SLOVENSKI STANDARD
SIST EN IEC 61810-10:2021

01-junij-2021

Elektromehanski osnovni releji - 10. del: Dodatni funkcionalni vidiki in varnostne zahteve za visoko zmogljive releje

Electromechanical elementary relays - Part 10: Additional functional aspects and safety requirements for high-capacity relays

Ta slovenski standard je istoveten z: EN IEC 61810-10:2019

ICS:

29.120.70 Releji Relays

SIST EN IEC 61810-10:2021 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61810-10

September 2019

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English Version

Electromechanical elementary relays - Part 10: Additional functional aspects and safety requirements for high-capacity relays (IEC 61810-10:2019)

Relais électromécaniques élémentaires - Partie 10: Aspects fonctionnels et exigences de sécurité supplémentaires pour les relais à grande capacité
(IEC 61810-10:2019)

Elektromechanische Elementarrelais - Teil 10: Hochleistungsrelais - Zusätzliche funktionale Aspekte und Sicherheitsanforderungen
(IEC 61810-10:2019)

This European Standard was approved by CENELEC on 2019-08-15. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard 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 European Standard 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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

European foreword

The text of document 94/453/FDIS, future edition 1 of IEC 61810-10, prepared by IEC/TC 94 "All-or-nothing electrical relays" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61810-10:2019.

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) 2020-05-15
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-08-15

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.

Endorsement notice

The text of the International Standard IEC 61810-10:2019 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 60038	NOTE	Harmonized as EN 60038
IEC 60060-1	NOTE	Harmonized as EN 60060-1
IEC 60068-2-20	NOTE	Harmonized as EN 60068-2-20
IEC 60085	NOTE	Harmonized as EN 60085
IEC 60364-4-44	NOTE	Harmonized as HD 60364-4-444
IEC 60664 (series)	NOTE	Harmonized as EN 60664 (series)
IEC 60695-2-10	NOTE	Harmonized as EN 60695-2-10
IEC 60947-2:2016	NOTE	Harmonized as EN 60947-2:2017 (not modified)
IEC 60947-5-1	NOTE	Harmonized as EN 60947-5-1
IEC 61210	NOTE	Harmonized as EN 61210
IEC 61810-7:2006	NOTE	Harmonized as EN 61810-7:2006 (not modified)
IEC 61984	NOTE	Harmonized as EN 61984

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.

Publication	Year	Title	EN/HD	Year
IEC 60028	-	International standard of resistance for copper	-	-
IEC 60060-1	2010	High-voltage test techniques - Part 1: General definitions and test requirements	EN 60060-1	2010
IEC 60068-2-14	-	Environmental testing - Part 2: Tests - Test N: Change of temperature	-	-
IEC 60068-2-17	-	Basic environmental testing procedures - Part 2-17: Tests - Test Q: Sealing	EN 60068-2-17	-
IEC 60068-2-27	-	Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock	EN 60068-2-27	-
IEC 60068-2-64	2008	Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance	EN 60068-2-64	2008
IEC 60270	-	High-voltage test techniques - Partial discharge measurements	EN 60270	-
IEC 60664-1	2007	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	2007
IEC 60664-3	2016	Insulation coordination for equipment within low-voltage systems - Part 3: Use of coating, potting or moulding for protection against pollution	EN 60664-3	2017
IEC 60947-1	2007	Low-voltage switchgear and controlgear - Part 1: General rules	EN 60947-1	2007
IEC 60999-1	-	Connecting devices - Electrical copper conductors - Safety requirements for screw-type and screwless-type clamping units - Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm^2 up to 35 mm^2 (included)	EN 60999-1	-
IEC 60099-2	-	Connecting devices - Electrical copper conductors - Safety requirements for screw-type and screwless-type clamping units - Part 2: Particular requirements for clamping units for conductors above 35 mm^2 up to 300 mm^2 (included)	EN 60999-2	-
IEC 61810-1	2015	Electromechanical elementary relays - Part 1: General and safety requirements	EN 61810-1	2015
ISO 16750-1	2019	Road vehicles - Environmental conditions and testing for electrical and electronic equipment - Part 1: General	-	-
ISO 16750-2	2012	Road vehicles - Environmental conditions and testing for electrical and electronic equipment - Part 2: Electrical loads	-	-

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Electromechanical elementary relays – Part 10: Additional functional aspects and safety requirements for high-capacity relays

Relais électromécaniques élémentaires – Partie 10: Aspects fonctionnels et exigences de sécurité supplémentaires pour les relais à grande capacité

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTROMECHANICAL ELEMENTARY RELAYS –

Part 10: Additional functional aspects and safety requirements for high-capacity relays

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

The International Standards of the IEC 61810 have been prepared by IEC technical committee 94: All-or-nothing electrical relays.

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

FDIS	Report on voting
94/453/FDIS	94/458/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.

A list of all parts of IEC 61810 series, published under the general title *Electromechanical elementary relays,* can be found on the IEC website.

This International Standard is to be used in conjunction with IEC 61810-1:2015.

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

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

ELECTROMECHANICAL ELEMENTARY RELAYS –

Part 10: Additional functional aspects and safety requirements for high-capacity relays

1 Scope

This part of IEC 61810, with functional and safety aspects, applies to electromechanical elementary relays (non-specified time all-or-nothing relays) with high capability requirements like breaking or short circuit capabilities and similar for incorporation into low-voltage equipment. These relays may have a specific design to extinguish the electric arc between contacts (e.g. by magnetic blow-out), or use an insulation coordination not covered by IEC 61810-1 (e.g. by gas filled contact chambers), or require safety assessments not covered by IEC 61810-1 (e.g. for higher loads).

It defines additional requirements for high-capacity relays with generic performance intended for use in applications in smart grids, electric vehicles and other applications where, for example, battery charge/discharge switching is used, such as:

- electrical energy storage (EES) systems,
- solar photovoltaic energy systems,
- electric road vehicles (EV) and electric industrial trucks,
- power electronic systems and equipment,
- secondary cells and batteries,
- road vehicles.

Compliance with the requirements of this standard is verified by the type tests indicated.

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 60028, *International standard of resistance for copper*

IEC 60060-1:2010, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60068-2-14, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-17, *Basic environmental testing procedures – Part 2-17: Tests – Test Q: Sealing*

IEC 60068-2-27, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60068-2-64:2008, *Environmental testing – Part 2-64: Tests – Test Fh: Vibration, broadband random and guidance*

IEC 60270, *High-voltage test techniques – Partial discharge measurements*

IEC 60664-1:2007, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60664-3:2016, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*

IEC 60947-1:2007, *Low-voltage switchgear and controlgear – Part 1: General rules*

IEC 60999-1, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm^2 up to 35 mm^2 (included)*

IEC 60999-2, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 2: Particular requirements for clamping units for conductors above 35 mm^2 up to 300 mm^2 (included)*

IEC 61810-1:2015, *Electromechanical elementary relays – Part 1: General and safety requirements*

ISO 16750-1:2018, *Road vehicles – Environmental conditions and testing for electrical and electronic equipment – Part 1: General*

ISO 16750-2:2012, *Road vehicles – Environmental conditions and testing for electrical and electronic equipment – Part 2: Electrical loads*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61810-1 and the following 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

NOTE In the text of this document, the term "relay" is used instead of "elementary relay" to improve the readability.

3.5 Terms and definitions related to contacts

Addition to IEC 61810-1:2015:

3.5.23
polarity of contact
indication of which terminal of a contact is to be connected to the positive supply and which to the negative

3.5.24
arcing time
<of a pole or a fuse> interval of time between the instant of the initiation of the arc in a pole or a fuse and the instant of final arc extinction in that pole or that fuse

[SOURCE: IEC 60050-441:1984, 441-17-37]

4 Influence quantities

Clause 4 of IEC 61810-1 is applicable.

5 Rated values

Clause 5 of IEC 61810-1 is applicable, except as follows.

5.6 Electrical endurance

Recommended number of cycles: 1; 2; 5; 10; 20; 50; 100; 200; 500; 1 000; 2 000; 3 000; 5 000; 6 000; 10 000; 20 000; 25 000; 30 000; 50 000;100 000; 200 000; 300 000; 500 000; etc.

5.7 Frequency of operation

Recommended frequencies: 180/h; 360/h; 720/h; 900/h and multiples thereof.

0,05 Hz; 0,1 Hz; 0,2 Hz; 0,25 Hz and multiples thereof.

5.8 Contact loads

a) Resistive loads, recommended values

Current: 0,1 A; 0,5 A; 1 A; 2 A; 3 A; 5 A; 6 A; 8 A; 10 A; 12 A; 16 A; 20 A; 25 A; 30 A; 35 A; 60 A; 100 A, 120 A; 150 A; 200 A; 300 A; 400 A; 600 A; 800 A; 1 000 A (AC/DC).

Voltage: 4,5 V; 5 V; 12 V; 24 V; 36 V; 42 V; 48 V; 110 V; 125 V; 230 V; 250 V; 300 V; 380 V; 400 V; 480 V; 500 V; 575 V; 600 V; 690 V; 1 000 V (AC/DC); 1 200 V DC; 1 500 V DC.

b) Recommended inductive loads: see Annex B.

c) Recommended capacitive loads: see Annex D of IEC 61810-1:2015.

6 General provisions for testing

Clause 6 of IEC 61810-1 is applicable, except as follows.

Deviating from IEC 61810-1, the specimens shall be grouped in 8 inspection lots, and the related tests shall be taken from Table 1 of this document.

Table 1 of this document replaces Table 3 of IEC 61810-1:2015.

Table 1 – Type testing

Inspection lot	Tests	Clause	Additional references
1	Marking and documentation	7	IEC 60417
	Heating (all coil voltages)	8	IEC 60085
	Basic operating function (all coil voltages)	9	
2	Dielectric strength	10	
3	Electrical endurance (per contact load and contact material)	11	
4	Mechanical endurance	12	
5	Clearances, creepage distances and distances through solid insulation	13	IEC 60664-1
6	Insulation coordination evaluation as a system (if applicable)	13.6	IEC 60060-1
	Screw type terminals and screwless terminals (if applicable)	14.2	IEC 60999-1
	Flat quick-connect terminations (if applicable)	14.3	IEC 61210
	Solder terminals (if applicable)	14.4	IEC 60068-2-20
	Sockets (if applicable)	14.5	IEC 61984
	Alternative termination types (if applicable)	14.6	
	Sealing (if applicable)	15	IEC 60068-2-17
7	Heat and fire resistance	16	IEC 60695-2-10
8	Leaking test (sealed relay only)	Annex Q	IEC 60068-2-14 IEC 60068-2-17
NOTE The number of coil voltages in inspection lot 1 to be tested can be reduced under certain conditions explained in Clauses 8 and 9. Beside the defined minimum requirements, deviations of test conditions and procedures could be specified by the manufacturer in the inspection lot 8.			

7 Documentation and marking

Clause 7 of IEC 61810-1:2015 is applicable with the additions given in Table 2 of this document.

Table 2 – Required relay data

N°	Data	Notes	Place of indication
2d	Coil polarity	N/A in case of non-polarized coil	Relay and/or catalogue or instruction sheet
3h	Classification of load and polarity of contacts	For DC only use:+, - For AC/DC use: +/⎓, -/⎓, ⎓	Relay and/or catalogue or instruction sheet
5l	Limited short circuit capacity	Specify the fuses or current limiting device (if applicable)	Catalogue or instruction sheet

8 Heating

Clause 8 of IEC 61810-1:2015 is applicable with the following changes/additions.