IEC 61204-7

Edition 2.0 2016-11

EXTENDED VERSION

colour inside

This Extended version of IEC 61204-7:2016 includes the provisions of the general rules of IEC 62477-1:2012

Low-voltage switch mode power supplies – Part 7: Safety requirements

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CONTENTS

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LOW-VOLTAGE SWITCH MODE POWER SUPPLIES –

Part 7: Safety requirements

FOREWORD

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This Extended version of IEC 61204-7:2016 includes the provisions of the general rules dealt with in IEC 62477-1:2012. Clauses and subclauses of IEC 62477-1:2012 that are applicable in IEC 61204-7:2016 have been introduced in the content in red text.

International Standard IEC 61204-7 has been prepared by subcommittee 22E: Stabilized power supplies, of IEC technical committee 22: Power electronic systems and equipment.

This second edition cancels and replaces the first edition published in 2006. This edition constitutes a complete technical revision.

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

a) use of IEC 62477-1 as reference document, instead of IEC 60950-1;

b) modification of the title by deleting the wording “DC output-“ and adding “switch mode”.

IEC 61204-7 has the status of a product standard.

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

FDIS	Report on voting
22E/175/FDIS	22E/177/RVD

Full information on the voting for the approval of this document 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.

A list of all parts in the IEC 61204 series, published under the general title *Low-voltage power supplies, d.c. output*, 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.

This International Standard is to be read in conjunction with IEC 62477-1:2012.

NOTE A consolidated version is under consideration.

Subclauses that are numbered starting from 100 are additional to those in IEC 62477-1:2012.

Additional tables and figures in this document are numbered starting from 100.

New annexes in this document are lettered AA, AB, AC, etc.

The wordings ***SMPS*** and "power supply" are considered to be identical throughout this document.

References of the reference document to clauses or tables, which have been modified in this document, shall be read as reference to the relevant clauses or tables of this document.

Refer to 3.100 for further information on how to read this document.

In this document, the following print types are used:

– Requirements proper and normative annexes: in roman type.

– Notes and other informative matter: in smaller roman type.

– Normative conditions within tables: in smaller roman type.

– Terms that are defined in clause 3 or IEC 62477-1:2012: ***Bold Italic***.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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.

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INTRODUCTION

IEC 62477-1:2012, used by this document as a reference, relates to products that include power electronic converters, with a rated system voltage not exceeding 1 000 V AC or 1 500 V DC. It specifies requirements to reduce risks of fire, electric shock, thermal, energy and mechanical hazards, except functional safety as defined in IEC 61508 (all parts). The objectives of this standard are to establish a common terminology and basis for the safety requirements of products that contain power electronic converters across several IEC technical committees.

IEC 62477-1:2012 was developed with the intention

– to be used as a reference document for product committees inside IEC technical committee 22: Power electronic systems and equipment in the development of product standards for power electronic converter systems and equipment,

– to replace IEC 62103 as a product family standard providing minimum requirements for safety aspects of power electronic converter systems and equipment in apparatus for which no product standard exists, and

NOTE The scope of IEC 62103 contains reliability aspects, which are not covered by this document.

– to be used as a reference document for product committees outside TC 22 in the development of product standards of power electronic converter systems and equipment intended for renewable energy sources. TC 82, TC 88, TC 105 and TC 114, in particular, have been identified as relevant technical committees at the time of publication.

As such, IEC technical sub-committee 22E: Stabilized switched-mode power supplies carefully considered the relevance of each paragraph of IEC 62477-1:2012 for the SMPS and referenced, added, replaced or modified requirements as relevant. This is because product-specific topics not covered by the reference document are the responsibility of the technical committee using the reference document.

The reference document, being a group safety standard, will not take precedence over this product-specific standard according to IEC Guide 104. IEC Guide 104 provides information about the responsibility of product committees to use group safety standards for the development of their own product standards.

LOW-VOLTAGE SWITCH MODE POWER SUPPLIES –

Part 7: Safety requirements

0 Principles of safety

Safety principles of this document follow the concepts of IEC Guide 116 and Annex D of CENELEC Guide 32:2014.

NOTE The principles of safety are mainly adopted from IEC 60950-1:2005/AMD1:2009/AMD2:2013.

0.1 General

The following principles have been adopted by IEC technical committee 22E in the development of this document. These principles do not cover performance or functional characteristics of equipment.

It is essential that designers understand the underlying principles of safety requirements in order that they can engineer safe equipment.

These principles are not an alternative to the detailed requirements of this document, but are intended to provide designers with an appreciation of the basis of these requirements. Where the equipment involves technologies, components and materials or methods of construction not specifically covered, the design of the equipment should provide a level of safety not less than that described in these principles of safety.

NOTE The need for additional detailed requirements to cope with a new situation is brought promptly to the attention of the appropriate committee.

Designers will take into account not only normal operating conditions of the equipment but also likely fault conditions, consequential faults, foreseeable misuse and external influences such as temperature, altitude, pollution, moisture, overvoltages on the ***mains supply*** and ***non-mains supply***.

Dimensioning of insulation spacings should take account of possible reductions by manufacturing tolerances, or where deformation could occur due to handling, shock and vibration likely to be encountered during manufacture, transport and normal operation.

The following priorities should be observed in determining what design measures to adopt:

– where possible, specify design criteria that will eliminate, reduce or guard against hazards;
– where the above is not practicable because the functioning of the equipment would be impaired, specify the use of protective means independent of the equipment, such as personal protective equipment (which is not specified in this document);
– where neither of the above measures is practicable, or in addition to those measures, specify the provision of markings and instructions regarding the residual risks.

There are two types of persons whose safety needs to be considered, ***operators*** (or ***users***) and ***service persons***.

Operator is the term applied to all persons other than ***service persons***. Requirements for protection should assume that ***operators*** are not trained to identify hazards, but will not intentionally create a hazardous situation. Consequently, the requirements will provide protection for cleaners and casual visitors as well as the assigned ***operators***. In general,