SLOVENSKI STANDARD
SIST EN 60947-2:2017/A1:2020

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Nizkonapetostne stikalne naprave - 2. del: Odklopniki - Dopolnilo A1 (IEC 60947-2:2016/A1:2019)

Low-voltage switchgear and controlgear - Part 2: Circuit-breakers (IEC 60947-2:2016/A1:2019)

Niederspannungsschaltgeräte - Teil 2: Leistungsschalter (IEC 60947-2:2016/A1:2019)

Appareillage à basse tension - Partie 2: Disjoncteurs (IEC 60947-2:2016/A1:2019)

Ta slovenski standard je istoveten z: EN 60947-2:2017/A1:2020

ICS:

29.130.20	Nizkonapetostne stikalne in krmilne naprave	Low voltage switchgear and controlgear

SIST EN 60947-2:2017/A1:2020 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60947-2:2017/A1

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English Version

Low-voltage switchgear and controlgear - Part 2: Circuit-breakers (IEC 60947-2:2016/A1:2019)

Appareillage à basse tension - Partie 2: Disjoncteurs (IEC 60947-2:2016/A1:2019)

Niederspannungsschaltgeräte - Teil 2: Leistungsschalter (IEC 60947-2:2016/A1:2019)

This amendment A1 modifies the European Standard EN 60947-2:2017; it was approved by CENELEC on 2019-08-12. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN 60947-2:2017/A1:2020 E

European foreword

The text of document 121A/286/FDIS, future IEC 60947-2/A1, prepared by SC 121A "Low-voltage switchgear and controlgear" of IEC/TC 121 "Switchgear and controlgear and their assemblies for low voltage" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60947-2:2017/A1:2020.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-08-07
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-02-07

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s), see informative Annexes ZZA and ZZB, included in this document.

Endorsement notice

The text of the International Standard IEC 60947-2:2016/A1:2019 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60364 (series)	NOTE	Harmonized as HD 60364 (series)
IEC 60364-5-52	NOTE	Harmonized as HD 60364-5-52
IEC 60695-2-11:2014	NOTE	Harmonized as EN 60695-2-11:2014 (not modified)
IEC 60898-1	NOTE	Harmonized as EN 60898-1
IEC 61000-3-2	NOTE	Harmonized as EN IEC 61000-3-2
IEC 61000-3-3	NOTE	Harmonized as EN 61000-3-3
IEC 61238-1	NOTE	Harmonized as EN 61238-1

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Annex ZA of EN 60947-2:2017 applies, except as follows:

Delete *from the existing list of Annex ZA of EN 60947-2:20177 the following references:*

Publication	Year	Title	EN/HD	Year
IEC 60364	Series	Low-voltage electrical installations	HD 60364	Series
IEC 61000-3-2	-	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)	EN 61000-3-2	2014
IEC 61000-3-3	-	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection	EN 61000-3-3	2013
CISPR 22	-	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	EN 55022 + AC	2010 2011

Replace *the existing references of the following list by the following new references:*

IEC 60269-1	2006	Low-voltage fuses - Part 1: General requirements	EN 60269-1	2007
			+A1	2009
			+A2	2014
IEC 61000-4-2	2008	Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test	EN 61000-4-2	2008

Publication	Year	Title	EN/HD	Year
IEC 61000-4-11	-	Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests	EN 61000-4-11	2004
IEC 61140	2016	Protection against electric shock - Common aspects for installation and equipment	EN 61140	2016
CISPR 11	2015	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement	EN 55011 (modified)	2016
+A1	2016		+A1	2017
Add *the following new references as follows:*				
IEC 60228	-	Conductors of insulated cables	EN 60228 + AC	2005 2005
IEC 61545[1]	1996	Connecting devices – Devices for the connection of aluminium conductors in clamping units of any material and copper conductors in aluminium bodied clamping units	-	-
CISPR 32	2015	Electromagnetic compatibility of multimedia equipment – Emission requirements	EN 55032 + AC	2015 2016

[1] Dated as no equivalent European Standard exists.

Annex ZZA
(informative)

Relationship between this European standard and the essential requirements of Directive 2014/30/EU [2014 OJ L96] aimed to be covered and the standardisation request M/552

This European standard has been prepared under the European Commission standardisation request C(2016) 7641 final of 30.11.2016[12], ('M/552'), as regards harmonised standards in support of Directive 2014/30/EU relating to electromagnetic compatibility, to provide one voluntary means of conforming to essential requirements of Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility [2014 OJ L96].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

Table ZZA.1 — Correspondence between this European standard and the Essential Requirements set out in Directive 2014/30/EU [2014 OJ L96]

Essential requirements of Directive 2014/30/EU	Clause(s) / sub-clause(s) of this EN	Remarks / Notes
Annex I. 1(a) (electromagnetic disturbances)	7.3, B.7.3, B.8.13.2, F.5, J.1, J.3, M.7.2.12, M.8.16.2, N.3, P.7.3	Full coverage of requirements for conducted and radiated disturbances in the range 150 kHz to 6 GHz
		Annex H of EN 55011 shall not be applied in conjunction with the emission limits specified in J.3 for the purposes of the presumption of conformance.
Annex I. 1(b) (electromagnetic immunity)	7.3, B.7.3, B.8.13.1, F.2.2, F.3, F.4, J.1, J.2, M.7.2.12, M.8.16.1, N.1, N.2, P.7.3	

WARNING 1: Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2: Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

[2] COMMISSION IMPLEMENTING DECISION C(2016) 7641 final of 30.11.2016 on a standardisation request to the European Committee for Standardisation, to the European Committee for Electrotechnical Standardisation and to the European Telecommunications Standards Institute as regards harmonised standards in support of Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility

Annex ZZB
(informative)

Relationship between this European standard and the safety objectives of Directive 2014/35/EU [2014 OJ L96] aimed to be covered

This European Standard has been prepared under a Commission's standardization request relating to harmonized standards in the field of the Low Voltage Directive, M/511, to provide one voluntary means of conforming to safety objectives of Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits [2014 OJ L96].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZB.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding safety objectives of that Directive, and associated EFTA regulations.

Table ZZB.1 — Correspondence between this European standard and Annex I of Directive 2014/35/EU [2014 OJ L96]

Safety objectives of Directive 2014/35/EU	Clause(s) / sub-clause(s) of this EN	Remarks/note
1 a)	Foreword, 1.1, 4, 5, B.5, D.5, H.5, L.5, M.5, O.5, P.5, R.5, Annex K	
1 b)	5, D.5, L.5, M.5, O.4, P.5	
1 c)	1.1, 2.1, 5.3	Refer to 2 a) to 2 d) and 3 a) to 3 c) in this table.
2 a)	5.2, 5.3, 7.1.3, 7.1.4, 7.2.3, 8.3, 8.4	
2 b)	7.2.2, 7.3, 8.3.2, F.1, J.3, D.8	
2 c)	5.3, 7.1, 7.1.2, 7.1.3, 7.1.5, 7.2.1, 7.3, 8.3.3 to 8.3.6, 8.4, 8.5, F.1, J.2, J.3, Annex D	
2 d)	5.2, 7.1.3, 7.1.4, 7.2.3, 8.3.2, F.2.2, B.7, M.7	
3 a)	5.3, 7.1.2, 7.1.5, 7.2.1, 8.3.3 to 8.3.6, 8.4, 8.5, B.7, M.7	
3 b)	7.3, F.1, J.3, Annex D	
3 c)	1.1, 7.2, 8.3	

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

IEC 60947-2

Edition 5.0 2019-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

Low-voltage switchgear and controlgear – Part 2: Circuit-breakers

Appareillage à basse tension – Partie 2: Disjoncteurs

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 29.130.20

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FOREWORD

This amendment 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.

The text of this amendment is based on the following documents:

FDIS	Report on voting
121A/286/FDIS	121A/302/RVD

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

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

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

1.1 Scope and object

Replace the existing first paragraph by the following:

This part of IEC 60947 series applies to circuit-breakers, intended to be installed and operated by instructed or skilled persons, the main contacts of which are intended to be connected to circuits, the rated voltage of which does not exceed 1 000 V a.c. or 1 500 V d.c.; it also contains additional requirements for integrally fused circuit-breakers.

Replace the 16th existing paragraph by the following:

For certain specific applications (for example traction, rolling mills, marine service, downstream of variable frequency drives, use in explosive atmospheres), particular or additional requirements may be necessary.

1.2 Normative references

Replace the existing references to IEC 61000-4-2, IEC 61140, and CISPR 11 by the following new references:

IEC 61000-4-2:2008, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

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

CISPR 11:2015, *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement*
CISPR 11:2015/AMD1:2016

Delete the existing references to IEC 60364 (all parts), IEC 61000-3-2, IEC 61000-3-3 and CISPR 22.

Add the following new normative references to the existing list:

IEC 60228, *Conductors of insulated cables*

IEC 61545, *Connecting devices – Devices for the connection of aluminium conductors in clamping units of any material and copper conductors in aluminium bodied clamping units*

CISPR 32:2015, *Electromagnetic compatibility of multimedia equipment – Emission requirements*

Add, after the existing definition 2.22, the following new definition:

2.23
closing release
closing coil
release, energized by a source of voltage, which triggers the closing of the circuit-breaker

Note 1 to entry: A closing release is an auxiliary device of the circuit-breaker, and is different from the "closing device" mentioned in the figures of Annex A, and in IEC 60947-1, which is part of the test setup and is intended to establish the short-circuit current.

4.7.1 Types

Renumber existing item "4) other releases." *to item* "5) other releases.".

Add new item "4) closing release;".

4.7.2 Characteristics

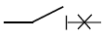
Change existing item 1) to read "1) shunt release and undervoltage release (for opening), and closing release:"*, keeping dashed items unchanged.*

5.2 Marking

Replace the existing text, including all lettered items, by the following new text and Table 13:

Each circuit-breaker shall be marked in a durable manner; data to be provided and corresponding locations are indicated in Table 13.

Table 13 – Product information

Item	Information	Marking location
1.1	rated current (I_n)	Visible
1.2	suitability for isolation, if applicable, with the symbol  (IEC 60617-S00288:2001-07 combined with IEC 60617-S00219:2001-07)	Visible
1.3	indication of the open and closed position with O (IEC 60417-5008;2002-10) and I (IEC 60417-5007;2002-10) respectively, if symbols are used (see 7.1.6.1 of IEC 60947-1:2007)	Visible
2.1	manufacturer's name or trade mark	Marked
2.2	type designation or catalogue reference	Marked
2.3	IEC 60947-2, if the manufacturer claims compliance with the standard	Marked
2.4	selectivity category A or B	Marked
2.5	rated operational voltage(s) U_e (see 4.3.2.1 and, where applicable, Annex H)	Marked
2.6	unsuitability for IT systems, if applicable, with the symbol  (IEC 60417-6363:2016-07)	Marked
2.7	rated impulse withstand voltage (U_{imp})	Marked
2.8	value (or range) of the rated frequency, and/or the indication "d.c." (or the symbol  (IEC 60417-5031:2002-10))	Marked
2.9	rated service short-circuit breaking capacity (I_{cs}) at the corresponding rated voltage (U_e)	Marked
2.10	rated ultimate short-circuit breaking capacity (I_{cu}) at the corresponding rated voltage (U_e)	Marked
2.11	rated short-time withstand current (I_{cw}), and associated short-time delay, for selectivity category B	Marked
2.12	range of the current setting (I_r) of the adjustable overload release	Marked [a]
2.13	range of the rated instantaneous short-circuit current setting (I_i), for adjustable releases	Marked [a]
2.14	reference temperature for non-compensated thermal releases, if different from 30 °C	Marked
2.15	terminals identification, according to 7.1.8.4 of IEC 60947-1:2007	Marked
2.16	line and load terminals, if applicable	Marked
2.17	neutral pole terminals, if applicable, by the letter N	Marked
2.18	protective earth terminal, where applicable, by the symbol  (IEC 60417-5019:2006-08) (see 7.1.10.3 of IEC 60947-1:2007)	Marked
3.1	rated short-circuit making capacity (I_{cm}), if higher than that specified in 4.3.6.1	Literature
3.2	rated insulation voltage (U_i), if higher than the maximum rated operational voltage	Literature
3.3	pollution degree if other than 3	Literature
3.4	conventional enclosed thermal current (I_{the}) if different from the rated current	Literature
3.5	IP code, where applicable (see Annex C of IEC 60947-1:2007/AMD1:2010)	Literature
3.6	minimum enclosure size and ventilation data (if any) to which marked ratings apply	Literature
3.7	details of minimum distance between circuit-breaker and earthed metal parts for circuit-breakers intended for use without enclosures	Literature
3.8	suitability for environment A or environment B per Annex J, as applicable	Literature
3.9	RMS sensing, if applicable, in accordance with F.4.1.1	Literature
3.10	minimum cable cross-section, if different from Table 9 of IEC 60947-1:2007, for ratings ≤ 20 A according to rated ultimate short-circuit breaking capacity I_{cu}	Literature
3.11	values of tightening torque for the circuit-breaker terminals	Literature

Item	Information	Marking location
3.12	current derating for terminals and connections, if applicable	Literature
4.1	for closing releases (see 2.23) and/or motor-operators, rated control circuit voltage, kind of current and rated frequency for a.c.	Aux
4.2	rated control circuit voltage of the shunt release and/or of the under-voltage release (or of the no-voltage release), kind of current and rated frequency for a.c.	Aux
4.3	rated current of indirect over-current releases	Aux
4.4	number and type of auxiliary contacts, rated operational currents at the rated operational voltages, and rated frequency for a.c.	Aux
Key		
Visible:	visible from the front when the circuit-breaker is installed as in service and the actuator is accessible	
Marked:	marked on the circuit-breaker	
Literature:	provided in the manufacturer's literature	
Aux:	marked on the auxiliaries or on the circuit-breaker, if marking space is sufficient; additionally, data shall be made available in the manufacturer's literature	
[a] Where applicable, I_r and I_i ranges may be displayed instead of being marked on the circuit-breaker.		

5.3 Instructions for installation, operation and maintenance

Replace the existing text by the following new text:

Subclause 5.3 of IEC 60947-1:2007/AMD2:2014 applies with the following addition:

Additional information for the decommissioning and dismantling of the circuit-breaker shall be provided to the user in the case of a foreseeable hazardous condition, for example due to stored energy or hazardous substances.

7.1.1 General

Replace the existing text by the following new text:

Subclause 7.1 of IEC 60947-1:2007/AMD1:2010/AMD2:2014 applies with the following modifications:

The requirements of 7.1.2 of IEC 60947-1:2007/AMD1:2010/AMD2:2014 do not apply to parts with a mass lower than 2 g (insignificant mass, in accordance with 3.14 of IEC 60695-2-11:2014). For products containing a plurality of small parts, the total mass of non-tested parts located in close proximity to each other shall not exceed 10 g. Proximity shall be based on engineering judgment that takes into consideration the risk of propagation of fire.

Where, in 7.1.2.2 of IEC 60947-1:2007/AMD1:2010/AMD2:2014, the test temperature is to be specified, the value required by this document for the parts necessary to retain in position current-carrying parts is:

– 960 °C for the main circuit;
– 850 °C for the other circuits.

7.2.2.3 Main circuit

Replace the existing text by the following new text: