



ENTWURF OVE HD 60364-8-2

Ausgabe: 2021-07-15

Low-voltage electrical installations Part 8-2: Prosumer's low-voltage electrical installations (IEC 64/2489/CDV)

Hinweis:

Aufgrund von Stellungnahmen kann die endgültige Fassung dieser OVE-Norm vom vorliegenden Entwurf abweichen. Stellungnahmen (schriftlich) bis 2021-08-15 an den OVE.

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Erläuterungen zum Entwurf

Die von IEC TC 64 ausgearbeitete Internationale Norm wurde als Entwurf zu einem Europäischen Harmonisierungsdokument **HD 60364-8-2** den CENELEC-Mitgliedern zur Abstimmung vorgelegt. Im Falle eines positiven Abstimmungsergebnisses im Sinne der CENELEC-Regeln wird dieser Entwurf zu einer HD führen.

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Der OVE legt hiermit diesen Entwurf eines europäischen Normungsdokumentes der Öffentlichkeit zur Information und Stellungnahme als OVE-Entwurf vor.

Da eine Übersetzung in die deutsche Sprache zu diesem Zeitpunkt noch nicht vorhanden ist, wird – um die von CENELEC vorgegebene Einspruchsfrist einzuhalten – die englischsprachige Fassung des IEC 64/2489/CDV zur Information und Stellungnahme vorgelegt.

Interessenten können das gegenständliche Dokument beim Österreichischen Verband für Elektrotechnik beziehen bzw. in den Text Einsicht nehmen.



64/2489/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

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IEC TC 64 : ELECTRICAL INSTALLATIONS AND PROTECTION AGAINST ELECTRIC SHOCK

SECRETARIAT:

Germany

SECRETARY:

Mr Wolfgang Niedenzu

OF INTEREST TO THE FOLLOWING COMMITTEES:

TC 8, SC 8B, SC 17B, TC 22, SC 23E, SC 23K, SC 32B, TC 57, TC 59, TC 82, PC 118, TC 120, SC 121A, SC 121B

PROPOSED HORIZONTAL STANDARD:

☐

Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.

FUNCTIONS CONCERNED:

☐ EMC☐ ENVIRONMENT☐ QUALITY ASSURANCE☒ SAFETY☒ SUBMITTED FOR CENELEC PARALLEL VOTING☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING**Attention IEC-CENELEC parallel voting**

The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.

The CENELEC members are invited to vote through the CENELEC online voting system.

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

Low-voltage electrical installations - Part 8-2: Prosumer's low-voltage electrical installations

PROPOSED STABILITY DATE: 2027

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE ELECTRICAL INSTALLATIONS –

Part 8-2: Prosumer's low-voltage electrical installations

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.
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IEC 60364-8-2 ED2 has been prepared by JWG44: Prosumer's low voltage installation, between IEC technical committees TC64: Electrical installations and protection against electrical shock, TC8: System aspects of electrical energy supply and SC8B: Decentralized electrical energy systems. It is an International Standard.

This **second** edition cancels and replaces the **first** edition published 2018/10/10. This edition constitutes a technical revision.

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

- a) the vocabulary and concepts have been aligned as much as possible with TC8 and SC8B ones, taking notably into account IEC 62898 and IEC 62786 series, still respecting the installers mindset (installers being the first users of IEC 60364 series and used to only refer to IEC 60364 series);
- b) the earthing system and the change of earthing system (sequencing) when change of mode of the prosuming installation, have been clarified;

- c) the conditions of connection and disconnection from the DSO network have also been described, both on the safety point of view and the proper functioning point of view
- d) there are then several more requirements compared to IEC 60364-8-2 ED1;
- e) the figures have been updated
- f) introduction of a normative annex D on single dwelling or similar application islandable PEI
- g) the numbering has also been reviewed to follow the updated numbering system of IEC 60364 more in line with the IEC directives and compatible with the Parts 7.

The text of this International Standard is based on the following documents:

Draft	Report on voting
XX/XX/FDIS	XX/XX/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

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.

The National Committees are requested to note that for this document the stability date is 2025.

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

INTRODUCTION

Historically, utilities were managing the public transmission and distribution network from the point of view of having a central production adapted to demand variation, a top-down energy flow, a production/consumption balance done by integrated utility companies and with rather passive users.

The following key factors are pushing the distribution network to change:

- the increasing number of electronic devices used daily and the growing needs as well as future needs (for example. charging Electric Vehicles) will result in the structural growing of electricity consumption;
- the mediated pressure on climate change results in pressure on CO₂ emissions reduction;
- the electricity market is also quickly changing due mainly to its unbundling and deregulation, and to the greater number of intermittent renewable energy sources (global and local);
- users' expectations are also evolving as a result of an increasing need for better distribution networks reliability and quality, the search for better economic performance and the willingness to pro-actively manage their energy;
- technological evolution should also be considered as information and communication technology (ICT) is affordable and new energy storage solutions are emerging.

All stakeholders directly involved in the electricity generation, transmission, distribution and consumption have new expectations:

- customers are willing to reduce electrical energy costs in order to meet environment targets (renewable energy, energy efficiency) but also wish to benefit from the quality of electricity supply;
- suppliers wish to limit customer churn rate with price and service management;
- producers expect to maximize their yield of assets, to optimize their investments and to take profit from energy trading;
- the aggregator wants to create conditions suitable for new market emergence;
- the transmission system operator (TSO) aspires to a robust transmission network and to meet regulation objectives (price and level of services), while the distribution system operator (DSO) wants to meet regulation objectives (price and level of services), to reduce costs by productivity (including meter) and to have a flexible network;
- finally, governments and regulators are willing to create a competitive and sustainable energy market.

The objective of this document is to ensure that the low-voltage electrical installation is compatible with the current and future ways to deliver safely and functionally the electrical energy to current-using equipment wherever the electrical energy comes from, the DSO or local generation. This document is not intended to influence all stakeholders of electricity supply on how the electrical energy should be sold and delivered.

LOW-VOLTAGE ELECTRICAL INSTALLATIONS –

Part 8-2: Prosumer's low-voltage electrical installations

82.1 Scope

The requirements, recommendations, and guidance of this part of IEC 60364 apply to low-voltage electrical installation connected or not to a distribution network able to operate:

- with local power supplies, and/or
- with local storage units,
and that monitors and controls the energy from the local connected sources delivering it to:
- current-using equipment, and/or
- local storage units, and/or
- distribution network.

Such electrical installations are designated as Prosumer's Electrical Installations (PEI).

These requirements and recommendations apply for new installations and modification of existing installations.

This document also provides requirements and recommendations for proper behaviour and actions of PEI in order to efficiently obtain sustainable and safe operations of these installations when integrated into smart grids.

NOTE: requirements for Electrical sources for safety services are given 60364-5-56

Information related to grid interaction to ensure the stability of the electrical system for grid connected PEI are covered in annex B

This document covers the requirements related to stability of the PEI when island or stand alone.

82.2 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 60038, *IEC standard voltages*

IEC 60364 (all parts), *Low-voltage electrical installations*

IEC 60364-4-41:2005, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock*
IEC 60364-4-41/AMD1:2017

IEC 60364-4-42:2010, *Low-voltage electrical installations – Part 4-42: Protection for safety – Protection against thermal effects*

271 IEC 60364-4-43:2008, *Low-voltage electrical installations – Part 4-43: Protection for safety –*
 272 *Protection against overcurrent*

273 IEC 60364-5-53:2019, *Electrical installations of buildings - Part 5-53: Selection and erection of*
 274 *electrical equipment – Devices for protection for safety, isolation, switching and control*

275 IEC 60364-5-54:2011, *Electrical installations of buildings - Part 5-54: Selection and erection of*
 276 *electrical equipment Earthing arrangements and protective conductors*

277 IEC 60364-5-55:2011, *Electrical installations of buildings – Part 5-55: Selection and erection of*
 278 *electrical equipment – Other equipment*

279 IEC 60364-5-55:2011/AMD1:2012

280 IEC 60364-5-55:2011/AMD2:2016

281 IEC 60364-6-61, *Electrical installations of buildings – Part 6: Verification – Initial verification*

282 IEC 60364-7-712, *Low-voltage electrical installations – Part 7-712: Requirements for special*
 283 *installations or locations – Solar photovoltaic (PV) power supply systems*

284 IEC 60364-7-722, *Low-voltage electrical installations – Part 7-722: Requirements for special*
 285 *installations or locations – Supplies for electric vehicles*

286 IEC 60364-8-1:2019, *Low-voltage electrical installations – Part 8-1: Functional aspects –*
 287 *Energy efficiency*

288 IEC TS 60364-8-3, *Low-voltage electrical installation – Part 8-3: Operation of prosumer's*
 289 *electrical installations*

290 IEC 60364-5-57¹, *Low-voltage electrical installations – Part 5-57: Selection and erection of*
 291 *electrical equipment - Erection of stationary secondary batteries*

292 IEC 60947-2:2016, *Low-voltage switchgear and controlgear – Part 2: Circuit-breakers*
 293 IEC 60947-2:2016/AMD1:2019

294 IEC 61557-12:2018 *Electrical safety in low voltage distribution systems up to 1 000 V AC and*
 295 *1 500 V DC - Equipment for testing, measuring or monitoring of protective measures - Part 12:*
 296 *Power metering and monitoring devices (PMD)*

297 IEC 62423, *Type F and type B residual current operated circuit-breakers with and without*
 298 *integral overcurrent protection for household and similar uses*

299 IEC TS 62749, *Assessment of power quality – Characteristics of electricity supplied by public*
 300 *networks*

301 **82.3 Terms and definitions**

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

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

- 305 • ISO Online browsing platform: available at <http://www.iso.org/obp>
- 306 • IEC Electropedia: available at <http://www.electropedia.org/>

¹ Under preparation. Stage at time of circulation: TCDV.

82.3.1**electrical power system**

all installations and plant provided for the purpose of generating, transmitting and distributing electricity

[SOURCE: IEC 60050-601:1985, 601-01-01]

82.3.2**smart grid****intelligent grid**

electric power system that utilizes information exchange and control technologies, distributed computing and associated sensors and actuators, for purposes such as:

- to integrate the behavior and actions of the network users and other stakeholders,
- to efficiently deliver sustainable, economic and secure electricity supplies

[SOURCE: IEC 60050-617:2009, 617-04-13]

82.3.3**distribution network**

electric power network for the distribution of electric power from and to network users for which a Distribution System Operator (DSO) is responsible

[SOURCE: IEC 62786 2017]

82.3.4**producer (of electricity)**

entity or party generating electrical energy

[SOURCE: IEC 60050-617:2009, 617-02-01]

82.3.5**consumer (of electricity)**

entity or party which uses electricity for its own needs

82.3.6**prosumer (of electricity)**

entity or part which can be both a producer and a consumer of electrical energy

82.3.7**prosumer's electrical installation****PEI**

low-voltage electrical installation connected or not to a distribution network able to operate:

- with local power supplies, and/or
 - with local storage units,
- and that monitors and controls the energy from the connected sources delivering it to:
- current-using equipment, and/or
 - local storage units, and/or
 - distribution network

82.3.8**electrical energy management system****EEMS**

system monitoring operating controlling and managing energy resources and loads of the installation

350 Note 1 to entry: EEMS can be a dedicated system or part of an integrated system, such as a home and building
351 electronic system (HBES) or Building Management System (BMS).

352 [SOURCE: IEC 60364-8-1:2019, 3.2.1, modified – Note 1 to entry has been added]

353 **82.3.9**

354 **operating mode**

355 operation of an installation with respect to the different sources of electrical energy and to
356 energy flow

357 **82.3.10**

358 **direct feeding mode**

359 operating mode in which the distribution network supplies the PEI

360 Note 1 to entry: Local storage units can supply current-using equipment or be charged by local power supplies
361 and/or the distribution system.

362 **82.3.11**

363 **reverse feeding mode**

364 operating mode in which the PEI supplies the distribution network

365 Note 1 to entry: Local storage units can supply current-using equipment and/or the distribution system or be
366 charged by local power supplies.

367 **82.3.12**

368 **connected mode**

369 operating mode which needs connection to the distribution network (direct feeding mode,
370 reverse feeding mode or no feeding mode i.e. without any energy exchange between PEI and
371 distribution network).

372 **82.3.13**

373 **island mode**

374 operating mode in which the PEI is disconnected from the distribution network.

375 Note 1 to entry: An island mode can be either the result of the action of automatic protections or the result of a
376 deliberate action.

377 [SOURCE: IEC 60050-617:2009, 617-04-12, modified – The definition has been adapted to the
378 PEI]

379 **82.3.14**

380 **grid connected PEI**

381 PEI intended for operating only when connected to a distribution network

382 Note 1 to entry: Non-intentional island mode shall be prevented.

383 **82.3.15**

384 **stand-alone PEI**

385 PEI permanently not connected to a distribution network

386 Note 1 to entry: A stand-alone PEI is in a permanent island mode.

387 Note 2 to entry: The word isolated is also used in some other IEC documents (IEC TS 62786:2017 for example) to
388 describe a stand-alone PEI.

389 **82.3.16**

390 **islandable PEI**

391 PEI intended for operating either being connected to a distribution network or being
392 disconnected from the distribution network

393 Note 1 to entry: An islandable PEI should be in a connected mode or an intentionally island mode.

82.3.17**point of connection****POC**

reference point where the prosumer's electrical installation is connected to the distribution network

Note 1 to entry: A PEI can have several points of connection.

Note 2 to entry: In IEC 60364 (all parts), the concept of origin of the installation is also used, origin of the installation meaning point at which energy is delivered to the electrical installation. The POC is so a specific origin of the installation, the one connected to the distribution network. Other can be the connection to the local power supply, to the storage system.

Note 3 to entry: Connection or disconnection of the prosumer electrical installation from the distribution network generally occurs at the POC.

[SOURCE: IEC 60050-617:2009, 617-04-01 modified – The definition has been adapted to the PEI]

82.3.18**load shedding**

method(s) of optimizing demand by controlling the electrical loads for variable periods of time

[SOURCE: IEC 60364-8-1:2019]

82.3.19**system referencing conductor**

The conductor connecting one live conductor of the power system to an earthing arrangement

NOTE 1 to entry: The live conductor connected is the neutral or the mid-point if existing, or a line conductor when not existing.

NOTE 2 to entry: this definition will be updated according to the future IEV

82.3.20**energy storage system****ESS**

installation able to absorb electrical energy, to store it for a certain amount of time and to release electrical energy

82.4 Integration of PEI in its environment**82.4.1 Main objectives**

Both smart grid and electrical installations interact, a dynamic power demand/response concept should be implemented.

The smart grid has an impact on the electrical installations, thus:

- the consumer shall take into consideration the constraints of the electrical power system and could adapt his needs (for example in the time) through the EEMS;
- the design and configuration of the installation shall allow load shedding (according to IEC 60364-8-1:2019) and source selection by the EEMS.

As production of energy from the renewable sources such as PV or wind turbines is intermittent, it is recommended to install storage capacity within the PEI to ensure continuity of supply in all modes without being supplied by the grid, to support stability of the PEI and/or to maximize the self-consumption in connected mode.

82.4.2 Safety

The implementation of the requirements provided in this document shall not impair the safety of the PEI, as required by other parts of the IEC 60364. In case of change from any energy supply configuration (e.g. from distribution network supply to local power supplies) all protective measures shall continue to be operational or shall be automatically replaced by other standardized protective measures providing an equivalent level of safety.

82.4.3 Proper functioning

The power quality parameters are used to demonstrate reliable operation of the PEI and should not be outside the allowed operating range for all components in the PEI.

For a non stand-alone PEI, unless otherwise specified, the power quality levels at the point of connection (POC) shall be in the same allowed range in grid-connected and island mode.

When a PEI is connected to a distribution system, it shall not cause unacceptable disturbances to the other system users.

The PEI shall operate in parallel with the distribution system without causing a voltage fluctuation at the distribution system or resulting in flicker and rapid voltage changes greater than the ranges defined in the IEC TS 62749.

NOTE: see also IEC TS 60364-8-3:2020, clause 11

82.4.4 Management of PEI

The electrical installations shall consider both the requests from the DSO and the needs expressed by the prosumer. An EEMS shall be implemented to combine information and/or data, from/to the DSO, the availability of energy by the local sources and the prosumer's needs. EEMS shall ensure the data security.

82.5 PEI concept

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

- supply (e.g. connection to public power supply, local generator, photovoltaic systems, wind turbines, energy storage system);
- distribution (e.g. distribution panel, wiring systems);
- consumption (e.g. motors, heating systems, lighting, lifts);
- energy management (e.g. load shedding equipment, monitoring device).

NOTE: an energy storage system can be considered as a generator and as a load.

The electrical distribution within the PEI can be AC, DC, or combination of both (see examples in Figure 1 and Figure 2 – Example of prosumer's low-voltage electrical installation with AC and DC electrical distribution within the PEI

), as every low voltage electrical installation covered by IEC 60364 (all parts).

An uninterruptible power supply (UPS) is not to be considered as a prosumer when the purpose of this UPS is only to supply downstream critical loads by using indifferently the energy from the distribution network or from its local dedicated battery system and not to have a reverse feeding mode to supply the distribution network and/or current-using equipment in the upstream part of the electrical installation.