



[1] **TYPE EXAMINATION CERTIFICATE**

[2] **for non-electrical equipment and components
of the Equipment Groups I and II, Categories M2 and 2 as well as 3
(Translation)**

[3] Type Examination Certificate Number: **IBExU08ATEXB019 X**

[4] Equipment / Component: **GEAREX Gear Couplings**
of the designs FA, FB and FAB
Sizes up to 70

[5] Manufacturer: **KTR Kupplungstechnik GmbH**

[6] Address: **Rodder Damm 170
48432 Rheine
Germany**

[7] The design of the product mentioned under [4] and any acceptable variations thereto are specified in the schedule to this Type Examination Certificate.

[8] IBExU Institut für Sicherheitstechnik GmbH, NOTIFIED BODY number 0637 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that the product mentioned under [4] has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of the product intended for use in potentially explosive atmospheres given in Annex II of the Directive.
The test results are recorded in the Test Report IB-08-4-020 of 12th December 2008.


[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with EN 13463-1:2001, EN 13463-5:2003 and EN 1710:2005.

[10] If the sign "X" is placed after the certificate number and / or the marking mentioned under [12], it indicates that the product is subject to special conditions for safe use specified under [17] in the schedule to this Type Examination Certificate.

[11] This Type Examination Certificate relates only to the design and construction of the defined product. If applicable, further requirements of this Directive apply to the manufacture and supply of this product (for example see [19]).




[12] The marking of the GEAREX gear couplings of the design mentioned under [4] can be as follows:

 **II 2G c IIC T6, T5 resp. T4 X**
-30 °C ≤ T_a ≤ +65 °C, +80 °C resp. +90 °C

 **II 2D c T 110 °C X**
-30 °C ≤ T_a ≤ +90 °C

 **I M2 c X**
-30 °C ≤ T_a ≤ +90 °C

The "short marking" listed in the following can alternatively be applied under reference to maximum permissible ambient temperatures resp. operating temperatures T_a and maximum surface temperatures under consideration of the temperature rise ΔT = 20 K explained under [16]:

 **II 2G c IIC T X**
 **II 2D c T X**
 **I M2 c X**


IBExU Institut für Sicherheitstechnik GmbH
An-Institut der TU Bergakademie Freiberg

IBExU Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7 - 09599 Freiberg, Germany
☎ +49 (0) 3731 3805-0 - 📠 +49 (0) 3731 23650

Freiberg, 12th December 2008

IBExU
Institut für Sicherheitstechnik GmbH
An-Institut der TU Bergakademie Freiberg
Fuchsmühlenweg 7
09599 Freiberg/Sachsen
Tel. (0 37 31) 38 05-0 • Fax 2 36 50

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.


(Prof. Dr. Redeker)

- Stamp -

Schedule

[13] **Schedule**

[14] to the **Type Examination Certificate IBExU08ATEXB019 X**

[15] **Description**

GEAREX gear couplings are gear-type couplings made of steel with grease lubrication and sealing by means of round cord rings. They are suitable as flexible shaft connections for the positive torque transmission. In addition, they ensure the compensation of axial, radial and angular shaft displacement within the defined tolerances.

Independently of the design GEAREX gear couplings essentially consist of two coupling hubs each with outer curved toothing and two coupling bushes each with internal toothing. The couplings are held together by screwing the two flanges of the coupling bushes. The coupling hubs are equipped with feather keyways for fastening on the shafts.

The toothings are lubricated by means of the grease depot placed in the couplings. The grease is filled in through two screwings each arranged in the connecting flanges of the coupling bushes. Round cord rings which are inserted in grooves of the coupling bushes serve for the sealing of the grease depot between the coupling hubs and bushes. A flat gasket situated between the flanges of the coupling bushes seals this gap against escaping grease.

The designs FA, FB and FAB are different in the various arrangements of the otherwise identically constructed coupling hubs.

The coupling hubs are prebored according to the documents of the manufacturer.

The couplings are intended by the manufacturer for the use in the temperature range T_a from -30 °C up to $+90\text{ °C}$.

Details are included in the documents of the manufacturer which are part of the Test Report.

[16] **Test Report**

GEAREX gear couplings of the designs and sizes mentioned under [4] fulfil the requirements for non-electrical equipment / components

- of the Equipment Group II, Category 2G.

Under consideration of the temperature increase of $\Delta T = 20\text{ K}$ the couplings fulfil the requirements of the Temperature Class T6 (for $T_a = 65\text{ °C}$), Temperature Class T5 (for $T_a = 80\text{ °C}$) and Temperature Classes T4 to T1 (for $T_a = 90\text{ °C}$) according to the maximum permissible ambient temperatures respectively operating temperatures T_a .

They fulfil the requirements of the Explosion Group IIC (thus the requirements of the Explosion Groups IIB and IIA, too).

- of the Equipment Group II, Category 2D.

At the maximum permissible ambient temperature respectively operating temperature T_a of $+90\text{ °C}$ the maximum surface temperature amounts to $+110\text{ °C}$.

- of the Equipment Group I, Category M2.

At the maximum permissible ambient temperature respectively operating temperature T_a of $+90\text{ °C}$ the surface temperature which is permissible for the Category M2 is not achieved.

The type of protection "c" (protection by constructional safety according to EN 13463-5:2003) was used as measure of ignition protection.

[17] Special conditions for safe use

The marking with "T X" means, that for the specification of the maximum surface temperature at the coupling the user has to consider a temperature increase of $\Delta T = 20$ K against the ambient temperature resp. operating temperature T_a .

The couplings may only be used if their materials resist to the mechanical and/or chemical influences respectively corrosion under the actual operating conditions, in such a way, that the explosion protection is always guaranteed.

Only screws specified by the manufacturer are allowed for the assembling of screw connections. The torque specified by the manufacturer has to be observed at the fastening of the screws. All screws for fastening the hubs have to be protected against the self-loosening, if no self-locking screws are used.

The user must equip the couplings with stable protective covers in order to protect the couplings against falling objects. Openings for the necessary heat discharging can be arranged in these protective covers. Protective covers of couplings intended for use in the mining industry (Equipment Group I) must withstand higher mechanical loads than the protective covers of couplings intended for use in the other industries (Equipment Group II). Detailed notes for the design of the protective cover are given in the Operating-/Installation Instructions.

The protective cover must be electrically conductive and must be included in the equipotential bonding.

If the couplings are used in dust explosion hazardous areas, the operator has to observe, that no dusts in dangerous quantities can accumulate between protective cover and coupling. The coupling must not run in a dust deposit.

For the use of the couplings in the mining industry, the user is obliged to observe the specifications of the national regulations for the mining industry, which are valid for the respective operating area.

[18] Essential safety and health requirements

Confirmed by compliance with standards (see [9]).

[19] Confirmation of the deposit of documents according to Annex VIII of Directive 94/9/EC

It is confirmed, that the documents pursuant to Annex VIII of the Directive 94/9/EC for the non-electrical product of the Category 2 mentioned under [4] are deposited under No IB-08-4-020 at the NOTIFIED BODY IBExU (EC-Identification No 0637). The deposit of the documents is carried out according to the regulations of Directive 94/9/EC, item 8 (1) b) ii).

Freiberg, 12th December 2008


(Prof. Dr. Redeker)