

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Low-voltage electrical installations –  
Part 4-43: Protection for safety – Protection against overcurrent**

**Installations électriques à basse tension –  
Partie 4-43: Protection pour assurer la sécurité – Protection contre les  
surintensités**



## THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2008 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester.

If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de la CEI ou du Comité national de la CEI du pays du demandeur.

Si vous avez des questions sur le copyright de la CEI ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de la CEI de votre pays de résidence.

IEC Central Office  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland  
Email: [inmail@iec.ch](mailto:inmail@iec.ch)  
Web: [www.iec.ch](http://www.iec.ch)

### About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

### About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

- Catalogue of IEC publications: [www.iec.ch/searchpub](http://www.iec.ch/searchpub)

The IEC on-line Catalogue enables you to search by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, withdrawn and replaced publications.

- IEC Just Published: [www.iec.ch/online\\_news/justpub](http://www.iec.ch/online_news/justpub)

Stay up to date on all new IEC publications. Just Published details twice a month all new publications released. Available on-line and also by email.

- Electropedia: [www.electropedia.org](http://www.electropedia.org)

The world's leading online dictionary of electronic and electrical terms containing more than 20 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary online.

- Customer Service Centre: [www.iec.ch/webstore/custserv](http://www.iec.ch/webstore/custserv)

If you wish to give us your feedback on this publication or need further assistance, please visit the Customer Service Centre FAQ or contact us:

Email: [csc@iec.ch](mailto:csc@iec.ch)  
Tel.: +41 22 919 02 11  
Fax: +41 22 919 03 00

### A propos de la CEI

La Commission Electrotechnique internationale (CEI) est la première organisation mondiale qui élabore et publie des normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

### A propos des publications CEI

Le contenu technique des publications de la CEI est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

- Catalogue des publications de la CEI: [www.iec.ch/searchpub/cur\\_fut-f.htm](http://www.iec.ch/searchpub/cur_fut-f.htm)

Le Catalogue en-ligne de la CEI vous permet d'effectuer des recherches en utilisant différents critères (numéro de référence, texte, comité d'études,...). Il donne aussi des informations sur les projets et les publications retirées ou remplacées.

- Just Published CEI: [www.iec.ch/online\\_news/justpub](http://www.iec.ch/online_news/justpub)

Restez informé sur les nouvelles publications de la CEI. Just Published détaille deux fois par mois les nouvelles publications parues. Disponible en-ligne et aussi par email.

- Electropedia: [www.electropedia.org](http://www.electropedia.org)

Le premier dictionnaire en ligne au monde de termes électroniques et électriques. Il contient plus de 20 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans les langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International en ligne.

- Service Clients: [www.iec.ch/webstore/custserv/custserv\\_entry-f.htm](http://www.iec.ch/webstore/custserv/custserv_entry-f.htm)

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions, visitez le FAQ du Service clients ou contactez-nous:

Email: [csc@iec.ch](mailto:csc@iec.ch)  
Tél.: +41 22 919 02 11  
Fax: +41 22 919 03 00



IEC 60364-4-43

Edition 3.0 2008-08

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Low-voltage electrical installations –  
Part 4-43: Protection for safety – Protection against overcurrent**

**Installations électriques à basse tension –  
Partie 4-43: Protection pour assurer la sécurité – Protection contre les  
surintensités**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

PRICE CODE  
CODE PRIX



ICS 29.120.50; 91.140.50

ISBN 2-8318- 8318-9922-2

## CONTENTS

FOREWORD.....	4
43 Protection against overcurrent .....	6
430.1 Scope .....	6
430.2 Normative references .....	6
430.3 General requirements .....	7
431 Requirements according to the nature of the circuits.....	7
431.1 Protection of line conductors .....	7
431.2 Protection of the neutral conductor .....	7
431.3 Disconnection and reconnection of the neutral conductor in multi-phase systems .....	8
432 Nature of protective devices .....	8
432.1 Devices providing protection against both overload current and short-circuit current.....	8
432.2 Devices ensuring protection against overload current only.....	9
432.3 Devices ensuring protection against short-circuit current only.....	9
432.4 Characteristics of protective devices.....	9
433 Protection against overload current .....	9
433.1 Coordination between conductors and overload protective devices .....	9
433.2 Position of devices for overload protection.....	10
433.3 Omission of devices for protection against overload .....	10
433.4 Overload protection of conductors in parallel .....	11
434 Protection against short-circuit currents.....	12
434.1 Determination of prospective short-circuit currents .....	12
434.2 Position of devices for short-circuit protection.....	12
434.3 Omission of devices for protection against short-circuit .....	12
434.4 Short-circuit protection of conductors in parallel .....	13
434.5 Characteristics of short-circuit protective devices .....	13
435 Coordination of overload and short-circuit protection .....	15
435.1 Protection afforded by one device.....	15
435.2 Protection afforded by separate devices .....	15
436 Limitation of overcurrent by characteristics of supply .....	15
Annex A (informative) Protection of conductors in parallel against overcurrent.....	16
Annex B (informative) Conditions 1 and 2 of 433.1.....	21
Annex C (informative) Position or omission of devices for overload protection .....	22
Annex D (informative) Position or omission of devices for short-circuit protection .....	25
Annex E (informative) List of notes concerning certain countries.....	28
Bibliography.....	30
Figure A.1 – Circuit in which an overload protective device is provided for each of the m conductors in parallel.....	18
Figure A.2 – Circuit in which a single overload protective device is provided for the m conductors in parallel.....	18

Figure A.3 – Current flow at the beginning of the fault.....	19
Figure A.4 – Current flow after operation of the protective device cs.....	19
Figure A.5 – Illustration of linked protective device .....	20
Figure B.1 – Illustration of conditions 1 and 2 of 433.1 .....	21
Figure C.1 – Overload protective device ( $P_2$ ) NOT at the origin of branch circuit (B) (refer to 433.2.2a)).....	22
Figure C.2 – Overload protective device ( $P_2$ ) installed within 3 m of the origin of the branch circuit (B) (refer to 433.2.2b)) .....	23
Figure C.3 – Illustration of cases where overload protection may be omitted (refer to 433.3.1a), b) and d)).....	23
Figure C.4 – Illustration of cases where overload protection may be omitted in an IT system .....	24
Figure D.1 – Limited change of position of short-circuit protective device ( $P_2$ ) on a branch circuit (refer to 434.2.1).....	25
Figure D.2 – Short-circuit protective device $P_2$ installed at a point on the supply side of the origin of a branch circuit (refer to 434.2.2) .....	26
Figure D.3 – Situation where the short-circuit protective device may be omitted for some applications (refer to 434.3).....	27
Table 43A – Values of $k$ for conductors.....	14

Witholded

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## LOW-VOLTAGE ELECTRICAL INSTALLATIONS –

**Part 4-43: Protection for safety –  
Protection against overcurrent**

## 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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 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 60364-4-43 has been prepared by IEC technical committee 64: Electrical installations and protection against electric shock.

This third edition cancels and replaces the second edition, published in 2001, and constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

- Annex B "IEC 60364 – Parts 1 to 6: Restructuring" deleted.
- Introduction of new informative Annexes B, C and D.
- Information concerning flexible cables added to Scope.
- The word "phase" changed to "line" throughout the standard.
- Requirement not to distribute the neutral in IT systems changed to a NOTE.
- Requirements added for overload detection for the neutral conductor for harmonic currents.

- Requirement that devices for protection against short-circuit current be capable of making as well as breaking short-circuit current added.
- Information added to clarify protection against overload current.
- Requirements where devices for protection against overload need not be provided expanded.
- More examples given where omission of devices for protection against overload is permitted.
- Requirements where devices for protection against short-circuit need not be provided expanded.
- Requirements for short-circuit current ratings of busbar trunking systems added.

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

FDIS	Report on voting
64/1641/FDIS	64/1656/RVD

Full information on the voting for the approval of this 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.

The reader's attention is drawn to the fact that Annex E lists all of the "in-some-country" clauses on differing practices of a less permanent nature relating to the subject of this standard.

A list of all parts in the IEC 60364 series, under the general title *Low-voltage electrical installations*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

The committee has decided that the contents of this 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.

The contents of the corrigendum of October 2008 have been included in this copy.