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Responsible committee: W/- Miscellaneous Standards # Consumer Products and Services

Interested committees:

Title: BS EN 61810-7-0 Electrical relays – Tests and Measurements

Part 7-0: General and Guidance

Please notify the secretary if you are aware of any keywords that might assist in classifying or identifying the standard or if the content of this standard

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- iii) requires additional national guidance or information

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



94/864/CD

COMMITTEE DRAFT (CD)

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IEC 61810-7-0 ED1

DATE OF CIRCULATION:
2023-04-28

CLOSING DATE FOR COMMENTS:
2023-06-23

SUPERSEDES DOCUMENTS:
94/724/CD, 94/861/CC

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

This document is still under study and subject to change. It should not be used for reference purposes.

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Recipients of this document are invited to submit, with their comments, notification of any local regulations or technical reasons that may exist and should be considered should this proposal proceed, recognizing that failure to address such requirements could result in the need for new or existing "In Some Countries" clauses. (SEE AC/22/2007 OR NEW GUIDANCE DOC).

TITLE:

Electrical relays – Tests and Measurements – Part 7-0: General and Guidance

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**Electrical Relays –
Tests and measurements****Part 7-0: Testing - General and Guidance****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 p
- 2) 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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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
94/724/CD	94/861/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.

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

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

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

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Electrical Relays – Tests and measurements

Part 7-0: Testing – General and Guidance

1 Scope

The IEC 61810-7-X series includes a series of methods for testing along with their appropriate severities and conditions for measurements and tests designed to assess the ability of specimens to perform under expected conditions of transportation, storage and all aspects of operational use.

This part of IEC 61810-7 series specifies the general condition applying for all testing if not otherwise specified and provide general guidance to be used in conjunction with all other IEC 61810-7 parts.

Table 1 – Table of all related part 7 standards

Part	Title
IEC 61810-7-0	Testing – General, Guidance and duty type of operation
IEC 61810-7-1	Visual inspection and check of dimensions
IEC 61810-7-2	Mechanical test and weighting
IEC 61810-7-3	Relay coil properties
IEC 61810-7-4	Dielectric strength test, impulse voltage test
IEC 61810-7-5	Insulation resistance
IEC 61810-7-6	Contact-circuit resistance (or voltage drop)
IEC 61810-7-7	Functional tests
IEC 61810-7-8	Timing Test
IEC 61810-7-9	Climatic tests sequence, damp heat steady state
IEC 61810-7-10	Heating
IEC 61810-7-11	Enclosure and IP Code (Ingress Protection Code)
IEC 61810-7-12	Internal moisture
IEC 61810-7-13	Corrosive atmospheres
IEC 61810-7-14	Mould growth
IEC 61810-7-15	Robustness of terminals
IEC 61810-7-16	Soldering
IEC 61810-7-17	Shock, Bump, Vibration, Acceleration
IEC 61810-7-18	Thermal resistance of the coil
IEC 61810-7-19	Electrical Endurance
IEC 61810-7-20	Mechanical Endurance
IEC 61810-7-21	Thermal Endurance
IEC 61810-7-22	Limiting continuous current

IEC 61810-7-23	Overload (contact circuit) [Handled within 61810-7-19]
IEC 61810-7-24	Load transfer
IEC 61810-7-25	Magnetic interference
IEC 61810-7-26	Crosstalk and insertion loss
IEC 61810-7-27	Electrical contact noise
IEC 61810-7-28	Thermoelectric emf
IEC 61810-7-29	Capacitance
IEC 61810-7-30	Contact sticking (delayed release)
IEC 61810-7-31	Magnetic remanence
IEC 61810-7-32	Acoustic noise
IEC 61810-7-33	Continuity of protective earth connection
IEC 61810-7-34	Fluid contamination
IEC 61810-7-35	Resistance to cleaning solvents
IEC 61810-7-36	Fire hazard
IEC 61810-7-37	Temperature rise at rated load
IEC 61810-7-38	Mechanical interlock
IEC 61810-7-39	Insertion and withdrawal force (mating relay and socket)
IEC 61810-7-40	Short circuit testing
IEC 61810-7-41	Insulation coordination
IEC 61810-7-42	EMC
IEC 61810-7-43	Prof tracking index (PTI)
IEC 61810-7-44	Salt mist
IEC 61810-7-45	Maximum cycling frequency
IEC 61810-7-46	Surge withstand test
IEC 61810-7-47	Making and breaking Capacity [Handled within 61810-7-19]
IEC 61810-7-48	Contact reliability test
IEC 61810-7-49	Long term stability of sealing (leak rate evaluation)
IEC 61810-7-50	Momentary drop in supply voltage
IEC 61810-7-51	React behaviour at coil voltage drop
IEC 61810-7-52	Coil overvoltage
IEC 61810-7-53	Slow decrease and increase of supply voltage
IEC 61810-7-54	Critical DC load current
IEC 61810-7-55	Maximum DC load breaking capacity
IEC 61810-7-56	Ball Pressure Test

91

92 2 Normative references

93 The following documents are referred to in the text in such a way that some or all of their content
94 constitutes requirements of this document. For dated references, only the edition cited applies.

- 95 For undated references, the latest edition of the referenced document (including any
96 amendments) applies.
- 97 IEC 60028, *International standard of resistance for copper*
- 98 IEC 60060-1:2010, *High-voltage test techniques – Part 1: General definitions and test*
99 *requirements*
- 100 IEC 60068-2-14, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*
- 101 IEC 60068-2-17, *Basic environmental testing procedures – Part 2-17: Tests – Test Q: Sealing*
- 102 IEC 60068-2-27, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*
- 103 IEC 60068-2-64:2008, *Environmental testing – Part 2-64: Tests – Test Fh: Vibration, broadband*
104 *random and guidance*
- 105 IEC 60270, *High-voltage test techniques – Partial discharge measurements*
- 106 IEC 60664-1:2007, *Insulation coordination for equipment within low-voltage systems – Part 1:*
107 *Principles, requirements and tests*
- 108 IEC 60664-3:2016, *Insulation coordination for equipment within low-voltage systems – Part 3:*
109 *Use of coating, potting or moulding for protection against pollution*
- 110 IEC 60721-3-3:1994, *Classification of environmental conditions – Part 3-3: Classification of*
111 *groups of environmental parameters and their severities – Stationary use at weatherprotected*
112 *locations*
- 113 *(IEC 60721-3-3:2019)*
- 114 IEC 60947-1:2007, *Low-voltage switchgear and controlgear – Part 1: General rules*
- 115 IEC 60999-1, *Connecting devices – Electrical copper conductors – Safety requirements for*
116 *screw-type and screwless-type clamping units – Part 1: General requirements and particular*
117 *requirements for clamping units for conductors from 0,2 mm² up to 35 mm² (included)*
- 118 IEC 60999-2, *Connecting devices – Electrical copper conductors – Safety requirements for*
119 *screw-type and screwless-type clamping units – Part 2: Particular requirements for clamping*
120 *units for conductors above 35 mm² up to 300 mm² (included)*
- 121 IEC 61810-1:2015, *Electromechanical elementary relays – Part 1: General and safety*
122 *requirements*
- 123 ISO 16750-1:2018, *Road vehicles – Environmental conditions and testing for electrical and*
124 *electronic equipment – Part 1: General*
- 125 ISO 16750-2:2012, *Road vehicles – Environmental conditions and testing for electrical and*
126 *electronic equipment – Part 2: Electrical loads*

127 **3 Terms and definitions**

- 128 For the purposes of this document, the terms and definitions given in IEC 61810-1 and the
129 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.

3.1 Types of relays

3.1.1

electromechanical relay

electrical relay in which the intended response results mainly from the movement of mechanical elements

[IEV 444-01-04]

3.1.2

all-or-nothing relay

electrical relay, which is intended to be energized by a quantity, the value of which is either within its operative range or effectively zero

[IEV 444-01-02]

3.1.3

elementary relay

all-or-nothing relay which operates and releases without any intentional time delay

[IEV 444-01-03]

3.1.4

monostable relay

electrical relay which, having responded to an energizing quantity and having changed its condition, returns to its previous condition when that quantity is removed

[IEV 444-01-07]

3.1.5

bistable relay

electrical relay which, having responded to an energizing quantity and having changed its condition, remains in that condition after the quantity has been removed; a further appropriate energization is required to make it change its condition

[IEV 444-01-08]

3.1.6

polarized relay

electrical relay, the change of condition of which depends upon the polarity of its DC energizing quantity

[IEV 444-01-09]

3.1.7

non-polarized relay

electrical relay, the change of condition of which does not depend upon the polarity of its energizing quantity

[IEV 444-01-10]

3.2 Types of relays, based upon environmental protection (relay technology RT)

3.2.1

RT 0 unenclosed relay

relay not provided with a protective case

3.2.2

RT I dust protected relay

relay provided with a case which protects its mechanism from dust

3.2.3

RT II flux proof relay

relay capable of being automatically soldered without allowing the migration of solder fluxes beyond the intended areas

NOTE Where an enclosed construction is used, venting to the outside atmosphere is permissible.

3.2.4

RT III wash tight relay

relay capable of being automatically soldered and subsequently undergoing a washing process to remove flux residues without allowing the ingress of flux or washing solvents

NOTE In service, this type of relay is sometimes vented to the atmosphere after the soldering or washing process.

3.2.5

RT IV sealed relay

relay provided with a case which has no venting to the outside atmosphere, and having a time constant better than 2×10^4 s (see IEC 60068-2-17)

3.2.6

RT V hermetically sealed relay

sealed relay having an enhanced level of sealing, assuring a time constant better than 2×10^6 s (see IEC 60068-2-17)

3.3 Functions of a relay

3.3.1

release condition

for a monostable relay, specified condition of the relay when it is not energized; for a bistable relay, one of the conditions, as declared by the manufacturer

[IEV 444-02-01]

3.3.2

operate condition

for a monostable relay, specified condition of the relay when it is energized by the specified energizing quantity and has responded to that quantity; for a bistable relay, the condition other than the release condition as declared by the manufacturer

[IEV 444-02-02]

3.3.3

operate (verb)

change from the release condition to the operate condition

[IEV 444-02-04]

3.3.4

release (verb)

for a monostable relay, change from the operate condition to the release condition

215 [IEV 444-02-05]

216 3.3.5

217 **reset** (verb)

218 for a bistable relay, change from the operate condition to the release condition

219 [IEV 444-02-06]

220 3.3.6

221 **change over** (verb)

222 for a monostable relay, operate or release; for a bistable relay, operate or reset

223 [IEV 444-02-07]

224 3.3.7

225 **cycle** (verb)

226 for a monostable relay, operate and then release or vice versa; for a bistable relay, operate and then reset or vice-versa

228 [IEV 444-02-08]

229 3.3.8

230 **revert** (verb)

231 for a specific type of polarized relay, release/reset again, or remain in the release condition, when supplied with a coil voltage in excess of that required for operation and of the same polarity as required for operation

234 [IEV 444-02-09, modified]

235 3.3.9

236 **revert reverse** (verb)

237 for a specific type of polarized bistable relay, operate again, or remain in the operate condition, when supplied with a coil voltage in excess of that required for resetting and of the same polarity as required for resetting

240 [IEV 444-02-10, modified]

241 3.4 Types of contacts

242 3.4.1

243 **make contact**

244 contact which is closed when the relay is in its operate condition and which is open when the relay is in its release condition

246 [IEV 444-04-17]

247 3.4.2

248 **break contact**

249 contact which is open when the relay is in its operate condition and which is closed when the relay is in its release condition

251 [IEV 444-04-18]

252 3.4.3

253 **change-over contact**

254 combination of two contact circuits with three contact members, one of which is common to the two contact circuits; such that when one of these contact circuits is open, the other is closed

256 [IEV 444-04-19]