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GB/T 1971-2021 / IEC 60034-8:2014

Replacing GB/T 1971-2006

Rotating Electrical Machines – Terminal Markings and Direction of Rotation

(IEC 60034-8:2014, Rotating Electrical Machines –

Part 8: Terminal Markings and Direction of Rotation, IDT)

旋转电机 线端标志与旋转方向

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Foreword

This Document was drafted as per the rules specified in GB/T 1.1-2020 *Directives for Standardization – Part 1: Rules for the Structure and Drafting of Standardizing Documents*.

This Document replaced GB/T 1971-2006 *Rotating Electrical Machines – Terminal Markings and Direction of Rotation*. Compared with GB/T 1971-2006, the major technical changes of this Document are as follows besides the structural adjustments and editorial modifications:

a) Add the primary winding of the synchronous motor (see 6.5.1 of this Edition);

b) Add the excitation winding of the synchronous motor (see 6.5.2 of this Edition);

c) Add permanent magnet synchronous motor (see 6.5.3 of this Edition);

d) Revise Figures 16 and 24, changing the symbol X into A (see Figures 16 and 24 of this Edition; Figures 16 and 24 of 2006 Edition);

e) Add Figure A.11 "Variable Torque, Dual Voltage (1:$\sqrt{3}$), Nine Terminals" in the Annex (see Annex A of this Edition);

f) Revise the symbol of the shunt winding terminal in Figures A.22 and A.23 in the Annex from F to E (see Annex A of this Edition; Annex A of 2006 Edition).

This Document equivalently adopts IEC 60034-8:2014 *Rotating Electrical Machines – Part 8: Terminal Markings and Direction of Rotation*.

The Chinese documents that have a consistent correspondence with the international documents cited in this document are as follows:

--- GB/T 755-2019 Rotating Electrical Machines - Rating and Performance (IEC 60034-1:2017, IDT);

--- GB/T 4026-2019 Basic and Safety Principles for Man-Machine Interface, Marking and Identification - Identification of Equipment Terminals, Conductor Terminations and Conductors (IEC 60445-2017, IDT);

--- GB/T 5465.1-2009 Graphical Symbols for Use on Electrical Equipment - Part 1: Overview and Classification (IEC 60417 Database: 2007-01, MOD).

This Document made the following editorial modifications:

--- Change the standard name into *Rotating Electrical Machines – Terminal Markings and Direction of Rotation*, so as to keep consistent with Chinese technical standard system.

Please note some contents of this Document may involve patents. The issuing agency of this

Rotating Electrical Machines – Terminal Markings and Direction of Rotation

1 Scope

This Document applies to A.C. and D.C. machines and specifies:

a) rules for the identification of winding connection points;

b) marking of winding terminals;

c) direction of rotation;

d) relationship between terminal markings and direction of rotation;

e) terminal marking of auxiliary devices;

f) connection diagrams of machines for common applications.

Turbine-type synchronous machines are excluded from this Document.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in 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 Document.

IEC 60034-1 Rotating Electrical Machines – Part 1: Rating and Performance

IEC 60417-1 Graphical Symbols for Use on Equipment – Part 1: Overview and Application

IEC 60445 Basic and Safety Principles for Man-Machine Interface, Marking and Identification of Equipment Terminals and Conductor Terminations

3 Terms and Definitions

For the purposes of this Document, the terms and definitions given in IEC 60034-1 and the

6.5.3 Permanent magnet machines

Since these machines do not have a separate excitation, the windings shall have terminal markings as established for asynchronous machines. This is valid for both machines operating with an adjustable frequency drive (AFD), with permanent magnets located in or on the rotor and for machines suitable for across the line start, with permanent magnets inserted in or on the rotor with or without a squirrel cage rotor for starting.

6.6 DC machines

The letter symbols assigned to winding elements shall be as listed in 4.2 with terminal markings as shown in Figures 16 ~ 24.

6.7 Relation between terminal markings and direction of rotation

6.7.1 Multi-phase machines

The terminal markings shall be so arranged that clockwise rotation is obtained when the alphabetical sequence of the letters (for example, U1, V1, W1) corresponds to the time sequence of the system phase voltages. The phase sequence of a secondary winding (for example, K, L, M) shall correspond to the phase sequence of the primary winding (for example, U, V, W).

For counter-clockwise rotation, the time sequence of the system phase voltages shall be reversed by rearrangement of the supply cables (for example, L2 and L3 in the case of 3-phase).

The requirement in this clause applies to machines of any rated output and voltage even if clockwise rotation is impracticable.

When machines are suitable for operation in only one direction of rotation, an arrow shall indicate the direction of rotation. This arrow need not be on the rating plate, but it shall be permanently attached and easily visible.

6.7.2 Multi-phase, multi-speed machines

With multi-speed machines incorporating a pole-changing winding, such as a Dahlander or PAM (pole-amplitude-modulated) winding, the markings of the terminals for the lower speed of these winding(s), which are to be connected to the supply (for example, 1U and 1W) shall be interchanged, when necessary, in order to obtain the same direction of rotation for both speeds.

6.7.3 Single-phase machines

Clockwise rotation shall be obtained when the supply is connected to U1 and U2 and the auxiliary winding is connected as Z1 with U1 and Z2 with U2. To reverse the direction of rotation, terminals Z1 shall be connected to U2 and Z2 to U1.

6.7.4 Multiple three-phase group (for example, six-phase) machines

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