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Specification for YS Series Three-phase Asynchronous Motors

YS 系列三相异步电动机技术条件

[Replaced by JB/T 1009-2016]

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Foreword

This Standard supersedes JB/T 1009-1991 *Specification for YS Series Three-phase Asynchronous Motors*.

Compared with JB/T 1009-1991, this Standard has the following main changes:

- In 4.4 of "Technical Requirements", guaranteed values of 6-pole and 8-pole motor power factor are lowered appropriately.

- In 4.10 of "Technical Requirements", assessment requirements for Grade F insulation are added and the information for the mounting method in the note is deleted.

- In 4.15 and 4.17 of "Technical Requirements", limit value of tripping current for withstand voltage test is added.

- In 4.16 of "Technical Requirements", process inspection is allowed to replace finished product inspection in inter-turn impulse withstand voltage test.

- In 4.21 of "Technical Requirements", the requirement "the mark shall not be placed on screw, dismountable gasket or dismountable spare parts used as connecting wire" is added.

- In 4.22 of "Technical Requirements", relevant requirements for creepage distance and electric clearance are added, i.e. "electric clearance of motor shall not be less than 3.0mm, and creepage distance shall not be less than 4.0mm."

- In "Inspection Rules" in 6.7 of JB/T 1009-1991, "samples for type test are taken according to JB/DQ 3619." is changed to "three samples for type inspection shall be randomly taken from products qualified in exit-factory inspection".

- In 7.2 of "Marking and Packaging", "j) efficiency" is added.

This Standard was proposed by China Machinery Industry Federation.

This Standard is under the jurisdiction and explanation of Subcommittee on Small-Power Machine of National Technical Committee on Rotating Machinery of Standardization Administration of China (SAC/TC 26/SC1).

Main drafting organizations of this Standard: Guangzhou Electric Apparatus Research Institute, Wolong Electric Group Co. Ltd., Guangzhou Miniature Electrical Machine Factory Co. Ltd., Kaiping Sanwei Micromotor Co. Ltd., Tianjin Tianhong Micromotor Co. Ltd., Foshan Nanhai Nanyang Electric Appliance & Motor Co. Ltd., Beijing Jingye Electric Group, Nanjing Nanwei Electric motor Co. Ltd., Mindong Electric, Guangdong Zhaoqing Electric Machinery Co. Ltd.

Specification for YS Series Three-phase Asynchronous Motors

1 Scope

This Standard specifies YS series three-phase asynchronous motor in terms of type, basic parameters and dimension, requirements, test methods, inspection rules and requirements for marking and packaging.

This Standard is applicable to YS series three-phase asynchronous motor (frame size 45-90) (hereinafter referred to as motor), and all other series motors derived from YS series three-phase asynchronous motor may also refer to this Standard.

2 Normative References

The following standards contain provisions which, through reference in this Standard, constitute the provisions of this Standard. For dated reference, the subsequent amendments to (excluding correction to), or revisions of any of these publications do not apply. However, the parties reaching to an agreement based on this Standard are encouraged to investigate whether the latest editions of the standards apply. For undated references, the latest editions of the normative documents referred to apply.

GB/T 191-2000	Packaging - Pictorial Marking for Handling of Goods (eqv ISO 780:1997)
GB 755-2000	Rotating Electrical Machines - Rating and Performance (idt IEC 60034-1:1996)
GB/T 1032-2005	Test Procedure for Three-phase Induction Motors
GB/T 2828.1-2003	Sampling Procedures for Inspection by Attributes - Part 1: Sampling Schemes Indexed by Acceptance Quality Limit(AQL) for Lot-by-Lot Inspection (ISO 2859-1:1999, IDT)
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 1080 (idt IEC 60072-1:1991)
GB/T 4942.1-2006	Degrees of Protection Provided by the Integral Design of Rotating Electrical Machines (IP Code) - Classification (IEC 60034-5:2000, IDT)
GB 10069.1-2006	Method for the Measurement of Airborne Noise Emitted by Rotating Electrical Machines Part 1: Method for the

If the altitude or ambient air temperature at the operation site differs from those that specified in 4.2, the temperature rise limit shall be corrected according to Table 8 in GB 755-2000.

4.11 Where the three-phrase power supply is balanced, the deviation between any one phase among the three-phase no-load current and the mean value of these three phases shall not be greater than 10% of this mean value.

4.12 Under thermal state or under the condition that the torque is increased gradually, the motor shall be able to withstand over-torque test with 1.6 times the rated torque, and be free of sudden change and stalling in rotation speed within 15s. During the test, the voltage and frequency shall be at rated values.

4.13 Under no-load condition, the motor shall be able to withstand the overspeed test for 2min, in a speed of 120% of its rated value, without injurious deformation.

4.14 The insulation resistance of motor stator winding to enclosure and that between windings shall not be less than 1.0 MΩ at thermal state or after temperature rise test, or shall not be less than 20 MΩ at normal state.

4.15 Motor stator winding shall be able to withstand 1min withstand voltage test at 50Hz voltage frequency without breakthrough and the sinusoidal waveform shall be available as much as possible. The capacity of test equipment is not less than 0.5kVA. The effective value of voltage is 1760V and tripping current shall not be greater than 10mA.

During inspection test for motors massively and continuously produced in large quantity, test duration is allowed to be shortened to 1s, the effective value of test voltage is 2110V, and the test voltage is applied by test bar.

4.16 Motor stator winding shall be able to withstand interturn insulation impulse withstand voltage test without breakdown, and voltage peak in the impulse test is 2500V. Voltage rising test is permissible and after the test, the motor winding shall not be damaged. The test is carried out for 3min when the motor is in no load and a 130% of rated voltage is applied. When the voltage is raised to 130% of rated voltage, the frequency is permissible to be raised, but it shall not exceed 115 % of the rated valve.

During impulse withstand voltage test, process inspection for stator winding is allowed to replace the exit-factory inspection for the motors, but explicit and reliable measures shall be taken to prevent winding insulation from being damaged during the subsequent production and mounting.

4.17 After damp heat test, insulation property of motors shall meet the following requirements:

a) The insulation resistance of motor winding to enclosure and that between

three-phase power supply, and observed from the shaft extension end, the motor shall be in clockwise rotation.

4.25 Operation instructions (at least one copy for the batch of motors of the same type to the same user) and product certificate for motor shaft extension's flat key shall be supplied to the user along with each motor.

5 Test Methods

5.1 The tests listed in 6.1.1 [excluding e) interturn impulse withstand voltage test] and 6.2.2 (excluding tests in i) and j)) are carried out according to GB/T 1032. The interturn impulse withstand voltage test in 6.1.1e) is carried out according to JB/T 9615.1 and JB/T 9615.2. 6.2.2 i) is carried out according to GB 10069.1. 6.2.2j) is carried out according to JB/T 10490. The inspection on mounting dimension and tolerance as specified in 6.1.2 is carried out according to GB/T 4772.1.

5.2 During type test, withstand voltage test of stator winding to enclosure and that between windings shall be conducted after the motor temperature rise is stable and after insulation resistance measurement, overspeed test and temporary over-torque test of the stator winding.

5.3 Enclosure protection level test and damp heat test of the motors may be conducted in case of construction type approval or significant change of construction and technology. The enclosure protection level test is carried out according to GB/T 4942.1 while damp heat test is conducted according to GB/T 12665.

6 Inspection Rules

Motor inspection is divided into exit-factory inspection and type inspection.

6.1 Exit-factory inspection

6.1.1 Each motor shall not leave the factory until being qualified in the exit-factory inspection and shall be accompanied by product certificate.

6.1.2 Exit-factory inspection items include:

a) Mechanical inspection (according to 6.1.2 and 6.1.3);

b) Determination of the insulation resistance of the stator winding to enclosure and that between the windings;

c) Determination of DC resistance of stator winding at actual cold state;

d) Withstand voltage test;

e) Interturn impulse withstand voltage test or voltage rising test of the stator winding;

f) Determination of no-load current and loss (no load characteristic curve needs to be measured during type inspection);

g) Determination of locked-rotor current and loss (during cold state).

6.1.3 Mechanical inspection items of motor include:

a) Rotation inspection: the motor shall rotate stably, smoothly and quickly, free from any stagnation and the sound is uniform and tuneful without harmful noise.

b) Appearance inspection: inspect whether the motor assembling is intact and correct, and the motor surface paint shall be dry, intact and uniform without stains, damage or crack.

c) Inspection on mounting dimension, boundary dimensions and dimensions of key: both mounting and boundary dimensions shall meet the requirements of 3.8.1, while the dimensions of key shall meet the requirements of 3.8.2.

d) Inspection on the circular runout tolerance, the parallelism tolerance and flatness tolerance of foot supporting surface and the symmetry tolerance of key groove: The circular runout tolerance shall meet the requirements of 3.8.3 and 3.8.4. The parallelism and flatness tolerance of the foot supporting surface shall respectively meet the requirements of 3.8.5 and 3.8.6. The symmetry tolerance of key groove shall meet the requirements of 3.8.7. The flatness tolerance of the foot supporting surface and the symmetry tolerance of key groove may be inspected on spare parts.

6.14 During exit-factory inspection, items in b) and c) in 6.1.2, c) and d) in 6.1.3 may be inspected randomly according to the method formulated by the manufacturer according to GB/T 2828.1.

6.2 Type inspection

6.2.1 Type inspection shall be carried out under one of the following conditions.

a) If the manufacturer conducts trial manufacture or small-lot trial production for the first time after identification and approval;

b) If the changes in the design or technology of motor are sufficient to cause the change of some characteristics and parameters;

c) If impermissible deviation occurs between the inspection test results and

previous type test results;

d) Periodical random inspection for mass produced motors once annually; if too many samples are needed for the test, interval time for the test may be duly postponed, but at least once for every two years.

6.2.2 Type inspection items of motor include:

a) All items of the exit-factory inspection;

b) Determination of locked-rotor torque and current (during cold state);

c) Temperature rise test;

d) Determination of efficiency and power factor;

e) Short-time over-torque test;

f) Determination of maximum torque;

g) Determination of minimum torque during startup;

h) Overspeed test;

i) Determination of noise;

j) Determination of vibration.

6.2.3 Three samples for type inspection shall be randomly taken from the products qualified in exit-factory inspection.

If construction material and technology are almost the same for the same kind of motors, typical specification may be selected for common property test items such as damp heat test.

7 Marking and Packaging

7.1 The nameplate material shall ensure the data on nameplate are durable throughout the whole service life of the motor.

7.2 Nameplate shall be fixed on the upper half of motor frame, on which the following items shall be indicated:

a) Manufacturer's name;

b) Motor name;

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