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**Evaluation of energy performance of motor system**

电机系统能效评价

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# Evaluation of energy performance of motor system

## 1 Scope

This Standard specifies evaluation levels, evaluation procedures for energy performance of motor system.

This Standard is applicable to evaluation of the energy efficiency of the stable running motor system (hereinafter referred to as the system) composed of small and medium-sized electric motors (below 1000kW), single driving equipment (fan, pump, air compressor) and its control device, transmission device and pipe network. Other complex motor systems, motor system stations can use this document as reference.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 12497, *Three-phase induction motors economic operation*

GB/T 13466, *The general principles of economic operation for AC driven fan (pump air compressor) system*

GB/T 13469, *Economical operation for centrifugal, mixed flow and axial flow pump systems*

GB/T 13470, *Economical operation for the fan system*

GB/T 15913, *Monitoring and testing for energy saving of fan's unit and distribute tube system*

GB/T 16665, *Monitoring and testing for energy saving of air compressor unit and air distribution system*

GB/T 16666, *Monitoring and testing for energy saving of motor-pump liquid transport system*

GB 17167, *General principle for equipping and managing of the measuring instrument of energy in organization of energy using*

GB 18613, *Minimum allowable values of energy efficiency and values of efficiency grades for motors*

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

GB 19761, *Minimum allowable values of energy efficiency and energy efficiency grades for fan*

GB 19762, *The minimum allowable values of energy efficiency and evaluating values of energy conservation of centrifugal pump for fresh water*

GB/T 21056, *Specification for adjustable speed drive systems of electricity conservation with VF for fans and pumps*

GB/T 26921, *The guide of design optimization for motor systems (fans, pumps, air compressors)*

GB/T 27883, *Economical operation for displacement air compressor system*

GB 28381, *Minimum allowable values of energy efficiency and evaluating values of energy conservation for centrifugal blower*

GB/T 29314, *Specification for the Reconstruction of Motor System for Energy-saving*

GB 30253, *Minimum Allowable Values of Energy Efficiency and Energy Efficiency Grades for Permanent Magnet Synchronous Motors*

GB 30254, *Minimum Allowable Values of Energy Efficiency and the Energy Efficiency Grades for Cage Three-phase High Voltage Induction Motor*

GB/T 30256, *Technical Requirements of Measurement and Verification of Energy Savings, Pumped Liquid Delivery System*

GB/T 30257, *Technical Requirements of Measurement and Verification of Energy Savings, Fan System*

GB 32029, *Minimum allowable values of energy efficiency and energy efficiency grades for small-size submersible motor-pumps*

GB 32030, *Minimum allowable values of energy efficiency and energy efficiency grades for submersible pumps for deep well*

GB 32031, *Minimum allowable values of energy efficiency and energy efficiency grades for waste submersible motor-pumps*

GB 32284, *Minimum allowable values of energy efficiency and energy efficiency grades for petrochemical centrifugal pumps*

- c) Relevant test, evaluation and verification reports;
- d) Operating procedures, operation records, maintenance records and other technical data;
- e) Personnel qualification certificates, training records;
- f) Energy-saving retrofit certification documents and others.

## **5.4 Evaluation implementation**

**5.4.1** The operator or management party of the motor system shall ensure that the operation of the system complies with the requirements of laws, regulations and mandatory standards such as safety, energy saving and environmental protection.

**5.4.2** The evaluation agency or personnel shall evaluate the energy efficiency of the motor system according to the scoring index system and scoring method given in Annex A and give quantitative results.

**5.4.3** The evaluation agency or personnel shall give scores by consulting and checking design documents, statistical reports, original records, declaration documents, analysis/test reports, relevant third-party certification certificates and other supporting materials. Relevant evaluation information can also be collected through discussions, field investigations, sample surveys, and field tests. Each scoring result shall be supported by documented information. The score for the scoring item without corroborating materials is 0.

**5.4.4** The evaluation agency or personnel can give suggestions on energy-saving measures in terms of system optimization and transformation, strengthening management based on the scoring results.

## **5.5 Preparation of evaluation report**

The content of the evaluation report shall include:

- a) A brief description of the evaluation work process;
- b) Evaluation of the implementation team;
- c) Scope of evaluation;
- d) Evaluation of the list of information collected;
- e) Description of the score sheet and the certified materials;
- f) Energy efficiency rating and comprehensive score;
- g) Recommendations for energy saving measures;

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