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Draft Indian Standard

**Low-voltage switchgear and controlgear – Part 4-1:
Contactors and motor-starters – Electromechanical contactors and
motor-starters**

(Third Revision)

ICS 29.120.99, 29.130.20

Low Voltage Switchgear and Controlgear
Sectional Committee, ETD 07

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NATIONAL FOREWORD

This draft Indian Standard (Third Revision) which is identical with IEC 60947-4-1-2023 “Low-voltage switchgear and controlgear – Part 4-1: Contactors and motor-starters – Electromechanical contactors and motor-starters” issued by the International Electrotechnical Commission (IEC) will be adopted by the Bureau of Indian Standards on the recommendation of the Low Voltage Switchgear and Controlgear Sectional Committee and approval of the Electrotechnical Division Council.

This standard was first published as IS 13947 (Part 4/ Sec 1) : 1993 and was identical to IEC 60947-4-1 : 2000. This standard was then superseded by IS/IEC 60947 (Part 4/Sec 1): 2000 which was identical to IEC 60947-4-1 : 2000 with Amendment No. 1 (2002) and Technical Corrigendum 1 (2001). First revision of IS/IEC 60947 (Part 4/Sec 1): 2000 was undertaken in 2018 which was identical to IEC 60947-4-1: 2012. Second revision of IS/IEC 60947 (Part 4/Sec 1): 2012 was undertaken in 2023 which was identical to IEC 60947-4-1: 2018. This third revision has now been undertaken to align the standard with the latest international practices.

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

- objective in the scope;
- instantaneous only motor protective switching device IMPSD (3.5.33);
- kinds of equipment (5.2.1);
- methods of overload protection of motors (5.2.6);
- separately mounted overload relay of a starter (in 5.7.3 b));
- starter and contactor suitable for use downstream to basic drive module (6.1.2 w));
- wiring subject to movement (in 8.1.3);
- use of voltage transient limiting device (8.1.18);
- accessible parts subject to temperature limits (in 8.2.2.3);
- reference to Annex X of IS/IEC 60947-1:2020 for the co-ordination of MPSD with SCPD (8.2.5.4);
- update and completion of the measurement method of the power consumption of the electromagnet (9.3.3.2.1.2);

- update of Annex C including rational about AC-3e;
- determination of the critical load current for photovoltaic applications (M.8.7).

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

- a) Wherever the words ‘International Standard’ appear 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 60034-1:2022, Rotating electrical machines – Part 1: Rating and performance	IS 15999 (Part 1) : 2021/ IEC 60034-1: 2017 Rotating electrical machines - Part 1 : Rating and performance	Identical with IEC 60034-1: 2017
IEC 60068-2-14:2023, Environmental testing – Part 2-14: Tests – Test N: Change of Temperature	IS/IEC 60068-2-14: 2009 Environmental testing Part 2: Tests Section 14: Test N: Change of temperature	Identical with IEC 60068 Part 2/Sec 14: 2009
IEC 60079-14, Explosive atmospheres – Part 14: Electrical installations design, selection and Erection	IS 16724: 2018/ IEC 60079-14: 2013 Explosive atmospheres - Electrical installations design, selection and erection	Identical with IEC 60079-14: 2013
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 with IEC 60085: 2007
IEC 60715:2017, Dimensions of low-voltage switchgear and controlgear – Standardized mounting on rails for mechanical support of switchgear, controlgear and accessories	IS/IEC 60715: 2017 Dimensions of low - Voltage switchgear and controlgear - Standardized mounting on rails for mechanical support of switchgear, controlgear and accessories (<i>First Revision</i>)	Identical with IEC 60715 : 2017
IEC 60730-1, Automatic electrical controls – Part 1: General requirements	IS/IEC 60730-1: 1999 Automatic electrical controls for household and similar use: part 1 General Requirements	Identical with IEC 60730-1: 1999
IEC 60947-1:2020, Low-voltage switchgear and controlgear – Part 1: General rules	IS/IEC 60947-1: 2020 Low-Voltage Switchgear and Controlgear Part 1 General Rules	Identical with IEC 60947-1:2020
IEC 60947-2:2016, Low-voltage switchgear and controlgear – Part 2: Circuit-breakers	IS/IEC 60947-2: 2016 Low - Voltage switchgear and controlgear: Part 2 circuit - Breakers (<i>First Revision</i>)	Identical with IEC 60947-2 : 2016
IEC 60947-5-1:2016, Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices	IS/IEC 60947-5-1: 2009 Low - Voltage switchgear and controlgear: Part 5 control circuit devices and switching elements: Sec 1 electromechanical control circuit devices (<i>First Revision</i>)	Identical with IEC 60947-5-1 : 2009
IEC 61140:2016, Protection against electric shock – Common aspects for installation and Equipment	IS 9409: 2023 / IEC 61140: 2016 Protection Against Electric Shock - Common Aspects for Installation and Equipment (<i>First Revision</i>)	Identical with IEC 61140 : 2016
IEC 61439 (all parts), Low-voltage	IS/IEC 61439 (all parts) Low-Voltage	Identical

switchgear and controlgear assemblies	Switchgear and Controlgear Assemblies	
IEC 61800-5-1:2022, Adjustable speed electrical power drive systems – Part 5-1: Safety requirements – Electrical, thermal and energy	IS/IEC 61800-5-1: 2016 Adjustable Speed Electrical Power Drive Systems Part 5 Safety Requirements Section 1 Electrical, thermal and energy	Identical with IEC 61800-5-1: 2016
IEC 61810-1, Electromechanical elementary relays – Part 1: General and safety requirements	IS 17064 (Part 1): 2018 / IEC 61810-1: 2015 Electromechanical elementary relays: Part 1 general and safety requirements	Identical with IEC 61810-1: 2015
ISO 2859-1:1999, Sampling procedures for inspection by attributes – Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection	IS 2500 (Part 1): 2000 / ISO 2859-1:1999 Sampling procedures for inspection by attributes: Part 1 sampling schemes indexed by acceptance quality limit (AQL) for lot - By - Lot inspection (<i>Third Revision</i>)	Identical with ISO 2859-1:1999
ISO 3864-2, Graphical symbols – Safety colours and safety signs – Part 2: Design principles for product safety labels	IS 16449 (Part 2) : 2021 / ISO 3864-2 : 2016 Graphical Symbols - Safety Colours and Safety Signs Part 2 Design Principles for Product Safety Labels	Identical with ISO 3864-2 : 2016

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 60034-12: 2016	Rotating electrical machines – Part 12: Starting performance of singlespeed three-phase cage induction motors
IEC 60034-30-1: 2014	Rotating electrical machines – Part 30-1: Efficiency classes of line operated AC motors (IE code)
IEC 60364-1: 2005	Low-voltage electrical installations – Part 1: Fundamental principles, assessment of general characteristics, definitions
IEC 61051-2	Varistors for use in electronic equipment – Part 2: Sectional specification for surge suppression varistors
IEC 61095:2023	Electromechanical contactors for household and similar purposes
IEC 61643-331	Components for low-voltage surge protection – Part 331: Performance requirements and test methods for metal oxide varistors (MOV)
IEC TS 63058	Switchgear and controlgear and their assemblies for low voltage – Environmental aspects
IEC TS 63208	Low-voltage switchgear and controlgear – Security aspects
IEC TR 63216:2019	Low-voltage switchgear and controlgear – Electromagnetic compatibility assessment for switchgear and controlgear and their assemblies
CISPR 11:2015 CISPR 11:2015/AMD1:2016 CISPR 11:2015/AMD2:2019	Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement

Only the 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 IEC Publication.

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 or analysis shall be rounded off in accordance with IS 2: 2022 ‘Rules for rounding of 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 the document is not available on website. For details, please refer the corresponding IEC 60947-4-1: 2023 or kindly contact:

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