

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Rotating electrical machines –  
Part 8: Terminal markings and direction of rotation**

**Machines électriques tournantes –  
Partie 8: Marques d'extrémité et sens de rotation**

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## CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references .....	8
3 Terms and definitions .....	8
4 Symbols .....	10
4.1 General.....	10
4.2 DC and single-phase commutator machines .....	10
4.3 AC machines without commutators.....	10
4.4 Auxiliary devices .....	11
5 Direction of rotation .....	11
6 Rules for terminal markings .....	11
6.1 General .....	11
6.2 Suffixes.....	12
6.3 Prefixes.....	13
6.4 Winding identification for categories of machines .....	13
6.5 Synchronous machines .....	14
6.6 DC machines.....	14
6.7 Relation between terminal markings and direction of rotation .....	14
6.8 Terminal marking figures .....	15
7 Auxiliary terminal marking rules.....	20
7.1 General.....	20
7.2 Marking.....	20
Annex A (normative) Connection diagrams for common applications.....	23
Figure 1 – Single three-phase winding, three elements, open connection, six terminals .....	15
Figure 2 – Single three-phase winding, delta connection, three terminals .....	16
Figure 3 – Single three-phase winding, internal star connection with neutral conductor, four terminals.....	16
Figure 4 – Single three-phase winding, two elements per phase, open connection, twelve terminals.....	16
Figure 5 – Single three-phase winding, four elements per phase, open connection, twenty-four terminals .....	16
Figure 6 – Single three-phase winding, two elements per phase with four tapping points per element, open connection, thirty-six terminals .....	17
Figure 7 – Two separate three-phase windings with two independent functions, two elements per phase, open connection, twenty-four terminals .....	17
Figure 8 – Two elements, internal connection, three terminals .....	17
Figure 9 – Single three-phase winding, star connection, duplicate terminals for alternate connection, six terminals .....	17
Figure 10 – Single three-phase winding, star connection, parallel terminals for shared current, six terminals .....	18

IEC 60034-8:2007

<https://standards.iteh.ai/document/iec-60034-8-2007/40d2261d99/iec-60034-8-2007>

Figure 11 – Three-phase wound-rotor, star connections with neutral conductors, eight terminals.....	18
Figure 12 – Main and auxiliary winding, two elements.....	18
Figure 13 – Single-phase auxiliary winding, integrally connected capacitor, one element .....	18
Figure 14 – Single-phase main winding, integrally connected thermal protector, one element .....	18
Figure 15 – Six-phase winding, open connection, six elements .....	18
Figure 16 – Armature winding, one element .....	19
Figure 17 – Commutating winding, one and two elements .....	19
Figure 18 – Compensating winding, one and two elements .....	19
Figure 19 – Series winding, one element, two tappings.....	19
Figure 20 – Shunt excitation winding, one element .....	19
Figure 21 – Separately excited excitation winding, one and two elements .....	19
Figure 22 – Direct-axis auxiliary winding, one element.....	19
Figure 23 – Quadrature-axis auxiliary winding, one element .....	19
Figure 24 – Armature winding with commutating and compensating windings, one element .....	19
Figure 25 – Single-phase, single voltage .....	20
Figure 26 – Single-phase, dual voltage .....	20
Figure 27 – Three-phase, single voltage .....	21
Figure 28 – Three-phase, dual voltage.....	21
Figure 29 – Two-lead devices (except type R) .....	21
Figure 30 – Two-lead devices of type R .....	21
Figure 31 – Three-lead devices of type R.....	22
Figure 32 – Four-lead devices of type R .....	22
Figure 33 – Switch connections .....	22
Figure A.1 – Delta connection.....	23
Figure A.2 – Star connection – with or without neutral .....	23
Figure A.3 – Dual voltage, six terminals ( $1:\sqrt{3}$ ).....	23
Figure A.4 – Star-connected, dual voltage, nine terminals (1:2) .....	24
Figure A.5 – Delta-connected, dual voltage, nine terminals (1:2).....	24
Figure A.6 – Star-delta, single voltage, six terminals.....	24
Figure A.7 – Star-delta, dual voltage, twelve terminals (1:2) .....	25
Figure A.8 – Part-winding, single voltage, six terminals .....	25
Figure A.9 – Part-winding, dual voltage, nine terminals (1:2).....	26
Figure A.10 – Variable-torque, six terminals .....	26
Figure A.11 – Variable-torque, dual-voltage ( $1:\sqrt{3}$ ), nine terminals .....	27
Figure A.12 – Constant-torque, six terminals .....	28
Figure A.13 – Constant power, six terminals .....	28
Figure A.14 – Variable-torque, six terminals .....	29
Figure A.15 – Constant-torque, seven terminals.....	29
Figure A.16 – Constant-power, seven terminals .....	29

Figure A.17 – Example of three-speed, constant torque motor using two separate windings, ten terminals ..... 30

Figure A.18 – Example of three-speed motor using three separate windings, ten terminals..... 30

Figure A.19 – Example of four-speed, variable-torque motor using two separate windings, twelve terminals ..... 31

Figure A.20 – Split-phase or capacitor-start reversible motor ..... 31

Figure A.21 – Reversible capacitor-start motor with four terminals with externally connected capacitor..... 32

Figure A.22 – Shunt motor or generator, four terminals..... 32

Figure A.23 – Compound-motor or generator with compensating and commutating windings, six terminals..... 32

Figure A.24 – Series-wound motor, two terminals ..... 33

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**ROTATING ELECTRICAL MACHINES –**

**Part 8: Terminal markings and direction of rotation**

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**IEC 60034-8 edition 3.1 contains the third edition (2007-06) [documents 2/1434/FDIS and 2/1451/RVD] and its amendment 1 (2014-03) [documents 2/1732/FDIS and 2/1743/RVD].**

**In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions and deletions are displayed in red, with deletions being struck through. A separate Final version with all changes accepted is available in this publication.**

International Standard IEC 60034-8 has been prepared by IEC technical committee 2: Rotating machinery.

The main change with respect to the previous edition is listed below:

- changed terminal markings for d.c. machines in Clause A.4.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts of the IEC 60034 series, under the general title *Rotating electrical machines*, can be found on the IEC website.

The committee has decided that the contents of the base publication and its amendment will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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## INTRODUCTION

The revision of this part of IEC 60034 provides worldwide uniformity in the electrical connections for rotating electrical machines and applies the recommendations of the basic safety publication IEC 60445 in specifying marking requirements.

These standardized connections will then permit the safe interchange of electric machines with their control and protective devices using standardized terminal markings.

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## ROTATING ELECTRICAL MACHINES –

### Part 8: Terminal markings and direction of rotation

#### 1 Scope

This part of IEC 60034 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 standard.

#### 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.

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*

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IEC 60445, *Basic and safety principles for man-machine interface, marking and identification – 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 following apply.

##### 3.1

##### **terminal marking**

permanent identification of the external termination of winding leads or auxiliary leads at the disposal of the user for connection of the machine to the supply or apparatus that indicates the function of the termination

##### 3.2

##### **connecting points**

all current transfer points that are used to permanently interconnect winding or winding element ends internally

### 3.3

#### **tapping points**

intermediate connections to a portion of a winding element

### 3.4

#### **winding leads**

insulated conductors that make the electrical connection between a winding and its termination

### 3.5

#### **winding**

assembly of turns or coils having a defined function in an electrical rotating machine

[IEV 411-37-01]

### 3.6

#### **winding phase**

one or more winding elements associated with a particular phase

### 3.7

#### **winding element**

part of a winding, all the turns or coils in that part being permanently connected together

### 3.8

#### **separate windings**

two or more windings, each having a separate function, and not interconnected, used only separately, whether fully or in part

### 3.9

#### **multi-speed motor**

motor, which can be operated at any one of two or more definite speeds

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### 3.10

#### **constant power**

when a multi-speed motor provides approximately constant power over the speed range

### 3.11

#### **constant torque**

when a multi-speed motor provides approximately constant torque over the speed range

### 3.12

#### **variable torque**

when output torque of a multi-speed motor is proportional to approximately the square of the speeds

### 3.13

#### **phase sequence**

order in which the voltages successively reach their maximum positive values between supply conductors

### 3.14

#### D-end

that end of the machine which accommodates the shaft end

[IEV 411-43-36]

NOTE For machines having two shaft ends, the D-end is the end

- a) having the larger diameter;
- b) opposite the external fan when the shaft ends are of the same diameter.

## 4 Symbols

### 4.1 General

L	Supply conductor
PE	Protective earthing terminal
○	User available terminal, marking mandatory
●	Internal connection point
(...)	Internal terminal marking (showing element symbol), optional
[ .... , .... ]	Grouping of user joined terminals
;	Separation of terminals or groups of terminals

### 4.2 DC and single-phase commutator machines

A	Armature winding
B	Commutating winding
C	Compensating winding
D	Series excitation winding
E	Shunt excitation winding
F	Separately excited winding
H	Direct-axis auxiliary winding
J	Quadrature-axis auxiliary winding

### 4.3 AC machines without commutator

F	DC excitation winding
K	Secondary winding
L	Secondary winding
M	Secondary winding
N	Star point (neutral conductor) of the primary winding
Q	Star point (neutral conductor) of a secondary winding
U	Primary winding
V	Primary winding
W	Primary winding
Z	Auxiliary windings

NOTE The primary and secondary symbol allocations are irrespective of whether the primary winding is located in the stator or rotor.