

INTERNATIONAL STANDARD

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**Marking of electrical equipment with ratings related to electrical supply –
Safety requirements**

(standards.iteh.ai)

**Marquage des matériels électriques avec des caractéristiques assignées
relatives à l'alimentation électrique – Exigences de sécurité**

IEC 61293:2019
<https://standards.iteh.ai/catalog/standards/sist/d018a650-4516-42c0-8ea3-68bb9bf8f0d9/iec-61293-2019>





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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MARKING OF ELECTRICAL EQUIPMENT WITH RATINGS RELATED
TO ELECTRICAL SUPPLY – SAFETY REQUIREMENTS**

FOREWORD

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International Standard IEC 61293 has been prepared by IEC technical committee 3: Information structures and elements, identification and marking principles, documentation and graphical symbols.

This second edition cancels and replaces the first edition published in 1994. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) its status as a basic safety publication has been removed, and it has become a horizontal publication in accordance with IEC Guide 108;
- b) the scope is extended to include the applicability of this document to product manufacturers;
- c) the addition of a provision that the visibility of the marking during normal operation should be considered;

- d) more detailed requirements where equipment has a set or range of rated values for a given characteristic;
- e) requirements regarding the provision of the markings also in the technical documentation have been added;
- f) some notes have been converted to normative text;
- g) normative references and references to other standards have been updated.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
3/1404/FDIS	3/1414/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

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

It has the status of a horizontal standard in accordance with IEC Guide 108.

The reader's attention is drawn to the fact that Table B.1 of Annex B lists all of the "in-some-country" clauses on differing practices of a less permanent nature relating to the subject of this standard.

iTeh STANDARD PREVIEW

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

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- reconfirmed, <https://standards.iteh.ai/catalog/standards/sist/d6f8a650-451b-42eb-8ea3-68bb9bf8f0d9/iec-61293-2019>
- withdrawn,
- replaced by a revised edition, or
- amended.

MARKING OF ELECTRICAL EQUIPMENT WITH RATINGS RELATED TO ELECTRICAL SUPPLY – SAFETY REQUIREMENTS

1 Scope

This International Standard establishes minimum requirements and general rules on marking electric equipment with ratings and other characteristics to enable the proper and safe selection and installation of electric equipment related to any supply of electricity.

The object of this document is to:

- provide general requirements for the marking of the characteristics related to any supply system, such as voltage, current, frequency and power, without any restrictions;
- provide technical committees with uniform methods for the marking of electrical ratings of products.

This document is primarily intended for application by technical committees when specifying minimum markings of ratings related to any electrical supply of equipment, sub-assemblies and components, but it is also for application by product manufacturers for marking their products.

NOTE For further markings see ISO/IEC Guide 51.

This horizontal standard is primarily intended for use by technical committees in the preparation of standards in accordance with the principles laid down in IEC Guide 108.

One of the responsibilities of a technical committee is, wherever applicable, to make use of horizontal standards in the preparation of its publications. The contents of this horizontal standard will not apply unless specifically referred to or included in the relevant publications.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60027 (all parts), *Letter symbols to be used in electrical technology*

IEC 60417, *Graphical symbols for use on equipment* (available at <http://www.graphical-symbols.info/equipment>)

IEC 60445, *Basic and safety principles for man-machine interface, marking and identification – Identification of equipment terminals, conductor terminations and conductors*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 60617, *Graphical symbols for diagrams* (available at <http://std.iec.ch/iec60617>)

IEC 61082-1:2014, *Preparation of documents used in electrotechnology – Part 1: Rules*

IEC 61140, *Protection against electric shock – Common aspects for installation and equipment*

IEC 80000 (all parts), *Quantities and units*

ISO 7000, *Graphical symbols for use on equipment – Registered symbols*

ISO 80000 (all parts), *Quantities and units*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

electric equipment

item used for such purposes as generation, conversion, transmission, distribution or utilization of electric energy, such as electric machines, transformers, switchgear and controlgear, measuring instruments, protective devices, wiring systems, current-using equipment

[SOURCE: IEC 60050-826:2004, 826-16-01]

3.2

line conductor

phase conductor (in AC systems) (deprecated)

pole conductor (in DC systems) (deprecated)

conductor which is energized in normal operation and capable of contributing to the transmission or distribution of electric energy but which is not a neutral or mid-point conductor

[SOURCE: IEC 60050-195:1998, 195-02-08]

3.3

mid-point conductor

conductor electrically connected to the mid-point and capable of contributing to the distribution of electric energy

[SOURCE: IEC 60050-195:1998, 195-02-07]

3.4

neutral conductor

conductor electrically connected to the neutral point and capable of contributing to the distribution of electric energy

[SOURCE: IEC 60050-195:1998, 195-02-06]

3.5

protective conductor

PE (identification)

conductor provided for purposes of safety, for example protection against electric shock

[SOURCE: IEC 60050-195:1998, 195-02-09]

3.6 rated value

value of a quantity used for specification purposes, established for a specified set of operating conditions of a component, device, equipment, or system

Note 1 to entry: Rated values are normally assigned by the manufacturer.

Note 2 to entry: When specifying a rated value for a quantity, the quantity is often identified by replacing the word "value" with the quantity name in the term.

[SOURCE: IEC 60050-151:2001, 151-16-08, modified – Notes to entry have been added.]

3.7 rated voltage range

voltage range as declared by the manufacturer expressed by its lower and upper rated voltages

[SOURCE: IEC 60050-151:2014, 151-16-49]

3.8 International System of Units

SI

system of units, based on the International System of Quantities, their names and symbols, including a series of prefixes and their names and symbols, together with rules for their use, adopted by the General Conference on Weights and Measures (CGPM)

Note 1 to entry: The SI is founded on the seven base quantities of the ISQ and the names and symbols of the corresponding base units that are contained in the following table

Base quantity		Base unit	
Name		Name	Symbol
length		metre	m
mass		kilogram	kg
time		second	s
electric current		ampere	A
thermodynamic temperature		kelvin	K
amount of substance		mole	mol
luminous intensity		candela	cd

Note 2 to entry: The base units and the coherent derived units of the SI form a coherent set, designated the "set of coherent SI units".

Note 3 to entry: For a full description and explanation of the International System of Units, see the current edition of the SI brochure published by the Bureau International des Poids et Mesures (BIPM) and available on the BIPM website.

Note 4 to entry: In quantity calculus, the quantity 'number of entities' is often considered to be a base quantity, with the base unit one, symbol 1.

Note 5 to entry: The SI prefixes for multiples of units and submultiples of units are:

Factor	Prefix		Factor	Prefix		Factor	Prefix	
	Name	Symbol		Name	Symbol		Name	Symbol
10 ²⁴	yotta	Y	10 ³	kilo	k	10 ⁻⁹	nano	n
10 ²¹	zetta	Z	10 ²	hecto	h	10 ⁻¹²	pico	p
10 ¹⁸	exa	E	10 ¹	deca	da	10 ⁻¹⁵	femto	f
10 ¹⁵	peta	P	10 ⁻¹	deci	d	10 ⁻¹⁸	atto	a
10 ¹²	tera	T	10 ⁻²	centi	c	10 ⁻²¹	zepto	z
10 ⁹	giga	G	10 ⁻³	milli	m	10 ⁻²⁴	yocto	y
10 ⁶	mega	M	10 ⁻⁶	micro	μ			

[SOURCE: ISO/IEC Guide 99:2007, 1.16]

4 Marking requirements

4.1 Basic requirements

Electric equipment shall be marked with electrical ratings on the equipment by a suitable method, for example, by means of name-plates or labels. The markings shall be legible, visible and durable throughout the anticipated life of the equipment, taking into account the environmental conditions in operation. Consideration should also be given to the visibility of the marking during normal operation of the equipment.

A marking shall not be placed on a part intended to be removed, except where the marking is placed on an enclosure which is intended to be removed in order to install the equipment and put back in place once the equipment is installed.

Requirements as to the material, method and location of the marking for the different product types are the responsibility of the relevant technical committee.

Some equipment requires the marking of both input and output characteristics. In such cases, consideration shall be given to provide markings for output as well as for input characteristics.

Some electric equipment may be designed for use on more than one supply voltage or frequency. On some equipment, the user may be required to make adjustments for use on a supply system with a given nominal voltage. Some equipment is designed to operate on several nominal voltages or over a voltage range without any adjustment and is marked accordingly. In such cases the equipment shall be properly marked so that the user can apply the equipment in a safe way.

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If special requirements as to the power quality of the power supply are necessary for the safe operation of the equipment, such requirements shall be provided as markings.

Ratings shall be marked with standard abbreviations according to IEC 60445 or with standard graphical symbols taken from IEC 60417, IEC 60617 or ISO 7000. Examples of such standard abbreviations are shown in Table A.2.

Physical quantities shall be expressed using only the numerical value and their decimal multiples and submultiples followed by the unit symbol as specified in IEC 60027, IEC 80000 (all parts), or ISO 80000 (all parts).

International Standards shall only use SI units, as given in the various parts of ISO 80000 and IEC 80000.

Dimensions and tolerances shall be indicated in an unambiguous manner.

4.2 Marking of electric equipment with its characteristics

4.2.1 General

Equipment shall be marked as specified in 4.1 with rated values and other characteristics related to any electricity supply.

Each technical committee shall select the characteristics listed in 4.2 necessary to enable the proper and safe application of equipment. Ratings and other characteristics which are not necessary may be omitted.

For products being too small to accommodate a rating plate, colour identification or other means in accordance with an International Standard or a recognized code should be used.

4.2.2 Characteristics of the supply system

Equipment shall be marked with the relevant characteristics of the supply system to which it has to be connected as follows:

- type of supply system (AC, DC);
- number of line conductors (e.g., 1, 2, 3);
- other designated conductors (e.g., neutral conductor, mid-point conductor, protective conductor, see IEC 60445);
- voltage corresponding to the supply system;
- frequency corresponding to the supply system.

NOTE IEC 60038 defines standard voltages for the nominal voltage of electrical supply systems and as reference values for equipment and system design.

Capital letters without full stops shall be used. Alphanumeric notations may be replaced by graphical symbols according to IEC 60417. Examples for the recommended applications of these rules, also for the sequence order and the separation of the characteristics by the character SOLIDUS (/) are given in Table A.1.

4.2.3 Rated values of equipment

The equipment shall be marked with the following rated values of equipment, where applicable:

- rated voltage in volts (V), and/or [IEC 61293:2019](https://standards.iteh.ai/catalog/standards/sist/d6f8a650-451b-42eb-8ea3-686b9bf8fd9/iec-61293-2019)
- rated frequency in hertz (Hz), and/or <https://standards.iteh.ai/catalog/standards/sist/d6f8a650-451b-42eb-8ea3-686b9bf8fd9/iec-61293-2019>
- rated current in amperes (A), and/or
- rated input and/or output power in watts (W), and/or
- rated input and/or output power in volt amperes (VA), and/or
- rated input and output power factor, $\cos\phi$, and/or
- rated efficiency, η , where necessary

SI prefixes based on ISO 80000-1 shall be applied, if applicable. Examples are shown in Table A.1.

Equipment marked with a number of rated voltages should also be marked with the rated input power corresponding to each rated voltage. Equipment marked with a rated voltage range should also be marked with the rated input and output powers corresponding to the minimum (lower) and maximum (upper) voltage levels of the range for which the object is designed and can be operated (see also 4.3.5).

4.2.4 Other characteristics

The equipment shall be marked to indicate the following characteristics, where applicable:

- the IP code in accordance with IEC 60529,
- the class of equipment in accordance with IEC 61140,
- indoor/outdoor applicability of the equipment.

4.2.5 Sequence of rated values and other characteristics

If a given sequential order is needed, or if the space available is restricted, for example, to one line, the following sequence is recommended:

- characteristics of the supply system,
- rated values and unit symbols,
- other characteristics.

For rated values of voltages, the value for line-to-neutral voltage or line-to-midpoint voltage shall be provided before the line-to-line voltage value.

EXAMPLE 3/N/PE 230/400 V 50 Hz

For ratings which are listed vertically, a horizontal separating line should be used to avoid confusion (see example in Table A.1, row 14).

4.3 Representation of values

4.3.1 General

Each indication within the marking shall consist of the numerical value followed by the unit symbol, separated by the character SPACE ().

4.3.2 Single value

Each rating indication shall consist of:

- a single numerical value;
- the character SPACE ();
- a unit symbol.

EXAMPLE 60 kV

4.3.3 Limit values

Where the value to be presented represents a limit, the quantity value shall be presented as specified in 4.3.2, followed by the character SPACE () and:

- for an upper limit, the upper-case letters MAX, or
- for a lower limit, the upper-case letters MIN.

EXAMPLE 250 V MAX

4.3.4 Two and more values

Equipment suitable for use on any of several specified rated values of input characteristics which requires manual adjustment for operation shall be marked as follows:

- numerical values, each separated by the character SOLIDUS (/) in a consistent descending order, followed by the SPACE (), and
- unit symbol.

EXAMPLE 1 24/12/6 V

For equipment which may be used on any of various values of voltages or frequencies and when the switching between the values is automatic, the quantity value shall be presented as specified in 4.3.2 followed by the character SPACE and the upper-case letters AUTOMATIC. The letters AUTOMATIC may be shortened to AUTO if no confusion is likely.