wear

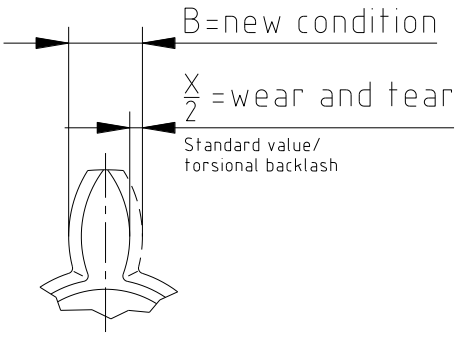

Illustration 32: Wear of spider

Table 14:

Size	Limits of wear (friction) $X_{max.}$ [mm]	
	ROTEX® spider	**ROTEX® GS spider**
24	3.00	1.00
28	3.00	1.40
38	3.00	1.70
42	4.00	2.00
48	4.00	2.25
55	5.00	2.50
65	5.00	2.75

10 Enclosure A

Advice and instructions regarding the use in potentially explosive atmospheres

10.4 marking of coupling for potentially explosive atmospheres

The explosion protection marking of the ROTEX® coupling is applied on the outer sheath or on the front side. The flexible spider is excluded.

For the complete marking refer to the operating/assembly instructions and/or the delivery note/package.

The following marking applies for the products:

- Type without aluminium, with feather keyway and/or clamping ring hub (Category 2)

	I M2	Ex h	I				Mb	X
	II 2G	Ex h	IIC	T6	…	T4	Gb	X
	II 2D	Ex h	IIIC	T80 °C	…	T110 °C	Db	X
<Year>		-30 °C ≤ T_a ≤	+60 °C		…	+90 °C		

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- Type without aluminium, without feather keyway (Category 3)

	I M2	Ex h	I				Mb	X
	II 3G	Ex h	IIC	T6	…	T4	Gc	X
	II 3D	Ex h	IIIC	T80 °C	…	T110 °C	Dc	X
<Year>		-30 °C ≤ T_a ≤	+60 °C		…	+90 °C		

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- Type with aluminium, with feather keyway and/or clamping ring hub (Category 2)

	II 2G	Ex h	IIC	T6	…	T4	Gb	X
	II 2D	Ex h	IIIC	T80 °C	…	T110 °C	Db	X
<Year>		-30 °C ≤ T_a ≤	+60 °C		…	+90 °C		

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- Type with aluminium, without feather keyway (Category 3)

	II 3G	Ex h	IIC	T6	…	T4	Gc	X
	II 3D	Ex h	IIIC	T80 °C	…	T110 °C	Dc	X
<Year>		-30 °C ≤ T_a ≤	+60 °C		…	+90 °C		

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Short marking:
(A short marking is only made if not possible differently for reason of space or functioning.)

ROTEX®
<Year>

10 Enclosure A

Advice and instructions regarding the use in potentially explosive atmospheres

10.4 marking of coupling for potentially explosive atmospheres

Deviating marking applied until 31st October 2019:

Short marking: II 2GD c IIC T X/I M2 c X

Valid for all types except for ZS-DKM-C:

Complete marking:
(valid for T-PUR® only)

II 2G c IIC T6, T5, T4 resp. T3 -50 °C ≤ T_a ≤ +65 °C, +80 °C, +115 °C resp. +120 °C
II 2D c T 140 °C -50 °C ≤ T_a ≤ +120 °C

Valid for type ZS-DKM-C only:

Complete marking:
(valid for PUR only)

II 2G c IIC T6, T5 resp. T4 -30 °C ≤ T_a ≤ +65 °C, +80 °C resp. +90 °C
II 2D c T 110 °C/I M2 c -30 °C ≤ T_a ≤ +90 °C

Comments on marking

Equipment group I	Mining
Equipment group II	Non-mining
Equipment category 2G	Equipment ensuring a high level of safety, suitable for zone 1
Equipment category 3G	Equipment ensuring a normal level of safety, suitable for zone 2
Equipment category 2D	Equipment ensuring a high level of safety, suitable for zone 21
Equipment category 3D	Equipment ensuring a normal level of safety, suitable for zone 22
Equipment category M2	Equipment ensuring a high level of safety must be able to be switched off when an explosive atmosphere occurs
D	Dust
G	Gases and vapours
Ex h	Nonelectrical explosion protection
IIC	Gases and vapours of class IIC (including IIA and IIB)
IIIC	Electrically conductive dusts of class IIIC (including IIIA and IIIB)
T6 … T4	Temperature class to be considered, depending on the ambient temperature
T80 °C … T110 °C	Maximum surface temperature to be considered, depending on the ambient temperature
-30 °C ≤ T_a ≤ +60 °C … +90 °C or -30 °C ≤ T_a ≤ +90 °C	Permissible ambient temperature from -30 °C to +60 °C resp. -30 °C to +90 °C
Gb, Db, Mb	Equipment protection level, high level of safety, analogous to the equipment category
Gc, Dc	Equipment protection level, normal level of safety, analogous to the equipment category
X	For a safe use of the couplings particular conditions apply

If the symbol Ex was punched in addition to marking U, the coupling component was supplied by KTR as an unbored or pilot bored version (see chapter 4.2 of the present operating/assembly instructions).

10 Enclosure A

Advice and instructions regarding the use in potentially explosive atmospheres

10.5 EU Certificate of conformity

EU Declaration of Conformity resp. Certificate of Conformity

corresponding to EU directive 2014/34/EU dated 26 February 2014
and to the legal regulations adopted for its implementation

The manufacturer - KTR Systems GmbH, Carl-Zeiss-Str. 25, D-48432 Rheine - states that the

flexible ROTEX® couplings

in an explosion-proof design described in these assembly instructions are equipment resp. components corresponding to article 2, 1. of directive 2014/34/EU and comply with the general safety and health specifications according to enclosure II of directive 2014/34/EU.
This declaration of conformity is issued under the sole responsibility of the manufacturers KTR Systems GmbH.

The coupling described in here complies with the specifications of the following standards/rules:

EN ISO 80079-36:2016-12
EN ISO 80079-37:2016-12
EN ISO/IEC 80079-38:2017-10
IEC/TS 60079-32-1:2020-01-24

The ROTEX® is in accordance with the specifications of directive 2014/34/EU.

According to article 13 (1) b) ii) of directive 2014/34/EU the technical documentation is deposited with the notified body (type examination certificate IBExU13ATEXB016 X):

IBExU
Institut für Sicherheitstechnik GmbH
Identification number: 0637
Fuchsmühlenweg 7

09599 Freiberg

Rheine,	2022-07-05	i. V.	i. V.
Place	Date	Reinhard Wibbeling Engineering/R&D	Michael Brüning Product Manager

10 Enclosure A

Advice and instructions regarding the use in potentially explosive atmospheres

10.6 UK Declaration of conformity

UK Declaration of Conformity resp. Certificate of Conformity

corresponding to UK directive SI 2016 No. 1107 dated 26 February 2014
and to the legal provisions adopted for its implementation

The manufacturer - KTR Systems GmbH, Carl-Zeiss-Str. 25, D-48432 Rheine - states that the

flexible ROTEX® couplings

in an explosion-proof design described in these assembly instructions are equipment resp. components corresponding to directive SI 2016 No. 1107 and comply with the general safety and health requirements according to directive SI 2016 No. 1107.
This declaration of conformity resp. certificate of conformity is issued under the sole responsibility of the manufacturer KTR Systems GmbH.

The coupling described in here complies with the specifications of the following standards/rules:

EN ISO 80079-36:2016-12
EN ISO 80079-37:2016-12
EN ISO/IEC 80079-38:2017-10
IEC/TS 60079-32-1:2020-01-24

The ROTEX® is in accordance with the specifications respectively the applicable specifications of directive SI 2016 No. 1107.

According to directive SI 2016 No. 1107 the technical documentation is deposited with the notified body:

Eurofins CML
Identification number: 2503

Rheine,	2022-07-05	i. V.	i. V.
Place	Date	Reinhard Wibbeling Engineering/R&D	Michael Brüning Product Manager