IEC 62606

Edition 1.2 2022-11
CONSOLIDATED VERSION

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

General requirements for arc fault detection and protection devices (AFDDs)

Exigences générales des dispositifs pour la détection de défaut d'arcs (DPDA) et des dispositifs de protection

IEC 62606:2013-02+AMD1:2017-02+AMD2:2022-11 CSV(en-fr)

IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
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 corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, …). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch
Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

A propos de l'IEC
La Commission Electrotechnique Internationale (IEC) 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 IEC
Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou un amendement peut avoir été publié.

Recherche de publications IEC - webstore.iec.ch/advsearchform
La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, …). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished
Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc
Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch
Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

Electropedia - www.electropedia.org
Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 300 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 19 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

IEC 62606

Edition 1.2 2022-11
CONSOLIDATED VERSION

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

General requirements for arc fault detection and protection devices (AFDDs)

Exigences générales des dispositifs pour la détection de défaut d'arcs (DPDA) et des dispositifs de protection

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 29.120.01; 29.120.50

ISBN 978-2-8322-6105-7

IEC 62606

Edition 1.2 2022-11
CONSOLIDATED VERSION

REDLINE VERSION

VERSION REDLINE

colour inside

General requirements for arc fault detection and protection devices (AFDDs)

Exigences générales des dispositifs pour la détection de défaut d'arcs (DPDA) et des dispositifs de protection

IEC 62606:2013-07+AMD1:2017-02+AMD2:2022-11 CSV(en-fr)

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

GENERAL REQUIREMENTS FOR ARC FAULT DETECTION AND PROTECTION DEVICES (AFDDs)

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 itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
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.

This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 62606 edition 1.2 contains the first edition (2013-07) [documents 23E/785/FDIS and 23E/797/RVD] and its corrigendum 1 (2013-11), its amendment 1 (2017-02) [documents 23E/993/FDIS and 23E/1003/RVD] and its amendment 2 (2022-11) [documents 23E/1267/FDIS and 23E/1304/RVD].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendments 1 and 2. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 62606 has been prepared by subcommittee 23E: Circuit-breakers and similar equipment for household use, of IEC technical committee 23: Electrical accessories.

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

In this standard, the following print types are used:

- *compliance statements: in italic type.*

The committee has decided that the contents of the base publication and its amendments will remain unchanged until the stability date indicated on the IEC web site under 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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication 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

This International Standard aims to provide necessary requirements and testing procedures for devices to be installed by skilled people in households and similar uses to mitigate the risk of igniting an electrical fire downstream of the device.

Residual Current Devices (RCDs) are recognised as efficient to reduce the risk of fire by detection of leakage current and arcing to ground as a consequence of tracking currents within an electrical installation. However, RCDs as fuses or circuit-breakers are not able to reduce the risk of electrical fire due to series or parallel arcing between live conductors.

During a series arc fault, there is no leakage to ground therefore RCDs cannot detect such a fault. Moreover, the impedance of the series arc fault reduces the load current, which will keep the current below the tripping threshold of the circuit-breaker and the fuse. In the case of a parallel arc between phase and neutral conductor, the current is only limited by the impedance of the installation. In the worst cases of sporadic arcs, the conventional circuit breakers were not designed for that purpose.

Experience and information available confirmed that the r.m.s. current value of an earth fault current caused by an arcing fault, which is able to ignite a fire, is not limited to the rated power supply frequency of 50/60 Hz, but may contain a much higher frequency spectrum that is not taken into account for the testing of RCDs.

It has been recognised that the risk of igniting a fire within an electrical installation can also be a consequence of an overvoltage due to a broken neutral in a three phase installation.

This ~~standard~~ document covers devices designed to be installed in a distribution board at the origin of one ~~or several~~ final circuit~~s~~ of a fixed installation.

GENERAL REQUIREMENTS FOR ARC FAULT DETECTION AND PROTECTION DEVICES (AFDDs)

1 Scope

This International Standard applies to arc fault detection devices (AFDDs) for household and similar uses, intended to be used in a.c. circuits, for rated voltages not exceeding 440 V a.c, with rated frequencies of 50 Hz, 60 Hz or 50/60 Hz and rated currents not exceeding 63 A.

NOTE 1 In the USA, Arc Fault Circuit Interrupters (AFCI) are considered similar to AFDDs.

An AFDD is designed by the manufacturer:

– either as a single device having opening means able to open the protected circuit in specified conditions; or

– as a single device ~~integrating~~, with arc fault detection integrated in or assembled by manufacturer to a protective device; or

– as a separate unit, according to Annex D assembled on site with a declared protective device.

The integrated protection device is either a circuit-breaker in accordance with IEC 60898-1 or an RCD in accordance with IEC 61008-1, IEC 61009-1 or IEC 62423.

These devices are intended to mitigate the risk of fire in a final circuit~~s~~ of a fixed installation due to the effect of arc fault currents that pose a risk of fire ignition under certain conditions if the arcing persists.

Protection against fire ignition due to overvoltage due to a broken neutral within a three phase installation to be included in this type of equipment as an additional option is under consideration in 9.22.

NOTE 2 Tracking current leads to arcing and therefore may ignite fire.

This International Standard applies to devices performing simultaneously the detection and discrimination of arcing current with regards to fire hazards and defines operating criteria under specified conditions for the opening of the circuit when the arcing current exceeds the limit values given in this standard.

AFDDs complying with this standard, with the exception of those with an uninterrupted neutral, are suitable for use in IT systems.

~~The maximum rated voltage is 240 V a.c. AFDDs, according to this standard, are supplied either between line and neutral or between two lines.~~

~~The maximum rated current (I_n) is 63 A a.c.~~

AFDDs energised from batteries or a circuit other than the protected circuit are not covered by this standard.

AFDDs provide isolation, they are intended to be operated by uninstructed persons and do not require maintenance.

Particular requirements may be necessary for:

– AFDDs incorporated in or intended only for association with plugs and socket-outlets or with appliance couplers for household or similar general purposes;