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Hermetic motor-compressors for room air conditioners

房间空气调节用全封闭型电动机-压缩机

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Hermetic motor-compressors for room air conditioners

1 Scope

This document specifies the terms and definitions, product classification, technical requirements, test methods, inspection rules, marking, packaging, transportation, storage requirements for hermetic motor-compressors for room air conditioners.

This document applies to hermetic motor-compressors for room air conditioners, which use the refrigerants R22, R410A, R32, R290 (hereinafter referred to as compressors, including rotor compressors and scroll compressors).

The similar compressor, which use other types of refrigerants, can make reference to this standard.

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) is applicable to this standard.

GB/T 1019 General requirements for the package of household and similar electrical appliances

GB/T 4214.1-2017 Test method for noise of household and similar electrical appliances - General requirements

GB/T 5773 The method of performance test for positive displacement refrigerant compressors

GB/T 7725 Room air conditioners

GB/T 9237 Refrigerating systems and heat pumps - Safety and environmental requirements

IEC 60335-2-34:2016 Household and similar electrical appliances - Safety - Part 2-34: Particular requirements for motor compressors

Variable capacity compressor

A compressor, whose working capacity is changed by mechanical and (or) electrical means.

3.7

Annual performance factor of compressor

When the compressor is tested according to the prescribed test method, the performance index, that reflects the compressor's annual operating energy efficiency, which is obtained by referring to the calculation method of the annual performance factor of the air conditioner.

Note: Refer to Appendix A for the test method of the annual performance factor of the speed controllable compressor.

4 Product classification

4.1 According to structure type, it can be divided into:

a) Rotor compressor;

b) Scroll compressor.

4.2 According to the type of power supply, it can be divided into:

a) Single-phase power compressor;

b) Three-phase power compressor.

4.3 According to the type of speed control, it can be divided into:

a) Fixed speed compressor;

b) Speed controllable compressor.

4.4 According to the change of cylinder capacity, it can be divided into:

a) Fixed capacity compressor;

b) Variable capacity compressor.

5 Requirements

5.1 Product technical specifications

value of the compressor, when it is running under the test conditions.

6.5 Noise measurement

This document adopts GB/T 4214.1-2017, as the method for determining the noise level of the compressor's A-weighted sound power level.

The fixed-speed compressor is tested at the rated frequency. The speed controllable rotor compressor is tested at 60 Hz. The speed controllable scroll compressor is tested at 60 Hz (or 90 Hz). The variable capacity compressor is tested at full capacity AND 60 Hz.

The compressor under test is placed in an occasion, that meets the requirements of the test environment in 4.4.1 of GB/T 4214.1-2017. The test environment is a semi-anechoic chamber. The compressor shall be equipped with its own damping pad. Place it on a rigid platform (with fixing bolts), in the center of the semi-anechoic chamber. The mass of the rigid platform shall be more than 10 times the mass of the compressor under test. The compressor is connected to the alternative cooling system, which is outside the semi-anechoic chamber, by a non-rigid connecting pipe. Alternative outdoor refrigeration system. The recommended alternative refrigeration system is as shown in Figure 2.

The compressor is vacuumed AND filled with a suitable refrigerant. Run the compressor. Adjust the condensing temperature (dew point temperature), to stabilize it at 54.4 °C ± 0.3 °C. Adjust the evaporation temperature (dew point temperature), to stabilize it at 7.2 °C ± 0.2 °C. Adjust the thermostatic control water valve, to make the return air temperature reach to the suction temperature, which is same as that in the refrigeration capacity test. The system enters a steady state for 30 min.

After the system is stable, it may start to measure the A-weighted sound pressure level AND noise value, at each point, according to the provisions of GB/T 4214.1-2017. Then calculate the average A-weighted sound pressure level's noise value of the measured surface. Calculate the compressor's A-weighted sound power level's noise value.

Appendix B

(Informative)

Special technical requirements for variable capacity compressors

B.1 Requirements

B.1.1 Product technical specifications

Except for the following content, the clause 5.1 is applicable.

For the variable capacity compressors, it should indicate the cylinder's working volume, refrigerant, cooling capacity, input power, working current, coefficient of performance and other values, during full capacity operation; meanwhile it shall indicate such parameters as the starting method of the compressor, the cylinder's working volume, cooling capacity, coefficient of performance of variable capacity operation mode, for user's reference.

For the variable-capacity compressors, it should indicate the range of pressure conditions for full-capacity operation and variable-capacity operation. If it is a speed-controllable compressor at the same time, it includes the frequency range of full-capacity operation and variable-capacity operation.

When the variable-capacity compressor changes the working volume, it should clarify the pressure, frequency and other conditions, during the switching. The user shall install the corresponding switching control device, in accordance with the requirements specified by the compressor manufacturer.

B.1.2 Ambient temperature to which the compressor is suitable for the air conditioner

The content of 5.2 applies.

B.1.3 Requirements for use performance

B.1.3.1 Cooling capacity and coefficient of performance

Carry out the test, according to the method specified in B.2.2. The measured cooling capacity is not less than 95% of its nominal value. The measured coefficient of performance of the compressor is not less than the corresponding limit, which is specified in 5.3.1 for the speed controllable compressor.

B.1.3.2 Starting performance

When the variable capacity compressor is started, it shall be carried out in the

The content of 6.1 applies. Meanwhile, the variable capacity compressor should be equipped with a switching control device to change the working volume. The compressor volume shall be changed, according to the test conditions and the needs of the test items.

B.2.2 Test of refrigeration capacity and coefficient of performance

Test according to GB/T 5773. The test conditions meet the requirements of Table 10. The suction temperature is consistent with the nominal test temperature of the product. The fixed speed compressor is tested at the rated frequency. The speed controllable compressor is tested at the rated frequency (or speed). Measure the compressor, respectively at 100% rated cooling capacity and another partial load rate (which is consistent with the nominal partial load rate of the compressor manufacturer). Take the cooling capacity, under 100% load rated conditions, as the actual measured cooling capacity of the compressor. Take the average value of the coefficient of performance, under two loads, as the measured coefficient of performance of the compressor.

B.2.3 Starting performance test

The content of 6.3 applies.

B.2.4 Measurement of input power and working current

The content of 6.4 applies.

B.2.5 Noise measurement

The content of 6.5 applies.

B.2.6 Vibration measurement

The content of 6.6 applies.

B.2.7 Test of airtightness of enclosure

The content of 6.7 applies.

B.2.8 Determination of residual moisture of whole machine

The content of 6.8 applies.

B.2.9 Detection of internal impurity content of whole machine

The content of 6.9 applies.

B.2.10 Accelerated life test

The content of 6.10 applies.

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