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STN	**Spínacie a riadiace zariadenia nízkeho napätia Časť 8: Riadiace jednotky na vstavanú tepelnú ochranu (PTC) točivých elektrických strojov**	**STN EN IEC 60947-8** 35 4101

Low-voltage switchgear and controlgear - Part 8: Control units for built-in thermal protection (PTC) for rotating electrical machines

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 06/23

Obsahuje: EN IEC 60947-8:2023, IEC 60947-8:2021

Oznámením tejto normy sa od 11.01.2026 ruší
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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 60947-8

April 2023

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Supersedes EN 60947-8:2003; EN 60947-8:2003/A1:2006; EN 60947-8:2003/A2:2012

English Version

Low-voltage switchgear and controlgear - Part 8: Control units for built-in thermal protection (PTC) for rotating electrical machines (IEC 60947-8:2021)

Appareillage à basse tension - Partie 8: Unités de commande pour la protection thermique incorporée (CTP) aux machines électriques tournantes (IEC 60947-8:2021)

Niederspannungsschaltgeräte - Teil 8: Auslösegeräte für den eingebauten thermischen Schutz (PTC) von rotierenden elektrischen Maschinen (IEC 60947-8:2021)

This European Standard was approved by CENELEC on 2023-01-11. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 121A/424/FDIS, future edition 2 of IEC 60947-8, prepared by SC 121A "Low-voltage switchgear and controlgear" of IEC/TC 121 "Switchgear and controlgear and their assemblies for low voltage" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60947-8:2023.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2023-10-11
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-01-11

This document supersedes EN 60947-8:2003 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a Standardization Request given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

For the relationship with EU Directive(s) / Regulation(s), see informative Annex ZZ, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 60947-8:2021 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated:

IEC 60034-11:2020	NOTE	Approved as EN IEC 60034-11:20201 (not modified)
IEC 60990:2016	NOTE	Approved as EN 60990:2016 (not modified)
IEC 62477-1:2012	NOTE	Approved as EN 62477-1:2012 (not modified) + A11:2014
IEC 62477-1:2012/A1:2016	NOTE	Approved as EN 62477-1:2012/A1:2017 (not modified)
IEC/TR 63201	NOTE	Approved as CLC IEC/TR 63201

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

Publication	Year	Title	EN/HD	Year
CISPR 11 (mod)	2015	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement	EN 55011	2016
+ A1	2016		+ A1	2017
			+ A11	2020
IEC 60068-2-6	2007	Environmental testing – Part 2-14: Tests – Test Fc: Vibration (sinusoidal)	EN 60068-2-6	2008
IEC 60068-2-27	2008	Environmental testing – Part 2: Tests – Test Ea and guidance: Shock	EN 60068-2-27	2009
IEC 60417	-	Graphical symbols for use on equipment	-	-
IEC 60445	-	Basic and safety principles for man-machine interface, marking and identification - Identification of equipment terminals, conductor terminations and conductors	EN 60445	2017
IEC 60730-1 (mod)	-	Automatic electrical controls - Part 1: General requirements	EN 60730-1	2016
			+ A1	2019
IEC 60738-1	2006	Thermistors – Directly heated positive step-function temperature coefficient – Part 1: Generic specification	EN 60738-1	2006
+ A1	2009		+ A1	2009
IEC 60738-1-4	2008	Thermistors - Directly heated positive step-function temperature coefficient - Part 1-4: Blank detail specification - Sensing application - Assessment level EZ	EN 60738-1-4	2008
IEC 60947-1	2020	Low-voltage switchgear and controlgear - Part 1: General rules	EN IEC 60947-1	2021

EN IEC 60947-8:2023 (E)

Publication	Year	Title	EN/HD	Year
IEC 60947-5-1	2016	Low-voltage switchgear and controlgear - Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices	EN 60947-5-1	2017
			+ AC	2020-05
IEC 61140	2016	Protection against electric shock – Common aspects for installation and equipment	EN 61140	2016
ISO 2859-1	1999	Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection	-	-
+ A1	2011		-	-

Annex ZZ
(informative)

Relationship between this European standard and the safety objectives of Directive 2014/35/EU [2014 OJ L96] aimed to be covered

This European standard has been prepared under a Commission's standardisation request relating to harmonised standards in the field of the Low Voltage Directive, M/511, to provide one voluntary means of conforming to safety objectives of Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits [2014 OJ L96].

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZZB.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding safety objectives of that Directive, and associated EFTA regulations.

Table ZZB.1 — Correspondence between this European standard and Annex I of Directive 2014/35/EU [2014 OJ L96]

Safety objectives of Directive 2014/35/EU	Clause(s) / sub-clause(s) of this EN	Remarks/note
1 a)	5, 6, 8, Annex A	
1 b)	5, 6, 7, 8, 9, Annex A, Annex B	
1 c)	5, 6, 7, 8, 9, Annex A	
2 a)	5, 6, 8, 9, Annex B	
2 b)	5, 6, 8, 9, Annex A	
2 c)	5, 6, 7, 8, Annex A	
2 d)	5, 6, 7, 8, 9, Annex B	
3 a)	5, 6, 7, 8, 9	
3 b)	5, 6, 7, 8, 9, Annex A	
3 c)	5, 6, 8, 9	

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

IEC 60947-8

Edition 2.0 2021-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Low-voltage switchgear and controlgear – Part 8: Control units for built-in thermal protection (PTC) for rotating electrical machines

Appareillage à basse tension – Partie 8: Unités de commande pour la protection thermique incorporée (CTP) aux machines électriques tournantes

IEC 60947-8:2021-07(en-fr)

IEC 60947-8

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 8: Control units for built-in thermal protection (PTC) for rotating electrical machines

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.
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IEC 60947-8 has been prepared by subcommittee 121A: Low voltage switchgear and controlgear, of IEC technical committee 121: Switchgear and controlgear and their assemblies for low voltage. It is an International Standard.

This second edition cancels and replaces the first edition published in 2003, Amendment 1:2006 and Amendment 2:2011. This edition constitutes a technical revision.

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

a) safety aspects related to:
   - general aspects;
   - limited energy circuits;
   - electronic circuits;
b) alignment to IEC 60947-1:2020;

c) wire break detection function;

d) the term detector is replaced by thermistor;

e) reference to IEC 60738-1-4.

The provisions of the general rules dealt with IEC 60947-1 are applicable to this part of IEC 60947 series where specifically called for. Clauses and subclauses, tables, figures and annexes of the general rules thus applicable are identified by reference to IEC 60947-1:2020.

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

FDIS	Report on voting
121A/424/FDIS	121A/436/RVD

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 www.iec.ch/standardsdev/publications.

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

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.

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

INTRODUCTION

Thermal protection systems which are based on the principle of monitoring the temperature of the protected parts constitute a simple and effective means of protecting rotating electrical machines, called also electric motors, against excessive temperature rises, including those caused by faults in the cooling system, or excessively high ambient temperature, whereas systems of protection based only on monitoring the current absorbed do not ensure this type of protection in every circumstances.

Since the operating temperature and response times of thermal protection systems are fixed in advance, they are not often adjusted in relation to the conditions of use of the machine and, hence, they are not completely effective for all fault conditions, or improper use of the machine.

A thermal protection system in accordance with this document can consist of a characteristic change thermal detector which has an associated control unit to convert a point on the characteristic of the detector to a switching function. A very large number of thermal protection systems are in use and, in all cases, the machine manufacturer will fit the detectors in the machine. The machine manufacturer will either supply the control unit with the machine or specify particulars of the control unit to be used.

It is also customary for the control units to be considered as part of the control system and not necessarily supplied with the machine. For this reason, it is considered useful to have an interchangeable system, where the characteristics of association between the detector and the control unit are specified. This particular system is not considered superior in any way to other systems complying with the requirements of this document, but in some fields the practice is likely to be that this interchangeable system will be used, as indicated by the designation “Mark A”.

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 8: Control units for built-in thermal protection (PTC) for rotating electrical machines

1 Scope

This part of IEC 60947 series specifies requirements for control units, which control a switching device in response to the PTC thermistors incorporated in rotating electrical machines and the industrial application.

It specifies requirements for that type of system comprising a positive temperature coefficient (PTC) thermistor having particular characteristics, and its associated control unit.

This document includes:

– the characteristics, construction, performance and tests of the control unit; and

– its association with a PTC thermistor designated “Mark A”.

This document does not cover:

– the incorporation of thermal protections into rotating machines and their maximum winding temperature. See IEC 60034-11;

– use of the product within explosive atmospheres (see IEC 60079 (all parts));

– software and firmware requirements;

NOTE 1 Guidance on embedded software is given in IEC TR 63201.

– cyber security aspects (see IEC TS 63208).

NOTE 2 It is not possible to specify all the requirements for the operating characteristics of a control unit, as they are dependent on some aspects of the PTC thermistors. Some aspects of the requirements of the thermal protector system can only be specified when account is taken of the characteristics of the rotating machine to be protected and the method of installation of the PTC thermistor within the machine.

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.

CISPR 11:2015, *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement*
CISPR 11:2015/AMD1:2016

IEC 60068-2-6:2007, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-27:2008, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

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

IEC 60445, *Basic and safety principles for man-machine interface, marking and identification – Identification of equipment terminals, conductor terminations and conductors*

IEC 60730-1, *Automatic electrical controls – Part 1: General requirements*

IEC 60738-1:2006, *Thermistors – Directly heated positive temperature coefficient – Part 1: Generic specification*
IEC 60738-1:2006/AMD1:2009

IEC 60738-1-4:2008, *Thermistors – Directly heated positive step-function temperature coefficient – Part 1-4: Blank detail specification – Sensing application – Assessment level EZ*

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

IEC 60947-5-1:2016, *Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices*

IEC 61140:2016, *Protection against electric shock – Common aspects for installation and equipment*

ISO 2859-1:1999, *Sampling procedures for inspection by attributes – Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*
ISO 2859-1:1999/AMD1:2011