

BUREAU OF INDIAN STANDARDS
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Draft Indian Standard

Rotating electrical machines – Part 1: Rating and performance

(Third Revision)

(ICS 29.160.01)

Rotating Machinery Sectional
Committee, ETD 15

Last date for comments-18/08/2024

NATIONAL FOREWORD

This Draft Indian Standard (Third Revision) which is identical with IEC 60034-1:2022 ‘Rotating electrical machines - Part 1: Rating and performance’ Issued By The International Electrotechnical Commission (IEC) is proposed to be adopted by the Bureau of Indian Standards on the recommendation of the Rotating Machinery Sectional Committee and approval of the Electrotechnical Division Council.

This standard was originally published in 2007 and subsequently revised in 2016 and 2021. The third revision of this standard has been undertaken to align it with the latest version of IEC 60034-1:2022.

The text of the IEC Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words ‘International Standard’ appears referring to this standard, they should be read as ‘Indian Standard’.
- b) Comma (,) has been used as a decimal marker, while in Indian Standards the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to International Standards for which Indian Standards also exists. The corresponding Indian Standards, which are to be substituted, are listed below along with their degree of equivalence for the editions indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
IEC 60027-1, Letter symbols to be used in electrical technology – Part 1: General	IS 3722 (Part 1) : 2023 / IEC 60027-1: 1992 Letter symbols and signs used In electrical technology - Part 1: General (<i>Second Revision</i>)	Identical
IEC 60034-2 (all parts), Rotating electrical machines –	IS 15999 (Part 2/Sec 1) : 2023/ 60034-2-1: 2014 Rotating Electrical Machines Part 2-1:	Identical

Part 2: Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles)	Standard Methods for Determining Losses and Efficiency from Tests Excluding Machines for Traction Vehicles	
IEC 60034-3:2020, Rotating electrical machines – Part 3: Specific requirements for synchronous generators driven by steam turbines or combustion gas turbines and for synchronous compensators	IS 15999 (Part 3) : 2023/IEC 60034-3: 2020 Rotating electrical machines Part 3: Specific requirements for synchronous generators driven by steam turbines or combustion gas turbines and for synchronous compensators (<i>First Revision</i>)	Identical
IEC 60034-5:2020, Rotating electrical machines – Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) – Classification	IS/IEC 60034-5 : 2000 Rotating electrical machines: Part 5 degrees of protection provided by the integral design of rotating electrical machines (IP Code) - Classification	Identical
IEC 60034-6:1991, Rotating electrical machines – Part 6: Methods of cooling (IC code)	IS 6362 : 1995/ IEC 60034-6: 1991 Designation of methods of cooling of rotating electrical machines (<i>First Revision</i>)	Identical
IEC 60034-8:2007, Rotating electrical machines – Part 8: Terminal markings and direction of rotation	IS/IEC 60034-8 : 2014 Rotating Electrical Machines Part 8 Terminal Markings and Direction of Rotation (<i>Third Revision</i>)	Identical
IEC 60034-15:2009, Rotating electrical machines – Part 15: Impulse voltage withstand levels of form-wound stator coils for rotating a.c. machines	IS 15999 (Part 15) : 2017/ IEC 60034-15 : 2009 Rotating Electrical Machines Part 15 Impulse Voltage Withstand Levels of Form-Wound Stator Coils for Rotating ac Machines	Identical
IEC 60034-18 (all parts), Rotating electrical machines – Part 18: Functional evaluation of insulation systems	IS 15999 (Part 18/Sec 42) : 2018/ IEC 60034-18-41 : 2014 Rotating Electrical Machines Part 18 Partial Discharge Free Electrical Insulation Systems (Type I) Used in Rotating Electrical Machines Fed From Voltage Converters Section 41 Qualification and quality control tests	Identical
	IS 15999 (Part 18/Sec 41) : 2018/ IEC 60034-18-41 : 2014 Rotating electrical machines: Part 18 partial discharge free electrical insulation systems (Type I) used in rotating electrical machines fed from voltage converters Sec 41 qualification and quality control tests	Identical
IEC 60034-27-4, Rotating electrical machines – Part 27-4:	IS/IEC 60034-27-4) : 2018/ IEC 60034-27-4 : 2018 Rotating Electrical Machines Part 27	Identical

Measurement of insulation resistance and polarization index of winding insulation of rotating electrical machines	Winding Insulation of Rotating Electrical Machines Section 4 Measurement of insulation resistance and polarization index	
IEC 60034-30-1, Rotating electrical machines – Part 30-1: Efficiency classes of line operated AC motors (IE code)	IS 12615 : 2018/ IEC 60034-30-1 : 2014 Line operated three phase AC motors (IE Code) "Efficiency classes and performance specification" (<i>Third Revision</i>)	Technically Equivalent
IEC 60050-411:1996, International Electrotechnical Vocabulary (IEV) – Part 411: Rotating machinery	IS 1885 : 2021/ IEC 60050: 411 Electrotechnical Vocabulary: Part 35 Rotating Machinery (<i>Second Revision</i>)	Identical
IEC 60060-1:2010, High-voltage test techniques – Part 1: General definitions and test requirements	IS 2071 (Part 1) : 2016/ IEC 60060-1 : 2010 High - Voltage test techniques: Part 1 general definitions and test requirements (<i>Third Revision</i>)	Identical
IEC 60085:2007, Electrical insulation – Thermal evaluation and designation	IS 1271 : 2012/ IEC 60085: 2007 Electrical insulation - Thermal evaluation and designation (<i>Second Revision</i>)	Identical
IEC 60204-1:2016, Safety of machinery – Electrical equipment of machines – Part 1: General requirements	IS 16504 (Part 1) : 2019 IEC 60204-1 : 2016 Safety of Machinery — Electrical Equipment of Machines Part 1 General Requirements (<i>First Revision</i>)	Identical
IEC 60204-11:2018, Safety of machinery – Electrical equipment of machines – Part 11: Requirements for equipment for voltages above 1 000 V AC or 1 500 V DC and not exceeding 36 kV	IS 16504 (Part 11) : 2020/ IEC 60204-11 : 2018 Safety of Machinery - Electrical Equipment of Machines Part 11 Requirements for Equipment for Voltages above 1 000 V AC or 1 500 V DC and not Exceeding 36 kV	Identical
IEC 60364 (all parts), Low-voltage electrical installations	IS 16997 : 2018/ IEC 60364-7-712 Requirements for Low-Voltage Special Electrical Installations or Locations Solar Photovoltaic (PV) Power Supply Systems	Identical
IEC 60335-1:2020, Household and similar electrical appliances – Safety – Part 1: General requirements	IS 302 (Part 1) : 2008 IEC 60335-1 Safety of household and similar electrical appliances: Part 1 general requirements (<i>Sixth Revision</i>)	Technically Equivalent
IEC 60445: 2021, Basic and safety principles for man-machine interface, marking and identification – Identification of equipment terminals, conductor terminations and conductors	IS 11353 : 2023 / IEC 60445 : 2021 Basic and Safety Principles for Man-Machine Interface Marking and Identification - Identification of Equipment Terminals Conductor Terminations and Conductors (<i>First Revision</i>)	Identical
IEC 60664-1:2020, Insulation coordination for equipment	IS 15382 (Part 1) : 2022 60664-1:2020 Insulation Coordination for	Identical

within low-voltage systems – Part 1: Principles, requirements and tests	Equipment Within Low-Voltage Systems Part 1 Principles Requirements and Tests	
CISPR 11:2015, Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement	IS 6873 (Part 4) : 2019/ CISPR 11: 2016 Limits and Methods of Measurement of Radio Disturbance Characteristics Part 4 Industrial Scientific and Medical Radio-Frequency Equipment (<i>Second Revision</i>)	Identical
CISPR 14 (all parts), Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus	IS 6873 (Part 2/Sec 1) : 2019/ CISPR 14-1:2009 Limits and methods of measurements of radio disturbance characteristics Part 2 Electro Magnetic Compatibility (EMC) “Requirements for Household Appliances, Electric tools and similar apparatus, Section 1 Emission	Identical
	IS 6873 (Part 2/Sec 2) : 2019/ CISPR 14-2 : 2015 Limits and Methods of Measurement of Radio Disturbance Characteristics Part 2 Electromagnetic Compatibility (EMC) — Requirements for Household Appliances, Electric Tools and Similar Apparatus Section 2 Emission — Product family standard (<i>Forth Revision</i>)	Identical
CISPR 16 (all parts), Specification for radio disturbance and immunity measuring apparatus and methods	IS 10052 (Part 1/Sec 1) : 2021/ CISPR 16-1-1: 2015 Radio Disturbance and Immunity Measuring Apparatus and Methods Specification Part 1 Radio Disturbance and Immunity Measuring Apparatus Section 1 Measuring apparatus (<i>Third Revision</i>)	Identical
	IS 10052 (Part 1/Sec 3) : 2018/ CISPR 16-1-3 : 2016 Radio Disturbance and Immunity Measuring Apparatus and Methods — Specification Part 1 Radio Disturbance and Immunity Measuring Apparatus Section 3 Ancillary equipment — Disturbance power	Identical
	IS 10052 (Part 1/Sec 4) : 2018/ CISPR 16-1-14 : 2017 Radio disturbance and immunity measuring apparatus and methods - Specificaiton: Part 1 radio disturbance and immunity measuring apparatus: Sec 4 antennas and test sites for radiated disturbance measurements	Identical
	IS 10052 (Part 1/Sec 4) : 2024/ CISPR 16-1-4: 2020 Radio Disturbance and Immunity Measuring Apparatus and Methods “Specification Part 1 Radio Disturbance and Immunity Measuring Apparatus Section 4	Identical

	Antennas and Test Sites for Radiated Disturbance Measurements	
	IS 10052 (Part 1/Sec 5) : 2018/ CISPR 16-1-5 : 2016 Radio Disturbance and Immunity Measuring Apparatus and Methods — Specification Part 1 Radio Disturbance and Immunity Measuring Apparatus Section 5 Antenna calibration sites and reference test sites for 5 MHz to 18 GHz	Identical
	IS 10052 (Part 1/Sec 6) : 2022/ CISPR 16-1-6: 2014 Specification for radio disturbance and immunity measuring apparatus and methods Part 1 Radio disturbance and immunity measuring apparatus Section 6 EMC antenna calibration	Identical
	IS 10052 (Part 2/Sec 1) : 2018/ CISPR 16-2-1 : 2014 Specification for radio disturbance and immunity measuring apparatus and methods: Part 2 methods of measurement of disturbances and immunity: Sec 1 conducted disturbance measurements (<i>Second Revision</i>)	Identical
	IS 10052 (Part 4/Sec 4) : 2018/ CISPR TR 16-4-4 : 2017 Radio disturbance and immunity measuring apparatus and methods - Specificaiton: Part 4 uncertainties, statistics and limit modelling: Sec 4 statistics of complaints and a model for the calculation of limits for the protection of radio services	Identical

The technical committee has reviewed the provisions of the following international standards referred in this adopted standard and decided that they are acceptable for use in conjunction with this standard.

<i>International Standard</i>	<i>Title</i>
IEC 60027-4:2006	Letter symbols to be used in electrical technology – Part 4: Rotating electric machines
IEC 60034-12:2016	Rotating electrical machines – Part 12: Starting performance of singlespeed three-phase cage induction motors
IEC 60034-19	Rotating electrical machines – Part 19: Specific test methods for DC machines on conventional and rectifier-fed supplies
IEC TS 60034-25:2014	Rotating electrical machines – Part 25: AC electrical machines used in power drive systems – Application guide
IEC 60034-29	Rotating electrical machines – Part 29: Equivalent loading and superposition techniques – Indirect testing to determine temperature rise
IEC TS 60034-30-2	Rotating electrical machines – Part 30-2: Efficiency classes of variable speed AC motors (IE-code)
IEC 60034-33	Rotating electrical machines – Part 33: Specific technical requirements for

	hydro generators
IEC 60417	Graphical symbols for use on equipment – 12-month subscription to regularly updated online database comprising all graphical symbols published in IEC 60417
IEC 61148:2011	Terminal markings for valve device stacks and assemblies and for power conversion equipment
IEC TS 61800-8	Adjustable speed electrical power drive systems – Part 8: Specification of voltage on the power interface

Only English language text has been retained while adopting it in this Indian Standard, and as such the page numbers given here are not the same as in the International Standard.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test, shall be rounded off in accordance with IS 2: 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

NOTE - The technical content of their document has not been enclosed as there are identical with the corresponding IEC standards for details, please refer the corresponding IEC 60034-1:2022 or kindly contact:

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