[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 **IBExU06ATEXB009 X** | Issue 2

[4] Product (equipment / component):

REVOLEX® KX – Torsionally flexible pin & bush couplings
designs
- KX (standard)
- KX-D (pins alternately arranged)
- KX-AB (with limitation of axial clearance)
- KX-TB (with taper clamping hub)

each in the sizes up to 650

[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:

Ex I	M2	Ex h I	Mb		
Ex II	2G	Ex h IIC	T6 ...	T5	Gb
Ex II	2D	Ex h IIIC	T80°C ...	T95°C	Db
	-30°C ≤ Ta ≤		+60°C ...	+75°C	

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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 IBExU06ATEXB009 X** | Issue 2

[15] **Description of product**

The REVOLEX® KX – Torsionally-flexible pin & bush couplings mentioned in [4] are torsionally-flexible and puncture-proof pin & bush couplings. They consist of two hub parts; one pin hub with the corresponding pins and one bush hub. The torque is transmitted via the steel pins with their taper elastomer rings which mesh with the corresponding bores in the bush hub. Pins and bores of the design REVOLEX® KX-D are alternately arranged in the two coupling hubs. The pins are tightly screwed together with the coupling flange by means of nuts or screws.
Grey cast iron EN GJL-250 is used as standard material for the coupling flanges. They can also be constructed of S355J2G3 steel, cast steel or EN GJS 400 ductile cast iron. The surfaces are phosphated or undercoated. The standard material for the pins is steel C40 (EN8) and 42CrMo4.
The elastomer rings are mainly produced from NBR – acrylonitrile-butadiene-caoutchouc. For special applications also other materials can be used, e.g. PUR or CR.

The REVOLEX® KX – Torsionally-flexible pin & bush couplings are capable of compensating shaft misalignments of all kinds within the specified limits. They compensate vibrations and shocks by means of the elastomer rings arranged on the pins.

A tongue and groove joint is normally planned between coupling hub and shaft. The coupling hubs are fixed on the shaft with at least one threaded pin. But also other joints are possible such as joints with taper clamping hub.

Details on the design of the equipment or components can be found in the manufacturer's documentation and the test reports IB-06-4-007, IB-18-2-0020 and IB-20-20145.

Variations compared to issue 1 of this certificate:

Variation 1
The permissible sizes have been extended to nominal size 650.

[16] **Test report**

The test results are recorded in the confidential test report IB-20-2-0145 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 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 REVOLEX® KX – Torsionally-flexible pin & bush 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. Only pins and screws specified by the manufacturer may be used for the screw connections. When tightening the screws, the torque specified by the manufacturer must be observed. All screw connections for mounting the hub onto the shafts must be secured against self-loosening.

4. All parts of a coupling half must be electrically conductive connected with each other and earthed via the respective hub/shaft connection.

5. The users must provide the REVOLEX® KX – Torsionally-flexible pin & bush couplings with protective devices which, from the point of view of explosion protection, are intended to protect the couplings against falling objects.
   The protective devices must be electrically conductive and included in the equipotential bonding.
   The protective devices must be installed in a sufficient distance to the couplings so that, in the event of simple damage, the couplings cannot rub against the protective devices.
   When used in the mining industry (Equipment Group I), the protective devices of the couplings must be able to withstand higher mechanical loads than those for use in other industries (Equipment Group II). They must not be constructed of light metal.

6. When using the couplings in potentially explosive dust atmospheres and in the mining industry, where coal dust accumulations are expected, the users must make sure that no dust in dangerous quantities accumulates between protective device and coupling. The coupling must not run in a dust accumulation.

7. 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 conformity 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.

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