

ICS 73.100.99
CCS D 98

MT

**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

MT/T 1041.4-2011

**Specification for adjustable speed electrical equipment of
shearer - Part 4: Switched reluctance drive
(English Translation)**

Issued on: April 12, 2011

Implemented on: September 1, 2011

**Issued by: State Administration of Work Safety of the People's Republic
of China**

Table of Contents

Foreword...	3
1 Scope...	4
2 Normative references...	4
3 Terms and definitions...	5
4 Requirements...	5
5 Test methods...	15
6 Inspection rules...	24
7 Marking...	26
Bibliography...	28

1 Scope

This Part of MT/T 1041 specifies the requirements, test methods, inspection rules and marking for switched reluctance drive of shearer's travel unit.

This Part applies to on-board and off-board switched reluctance drive of shearer's travel unit (hereinafter referred to as switched reluctance drive).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition dated applies to this document. For undated references, the latest edition of the referenced documents (including all amendments) applies to this document.

GB/T 2423.4-2008, Environmental testing for electric and electronic products -

Part 2. Test method - Test Db. Damp heat, cyclic (12h+12h cycle)

GB 3836.1-2000, Electrical apparatus for explosive gas atmospheres - Part 1.

General requirements

GB 3836.2-2000, Electrical apparatus for explosive gas atmospheres - Part 2.

Flameproof enclosure d

GB 3836.4-2000, Electrical apparatus for explosive gas atmospheres - Part 4.

Intrinsic safety i

GB 4208-2008, Degrees of protection provided by enclosure (IP code)

GB 8286-2005, Mining flameproof movable substations

GB/T 12668.2-2002, Adjustable speed electrical power drive systems - Part 2.

General requirements - Rating specifications for low voltage adjustable frequency a.c. power drive systems

GB/T 12668.3-2003, Adjustable speed electrical power drive systems - Part 3.

EMC product standard including specific test methods

4.3.1 Flameproof enclosure

4.3.1.1

The enclosure of switched reluctance drive shall be manufactured using steel plates or cast steel.

4.3.1.2 The joining surfaces of the flameproof enclosure of switched reluctance drive

shall be as specified in Clause 5 of GB 3836.2-2000.

4.3.1.3 The flameproof performance of the enclosure of switched reluctance drive shall be as specified in GB 3836.2-2000, which is capable of withstanding the enclosure pressure test specified in 15.1, and the non-propagation explosion test of internal ignition specified in 15.2, of GB 3836.2-2000.

4.3.1.4 The enclosure of switched reluctance drive shall be subjected to the static pressure test according to 15.1.2.1 or 16.3 of GB 3836.2-2000, after finish machining.

There shall be no structural damage in the enclosure during the test, not any permanent deformation which may influence the flameproof performance.

4.3.2 Cable entry device

4.3.2.1

The cable entry device of switched reluctance drive shall be as specified in Clause 16 of GB 3836.1-2000 and Clause 12 of GB 3836.2-2000.

4.3.2.2

The cable entry device of switched reluctance drive shall be capable of withstanding the clamping test specified in Annex D to GB 3836.1-2000 and the flameproof cable entry device test specified in Annex D to GB 3836.2-2000.

4.3.2.3

The rubber sealing ring of the cable entry device of switched reluctance drive shall be capable of withstanding the ageing test of elastic sealing ring materials specified in Annex D to GB 3836.1-2000.

4.3.3.1 The terminal compartments and the terminal blocks in the terminal

compartments of switch reluctance drive shall be as specified in Clause 14 of GB 3836.1-2000.

4.3.3.2 The insulated bushings of the terminal blocks of switched reluctance drive shall be as specified in Clause 11 of GB 3836.1-2000.

4.3.4.1 The installation of the flameproof enclosure's viewing window (display window)

and the materials of clear parts shall be as specified in Clause 8 of GB 3836.2-2000.

4.3.4.2 The clear parts shall be capable of withstanding the impact test specified in 23.4.3.1 of GB 3836.1-2000.

ne - the rotational speed when the output torque of switched reluctance drive is the rated torque at the same given output rotational speed corresponding to n_{10} , in r/min;

n_{max} - when the given output rotational speed is not greater than the rated rotational speed, it is the rated rotational speed; when the given output rotational speed is greater than the rated rotational speed, it is 120% of the rated rotational speed, in r/min.

4.4.3.4 Speed regulation properties of constant torque and constant power

Switched reluctance drive shall be designed that 100 r/min ~ the rated rotational speed is the constant-torque speed regulation segment (corresponding to the working traction speed) and that greater than the rated rotational speed ~ 120% of the rated rotational speed is the constant power speed regulation segment (corresponding to the working traction speed).

The speed regulation properties of switched reluctance drive within the specified speed regulation range shall be as specified in Item 3 of Table 5 of MT/T 81-1998, i.e. within the constant torque speed regulation segment of 100 r/min ~ the rated rotational speed, its output torque shall achieve the rated torque (with the tolerance of + 8% ~ -3% of the rated value), and the rotational speed shall decrease automatically when exceeding the rated rotational speed; within the constant power speed regulation segment above the rated rotational speed, its output power shall achieve the rated power (with the tolerance of + 8% ~ -3% of the rated value), i.e. its output torque shall achieve the torque converted from the

rated power and output rotational speed, and the rotational speed shall decrease automatically when exceeding the rated power.

4.4.4 Deceleration time

Switched reluctance drive shall be capable of reducing its motor's rotational speed from the rated rotational speed to zero within 10 s, and its d.c. return circuit will not generate overvoltage alarms.

4.4.5 Double-quadrant operation

Switched reluctance drive shall have the double-quadrant operation function at least and shall meet the requirements specified in 4.4.3 and 4.4.4 in the two directions of forward direction (quadrant I) and reverse direction (quadrant III).

4.4.6 Four-quadrant operation

Switched reluctance drive of four-quadrant operation shall meet the requirements of 4.4.3 and 4.4.4 in quadrants I and III. In addition, it shall also have the re-generation (braking) function in quadrants II and IV and specify its braking torque (braking power) in relevant product standards. The speed regulation properties in the braking operating state shall be as specified in 4.4.3; the braking torque (braking power) shall not be lower than the specified value.

the test required by electromagnetic emission as specified in Clause 6 of GB 12668.3-2003.

4.4.13.1 The cooling water channel of switch reluctance drive with the enclosure water

cooling shall be designed properly with adequate heat exchange, ensuring cooling water flows smoothly. When the flow of cooling water achieves the design requirement, the pressure drop at the inlet-outlet shall not be greater than 0.3 MPa.

4.4.13.2 Cooling water channel shall be capable of withstanding the hydraulic test of 1.5 times of the maximum working pressure, without leakage and detrimental deformation.

4.5 Appearance

4.5.1

The paint on the surface of switched reluctance drive shall be dry and full.