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

01-oktober-2023

Električni releji - Preskusi in meritve - 7-7. del: Funkcionalni preskusi

Electrical relays - Tests and Measurements - Part 7-7: Functional Tests

Relais électriques - Essais et mesurages - Partie 7-7: Essais fonctionnels

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

ICS:

29.120.70 Releji Relays

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

94/924/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: **IEC 61810-7-7 ED1**	
DATE OF CIRCULATION: **2023-08-18**	CLOSING DATE FOR VOTING: **2023-11-10**
SUPERSEDES DOCUMENTS: **94/818/CD, 94/911/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 CDV to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY	
☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING
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TITLE:

Electrical relays – Tests and Measurements – Part 7-7: Functional Tests

PROPOSED STABILITY DATE: 2025

NOTE FROM TC/SC OFFICERS:

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRICAL RELAYS – TESTS AND MEASUREMENTS

Part 7-7: Functional Tests

FOREWORD

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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
94/818/CD	94/911/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

at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at http://www.iec.ch/standardsdev/publications.

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

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

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

ELECTRICAL RELAYS – TESTS AND MEASUREMENTS

Part 7-7: Functional Tests

1 Scope

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

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

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

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

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

IEC 61810-3:2015, Electromechanical elementary relays – Part 3: Relays with forcibly guided (mechanically linked) contacts

IEC 61810-4:2020, Electromechanical elementary relays – Part 4: General and safety requirements for reed relays

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

IEC 61810-7-25, All-or-nothing relays – Tests and measurements – Part 7-25: Testing – Magnetic interference

IEC61812-1:2011, Time relays for industrial and residential use – Part1: Requirements and tests

IEC 62314:2022 (FDIS), Solid-state relays – Safety requirements

IEC 62246-1:2015, Reed switches – Part 1: Generic specification

3 Terms and definitions

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

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

3.1 Energization values

3.1.1 reverse revert voltage

for a specific type of polarized bistable relay, value of the coil voltage greater than and with the same polarity as the reset voltage, at which the relay reverts reversely

[IEV 444-03-14, modified]

3.1.2 reverse non-revert voltage

for a specific type of polarized bistable relay, value of the coil voltage greater than and with the same polarity as the reset voltage, at which the relay does not revert reversely

[IEV 444-03-15, modified]

3.1.3 reverse polarity voltage

for a polarized monostable relay, value of the coil voltage of reverse polarity at which the relay does not operate

[IEV 444-03-16, modified]

NOTE: This voltage can be considered a special characteristic of non-operate for polarized monostable relays only, in particular when the polarized property is established by means of a diode (breakdown voltage).

4 Test procedure

4.1 Purpose

To ensure that the DUT performs satisfactorily at its specified energization values throughout the defined temperature range. This test is a part of the general DUT type test according to IEC 61810-1:2015, Table 3.

4.2 Procedure

The basic operation functions for monostable and bistable relays are described in clause 9 of IEC 61810-1:2015. The following functional tests cover a wider range and shall be done in a sequence, that covers of all foreseeable DUT states and state changes. Table 1 sets out the applicable values and the significance of the functional tests, referring to Figure 1 to Figure 5, which give typical examples.

Additional and/or alternative functional test procedures for the particular types of relays are stated in Annex A.

- Elementary relays with reed switches (Annex A.1)
- Time relays for industrial and residential use (Annex A.2)
- Solid-state relays (Annex 0)
- Relays with forcibly guided (mechanically linked) contacts (Annex A.4)

Table 1 – Energization quantity values and corresponding functions

Diagram code (see Figure 1 to Figure 5)	Applied energization quantitye	The DUT shall	Applicable to
a	Non-operate voltage	Not operate	All types
b	Operate voltage	Operate	All types
c	Rated voltage	Remain operated	All types
d	Non-revert voltage	Remain operated	Polarized
e	Non-release voltage	Not release	Monostable
f	Release voltage	Release	Monostable
g	Non-reset voltage	Not reset	Bistable
h	Reset voltage	Reset	Bistable
i	Reverse rated voltage	Remain reset	Bistable polarized
j	Reverse non-revert voltage	Remain non-operated / reset	Bistable polarized
k	Reverse polarity voltage	Not operate	Monostable polarized
x	Preconditioning value	Be preconditioned	All if required
y	Setting voltage	Be set in required position	All if required
z	Reverse setting voltage	Be set in required position	All if required

Testing is made by attributes and shall be made in the order given in the following figures, unless otherwise specified.

When required, the external magnetic preconditioning shall be applied, respecting the correct orientation of the DUT with regard to the applied external magnetic fields.

When proceeding from one step to the next, the characteristics of the coil voltage shall be as specified. The corresponding function of the DUT shall be checked by electrically monitoring the contact state as defined in IEC 61810-7-0.

NOTE 1 For statistical evaluation across a number of DUTs or several batches of DUTs, actual data for the values given in Table 1 may be recorded instead of attributive testing.

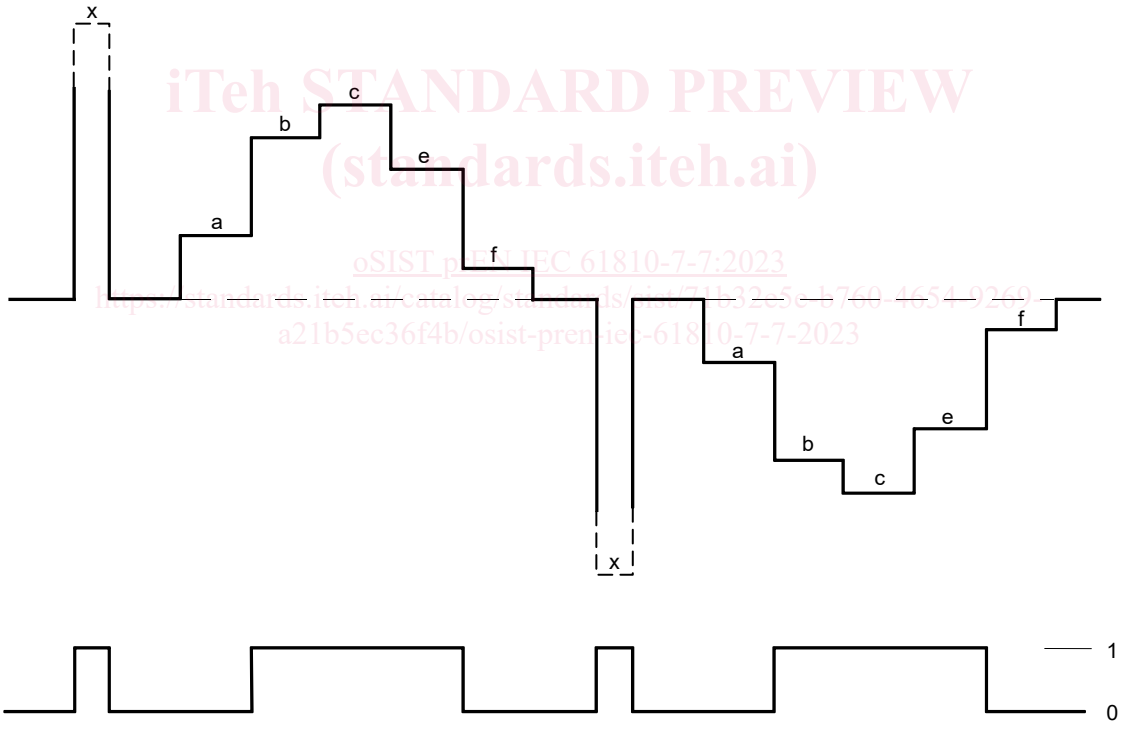
NOTE 2 DUTs incorporating permanent magnets should be preconditioned with the rated voltage for a full cycle to achieve consistent electrical measurements. In case of expected external influences like shocks, which may change contact state without energization, the functional tests should be executed with and without preconditioning to verify performance.

Explanatory notes concerning performance diagrams, Figure 1 to Figure 5:

The drawings are not to scale.

The preconditioning pulses are examples only. Any other waveform direction, duration or amplitude may be used.

The sequence of Figure 5, bistable polarized DUT, is an example only. Other sequences might apply to further types of such DUTs.



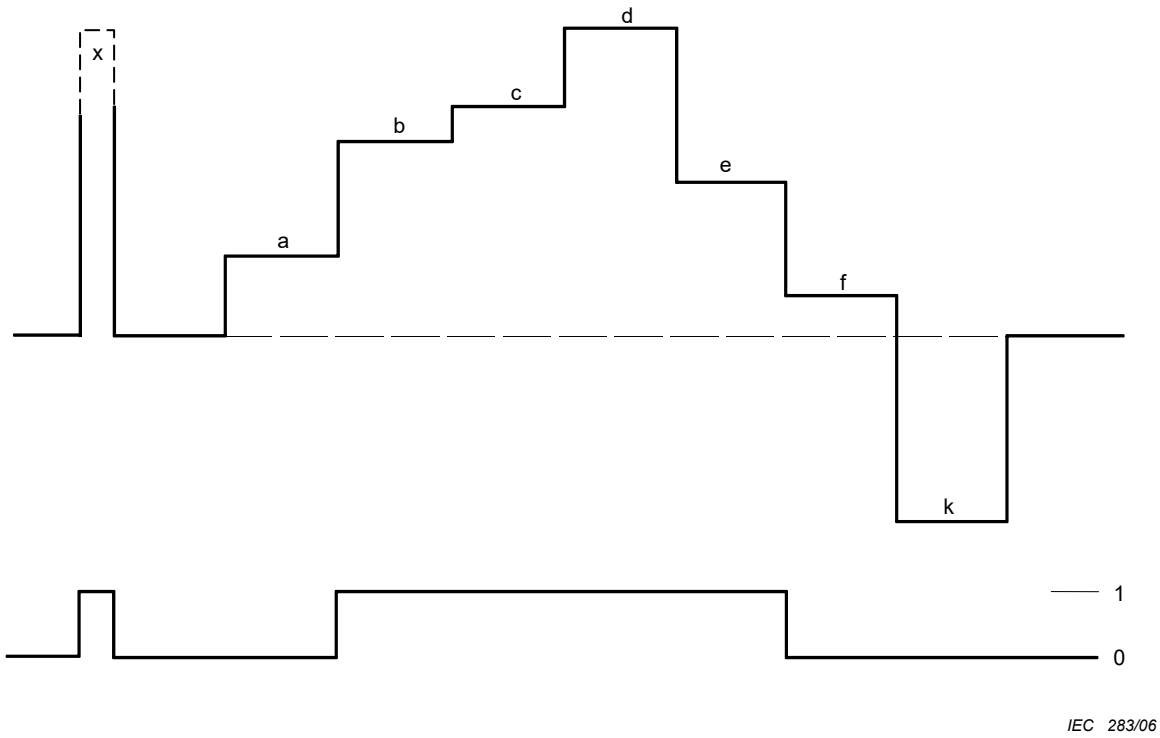
IEC 282/06

Key

a	non-operate voltage	e	non-release voltage (monostable DUTs)
b	operate voltage	f	release voltage (monostable DUTs)
c	rated voltage	x	preconditioning voltage

The upper traces each represent the energization values, the lower traces indicate the condition of the contact (0 = release condition, 1 = operate condition).

Figure 1 – Monostable non-polarized DUT



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229 **Key**

a	non-operate voltage	e	non-release voltage (monostable DUTs)
b	operate voltage	f	release voltage (monostable DUTs)
c	rated voltage	k	reverse polarity voltage
d	non-revert voltage	x	preconditioning voltage

230 The upper traces each represent the energization values, the lower traces indicate the condition of the contact
231 (0 = release condition, 1 = operate condition).

232 **Figure 2 – Monostable DUT polarized by diode**

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