



**SLOVENSKI STANDARD**  
**oSIST prEN IEC 61810-7-13:2023**  
**01-oktober-2023**

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**Električni releji - Preskusi in meritve - 7-1. del: Korozivne atmosfere - Onesnažena atmosfera**

Electrical relays - Tests and Measurements - Part 7-13: Corrosive atmospheres - Polluted atmospheres

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Ta slovenski standard je istoveten z: **prEN IEC 61810-7-13:2023**

**ICS:**

29.120.70      Releji      Relays

**oSIST prEN IEC 61810-7-13:2023**      **en**





## COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: <b>IEC 61810-7-13 ED1</b>	
DATE OF CIRCULATION: <b>2023-08-18</b>	CLOSING DATE FOR VOTING: <b>2023-11-10</b>
SUPERSEDES DOCUMENTS: <b>94/816/CD, 94/916/CC</b>	

IEC TC 94 : ELECTRICAL RELAYS	
SECRETARIAT: Austria	SECRETARY: Mr Bernhard Spalt
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: <input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING	<input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING
<p><b>Attention IEC-CENELEC parallel voting</b></p> <p>The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.</p> <p><a href="https://standards.iteh.ai/catalog/standards/sist/9c7d21c1-4b62-4ec3-9676-9c7d21c1-4b62-4ec3-9676-pr-en-iec-61810-7-13-2023">https://standards.iteh.ai/catalog/standards/sist/9c7d21c1-4b62-4ec3-9676-9c7d21c1-4b62-4ec3-9676-pr-en-iec-61810-7-13-2023</a></p> <p>The CENELEC members are invited to vote through the CENELEC online voting system.</p>	

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TITLE:

**Electrical relays – Tests and Measurements – Part 7-13: Corrosive atmospheres – Polluted atmospheres**

PROPOSED STABILITY DATE: 2025

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## ELECTRICAL RELAYS – TESTS AND MEASUREMENTS

## Part 7-13: Corrosive Atmospheres – Polluted Atmospheres

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IEC 61810-7 has been prepared by subcommittee WG3: Maintenance of basic relay standards, of IEC technical committee 94: All-or-nothing electrical relays. It is an International Standard.

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

CD	CC
94/816/CD	94/916/CC

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available

67 at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are  
68 described in greater detail at <http://www.iec.ch/standardsdev/publications>.

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

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

72 The committee has decided that the contents of this document will remain unchanged until the  
73 stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the  
74 specific document. At this date, the document will be

- 75 • reconfirmed,
- 76 • withdrawn,
- 77 • replaced by a revised edition, or
- 78 • amended.

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## ELECTRICAL RELAYS – TESTS AND MEASUREMENTS

### Part 7-13: Corrosive Atmospheres – Polluted Atmospheres

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#### 87 **1 Scope**

88 This part of IEC 61810-7 is used for testing all kind of relays within the scope of technical  
89 committee 94 and shall evaluate their ability to perform under expected conditions of  
90 transportation, storage and all aspects of operational use.

91 The tests stated here within shall be done with test conditions and appropriate severities, as  
92 well as suitable measurements conditions.

93 The object of this test is to define a standard test method to ensure that the DUT performs  
94 satisfactorily at its specified energization values throughout the defined temperature range.

95 The tests assess the suitability of the DUT for its use and/or storage in corrosive atmospheres,  
96 in particular atmospheres polluted with sulfur dioxide or hydrogen sulfide. The test conditions  
97 simulate an artificial situation and allow a performance comparison for usability of DUTs with  
98 regard to known and existing switching solutions.

99 NOTE 1: The test is a static test without actual operation of the DUT to simulate a worst case scenario for corrosion.  
100 That is, because corrosion grows over time and its nature of layer growths to potentially create stickings, resistance  
101 increase or other undesired effects may be affected by DUT actuations, that may destroy the layers or hide long-  
102 term effects.

103 NOTE 2: In addition to polluted atmospheres, the suitability of the DUT for use and/or storage in corrosive  
104 atmospheres may be assessed in a salt-laden atmosphere as described in IEC 61810-7-44, All-or-nothing relays –  
105 Tests and measurements – Part 7-44: Salt mist.

#### 106 **2 Normative references**

107 The following documents are referred to in the text in such a way that some or all of their content  
108 constitutes requirements of this document. For dated references, only the edition cited applies.  
109 For undated references, the latest edition of the referenced document (including any  
110 amendments) applies.

111 IEC 60068-2-42, Environmental testing - Part 2-42: Tests - Test Kc: Sulfur dioxide test for  
112 contacts and connections

113 IEC 60068-2-43, Environmental testing - Part 2-43: Tests - Test Kd: Hydrogen sulfide test for  
114 contacts and connections

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

117 IEC 61810-1:2015/AMD1:2019, Amendment 1 - Electromechanical elementary relays - Part 1:  
118 General and safety requirements

119 IEC 61810-7-0, All-or-nothing relays – Tests and measurements – Part 7-0: Testing – General  
120 and Guidance

121 IEC 61810-7-1, All-or-nothing relays – Tests and measurements – Part 7-1: Visual Inspection  
122 and check of dimensions

123 IEC 61810-7-6, All-or-nothing relays – Tests and measurements – Part 7-6: Contact-circuit  
124 resistance

125 IEC 61810-7-7, All-or-nothing relays – Tests and measurements – Part 7-7: Functional tests  
126

### 127 **3 Terms and definitions**

128 For the purposes of this document, the terms and definitions given in Clause 3 of IEC 61810-7-  
129 0 apply.

130 ISO and IEC maintain terminological databases for use in standardization at the following  
131 addresses:

- 132 • IEC Electropedia: available at <http://www.electropedia.org/>
- 133 • ISO Online browsing platform: available at <http://www.iso.org/obp>

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## 136 4 Test procedure

### 137 4.1 Purpose

138 To assess the resistance of a DUT to atmospheres polluted with sulfur dioxide or hydrogen  
139 sulfide. The primary purpose is to evaluate the effects of a polluted atmosphere in short time  
140 after the test to gain repeatable data, because storage conditions after the test may alter the  
141 test results.

142

### 143 4.2 Procedure

144 The DUT shall be in a new and clean condition, mounted as in service or specified by the  
145 manufacturer. The test shall be performed under applicable reference conditions given in  
146 Clause 4 of IEC 61810-7-0.

147 The test shall be carried out in accordance with the sulfur dioxide test according to test Kc of  
148 IEC 60068-2-42 and/or with the hydrogen sulfide test according to test Kd of IEC 60068-2-43.  
149 A different pollution severity (ppm content) of the atmosphere may be defined.

150 There shall be no preconditioning, unless otherwise specified.

151 The initial value of the contact circuit resistance of all DUT contacts shall be measured.

152 Then the DUT is placed in the test chamber without any electrical contact load and energization  
153 supply and kept in the polluted atmosphere for a period as specified in 4.3 f). After a recovery  
154 period of not more than 2 h, the functional performance of each DUT shall be evaluated and its  
155 contact circuit resistance of all contacts shall be measured.

156 NOTE Depending on the underlying corrosion mechanism, in some cases, the contact resistance may increase  
157 further during storage in air after the test. Thus, the relevant contact resistance can consistently be measured only  
158 within 2 h after removal from the polluted atmosphere. For a detailed observation of the corrosion mechanism, a  
159 regular recording of the contact resistance during the test is recommended (electrical connections need to be fed  
160 outside of the test chamber). In addition, the contact resistance may be checked again also after several days after  
161 the test.

162

### 163 4.3 Conditions

164 The conditions to be specified are the following:

- 165 a) test with sulfur dioxide or hydrogen sulfide, or both (in case of both tests, then sulfur dioxide  
166 shall be tested for first, followed by hydrogen sulfide);
- 167 b) composition and conditions of testing atmosphere, preferably in accordance with  
168 IEC 60068-2-42, clause 4 (25±5 ppm sulfur dioxide) and IEC 60068-2-43, clause 4 (10...15  
169 ppm hydrogen sulfide), respectively;
- 170 c) DUT contact state open or closed, or both. If both states are specified to be used for the  
171 test, it shall be done on separate DUTs. Each version shall be considered as an independent  
172 test on a new set of DUTs.
- 173 d) preconditioning, only if required;
- 174 e) initial value(s) of contact circuit resistance as specified in IEC 61810-7-6 (irrespective of test  
175 condition 4.3 c));
- 176 f) duration of the test (recommended values: 4, 10, 21 days);
- 177 g) functional testing parameters as specified in IEC 61810-7-7;
- 178 h) energization of the DUT coil, shall be at rated operate value unless otherwise stated by the  
179 manufacturer.

180 NOTE Tests with hydrogen sulfide are primarily intended for tests of DUTs with contacts with silver or silver alloy  
181 surfaces, but also copper materials in general. Tests with sulfur dioxide are mainly intended for any other contact  
182 surface alloys. Both tests can be carried out in sequence as defined to have the most aggressive atmosphere  
183 simulation. A mixed flow gas test acc. to IEC 60068-2-60 is not appropriate, as concentrations are too weak and test  
184 duration would be too long for relevant results.

185

## 186 5 Evaluation

187 The evaluation results shall only refer to the situation after full completion of the tests Kc, Kd  
188 or Kc followed by Kd. If both tests are run sequentially, an interim evaluation after Kc may be  
189 carried out as below.

190 Final evaluation shall be done and documented as follows:

- 191 • visual inspection as specified in IEC 61810-7-1. There shall be no evidence of corrosion,  
192 peeling and chipping, or of mechanical deterioration that could impair operation,
- 193 • functional test as specified in IEC 61810-7-7. The DUT shall respond to each functional test  
194 step with its intended contact state for each defined voltage step,
- 195 • contact circuit resistance value(s) as specified in IEC 61810-7-6. The contact circuit  
196 resistance value(s) shall not exceed twice the specified initial value(s), or shall not exceed  
197 a value agreed by the parties, representing a permissible heat rise. Clause 6.3 of  
198 IEC 60068-2-42 and/or IEC 60068-2-43 shall be observed, respectively,
- 199 • any other measurements, if required.

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