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

GB 19153-2019

**Minimum allowable values of energy efficiency and energy
efficiency grades for displacement air compressors**

容积式空气压缩机能效限定值及能效等级

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Foreword

This Standard was drafted as per the rules specified in GB/T 1.1-2009. This Standard replaced GB 19153-2009 Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for Displacement Air Compressors. Compared with GB 19153-2009, this Standard has the following major technical changes besides the editorial modifications.

- Adjust the scope of the standard (see Clause 1 of this Edition; Clause 1 of 2009 Edition);
- Change the terms from actual volume flow rate to volume flow rate of packaged compressor; from input power of air compressor to power of air compressor; from input specific power of air compressor to the specific power of air compressor (see 3.1, 3.2, 3.3 of this Edition; 3.1, 3.2, 3.3 of 2009 Edition);
- Add the definition of variable speed rotary air compressor (see 3.5 of this Edition);
- Delete the target energy efficiency limit value of air compressor and the energy saving evaluation value of air compressor (3.5, 3.6 of 2009 Edition);
- Increase the energy efficiency indicators for some products (see Table 1, Tables 3~6 of this Edition; Tables 1~7 of 2009 Edition);
- Add the energy efficiency evaluation of variable speed oil-injected rotary compressor (see 4.2 of this Edition);

--- Unify the energy efficiency indicators of general-use oil-injected screw air compressor, oil-injected scroll air compressor, oil-injected vane air compressor into the energy efficiency indicators of general-use oil-injected rotary air compressor (see Tables 1 and 2 of this Edition; Tables 6 and 7 of 2009 Edition);

--- Unify the energy indicators of miniature, general-use reciprocating piston air compressor into the energy efficiency indicators of reciprocating piston air compressor (see Table 3 of this Edition; Tables 3 and 5 of 2009 Edition);

1 Scope

GB 19153-2019 is the Chinese national standard on minimum allowable values of energy efficiency and energy efficiency grades for displacement air compressors, in the field of energy and heat transfer engineering. It carries no /T suffix, which in the Chinese system means compliance is mandatory: a product or a practice within its scope has to meet it to be lawfully made, sold or carried out in China. It was issued on 31 December 2019 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 July 2020. Classification: ICS 27.010, CCS F01. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This Standard specifies the energy efficiency grades, energy efficiency limit values, test and calculation methods for the displacement air compressors. This Standard is applicable to.

- a) General-use oil-injected rotary air compressors (including general-use oil-injected screw air compressors, general-use single-screw air compressors, general-use oil-injected vane air compressors and oil-injected scroll air compressors with drive motor power of 1.5kW~630kW, exhaust pressure of 0.25MPa~1.4MPa;
- b) General-use variable-speed oil-injected rotary air compressors (including general-use variable-frequency oil-injected screw air compressors and integrated permanent-magnet variable-frequency screw air compressor) with drive motor power of 2.2kW~315kW, exhaust pressure of 0.25MPa~1.4MPa;
- c) General-use reciprocating piston air compressors (including miniature reciprocating piston air compressors and general-use fixed reciprocating piston air compressors) with driving motor power of 0.75kW~75kW and exhaust pressure of 0.25MPa~1.4MPa;
- d) Oil-free reciprocating piston air compressor with drive motor power of 0.55kW~22kW and exhaust pressure of 0.4MPa ~ 1.4MPa;
- e) Directly drive portable reciprocating piston air compressor.

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 3853 Displacement Compressor - Acceptance Tests
 GB/T 4975 Displacement Compressors Vocabulary - General
 GB/T 13279 Stationary Reciprocating Piston Air Compressor for General Use
 GB/T 13928 Reciprocating Piston Micro Air Compressor
 GB/T 26967 Oil Injected Single Screw Air Compressor for General Use
 JB/T 4253 Oil Flooded Sliding Vane Air Compressor for General Use
 JB/T 6430 Oil Injected Screw Air Compressor for General Use

3 Terms and Definitions

For the purpose of this document, the terms and definitions given in GB/T 3853, GB/T 4975, GB/T 13279, GB/T 13928, GB/T 26967, JB/T 4253, JB/T 6430, JB/T 7662, JB/T 8933, JB/T 8934, JB/T 9107, JB/T 10972, JB/T 11423 and JB/T 13345 and the following apply.

3.1 Volume flow rate of packaged compressor The actual air volume flow at the standard exhaust position of the air compressor unit, which is converted to the full temperature, full pressure, and component status of the standard intake position.

3.3 Specific energy requirement of a packaged compressor; input specific power Under specified operating conditions, the ratio of the power of the air compressor unit to the volumetric flow rate of the unit.

3.4 Minimum allowable values of energy efficiency for air compressor The maximum unit specific power allowed by the air compressor under specified conditions.

3.5 Variable speed rotary air compressor The air compressor, during the running process, the speed of the main drive motor is automatically adjusted through technologies such as frequency conversion to achieve a change in volume flow.

4 Energy Efficiency Grades

4.1 The energy efficiency grade of air compressors is divided into 3 grades, of which Grade-1 has the highest energy efficiency. The energy efficiency value of each grade of the air compressor under the specified operating conditions shall be no greater than the values

specified in Tables 1~6.

4.2 The energy efficiency grades of all types of air compressors shall comply with the provisions in Tables 1~6 among them.

4.3 When determining the energy efficiency grade of the air compressor, it shall be evaluated according to the corresponding energy efficiency index of the rated power column of the drive motor, and it shall meet the following requirements.

5 Energy Efficiency Limit Values

The energy efficiency limit value of the air compressor shall be no greater than Grade- 3 in Tables 1 ~ 6.

6 Test and Calculation Methods

6.1 Specified working conditions The specified working conditions of the air compressor include.

6.2 Test method The air compressor energy efficiency test is performed as specified in GB/T 3853; and the suction temperature shall be measured in the range of 5°C ~ 40°C.

6.3 Input specific power

6.4 Volume flow rate of the compressor The test on the volume flow rate of the air compressor shall be as specified in GB/T 3853.

6.5 Input power of air compressor

6.5.1 The test on input power of air compressor shall be as specified in GB/T 3853.

6.6 Conversion between input specific power and isentropic efficiency, transmission power efficiency If the conversion between input specific power and isentropic efficiency, transmission power efficiency is required, see Appendix A.