IEC TS 61200-101

Edition 1.0 2018-11

TECHNICAL SPECIFICATION

colour inside

Electrical installation guide – Part 101: Application guidelines on extra-low-voltage direct current electrical installations not intended to be connected to a public distribution network

IEC TS 61200-101:2018-11(en)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRICAL INSTALLATION GUIDE –

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FOREWORD

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- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 61200-101, which is a Technical Specification, has been prepared by IEC technical committee 64: Electrical installations and protection against electric shock.

The text of this Technical Specification is based on the following documents:

Draft TS	Report on voting
64/2284/DTS	64/2338/RVDTS

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

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

A list of all parts in the IEC 61200 series, published under the general title *Electrical installation guide*, 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 "http://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- withdrawn,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.

A bilingual version of this publication may be issued at a later date.

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

Many people in the world who still have no access to electricity would benefit from access to electrical power. This can now be achieved with distributed electrical sources using renewable energy.

Many of these electrical sources using renewable energy generate direct current (e.g. photovoltaic system, wind turbines) and supply from these renewable energies is not constant: photovoltaic panels do not operate at night and wind turbines require wind for generating electrical energy. Therefore, the use of storage units becomes a necessity. Manufacturers of stationary secondary batteries have been investing a lot in these technologies and prices will soon become affordable to those people in need of access to electricity.

In addition, new technologies, such as light emitting diodes (LEDs) and/or other electronic equipment use direct current and connecting these types of current-using equipment to electricity sources using renewable energy through DC electrical installations is more and more realistic. For changing DC voltage, DC/DC converters are available.

All requirements and recommendations in this document comply with IEC 60364 (all parts) [1][1].

The voltage is limited to 60 V DC taking into account environmental conditions and use cases.

[1] Numbers in square brackets refer to the Bibliography.

ELECTRICAL INSTALLATION GUIDE –

Part 101: Application guidelines on extra-low-voltage direct current electrical installations not intended to be connected to a public distribution network

1 Scope

This part of IEC 61200 applies to individual DC low-voltage electrical installations entirely supplied by local power sources, and not intended to be connected to a public distribution network and having a nominal voltage lower or equal to 60 V DC within the extra-low-voltage limit.

This document also applies to DC installations according to use cases TIER 2 and TIER 3 of the World Bank defined in ESMAP 008/15 Report [2].

This document does not apply to shared or collective electrical installations which are covered in IEC 61200-102 [3].

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.

IEC 60269-3, *Low-voltage fuses – Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household or similar applications) – Examples of standardized systems of fuses A to F*

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

IEC 60898-2, *Electrical accessories – Circuit-breakers for overcurrent protection for household and similar installations – Part 2: Circuit-breakers for AC and DC operation*

IEC 60898-3[2], *Electrical accessories – Circuit-breakers for overcurrent protection for household and similar installations – Part 3: Circuit-breakers for DC operation*

IEC 61558-2-6, *Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V – Part 2-6: Particular requirements and tests for safety isolating transformers and power supply units incorporating safety isolating transformers*

3 Terms and definitions

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

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2 Under preparation. Stage at the time of publication: IEC/PRVC 60898-3:2018.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
individual electrical installation
single consuming and/or producing electrical installation

3.2
collective electrical installation
set of consuming electrical installations sharing one common set of local power supplies and energy storage equipment

3.3
public distribution network
PDN
set of coordinated equipment intended to be used for the distribution of electrical energy to private electrical installations and operated by a public organization

3.4
overcurrent protective device
OCPD
device provided to interrupt an electric circuit in case the conductor current in the electric circuit exceeds a predetermined value for a specified duration

[SOURCE: IEC 60050-826:2004, 826-14-14]

4 Concept of an electrical installation

Any low-voltage electrical installation is to be considered as a set of electrical equipment having the following functions (see Figure 1):

- supply (e.g. photovoltaic systems, wind turbine, batteries);
- distribution (e.g. distribution board, wiring systems, socket-outlets);
- consumption (e.g. fans, lighting, appliances, pumps, batteries).

NOTE Batteries can be considered as a power supply and as a consuming unit (prosumer).

The installation shall be designed to meet the requirements for safety extra-low-voltage (SELV) systems.

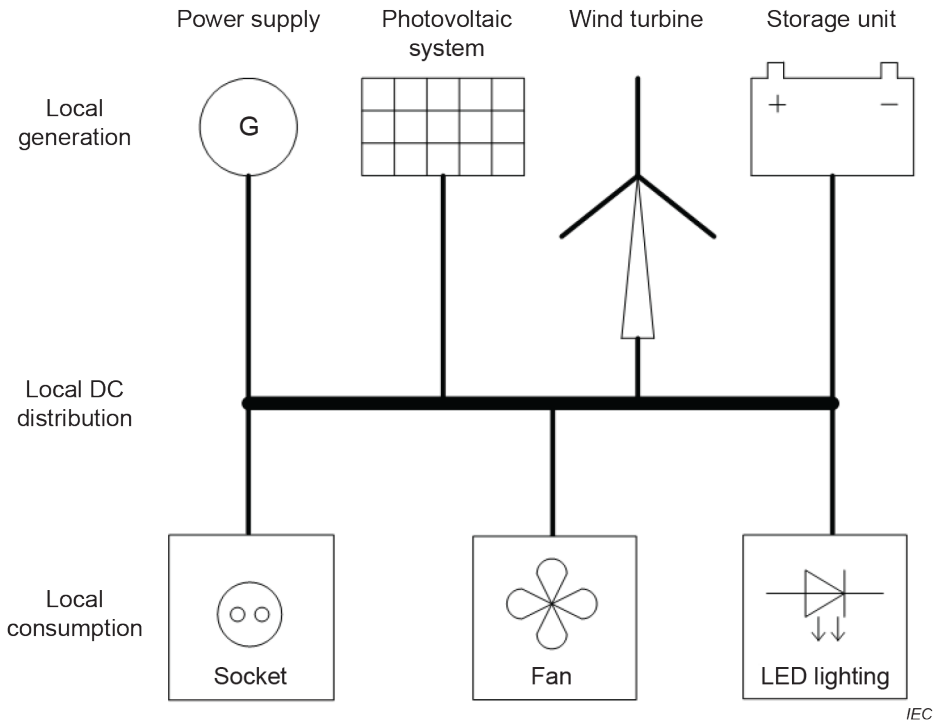

Figure 1 – Concept of a low voltage electrical installation

5 DC supplies

As the low-voltage electrical installation is not intended to be connected to a public distribution network (PDN), local power source(s) is (are) necessary. Examples of local power sources are:

- local DC generating set,
- storage units,
- photovoltaic system, and
- wind turbine.

Any combination of different types of local power sources is possible.

The output voltage of the installed sources shall meet the requirements for SELV systems.

Where power sources use renewable energy, which provides intermittent supply, storage of this energy provides flexibility and comfort to the users as consumption of the electrical energy becomes possible at almost any time.

6 Loads

6.1 Preferred nominal voltages

The selection of the rated voltage for the electrical installation has an impact on the length of cables and protective measures.

Derived from the Ohm's law, the use of ELV limits the lengths of cables as decreasing the voltage will increase the current and consequently the voltage drop along cables (see Annex A).