

MT/T 575-2011

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NATIONAL COAL INDUSTRY STANDARD
OF THE PEOPLE'S REPUBLIC OF CHINA

ICS 29.160.30; 29.260.20

K 25

Record No.: 31808-2011

MT/T 575-2011

Replacing MT/T 575-1996

**YBRB Series Flameproof Three
Phases Asynchronous Motor for Pump**

YBRB 系列泵用隔爆型三相异步电动机

Issued on: April 12, 2011

Implemented on: September 01, 2011

Issued by: State Administration of Work Safety

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YBRB Series Flameproof Three Phases Asynchronous Motor for Pump

1 Scope

This Standard specifies the type and basic parameters, technical requirements, test methods, inspection rules, marking, package and storage of YBRB series flameproof three phases asynchronous motor for pump (hereinafter referred to as motor).

This Standard is applicable to the emulsion pumping station and spray pump; while the motor used for coal mining machine, heading machine and other similar mining machinery oil pump can use for reference.

2 Normative References

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this document.

GB/T 191-2008 Packaging - Pictorial Marking for Handling of Goods

GB 755-2008 Rotating Electrical Machines - Rating and Performance

GB/T 997-2008 Rotating Electrical Machines - Classification of Types of Construction, Mounting Arrangements and Terminal Box Position (IM Code)

GB/T 1032-2005 Test Procedures for Three-Phase Induction Motors

GB/T 1993-1993 Cooling Methods for Rotating Electrical Machines

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 3836.3-2000 Electrical Apparatus for Explosive Gas Atmospheres - Part 3: Increased Safety e

GB/T 4772.1-1999 Dimensions and Output Series for Rotating Electrical Machines -Part 1: Frame Numbers 56 to 400 and Flange Numbers 55 to 1 080

GB/T 4942.1-2006 Degrees of Protection Provided by the Integral Design of Rotating Electrical Machined (IP Code)-Classification

GB 10068-2008 Mechanical Vibration of Certain Machines with Shaft Heights 56 Mm and Higher-Measurement Evaluation and Limits of Vibration Severity

GB/T 10069.1-2006 Measurement of Airborne Noise Emitted by Rotating Electrical Machines and the Noise Limits Part 1: Method for the Measurement of Airborne Noise Emitted by Rotating Electrical Machines

GB/T 10111-2008 Generation of Random Numbers and Procedures Applied to Sampling Inspection for Product Quality

AQ 1043-2007 Mining Products Safety Label

JB/T 9615.1-2000 Test Methods of the Interturn Insulation on Random Wound Winding for AC Low-Voltage Machines

JB/T 9615.2-2000 Test Limits of the Interturn Insulation on Random Wound Winding for AC Low-Voltage Machines

JB/T 10098-2000 Impulse Voltage Withstand Levels of Rotating A.C. Machines with Form-Wound Stator Coils

3 Type and Basic Parameters

3.1 Type

3.1.1 The motor shall be manufactured into flameproof type according to the provisions of GB 3836.2-2000, its anti-explosion mark is Exd I.

3.1.2 The overall structural protection rating of the motor shall conform to the IP55 specified in GB/T 4942.1-2006.

3.1.3 The cooling method of the motor shell water-cooled or air-cooled, which shall conform to the provisions of GB/T 1993-1993; while the cooling method shall be marked as IC3W7 or IC0141.

3.1.4 The structure and installation type of the motor are IMB3, IMB5 as specified in GB/T 997-2008; other suitable installation type can also be available. The base

- b) The ambient air temperature shall not exceed 40°C; the ambient temperature for water-cooling shall be no less than 0°C; while the ambient temperature for air-cooling shall be no less than -20°C.
- c) The relative humidity of the air shall be no greater than 95% (at 25°C);
- d) Coal mining underground working face containing methane and with coal dust explosion hazard;
- e) The inlet water temperature for cool water shall not exceed 25°C;
- f) The working pressure of the cooling water channel shall not exceed 3.0MPa;
- g) The flowrate of the cooling water shall be no less than the provisions of Table 1.

NOTE: If the altitude or ambient temperature of the operation site or test site is different from the provisions of 4.2, the temperature-rise limit can be corrected according to the provisions of GB 755-2008.

4.3 Water-cooled motor shall be able to start and operate directly under the conditions of guaranteed cooling water flowrate.

4.4 The motor shall be allowed to start directly within the rated voltage range.

4.5 The deviation between power supply, voltage and the rated values during the operating period of the motor shall conform to the provisions of GB 755-2008.

4.6 The anti-explosion structure of the motor shall meet the requirements of GB 3836.1-2000 and GB 3836.2-2000.

4.7 The motor shall be cable of withstanding the shell pressure test (static pressure test or dynamic pressure test) and internal ignition non-explosion test specified in GB 3836.2-2000.

4.8 The cable entry device of the motor shall be conducted clamping test according to the provisions of GB 3836.1-2000; and shall also be conducted sealing and mechanical strength tests according to the provisions of GB 3836.2-2000.

4.9 The sealing ring of the motor shall be conducted aging test of the elastic sealing ring material according to the provisions of GB 3836.1-2000.

4.10 The electrical clearance and creepage distance in the junction box of the motor shall meet the requirements of 4.3, 4.4 in GB 3836.3-2000; the grounding bolts shall be set as required. The grounding mark shall be placed near the grounding bolts; such mark shall not be worn out during the entire life of the motor.

4.11 The wiring terminal of junction box shall be conducted insulating casing torsion

5 Test Methods

5.1 The power supply during the test of the motor shall be subjected to the provisions of 4.2 in GB/T 1032-2005; while the measuring instrument shall be subjected to the provisions of 4.3 in GB/T 1032-2005.

5.2 The measurement of motor winding insulation resistance shall be as specified in 5.1 of GB/T 1032-2005.

5.3 The measurement of DC resistance with motor winding in the actual cold state shall be as specified in 5.2 of GB/T 1032-2005.

5.4 Check the motor appearance dimension and installation dimension as per the method specified by the measuring instrument manufacturer.

5.5 When verifying whether the cooling channel of the water-cooled motor is unobstructed, provide cooling water to the water-cooled motor, so that its flowrate reaches the specified value in Table 1.

5.6 When the motor cooling water channel is conducted the pressure test, block the water outlet of the water channel; raise the water pressure on the water inlet to the test required value for 5min; the water pressure shall not reduce; meanwhile check whether there is leakage. Check the motor appearance dimension after the test as per the method specified by the measuring instrument manufacturer.

5.7 The no-load test of the motor shall be carried out as per the provisions of Clause 6 in GB/T 1032-2005. Meanwhile check the running condition and rotation direction of the motor bearing. When checking the rotation direction, please pay attention to making the power phase sequence consistent with the mark alphabetical order on the output wire end.

5.8 The locked-rotor test of the motor shall be as specified in Clause 7 of GB/T 1032-2005.

5.9 The motor load test, determination of various losses, efficiency and power factor shall be as specified in Clauses 8, 9, 10 of GB/T 1032-2005.

5.10 The motor temperature-rise test (thermal test) shall be as specified in Clause 11 of GB/T 1032-2005.

5.11 The maximum torque of the motor shall be measured as specified in Clause 12 of GB/T 1032-2005.

5.12 The minimum torque during the starting process of the motor shall be measured as specified in Clause 13 of GB/T 1032-2005.

5.13 Motor overspeed test shall be conducted as specified in 14.1 of GB/T 1032-2005.

5.14 Motor short-term over-torque test shall be conducted as specified in 14.4 of GB/T 1032-2005.

5.15 Motor withstand voltage test shall be conducted as specified in 14.5 of GB/T 1032-2005.

5.16 The inter-turn insulation test of AC low-voltage random winding motor shall be conducted as specified in JB/T 9615.1-2000.

5.17 The withstand impact voltage level test of the AC motor consisting of the stator-formed coil shall be as specified in JB/T 10098-2000.

5.18 The measurement and evaluation of the motor vibration shall be conducted as specified in GB 10068-2008.

5.19 The measurement of motor noise shall be as specified in GB/T 10069.1-2006.

5.20 Motor alternation damp heat test shall be conducted as specified in GB/T 2423.4-2008.

5.21 When motor is conducted water-interrupting test, firstly run to the hot stable state by the rated value; then cut off the cooling water source (maintaining the accumulative water in the cooling water channel of the motor); continue to run 10min by the rated value; measure the temperature on the stator winding end by the embedded thermometer.

5.22 The overall structural protection rating test of the motor shall be as specified in GB/T 4942.1-2006.

5.23 The anti-explosion structure inspection, internal ignition non-explosion test, and shell pressure test (static or dynamic pressure test) of the motor shall be as specified in GB 3836.2-2000.

5.24 The clamping test and sealing performance test of cable entry shall be as specified in GB 3836.1-2000 and GB 3836.2-2000.

5.25 Elastomeric sealing ring material aging test shall be as specified in GB 3836.1-2000.

5.26 Electrical connector, i.e. the torsion test of the wiring terminal insulating bush shall be as specified in GB 3836.1-2000.

5.27 The electrical clearance and creepage distance of the motor junction box shall be measured as specified in GB 3836.3-2000.

unqualified items, double the sampling quantity for reinspection. If there are still unqualified items, then such batch of products are judged unqualified.

7 Markings, Package and Storage

7.1 The motor shall be provided with anti-explosion mark “Exd I” and the mine product safety mark “MA” in the obvious position of the main part. The marking shall be considered to be clear and durable in the presence of possible chemical corrosion. Its mark Ex, anti-explosion type, category can be marked with embossed or concave marks on the obvious position of the shell. The preparation of the mine product safety mark “MA” shall conform to the provisions of AQ 1043-2007.

7.2 The nameplate shall be made of the chemically resistant materials, such as bronze, brass or stainless steel. The method of scribing shall be such that the wiring is not easily erased during the entire use of the motor. The nameplate shall be installed in the obvious position of the motor body.

7.3 The items to be marked on the nameplate shall be as follows:

- a) The name of the manufacturer;
- b) The name and model of the motor;
- c) Anti-explosion mark;
- d) Degree of protection;
- e) Work system;
- f) Rated power;
- g) Rated frequency;
- h) Rated voltage;
- i) Rated current;
- j) Rated speed;
- k) Thermal grading;
- l) Wiring method;
- m) Cooling water flowrate (water-cooled motor);
- n) Cooling water pressure (water-cooled motor);

- o) Exit-factory date and number;
- p) Standard number;
- q) Anti-explosion certificate number;
- r) Safety mark number;
- s) Quality.

7.4 The product manual and product certificate of the motor shall be provided to the user along with each motor.

7.5 The output shaft of the motor shall be protected; the installation and fitting surface of the motor shall take anti-rust and protective measures; these measures shall be easily removed during the motor installation period.

7.6 When the water-cooled motor leaves the factory or is stored, take anti-rust measures and that prevent water channel from freezing in the cooling water channel; discharge all water from the channel; the inlet and outlet shall be equipped with sealing plugs.

7.7 The motor shall be packaged to ensure that it shall not be damped or damaged due to poor package within one year since the date of shipment under normal storage and transportation conditions. The motor shall be fixed and non-moveable in the package box.

7.8 The text and logo on the outer wall of the package box shall be clear and tidy. The following items shall be marked on the two easily-observable surfaces of the package box:

- a) The names of the delivery station and manufacturer;
- b) The names of the receiving station and receiving organization;
- c) Motor model and product number;
- d) Net weight of the motor and gross weight together with the package;
- e) Appearance dimension of package box;
- f) Words and graphics such as “careful handling”, “no moisture”, “no tumbling” shall be marked; the graphics shall conform to the provisions of GB/T 191-2008.

7.9 The motor shall be placed in air-circulated and dry zone; preventing the moisture, corrosion and other damage.

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