



**SLOVENSKI STANDARD**  
**oSIST prEN IEC 61810-7-2:2023**  
**01-oktober-2023**

---

**Električni releji - Preskusi in meritve - 7-2. del: Mehanski preskusi in tehtanje**

Electrical relays - Tests and Measurements - Part 7-2: Mechanical tests and weighing

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

Ta slovenski standard je istoveten z: **prEN IEC 61810-7-2:2023**

<https://standards.iteh.ai/catalog/standards/sist/a922d37d-68e3-43f9-a33a-818f03719c44/osist-pren-iec-61810-7-2-2023>

---

**ICS:**

29.120.70      Releji      Relays

**oSIST prEN IEC 61810-7-2:2023**      **en**





94/925/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: <b>IEC 61810-7-2 ED1</b>	
DATE OF CIRCULATION: <b>2023-08-18</b>	CLOSING DATE FOR VOTING: <b>2023-11-10</b>
SUPERSEDES DOCUMENTS: <b>94/857/CD, 94/912/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>The CENELEC members are invited to vote through the CENELEC online voting system.</p>	

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

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 relevant "In Some Countries" clauses to be included should this proposal proceed. Recipients are reminded that the CDV stage is the final stage for submitting ISC clauses. (SEE [AC/22/2007](#) OR [NEW GUIDANCE DOC](#)).

TITLE:

**Electrical relays – Tests and Measurements – Part 7-2: Mechanical tests and weighing**

PROPOSED STABILITY DATE: 2025

NOTE FROM TC/SC OFFICERS:

## CONTENTS

1		
2		
3	FOREWORD .....	3
4	1 Scope .....	5
5	2 Normative references .....	5
6	3 Terms and definitions .....	5
7	4 Testing procedure.....	6
8	4.1 Mechanical tests .....	6
9	4.1.1 Purpose .....	6
10	4.1.2 Procedure .....	6
11	4.1.3 Conditions to be specified .....	10
12	4.2 Weighing .....	11
13	4.2.1 Purpose .....	11
14	4.2.2 Procedure .....	11
15	4.2.3 Conditions to be specified .....	11
16	5 Evaluation .....	11
17	Annex A (informative) Diagram of typical relay test level.....	12
18	Annex T (informative) Test report.....	14
19	T.1 Mechanical tests report.....	14
20	T.2 Weighing report .....	14
21	Bibliography.....	15
22		
23	Figure 1 – Parameter schematic diagram based on Force-Displacement curve .....	5
24	Figure 2 – Diagram of Clapper-type relay test level.....	6
25	Figure B.1 – Diagram of Direct acting relay test level.....	10
26	Figure B.2 –Diagram of Balanced armature relay test level .....	10
27	Figure B.3 – Diagram of Balanced force relay test level .....	11
28		
29		
30		

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## ELECTRICAL RELAYS – Tests and Measurements

## Part 7-2: Mechanical tests and weighing

## 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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 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 Standard IEC 61810 has 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
94/857/CD	94/912/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 the IEC 61810 series can be found, under the general title *Electromechanical elementary relays*, on the IEC website.

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

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

- 84 • reconfirmed,
- 85 • withdrawn,
- 86 • replaced by a revised edition, or
- 87 • amended.

88

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[oSIST prEN IEC 61810-7-2:2023](https://standards.iteh.ai/catalog/standards/sist/a922d37d-68e3-43f9-a33a-8f8f037f9e44/osist-pren-iec-61810-7-2-2023)

<https://standards.iteh.ai/catalog/standards/sist/a922d37d-68e3-43f9-a33a-8f8f037f9e44/osist-pren-iec-61810-7-2-2023>

## ELECTRICAL RELAYS – Tests and Measurements

### Part 7-2: Mechanical tests and weighing

89  
90  
91  
92  
93  
94

#### 95 **1 Scope**

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

99 The object of this test is to define a standard test method for ensure that particular mechanical  
100 properties (such as contact force, contact gaps, armature travel) and weight , are within  
101 specified limits.

#### 102 **2 Normative references**

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

107 IEC 61810-7-0: 20XX, All-or-nothing electrical relays – Tests and Measurements – Part 7-0: –  
108 Testing general

109

#### 110 **3 Terms and definitions**

111 For the purposes of this document, the terms and definitions given in Clause 3 of IEC 61810-7-  
112 0 apply.

113 ISO and IEC maintain terminological databases for use in standardization at the following  
114 addresses:

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

#### 117 **3.1**

##### 118 **Contact force**

119 force which two contact members exert against each other at their contact points in the closed  
120 position.

121 [SOURCE: IEC 60050-444:2002, 444-04-10]

122 NOTE 1 The contact force can be obtained by F-D curve or direct measurement.

#### 123 **3.2**

##### 124 **Counter force**

125 force which from reed (or spring) system before the relay is energized at contact points or  
126 armature.

#### 127 **3.3**

##### 128 **Armature travel**

129 distance (angle) which the armature moves from its initial position to final position when the  
130 relay is energized.

131 **3.4**

132 **F-D curve**

133 curve which represents the relationship between the attractive force from electromagnetic system and  
134 counter force from reed (or spring) system in an electromagnetic relay.

135 **3.5**

136 **Contact gap**

137 gap between the contact points when the contact circuit is open

138 [SOURCE: IEC 60050-444:2002, 444-04-09]

139

140 **4 Testing procedure**

141 **4.1 Mechanical tests**

142 **4.1.1 Purpose**

143 To ensure that particular mechanical properties (for example contact force, armature travel,  
144 contact gaps) of relay are within specified limits.

145 **4.1.2 Procedure**

146 **4.1.2.1 General**

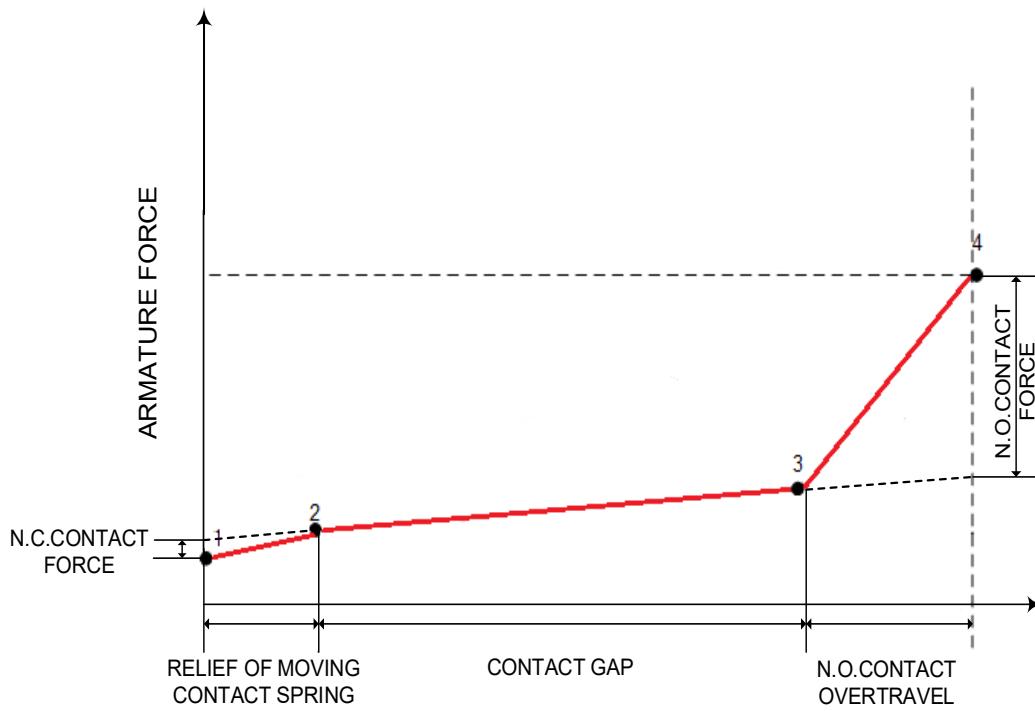
147 On the basis of ensuring the accuracy of the test, other test procedures that are more suitable  
148 for the relay under test can be adopted. The following test procedures are recommended.

149 NOTE 1 Three typical test instruments (such as using an image system, force-displacement test system or optical  
150 measurements) are recommended, but not restricted to.

151 NOTE 2 The force-displacement test system is usually used for complex test, when it is necessary to test contact  
152 force and moving displacement of contact at the same time to obtain the force-displacement curve (F-D curve).

<https://standards.iteh.ai/catalog/standards/sist/a922d37d-68e3-43f9-a33a-8f8f037f9e44/osist-pren-iec-61810-7-2-2023>





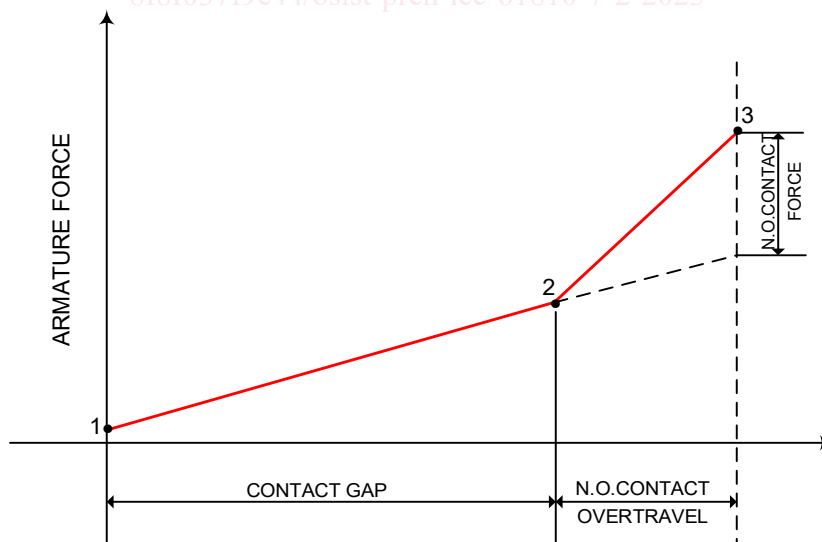
- 1: ARMATURE POSITION COIL UNENERGIZED
- 2: N.C.CONTACT OPENS
- 3: N.O.CONTACT CLOSES
- 4: END POSITION OF COLSED CONTACT

STANDARD PREVIEW  
(standards.iteh.ai)

153

154

a) Example of F-D curve for change over relay

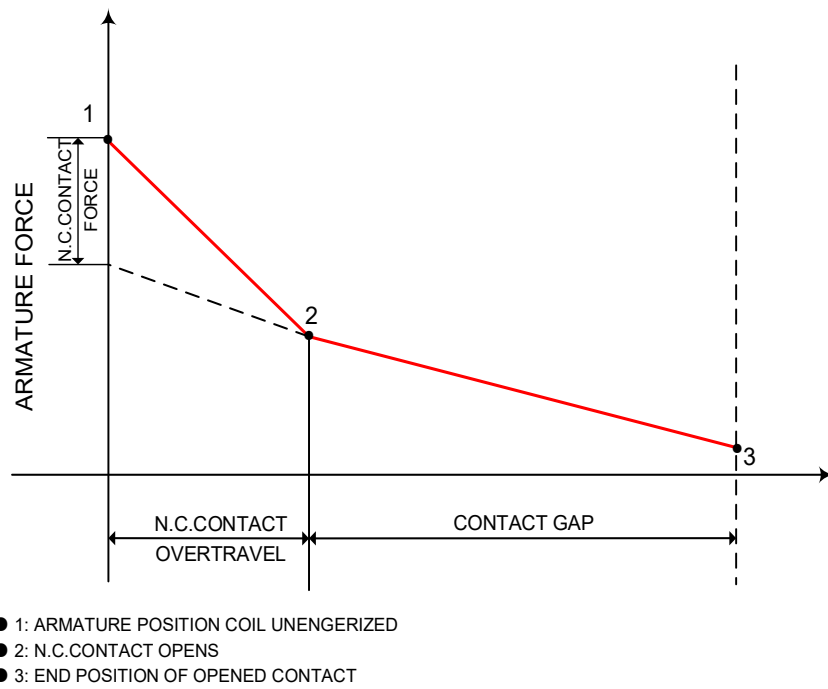


- 1: ARMATURE POSITION COIL UNENERGIZED
- 2: N.O.CONTACT CLOSES
- 3: END POSITION OF COLSED CONTACT

155

156

b) Example of F-D curve for N.O relay



157

158

159

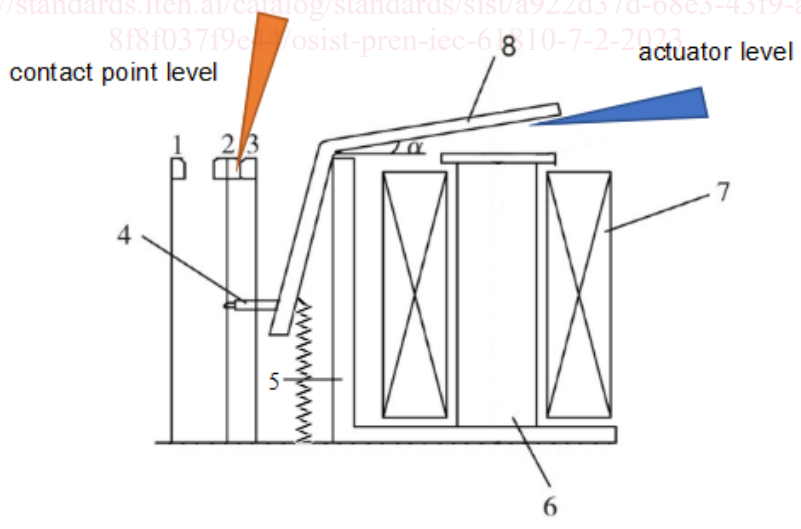
160

iTeh STANDARD PREVIEW  
 (standards.iteh.ai)

c) Example of F-D curve for N.C relay

**Figure 1 – Parameter schematic diagram based on Force-Displacement curve**

oSIST prEN IEC 61810-7-2:2023  
<https://standards.iteh.ai/catalog/standards/sist/a922d37d-68e3-43f9-a33a-8f8f037f9e01/osist-pren-iec-61810-7-2-2023>



161

162

a) initial position