



[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 of 23 April 2010)**

[3] Type Examination Certificate Number: **IBExU04ATEXB023 X**

[4] Component: **Permanent magnetic couplings MINEX® - S**  
Sizes 22 to 165

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

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

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

[8] IBExU Institut für Sicherheitstechnik GmbH certifies that the component mentioned in [4] has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of the component intended for use in potentially explosive atmospheres given in Annex II to the Directive 94/9/EC.  
The test results are recorded in the Test Report IB-04-4-027 of 28 October 2004.

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

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

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

[12] The marking of the Permanent magnetic couplings mentioned in [4] shall include the following:

 **II 2G c IIC T X**

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Freiberg, 28 October 2004

By order

  
(Dipl.-Ing. Willamowski)

**Schedule**

**IBExU**  
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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.

[13]

**Schedule**

[14] to **TYPE EXAMINATION CERTIFICATION IBExU04ATEXB023 X**

[15] **Description**

The Permanent magnetic couplings of the series **MINEX® - S** are intended for the installation in machines such as pumps and agitators.

The Permanent magnetic couplings consist essentially of the following members:

- External rotor
- Containment shroud
- Internal rotor

The containment shroud is provided with a flange which is screwed on to the machine together with an interposed sealing element. The internal rotor is normally fixed by means of a hub with tongue and groove joint on the shaft of the machine to be driven. The external rotors of the smaller sizes (to SB 60/8) are provided with a directly fixed hub with feather keyway/slot joint. From size SA 75/10 upwards the external rotors are prepared for the equipment with a flange hub for the attachment on the shaft of the machine to be driven.

The hubs and the containment shroud are predominantly constructed of the following materials:

- |                       |                |   |
|-----------------------|----------------|---|
| - External rotor:     | hub, ring      | steel (355J2G3)   |
| - Containment shroud: | flange         | stainless steel (1.4571)  |
|                       | shroud         | stainless steel (1.4571),<br>from size SA 75 upwards also Hastelloy |
| - Internal rotor:     | magnetic cover | stainless steel (1.4571)  |
|                       | hub            | stainless steel (1.4571)  |

The coupling hubs are finish-bored by the manufacturer.

The maximum operational speed is specified by the manufacturer with 3600 min<sup>-1</sup>.

The operating temperature range of the Permanent magnetic couplings is from -30 °C to +150 °C (NdFeB) resp. +250 °C (Sm<sub>2</sub>Co<sub>17</sub>) depending on the material used for the permanent magnets.

For the safe use of the Permanent magnetic couplings in explosion hazardous areas, the manufacturer stipulates in the operating/installation instructions that

- the temperature at the Permanent magnetic couplings must permanently be controlled during the operation and the temperature monitoring system must automatically trigger switching off the drive before reaching the maximum permissible surface temperature and that
- the heat at the Permanent magnetic couplings caused by eddy-current losses must continuously be discharged (for example by means of a split stream of the conveying medium at pumps or a sealing liquid).

The Permanent magnetic couplings are not prepared by the manufacturer for the installation of temperature sensors.

Further details are contained in the documents of the manufacturer which are part of the Test Report IB-04-4-027.

[16] **Test Report**

The test results are recorded in the Test Report IB-04-4-027 of 28 October 2004.

**Summary of test results:**

The Permanent magnetic couplings of the designs mentioned in [4] meet as component the requirements for non-electrical equipment of Equipment Group II, Category 2G.

The Permanent magnetic couplings are protected by the type of protection "c" (Protection by constructional safety).

They fulfil the requirements for use in Explosion Group IIC (and so also the requirements for the Explosion Groups IIB and IIA).

The maximum permissible surface temperatures for use of the couplings in hazardous areas are kept by the stipulated temperature monitoring system which automatically triggers switching off the drive before reaching the specified temperature below the maximum permissible surface temperature.

[17] **Special conditions for safe use**

The operating/installation instruction for the Permanent magnetic couplings contain corresponding notes for the operator for the safe use of the Permanent magnetic couplings in explosive areas. Since the Permanent magnetic couplings are intended as a component for the installation in devices (machines), the manufacturer must either give the operating instruction for the Permanent magnetic couplings to the operator or the safety instructions furthermore to be observed by the operator have to be taken into the instructions of the device (machine).

**It is particularly pointed out to the following:**

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

The Permanent magnetic couplings may be operated in explosive areas only with temperature monitoring systems which automatically switch off the drive when reaching a defined temperature.

**The temperature monitoring system must trigger the switching off the drive at the following temperature differences:**

- **Temperature measurement with resistance thermometers (as PT 100) in a blind hole in the flange of the containment shroud**  
 $\Delta T = 15 \text{ K}$  below the maximum surface temperature permitted for the respective explosive area
- **Temperature measurement with resistance thermometers (as PT 100) direct on the surface of the containment shroud**  
 $\Delta T = 10 \text{ K}$  below the maximum surface temperature permitted for the respective explosive area
- **Temperature measurement with thermocouples direct on the casing of the containment shroud**  
 $\Delta T = 5 \text{ K}$  below the maximum surface temperature permitted for the respective explosive area

The temperature monitoring system must meet the requirements of the Directive 94/9/EC.

The following shut-off temperatures result from the afore-mentioned specifications under consideration of the maximum surfaces temperatures which are permitted for the respective Temperature Classes:

Temperature Class	Max. permissible surface temperature in °C	Shut-off temperature in °C		
		at temperature measurement with resistance thermometers		at temperature measurement with thermocouples direct on the surface of the containment shroud
		in a blind hole in the flange of the containment shroud	direct on the surface of the containment shroud	
T1	450	250 ) <sup>1</sup>	250 ) <sup>1</sup>	250 ) <sup>1</sup>
T2	300	250 ) <sup>1</sup>	250 ) <sup>1</sup>	250 ) <sup>1</sup>
T3	200	185 ) <sup>2</sup>	190 ) <sup>2</sup>	195 ) <sup>2</sup>
T4	135	120	125	130
T5	100	85	90	95
T6	85	70	75	80

Explanations:

)<sup>1</sup> At use of the magnetic material Sm<sub>2</sub>Co<sub>17</sub> the technically conditional shut-off temperature is +250 °C.

)<sup>2</sup> At use of the magnetic material NdFeB the technically conditional shut-off temperature is +150 °C.

The Permanent magnet couplings must be cooled by a split stream of the conveying medium or by a sealing liquid.

Only screws specified by the manufacturer are allowed for the assembly of screw connections. When tightening the screws, the torque specified by the manufacturer has to be kept. All screw connections have to be protected against self-loosening, if no self-locking screws are used.

The user has to provide Permanent magnetic couplings with stable covers in order to protect the couplings against falling objects.

The covers must be electrically conductive. They must be included in the compensation of potential.

**[18] Essential safety and health requirements**

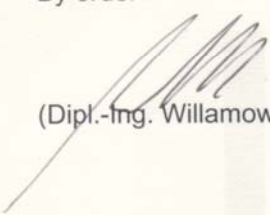
Confirmed by compliance with standards (see [9]).

**[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 component mentioned in [4] are deposited under No. IB-04-4-027 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).

By order

Freiberg, 28 October 2004

  
(Dipl.-Ing. Willamowski)