[1] **TYPE EXAMINATION CERTIFICATE** - Translation

[2] for non-electrical products of equipment-groups I and II,
equipment-categories M2 and 2 plus products of equipment-category 3

[3] Type examination certificate number **IBExU13ATEXB016 X** | Issue 2

[4] Product (equipment / component):

ROTEX® - Couplings in the following types and designs

a) Hubs with feather keyway and hubs with CLAMPEX®-clamping set or clamping ring hubs

- 1.0 Hub with feather keyway and threaded pin
- 1.3 Hub with profile
- 1.4 Hub with feather keyway without threaded pin
- 2.1 Clamping hub single-slotted with feather keyway
- 2.3 Clamping hub single-slotted with profile
- 2.6 Clamping hub double-slotted 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 design as for 6.0, but only clamping screws from outside)
- 7.1 SPLIT hub with feather keyway
- 7.6 Half-shell hub (DH) with feather keyway
- 7.9 Half-shell hub (H) with feather keyway
- Design Standard, AFN, BFN, CF, CFN, DF, DFN, DKM, ZS-DKM, ZS-DKM-H, SP and TB with hubs according to the aforementioned designs

b) Hubs without feather keyway

- 2.0 Clamping hub single-slotted without feather keyway
- 2.5 Clamping hub double-slotted without feather keyway
- 2.8 Clamping hub axially slotted without feather keyway
- 7.0 SPLIT hub without feather keyway
- 7.5 Half-shell hub (DH) without feather keyway
- 7.8 Half-shell hub (H) without feather keyway
- Design Standard, AFN, BFN, CF, CFN, DKM, ZS-DKM, ZS-DKM-H and SP with hubs according to the aforementioned designs

[5] Manufacturer: KTR Systems GmbH

[6] Address: Carl-Zeiss-Straße 25
48432 Rheine
GERMANY

[7] This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] IBExU Institut für Sicherheitstechnik GmbH certifies that this product has been found to comply with the essential health and safety requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014.

The examination and test results are recorded in the confidential test report IB-20-2-0145.

[9] Compliance with the essential health and safety requirements has been assured by compliance with:
EN ISO 80079-36:2016 EN ISO 80079-37:2016 EN ISO/IEC 80079-38:2017
except in respect of those requirements listed at item [18] of the schedule.

[10] If the sign "X" or "U" is placed after the certificate number, it indicates that the product is subject to the specific conditions of use specified in the schedule to this certificate.

[11] This type examination certificate relates only to the design of the specified equipment and not to specific items of equipment subsequently manufactured or supplied.

[12] The marking of the product shall include the following:

Design as per a) without aluminium, with feather keyway

Ex I M2 Ex h I Mb
Ex II 2G Ex h IIC T6 ... T4 Gb
Ex II 2D Ex h IIIC T80°C ... T110°C Db
-30°C ≤ Ta ≤ +60°C ... +90°C

Design as per b) without aluminium, without feather keyway

Ex I M2 Ex h I Mb
Ex II 3G Ex h IIC T6 ... T4 Gc
Ex II 3D Ex h IIIC T80°C ... T110°C Dc
-30°C ≤ Ta ≤ +60°C ... +90°C

Design as per a) with aluminium, with feather keyway

Ex II 2G Ex h IIC T6 ... T4 Gb
Ex II 2D Ex h IIIC T80°C ... T110°C Db
-30°C ≤ Ta ≤ +60°C ... +90°C

Design as per b) with aluminium, without feather keyway

Ex II 3G Ex h IIC T6 ... T4 Gc
Ex II 3D Ex h IIIC T80°C ... T110°C Dc
-30°C ≤ Ta ≤ +60°C ... +90°C

IBExU Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7
09599 Freiberg, GERMANY

Tel: + 49 (0) 37 31 / 38 05 0
Fax: + 49 (0) 37 31 / 38 05 10

By order

IBExU
Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7
09599 Freiberg/Sachsen
Telefon (03731) 3805-0
Telefax (03731) 38 05 10

Dipl.-Ing. Willamowski - Stamp -

Certificates without signature and stamp are not valid. Certificates may only be duplicated completely and unchanged. In case of dispute, the German text shall prevail.

Freiberg, 2020-11-30

[13] **Schedule**

[14] **Certificate number IBExU13ATEXB016 X** | Issue 2

[15] **Description of product**

The ROTEX® - Couplings mentioned in [4] are torsionally-flexible couplings, which transform torques in a form-locking way. They are puncture-proof. The ROTEX® - Couplings can compensate axial, radial and angular displacements of the shafts to be connected.
Involute gear rims or double tooth elements (DZ) are inserted between two coupling halves, the hubs, which are provided with concave claws. The hubs are staggered against each other in circumferential direction by half a pitch. In this manner, single-cardanic or, if spacers are used, double-cardanic joints are formed.
The hubs of the non-sparking ROTEX® - Coupling SP are formed by the direct metal – synthetic material – connection.
The involute gear rims are elastomeric parts, which are made mainly from polyurethane of various hardness, Hytrel or polyamide. All of the elastomers mentioned have surface resistances > 10^9 Ω.
The designs of the ROTEX® - Couplings differ in the design of the coupling halves, hubs, flange connections and disassembling parts.

Details on the design of the equipment or components can be found in the manufacturer's documentation and the test reports IB-13-4-024, IB-18-2-0020 and IB-20-2-0145.

Variations compared to issue 1 of this certificate:

Variation 1
The hub designs 7.0 and 7.1 have been listed.

[16] **Test report**

The test results are recorded in the confidential test report IB-18-2-0145 of 2020-11-26.

The test documents are part of the test report and they are listed there.

Summary of the test results
The equipment or components mentioned in [4] meet(s) the requirements of explosion protection for equipment of Equipment Group II, Categories 2D or 2G or 3D or 3G or M2 in type of protection "c" (constructional safety, marking with "Ex h") for use with explosive dust and gas atmospheres and for underground use.

[17] **Specific conditions of use**

1. The temperature marking indicates that for determining the maximum surface temperature occurring on the coupling a temperature increase ΔT to the ambient or operating temperature T_a must be considered. The temperature increase ΔT is stated in the operating instructions.

2. The ROTEX® - Couplings may only be used, if their materials resist, under the respective operating conditions, the mechanical and/or chemical effects and corrosion, so that the explosion protection is always maintained.

3. The users must provide the ROTEX® - Couplings with fixed covers in order to protect the couplings against falling objects. The covers can have openings for the necessary heat dissipation. When used in the mining industry (Equipment Group I), the covers of the couplings must be able to withstand higher mechanical loads than for use in other industries (Equipment Group II). Detailed information on the cover design is given in the operating / assembly instructions.
The covers must be electrically conductive and included in the equipotential bonding.

4. When using the couplings in potentially explosive dust atmospheres, the users must make sure that no dust in dangerous quantities accumulates between cover and coupling. The coupling must not run in a dust accumulation.

5. All screw connections for fixing must be secured against self-loosening.

6. For use of the couplings in the mining industry, the requirements of the national mining regulations valid for the respective area of application must be observed.

[18] **Essential health and safety requirements**
In addition to the essential health and safety requirements (EHSRs) covered by the standards listed at item [9], the following are considered relevant to this product, and conforwithy is demonstrated in the test report:

Clause	*Subject*
-	-

[19] **Drawings and Documents**

Number	*Sheet*	*Issue*	*Date*	*Description*
-	-	-	-	-

The documents are listed in the test report.

IBExU Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7
09599 Freiberg, GERMANY

By order

Dipl.-Ing. Willamowski

Freiberg, 2020-11-30