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Technical Specification for YY Series Permanent-split Capacitor Asynchronous Motors

YY 系列电容运转异步电动机 技术条件

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Technical Specification for YY Series Permanent-split Capacitor Asynchronous Motors

1 Scope

This Standard specifies the types, basic parameters and dimensions, technical requirements, test methods, inspection rules, marking, packaging, storage and transportation of YY series permanent-split capacitor asynchronous motors.

This Standard is applicable to YY series permanent-split capacitor asynchronous motors (frame No.: 45 ~ 90) (hereinafter referred to as motors). All kinds of motors derived from this series of motors may also take this Standard as a reference.

2 Normative References

The following documents are indispensable to the application of this document. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 755 *Rotating Electrical Machines - Rating and Performance*

GB/T 2828.1-2012 *Sampling Procedures for Inspection by Attribute - Part 1: Sampling Schemes Indexed by Acceptance Quality Limit (AQL) for Lot-by-lot Inspection*

GB/T 5171.1-2014 *Small Power Motors - Part 1: General Technical Requirements*

GB/T 5171.21-2016 *Small Power Motors - Part 21: General Test Methods*

GB 12350-2009 *Safety Requirements of Small-power Motors*

GB/T 22719.2-2008 *Interturn Insulation of Random-wound Winding for AC Low-voltage Electrical Machines - Part 2: Test Limits*

GB/T 32891.1-2016 *Rotating Electrical Machines - Efficiency Classification (IE code) - Part 1: Grid-fed AC Motors*

3 Types, Basic Parameters and Dimensions

3.1 The enclosure protection class of the motors is IP44, IP54 and IP55.

3.2 The cooling methods for the motors: IC 411 for 63 and above frame; IC 410 for 56

- The altitude does not exceed 1,000 m;
- The highest ambient air temperature changes with the seasons, but does not exceed 40 °C;
- If the motors are designated to be used at an altitude of more than 1,000 m or an ambient air temperature of above 40 °C, it shall be handled in accordance with the stipulations of GB/T 755-2008;
- The lowest ambient air temperature is -15 °C;
- The monthly average maximum relative humidity of the wettest month is 90%, and the monthly average minimum temperature of that month is not higher than 25 °C.

4.3 During the operation of the motors, the deviation of the power supply voltage and frequency from the rated value shall comply with the stipulations of GB 5171.1-2014.

4.4 When the power, voltage and frequency of the motors are rated values, the guaranteed values of the efficiency and power factor shall comply with the stipulations of Table 14 in this Standard. The efficiency classification of the motors shall comply with the requirements of GB/T 32891.1-2016 and be indicated on the nameplate, as it is shown in 7.2 j) of this Standard.

NOTE: in terms of motors with a protection class of IP54 and IP55, when measuring their efficiency, the shaft sealing device may be removed for testing.

- a) Mechanical inspection (in accordance with the stipulations of 6.1.3 and 6.1.4);
- b) The determination of insulation resistance of the stator winding to the casing and the windings;
- c) The determination of DC resistance of stator winding in actual cold state;
- d) Stator winding interturn insulation impulse voltage resistance test or elevated voltage test (the interturn insulation impulse voltage resistance test may be implemented during the production process);
- e) Voltage withstand test;
- f) The determination of no-load current and loss (during type inspection, the no-load characteristic curve shall be taken);
- g) The determination of locked-rotor current and loss (determined in cold state).

6.1.3 The mechanical inspection items of the motors include:

- a) Rotation inspection: when the motor rotates, it shall be smooth and brisk, without stagnation; the sound shall be uniform and harmonious, without harmful noise.
- b) Appearance inspection: check whether the motor assembly is complete and correct; the surface paint of the motor shall be dry, complete, uniform, and free from stains, collision damages or cracks, etc.
- c) Inspection of installation dimensions, overall dimensions and key dimensions: the installation dimensions and overall dimensions shall comply with the stipulations of 3.8 a); the key dimensions shall comply with the stipulations of 3.8 b).
- d) Inspection of circular run-out, parallelism and flatness of the bottom supporting surface and symmetry of the keyway: the circular run-out shall comply with the stipulations of 3.8 c and 3.8 d; the parallelism and flatness of the bottom supporting surface shall respectively comply with the stipulations of 3.8 e) and 3.8 f); the symmetry of the keyway shall comply with the stipulations of 3.8 g). The flatness of the bottom supporting surface and the symmetry of the keyway are allowed to be inspected on the parts.

6.1.4 During exit-factory inspection, 6.1.2 b), 6.1.2 c), 6.1.3 c) and 6.1.3 d) in this Standard may be spot-checked. The spot-check method may be formulated by the manufacturer in accordance with the stipulations of GB/T 2828.1-2012.

6.2 Type Inspection

6.2.1 Under any of the following situations, type inspection must be performed:

- After appraisal and finalization, the manufacturer conducts the first trial production or small-batch trial production.
- When changes in motor design or process are sufficient to cause changes in certain properties and parameters.
- When the exit-factory results and the previous type inspection results manifest an inadmissible deviation.
- Sampling inspection of motors produced in batches shall be conducted once a year. When the size of sampling inspection is excessively large, the interval between the sampling inspections may be properly prolonged, but at least once every two years.

6.2.2 The type inspection items of the motors include:

- All items of exit-factory inspection;
- Determination of locked-rotor torque (determined in cold state);
- Temperature-rise test;
- Determination of efficiency and power factor;
- Short-time over-torque test;
- Determination of maximum torque;
- Determination of minimum torque during the starting process;
- Overspeed test;
- Determination of vibration and noise;
- Determination of voltage of the starting capacitor end.

6.2.3 In terms of the samples for the type inspection, three samples shall be randomly taken from the products that have passed the exit-factory inspection. In the same type of motors, for those with basically the same structural materials and processes, the selection of typical specifications is allowed for the common test items, for example, damp heat test.

7 Marking, Packaging, Storage and Transportation

7.1 The method of marking the nameplate material and the data on the nameplate shall ensure that the writing is not easy to be worn out during the whole service period of the motors.

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