

CONSOLIDATED VERSION

VERSION CONSOLIDÉE



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

**Appareillage à basse tension –
Partie 6-1: Matériels à fonctions multiples – Matériels de connexion de transfert**

IEC 60947-6-1:2005

<https://standards.iteh.ai/standards/iec/60947-6-1:2005>



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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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

**Appareillage à basse tension –
Partie 6-1: Matériels à fonctions multiples – Matériels de connexion de transfert**

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

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

FOREWORD

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This Consolidated version of IEC 60947-6-1 bears the edition number 2.1. It consists of the second edition (2005) [documents 17B/1418/FDIS and 17B/1424/RVD] and its amendment 1 (2013) [documents 17B/1830/FDIS and 17B/1840/RVD]. The technical content is identical to the base edition and its amendment.

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions and deletions are displayed in red, with deletions being struck through. A separate Final version with all changes accepted is available in this publication.

This publication has been prepared for user convenience.

International Standard IEC 60947-6-1 has been prepared by subcommittee 17B: Low-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

This part of IEC 60947 shall be used in conjunction with IEC 60947-1: General rules.

The provisions of the general rules dealt with in IEC 60947-1 are applicable to this part of IEC 60947, where specifically called for. Clauses and subclauses, tables, figures and annexes of the general rules thus applicable are identified by reference to IEC 60947-1 (e.g. 1.2.3 of IEC 60947-1, Table 4 of IEC 60947-1 or Annex A of IEC 60947-1, etc.).

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

IEC 60947 consists of the following parts, under the general title *Low-voltage switchgear and controlgear*:

- Part 1: General rules
- Part 2: Circuit-breakers
- Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units
- Part 4-1: Contactors and motor-starters – Electromechanical contactors and motor-starters
- Part 4-2: Contactors and motor-starters – AC semiconductor motor controllers and starters
- Part 4-3: Contactors and motor-starters – AC semiconductor controllers and contactors for non-motor loads
- Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices
- Part 5-2: Control circuit devices and switching elements – Proximity switches
- Part 5-3: Control circuit devices and switching elements – Requirements for proximity devices with defined behaviour under fault conditions (PDF)
- Part 5-4: Control circuit devices and switching elements – Method of assessing the performance of low-energy contacts – Special tests
- Part 5-5: Control circuit devices and switching elements – Electrical emergency stop device with mechanical latching function
- Part 5-6: Control circuit devices and switching elements – DC interface for proximity sensors and switching amplifiers (NAMUR)
- Part 5-7: Control circuit devices and switching elements – Requirements for proximity devices with analogue output
- Part 5-8: Control circuit devices and switching elements – Three-position enabling switches¹
- Part 5-9: Control circuit devices and switching elements – Flow rate switches¹
- Part 6-1: Multiple function equipment – Automatic transfer switching equipment
- Part 6-2: Multiple function equipment – Control and protective switching devices (or equipment) (CPS)
- Part 7-1: Ancillary equipment – Terminal blocks for copper conductors
- Part 7-2: Ancillary equipment – Protective conductor terminal blocks for copper conductors
- Part 7-3: Ancillary equipment – Safety requirements for fuse terminal blocks
- Part 7-3: Ancillary equipment – Safety requirements for fuse terminal blocks
- Part 8: Control units for built-in thermal protection (PTC) for rotating electrical machines

¹ Under consideration.

The committee has decided that the contents of the base publication and its amendment will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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INTRODUCTION TO THE AMENDMENT

This amendment includes the following significant technical changes with respect to the second edition of IEC 60947-6-1 published in 2005:

- clarification of the scope and object;
- update of the normative references;
- clarification of the classification in Clause 4;
- new EMC test: voltage harmonics
- minimum test for derived TSE;
- alignments to the Amendment 1 (2010) of IEC 60947-1:2007:
 - electrically or electronically controlled circuits;
 - markings ("s", "sol", "r" or "f");
 - constructional requirements including material requirements;
 - requirement for screwless terminals;
 - references to EMC test.
- alignments to the Amendment 1 (2012) of IEC 60947-4-1:2009:
 - test at the rated conditional short-circuit current I_q of protected switching devices;
 - short-circuit tests harmonisation.
- creation of bibliography.

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

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

1 Scope and object

This part of IEC 60947 applies to transfer switching equipment (TSE) to be used in power systems for transferring a load supply between a normal and an alternate source with a supply interruption of the supply to the load during transfer, the rated voltage of which does not exceed 1 000 V a.c. or 1 500 V d.c.

It covers:

- manually operated transfer switching equipment (MTSE);
- remotely operated transfer switching equipment (RTSE);
- automatic transfer switching equipment (ATSE).

It covers TSE provided with or without an enclosure.

Devices necessary for the control (e.g. control switches, etc.) and the protection (e.g. circuit-breakers, etc.) of a TSE are covered by the relevant IEC standards.

NOTE 1 TSE used only for emergency lighting may be subject to specific rules and/or legal requirements and are not, therefore, covered by this standard.

The object of this part of IEC 60947 is to state:

- 1) The characteristics of the equipment:
 - ~~a) specific equipment;~~
 - ~~b) equipment the main part of which being devices covered by other IEC 60947 product standards.~~
- 2) The conditions of the equipment with respect to:
 - a) operation for which the equipment is intended;
 - b) operation and behaviour in case of specified abnormal conditions, for example, short-circuit;
 - c) dielectric properties.
- 3) The tests intended to confirm that these conditions have been met and the methods for performing these tests.
- 4) The data to be marked on the equipment and provided by the manufacturer.

NOTE 2 This standard covers also ATSE or RTSE which can be used for safety services as defined in IEC 60364-1 and for which the installation requirements are given by IEC 60364-5-56.

NOTE 3 Other ATSE requirements are under consideration such as closed transition TSE (make before break transfer operation).

2 Normative references

The following referenced documents are indispensable for the application 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 60417-DB², Graphical symbols for use on equipment

IEC 60695-11-10:1999, *Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods*
Amendment 1 (2003)

IEC 60947-1:~~2004~~ 2007, *Low-voltage switchgear and controlgear – Part 1: General rules*
Amendment 1 (2010)

IEC 60947-2:~~2003~~ 2006, *Low-voltage switchgear and controlgear – Part 2: Circuit-breakers*
Amendment 1 (2009)
Amendment 2 (2013)

IEC 60947-3:~~1999~~ 2008, *Low-voltage switchgear and controlgear – Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units*
Amendment 1 (~~2004~~ 2012)

IEC 60947-4-1:~~2000~~ 2009, *Low-voltage switchgear and controlgear – Part 4-1: Contactors and motor-starters – Electromechanical contactors and motor-starters*
Amendment 1 (~~2002~~ 2012)

IEC 60947-4-2:1999, *Low-voltage switchgear and controlgear – Part 4-2: Contactors and motor-starters – AC semiconductor motor controllers and starters*
Amendment 1 (2001)

IEC 60947-4-3:1999, *Low-voltage switchgear and controlgear – Part 4-3: Contactors and motor-starters – AC semiconductor controllers and contactors for non-motor loads*

IEC 60947-6-2:2002, *Low-voltage switchgear and controlgear – Part 6-2: Multiple function equipment – Control and protective switching devices (or equipment) (CPS)*
Amendment 1 (2007)

IEC 61000-4-2:1995, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*
Amendment 1 (1998)
Amendment 2 (2000)

IEC 61000-4-3:2002, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*
Amendment 1 (2002)

IEC 61000-4-4:1995, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*
Amendment 1 (2000)
Amendment 2 (2001)

IEC 61000-4-5:1995, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*
Amendment 1 (2000)

IEC 61000-4-6:2003, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*
Amendment 1 (2004)

² Available at: <http://www.graphical-symbols.info/equipment>

IEC 61000-4-13:2002, *Electromagnetic compatibility (EMC) – Part 4-13: Testing and measurement techniques – Harmonics and interharmonics including mains signalling at a.c. power port, low-frequency immunity tests*
Amendment 1:2009

CISPR 11:2003, *Industrial, scientific and medical (ISM) radio-frequency equipment – Electromagnetic disturbance characteristics – Limits and methods of measurement*
Amendment 1 (2004)

CISPR 11:2009, *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement*
Amendment 1:2010

3 Terms and definitions, symbols and abbreviations

For the purpose of this part of IEC 60947 the relevant terms and definitions given in Clause 2 of IEC 60947-1 and the following additional definitions shall apply:

	Reference
	A
Alternative position	3.3.2
Automatic transfer switching equipment (ATSE)	3.1.4
	C
Contact transfer time	3.2.5
	D
Derived transfer switching equipment (derived TSE)	3.1.5
	F
Frequency supply deviation	3.2.4
	M
Manually operated transfer switching equipment (MTSE)	3.1.2
Monitored supply deviation of ATSE	3.2.2
	N
Normal position	3.3.1
	O
Off position	3.3.3
Off-time	3.2.9
Operating sequence of ATSE	3.2.1
Operating transfer time	3.2.6
	R
Remotely operated transfer switching equipment (RTSE)	3.1.3
Return transfer time	3.2.8
	S
Switching position	3.3.4
	T
Total operating time	3.2.7
Transfer switching equipment (TSE)	3.1.1
	V
Voltage supply deviation	3.2.3