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

Interested committees:

Title: BS EN IEC 61810-7-19 Electrical relays - Tests and Measurements

Part 7-19: Electrical endurance testing

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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- ii) affects other national standard(s)
- 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 Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.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

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- 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.	

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2023-03-31

CLOSING DATE FOR COMMENTS:
2023-05-26

SUPERSEDES DOCUMENTS:
94/728/CD, 94/848/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

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Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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 7-19: Electrical endurance

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**Electrical Relays –
Tests and measurements****Part 7-19: Electrical endurance****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
94/728/CD	94/848/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.

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

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

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

- 98 • reconfirmed,
- 99 • withdrawn,
- 100 • replaced by a revised edition, or
- 101 • amended.

102

103

Electrical Relays – Tests and measurements

Part 7-19: Electrical endurance

1 Scope

This part of IEC 61810-7 is used for testing along with the 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.

The object of this part gives guidance to perform different kind of electrical endurance.

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 mm² up to 35 mm² (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 mm² up to 300 mm² (included)*

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

142 IEC 61810-10, *Electrical relays – Part 10: Additional functional aspects and safety requirements*
143 *for high-capacity relays*

144 IEC 61810-7-0, *Electrical relays – Test and Measurements - Part 7-0: Testing – General and*
145 *Guidance*

146 IEC 61810-7-45, *Electrical relays – Test and Measurements - Part 7-45: Maximum frequency*
147 *of operation*

148 IEC 62246-1, *Reed Switches – Part 1: Generic Specification*

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

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

153 **3 Terms and definitions**

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

155 **3.1 Terms and definitions related to general terms**

156 **3.1.1**

157 **making and breaking capacities**

158 greatest value of electric current which an output circuit is capable of making and breaking
159 under specified conditions such as contact voltage, number of makes and breaks, power factor,
160 time constant

161 Note For alternating current, the RMS value is specified.

162 [SOURCE: IEC 60050-444:2002, 444-04-30 and 444-04-31, merged – modification of the term
163 and definition]

164 **3.1.2**

165 **overload**

166 operating conditions in an electrically undamaged circuit, which cause an overcurrent

167 [SOURCE: IEC 60050-441:1984/AMD1:2000, 441-11-08]

168 **3.1.3**

169 **utilization category**

170 a combination of specified requirements related to the condition in which the switching device
171 or the fuse fulfils its purpose, selected to represent a characteristic group of practical
172 applications

173 Note The specified requirements may concern e.g. the values of making capacities (if applicable), breaking
174 capacities and other characteristics, the associated circuits and the relevant conditions of use and behaviour.

175 [SOURCE: IEC 60050-441:1984/AMD1:2000, 441-17-19]

176

4 Electrical endurance

4.1 Purpose

To check the performance of the relay under operating conditions and for the number of cycles specified by the manufacturer.

NOTE With respect to the establishment and assessment of reliability data for relays reference is made to IEC 61810-2.

4.2 Procedure

4.2.1 General

The test is performed according to Table 2 on each contact load and each contact material as specified by the manufacturer.

The number of test samples shall be in compliance with the specified test procedure from Table 1.

Table 1 - Number of samples

Kind of testing	Test procedure	Number of samples	Mounting conditions
Type test	Aa	3	Group mounting
	B	1	Single mounting
Sampling test	n.a.	3	n.a.

Table 2 – Electrical endurance test procedures

Procedure	A (Group mounting)	B (Single mounting)	Test procedure ^a	
			B (Single mounting) and Annex B ^d	B (Single mounting) and Annex C ^e
Test sequence	Overload test (optional, see 4.4)	Overload test (optional, see 4.4)	Abnormal Conditions Parameter given in Annex B	Overload test ^c Parameter given in Annex C
			Normal Conditions Parameter given in Annex B	
	Electrical endurance		Electrical endurance Parameter given in Annex B	Electrical endurance Parameter given in Annex C
	Dielectric strength test			
	Heating test ^b (optional)		n.a.	n.a.

^a See also Table 1.

^b For application standards e.g. IEC 60730-1 or IEC 60669-1 the heating test after the electrical endurance is requested.

^c For electronic ballast: overload test is not requested.

^d Following exactly the requirements in accordance with Annex B.

^e Following exactly the requirements in accordance with Annex C.

Three severity levels are specified.

– Severity A: The first detected malfunction is defined as a failure.

194 – Severity B: The sixth detected malfunction or two consecutive malfunctions are defined as
195 a failure.

196 – Severity C: As specified by the manufacturer.

197 The test circuit described in Annex A of IEC 61810-7-0 shall be used, unless otherwise specified
198 by the manufacturer and explicitly indicated in the test report.

199 For high-capacity relays according IEC 61810-10 and reed switches according IEC 62246-12
200 applies only the following:

- 201 • Severity level A is mandatory.
- 202 • If the relay has a defined polarity of a contact, the manufacturer shall specify an appropriate
203 schematic for contact loading for the test, which may deviate from the schematics of Table 3.

204 The heating test after the electrical endurance is mandatory if prescribed by the relevant product
205 application Annex in IEC 61810-10, or by application standards (e.g. IEC 60730-1 or
206 IEC 60669-1).

207 **4.2.2 Electrical endurance**

208 Unless otherwise explicitly stated by the manufacturer, this test is carried out at the upper limit
209 of the ambient temperature range, and the relay coil(s) shall be energized with rated voltage or
210 an appropriate value within the rated coil voltage range or operative range.

211 The contacts shall be monitored to detect break and/or make malfunctions as well as unintended
212 bridging.

213 The preferred arrangement of the relays is group mounted under the mounting conditions of
214 Annex A of IEC 61810-7-10 for the heating test unless otherwise prescribed by the manufacturer.
215 For PCB relays it is permitted to use a PCB for connecting the relays with the wires and ensure
216 the minimum mounting distances. However, the dimensions of the connecting wires shall be
217 according to clause 4.9 of IEC 61810-7-0.

218 The contacts are connected to the load(s) in accordance with Table 3 as specified and indicated
219 by the manufacturer. If not otherwise specified by the manufacturer, the load shall be applied
220 to both the make and break side of a change-over contact.

221 If not otherwise specified, the frequency of operations shall be 360 operations per hour with
222 duty type S6 50% in accordance to IEC 61810-7-0 and for 6000 operations. However, the
223 frequency of operations shall be less the maximum frequency of operation according to
224 IEC 61810-7-45.

225 Relays provided with an additional actuating member for manual operation (for example push-
226 button) shall be tested respectively to verify that the relay is capable to switch on and off
227 properly its maximum rated switching current at related voltage for the number of manual
228 operations within a time diagram stated by the manufacturer at ambient temperature in
229 accordance with Table 2 of IEC 61810-2-0 at least 100 times - if not otherwise specified by the
230 manufacturer.

231