SLOVENSKI STANDARD
oSIST prEN IEC 61810-7-41:2023

01-september-2023

Električni releji - Preskusi in meritve -7-41. del:Uskladitev izolacije

Electrical relays - Tests and Measurements - Part 7-41: Insulation coordination

Ta slovenski standard je istoveten z: **prEN IEC 61810-7-41:2023**

ICS:

29.120.70 Releji Relays

oSIST prEN IEC 61810-7-41:2023 **en**

94/884/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: **IEC 61810-7-41 ED1**	
DATE OF CIRCULATION: **2023-07-07**	CLOSING DATE FOR VOTING: **2023-09-29**
SUPERSEDES DOCUMENTS: **94/836/CD, 94/870/CC**	

IEC TC 94 : ELECTRICAL RELAYS	
SECRETARIAT: Austria	SECRETARY: Mr Bernhard Spalt
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 121,SC 121A	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY	
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TITLE:

Electrical relays – Tests and Measurements – Part 7-41: Insulation coordination

PROPOSED STABILITY DATE: 2026

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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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:

CD	CC
94/836/CD	94/870/CC

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.

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

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

69 • reconfirmed,
70 • withdrawn,
71 • replaced by a revised edition, or
72 • amended.

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All-or-nothing electrical relays – Tests and Measurements

Part 7-41: Insulation coordination

1 Scope

This part of IEC 61810 part7 provides general guidance for the insulation coordination for electromechanical elementary relays and similar components within the scope of IEC technical committee 94. This part may also be used for similar devices when specified in a detail specification.

The test and/or measurement of creepages, clearances, solid insolation and insulation systems shall be carried out in conjunction with other IEC 61810-7 series parts.

The basis for the insulation coordination is given in IEC 60664 series.

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 60664-1:2020, *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

Clause 3 of IEC 61810-7-0 is applicable.

3.1 Terms and definitions related to insulation

3.1.1
functional insulation
insulation between conductive parts which is necessary only for the proper functioning of the relay

Note 1: A typical functional insulation is the coil wire insulation.

[SOURCE: IEC 60050-195, 195-02-41, modified – modification of the definition]

3.1.2
basic insulation
insulation of hazardous-live-parts which provides basic protection against electric shock

Note 21 to entry: Basic insulation does not necessarily include insulation used exclusively for functional purposes.

[SOURCE: IEC 60664-1:2007, 3.17.2, modified – modification of the definition]

3.1.3
supplementary insulation
independent insulation applied in addition to basic insulation, in order to provide protection against electric shock in the event of a failure of basic insulation

[SOURCE: IEC 60050-195, 195-06-07, modified – modification of the definition]

3.1.4
double insulation
insulation comprising both basic insulation and supplementary insulation

[SOURCE: IEC 60050-195, 195-06-08]

3.1.5
reinforced insulation
insulation of hazardous-live-parts which provides a degree of protection against electric shock equivalent to double insulation

[SOURCE: IEC 60050-195, 195-06-09, modified – modification of the definition]

3.1.6
conductive part
part which is capable of conducting electric current, although it may not necessarily be used for this purpose

[SOURCE: IEC 60050-195, 195-01-06, modified – modification of the definition]

3.1.7
live part
conductor or conductive part intended to be energized in normal operation, including a neutral conductor, but by convention not a PEN conductor

Note 1 to entry: A PEN conductor combines the functions of both a protective earthing conductor and a neutral conductor.

[SOURCE: IEC 60050-195, 195-02-19, modified – modification of the definition]

3.1.8
clearance
shortest distance in air between two conductive parts, or between a conductive part and the accessible surface of a relay

Note 1 to entry: An example for an accessible surface is the actuating member of a relay used for manual operation.

[SOURCE: IEC 60664-1:2007, 3.2, modified – modification of the definition]

3.1.9
solid insulation
solid insulating material interposed between two conductive parts

[SOURCE: IEC 60664-1:2007, 3.4]

3.1.10
thin layer
thin layer are considered as solid, homogenic insulating material whit specified dielectric strength

NOTE Typical examples for thin layers are insulation tapes and similar.

3.1.11
creepage distance
shortest distance along the surface of the insulating material between two conductive parts

[SOURCE: IEC 60664-1:2007, 3.3, modified – modification of the definition]

3.1.12
tracking
progressive degradation of a solid insulating material by local discharges to form conducting or partially conducting paths

Note 1 to entry: Tracking usually occurs due to surface contamination.

[SOURCE: IEC 60050-212:2010, 212-11-56, modified – modification of the definition]

3.1.13
proof tracking index
PTI
numerical value of the proof voltage expressed in volts which a material can withstand without tracking under specified test conditions

191 [SOURCE: IEC 60050-212:2010, 212-11-60, modified – modification of the definition]

192 **3.1.14**
193 **pollution**
194 any addition of foreign matter, solid, liquid, or gaseous that can result in a reduction of electric
195 strength or surface resistivity of the insulation

196 [SOURCE: IEC 60664-1:2007, 3.11]

197 **3.1.15**
198 **pollution degree**
199 numeral characterizing the expected pollution of the micro-environment

200 Note 1 to entry: Pollution degrees 1, 2 and 3 are used, see Annex C.

201 [SOURCE: IEC 60664-1:2007, 3.13]

202 **3.1.16**
203 **micro-environment**
204 immediate environment of the insulation which particularly influences the dimensioning of the
205 creepage distances

206 [SOURCE: IEC 60664-1:2007, 3.12.2]

207 **3.2 Terms and definitions related to contacts**

208 **3.2.1**
209 **micro-interruption**
210 interruption of a circuit by contact separation which does not provide full-disconnection or micro-
211 disconnection

212 Note 1 to entry: There are no dielectric strength or dimensional requirements for the contact gap.

213 [SOURCE: IEC 60730-1:2013, 2.4.4, modified – modification of the definition]

214 **3.2.2**
215 **micro-disconnection**
216 adequate contact separation in at least one contact so as to provide functional security

217 Note 1 to entry: There is a requirement for the dielectric strength of the contact gap but no dimensional requirement.

218 [SOURCE: IEC 60730-1:2013, 2.4.3, modified – modification of the term and definition]

219 **3.2.3**
220 **full-disconnection**
221 contact separation for the disconnection of conductors so as to provide the equivalent of basic
222 insulation between those parts intended to be disconnected

223 Note 1 to entry: There are dielectric strength and dimensional requirements.

224 [SOURCE: IEC 60730-1:2013, 2.4.2, modified – modification of the definition]

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