
**Nizkonapetostne stikalne in krmilne naprave - 6-1. del: Večfunkcijska oprema -
Preklopna stikalna oprema**

Low-voltage switchgear and controlgear - Part 6-1: Multiple function equipment -
Transfer switching equipment

Niederspannungsschaltgeräte - Teil 6-1: Mehrfunktionsschaltgeräte - Netzumschalter

Appareillage à basse tension - Partie 6-1: Matériels à fonctions multiples - Equipement
de transfert de source

Ta slovenski standard je istoveten z: prEN IEC 60947-6-1:2025

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TITLE: Low-voltage switchgear and controlgear – Part 6-1: Multiple function equipment - Transfer switching equipment
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NOTE FROM TC/SC OFFICERS: SC121A officers are supporting the circulation of CDV for IEC 60947-6-1 ED4. Experts are kindly asked to refer to line numbers when commenting the document.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 6-1: Multiple function equipment – Transfer switching equipment

FOREWORD

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- 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.

International Standard IEC 60947-6-1 has been prepared by sub-committee 121A: Low-voltage switchgear and controlgear, of IEC technical committee 121: Switchgear and controlgear and their assemblies for low voltage.

This third edition cancels and replaces the second edition published in 2005, and its Amendment 1:2013. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- clarification of scope and object;
- clarification of terms and definitions;
- removal of unnecessary definitions;
- modification of characteristics;

- modification of utilization categories definitions;
- introduction of new markings requirements;
- addition of new requirements for clearances and creepage distances;
- addition of new requirements and tests for mechanical and electrical interlocks;
- clarification of transfer sequences;
- modification of requirements for rated short-time withstand currents;
- modification of new requirements for electromagnetic compatibility;
- clarification of performance requirements for CB type TSE, in alignment with requirements stated in IEC 60947-2;
- addition of new test sequence V: Critical load current performance of equipment with DC ratings.

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

FDIS	Report on voting
121A/XXX/FDIS	121A/XXX/RVD

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 publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 60947 series, published under the general title *Low-voltage switchgear and controlgear*, can be found on the IEC website.

This document shall be read in conjunction with IEC 60947-1:2020, *Low voltage switchgear and controlgear – Part 1: General rules*.

The provisions of the general rules are applicable to IEC 60947-6-1 where specifically called for. General rules clauses and subclauses thus applicable as well as tables, figures and appendices are identified by reference to IEC 60947-1:2020, for example, 1.2.3, Table 4, or Annex A of IEC 60947-1:2020. The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

The National Committees are requested to note that for this publication the stability date is 2022

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

IMPORTANT – The “colour inside” logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this publication using a colour printer.

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INTRODUCTION

The availability of power in low voltage electrical installations is playing an ever increasing role in modern society. In actual fact, this requirement is a fundamental characteristic for the creation of economically and functionally efficient installations. A system able to switch a load from one source to another safely and with minimum disturbance to the load reduces problems caused by faulty conditions in the normal supply to the minimum.

All these operations, commonly known as “transfer switching”, control the installations and can be done automatically, remotely or manually.

Therefore, an installation with installed “transfer switching” capability:

- ensures the continuity of production processes;
- provides a backup source of power if the main network is out of service;
- reduces the effect caused by network faults on parts of the installation;
- achieves a good compromise between reliability, simplicity and cost-effectiveness;
- provides the facility manager and managing system with a power source able to supply all or part of the installation.

Key factors motivating customers to use Transfer Switch Equipment (TSE) include:

- the continuous world growth population, the increasing number of electronic devices and the new demands of electric vehicles;
- the mediated pressure on climate change with a resulting increase in the cost of energy;
- the evolution of the electricity market with a greater number of alternate energy sources;
- the user’s expectations of better grid reliability, better economic performance, and a desire to manage their energy.

Stakeholders involved in the management of electricity also have new expectations:

- customers want to reduce the cost of their energy and to have a quality energy supply;
- suppliers want to reinforce confidence to their customers;
- producers expect to optimize their investments;
- governments and regulators are willing to create a competitive and sustainable energy market.

Today, the performance of Transfer Switching Equipment is defined by TSE manufacturers and also by this document. Consultants, integrators, facility managers and end users rely on this document for their power availability needs.

Transfer switching are often realised by implementing a transfer function within the electrical installation, but this critical function may not be appropriately designed. Using a TSE following the requirements of this document ensure the safety and the performance of the transfer function which are necessary for reaching the objectives listed above.

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 6-1: Multiple function equipment – Transfer switching equipment

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1 Scope

45 This document applies to transfer switching equipment (TSE), to be used in power systems for
46 ensuring the continuity of the supply and allowing the energy management of the installation,
47 by transferring a load between power supply sources, the rated voltage of which does not
48 exceed 1 000 V AC or 1 500 V DC.

49 Specific requirements for bypass/isolation transfer switch equipment are given in Annex C,
50 ATSE having closed transition capability are given in Annex D, stand-alone ATS controllers are
51 given in Annex E, TSE for electric driven fire pump controllers are given in Annex F.

52 It covers:

- 53 – manually operated transfer switching equipment (MTSE);
- 54 – remotely operated transfer switching equipment (RTSE);
- 55 – automatic transfer switching equipment (ATSE), including the controller.
- 56 – stand-alone ATS controllers;
- 57 – bypass/isolation transfer switch equipment (BTSE);
- 58 – ATSE having closed transition capability;
- 59 – fire pump TSE.

60 It does not cover:

- 61 – TSE configurations that are not fully manufacturer type tested and/or marked according to
62 this document as a complete transfer switch;
- 63 – auxiliary contacts (for guidance, see IEC 60947-5-1);
- 64 – transfer switches used in explosive atmospheres (for guidance, see IEC 60079 (all parts));
- 65 – embedded software design (for guidance, see IEC TR 63201);
- 66 – cybersecurity aspects (for guidance, see IEC TS 63208);
- 67 – TSE rated for direct-on-line starting asynchronous motor of design NE and HE, according
68 to IEC 60034-12:2016. (for guidance, see AC-3e utilisation category according IEC 60947-
69 4-1:2018);
- 70 – other types of TSE under consideration including overlapping neutral TSE, multi-source TSE
71 (i.e. TSE with more than two sources of supply), TSE with load-shedding functions and bus-
72 tie TSE;
- 73 – static transfer switches covered by IEC 62310 series.

74 NOTE TSE used for safety services and for emergency escape lighting systems as described in IEC 60364-5-56 are
75 subject to specific rules and/or legal requirements.

76 The object of this document is to state:

- 77 1) the characteristics of the equipment;
- 78 2) the conditions of the equipment with respect to:
 - 79 a) operation for which the equipment is intended;

- 80 b) operation and behaviour in case of specified abnormal conditions, for example, short-
81 circuit;
- 82 c) dielectric properties;
- 83 3) the tests intended to confirm that these conditions have been met and the methods for performing
84 these tests;
- 85 4) the product information to be provided by the manufacturer.

86

87 2 Normative references

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

92 IEC 60068-2-2:2007, *Environmental testing – Part 2-2: Tests - Test B: Dry heat*

93 IEC 60417, *Graphical symbols for use on equipment* (available at [http://www.graphical-
symbols.info/equipment](http://www.graphical-
94 symbols.info/equipment))

95 IEC 60715:2017, *Dimensions of low-voltage switchgear and controlgear – Standardized mounting on
96 rails for mechanical support of switchgear, controlgear and accessories*

97 IEC 60812, *Failure modes and effects analysis (FMEA and FMECA)*

98 IEC 60947 (all parts), *Low-voltage switchgear and controlgear*

99 IEC 60947-1:2020, *Low-voltage switchgear and controlgear – Part 1: General rules*

100 IEC 60947-2:2016, *Low-voltage switchgear and controlgear – Part 2: Circuit-breakers*

101 IEC 60947-2:2016/AMD1:2019

102 IEC 60947-3:2020, *Low-voltage switchgear and controlgear – Part 3: switches, disconnectors,
103 switch-disconnectors and fuse-combination units*

104 IEC 60947-4-1:2023, *Low-voltage switchgear and controlgear – Part 4-1: Contactors and motor-
105 starters - Electromechanical contactors and motor-starters*

106 IEC 61000-4-13:2002, *Electromagnetic compatibility (EMC) – Part 4-13: Testing and
107 measurement techniques – Harmonics and interharmonics including mains signalling at a.c.
108 power port, low-frequency immunity tests*

109 IEC 61000-4-13:2002/AMD1:2009

110 IEC 61000-4-13:2002/AMD2:2015

111 CISPR 11:2015, *Industrial, scientific and medical equipment – Radio-frequency disturbance
112 characteristics – Limits and methods of measurement*

113 CISPR 11:2015/AMD1:2016

114 **3 Terms and definitions**

115 **3.1 General**

116 For the purposes of this document, the terms and definitions given in Clause 3 of IEC 60947-
117 1:2020, and the following apply.

118 ISO and IEC maintain terminological databases for use in standardization at the following
119 addresses:

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

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