

**MADALPINGELISED LÜLITUSAPARAADID. OSA 4-1:
KONTAKTORID JA MOOTORIKÄIVITID.
ELEKTROMEHAANILISED KONTAKTORID JA
MOOTORIKÄIVITID**

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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>See Eesti standard EVS-EN IEC 60947-4-1:2025 sisaldab Euroopa standardi EN IEC 60947-4-1:2025 ingliskeelset teksti.</p> <p>Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas</p> <p>Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 05.09.2025.</p> <p>Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.</p>	<p>This Estonian standard EVS-EN IEC 60947-4-1:2025 consists of the English text of the European standard EN IEC 60947-4-1:2025.</p> <p>This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.</p> <p>Date of Availability of the European standard is 05.09.2025.</p> <p>The standard is available from the Estonian Centre for Standardisation and Accreditation.</p>
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**Low-voltage switchgear and controlgear - Part 4-1: Contactors and motor-starters - Electromechanical contactors and motor-starters
(IEC 60947-4-1:2023)**

Appareillage à basse tension - Partie 4-1: Contacteurs et démarreurs de moteurs - Contacteurs et démarreurs électromécaniques
(IEC 60947-4-1:2023)

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(IEC 60947-4-1:2023)

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European foreword

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INTERNATIONAL STANDARD

NORME INTERNATIONALE



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**Appareillage à basse tension –
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INTERNATIONAL STANDARD

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CONTENTS

FOREWORD.....	10
1 Scope.....	13
2 Normative references.....	14
3 Terms, definitions, symbols and abbreviated terms.....	15
3.1 General.....	15
3.2 Alphabetical index of terms	15
3.3 Terms and definitions concerning contactors.....	18
3.4 Terms and definitions of the functions of starters	19
3.5 Terms and definitions concerning starters.....	20
3.6 Terms and definitions concerning characteristic quantities	26
3.7 Terms and definitions concerning safety aspects	28
3.8 Terms and definitions concerning electric motor characteristics.....	31
3.9 Symbols and abbreviated terms.....	31
4 Classification.....	32
5 Characteristics of contactors and starters.....	33
5.1 Summary of characteristics	33
5.2 Type of equipment	33
5.2.1 Kind of equipment.....	33
5.2.2 Number of poles.....	34
5.2.3 Kind of current (AC or DC)	34
5.2.4 Interrupting medium (air, oil, gas, vacuum, etc.).....	34
5.2.5 Operating conditions of the equipment.....	34
5.2.6 Methods of overload protection of motors	34
5.3 Rated and limiting values for main circuits	35
5.3.1 Rated voltages.....	35
5.3.2 Currents or powers	36
5.3.3 Rated frequency.....	38
5.3.4 Rated duties	38
5.3.5 Normal load and overload characteristics	39
5.3.6 Short-circuit characteristics	41
5.3.7 Pole impedance of a contactor (Z) or starter	41
5.4 Utilization category.....	41
5.4.1 General	41
5.4.2 Assignment of utilization categories based on the results of tests.....	42
5.5 Control circuits.....	43
5.6 Auxiliary circuits.....	44
5.7 Characteristics of relay and release of overload relays and of motor protective switching device (MPSD).....	44
5.7.1 Summary of characteristics	44
5.7.2 Types of relay or release.....	44
5.7.3 Characteristic values.....	45
5.7.4 Designation and current settings of overload relays	46
5.7.5 Time-current characteristics of overload relays	47
5.7.6 Influence of ambient air temperature	47
5.8 Co-ordination with short-circuit protective devices.....	47
5.9 Void.....	47

5.10	Types and characteristics of automatic change-over devices and automatic acceleration control devices	47
5.10.1	Types	47
5.10.2	Characteristics	47
5.11	Types and characteristics of auto-transformers for two-step auto-transformer starters	48
5.12	Types and characteristics of starting resistors for rheostatic rotor starters	48
6	Product information	49
6.1	Nature of information	49
6.1.1	Identification	49
6.1.2	Characteristics, basic rated values and utilization	49
6.2	Marking	51
6.3	Instructions for installation, operation, maintenance, decommissioning and dismantling	52
6.4	Environmental information	52
6.5	Instruction for equipment capable to be reused, repaired and upgraded	53
7	Normal service, mounting and transport conditions	53
8	Constructional and performance requirements	53
8.1	Constructional requirements	53
8.1.1	General	53
8.1.2	Materials	54
8.1.3	Current-carrying parts and their connections	54
8.1.4	Clearances and creepage distances	54
8.1.5	Actuator	55
8.1.6	Indication of the contact position	55
8.1.7	Additional requirements for equipment suitable for isolation	55
8.1.8	Terminals	56
8.1.9	Additional requirements for equipment provided with a neutral pole	56
8.1.10	Provisions for protective earthing	56
8.1.11	Enclosures for equipment	56
8.1.12	Degrees of protection of enclosed equipment	56
8.1.13	Conduit pull-out, torque and bending with metallic conduits	56
8.1.14	Limited energy source	57
8.1.15	Stored charge energy circuit	59
8.1.16	Fault and abnormal conditions	59
8.1.17	Short-circuit and overload protection of ports	60
8.1.18	Use of voltage transient limiting device	60
8.2	Performance requirements	60
8.2.1	Operating conditions	60
8.2.2	Temperature-rise	66
8.2.3	Dielectric properties	69
8.2.4	Normal load and overload performance requirements	70
8.2.5	Co-ordination with short-circuit protective devices	75
8.3	Electromagnetic compatibility (EMC)	77
8.3.1	General	77
8.3.2	Immunity	78
8.3.3	Emission	78
8.4	Embedded software	79
8.5	Security	79

9	Tests.....	79
9.1	Kinds of test.....	79
9.1.1	General	79
9.1.2	Type tests.....	79
9.1.3	Routine tests.....	79
9.1.4	Sampling tests	80
9.1.5	Special tests	80
9.2	Compliance with constructional requirements.....	81
9.2.1	General	81
9.2.2	Electrical performance of screwless-type clamping units	81
9.2.3	Ageing test for screwless-type clamping units	82
9.2.4	Limited energy source test	82
9.2.5	Breakdown of components	83
9.2.6	Wire flexing test.....	83
9.3	Compliance with performance requirements.....	84
9.3.1	Test sequences.....	84
9.3.2	General test conditions	84
9.3.3	Performance under no load, normal load and overload conditions	85
9.3.4	Performance under short-circuit conditions	98
9.3.5	Overload current withstand capability of contactors and IMPSDs.....	104
9.3.6	Routine tests and sampling tests	104
9.4	EMC tests	106
9.4.1	General	106
9.4.2	Immunity.....	106
9.4.3	Emission.....	108
	Annex A (normative) Marking and identification of terminals of contactors, starters and associated overload relays.....	110
A.1	General.....	110
A.2	Marking and identification of terminals of main circuits.....	110
A.3	Marking and identification of terminals of overload relays.....	110
	Annex B (normative) Special tests.....	112
B.1	General.....	112
B.2	Mechanical durability.....	112
B.2.1	General	112
B.2.2	Verification of mechanical durability.....	112
B.3	Electrical durability.....	114
B.3.1	General	114
B.3.2	Results to be obtained	115
B.3.3	Statistical analysis of test results for contactors or starters	115
B.4	Co-ordination at the crossover current between the starter and associated SCPD	116
B.4.1	General	116
B.4.2	Condition for the test for the verification of co-ordination at the crossover current by a direct method	116
B.4.3	Test currents and test circuits.....	116
B.4.4	Test procedure and results to be obtained	117
B.4.5	Verification of co-ordination at the crossover current by an indirect method	117

Annex C (informative) Electric motor evolutions and motor starting methods	120
C.1 General.....	120
C.1.1 Major changes on the market concerning electrical motors.....	120
C.1.2 Electric motor characteristics.....	121
C.1.3 Efficiency motor analysis.....	121
C.1.4 Impacts on switchgear and controlgear.....	123
C.2 Typical variants direct-on-line starters	123
C.3 Functional aspects of motor starters	126
C.4 Currents and torques during a star-delta start	128
C.5 Currents and torques during an auto-transformer start	131
C.6 Currents waveform of the different modes of operation of a starter	133
Annex D (informative) Items subject to agreement between manufacturer and user	135
Annex E (Void)	136
Annex F (normative) Requirements for auxiliary contact linked with power contact (mirror contact).....	137
F.1 Application and object	137
F.1.1 Application.....	137
F.1.2 Object.....	137
F.2 Characteristics	137
F.3 Product information	137
F.4 Normal service, mounting and transport conditions	138
F.5 Constructional and performance requirements	138
F.6 Tests	138
F.6.1 General	138
F.6.2 Tests on products in a new condition.....	138
F.6.3 Test after conventional operational performance (defined under Table 10).....	139
Annex G (informative) Rated operational currents and rated operational powers of switching devices for electrical motors.....	140
G.1 General.....	140
G.2 Rated operational powers and rated operational currents	140
Annex H (normative) Extended functions to electronic overload relays	144
H.1 General.....	144
H.2 Limits of operation of control functions.....	144
H.2.1 General	144
H.2.2 Limits of electronic overload relay with main circuit undervoltage restarting function	144
H.3 Test of the control functions	144
Annex I (informative) AC-1 contactors for use with semiconductor controlled motor load 145	
Annex J (Void).....	146
Annex K (normative) Procedure to determine data for electromechanical contactors used in functional safety applications	147
K.1 General.....	147
K.2 Test requirements	147
K.3 Characterization of a failure mode	147
K.4 Failure ratios of a contactor.....	147

Annex L (normative) Assessment procedure for electromechanical overload protection used in safety applications and especially in explosive atmospheres.....	149
L.1 Application and object	149
L.1.1 Application.....	149
L.1.2 Object.....	149
L.2 Procedure	149
L.2.1 General	149
L.2.2 Safety design process.....	150
L.3 Requirements.....	150
L.3.1 General	150
L.3.2 Safety plan	150
L.3.3 Design.....	151
L.3.4 Failure mode and effects analysis of the safety function.....	151
L.3.5 Design plan.....	152
L.3.6 Verification	152
L.3.7 Function assessed	152
L.4 Documentation.....	152
L.4.1 Technical safety documentation	152
L.4.2 Safety instructions	152
L.5 Example.....	153
L.5.1 architecture description.....	153
L.5.2 FMEA	154
Annex M (normative) DC contactors for use in photovoltaic (PV) applications.....	162
M.1 Application.....	162
M.2 Object.....	162
M.3 Classification	162
M.4 Characteristics	162
M.4.1 General	162
M.4.2 Rated impulse withstand voltage	162
M.4.3 Utilization category	163
M.5 Product information	163
M.6 Normal service, mounting and transport conditions	164
M.6.1 General	164
M.6.2 Ambient air temperature.....	164
M.6.3 Altitude	164
M.7 Constructional and performance requirements	164
M.7.1 Constructional requirements.....	164
M.7.2 Performance requirements	164
M.7.3 Electromagnetic compatibility (EMC)	165
M.8 Tests	166
M.8.1 General	166
M.8.2 Type tests.....	166
M.8.3 Making and breaking capacities and conventional operational performance	166
M.8.4 Thermal cycling test.....	166
M.8.5 Climatic test.....	167
M.8.6 Dielectric test.....	167
M.8.7 Critical load current test	167
M.8.8 Mechanical and electrical properties of terminals	168

M.8.9	Degree of protection of enclosed contactors	168
M.8.10	EMC	168
M.8.11	Clearance and creepage distances	168
Annex N (normative)	Additional requirements and tests for equipment with protective separation	169
N.1	General.....	169
N.2	Terms and definitions	169
N.3	Requirements.....	169
N.3.1	Test method for implementing protective impedance	169
N.3.2	Touch current measurement.....	170
Annex O (normative)	Load monitoring indicators.....	172
O.1	General.....	172
O.2	Indicators list	172
O.3	Uncertainty	174
O.4	Tests	175
O.4.1	Routine tests.....	175
O.4.2	Type tests.....	175
Annex P (normative)	Short-circuit breaking tests of MPSD	177
P.1	General test conditions.....	177
P.2	Rated service short-circuit breaking capacity	178
P.2.1	General	178
P.2.2	Test of rated service short-circuit breaking capacity	178
P.2.3	Verification of operational performance capability	178
P.2.4	Verification of dielectric withstand	178
P.2.5	Verification of temperature-rise	179
P.2.6	Verification of overload releases.....	179
P.3	Rated ultimate short-circuit breaking capacity	179
P.3.1	General	179
P.3.2	Verification of overload releases.....	179
P.3.3	Test of rated ultimate short-circuit breaking capacity.....	180
P.3.4	Verification of dielectric withstand	180
P.3.5	Verification of overload releases.....	180
P.4	Test of MPSD for IT system.....	180
P.4.1	General	180
P.4.2	Individual pole short-circuit.....	181
P.4.3	Verification of dielectric withstand	181
P.4.4	Verification of overload releases.....	181
P.4.5	Marking	182
Bibliography	183
Figure 1	– Multiple of current setting limits for ambient air temperature compensated time-delay overload relays	63
Figure 2	– Thermal memory test.....	64
Figure 3	– Example of different parts.....	67
Figure 4	– Examples of co-ordination characteristics of a starter	77
Figure 5	– Voltage drop measurement at contact point of the clamping terminal	82
Figure 6	– Peak current envelope.....	89
Figure A.1	– Main circuit	110

Figure A.2 – Overload relays.....	111
Figure B.1 – Examples of time-current withstand characteristic.....	119
Figure C.1 – Electric motor characteristics.....	121
Figure C.2 – Rated current of different energy efficiency classes.....	122
Figure C.3 – Ratio of the rated locked-rotor current to the nominal current.....	122
Figure C.4 – Ratio of the inrush current to the nominal current.....	123
Figure C.5 – Connections to motor windings.....	124
Figure C.6 – Current and torque during direct-on-line starting.....	125
Figure C.7 – Typical variants of protected starters, combination starters, protected switching devices and combination switching devices.....	126
Figure C.8 – Functional view of motor starters.....	127
Figure C.9 – Motor overload protection embedded into a circuit-breaker.....	128
Figure C.10 – Typical curves of currents and torques during a star-delta start.....	129
Figure C.11 – Timing of star-delta-switching.....	130
Figure C.12 – Typical method and diagram of starting alternating-current induction motors by means of star-delta starter.....	131
Figure C.13 – Typical curves of currents and torques during an auto-transformer starting of a motor.....	132
Figure C.14 – Typical schematic diagrams for starting alternating-current induction motors by means of auto-transformers.....	133
Figure C.15 – Examples of current and time curves of motor starting and stopping in one or two directions.....	134
Figure F.1 – Mirror contact.....	138
Figure L.1 – Safety design process.....	150
Figure L.2 – Typical structure of a thermal overload relay.....	153
Figure L.3 – typical structure of MPSD.....	154
Figure N.1 – Protection by means of protective impedance.....	170
Figure N.2 – Measuring instrument.....	171
Figure O.1 – Example of quantification of a process change.....	174
Table 1 – Utilization categories.....	43
Table 2 – Trip classes of overload relays.....	46
Table 19 – Limits for limited energy sources without an overcurrent protective device.....	58
Table 20 – Limits for limited energy sources with an overcurrent protective device.....	58
Table 21 – Limits for limited energy source with current limiting impedance.....	59
Table 3 – Limits of operation of time-delay overload relays when energized on all poles.....	63
Table 4 – Limits of operation of three-pole time-delay overload relays when energized on two poles only.....	65
Table 5 – Temperature-rise limits for insulated coils in air and in oil.....	66
Table 6 – Intermittent duty test cycle data.....	69
Table 7 – Making and breaking capacities – Making and breaking conditions according to utilization category.....	70
Table 8 – Relationship between the test current and off-time for the verification of rated making and breaking capacities.....	72
Table 9 – Operational current determination for utilization categories AC-6a and AC-6b when derived from AC-3 ratings.....	72

Table 10 – Conventional operational performance – Making and breaking conditions according to utilization category	73
Table 11 – Overload current withstand requirements	74
Table 12 – Specific acceptance criteria for immunity tests	78
Table 13 – Value of the prospective test current according to the rated operational current.....	101
Table 14 – Value of the conventional prospective test current according to the rated operational current (harmonized table)	101
Table 15 – Test conditions for I_{Cd}	104
Table 16 – EMC immunity tests	107
Table 17 – Terminal disturbance voltage limits for conducted radio-frequency emission (for mains ports)	109
Table 18 – Radiated emission test limits.....	109
Table B.1 – Verification of the number of on-load operating cycles – Conditions for making and breaking corresponding to the several utilization categories	115
Table B.2 – Test conditions.....	118
Table F.1 – Test voltage according to altitude.....	139
Table G.1 – Rated operational powers and rated operational currents of motors.....	141
Table K.1 – Failure mode of contactors	147
Table K.2 – Typical failure ratios for normally open contactors	148
Table L.1 – Severity.....	154
Table L.2 – Occurrence.....	155
Table L.3 – Detection levels	155
Table L.4 – Conclusion	156
Table L.5 – Example of failure mode and effects analysis for thermal overload relay	157
Table M.1 – Rated impulse voltage levels for PV contactors	163
Table M.2 – Utilization categories	163
Table M.3 – Ambient air temperature conditions	164
Table M.4 – Verification of rated making and breaking capacities – Conditions for making and breaking corresponding to the DC-PV category	165
Table M.5 – Conventional operational performance – Making and breaking condition corresponding to the DC-PV category.....	165
Table M.6 – Overall scheme of test sequences.....	166
Table M.7 – Number of operating cycles corresponding to the critical load current.....	168
Table M.8 – Critical load current performance	168
Table O.1 – AC monitoring indicators list.....	173
Table O.2 – Different possibilities authorized for verification of indicators.....	175
Table O.3 – Reference for verification conditions.....	176
Table O.4 – Harmonic levels	176

INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –**Part 4-1: Contactors and motor-starters –
Electromechanical contactors and motor-starters**

FOREWORD

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IEC 60947-4-1 has been prepared by subcommittee 121A: Low-voltage switchgear and controlgear, of IEC technical committee 121: Switchgear and controlgear and their assemblies for low voltage. It is an International Standard.

This fifth edition cancels and replaces the fourth edition published in 2018. This edition constitutes a technical revision.

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

- a) objective in the scope;
- b) instantaneous only motor protective switching device IMPSD (3.5.33);
- c) kinds of equipment (5.2.1);

- d) methods of overload protection of motors (5.2.6);
- e) adoption of the AC-7d from IEC 61095:2023 (in 5.4.2);
- f) separately mounted overload relay of a starter (in 5.7.3 b));
- g) starter and contactor suitable for use downstream to basic drive module (6.1.2 w));
- h) reference to IEC TS 63058 for environmental aspects (in 6.4);
- i) wiring subject to movement (in 8.1.3);
- j) use of voltage transient limiting device (8.1.18);
- k) accessible parts subject to temperature limits (in 8.2.2.3);
- l) reference to Annex X of IEC 60947-1:2020 for the co-ordination of MPSD with SCPD (8.2.5.4);
- m) reference to IEC TR 63216 with different EMC environments (8.3.1);
- n) reference to IEC TR 63201 for the embedded software design (8.4);
- o) reference to IEC TS 63208 for cybersecurity aspects (8.5);
- p) update and completion of the measurement method of the power consumption of the electromagnet (9.3.3.2.1.2);
- q) update of Annex C including rational about AC-3e;
- r) determination of the critical load current for photovoltaic applications (M.8.7).

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

Draft	Report on voting
121A/571/FDIS	121A/580/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of the IEC 60947 series can be found, under the general title *Low-voltage switchgear and controlgear*, on the IEC website.

This document shall be read in conjunction with IEC 60947-1:2020, *Low voltage switchgear and controlgear – Part 1: General rules*. The provisions of the general rules are applicable to this document, where specifically called for.

The provisions of the general rules dealt with IEC 60947-1 are applicable to this part of IEC 60947 series where specifically called for. Clauses and subclauses, tables, figures and annexes of the general rules thus applicable are identified by reference to IEC 60947-1:2020. For example, 5.3.4.1 of IEC 60947-1:2020, Table 4 of IEC 60947-1:2020, or Annex A of IEC 60947-1:2020.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 4-1: Contactors and motor-starters – Electromechanical contactors and motor-starters

1 Scope

This part of IEC 60947 is applicable to the following equipment:

- electromechanical contactors and starters including motor protective switching devices (MPSD and IMPSD);
- actuators of contactor relays;
- contacts dedicated exclusively to the coil circuit of the contactor or the contactor relay;
- dedicated accessories (e.g. dedicated wiring, dedicated latch accessory);

intended to be connected to distribution circuits, motors circuits and other load circuits, the rated voltage of which does not exceed 1 000 V AC or 1 500 V DC.

This document does not apply to:

- starters for DC motors;
- auxiliary contacts of contactors and contacts of contactor relays. These are covered by IEC 60947-5-1;
- the short-circuit protective device integrated within starters, other than MPSDs. This is covered by IEC 60947-2 and IEC 60947-3;
- motor overload protection function performed by control units for built-in thermal protection (PTC). They are covered by IEC 60947-8;
- the use of the equipment with additional measures within explosive atmospheres. These are given in IEC 60079 series;

The objective of this document is to state:

- the characteristics and composition of the equipment (Clause 5);
- the conditions applicable to the equipment with reference to:
 - its operation (5.2.5) and protection functions (5.2.6, 5.7, 5.8),
 - its intended environments (6.5, 8.3.1) and applications (5.4, Annex C, Annex D, Annex G, Annex H, Annex I, Annex M, Annex O) including safety applications (Annex F, Annex K, Annex L),
 - its construction and performance (Clause 8) including requirements to reduce risks of electric shock, thermal hazard, energy hazard, fire hazard and mechanical hazard, reasonably foreseeable misuse, electromagnetic compatibility (EMC) issues, software errors and security issues;
- the tests intended for confirming that these conditions have been met, and the methods to be adopted for these tests (Clause 9);
- the information to be included with the equipment or in the product documentation (Clause 6).

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 60034-1:2022, *Rotating electrical machines – Part 1: Rating and performance*

IEC 60034-12:2016, *Rotating electrical machines – Part 12: Starting performance of single-speed 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 60068-2-14:2023, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60079-14, *Explosive atmospheres – Part 14: Electrical installations design, selection and erection*

IEC 60085:2007, *Electrical insulation – Thermal evaluation and designation*

IEC 60364-1:2005, *Low-voltage electrical installations – Part 1: Fundamental principles, assessment of general characteristics, definitions*

IEC 60715:2017, *Dimensions of low-voltage switchgear and controlgear – Standardized mounting on rails for mechanical support of switchgear, controlgear and accessories*

IEC 60730-1, *Automatic electrical controls – Part 1: General requirements*

IEC 60947-1:2020, *Low-voltage switchgear and controlgear – Part 1: General rules*

IEC 60947-2:2016, *Low-voltage switchgear and controlgear – Part 2: Circuit-breakers*

IEC 60947-5-1:2016, *Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices*

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 61140:2016, *Protection against electric shock – Common aspects for installation and equipment*

IEC 61439 (all parts), *Low-voltage switchgear and controlgear assemblies*

IEC 61643-331, *Components for low-voltage surge protection – Part 331: Performance requirements and test methods for metal oxide varistors (MOV)*

IEC 61800-5-1:2022, *Adjustable speed electrical power drive systems – Part 5-1: Safety requirements – Electrical, thermal and energy*

IEC 61810-1, *Electromechanical elementary relays – Part 1: General and safety requirements*

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, *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement*

CISPR 11:2015/AMD1:2016

CISPR 11:2015/AMD2:2019

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*

ISO 3864-2, *Graphical symbols – Safety colours and safety signs – Part 2: Design principles for product safety labels*

3 Terms, definitions, symbols and abbreviated terms

3.1 General

For the purposes of this document, the terms and definitions of Clause 3 of IEC 60947-1:2020, as well as the following terms, definitions, symbols and abbreviated terms apply.

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

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

3.2 Alphabetical index of terms

	Reference
A	
abnormal operating condition	3.7.1
accessible part	3.7.2
auto-transformer starter	3.5.4.2
auto-transformer	3.5.4.3
B	
basic drive module (abbreviation: BDM)	3.5.36
C	
closed transition (with an auto-transformer starter or star-delta starter)	3.5.23
combination starter	3.5.7
combination switching device	3.5.27
conventional prospective current "r"	3.6.9
CO operation	3.6.3
contactor (mechanical).....	3.3.1
D	
dedicated wiring accessory	3.5.34
direct-on-line starter.....	3.5.2