



[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 **IBExU04ATEXB020 U** | Issue 3

[4] Component: **Series Permanent Magnetic Couplings**
Types DST 27 to 200

[5] Manufacturer: **DST Dauermagnetic-SystemTechnik GmbH**

[6] Address: **Hönnestraße 45**
58809 Neuenrade
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-21-2-0097 of 12 July 2021.

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

[10] The sign "U" placed after the certificate number indicates that this certificate must not be mistaken for a certificate intended for an equipment or protective system. This partial certificate may be used as a basis for certification of an equipment or protective system.

[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:

II 2G Ex h IIC T6 .. T1 Gb X
-40 °C ≤ T_E ≤ +350 °C

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By order

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.

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[13] **Schedule**

[14] **Certificate number IBExU04ATEXB020 U | Issue 3**

[15] **Description of product**

The permanent magnetic couplings are torque-actuated couplings and are assigned to the category of engaging and disengaging couplings. They transmit the torque synchronously by means of magnetic field lines up to the maximum torque (breakaway torque) and ideally run below the breakaway torque in synchronous operation (input speed is equal to the output speed).

With permanent magnetic couplings, the torque of the driving unit is transmitted to the output side by magnetic force without any contact. The outer rotor directly transmits the driving torque of the motor to the inner rotor. The split-case is located between the permanent magnetic rotors on the input side and output side. It serves as a static seal and acts like a partition wall. Instead of dynamic shaft seals (e.g.: mechanical seals, stuffing box packings), static seals (e.g.: flat seals or O-rings) are required for sealing the split-case.

For the sizes DST 27 to DST 165 with different split-case materials, several investigations have been carried out and ignition hazard assessments are already available. The results can be partially transferred to the couplings of size DST 200. A complete transfer as in series with formally the same characteristics is not possible with the permanent magnetic couplings because of the design-related maximum possible gap dimensions. The inner rotor is usually fixed to the shaft of the machine to be driven by means of a hub with key/groove connection. The outer rotor of the smaller sizes (DST 27) is provided with a directly attached hub with key/groove connection. From size DST 45, the outer rotor is prepared for the attachment of a flange hub (motor hub) for fastening on the shaft of the driving machine.

The following materials are mainly used:

- Outer rotor: 1.0570 (St52-3) / 1.4571
- Split-case: 1.4571 / 2.4610 (Alloy C-4, Hastelloy 2.4610), 1.4980 and 3.7165, ceramics (Mg-PSZ), PEEK or two-layer carbon-fibre reinforced plastics (outside) and PTFE-L (inside)
- Inner rotor: 1.0570 (St52-3) encapsulated in 1.4571

The selection of the materials for the media-contacted parts is essentially determined by their resistance to various substances. In addition to the materials already mentioned, material 1.4404 is also used.

The coupling hubs are predrilled by the manufacturer.

The individual magnetic elements of the multipole permanent magnetic coupling are produced from permanent magnetic materials based on samarium cobalt or neodymium-iron-boron.

The operating temperature of the permanent magnetic couplings ranges from -40 °C to +350 °C.

The permanent magnetic couplings are not prepared to be fitted with temperature sensors as standard.

More details can be found in the manufacturer's documents, which are part of the test reports IB-04-4-013, IB-04-4-033, IB-16-4-006, IB-18-2-0146 and IB-20-2-0162.

Variations compared to issue 2 of this certificate:

Variation 1

The size DST 200 has been added.

[16] **Test report**

The test results are recorded in the confidential test report IB-21-2-0097 of 2021-07-12.

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

Summary of the test results

The permanent magnetic couplings in the designs mentioned in [4] fulfil as component the requirements for non-electrical products of equipment group II, category 2G. They are designed in type of protection "Ex h" (protection by constructional safety "c").

The permanent magnetic couplings fulfil the requirements of explosion group IIC (and therewith also of explosion groups IIB and IIA).

The maximum permissible surface temperatures for operation of the permanent magnetic couplings in hazardous areas are monitored by means of a specified temperature monitoring system. The monitoring system will automatically switch off the driving machine when the set temperature value below the maximum permissible surface temperature is reached. When operated without temperature monitoring, the maximum surface temperatures as listed in the instruction manual must be observed.

[17] Specific conditions of use

The "Operating and Installation Instructions" to be enclosed with each permanent magnetic coupling gives the user essential instructions for a safe operation of the permanent magnetic couplings in hazardous areas. The user must strictly observe these instructions. As the permanent magnetic couplings are intended as component for the installation in devices (machines), the manufacturer of the machines must either pass on the instruction manual to the users of the permanent magnetic couplings, or he must incorporate the instructions and safety requirements to be observed by the user in the instruction manual to be prepared for the complete device (machine).

The following essential instructions must be particularly observed:

The permanent magnetic couplings may only be used if their materials are resistant to mechanical and/or chemical effects and corrosion under the respective operating conditions, so that the explosion protection is always maintained.

The permanent magnetic couplings with conductive split-cases, where heating due to the occurrence of eddy currents is to be expected, are always to be
- installed with a temperature monitoring system for the automatic switch-off when a specified temperature is reached.

Temperature monitoring for ceramic or non-conductive split-cases that are not susceptible to eddy currents is not necessary.

The recommended limit values for the switch-off can be found in the test report and the instruction manual of the component. The design of the temperature monitoring system must be functionally safe and must meet the requirements of Directive 2014/34/EU.

The permanent magnetic couplings can be cooled by a partial flow of the pumped fluid medium or by the cooling of the outer rotor.

Only screws specified by the manufacturer may be used for the screw connections to be assembled. When tightening the screws, the torque specified by the manufacturer must be observed. The screws must be secured against self-loosening unless self-locking screws are used.

The adjustment and alignment of the permanent magnetic couplings may only be carried out with the aids provided for this purpose as specified in sect. 4.3 of the instruction manual and in compliance with all instructions.

The user must provide the permanent magnetic couplings with compact covers to protect them, from the point of view of explosion protection, in particular against falling objects. The cover must be electrically conductive and integrated into the equipotential bonding and it must have a distance of min. 5 mm to moving parts. Removal of the cover is only permitted when the machine is at a standstill.

Strong mechanical vibrations that can lead to contact with coupling parts or vibration heating must be avoided.

[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: none

[19] Confirmation of storage of the technical documentation in accordance with Annex VIII of Directive 2014/34/EU

It is confirmed that the technical documentation as set out in Annex VIII of Directive 2014/34/EU for the non-electrical component mentioned in [4] is stored at the Notified Body IBExU (EU Identification no. 0637) in accordance with the regulations of Directive 2014/34/EU, Article 13 (1) b) ii) (processing no. IB-21-2-0097).

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By order


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Freiberg, 2021-07-15