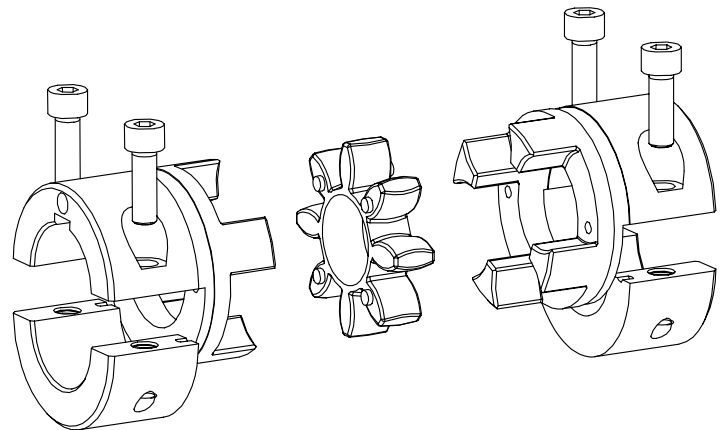




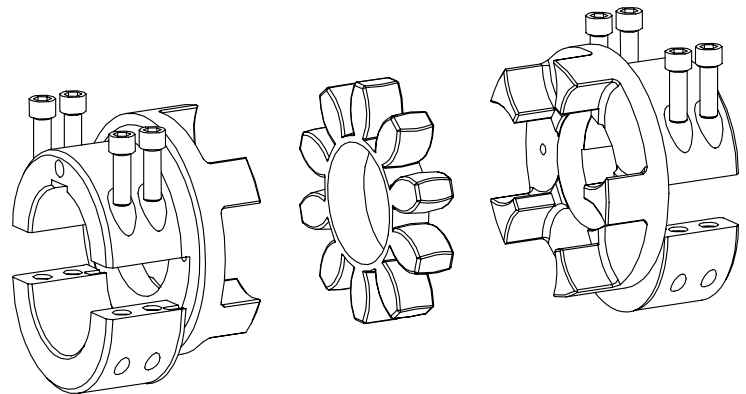
ROTEX®

Torsionally flexible
jaw-type couplings
design A-H,
and their combinations

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



design A-H, size 19 – 90



design A-H, size 100 – 125



ROTEX® is a torsionally flexible jaw coupling. It is able to compensate for shaft displacement caused by, as an example, inaccuracies in production, heat expansion, etc.
The design A-H allows to replace the spider/coupling without having to disassemble the driving or driven machine.

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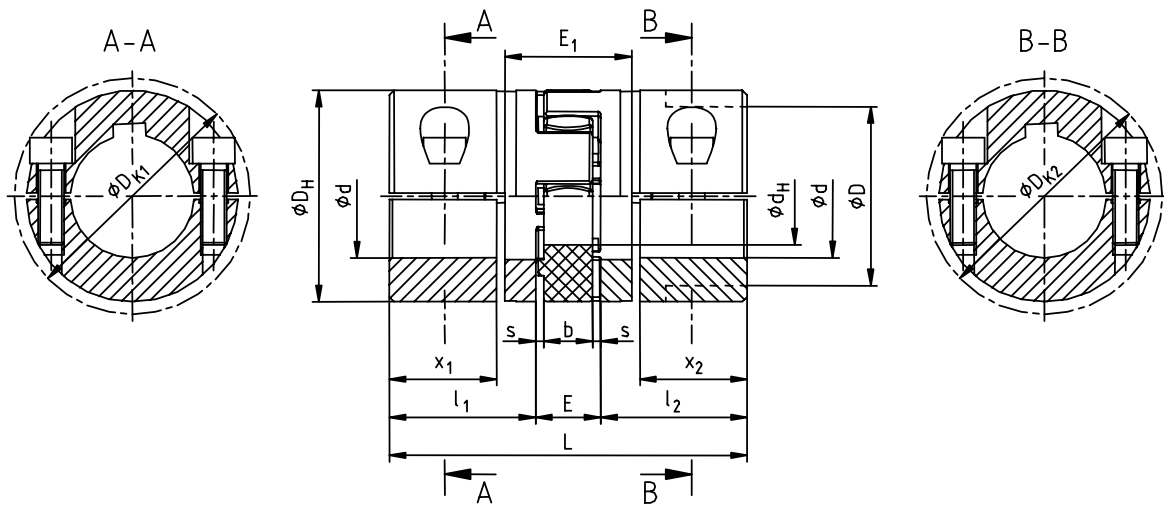
5 Enclosure A

Hints and Instructions Regarding the Use in Hazardous Areas

- 5.1 Control Intervals for Couplings in  Hazardous Areas
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1 Technical Data



picture 1: ROTEX® design A-H (steel)

Table 1:

| ROTEX® size | component | spider ¹⁾ (component 2) rated torque [Nm] | | | finish bore ²⁾ d (min-max) | dimensions [mm] | | | | | |
|-------------|-----------|---|------------------|--------------------|--|-----------------|----------------|----------------|-----|-----|-----|
| | | 92 Sh A (yellow) | 98 Sh A (red) | 64 Sh D (green) | | general | | | | | |
| | | L | E | b | | s | D _H | d _H | | | |
| 19 | 1H | 10 | 17 | 21 | 0 - 20 | 66 | 16 | 12 | 2 | 40 | 18 |
| 24 | 1H | 35 | 60 | 75 | 0 - 28 | 78 | 18 | 14 | 2 | 55 | 27 |
| 28 | 1H | 95 | 160 | 200 | 0 - 38 | 90 | 20 | 15 | 2,5 | 65 | 30 |
| 38 | 1H | 190 | 325 | 405 | 0 - 45 | 114 | 24 | 18 | 3 | 80 | 38 |
| 42 | 1H | 265 | 450 | 560 | 0 - 55 | 126 | 26 | 20 | 3 | 95 | 46 |
| 48 | 1H | 310 | 525 | 655 | 0 - 60 | 140 | 28 | 21 | 3,5 | 105 | 51 |
| 55 | 1H | 410 | 685 | 825 | 0 - 70 | 160 | 30 | 22 | 4 | 120 | 60 |
| 65 | 1H | 625 | 940 | 1175 | 0 - 80 | 185 | 35 | 26 | 4,5 | 135 | 68 |
| 75 | 1H | 1280 | 1920 | 2400 | 0 - 90 | 210 | 40 | 30 | 5 | 160 | 80 |
| 90 | 1H | 2400 | 3600 | 4500 | 0 - 110 | 245 | 45 | 34 | 5,5 | 200 | 100 |

| ROTEX® size | dimensions [mm] | | | | | | | | |
|-------------|---------------------------------|-----|----|-----------------|-----------------|----------------|---------------------------------|-----------------------------------|---------------------|
| | general | | | | | | | clamping screw DIN EN ISO 4762 | |
| | l ₁ , l ₂ | D | N | D _{K1} | D _{K2} | E ₁ | x ₁ , x ₂ | M x l | T _A [Nm] |
| 19 | 25 | - | - | 45,0 | - | 31 | 16,0 | M6 x 16 | 14 |
| 24 | 30 | - | - | 57,1 | - | 33 | 21,0 | M6 x 20 | 14 |
| 28 | 35 | - | - | 73,0 | - | 39 | 23,5 | M8 x 25 | 35 |
| 38 | 45 | - | - | 83,5 | - | 43 | 33,5 | M8 x 30 | 35 |
| 42 | 50 | 85 | 28 | 97,0 | 93,5 | 48 | 36,5 | M10 x 30 | 69 |
| | | 95 | - | | | | | M10 x 35 | |
| 48 | 56 | 95 | 32 | 108,5 | 105,0 | 50 | 42,5 | M12 x 35 | 120 |
| | | 105 | - | | | | | M12 x 40 | |
| 55 | 65 | 110 | 37 | 122,0 | 119,5 | 60 | 47,5 | M12 x 40 | 120 |
| | | 120 | - | | | | | M12 x 45 | |
| 65 | 75 | 115 | 47 | 132,5 | 123,5 | 65 | 57,0 | M12 x 40 | 120 |
| | | 135 | - | | | | | M12 x 45 | |
| 75 | 85 | 135 | 53 | 156,0 | 147,5 | 75 | 64,5 | M16 x 50 | 295 |
| | | 160 | - | | | | | | |
| 90 | 100 | 160 | 62 | 197,0 | 176,0 | 82 | 78,5 | M20 x 60 | 580 |
| | | 200 | - | | | | | | |

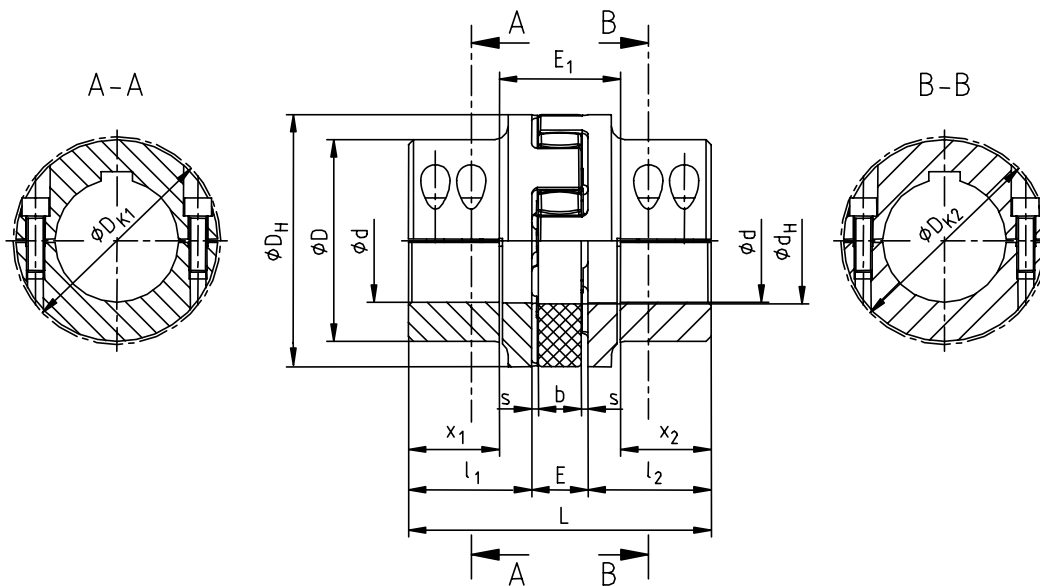
1) maximum torque of the coupling T_{Kmax} = rated torque of the coupling T_{KNenn} x 2

2) bore H7 keyway according to DIN 6885 sheet 1 [JS9]

| | | |
|--------------------------------------|-----------------------------|--------------------------------|
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1 Technical Data



picture 2: ROTEX® design A-H (EN-GJS-400-15)

Table 2:

| ROTEX® size | component | spider ¹⁾ (component 2) rated torque [Nm] | | | finish bore ²⁾ d (min-max) | dimensions [mm] | | | | | |
|-------------|-----------|---|------------------|--------------------|--|-----------------|----|----|-----|----------------|----------------|
| | | 92 Sh A (yellow) | 98 Sh A (red) | 64 Sh D (green) | | general | | | | | |
| | | | | | | L | E | b | s | D _H | d _H |
| 100 | 1H | 3300 | 4950 | 6185 | 50 - 115 | 270 | 50 | 38 | 6 | 225 | 113 |
| 110 | 1H | 4800 | 7200 | 9000 | 60 - 125 | 295 | 55 | 42 | 6,5 | 255 | 127 |
| 125 | 1H | 6650 | 10000 | 12500 | 60 - 145 | 340 | 60 | 46 | 7 | 290 | 147 |

| ROTEX® size | dimensions [mm] | | | | | | | | |
|-------------|---------------------------------|-----|-----|-----------------|-----------------|----------------|---------------------------------|-----------------------------------|---------------------|
| | general | | | | | | | clamping screw DIN EN ISO 4762 | |
| | l ₁ , l ₂ | D | N | D _{K1} | D _{K2} | E ₁ | x ₁ , x ₂ | M x l | T _A [Nm] |
| 100 | 110 | 180 | 89 | - | 185,5 | 102 | 81 | M16 x 50 | 295 |
| 110 | 120 | 200 | 96 | - | 208,0 | 115 | 87 | M20 x 60 | 580 |
| 125 | 140 | 230 | 112 | - | 242,5 | 130 | 102 | M24 x 70 | 1000 |

1) maximum torque of the coupling T_{Kmax.} = rated torque of the coupling T_{KNenn.} x 2

2) bore H7 keyway according to DIN 6885 sheet 1 [JS9]



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ROTEX®
Operating-/Assembly instructions
design A-H

KTR-N 40226 E
sheet: 5
edition: 2

2 Hints

2.1 Coupling selection



CAUTION!

For a continuous and troublefree operation of the coupling it must be designed according to the selection instructions (according to DIN 740 part 2) for the particular application (see ROTEX® catalogue).

If the operating conditions (performance, speed, changes at engine and machine) change, the coupling selection must be checked again.

Please make sure that the technical data regarding torque only refers to the spider. The transmissible torque of the shaft/hub connection must be checked by the orderer, and he is responsible for the same.

For drives with endangered torsional vibration (drives with periodical load on torsional vibration) it is necessary to make a torsional vibration calculation to ensure a perfect selection. Typical drives with endangered torsional vibration are e. g. drives with diesel engines, piston pumps, piston compressors etc. On request KTR makes the coupling selection and the torsional vibration calculation.

2.2 General Hints

Please read through these mounting instructions carefully before you set the coupling into operation. Please pay special attention to the safety instructions!



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

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

2.3 Safety and Advice Hints



DANGER!

Danger of injury to persons.



CAUTION!

Damages on the machine possible.



ATTENTION!

Pointing to important items.



PRECAUTION!

Hints concerning explosion protection.

| | | |
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|--|---|--|----------|---------|
|  KTR Kupplungstechnik GmbH D-48407 Rheine | ROTEX® | | KTR-N | 40226 E |
| | Operating-/Assembly instructions | | sheet: | 6 |
| | design A-H | | edition: | 2 |

2 Hints

2.4 General Hints of Danger



DANGER!

With assembly, operation and maintenance of the coupling it has to be made sure that the entire drive train is protected against unintentional engagement. You can be seriously hurt by rotating parts. Please make absolutely sure to read through and observe the following safety instructions.

- All operations on and with the coupling have to be performed taking into account "safety first".
- Please make sure to disengage the power pack before you perform your work.
- Protect the power pack against unintentional engagement, e. g. by providing hints at the place of engagement or removing the fuse for current supply.
- Do not touch the operation area of the coupling as long as it is in operation.
- Please protect the coupling against unintentional touch. Please provide for the necessary protection devices and caps.

2.5 Proper Use

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

- carefully read through the mounting instructions and understood them
- had technical training
- are authorized to do so by your company

The coupling may only be used in accordance with the technical data (see tables 1 and 2 in chapter 1). Unauthorized modifications on the coupling design are not admissible. We do not take any warranty for resulting damages. To further develop the product we reserve the right for technical modifications. The **ROTEX®** described in here corresponds to the technical status at the time of printing of these mounting instructions.

3 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 in case of favourable stock conditions.



CAUTION!

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

Humid storage rooms are not suitable.

Please make sure that there is no condensation. The best relative air humidity is under 65%.

| | | | | |
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4 Assembly

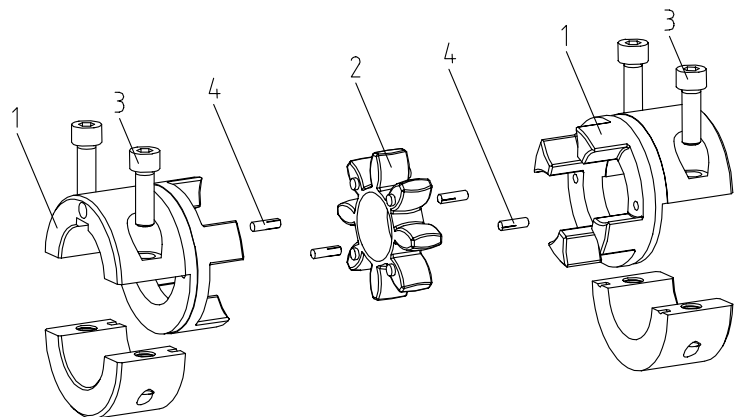
The coupling is generally delivered as a pre-assembled product. Before assembly the coupling has to be controlled for completeness.

4.1 Components of Couplings

Components of ROTEX® design A-H, size 19 – 90

| component | quantity | designation |
|-----------|-----------------|---|
| 1 | 2 | clamping hub H |
| 2 | 1 | spider |
| 3 | 2 ¹⁾ | cap screws DIN EN ISO 4762 |
| 4 | 2 ¹⁾ | half length taper- grooved dowel pins DIN EN ISO 8745 |

1) each clamping hub

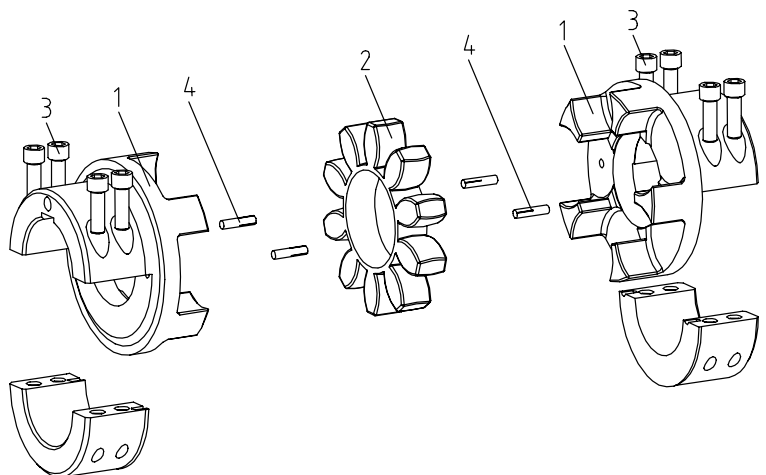


picture 3: ROTEX® design A-H, size 19 - 90

Components of ROTEX® design A-H, size 100 – 125

| component | quantity | designation |
|-----------|-----------------|---|
| 1 | 2 | clamping hub H |
| 2 | 1 | spider |
| 3 | 4 ¹⁾ | cap screws DIN EN ISO 4762 |
| 4 | 2 ¹⁾ | half length taper- grooved dowel pins DIN EN ISO 8745 |

1) each clamping hub



picture 4: ROTEX® design A-H, size 100 - 125

Features of the standard spiders

| spider hardness (Shore) | marking (colour) |
|----------------------------|--|
| 92 Sh A | yellow |
| 95/98 Sh A | red |
| 64 Sh D-F | natural white with green marking of teeth |



PRECAUTION!

Hubs without feather key may be used in category 3 only.

| | | |
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4 Assembly

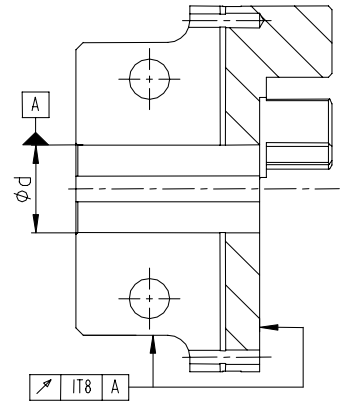
4.2 Hint Regarding the Finish Bore



DANGER!

The maximum permissible bore diameters d (see tables 1 and 2 in chapter 1 - Technical Data) must not be exceeded. If these figures are disregarded, the coupling may tear. Rotating particles may cause serious danger.

- Hub bores machined by the customer have to observe concentric running or axial running, respectively (see picture 5).
- Please make absolutely sure to observe the figures for d_{max} .
- Carefully align the hubs when the finish bores are brought in.



picture 5: concentric running and axial running



CAUTION!


The orderer is responsible for all subsequently made machinings to unbored or pilot bored and to finish machined coupling parts and spare parts. KTR does not assume any warranty claims resulting from insufficient refinishing.



PRECAUTION!

Any mechanical rework to couplings that are used in hazardous areas require an explicit release by KTR.

The orderer must send a drawing to KTR acc. to which the manufacture must be made. KTR checks this drawing and returns it to the orderer with approval.

KTR supplies unbored or pilot bored coupling parts and spare parts on explicit customer's request. These parts are additionally labelled with the symbol .

4.3 Assembly of the Hubs



ATTENTION!

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



PRECAUTION!

Please pay attention to the danger of ignition in hazardous areas.



CAUTION!

For the assembly please make sure that the distance dimension E (see tables 1 and 2) is kept to ensure that the spider can be moved axially.

Disregarding this hint may cause damage on the coupling.

- Remove the shells from the hub body.
- Fit the hub body together with the spider.
- Mount the fitted unit together with the shells and the clamping screws onto the shaft ends of the driving and driven machine.
- Screw in the clamping screws finger-tight in a way that the hubs and shells fit closely to the shaft.

| | | |
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4 Assembly

4.3 Assembly of the Hubs

Continuation:

- Move the hubs in axial direction until the dimension E is achieved.
- Secure the hubs by tightening the clamping screws reciprocally.
Tighten the screws to the tightening torques T_A listed in table 1 and 2 by means of a suitable dynamometric screwdriver.



ATTENTION!

If the shaft diameters with inserted feather key are smaller than the dimension d_H (see tables 1 and 2) of the spider, one or two shaft ends may protrude into the spider.



PRECAUTION!

Hubs without feather key may be used in category 3 only.

4.4 Displacements - Alignment of the Couplings

The displacement figures shown in table 4 offer sufficient safety to compensate for environmental influences like, for example, heat expansion or lowering of foundation.



CAUTION!

In order to ensure a long lifetime of the coupling and to avoid dangers regarding the use in hazardous areas, the shaft ends must be accurately aligned.



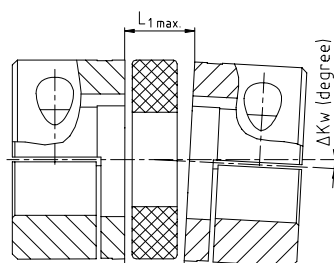
Please absolutely observe the displacement figures indicated (see table 4). If the figures are exceeded, the coupling is damaged.

The exacter the alignment of the coupling, the higher is its lifetime.

In case of a use in hazardous areas for the explosion group IIC (marking II 2GD c IIC T X), only the half displacement figures (see table 4) are permissible.

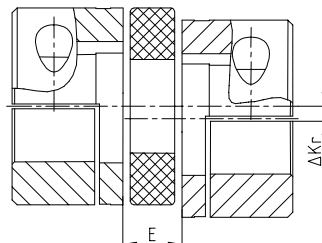
Please note:

- The displacement figures mentioned in table 4 are maximum figures which must not arise in parallel. If radial and angular displacement arises at the same time, the permissible displacement values may only be used in part (see picture 7).
- Please check with a dial gauge, ruler or feeler whether the permissible displacement figures of table 4 can be observed.

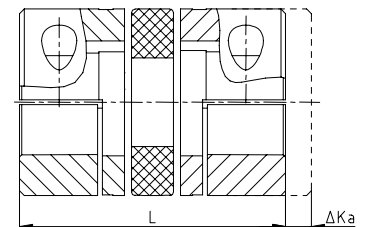


angular displacements

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



radial displacements



axial displacements

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

picture 6: displacements

| | | |
|--------------------------------------|-----------------------------|--------------------------------|
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4 Assembly

4.4 Displacements - Alignment of the Couplings

Example for the misalignment combinations given in picture 7:

Example 1:

$\Delta K_r = 30\%$

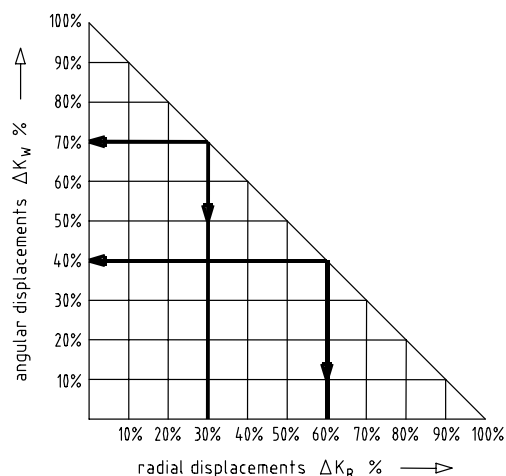
$\Delta K_w = 70\%$

Example 2:

$\Delta K_r = 60\%$

$\Delta K_w = 40\%$

picture 7:
combinations of
displacement



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

Table 4: displacement figures

| ROTEX® size | 19 | 24 | 28 | 38 | 42 | 48 | 55 | 65 | 75 | 90 | 100 | 110 | 125 |
|--|------------|------|------|------|------|------|------|------|------|------|------|------|------|
| max. axial displacement ΔK_a [mm] | 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 |
| max. radial displacement ΔK_r [mm] with | 1500 1/min | 0,20 | 0,22 | 0,25 | 0,28 | 0,32 | 0,36 | 0,38 | 0,42 | 0,48 | 0,50 | 0,52 | 0,60 |
| | 3000 1/min | 0,13 | 0,15 | 0,17 | 0,19 | 0,21 | 0,25 | 0,26 | 0,28 | 0,32 | 0,34 | 0,36 | - |
| ΔK_w [degree] max. angular displacement with $n = 1500$ 1/min ΔK_w [mm] | 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 |
| | 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 |
| ΔK_w [degree] max. angular displacement with $n = 3000$ 1/min ΔK_w [mm] | 1,1 | 0,8 | 0,8 | 0,8 | 0,8 | 0,9 | 1,0 | 1,0 | 1,0 | 1,1 | 1,1 | 1,1 | - |
| | 0,70 | 0,75 | 0,84 | 1,10 | 1,40 | 1,60 | 2,00 | 2,30 | 2,90 | 3,80 | 4,20 | 5,00 | - |


4.6 Spares Inventory, Customer Service Addresses

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

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

| | | |
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5 Enclosure A

Hints and Instructions Regarding the Use in  Hazardous Areas

design A-H: shell hub/spider/ shell hub



PRECAUTION!

Hubs without feather key may be used in category 3 only.

5.1 Use in Hazardous Areas According to the Regulations

Conditions of operation in hazardous locations

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

1. Industry (with the exception of mining)

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

Temperature class:

| Temperature class | ambient temperature | max. surface temperature ¹⁾ |
|-------------------|---------------------|--|
| T4, T3, T2, T1 | - 30 °C to + 90 °C | 110 °C ²⁾ |
| T5 | - 30 °C to + 80 °C | 100 °C |
| T6 | - 30 °C to + 65 °C | 85 °C |

Explanation:

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

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

2. Mining

Device class I of category M2 (coupling is not approved for device category M1).
Permissible ambient temperature - 30 °C to + 90 °C.

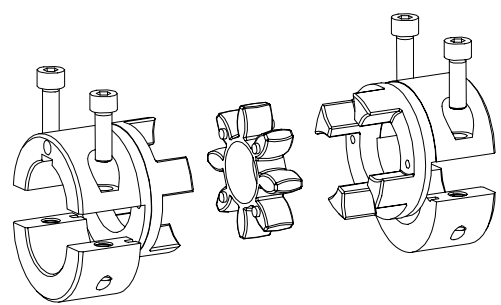
5 Enclosure A

Hints and Instructions Regarding the Use in  **Hazardous Areas**

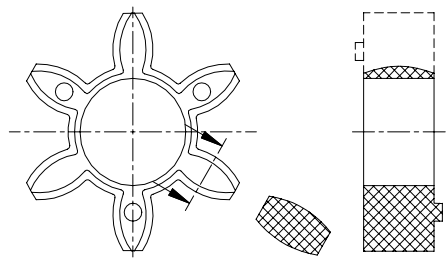
5.2 Control Intervals for Couplings in  Hazardous Areas

| explosion group | control intervals |
|---------------------------|--|
| 3G 3D | <p>For couplings which are classified in category 3G or 3D the operating and assembly instructions that are usual for standard operation apply. During the standard operation which has to be subject to the analysis of danger of ignition the couplings are free from any ignition source. Merely the temperature increase produced by proper heating and depending on the coupling type has to be considered: for ROTEX®: $\Delta T = 20\text{ K}$</p> |
| II 2G c IIB T4, T5, T6 | <p>A checking of the circumferential backlash and a visual check of the flexible spider must be effected after 3,000 operating hours for the first time, after 6 months at the latest. Except for centered, stiff connecting flanges (e. g. bellhousings). If you note an unconsiderable or no wear at the spider after this first inspection, the further inspections can be effected, in case of the same operating parameters, respectively after 6,000 operating hours or after 18 months at the latest. If you note a considerable wear during the first inspection, so that a change of the spider would be recommended, please find out the cause according to the table „Breakdowns“, as far as possible. The maintenance intervals must be adjusted according to the changed operating parameters.</p> |
| II 2G c IIC T4, T5, T6 | <p>A checking of the circumferential backlash and a visual check of the flexible spider must be effected after 2,000 operating hours for the first time, after 3 months at the latest. Except for centered, stiff connecting flanges (e. g. bellhousings). If you note an unconsiderable or no wear at the spider after this first inspection, the further inspections can be effected, in case of the same operating parameters, respectively after 4,000 operating hours or after 12 months at the latest. If you note a considerable wear during the first inspection, so that a change of the spider would be recommended, please find out the cause according to the table „Breakdowns“, as far as possible. The maintenance intervals must be adjusted according to the changed operating parameters.</p> |

ROTEX® coupling



picture 8: ROTEX®, design A-H



picture 9: ROTEX® spider

Here the backlash between coupling cams and the flexible spider must be checked by a feeler gauge. When reaching the limit of wear of max. friction, the spider must be exchanged immediately, independent of the inspection intervals.




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ROTEX®
Operating-/Assembly instructions
design A-H

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5 Enclosure A

Hints and Instructions Regarding the Use in  Hazardous Areas

5.3 Approximate Values of Wear

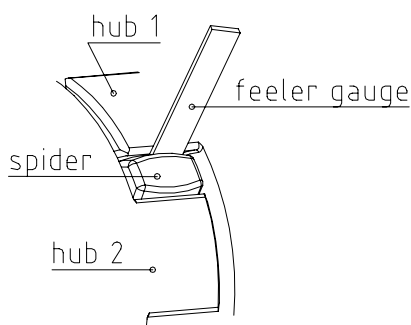
In case of a backlash of more than X mm, the flexible spider must be exchanged.

The reaching of the exchange values depends on the operating conditions and the existing operating parameters.

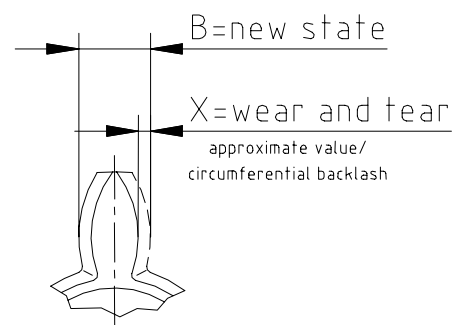


CAUTION!

In order to ensure a long lifetime of the coupling and to avoid dangers regarding the use in hazardous areas, the shaft ends must be accurately aligned. Please absolutely observe the displacement figures indicated (see table 4). If the figures are exceeded, the coupling is damaged.



picture 10: checking of the limit of wear



picture 11: wear of spider

Table 5:

| ROTEX® size | limits of wear (friction) | | ROTEX® size | limits of wear (friction) | |
|----------------|---------------------------|--|----------------|---------------------------|--|
| | X _{max.} [mm] | | | 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 | |

5.4 Permissible Coupling Materials in the  Hazardous Area

In the Explosion Groups **IIA, IIB** and **IIC** the following materials may be combined:

- EN-GJL-250 (GG 25)
- EN-GJS-400-15 (GGG 40)
- steel
- stainless steel


Semifinished products from aluminium with a magnesium part of up to 7,5 % and a yield point of $R_{p0,2} \geq 250 \text{ N/mm}^2$ are permitted for the use in hazardous areas.

Aluminium diecast is generally excluded for hazardous areas.


| | | |
|--------------------------------------|-----------------------------|--------------------------------|
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| | | |
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| | | |

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Hints and Instructions Regarding the Use in  Hazardous Areas

5.5 Marking of Coupling for the Hazardous Area

Couplings for the use in hazardous areas are marked on at least one component completely and on the remaining components at the outside diameter of the hub or on the front side with an  label for the respectively permitted conditions of use. The flexible spider is excluded.

Complete labelling:



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

Short labelling:



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

The former marking
remains valid:



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

The labelling with Explosion Group IIC includes the Explosion Groups IIA and IIB.

If the coupling part is labelled with  in addition to , KTR supplied it unbored or pilot bored.



CAUTION!

Any mechanical rework to couplings that are used in hazardous areas require an explicit release by KTR.

The orderer must send a drawing to KTR acc. to which the manufacture must be made. KTR checks this drawing and returns it to the orderer with approval.

5.6 Starting

Before putting the coupling into operation, check the tightness of the setscrews in the hubs, the alignment and the distance dimension E and correct, if necessary, and also check all screw connections regarding the stipulated tightening torques dependent on the type of coupling.



If used in hazardous areas the grub screws to fix the hub as well as all screw connections must be additionally secured against self-loosening, e. g. glue with Loctite (medium strength).

Last but not least, the coupling protection against unintended contact must be fixed.

The cover must be electrically conductive and be included in the equipotential bonding. Bellhousings (magnesium part below 7,5 %) made from aluminium and damping rings (NBR) can be used as connecting element between pump and electro motor. The cover may only be taken off after having stopped the unit.

During operation, please pay attention to

- strange running noises
- occurring vibrations.

If the couplings are used in dust explosive areas and in mining the user must make sure that there is no accumulation of dust in a critical quantity between the cover and the coupling. The coupling must not operate in an accumulation of dust.


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

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

| | | |
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5.6 Starting

The minimum distance of the protection device to the rotating parts must be at least 5mm.

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

| | form of the openings | | |
|-----------------------------|-------------------------------------|---|--|
| | circular openings diameter in mm | rectangular openings side length in mm | straight or bended slot distance of the side limit in mm |
| top surface of the covering | 4 | 4 | prohibited |
| side parts of the covering | 8 | 8 | 8 |



CAUTION!

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

Coupling layer:



If coated (priming, painting etc.) couplings are used in hazardous areas, the requirements to conductivity and layer thickness must be considered. In case of paintings up to 200 µm no electrostatic load can be expected. Multiple coatings that are thicker than 200 µm are prohibited for explosion group IIC.

5.7 Breakdowns, Causes and Elimination

The below-mentioned errors can lead to an incorrect use of the **ROTEX®** coupling. In addition to the stipulations in these operating and mounting instructions please make sure to avoid these errors. The errors listed can only be clues to search for the errors. When searching for the error the adjacent components must be generally included.



Due to incorrect use the coupling can become a source of ignition. EC Standard 94/9/EC requires a special care from the manufacturer and the user.


General errors incorrect use:

- Important data for the coupling selection was not forwarded.
- The calculation of the shaft/hub connection was not considered.
- Coupling parts with damage occurred during transport are assembled.
- If the heated hubs are assembled, the permissible temperature is exceeded.
- The fits of the parts to be assembled are not coordinated with each other.
- Tightening torques are below/exceeded.
- Components are exchanged by mistake/put together incorrectly.
- A wrong or no spider is inserted into the coupling.
- No original KTR parts (purchased parts) are used.
- Old spiders/already worn out spiders or superposed spiders are used.
- The coupling used/the coupling protection used is not suitable for the operation in hazardous areas and does not correspond to EC Standard 94/9/EC, respectively.
- Maintenance intervals are not observed.

| | | |
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Hints and Instructions Regarding the Use in  Hazardous Areas

5.7 Breakdowns, Causes and Elimination

| breakdowns | causes | danger hints for hazardous areas | elimination |
|--|---|---|---|
| change of the running noises and/or occurring vibrations | misalignment | increased temperature the the spider surface; danger of ignition by hot surfaces | 1) put the unit out of operation 2) eliminate the reason for the misalignment (e. g. loose foundation bolts, break of the engine fixing, heat expansion of unit components, change of the assembly dimension E of the coupling) 3) checking of wear see under point Control |
| | wear of spider, short-term torque transmission due to metal contact | danger of ignition due to sparking | 1) put the unit out of operation 2) disassemble the coupling and remove rests of the spider 3) check coupling parts and exchange damaged coupling parts 4) insert spider, assemble coupling parts 5) check alignment, correct if necessary |
| | loose screws for axial securement of hubs | danger of ignition due to hot surfaces and sparking | 1) put the unit out of operation 2) check alignment of coupling 3) tighten the screws to secure the hubs and secure against self-loosening 4) checking of wear see under point Control |
| break of cam | wear of spider, torque transmission due to metal contact | danger of ignition due to sparking | 1) put the unit out of operation 2) change complete coupling 3) check alignment |
| | break of the cams due to high shock energy/overload | danger of ignition due to sparking | 1) put the unit out of operation 2) change complete coupling 3) check alignment 4) find out the reason of overload |
| | operating parameters do not correspond to the performance of the coupling | danger of ignition due to sparking | 1) put the unit out of operation 2) check the operating parameters and select a larger coupling (consider installation space) 3) assemble new coupling size 4) check alignment |
| | mistake in service of the unit | danger of ignition due to sparking | 1) put the unit out of operation 2) change complete coupling 3) check alignment 4) instruct and train the service staff |
| premature wear of spider | misalignment | increased temperature the the spider surface; danger of ignition by hot surfaces | 1) put the unit out of operation 2) eliminate the reason for the misalignment (e. g. loose foundation bolts, break of the engine fixing, heat expansion of unit components, change of the assembly dimension E of the coupling) 3) checking of wear see under point Control |



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Hints and Instructions Regarding the Use in  Hazardous Areas

5.7 Breakdowns, Causes and Elimination

| breakdowns | causes | danger hints for hazardous areas | elimination |
|---|--|--|--|
| premature wear of spider | e. g. contact with aggressive liquids/ oils, ozone-influence, too high/low ambient temperatures etc. effecting a physical change of the spider | danger of ignition due to sparking in case of metallic contact of the cams | 1) put the unit out of operation 2) disassemble the coupling and remove rests of the spider 3) check coupling parts and exchange damaged coupling parts 4) insert spider, assemble coupling parts 5) check alignment, correct if necessary 6) make sure that further physical changes of the spider are excluded |
| | ambient/contact temperatures which are too high for the spider, max. permissible e. g. T4 = - 30 °C/+ 90 °C | danger of ignition due to sparking in case of metallic contact of the cams | 1) put the unit out of operation 2) disassemble the coupling and remove rests of the spider 3) check coupling parts and exchange damaged coupling parts 4) insert spider, assemble coupling parts 5) check alignment, correct if necessary 6) check and regulate ambient/contact temperature (eventually even elimination by using other spider materials) |
| premature wear of spider (liquefaction of material inside the spider cam) | drive vibrations | danger of ignition due to sparking in case of metallic contact of the cams | 1) put the unit out of operation 2) disassemble the coupling and remove rests of the spider 3) check coupling parts and exchange damaged coupling parts 4) insert spider, assemble coupling parts 5) check alignment, correct if necessary 6) find out the reason for the vibrations (eventually elimination by spider with lower or higher shore hardness) |



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



ATTENTION!

KTR does not assume any liabilities or guarantees regarding the use of spare parts and accessories which are not provided by KTR and for the damages resulting herefrom.




KTR Kupplungstechnik
GmbH
D-48407 Rheine

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5.8 EC Certificate of Conformity

EC Certificate of Conformity

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

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

flexible ROTEX® couplings

described in these mounting instructions and explosion-proof designed correspond to Article 1 (3) b) of Standard 94/9/EC and comply with the general Safety and Health Requirements according to enclosure II of Standard 94/9/EC.

The couplings are certified according to Type Examination Certificate IBExU02ATEXB001_05 X vor.

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

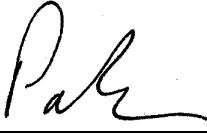
IBExU
Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7

09599 Freiberg

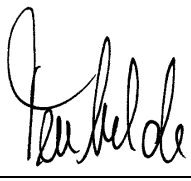
Rheine,

12.05.05
Date

ppa.


Dr. Norbert Partmann
Engineering Manager

i. V.


Bernd Tenfelde
Product Manager

Schutzvermerk
ISO 16016 beachten.

Gezeichnet: 16.10.06 Sha/At
Geprüft: 16.10.06 Sha

Ersatz für: KTR-N vom 16.08.06
Ersetzt durch: