This document is a preview generated by EVS

# ELEKTRILISTE KAITSE-, TURVALAHUTUS-, LÜLITUS- JA JUHTIMISAPARAATIDE KOORDINEERIMINE

# Co-ordination of electrical equipment for protection, isolation, switching and control

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

| | |
|---|---|
| See Eesti standard EVS-HD 50573-5-57:2014 sisaldab Euroopa standardi HD 50573-5-57:2014 ingliskeelset teksti. | This Estonian standard EVS-HD 50573-5-57:2014 consists of the English text of the European standard HD 50573-5-57:2014. |
| Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas. | This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation. |
| Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 14.02.2014. | Date of Availability of the European standard is 14.02.2014. |
| Standard on kättesaadav Eesti Standardikeskusest. | The standard is available from the Estonian Centre for Standardisation. |

This document is a preview generated by EVS

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 91.140.50

**Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele**

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:
Aru 10, 10317 Tallinn, Eesti; koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

**The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation**

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Aru 10, 10317 Tallinn, Estonia; homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

HARMONIZATION DOCUMENT

DOCUMENT D'HARMONISATION

HARMONISIERUNGSDOKUMENT

# HD 50573-5-57

February 2014

ICS 91.140.50

English version

# Co-ordination of electrical equipment for protection, isolation, switching and control

Coordination des dispositifs électriques

Koordinierung elektrischer Einrichtungen

This document is a preview generated by EVS

This Harmonization Document was approved by CENELEC on 2013-12-30. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this Harmonization Document at national level.

Up-to-date lists and bibliographical references concerning such national implementations may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This Harmonization Document exists in three official versions (English, French, German).

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

CENELEC

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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B - 1000 Brussels**

© 2014 CENELEC - All rights of exploitation in any form and by any means reserved worldwide for CENELEC members.

Ref. No. HD 50573-5-57:2014 E

# Contents

**Foreword** ..... **3**
**570 Co-ordination of electrical equipment for protection, isolation, switching and control** ..... **4**
570.1 Scope ..... 4
570.2 Normative references ..... 4
570.3 Terms and definitions ..... 5
**571 Electrical devices considered and function provided** ..... **8**
**572 Aspects of device co-ordination** ..... **10**
572.1 Basis of correct co-ordination ..... 10
572.2 Parameters ..... 10
572.3 Device co-ordination table ..... 10
**573 Co-ordination requirements** ..... **11**
573.1 Requirements for selectivity ..... 12
573.1.1 General ..... 12
573.1.2 Selectivity under overload conditions between OCPDs ..... 12
573.1.3 Selectivity in short-circuit conditions between OCPDs ..... 13
573.1.4 Selectivity between RCDs ..... 14
573.1.5 Selectivity between OCPDs and RCDs ..... 15
573.2 Requirements for protection in case of short circuit ..... 17
573.2.1 Combined short-circuit protection of OCPDs ..... 17
573.2.2 Back-up protection of contactors or overload relays ..... 18
573.2.3 Back-up protection of switches, Transfer Switching Equipment (TSE) or impulse relays ..... 21
573.2.4 Back-up protection of RCCB ..... 22
573.3 Requirements for protection in case of overload ..... 23
573.3.1 Overload protection of contactor or SCPDs ..... 23
573.3.2 Overload protection of RCCB, switch, Transfer Switching Equipment (TSE) or impulse relay ..... 23
573.4 Requirements for selectivity between OCPDs equipped with under-voltage relay ..... 23
573.5 Low voltage assemblies according to EN 61439 series ..... 24
**574 Documentation** ..... **24**
**Bibliography** ..... **26**

**Figures**

Figure 57.1 – Selectivity between OCPDs ..... 12
Figure 57.2 – Selectivity between RCDs in case of residual current ..... 15
Figure 57.3 – Selectivity between OCPD and RCD using RCBOs ..... 15
Figure 57.4 – Selectivity between OCPD and RCD using RCCBs ..... 16
Figure 57.5 – Selectivity between upstream RCCB and RCBOs. ..... 17
Figure 57.6 – Typical configuration for combined short-circuit protection of OCPDs ..... 17
Figure 57.7 – Co-ordination between OCPD and contactor in case of short-circuit ..... 19
Figure 57.8 – Co-ordination of a contactor and overload relay with a OCPD ..... 20
Figure 57.9 – Co-ordination between OCPD and switch ..... 21
Figure 57.10 – Co-ordination between OCPD and RCCB ..... 22
Figure 57.11 – Selectivity with OCPD and undervoltage relays ..... 24

**Tables**

Table 57.1 – Devices and associated functions ..... 9
Table 57.2 – Device co-ordination in a LV electrical installation ..... 11

This document is a preview generated by EVS

# Foreword

This document (HD 50573-5-57:2014) has been prepared by CLC/TC64 "Electrical installations and protection against electric shock".

The following dates are fixed:

| | | |
|---|---|---|
| • latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2014-12-30 |
| • latest date by which the national standards conflicting with this document have to be withdrawn | (dow) | 2016-12-30 |

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

During the design of an electrical installation, HD 60364 applies.

In an electrical installation, each device is required to comply with its relevant product standard according to Clause 133.1 of HD 60364-1:2008 and to Clause 511 of HD 60364-5-51:2009.

It is also recognized that in an electrical installation, the combination of various device shall be selected carefully so as not to impair safety. In case of a fault, the combination of several protective devices (circuit-breakers, fuses, residual current devices…) may also affect the continuity of supply of the installation if the upstream devices open, whereas the fault could be cleared by the downstream device.

This Harmonization Document is intended to bring complementary requirements to part 5 of HD 60364 for selection and erection of electrical equipment, and cover aspects of co-ordination.

This document is a preview generated by EVS

# 570 Co-ordination of electrical equipment for protection, isolation, switching and control

## 570.1 Scope

This Harmonization Document specifies the requirements for the selection and erection of electrical equipments for protection, isolation, switching and control (hereafter referred to as electrical devices and assemblies) with respect to co-ordination.

This Harmonization Document applies to electrical installations as detailed in HD 60364-1:2008, 11.1. The requirements of this document are additional to those specified in HD 60364.

This Harmonization Document is intended to provide requirements for the safety of humans, livestock and property against danger and damage which may arise in the reasonable use of electrical installations and to specify requirements for the proper functioning of those installations. The requirements also cover aspects of continuity of supply of the installation.

This part covers co-ordination in the case of a fault condition (e.g. short circuit, overload, residual currents) and also takes into consideration aspects of HD 60364-1:2008, 33.1 relevant to the co-ordination of electrical devices as follows :

- overcurrent protective device (OCPD);
- control and protective switching device (CPS);
- residual current device (RCD);
- contactor and starter;
- switch and disconnector.

NOTE 1 Co-ordination of monitoring devices is under consideration.

NOTE 2 Reference to the meaning of the acronyms used in this document may be found in Table 57.1.

This Harmonization Document does not provide requirements for the selection of an electrical device alone, but provides requirements for the selection of electrical devices to ensure electrical co-ordination between them.

## 570.2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 60269 series, *Low-voltage fuses (IEC 60269 series)*

HD 60364-1:2008*, Low-voltage electrical installations – Part 1: Fundamental principles, assessment of general characteristics, definitions (IEC 60364-1:2005, mod.)*

HD 60364-4-43:2010*, Low-voltage electrical installations – Part 4-43: Protection for safety – Protection against overcurrent (IEC 60364-4-43:2008, mod. + corrigendum Oct. 2008)*

HD 60364-5-51:2009*, Electrical installations of buildings – Part 5-51: Selection and erection of electrical equipment – Common rules (IEC 60364-5-51:2005, mod.)*

EN 60669-2-2*, Switches for household and similar fixed electrical installations – Part 2-2: particular requirements – Electromagnetic remote-control switches (RCS) (IEC 60069-2-2)*

EN 60669-2-4*, Switches for household and similar fixed electrical installations – Part 2-4: particular requirements – Isolating switches (IEC 60669-2-4)*

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

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

This document is a preview generated by EVS

EN 60947-3, *Low-voltage switchgear and controlgear – Part 3: switches, disconnectors, switch-disconnectors and fuse-combination units (IEC 60947-3)*

EN 60947-4-1, *Low-voltage switchgear and controlgear – Part 4-1: Contactors and motor-starters – Electromechanical contactors and motor starters (IEC 60947-4-1)*

EN 60947-6-1, *Low-voltage switchgear and controlgear – Part 6-1: multiple function equipment – Transfer Switching Equipment (IEC 60947-6-1)*

EN 60947-6-2, *Low-voltage switchgear and controlgear – Part 6-2: multiple function equipment – Control and protective switching devices (or equipment) (CPS) (IEC 60947-6-2)*

EN 60898-1, *Electrical accessories – Circuit breakers for overcurrent protection for household and similar installations – Part 1: Circuit-breakers for a.c. operation (IEC 60898-1)*

EN 60898-2, *Electrical accessories – Circuit-breakers for overcurrent protection for household and similar installations – Part 2: Circuit-breakers for a.c. and d.c. operation (IEC 60898-2)*

EN 61008-2-1, *Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCB's) – Part 2-1: applicability of the general rules to rccb'S functionally independent of line (IEC 61008-2-1)*

EN 61009-2-1, *Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBO's) – Part 2-1: applicability of the general rules to rcbo'S functionally independent of line the voltage (IEC 61009-2-1)*

EN 61095, *Electromechanical contactors for household and similar purposes (IEC 61095)*

EN 62423, *Type B residual current operated circuit-breakers with and without integral overcurrent protection for household and similar uses (Type B RCCBs and Type B RCBOs) (IEC 62423)*

## 570.3 Terms and definitions

For the purpose of this document, the following terms and definitions apply.

**570.3.1**
**co-ordination of electrical equipment**
correct way of selecting electrical devices in series to ensure safety and continuity of service of the installation taking into account short-circuit protection and/or overload protection and/or selectivity

**570.3.2**
**safety of electrical installation**
safety of human, livestock and property against danger and damage which may arise in the reasonable use of electrical installations and which is covered by measures for:

- protection against electric shock;
- protection against thermal effects;
- protection against overcurrent;
- protection against fault currents;
- protection against voltage disturbances and measures against o electromagnetic influences;
- protection against power supply interruption where danger or damage is expected

Note 1 to entry: Continuity of supply may be necessary for certain circuits (e.g. circuits in medical locations, circuits supplying emergency systems).

**570.3.3**
**continuity of service**
quality of an installation which is expressed by the extent to which the operation of an electrical system approaches the ideal state of freedom from interruption, or which the operation of electrical system minimizes supply interruption thanks to co-ordination of electrical devices

This document is a preview generated by EVS