SLOVENSKI STANDARD
SIST EN 60947-6-2:2003/A1:2007

01-september-2007

Nizkonapetostne stikalne naprave ï 6. del: Veļ funkcijska oprema ï 2. oddelek: Krmilne in zaġļ itne stikalne naprave (ali oprema) (CPS) (IEC 60947-6-2:2002/A1:2007)

Low-voltage switchgear and controlgear -- Part 6-2: Multiple function equipment - Control and protective switching devices (or equipment) (CPS) (IEC 60947-6-2:2002/A1:2007)

Niederspannungsschaltgeräte -- Teil 6-2: Mehrfunktions-Schaltgeräte - Steuer- und Schutz-Schaltgeräte (CPS) (CPS) (IEC 60947-6-2:2002/A1:2007)

Appareillage a basse tension -- Partie 6-2: Matériels a fonctions multiples - Appareils (ou matériel) de connexion de commande et de protection (ACP) (IEC 60947-6-2:2002/A1:2007)

Ta slovenski standard je istoveten z: **EN 60947-6-2:2003/A1:2007**

ICS:

29.130.20	Nizkonapetostne stikalne in krmilne naprave	Low voltage switchgear and controlgear

SIST EN 60947-6-2:2003/A1:2007 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60947-6-2/A1

March 2007

ICS 29.120.40; 29.130.20

English version

Low-voltage switchgear and controlgear - Part 6-2: Multiple function equipment - Control and protective switching devices (or equipment) (CPS)

(IEC 60947-6-2:2002/A1:2007)

Appareillage à basse tension -
Partie 6-2: Matériels à fonctions multiples -
Appareils (ou matériel) de connexion
de commande et de protection (ACP)
(CEI 60947-6-2:2002/A1:2007)

Niederspannungsschaltgeräte -
Teil 6-2: Mehrfunktions-Schaltgeräte -
Steuer- und Schutz-Schaltgeräte (CPS)
(IEC 60947-6-2:2002/A1:2007)

This amendment A1 modifies the European Standard EN 60947-6-2:2003; it was approved by CENELEC on 2007-03-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 17B/1526/FDIS, future amendment 1 to IEC 60947-6-2:2002, prepared by SC 17B, Low-voltage switchgear and controlgear, of IEC TC 17, Switchgear and controlgear, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 60947-6-2:2003 on 2007-03-01.

The following dates were fixed:

– latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2007-12-01
– latest date by which the national standards conflicting with the amendment have to be withdrawn	(dow)	2010-03-01

Annex ZA has been added by CENELEC

Endorsement notice

The text of amendment 1:2007 to the International Standard IEC 60947-6-2:2002 was approved by CENELEC as an amendment to the European Standard without any modification.

Replace *Annex ZA of EN 60947-6-2:2003 by the following:*

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60034-1	2004	Rotating electrical machines - Part 1: Rating and performance	EN 60034-1	2004
IEC 60085	2004	Electrical insulation - Thermal classification	EN 60085	2004
IEC 60410	1973	Sampling plans and procedures for inspection by attributes	-	-
IEC 60695-2-10	2000	Fire hazard testing - Part 2-10: Glowing/hot-wire based test methods - Glow-wire apparatus and common test procedure	EN 60695-2-10	2001
IEC 60695-2-11	2000	Fire hazard testing - Part 2-11: Glowing/hot-wire based test methods - Glow-wire flammability test method for end-products	EN 60695-2-11	2001
IEC 60695-2-12	2000	Fire hazard testing - Part 2-12: Glowing/hot-wire based test methods - Glow-wire flammability test method for materials	EN 60695-2-12	2001
IEC 60695-2-13	2000	Fire hazard testing - Part 2-13: Glowing/hot-wire based test methods - Glow-wire ignitability test method for materials	EN 60695-2-13	2001
IEC 60695-11-10 A1	1999 2003	Fire hazard testing - Part 11-10: Test flames - 50 W horizontal and vertical flame test methods	EN 60695-11-10 A1	1999 2003
IEC 60947-1	2004	Low-voltage switchgear and controlgear - Part 1: General rules	EN 60947-1 + corr. November	2004 2004
IEC 60947-2	2006	Low-voltage switchgear and controlgear - Part 2: Circuit-breakers	EN 60947-2	2006

Publication	Year	Title	EN/HD	Year
IEC 60947-6-1 A1 A2	1989 1994 1997	Low-voltage switchgear and controlgear - Part 6-1: Multiple function equipment - Automatic transfer switching equipment	EN 60947-6-1 [1)] A1 A2	1991 1994 1997
IEC 61000-4-2 A1 A2	1995 1998 2000	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test	EN 61000-4-2 A1 A2	1995 1998 2001
IEC 61000-4-3	2006	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test	EN 61000-4-3	2006
IEC 61000-4-4	2004	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	EN 61000-4-4	2004
IEC 61000-4-5 A1	1995 2000	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5 [2)] A1	1995 2001
IEC 61000-4-6 + A1 + A2	2003 2004 2006	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	 EN 61000-4-6	 - 200X [3)]
IEC 61131-2	2003	Programmable controllers - Part 2: Equipment requirements and tests	EN 61131-2 + corr. August	2003 2003
CISPR 11 (mod) + A1 A2	2003 2004 2006	Industrial scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement	 EN 55011 A2	 2007 2007

[1)] EN 60947-6-1 is superseded by EN 60947-6-1:2005, which is based on IEC 60947-6-1:2005.

[2)] EN 61000-4-5 is superseded by EN 61000-4-5:2006, which is based on IEC 61000-4-5:2005.

[3)] To be ratified.

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC
60947-6-2

2002

AMENDEMENT 1
AMENDMENT 1
2007-01

Amendement 1

Appareillage à basse tension –

Partie 6-2:
Matériels à fonctions multiples – Appareils (ou matériel) de connexion de commande de protection (ACP)

Amendment 1

Low-voltage switchgear and controlgear –

Part 6-2:
Multiple function equipment – Control and protective switching devices (or equipment) (CPS)

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International Electrotechnical Commission
Международная Электротехническая Комиссия

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For price, see current catalogue

FOREWORD

This amendment has been prepared by subcommittee 17B: Low-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

The text of this amendment is based on the following documents:

FDIS	Report on voting
17B/1526/FDIS	17B/1535/RVD

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

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the maintenance result 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

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

Page 3

CONTENTS

*Delete, on page 5, Subclauses 5.8 and 8.2.6: "*Switching overvoltages*".*

*Delete, on page 7, Subclause 9.6: "*Sampling plans and test procedure*".*

Insert the following annexes:

Annex E (informative) Examples of control circuit configurations .....

Annex F (normative) Coordination under short-circuit conditions between a CPS and another short-circuit protective device associated in the same circuit .....

Annex G (normative) Test sequence for CPSs for IT systems .....

Annex H (normative) Extended functions within electronic overload relays or releases .....

Insert the following figures:

Figure 26 – Thermal memory test .....

Figure F.1 – Over-current coordination between a CPS and a fuse or back-up protection by a fuse: operating characteristics .....

Figure F.2 – Total discrimination between CPSs and circuit-breakers – Case 1 .....

Figure F.3 – Total discrimination between CPSs and circuit-breakers – Case 2 .....

Figure F.4 – Back-up protection by a CPS/circuit-breaker – Operating characteristics – Case 1

Figure F.5 – Back-up protection by a CPS/circuit-breaker – Operating characteristics – Case 2

Figure F.6 – Example of test circuit for conditional short-circuit breaking capacity tests showing cable connections for a 3-pole CPS (C_1) .....

Figure H.1 – Test circuit for the verification of the operating characteristic of a residual current electronic overload relay .....

Modify, on page 11, the title of Tables 3 and 4 as follows:

Table 3 – Trip classes of overload relays or releases for utilization categories AC-42, AC-43, AC-44, DC-43, DC-45 .....

Table 4 – Limits of operation of inverse time-delay overload relays or releases when energized on two poles only.....

Insert the following tables:

Table G.1 – Individual pole .....

Table H.1 – Operating time of residual current electronic overload relays .....

Page 19

1 Scope and object

Insert, after the second paragraph, the following new paragraph:

Digital inputs and/or digital outputs contained in CPSs, and intended to be compatible with PLCs are covered by IEC 61131-2.

2 Normative references

Replace the reference to IEC 60034-1:1996 by the following:

IEC 60034-1:2004, *Rotating electrical machines – Part 1: Rating and performance*

Replace the reference to IEC 60085:1984 by the following:

IEC 60085:2004, *Electrical insulation – Thermal classification*

Replace the reference to IEC 60947-1:1999 by the following:

IEC 60947-1:2004, *Low-voltage switchgear and controlgear – Part 1: General rules*

Insert the following references:

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 60947-2:2006, *Low-voltage switchgear and controlgear – Part 2: Circuit-breakers*

Replace the reference to IEC 61000-4-3:1995 by the following:

IEC 61000-4-3:2006, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated radio-frequency electromagnetic field immunity test*

Replace the reference to IEC 61000-4-4:1995 by the following:

IEC 61000-4-4:2004, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

Replace the reference to IEC 61000-4-6:1996 by the following:

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)
Amendment 2 (2006)

Insert the following reference:

IEC 61131-2:2003, *Programmable controllers – Part 2: Equipment requirements and tests*

Replace the reference to CISPR 11:1997 by the following:

CISPR 11:2003, *Industrial, scientific and medical (ISM) radio-frequency equipment – Electromagnetic disturbance characteristics – Limits and methods of measurement*
Amendment 1 (2004)
Amendment 2 (2006)

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3 Definitions

Under definition 3.1, insert, after the existing NOTE 1, the following new NOTE 2:

NOTE 2 For CPSs controlled with an electromagnet, such an electromagnet may be electronically controlled (see 3.1.1).

Renumber, on page 23, the existing NOTE 2, NOTE 3 and NOTE 4 as NOTE 3, NOTE 4 and NOTE 5, respectively.

Insert, after definition 3.1, the following new definition 3.1.1:

3.1.1
electronically controlled coil for electromagnet
coil controlled by a circuit with active electronic elements

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Add, after definition 3.5, the following new definitions:

3.6
under-current relay or release
relay or release which operates automatically when the current through it is reduced below a predetermined value

3.7
under-voltage relay or release
relay or release which operates automatically when the voltage applied to it is reduced below a predetermined value

3.8
stall sensitive electronic overload relay or release
electronic overload relay or release which operates when the current has not decreased below a predetermined value for a specific period of time during start-up or when the relay receives the input indicating there is no rotation of the motor after a predetermined time in accordance with specified requirements

NOTE Explanation of stall: rotor locked during start.

3.9
jam sensitive electronic overload relay or release
electronic overload relay or release which operates in the case of overload and also when the current has increased above a predetermined value for a specific period of time during run in accordance with specified requirements

NOTE Explanation of jam: high overload occurring after the completion of starting which causes the current to reach the locked rotor current value of the motor being controlled.

3.10
inhibit time
time-delay period during which the tripping function of the relay is inhibited (may be adjustable)

3.11
***I*²*t* characteristic of a SCPD**
information (usually a curve) giving the maximum values of I^2t related to break time as a function of prospective current (r.m.s. symmetrical for a.c.) up to the maximum prospective current corresponding to the rated short-circuit breaking capacity and associated voltage

5.1 Summary of characteristics

Delete the last dashed item: "– switching over-voltages (5.8)".

Page 27

5.3.1 Rated voltages

Replace the existing text of this subclause by the following:

Subclause 4.3.1 of IEC 60947-1 applies with the following addition.

CPSs for unearthed or impedance earthed systems (IT) require additional tests according to Annex G.

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5.5 Control circuits

Replace the existing text of this subclause by the following:

Subclause 4.5 of IEC 60947-1 applies; moreover, for an electronically controlled electromagnet, Subclause 4.5.1 of IEC 60947-1 applies with the following addition.

The electronic part may form an integral part or a separate part provided it is an intrinsic function of the device. In both cases, the device shall be tested with this electronic part mounted and installed as in normal use.

The characteristics of electronic control circuits are as follows:

– type of current;
– power consumption;
– rated frequency (or d.c.);
– rated control circuit voltage, U_c (nature: a.c./d.c.);
– rated control supply voltage, U_s (nature: a.c./d.c.);
– nature of external control circuit devices (contacts, sensors, optocouplers, electronic active components, etc.).

Annex E gives examples and illustrations of different circuit configurations.

NOTE A distinction is made between the control circuit voltage U_c, which is the controlling input signal, and the control supply voltage U_s, which is the voltage applied to energize the power supply terminals of the control circuit equipment and may be different from U_c due to the presence of built-in transformers, rectifiers, resistors, electronic circuitry, etc.

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5.7.1.3.1 Overload relay or release (2.4.25 and 2.4.30 of Part 1):

Modify the existing title as follows:

5.7.1.3.1 Overload relay or release

Modify the existing text of item a) as follows:

a) Instantaneous overload relay or release (e.g. jam sensitive, see 3.9).

Modify, under item c), the existing text of items i), ii) and iii) as follows:

i) substantially independent of previous load;
ii) dependent on previous load;
iii) dependent on previous load and also sensitive to phase loss (see 3.5).

Add, after item c), the following new item d):

d) Stall relay or release (see 3.8).

5.7.2 Characteristic values

Replace the existing text of this subclause by the following:

Shunt, under-voltage (under-current), over-voltage (instantaneous over current), current or voltage asymmetry and phase reversal opening relay or release:

– rated voltage (current);
– rated frequency;
– operating voltage (current);
– operating time (when applicable);
– inhibit time (when applicable).

Over-current relay or release:

– designation and current setting (or range of settings) (see 5.7.3);
– rated frequency, where necessary (e.g. in the case of a current transformer operated overload relay);
– time-current characteristics (or range of characteristics), where necessary;
– trip class, where applicable according to classification in Table 3, or the value of the maximum tripping time, in seconds, under the conditions specified in 8.2.1.5.1, Table 2, column *D*, when this time exceeds 40 s;
– nature of the relay or release: thermal, magnetic, electronic or electronic without thermal memory;
– nature of the reset: manual or automatic.

Relay or release with residual current sensing:

– rated current;
– operating current;
– operating time or time-current characteristic according to Table H.1;
– inhibit time (when applicable);
– type designation (see Annex H).

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5.8 Switching overvoltages

Delete this subclause completely.

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6.1.2 Characteristics

Modify the existing text of item d) as follows:

d) Rated operational voltages U_e (see 5.3.1 and, where applicable, Annex G).

Modify the existing text of item m) as follows:

m) Vacant.