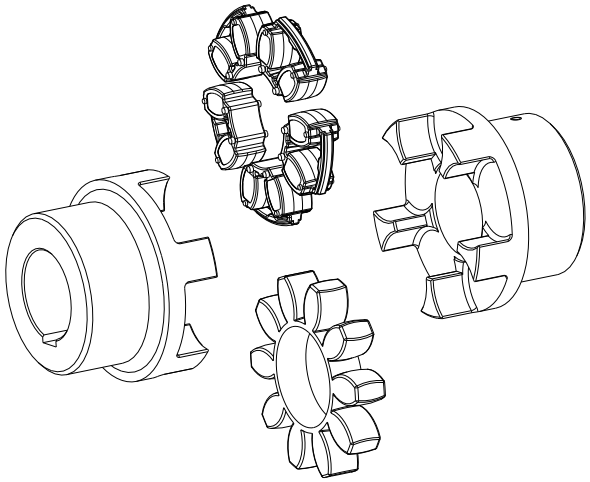
# ROTEX®

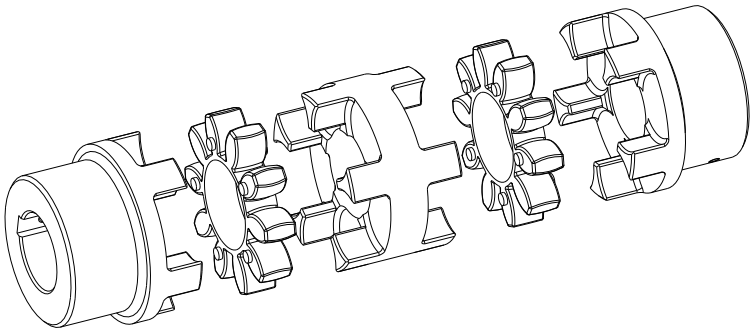
Torsionally flexible jaw couplings type

No. 001 - shaft coupling,
No. 018 - DKM,
with taper clamping sleeve
and their combinations

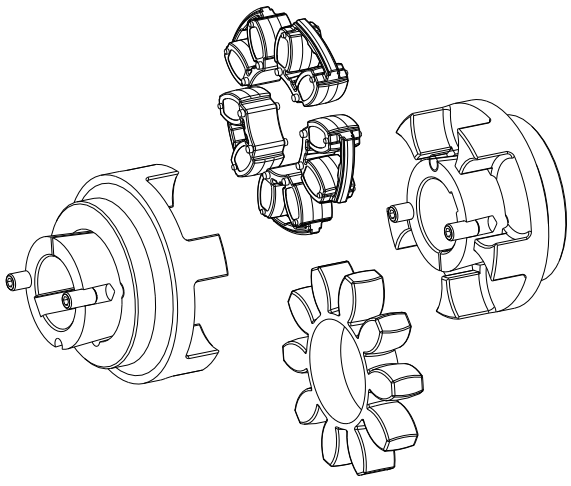
according to directive 2014/34/EU



**Type No. 001 - shaft coupling**



**Type No. 018 - DKM**
**double-cardanic coupling**



**Type with taper clamping sleeve**

**ROTEX®** is a torsionally flexible jaw coupling. It is able to compensate for shaft misalignment, for example caused by manufacturing inaccuracies, thermal expansion, etc.

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# 1 Technical data

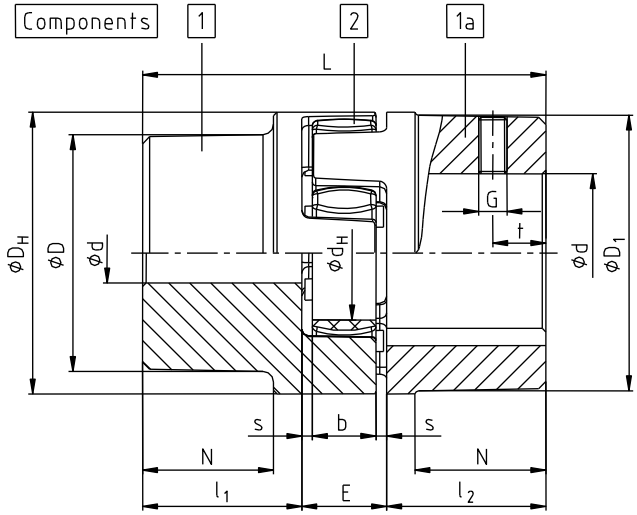



Illustration 1: ROTEX® (material: powder metal, Al-D and Al-H)

**Table 1: Material powder metal steel (Sint)**

| Size | Com-ponent | Spider [1] (component 2) Rated torque [Nm] | | | Dimensions [mm] [3] | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Finish bore [2] d (min-max) | General | | | | | | | | | | |
| | | 92 ShA | 98 ShA | 64 ShD | | L | $l_1$, $l_2$ | E | b | s | $D_H$ | $D_Z$ | $D_{Z1}$ [4] | $d_H$ | $D_1$ | N |
| 14 | 1a | 7.5 | 12.5 | - | 6 - 16 | 35 | 11 | 13 | 10 | 1.5 | 30 | - | - | 10 | - | - |
| 19 | 1a | 10 | 17 | - | 6 - 24 | 66 | 25 | 16 | 12 | 2.0 | 40 | - | - | 18 | - | - |
| 24 | 1a | 34 | 60 | - | 9 - 28 | 78 | 30 | 18 | 14 | 2.0 | 56 | - | - | 27 | - | - |

**Table 2: Material aluminium diecast (Al-D) - no approval for ATEX**

| Size | Com-ponent | Spider [1] (component 2) Rated torque [Nm] | | | Dimensions [mm] [3] | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Finish bore [2] d (min-max) | General | | | | | | | | | | |
| | | 92 ShA | 98 ShA | 64 ShD | | L | $l_1$, $l_2$ | E | b | s | $D_H$ | $D_Z$ | $D_{Z1}$ [4] | $d_H$ | D, $D_1$ | N |
| 19 | 1 | 10 | 17 | - | 6 - 19 | 66 | 25 | 16 | 12 | 2.0 | 41 | - | - | 18 | 32 | 20 |
| | 1a | | | | 19 - 24 | | | | | | | | | | 41 | |
| 24 | 1 | 35 | 60 | - | 9 - 24 | 78 | 30 | 18 | 14 | 2.0 | 56 | - | - | 27 | 40 | 24 |
| | 1a | | | | 22 - 28 | | | | | | | | | | 56 | |
| 28 | 1 | 95 | 160 | - | 10 - 28 | 90 | 35 | 20 | 15 | 2.5 | 67 | - | - | 30 | 48 | 28 |
| | 1a | | | | 28 - 38 | | | | | | | | | | 67 | |

**Table 3: Material aluminium (Al-H)**

| Size | Com-ponent | Spider [1] (component 2) Rated torque [Nm] | | | Dimensions [mm] [3] | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Finish bore [2] d (min-max) | General | | | | | | | | | | |
| | | 92 ShA | 98 ShA | 64 ShD | | L | $l_1$, $l_2$ | E | b | s | $D_H$ | $D_Z$ | $D_{Z1}$ [4] | $d_H$ | $D_1$ | N |
| 5 | 1a | 0.5 | 0.9 | - | 0 - 6 | 15 | 5 | 5 | 4 | 0.5 | 10 | - | - | - | - | - |
| 7 | 1a | 1.2 | 2.0 | 2.4 | 0 - 7 | 22 | 7 | 8 | 6 | 1.0 | 14 | - | - | - | - | - |
| 9 | 1a | 3.0 | 5.0 | 6.0 | 0 - 11 | 30 | 10 | 10 | 8 | 1.0 | 20 | - | - | 7.2 | - | - |
| 12 | 1a | 5.0 | 9.0 | 12 | 0 - 12 | 34 | 11 | 12 | 10 | 1.0 | 25 | - | - | 8.5 | - | - |
| 14 | 1a | 7.5 | 12.5 | 16 | 0 - 16 | 35 | 11 | 13 | 10 | 1.5 | 30 | - | - | 10.5 | - | - |
| 19 | 1a | 10 | 17 | 26 | 0 - 24 | 66 | 25 | 16 | 12 | 2.0 | 40 | - | - | 18 | - | - |
| 24 | 1a | 35 | 60 | 75 | 0 - 28 | 78 | 30 | 18 | 14 | 2.0 | 55 | - | - | 27 | - | - |
| 28 | 1a | 95 | 160 | 200 | 0 - 38 | 90 | 35 | 20 | 15 | 2.5 | 65 | - | - | 30 | - | - |
| 38 | 1a | 190 | 325 | 405 | 0 - 45 | 114 | 45 | 24 | 18 | 3.0 | 80 | - | - | 38 | - | - |
| 42 | 1a | 265 | 450 | 560 | 0 - 55 | 126 | 50 | 26 | 20 | 3.0 | 95 | - | - | 46 | - | - |
| 48 | 1a | 310 | 525 | 655 | 0 - 62 | 140 | 56 | 28 | 21 | 3.0 | 105 | - | - | 51 | - | - |

1) Maximum torque of the coupling $T_{Kmax.}$ = rated torque of the coupling $T_{K\ rated}$ x 2
2) Bores H7 with keyway to DIN 6885 sheet 1 [JS9] and setscrew
3) For dimensions G and t see table 8; there is a setscrew on the keyway (only with Al-D opposite the keyway)
4) $D_{Z1}$ = internal diameter of housing

# 1 Technical data

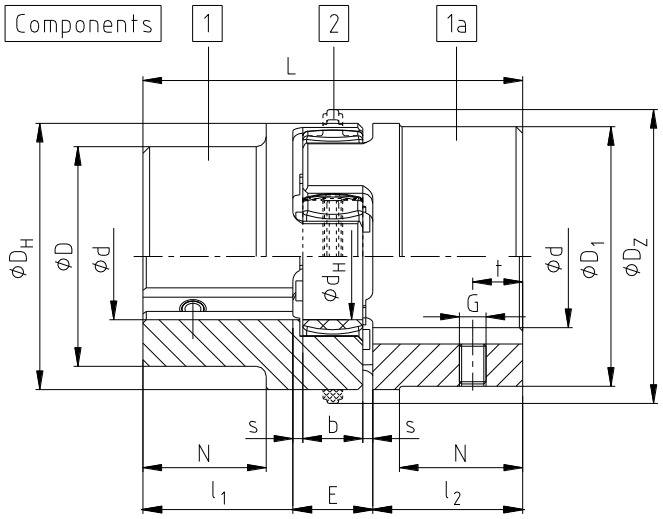



Illustration 2: ROTEX® (material: GJL/GJS)

**Table 4: Material cast iron (GJL)/nodular iron (GJS)**

| Size | Component | Spider [1] (component 2) Rated torque [Nm] | | | Finish bore [2] d (min-max) | Dimensions [mm] [3] General | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 92 ShA | 98 ShA | 64 ShD | | L | $l_1$, $l_2$ | E | b | s | $D_H$ | $D_Z$ | $D_{Z1}$ [4] | $d_H$ | D, $D_1$ | N |
| **Cast iron (GJL)** | | | | | | | | | | | | | | | | |
| 38 | 1 | 190 | 325 | 405 | 12 - 40 | 114 | 45 | 24 | 18 | 3.0 | 80 | - | - | 38 | 66 | 37 |
| | 1a | | | | 38 - 48 | | | | | | | | | | 78 | |
| | 1b | | | | 12 - 48 | 164 | 70 | | | | | | | | | 62 |
| 42 | 1 | 265 | 450 | 560 | 14 - 45 | 126 | 50 | 26 | 20 | 3.0 | 95 | - | - | 46 | 75 | 40 |
| | 1a | | | | 42 - 55 | | | | | | | | | | 94 | |
| | 1b | | | | 14 - 55 | 176 | 75 | | | | | | | | | 65 |
| 48 | 1 | 310 | 525 | 655 | 15 - 52 | 140 | 56 | 28 | 21 | 3.5 | 105 | - | - | 51 | 85 | 45 |
| | 1a | | | | 48 - 62 | | | | | | | | | | 104 | |
| | 1b | | | | 15 - 62 | 188 | 80 | | | | | | | | | 69 |
| 55 | 1 | 410 | 685 | 825 | 20 - 60 | 160 | 65 | 30 | 22 | 4.0 | 120 | - | - | 60 | 98 | 52 |
| | 1a | | | | 55 - 74 | | | | | | | | | | 118 | |
| 65 | 1 | 625 | 940 | 1175 | 22 - 70 | 185 | 75 | 35 | 26 | 4.5 | 135 | - | - | 68 | 115 | 61 |
| 75 | 1 | 1280 | 1920 | 2400 | 30 - 80 | 210 | 85 | 40 | 30 | 5.0 | 160 | - | - | 80 | 135 | 69 |
| 90 | 1 | 2400 | 3600 | 4500 | 40 - 97 | 245 | 100 | 45 | 34 | 5.5 | 200 | 218 | 230 | 100 | 160 | 81 |
| **Nodular iron (GJS)** | | | | | | | | | | | | | | | | |
| 100 | 1 | 3300 | 4950 | 6185 | 50 - 115 | 270 | 110 | 50 | 38 | 6.0 | 225 | 246 | 260 | 113 | 180 | 89 |
| 110 | 1 | 4800 | 7200 | 9000 | 60 - 125 | 295 | 120 | 55 | 42 | 6.5 | 255 | 276 | 290 | 127 | 200 | 96 |
| 125 | 1 | 6650 | 10000 | 12500 | 60 - 145 | 340 | 140 | 60 | 46 | 7.0 | 290 | 315 | 330 | 147 | 230 | 112 |
| 140 | 1 | 8550 | 12800 | 16000 | 60 - 160 | 375 | 155 | 65 | 50 | 7.5 | 320 | 345 | 360 | 165 | 255 | 124 |
| 160 | 1 | 12800 | 19200 | 24000 | 80 - 185 | 425 | 175 | 75 | 57 | 9.0 | 370 | 400 | 415 | 190 | 290 | 140 |
| 180 | 1 | 18650 | 28000 | 35000 | 85 - 200 | 475 | 185 | 85 | 64 | 10.5 | 420 | 450 | 465 | 220 | 325 | 156 |

1) Maximum torque of the coupling $T_{Kmax.}$ = rated torque of the coupling $T_{K\ rated}$ x 2
2) Bores H7 with keyway to DIN 6885 sheet 1 [JS9] and setscrew
3) For dimensions G and t see table 8; there is a setscrew on the keyway
4) $D_{Z1}$ = internal diameter of housing

# 1 Technical data

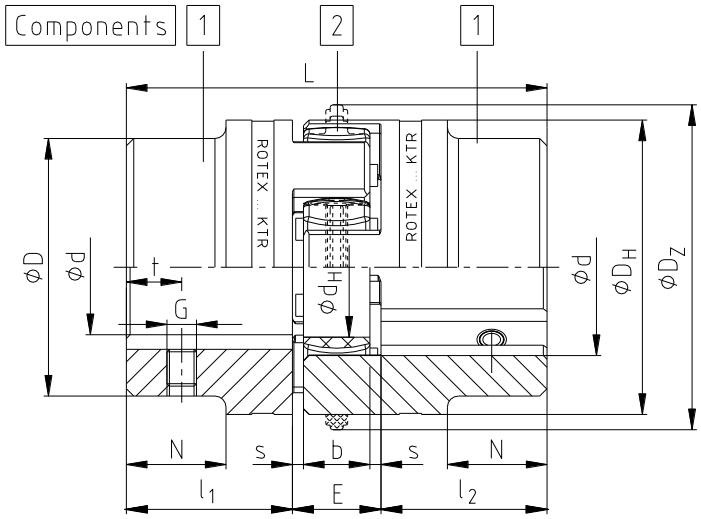



Illustration 3: ROTEX® (material: steel)

**Table 5: Material steel**

| Size | Component | Spider [1] (component 2) Rated torque [Nm] | | | Dimensions [mm] [3] | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Finish bore [2] | General | | | | | | | | | | |
| | | 92 ShA | 98 ShA | 64 ShD | d (min-max) | L | $l_1$, $l_2$ | E | b | s | $D_H$ | $D_Z$ | $D_{Z1}$ [4] | $d_H$ | D | N |
| 14 | 1a | 7.5 | 12.5 | 16 | 0 - 16 | 35 | 11 | 13 | 10 | 1.5 | 30 | - | - | 10 | 30 | - |
| | 1b | | | | | 50 | 18.5 | | | | | | | | | |
| 19 | 1a | 10 | 17 | 21 | 0 - 25 | 66 | 25 | 16 | 12 | 2.0 | 40 | - | - | 18 | 40 | - |
| | 1b | | | | | 90 | 37 | | | | | | | | | |
| 24 | 1a | 35 | 60 | 75 | 0 - 35 | 78 | 30 | 18 | 14 | 2.0 | 55 | - | - | 27 | 55 | - |
| | 1b | | | | | 118 | 50 | | | | | | | | | |
| 28 | 1a | 95 | 160 | 200 | 0 - 40 | 90 | 35 | 20 | 15 | 2.5 | 65 | - | - | 30 | 65 | - |
| | 1b | | | | | 140 | 60 | | | | | | | | | |
| 38 | 1 | 190 | 325 | 405 | 0 - 48 | 114 | 45 | 24 | 18 | 3.0 | 80 | - | - | 38 | 70 | 27 |
| | 1b | | | | | 164 | 70 | | | | | | | | 80 | - |
| 42 | 1 | 265 | 450 | 560 | 0 - 55 | 126 | 50 | 26 | 20 | 3.0 | 95 | - | - | 46 | 85 | 28 |
| | 1b | | | | | 176 | 75 | | | | | | | | 95 | - |
| 48 | 1 | 310 | 525 | 655 | 0 - 62 | 140 | 56 | 28 | 21 | 3.5 | 105 | - | - | 51 | 95 | 32 |
| | 1b | | | | | 188 | 80 | | | | | | | | 105 | - |
| 55 | 1 | 410 | 685 | 825 | 0 - 75 | 160 | 65 | 30 | 22 | 4.0 | 120 | - | - | 60 | 110 | 37 |
| | 1b | | | | | 210 | 90 | | | | | | | | 120 | - |
| 65 | 1 | 625 | 940 | 1175 | 0 - 80 | 185 | 75 | 35 | 26 | 4.5 | 135 | - | - | 68 | 115 | 47 |
| | 1b | | | | | 235 | 100 | | | | | | | | 135 | - |
| 75 | 1 | 1280 | 1920 | 2400 | 0 - 95 | 210 | 85 | 40 | 30 | 5.0 | 160 | - | - | 80 | 135 | 53 |
| | 1b | | | | | 260 | 110 | | | | | | | | 160 | - |
| 90 | 1 | 2400 | 3600 | 4500 | 0 - 110 | 245 | 100 | 45 | 34 | 5.5 | 200 | 218 | 230 | 100 | 160 | 62 |
| | 1b | | | | | 295 | 125 | | | | | | | | 200 | - |
| 100 | 1 | 3300 | 4950 | 6185 | 0 - 115 | 270 | 110 | 50 | 38 | 6.0 | 225 | 246 | 260 | 113 | 180 | 89 |
| 110 | 1 | 4800 | 7200 | 9000 | 0 - 125 | 295 | 120 | 55 | 42 | 6.5 | 255 | 276 | 290 | 127 | 200 | 96 |
| 125 | 1 | 6650 | 10000 | 12500 | 60 - 145 | 340 | 140 | 60 | 46 | 7.0 | 290 | 315 | 330 | 147 | 230 | 112 |
| 140 | 1 | 8550 | 12800 | 16000 | 60 - 160 | 375 | 155 | 65 | 50 | 7.5 | 320 | 345 | 360 | 165 | 255 | 124 |
| 160 | 1 | 12800 | 19200 | 24000 | 80 - 185 | 425 | 175 | 75 | 57 | 9.0 | 370 | 400 | 415 | 190 | 290 | 140 |
| 180 | 1 | 18650 | 28000 | 35000 | 85 - 200 | 475 | 195 | 85 | 64 | 10.5 | 420 | 450 | 465 | 220 | 325 | 156 |

1) Maximum torque of the coupling $T_{Kmax.}$ = rated torque of the coupling $T_{K\ rated}$ x 2
2) Bores H7 with keyway to DIN 6885 sheet 1 [JS9] and setscrew
3) For dimensions G and t see table 8; there is a setscrew on the keyway
4) $D_{Z1}$ = internal diameter of housing

# 1 Technical data

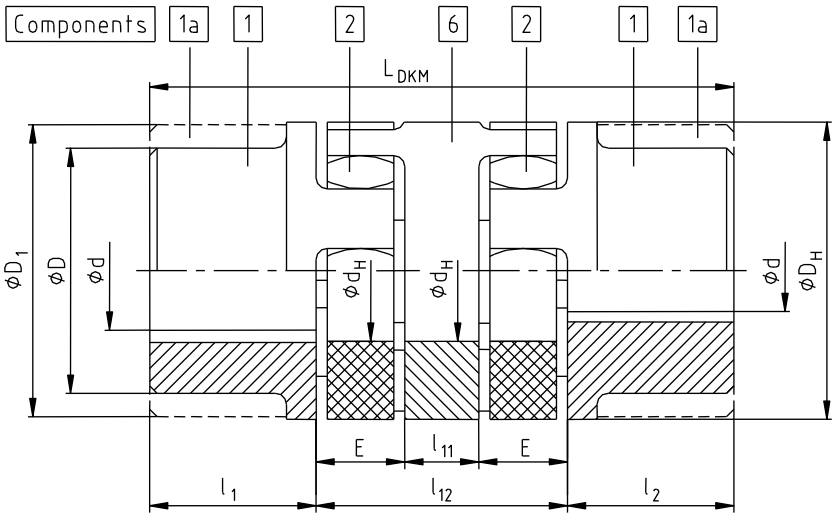



Illustration 4: ROTEX® type DKM

**Table 6: Type DKM [5)]**

| Size | Spider [1)] (component 2) Rated torque [Nm] | | Dimensions [mm] [3)] | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Dimensions d, D, $D_1$ | General | | | | | | | | |
| | 92 ShA | 98 ShA | | $L_{DKM}$ | $l_1$, $l_2$ | E | b | s | $D_H$ | $d_H$ | l11 | l12 |
| 19 | 10 | 17 | see table 1 to 5 | 92 | 25 | 16 | 12 | 2.0 | 40 | 18 | 10 | 42 |
| 24 | 35 | 60 | | 112 | 30 | 18 | 14 | 2.0 | 55 | 27 | 16 | 52 |
| 28 | 95 | 160 | | 128 | 35 | 20 | 15 | 2.5 | 65 | 30 | 18 | 58 |
| 38 | 190 | 325 | | 158 | 45 | 24 | 18 | 3.0 | 80 | 38 | 20 | 68 |
| 42 | 265 | 450 | | 174 | 50 | 26 | 20 | 3.0 | 95 | 46 | 22 | 74 |
| 48 | 310 | 525 | | 192 | 56 | 28 | 21 | 3.5 | 105 | 51 | 24 | 80 |
| 55 | 410 | 685 | | 218 | 65 | 30 | 22 | 4.0 | 120 | 60 | 28 | 88 |
| 65 | 625 | 940 | | 252 | 75 | 35 | 26 | 4.5 | 135 | 68 | 32 | 102 |
| 75 | 1280 | 1920 | | 286 | 85 | 40 | 30 | 5.0 | 160 | 80 | 36 | 116 |
| 90 | 2400 | 3600 | | 330 | 100 | 45 | 34 | 5.5 | 200 | 100 | 40 | 130 |

1) Maximum torque of the coupling $T_{Kmax.}$ = rated torque of the coupling $T_{K\ rated}$ x 2
2) Bores H7 with keyway to DIN 6885 sheet 1 [JS9] and setscrew
3) For dimensions G and t see table 8; there is a setscrew on the keyway (only with Al-D opposite the keyway)

# 1 Technical data

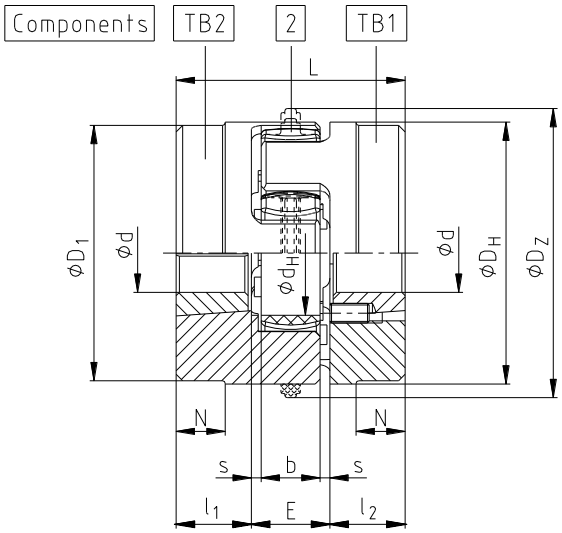



Illustration 5: ROTEX® type with taper clamping sleeve

**Coupling design:**

TB1 Screwing on cam side
TB2 Screwing on collar side

Different combinations of types TB1 and TB2 are possible.

**Table 7: Type with taper clamping sleeve**

| Size | Com-ponent | Spider [1] (component 2) Rated torque [Nm] | | Dimensions [mm] | | | | | | | | | | | | Taper clamping sleeve |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Finish bore | General | | | | | | | | | | | |
| | | 92 ShA | 98 ShA | d (min-max) | L | $l_1$, $l_2$ | E | b | s | $D_H$ | $D_Z$ | $D_{Z1}$ [2] | $d_H$ | $D_1$ | N | |
| 24 | 1a | 35 | 60 | 10 - 25 | 64 | 23 | 18 | 14 | 2.0 | 55 | - | - | 27 | - | - | 1008 |
| 28 | 1a | 95 | 160 | 10 - 25 | 66 | 23 | 20 | 15 | 2.5 | 65 | - | - | 30 | - | - | 1108 |
| 38 | 1a | 190 | 325 | 10 - 25 | 70 | 23 | 24 | 18 | 3.0 | 80 | - | - | 38 | 78 | 15 | 1108 |
| 42 | 1a | 265 | 450 | 14 - 25 | 78 | 26 | 26 | 20 | 3.0 | 95 | - | - | 46 | 94 | 16 | 1610 |
| 48 | 1a | 310 | 525 | 14 - 40 | 106 | 39 | 28 | 21 | 3.5 | 105 | - | - | 51 | 104 | 28 | 1615 |
| 55 | 1a | 410 | 685 | 14 - 50 | 96 | 33 | 30 | 22 | 4.0 | 120 | - | - | 60 | 118 | 20 | 2012 |
| 65 | 1 | 625 | 940 | 14 - 50 | 101 | 33 | 35 | 26 | 4.5 | 135 | - | - | 68 | 115 | 5 | 2012 |
| 75 | 1 | 1280 | 1920 | 16 - 60 | 144 | 52 | 40 | 30 | 5.0 | 160 | - | - | 80 | 158 | 36 | 2517 |
| | | | | 25 - 75 | | | | | | | | | | | | 3020 [3] |
| 90 | 1 | 2400 | 3600 | 25 - 75 | 149 | 52 | 45 | 34 | 5.5 | 200 | 218 | 230 | 100 | 160 | 14 | 3020 |
| 100 | 1 | 3300 | 4950 | 35 - 90 | 230 | 90 | 50 | 38 | 6.0 | 225 | 246 | 260 | 113 | 180 | 69 | 3535 |
| 125 | 1 | 6650 | 10000 | 55 - 110 | 288 | 114 | 60 | 46 | 7.0 | 290 | 315 | 330 | 147 | 230 | 86 | 4545 |

1) Maximum torque of the coupling $T_{Kmax.}$ = rated torque of the coupling $T_{K\ rated}$ x 2
2) $D_{Z1}$ = internal diameter of housing
3) Available for type TB2 only

**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.**

# 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 Advice

## 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. 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 operating 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.

## 2.4 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®** described in here corresponds to the technical status at the time of printing of these operating/assembly instructions.

# 2 Advice

## 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 imperatively be reviewed.**
**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.

## 2.6 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 at 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.**
**Please 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 coupling

### Components of ROTEX®, shaft coupling type No. 001

| Component | Number | Description |
|---|---|---|
| 1 | 2 | Hub |
| 2 | 1 | Spider [1] |
| 3 | 5 [2] | DZ elements [1] |
| 4 | 2 | Setscrews DIN EN ISO 4029 |

1) Optionally spider or DZ elements
2) With size 180 the number is 6.

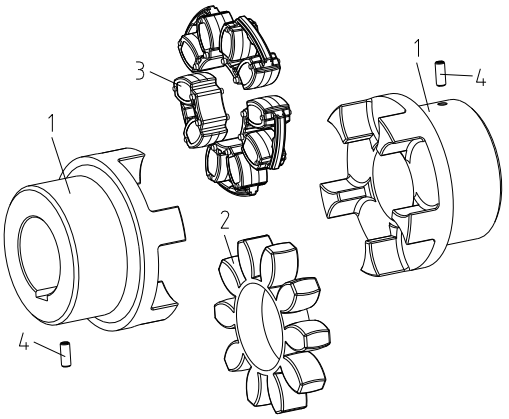



Illustration 6: ROTEX®

### Components of ROTEX® type DKM [1]

| Component | Number | Description |
|---|---|---|
| 1 | 2 | Hub |
| 2 | 2 | Spider |
| 3 | 1 | DKM spacer |
| 4 | 2 | Setscrews DIN EN ISO 4029 |

1) Type DKM not available with DZ elements.

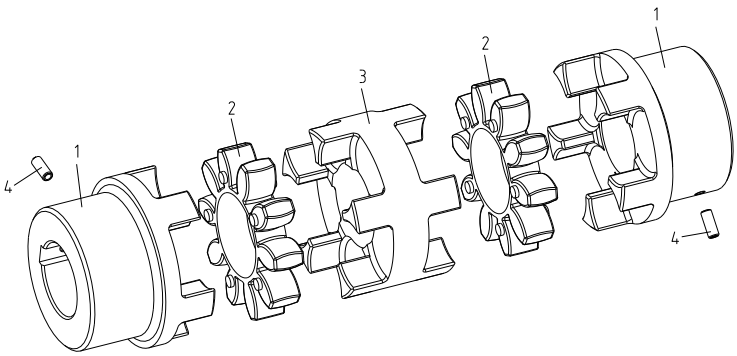



Illustration 7: ROTEX® type DKM

### Components of ROTEX® type with taper clamping sleeve

| Component | Number | Description |
|---|---|---|
| TB1/TB2 | 2 | Hub for taper clamping sleeve |
| 1 | 2 | Taper clamping sleeve |
| 2 | 1 | Spider [1] |
| 3 | 5 [2] | DZ elements [1] |
| 4 | 4 | Setscrews DIN EN ISO 4029 |

1) Optionally spider or DZ elements
2) With size 180 the number is 6.

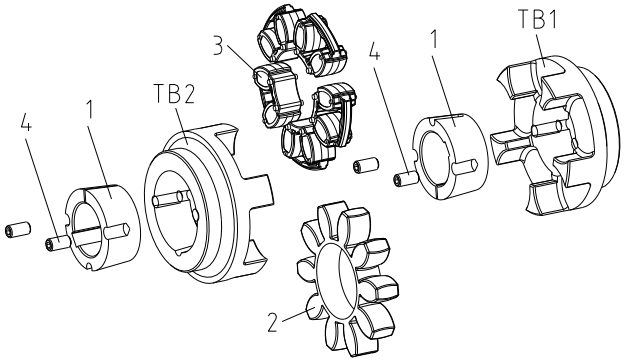



Illustration 8: ROTEX® type with taper clamping sleeve

# 4 Assembly

## 4.1 Components of the coupling

### Features of standard spiders

| Spider hardness (Shore) | 92 Shore A | | 98 Shore A | | 64 Shore D | |
|---|---|---|---|---|---|---|
| | T-PUR® (orange) | PUR (yellow) | T-PUR® (purple) | PUR (red) | T-PUR® (light green) | PUR (natural white 1)) |
| Marking (colour) |  |  |  |  |  |  |

1) Natural white with green marking of teeth

## 4.2 Advice for finish bore

**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 or axial runout, respectively (see illustration 9).
- Make absolutely sure to observe the figures for Ø $d_{max}$.
- Carefully align the hubs when the finish bores are drilled.
- Provide for a setscrew according to DIN EN ISO 4029 with a cup point or an end plate to fasten the hubs axially.

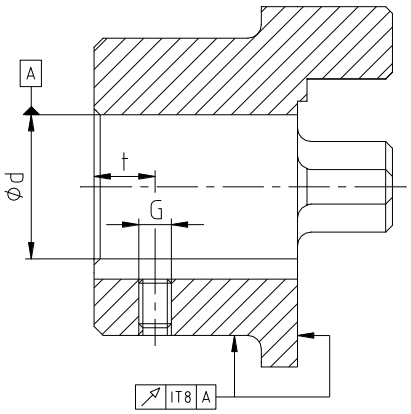



Illustration 9: Concentricity and axial run-out

**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 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 remachining performed properly.

### Table 8: Setscrew DIN EN ISO 4029

| Size | 14 | 19 | 24 | 28 | 38 | 42 | 48 | 55 | 65 | 75 | 90 | 100 | 110 | 125 | 140 | 160 | 180 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dimension G | M4 | M5 | M5 | M8 | M8 | M8 | M8 | M10 | M10 | M10 | M12 | M12 | M16 | M16 | M20 | M20 | M20 |
| Dimension t | 5 | 10 | 10 | 15 | 15 | 20 | 20 | 20 | 20 | 25 | 30 | 30 | 35 | 40 | 45 | 50 | 50 |
| Tightening torque $T_A$ [Nm] | 1.5 | 2 | 2 | 10 | 10 | 10 | 10 | 17 | 17 | 17 | 40 | 40 | 80 | 80 | 140 | 140 | 140 |

# 4 Assembly

## 4.2 Advice for finish bore

**Table 9: Recommended fit pairs acc. to DIN 748-1**

| Bore [mm] | | Shaft tolerance | Bore tolerance |
|---|---|---|---|
| above | up to | | |
| | 50 | k6 | H7<br>(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 complicated operating conditions (frequently alternating torsional direction, shock loads, etc.). The keyway should preferably be located between the cams. With axial fastening via setscrew the tapped hole should be positioned on the keyway except for Al-D which should be positioned opposite 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 hubs

**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 shaft.**

**Please 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 (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).**

- Mount the hubs on the shaft of driving and driven side (see illustration 10).
- Insert the spider or DZ elements into the cam section of the hub on the driving or driven side.
- Shift the power packs in axial direction until the distance dimension E is achieved (see illustration 11).
- 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 torques see table 8).

**If the shaft diameters with inserted feather key are smaller than dimension $d_H$ (see table 1 to 7) of the spider, one or two shaft ends may protude into the spider.**

# 4 Assembly

## 4.3 Assembly of the hubs

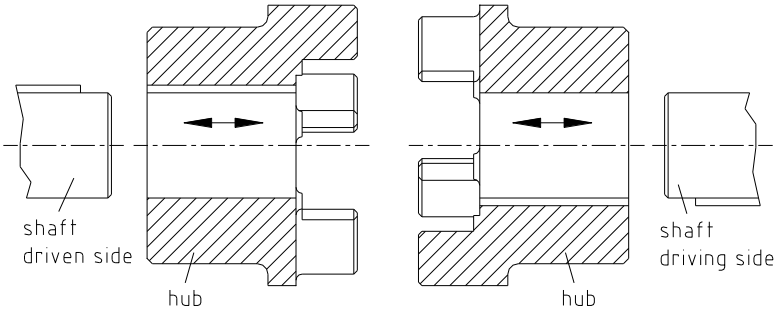



Illustration 10: Assembly of the hubs

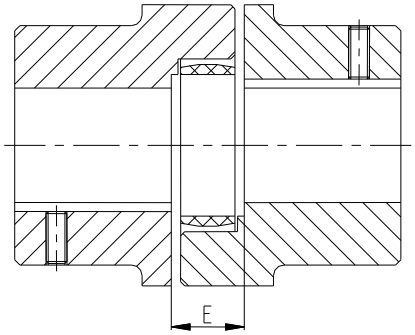



Illustration 11: Assembly of coupling

## 4.4 Assembly of taper clamping sleeve

**Assembly of taper clamping sleeve:**

Clean the contact surfaces of the taper clamping sleeves and of shaft and hub and afterwards apply thin fluid oil lightly (e. g. Ballistol Universal oil or Klüber Quietsch-Ex).
The taper clamping sleeves have got axially parallel, cylindrical and smooth tapped blind holes. Only half of these holes are located in the material of the sleeve. The other half located in the hub has got threads.
Fit the coupling element and the taper clamping sleeve into each other, make sure that the bores cover each other and tighten the setscrews lightly. Fit the coupling element along with the taper clamping sleeve on the shaft and tighten the setscrews at the tightening torque specified in table 10.
During the screwing operation the hub is mounted onto the taper sleeve and thus the sleeve is pressed onto the shaft. By light blows of the hammer the taper clamping sleeve must be pushed further into the taper bore by means of a suitable sleeve. Afterwards re-tighten the setscrews at the tightening torque specified in table 10. This process must be performed at least once.
After operation under load of the drive for a short while please inspect if the setscrews have unscrewed.
Axial fixing of the Taper Lock hub (coupling hub with taper clamping sleeve) is obtained by proper assembly only.

**If used in potentially explosive atmospheres the setscrews to fasten the taper clamping sleeves have to be secured against working loose additionally, e. g. conglutinating with Loctite (average strength).**
**Taper clamping sleeves used without a feather key are not permitted in potentially explosive atmospheres and are thus not provided with a respective explosion protection marking.**

**Oils and greases with molybdenum disulphide or high-pressure additives, additives of Teflon and silicone as well as internal lubricants reducing the coefficient of friction significantly must not be used.**

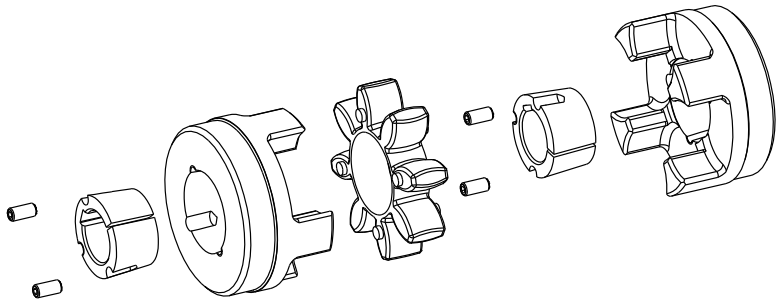


Illustration 12: ROTEX® type with taper clamping sleeve

# 4 Assembly

## 4.4 Assembly of taper clamping sleeve

**Disassembly of taper clamping sleeve:**

The taper clamping sleeve is released by removing the setscrews. Afterwards one of the setscrews used as forcing screw is screwed in the thread of the sleeve and tightened.
The coupling hub untightened that way can be manually removed from the shaft with the taper clamping sleeve.

**Table 10:**

| Taper clamping sleeve | Screw dimensions | | | | Number |
|---|---|---|---|---|---|
| | G [inch] | L [inch] | SW [mm] | $T_A$ [Nm] | |
| 1008 | 1/4 | 1/2 | 3 | 5.7 | 2 |
| 1108 | 1/4 | 1/2 | 3 | 5.7 | 2 |
| 1610 | 3/8 | 5/8 | 5 | 20 | 2 |
| 1615 | 3/8 | 5/8 | 5 | 20 | 2 |
| 2012 | 7/16 | 7/8 | 6 | 31 | 2 |
| 2517 | 1/2 | 7/8 | 6 | 49 | 2 |
| 3020 | 5/8 | 1 1/4 | 8 | 92 | 2 |
| 3535 | 1/2 | 1 1/2 | 10 | 115 | 3 |
| 4545 | 3/4 | 1 3/4 | 12 | 170 | 3 |

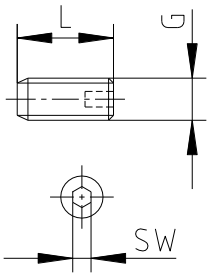



Illustration 13: Withworth setscrew (BSW)

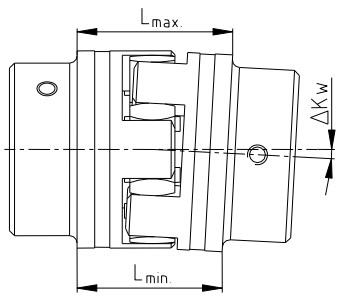
## 4.5 Displacements - alignment of the couplings

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

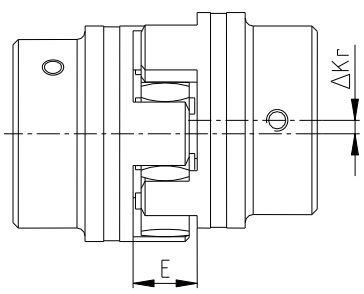
**In order to ensure a long service life of the coupling and avoid risks with the use in potentially explosive atmospheres, the shaft ends must be accurately aligned.**
**Please absolutely observe the displacement figures indicated (see table 11 to 13). If the figures are exceeded, the coupling will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

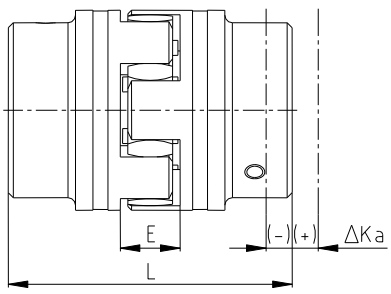
- The displacement figures specified in table 11 to 13 are maximum figures which must not arise in parallel. If radial and angular displacements arise at the same time, the permissible displacement values may only be used proportionally (see illustration 15).
- Please inspect with a dial gauge, ruler or feeler whether the permissible displacement figures of tables 11 to 13 can be observed.




Angular displacements




Radial displacements




Axial displacements

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

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

Illustration 14: Displacements

# 4 Assembly

## 4.5 Displacements - alignment of the couplings

Examples of the displacement combinations specified in illustration 15:

Example 1:
$\Delta K_r$ = 30 %
$\Delta K_w$ = 70 %

Example 2:
$\Delta K_r$ = 60 %
$\Delta K_w$ = 40 %

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

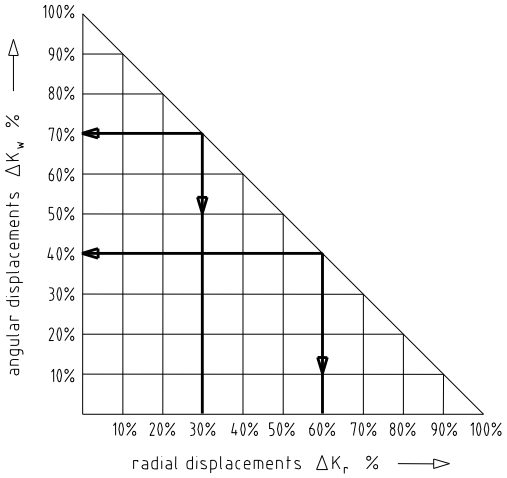



Illustration 15: Combinations of displacement

**Table 11: Displacement figures for 92 and 98 Shore A**

| Size | | 14 | 19 | 24 | 28 | 38 | 42 | 48 | 55 | 65 | 75 | 90 | 100 | 110 | 125 | 140 | 160 | 180 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max. axial displacement $\Delta K_a$ [mm] | | -0.5 | -0.5 | -0.5 | -0.7 | -0.7 | -1.0 | -1.0 | -1.0 | -1.0 | -1.5 | -1.5 | -1.5 | -2.0 | -2.0 | -2.0 | -2.5 | -3.0 |
| | | +1.0 | +1.2 | +1.4 | +1.5 | +1.8 | +2.0 | +2.1 | +2.2 | +2.6 | +3.0 | +3.4 | +3.8 | +4.2 | +4.6 | +5.0 | +5.7 | +6.4 |
| Max. radial displacement $\Delta K_r$ [mm] with | 1500 rpm | 0.17 | 0.20 | 0.22 | 0.25 | 0.28 | 0.32 | 0.36 | 0.38 | 0.42 | 0.48 | 0.50 | 0.52 | 0.55 | 0.60 | 0.62 | 0.64 | 0.68 |
| | 3000 rpm | 0.11 | 0.13 | 0.15 | 0.17 | 0.19 | 0.21 | 0.25 | 0.26 | 0.28 | 0.32 | 0.34 | 0.36 | 0.38 | - | - | - | - |
| $\Delta K_w$ [degree] max. angular displacement with n=1500 rpm | | 1.2 | 1.2 | 0.9 | 0.9 | 1.0 | 1.0 | 1.1 | 1.1 | 1.2 | 1.2 | 1.2 | 1.2 | 1.3 | 1.3 | 1.2 | 1.2 | 1.2 |
| $\Delta K_w$ [mm] | | 0.67 | 0.82 | 0.85 | 1.05 | 1.35 | 1.70 | 2.00 | 2.30 | 2.70 | 3.30 | 4.30 | 4.80 | 5.60 | 6.50 | 6.60 | 7.60 | 9.00 |
| $\Delta K_w$ [degree] max. angular displacement with n=3000 rpm | | 1.1 | 1.1 | 0.8 | 0.8 | 0.9 | 0.9 | 1.0 | 1.0 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | - | - | - | - |
| $\Delta K_w$ [mm] | | 0.60 | 0.70 | 0.75 | 0.85 | 1.10 | 1.40 | 1.60 | 2.00 | 2.30 | 2.90 | 3.80 | 4.20 | 5.00 | - | - | - | - |

**Table 12: Displacement figures for 64 Shore D**

| Size | | 14 | 19 | 24 | 28 | 38 | 42 | 48 | 55 | 65 | 75 | 90 | 100 | 110 | 125 | 140 | 160 | 180 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max. axial displacement $\Delta K_a$ [mm] | | -0.5 | -0.5 | -0.5 | -0.7 | -0.7 | -1.0 | -1.0 | -1.0 | -1.0 | -1.5 | -1.5 | -1.5 | -2.0 | -2.0 | -2.0 | -2.5 | -3.0 |
| | | +1.0 | +1.2 | +1.4 | +1.5 | +1.8 | +2.0 | +2.1 | +2.2 | +2.6 | +3.0 | +3.4 | +3.8 | +4.2 | +4.6 | +5.0 | +5.7 | +6.4 |
| Max. radial displacement $\Delta K_r$ [mm] with | 1500 rpm | 0.11 | 0.13 | 0.15 | 0.18 | 0.21 | 0.23 | 0.25 | 0.27 | 0.30 | 0.34 | 0.36 | 0.37 | 0.40 | 0.43 | 0.45 | 0.46 | 0.49 |
| | 3000 rpm | 0.08 | 0.09 | 0.10 | 0.13 | 0.15 | 0.16 | 0.18 | 0.19 | 0.21 | 0.24 | 0.25 | 0.26 | 0.28 | - | - | - | - |
| $\Delta K_w$ [degree] max. angular displacement with n=1500 rpm | | 1.1 | 1.1 | 0.8 | 0.8 | 0.9 | 0.9 | 1.0 | 1.0 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 |
| $\Delta K_w$ [mm] | | 0.57 | 0.77 | 0.77 | 0.90 | 1.25 | 1.40 | 1.80 | 2.00 | 2.50 | 3.00 | 3.80 | 4.30 | 5.30 | 6.00 | 6.10 | 7.10 | 8.00 |
| $\Delta K_w$ [degree] max. angular displacement with n=3000 rpm | | 1.0 | 1.0 | 0.7 | 0.7 | 0.8 | 0.8 | 0.9 | 0.9 | 1.0 | 1.0 | 1.0 | 1.0 | 1.1 | - | - | - | - |
| $\Delta K_w$ [mm] | | 0.52 | 0.70 | 0.67 | 0.80 | 1.00 | 1.30 | 1.60 | 1.80 | 2.20 | 2.70 | 3.50 | 4.00 | 4.90 | - | - | - | - |

**Table 13: Displacement figures for type DKM only**

| Size | | 19 | 24 | 28 | 38 | 42 | 48 | 55 | 65 | 75 | 90 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Max. axial displacement $\Delta K_a$ [mm] | | +1.2 | +1.4 | +1.5 | +1.8 | +2.0 | +2.1 | +2.2 | +2.6 | +3.0 | +3.4 |
| | | -1.0 | -1.0 | -1.4 | -1.4 | -2.0 | -2.0 | -2.0 | -2.0 | -3.0 | -3.0 |
| Max. radial displacement $\Delta K_r$ [mm] with n = | 1500 rpm | 0.45 | 0.59 | 0.66 | 0.77 | 0.84 | 0.91 | 1.01 | 1.17 | 1.33 | 1.48 |
| | 3000 rpm | 0.40 | 0.53 | 0.60 | 0.70 | 0.75 | 0.82 | 0.81 | 1.05 | 1.19 | 1.33 |
| $\Delta K_w$ [degree] max. angular displacement with n = | 1500 rpm | 1.0 | 1.0 | 1.0 | 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 | 0.9 | 0.9 | 0.9 |

## 5 Start-up

Before start-up of the coupling, inspect the tightening of 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.

**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 directive 2014/34/EU and must protect against

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

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, made of 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.**

**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. Paintings and coatings exceeding a thickness of 200 µm are generally impermissible for potentially explosive atmospheres. 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. In addition, make sure that the marking of the coupling remains legible. Painting or coating of the spider is generally not admitted.**

## 6 Breakdowns, causes and elimination

The below-mentioned failures can lead to a use of the **ROTEX®** coupling other than intended. 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.

**If used other than intended the coupling can become a source of ignition.**
**EU directive 2014/34/EU requires special care by the manufacturer and the user.**

**General failures with use other than intended:**

- 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/DZ elements are inserted in the coupling.
- No original **KTR** components (purchased parts) are used.
- Old/ spiders/DZ elements already worn off or spiders/DZ elements stored for too long are used.
- Maintenance intervals are not observed.

| 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<br>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 installation dimension E of the coupling)<br>3) For inspection of wear see chapter 10.2 |
| | Wear of spider, short-term torque transmission due to metal contact | Ignition risk due to sparking | 1) Set the unit out of operation<br>2) Disassemble the coupling and remove residues of the spider<br>3) Inspect coupling components and replace coupling components that have been damaged<br>4) Insert spider, assemble coupling components<br>5) Inspect alignment, adjust if necessary |
| | Screws for axial fastening of hubs working loose | Ignition risk due to hot surfaces and sparking | 1) Set the unit out of operation<br>2) Inspect alignment of coupling<br>3) Tighten the screws to fasten the hubs and secure against working loose<br>4) For inspection of wear see chapter 10.2 |
| Breaking of cams | Wear of spider, torque transmission due to metal contact | Ignition risk due to sparking | 1) Set the unit out of operation<br>2) Replace complete coupling<br>3) Inspect alignment |
| | Breaking of the cams due to high impact energy/overload | | 1) Set the unit out of operation<br>2) Replace complete coupling<br>3) Inspect alignment<br>4) Find out the reason for overload |

## 6 Breakdowns, causes and elimination

| Breakdowns | Causes | Hazard notes for potentially explosive atmospheres | Elimination |
|---|---|---|---|
| Breaking of cams | Operating parameters do not meet with the performance of the coupling | Ignition risk due to sparking | 1) Set the unit out of operation<br>2) Review the operating parameters and select a bigger coupling (consider mounting space)<br>3) Assemble new coupling size<br>4) Inspect alignment |
| | Operating error of the unit | | 1) Set the unit out of operation<br>2) Replace complete coupling<br>3) Inspect alignment<br>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<br>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 installation dimension E of the coupling)<br>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 | Ignition risk due to sparking with metallic contact of the cams | 1) Set the unit out of operation<br>2) Disassemble the coupling and remove residues of the spider<br>3) Inspect coupling components and replace coupling components that have been damaged<br>4) Insert spider, assemble coupling components<br>5) Inspect alignment, adjust if necessary<br>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<br>2) Disassemble the coupling and remove residues of the spider<br>3) Inspect coupling components and replace coupling components that have been damaged<br>4) Insert spider, assemble coupling components<br>5) Inspect alignment, adjust if necessary<br>6) Inspect and adjust ambient/contact temperature (correct by using other spider materials, if necessary) |
| Early wear of spider (liquefaction of material inside the spider cam) | Vibrations of drive | | 1) Set the unit out of operation<br>2) Disassemble the coupling and remove residues of the spider<br>3) Inspect coupling components and replace coupling components that have been damaged<br>4) Insert spider, assemble coupling components<br>5) Inspect alignment, adjust if necessary<br>6) Find out the reason for the vibrations (correct by spider with lower or higher Shore hardness, if necessary) |

**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 and 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 visually inspected.

**Having started up the coupling the tightening torques of the screws have to be inspected during the usual inspection intervals.**

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

## 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
- 1.3 Hub with spline
- 1.4 Hub with feather keyway, without setscrew
- 2.1 Clamping hub single slot with feather keyway
- 2.3 Clamping hub single slot with spline
- 2.6 Clamping hub double slot with feather keyway
- 4.0 Hub with CLAMPEX® clamping set KTR 150
- 4.1 Hub with CLAMPEX® clamping set KTR 200
- 4.2 Hub with CLAMPEX® clamping set KTR 250
- 4.3 Hub with CLAMPEX® clamping set KTR 400
- 4.4 Hub with CLAMPEX® clamping set KTR 401
- 6.0 Clamping ring hub
- 6.5 Clamping ring hub (hub type as 6.0, but external clamping screws only)
- 7.6 Half shell hub (DH) with feather keyway
- 7.9 Half shell hub (H) with feather keyway
- Type standard, AFN, BFN, CF, CFN, DF, DFN, DKM, ZS-DKM, ZS-DKM-H, SP and TB with hubs corresponding to the specifications above

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

- 2.0 Clamping hub single slot without feather keyway
- 2.5 Clamping hub double slot without feather keyway
- 2.8 Clamping hub with axial slot without feather keyway
- 7.5 Half shell hub (DH) without feather keyway
- 7.8 Half shell hub (H) without feather keyway
- Type standard, AFN, BFN, CF, CFN, DKM, ZS-DKM, ZS-DKM-H and SP with hubs corresponding to the specifications above

ROTEX® DKM and ROTEX® ZS-DKM only with spacer made of steel or aluminium semi-finished products with a yield point of $R_{p0.2} \geq 250$ N/mm².

**Hubs, clamping hubs or similar types without feather keyways may be used in category 3 only and are marked with category 3 accordingly.**
**The hubs types 1.1 and 1.2 are not approved for potentially explosive atmospheres!**

# 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**

**ROTEX®** couplings are suitable for the use according to EU directive 2014/34/EU.

**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 group IIA and IIB are included in IIC)* and explosion group IIIC (*dusts*) *(explosion group 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<br>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<br>2G<br>2D<br>No gases and vapours of explosion group IIC | An inspection of the torsional backlash and a visual inspection of the flexible spider/DZ elements must be performed after 3,000 operating hours for the first time, at the latest after 6 months after start-up of the coupling.<br>If you note insignificant or no wear on the spider/DZ elements 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.<br>If you note significant wear during the initial inspection so that it would be recommendable to replace the spider/DZ elements, find out the cause according to the table „Breakdowns“, if possible.<br>The maintenance intervals must be adjusted to the modified operating parameters without fail. |
| M2<br>2G<br>2D<br>Gases and vapours of explosion group IIC | An inspection of the torsional backlash and a visual inspection of the flexible spider/DZ elements must be performed after 2,000 operating hours for the first time, at the latest after 3 months after start-up of the coupling.<br>If you note insignificant or no wear on the spider/DZ elements 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.<br>If you note significant wear during the initial inspection so that it would be recommendable to replace the spider/DZ elements, find out the cause according to the table „Breakdowns“, if possible.<br>The maintenance intervals must be adjusted to the modified operating parameters without fail. |

**Hubs, clamping hubs or similar types 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® coupling**

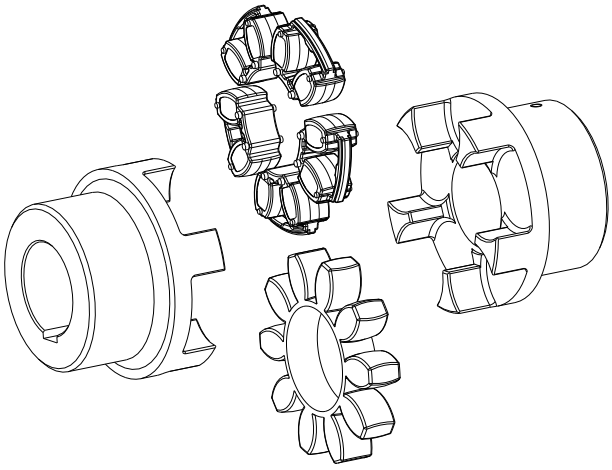


Illustration 16: ROTEX® coupling

Illustration 17.1: ROTEX® DZ elements

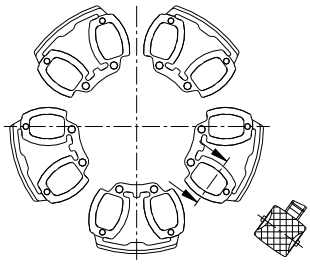
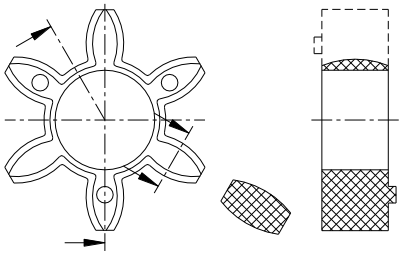


Illustration 17.2: ROTEX® spider



Here the backlash between the cams of the coupling and the flexible spider/DZ element must be inspected by means of a feeler gauge.
When reaching the wear limit ***maximum wear***, the spider/DZ element 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/DZ elements must be replaced.**

The general condition of the coupling can both be monitored 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. Should any distinctive features arise, testing must be performed with the machine at standstill.

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 risks with the use in potentially explosive atmospheres, the shaft ends must be accurately aligned. Please absolutely observe the displacement figures indicated (see table 11 to 13). If the figures are exceeded, the coupling will be damaged.**

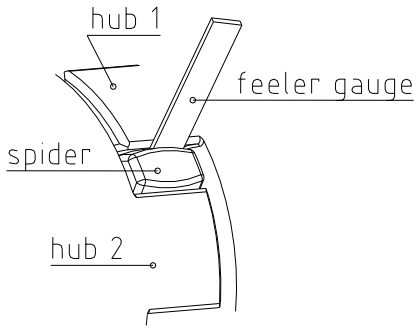



Illustration 18: Inspection of the limit of wear

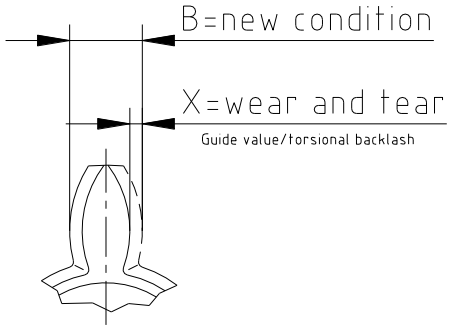



Illustration 19: Wear of spider

**Table 14:**

| Size | Limits of wear (friction) $X_{max.}$ [mm] | Size | Limits of wear (friction) $X_{max.}$ [mm] |
|---|---|---|---|
| 9 | 2 | 65 | 5 |
| 14 | 2 | 75 | 6 |
| 19 | 3 | 90 | 8 |
| 24 | 3 | 100 | 9 |
| 28 | 3 | 110 | 9 |
| 38 | 3 | 125 | 10 |
| 42 | 4 | 140 | 12 |
| 48 | 4 | 160 | 14 |
| 55 | 5 | 180 | 14 |

# 10 Enclosure A

## Advice and instructions regarding the use in potentially explosive atmospheres

## 10.4 marking of coupling for potentially explosive atmospheres

The ATEX marking of the ROTEX® coupling is applied on the outer sheath or on the front side.
The flexible spider resp. DZ element is not marked.

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

**The following marking applies for the products:**

- Hubs resp. spacer ***without aluminium***
  Category 2 (hubs resp. clamping hubs with feather keyway)

ROTEX®
<Year>

I M2 Ex h I Mb
II 2G Ex h IIC T6 … T4 Gb
II 2D Ex h IIIC T80 °C … T110 °C Db
-30 °C ≤ $T_a$ ≤ +60 °C … +90 °C
KTR Systems GmbH, Carl-Zeiss-Straße 25, D-48432 Rheine

- Hubs resp. spacer ***without aluminium***
  Category 3 (hubs resp. clamping hubs without feather keyway)

ROTEX®
<Year>

I M2 Ex h I Mb
II 3G Ex h IIC T6 … T4 Gc
II 3D Ex h IIIC T80 °C … T110 °C Dc
-30 °C ≤ $T_a$ ≤ +60 °C … +90 °C
KTR Systems GmbH, Carl-Zeiss-Straße 25, D-48432 Rheine

- Hubs resp. spacer ***made of aluminium only***
  Category 2 (hubs resp. clamping hubs with feather keyway)

ROTEX®
<Year>

II 2G Ex h IIC T6 … T4 Gb
II 2D Ex h IIIC T80 °C … T110 °C Db
-30 °C ≤ $T_a$ ≤ +60 °C … +90 °C
KTR Systems GmbH, Carl-Zeiss-Straße 25, D-48432 Rheine

- Hubs resp. spacer ***made of aluminium only***
  Category 3 (hubs resp. clamping hubs without feather keyway)

ROTEX®
<Year>

II 3G Ex h IIC T6 … T4 Gc
II 3D Ex h IIIC T80 °C … T110 °C Dc
-30 °C ≤ $T_a$ ≤ +60 °C … +90 °C
KTR Systems GmbH, Carl-Zeiss-Straße 25, D-48432 Rheine

**Short marking:**
**(A short marking is only made if there is no other option 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 applies until 31st October 2019:**

| | |
|---|---|
| Short marking: | II 2GD c IIC T X/I M2 c X |
| Complete marking:<br>(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<br>II 2D c T 140 °C/I M2 c -50 °C ≤ $T_a$ ≤ +120 °C |
| Complete marking:<br>(valid for PUR only) | II 2G c IIC T6, T5 resp. T4 -30 °C ≤ $T_a$ ≤ +65 °C, +80 °C resp. +90 °C<br>II 2D c T 110 °C/I M2 c -30 °C ≤ $T_a$ ≤ +90 °C |

**Substance group - gases, fogs and vapours:**
The marking with explosion group IIC includes explosion groups IIA and IIB.

**Substance group - dusts:**
The marking with explosion group IIIC includes explosion groups IIIA and IIIB.

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 Certificate of conformity

corresponding to EU directive 2014/34/EU dated 26 February 2014
and to the legal regulations

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

**flexible ROTEX® couplings**

in an explosion-proof design described in the present operating/assembly instructions are devices corresponding to article 2, 1. of directive 2014/34/EU and comply with the general safety and health requirements according to enclosure II of directive 2014/34/EU.

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

DIN EN ISO 80079-36
DIN EN ISO 80079-37
DIN EN ISO 80079-38
IEC/TS 60079-32-1

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, | 2019-07-02 | i. V. | i. V. |
| Place | Date | Reinhard Wibbeling<br>Engineering/R&D | Michael Brüning<br>Product Manager |