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MECHANICAL INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

JB/T 6430-2014

Replacing JB/T 6430-2002

Oil injected screw air compressor for general use

一般用喷油螺杆空气压缩机

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Table of Contents

Foreword.....	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	6
4 Model and basic parameters	6
5 Requirements	8
6 Test methods	12
7 Inspection rules	13
8 Marking, packaging and storage	16
APPENDIX A (Normative) Compressed air dew point temperature diagram .	18
APPENDIX B (Normative) Allowable eccentricity	19
Figure A. 1 Compressed air dew point temperature.....	18
Figure B. 1 Allowable eccentricity	20
Table 1 Performance parameters (I).....	6
Table 2 Cooling water amount.....	8
Table 3 Performance parameters (II).....	9
Table 4 Cleanliness values	12
Table 5 One-off sampling plan	15

Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces JB/T 6430-2002 “Oil injected screw air compressor for general use”. As compared with JB/T 6430-2002, the main technical changes are as follows:

- UPDATE the normative references;
- EXPAND the application scope of this standard;
- ADD the performance parameters of the screw air compressor for which the exhaust pressure is 0.3 MPa and 0.5MPa;
- ADJUST and IMPROVE the performance parameters of the screw air compressor for which the exhaust pressure is 0.7 MPa ~ 1.25 MPa;
- ADD the energy efficiency requirements for screw air compressors;
- ADD the automatic protection device requirements of the screw air compressor.

This standard was proposed by the China Machinery Industry Federation.

This standard shall be under the jurisdiction of the National Compressor Standardization Committee (SAC/TC 145).

The drafting organizations of this standard: Wuxi Compressor Co., Ltd., Nanjing Compressor Co., Ltd., Zhejiang Kaishan Compressor Co., Ltd., Zhejiang Hongwuhuan Group Co., Ltd.

The main drafters of this standard: Zhu Weiyu, Tan Mengxu, Jin Hongchun, Zhu Jianguo, Jiang Jianjiang, Zhou Yun, Zhang Kaichuang, Yao Chunzan, Jie Zhengyi, Hong Liangkun.

This standard replaces the standard previously issued as follows:

- JB/T 6430-1992; JB/T 6430-2002.

Oil injected screw air compressor for general use

1 Scope

This standard specifies the terms and definitions, models, basic parameters, requirements, test methods, inspection rules, marking, packaging and storage of oil injected screw air compressors for general use (hereinafter abbreviated as "screw air compressors").

This standard is applicable to the fixed and the modified mobile screw air compressor for general use for which the driver power is 2.2 kW ~ 630 kW AND the rated exhaust pressure is 0.3 MPa (0.5 MPa), 0.7 MPa (0.8 MPa), 1.0 MPa and 1.25 MPa.

The other screw air compressors for which the rated exhaust pressure is not more than 1.6 MPa can also make reference to this standard.

This standard does not apply to the variable frequency oil injected screw air compressor for general use.

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 standard.

GB 150 (all parts) Pressure vessels

GB 151 Tubular heat exchanger

GB/T 3480.5 Calculation of load capacity of spur and helical gears - Part 5: Strength and quality of materials

GB/T 3853-1998 Displacement compressor - Acceptance tests

GB/T 4975 Displacement compressor vocabulary - General

GB/T 4980 Determination of sound level for noise emitted by displacement compressors

GB/T 5330-2003 Industrial woven metal wire cloth (square opening series)

GB/T 6388 Shipping packaging and shipping signs

GB/T 7777 Measurement and evaluation of mechanical vibration of displacement compressors

GB/T 10095.2-2008 Cylindrical gears - System of accuracy - Part 2: Definitions and allowable values of deviations relevant to radial composite deviations and runout information

GB/T 13306 Plate

GB/T 14295 Air filters

GB 19153 Minimum allowable values of energy efficiency and energy efficiency grades for displacement air compressors

GB 22207 Safety requirements of displacement air compressors

JB/T 2589 Displacement compressors - Methods for model designation

JB/T 3771 Specifications for the portable compressor chassis

JB/T 6431 Gray iron castings for displacement compressor - Specification

JB/T 6441 Safety valves for compressor

JB/T 6908 Steel forgings for displacement compressors

JB/T 7662 Displacement compressor vocabulary - Rotating compressor

JB/T 7663.1 Packaging technical conditions of displacement compressors

JB/T 7663.2 Coating specifications for displacement compressors

JB/T 9104 The technical specification for spheroidal graphite iron castings of displacement compressors

NB/T 47006 Aluminum Plate-fin heat exchanger

TSG R0003 Simple pressure vessels safety and technical regulations

TSG R0004 Supervision regulation on safety technology for stationary pressure vessel

5 Requirements

5.1 Screw air compressors shall comply with the provisions of this standard, AND be manufactured in accordance with the drawings and technical documents as approved.

5.2 The specified operation conditions of the screw air compressor are:

- a) Suction pressure: 0.1 MPa (absolute pressure);
- b) Suction temperature: 20 °C;
- c) Suction relative humidity: 0;
- d) Water-cooled screw air compressor cooling water inlet temperature: 15 °C;
- e) Water-cooled screw air compressor oil cooler cooling water shall comply with the provisions of Table 2, in the unit of liters per cubic meter (L/m³);
- f) Air-cooled screw air compressor cooling air temperature: the ambient temperature at which the suction temperature is 20 °C, in the unit of degree Celsius (°C);
- g) Exhaust pressure: in accordance with Table 1, in the unit of Megapascal (MPa);
- h) Rotation speed: the rated speed as specified in the product technical document, in the unit of revolutions per minute (r/n).

Table 2 Cooling water amount

Rated exhaust pressure MPa	0.3 (0.5)	0.7 (0.8)	1.0	1.25
Cooling water amount under specified operating conditions	3.2	4.0	4.8	5.6

5.3 The actual volume flow of the screw air compressor under the specified conditions shall not be less than 95% of the nominal volume flow.

5.4 The specific power and noise sound power of the screw air compressor under the specified conditions shall no be greater than the provisions of Table 3.

5.5 The energy efficiency of the screw air compressor shall comply with the provisions of GB 19153.

5.6 The vibration intensity of the screw air compressor shall comply with the requirements of GB/T 7777.

5.7 The lubricant consumed per each cubic meter of volume flow of the screw air compressor shall not be greater than 30 mg.

5.8 The safety requirements of the screw air compressor shall follow the provisions of GB 22207.

5.9 When the temperature of the primary air suction is 40 °C, the inlet water temperature of the cooling water is less than or equal to 30 °C, AND the exhaust pressure is the nominal value, the exhaust temperature shall be not greater than 110 °C. However, the minimum temperature of each stage of compressed air shall not be lower than its dew point (SEE Appendix A). Under the conditions that there is after-cooler, the exhaust temperature of the water-cooled screw air compressor shall be not greater than 40 °C.

5.10 The screw air compressor shall be reasonable in overall layout AND stable and reliable in operation.

5.11 The suction inlet of the screw air compressor shall be equipped with an air filter (filter) which complies with the requirements of GB/T 14295.

5.12 The screw air compressor shall be equipped with a check valve OR minimum pressure valve to prevent oil backflow, AND such valves shall be sensitive and reliable.

5.13 The screw air compressor shall be equipped with a safety valve which complies with the provisions of JB/T 6441 and TSG ZF001.

Table 3 Performance parameters (II)

5.20 When the screw air compressor is equipped with the after-cooler, it shall also be equipped with the condensate discharge device.

5.21 It is not allowed for the outside of the screw air compressor to have sharp edges or protruding dangerous parts; AND its exposed motion components shall have security guards.

5.22 The pressure bearing parts such as the enclosure, exhaust end cover, exhaust cavity, and oil pump, etc., shall be subjected to the hydraulic test at the pressure not less than 1.5 times of the rated exhaust pressure, AND they shall have no leakage after 30 min.

5.23 When the screw air compressor is equipped with gearbox, its shell shall be subjected to leakage test using kerosene, which lasts for 2 h, AND there shall be no leakage.

5.24 The pressure vessel of the screw air compressor shall comply with the provisions of GB 150 and TSG R0004 (or TSG R0003), of which the steel tubular heat exchanger shall also comply with the provisions of GB 151, AND the aluminum plate-fin heat exchanger shall also comply with the provisions of NB/T 47006.

5.25 Gray iron parts of the screw air compressor shall comply with the provisions of JB/T 6431, AND nodular cast iron parts shall comply with the provisions of JB/T 9104.

5.26 The forging parts of the screw air compressor shall comply with the provisions of JB/T 6908.

5.27 The rotor outer circle, surface, tooth socket, and the main journal surface shall be free from cracks, cold septum, shrinkage, porosity, inclusions and other defects which may affect the quality; AND the friction surface shall have no dents, burrs and damages.

5.28 The gear materials and heat treatment quality inspection shall comply with the provisions of GB/T 3480.5. The gear accuracy shall not be less than the class 6 requirements in GB/T 10095.2-2008.

5.29 The rotor shall be subjected to a dynamic balancing test in which the balance accuracy class shall be not less than G 6.3, AND the allowable eccentricity e of the unit rotor mass shall comply with the provisions of Appendix B.

6.2 The performance test of the screw air compressor shall follow the provisions of GB/T 3853-1998.

6.3 The energy efficiency measurement of screw air compressor shall follow the provisions of GB 19153.

6.4 The vibration test of screw air compressor shall follow the provisions of GB/T 7777.

6.5 The noise measurement of screw air compressor shall follow the provisions of GB/T 4980.

6.6 The cleanliness inspection of screw air compressor shall be conducted as follows:

- a) DISMANTLE the screw compressor; USE the cleaning agent to clean the host inside, gear surface, acceleration box, oil filter, oil cooler, oil tank, and other main part cavity;
- b) USE the copper wire mesh which complies with GB/T 5330-2003 and has the basic opening size of 0.08 mm to filter the cleaning agent; AND HEAT the filtered debris to 80 °C; and MAKE it subjected to drying for 1 h;
- c) With respect to the dried residues, USE the common balance not less than class 7 of accuracy to weigh it; and the weighed mass is the cleanliness value of the screw air compressor.

7 Inspection rules

7.1 Inspection type

The inspection types include:

- a) Type test;
- b) Sampling inspection;
- c) Ex-factory inspection.

7.2 Type test

7.2.1 The prototype screw air compressor (including the new product or the old product manufactured by another factory) shall be subjected to type test. During

7.4.2 The contents and requirements of the ex-factory inspection shall meet the following provisions:

- a) CHECK the assembly quality, working conditions, and correctness of mutual action of each part and component;
- b) In accordance with the provisions of Appendix C of GB/T 3853-1998, at the rated exhaust pressure, MEASURE the actual volume flow, exhaust pressure, and shaft power, AND the measurement results shall comply with this standard and the relevant technical documents.
- c) CHECK the volume flow automatic adjustment system and the safety valve.

8 Marking, packaging and storage

8.1 Each screw air compressor shall be, at a flat and obvious location, fixed with a product nameplate, the dimensions of which shall comply with the provisions of GB/T 13306.

At a minimum, the following information shall be indicated on the nameplate:

- a) Product model;
- b) Product name;
- c) Nominal volume flow, in the unit of cubic meters per minute (m^3/min);
- d) Rated exhaust pressure, in the unit of Megapascal (MPa);
- e) Shaft power or drive motor power, in the unit of kilowatts (kW);
- f) Dimensions (length $\times$ width $\times$ height), in the unit of millimeters (mm);
- g) Net mass, in the unit of kilograms (kg);
- h) Ex-factory number;
- i) Ex-factory date;
- j) The name and address of manufacturer.

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