

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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IEC 64/2489/CDV prHD 60364-8-2:2021

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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.

Wie alle Mitgliedsorganisationen von CENELEC ist der OVE grundsätzlich verpflichtet, Europäische Normen und Harmonisierungsdokumente in das nationale Normenwerk zu übernehmen und entgegenstehende Normen zurückzuziehen. In Österreich erfolgt die Übernahme mit Neuausgabe der OVE E 8101.

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)

	PROJECT NUMBER:	D2			
	DATE OF CIRCULATIO	NC:	CLOSING DATE FOR VOTING: 2021-09-10		
	SUPERSEDES DOCUM 64/2425/CD, 64/2	MENTS: 2484/CC	SI.		
IEC TC 64 : ELECTRICAL INSTALLATIONS	AND PROTECTION AG	AINST ELECTRIC SHO	СК		
SECRETARIAT:		SECRETARY:			
Germany		Mr Wolfgang Nie	denzu		
OF INTEREST TO THE FOLLOWING COMMI	TTEES:	PROPOSED HORIZON	NTAL STANDARD:		
TC 8,SC 8B,SC 17B,TC 22,SC 23I	E,SC 23K,SC				
32B,TC 57,TC 59,TC 82,PC 118,TC 120,SC 121A,SC 121B		Other TC/SCs are any, in this CDV to	requested to indicate their interest, if the secretary.		
	ONMENT				
SUBMITTED FOR CENELEC PARALLEI		NOT SUBMITTED	FOR CENELEC PARALLEL VOTING		
Attention IEC-CENELEC parallel vot	ing				
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 t CENELEC online voting system.	o vote through the				
This document is still under study and	subject to change.	It should not be use	d for reference purposes.		
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TITLE:					
Low-voltage electrical installation	ons - Part 8-2: Pro	osumer's low-vol	tage electrical installations		

PROPOSED STABILITY DATE: 2027

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113		INTERNATIONAL ELECTROTECHNICAL COMMISSION
114		
115 116 117		LOW-VOLTAGE ELECTRICAL INSTALLATIONS –
118		Part 8-2: Prosumer's low-voltage electrical installations
119 120		FOREWORD
121 122 123 124 125 126 127 128 129	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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153 154 155 156	IE IE T(sy	C 60364-8-2 ED2 has been prepared by JWG44: Prosumer's low voltage installation, between C technical committees TC64: Electrical installations and protection against electrical shock, C8: System aspects of electrical energy supply and SC8B: Decentralized electrical energy stems. It is an International Standard.
157 158	Th co	his second edition cancels and replaces the first edition published 2018/10/10. This edition onstitutes a technical revision.
159	T٢	nis edition includes the following significant changes with respect to the previous edition:
160 161 162 163	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);
164 165	b)	the earthing system and the change of earthing system (sequencing) when change of mode of the prosuming installation, have been clarified;

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- 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;
- 169 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.
- 174 The text of this International Standard is based on the following documents:

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

175

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

178 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

- 186 reconfirmed,
- 187 withdrawn,
- replaced by a revised edition, or
- 189 amended.
- The National Committees are requested to note that for this document the stability date is 2025.

192THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED193AT THE PUBLICATION STAGE.

194

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195

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.

- 200 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;
- 204 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;
- 217 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;
- 220 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.

232

233	LOW-VOLTAGE ELECTRICAL INSTALLATIONS –
234 235 236	Part 8-2: Prosumer's low-voltage electrical installations
237 238	
239	
240	82.1 Scope
241 242	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:
243	 with local power supplies, and/or
244	 with local storage units,
245	and that monitors and controls the energy from the local connected sources delivering it to:
246	 current-using equipment, and/or
247	 local storage units, and/or
248	- distribution network.
249	Such electrical installations are designated as Prosumer's Electrical Installations (PEI).
250 251	These requirements and recommendations apply for new installations and modification of existing installations.
252 253 254	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.
255	NOTE: requirements for Electrical sources for safety services are given 60364-5-56
256 257	Information related to grid interaction to ensure the stability of the electrical system for grid connected PEI are covered in annex B
258	This document covers the requirements related to stability of the PEI when island or stand alone.
259	82.2 Normative references
260	The following documents are referred to in the text in such a way that some or all of their content
261	constitutes requirements of this document. For dated references, only the edition cited applies.
262 263	amendments) applies.
264	IEC 60038, IEC standard voltages
265	IEC 60364 (all parts), Low-voltage electrical installations

IEC 60364-4-41:2005, Low-voltage electrical installations – Part 4-41: Protection for safety –

- 267 Protection against electric shock
- 268 IEC 60364-4-41/AMD1:2017
- 1EC 60364-4-42:2010, Low-voltage electrical installations Part 4-42: Protection for safety –
- 270 Protection against thermal effects

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- 1EC 60364-4-43:2008, Low-voltage electrical installations Part 4-43: Protection for safety 1272 Protection against overcurrent
- 1273 IEC 60364-5-53:2019, Electrical installations of buildings Part 5-53: Selection and erection of 1274 electrical equipment – Devices for protection for safety, isolation, switching and control
- 1275 IEC 60364-5-54:2011, *Electrical installations of buildings Part 5-54: Selection and erection of* 1276 *electrical equipment Earthing arrangements and protective conductors*
- 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
- 1281 IEC 60364-6-61, Electrical installations of buildings Part 6: Verification Initial verification
- 182 IEC 60364-7-712, Low-voltage electrical installations Part 7-712: Requirements for special 183 installations or locations – Solar photovoltaic (PV) power supply systems
- 184 IEC 60364-7-722, Low-voltage electrical installations Part 7-722: Requirements for special 185 installations or locations – Supplies for electric vehicles
- 1EC 60364-8-1:2019, Low-voltage electrical installations Part 8-1: Functional aspects 287 Energy efficiency
- 188 IEC TS 60364-8-3, Low-voltage electrical installation Part 8-3: Operation of prosumer's electrical installations
- IEC 60364-5-57¹, Low-voltage electrical installations Part 5-57: Selection and erection of electrical equipment Erection of stationary secondary batteries
- IEC 60947-2:2016, Low-voltage switchgear and controlgear Part 2: Circuit-breakers
 IEC 60947-2:2016/AMD1:2019
- IEC 61557-12:2018 Electrical safety in low voltage distribution systems up to 1 000 V AC and
 1 500 V DC Equipment for testing, measuring or monitoring of protective measures Part 12:
 Power metering and monitoring devices (PMD)
- 1297 IEC 62423, Type **F** and type **B** residual current operated circuit-breakers with and without 1298 integral overcurrent protection for household and similar uses
- IEC TS 62749, Assessment of power quality Characteristics of electricity supplied by public
 networks
- 301 82.3 Terms and definitions
- 302 For the purposes of this document, the following terms and definitions apply.
- ISO and IEC maintain terminological databases for use in standardization at the followingaddresses:
- ISO Online browsing platform: available at http://www.iso.org/obp
- IEC Electropedia: available at http://www.electropedia.org/

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

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- 307 **82.3.1**
- 308 electrical power system
- all installations and plant provided for the purpose of generating, transmitting and distributing
 electricity
- 311 [SOURCE: IEC 60050-601:1985, 601-01-01]
- 312 **82.3.2**
- 313 smart grid
- 314 intelligent grid
- electric power system that utilizes information exchange and control technologies, distributed computing and associated sensors and actuators, for purposes such as:
- 317 to integrate the behavior and actions of the network users and other stakeholders,
- 318 to efficiently deliver sustainable, economic and secure electricity supplies
- 319 [SOURCE: IEC 60050-617:2009, 617-04-13]
- 320 **82.3.3**

321 distribution network

- electric power network for the distribution of electric power from and to network users for whicha Distribution System Operator (DSO) is responsible
- 324 [SOURCE: IEC 62786 2017]
- 325 **82.3.4**
- 326 producer (of electricity)
- 327 entity or party generating electrical energ
- 328 [SOURCE: IEC 60050-617:2009, 617-02-01]
- 329 **82.3.5**

330 consumer (of electricity)

- antity or party which uses electricity for its own needs
- 332 **82.3.6**
- 333 prosumer (of electricity)
- entity or part which can be both a producer and a consumer of electrical energy
- 335 **82.3.7**

PEI

336 prosumer's electrical installation

- 337
- low-voltage electrical installation connected or not to a distribution network able to operate:
- 339 with local power supplies, and/or
- 340 with local storage units,
- and that monitors and controls the energy from the connected sources delivering it to:
- 342 current-using equipment, and/or
- 343 local storage units, and/or
- 344 distribution network
- 345 **82.3.8**
- 346 electrical energy management system
- 347 EEMS
- 348 system monitoring operating controlling and managing energy resources and loads of the 349 installation

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- Note 1 to entry: EEMS can be a dedicated system or part of an integrated system, such as a home and building
 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

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

357 **82.3.10**

358 direct feeding mode

- 359 operating mode in which the distribution network supplies the PEI
- Note 1 to entry: Local storage units can supply current-using equipment or be charged by local power supplies
 and/or the distribution system.

362 **82.3.11**

363 reverse feeding mode

364 operating mode in which the PEI supplies the distribution network

365Note 1 to entry: Local storage units can supply current-using equipment and/or the distribution system or be366charged by local power supplies.

367 **82.3.12**

368 connected mode

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

372 **82.3.13**

373 island mode

- operating mode in which the PEI is disconnected from the distribution network.
- Note 1 to entry: An island mode can be either the result of the action of automatic protections or the result of a
 deliberate action.
- [SOURCE: IEC 60050-617:2009, 617-04-12, modified The definition has been adapted to the
 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.
- Note 2 to entry: The word isolated is also used in some other IEC documents (IEC TS 62786:2017 for example) to
 describe a stand-alone PEI.

389 **82.3.16**

390 islandable PEI

- PEI intended for operating either being connected to a distribution network or being
 disconnected from the distribution network
- 393 Note 1 to entry: An islandable PEI should be in a connected mode or an intentionally island mode.

394 **82.3.17**

395 **point of connection**

396 **POC**

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

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

400 Note 2 to entry: In IEC 60364 (all parts), the concept of origin of the installation is also used, origin of the installation 401 meaning point at which energy is delivered to the electrical installation. The POC is so a specific origin of the 402 installation, the one connected to the distribution network. Other can be the connection to the local power supply, to 403 the storage system.

- 404 Note 3 to entry: Connection or disconnection of the prosumer electrical installation from the distribution network
 405 generally occurs at the POC.
- IEC 60050-617:2009, 617-04-01 modified The definition has been adapted to the
 PEI]

408 **82.3.18**

409 load shedding

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

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

412 **82.3.19**

413 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.
- 417 NOTE 2 to entry: this definition will be updated according to the future IEV

418 **82.3.20**

419 energy storage system

420 **ESS**

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

423 82.4 Integration of PEI in its environment

424 82.4.1 Main objectives

- Both smart grid and electrical installations interact, a dynamic power demand/response concept
 should be implemented.
- 427 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.

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436 **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.

442 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.

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

453 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.

458 **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):

- 461 supply (e.g. connection to public power supply, local generator, photovoltaic systems, wind
 462 turbines, energy storage system);
- 463 distribution (e.g. distribution panel, wiring systems);
- 464 consumption (e.g. motors, heating systems, lighting, lifts);
- 465 energy management (e.g. load shedding equipment, monitoring device).
- 466 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

470), 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.