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**oSIST prEN 62909-2:2018**  
**01-april-2018**

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**Dvosmerni omrežni elektroenergetski pretvorniki - 2. del: Vmesnik GCPC in porazdeljeni energijski viri ter dodatne zahteve za 1. del**

Bi-directional grid connected power converters - Part 2: Interface of GCPC and distributed energy resources and additional requirements to Part 1

iTeh STANDARD PREVIEW  
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SIST EN IEC 62909-2:2019

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Usmerniki. Pretvorniki.  
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TITLE:

**Bi-directional grid connected power converters - Part 2: Interface of GPCP and distributed energy resources and additional requirements to Part 1**

PROPOSED STABILITY DATE: 2023

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## BI-DIRECTIONAL GRID CONNECTED POWER CONVERTERS

## Part 2: interface of GCPC and distributed energy resources and additional requirements to Part 1

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International Standard IEC 62909-2 has been prepared by subcommittee 22E: Stabilized power supplies, of IEC technical committee 22: Power electronic systems and equipment.

IEC 62909 consists of the following parts, under the general title Bi-directional grid connected power converters

--- Part 1: General requirements

--- Part 2: interface of GCPC and distributed energy resources and additional requirements to Part 1

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

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

105 Full information on the voting for the approval of this International Standard can be found in  
106 the report on voting indicated in the above table.

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

108 The committee has decided that the contents of this document will remain unchanged until the  
109 stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to  
110 the specific document. At this date, the document will be

- 111 • reconfirmed,
- 112 • withdrawn,
- 113 • replaced by a revised edition, or
- 114 • amended.

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## INTRODUCTION

In order to optimize power consumption within the nano-grid of a home, it is necessary to optimally combine electricity generation with rechargeable energy storage. This optimization is accomplished, in part, by providing an efficient transfer between d.c. and a.c. electricity to accommodate storage batteries. IEC 62909 standards describe a bi-directional grid-connected power converter (GCPC) which efficiently integrates sources of power generation with energy storage.

IEC 62909-1 defines common general requirements, independent from the special characteristics of individual applications. IEC 62909-2 defines the additional requirements necessary for interfacing particular types of distributed energy resources to a GCPC.

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## BI- DIRECTIONAL GRID CONNECTED POWER CONVERTERS –

### Part 2: interface of GCPC and distributed energy resources and additional requirements to Part 1

#### 1 Scope

This document specifies GCPC interface requirements for particular distributed energy resources, including electric vehicle (EV), battery, and photovoltaic (PV) systems. These requirements are in addition to the general requirements found in IEC 62909-1.

#### 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 62909-1:2017, *Bi-directional grid-connected power converters – Part 1: General requirements*

IEC 62109-1:2010, *Safety of power converters for use in photovoltaic power systems – Part 1: General requirements*

IEC 61851-1:2017, *Electric vehicle conductive charging system - Part 1: General requirements*

IEC 61851-23:2014, *Electric vehicle conductive charging system - Part 23: DC electric vehicle charging station*

IEC 61982:2012, *Secondary batteries (except lithium) for the propulsion of electric road vehicles - Performance and endurance tests*

IEC 60364-7-722:2015, *Low-voltage electrical installations - Part 7-722: Requirements for special installations or locations - Supplies for electric vehicles*

IEC 62619: 2017, *Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications*

#### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply, as well as the terms and definitions described in IEC 62909-1.

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>

Table 1 provides an alphabetical cross-reference listing of terms.



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**Table 1 – Alphabetical list of terms**

Term	Term number	Term	Term number	Term	Term number
arc fault detector AFD	3.101	dedicated auxiliary power port	3.113	photovoltaic PV	3.124
arc fault interrupter AFI	3.102	earth fault	3.114	PV DC-port interface	3.125
battery management system BMS	3.103	electric vehicle EV	3.115	PV section	3.126
battery system BS	3.104	EV DC/DC converter	3.116	shutdown sequence	3.127
battery system section	3.105	EV DC-port interface	3.117		
BS DC-port interface	3.106	EV section	3.118		
charge/discharge switch	3.107	fault status signal	3.119		
charging connector	3.108	GCPC	3.120		
DC-connection interface	3.109	GCPC fault detection circuit	3.121		
DC/DC converter	3.110	grid-independent operation	3.122		
DC-port interface	3.111	isolated dc/dc converter	3.123		
dedicated auxiliary power port	3.112				

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177 **3.101**  
 178 **arc fault detector**  
 179 **AFD**

180 device or group of devices to detect arcs

181 Note: This definition is equivalent to the definition in the future IEC 63027.

182 **3.102**  
 183 **arc fault interrupter**  
 184 **AFI**

185 device able to interrupt arc faults triggered by an AFD

186 Note: This definition is equivalent to the definition in the future IEC 63027.

187 **3.103**  
 188 **battery management system**  
 189 **BMS**

190 electronic system associated with a battery which has functions to cut off or disconnect it in  
 191 case of overcharge, overcurrent, overdischarge, and overheating

192 Note 1 to entry: The BMS monitors and/or manages the battery's state, calculates secondary data, reports that  
 193 data and/or controls the battery's environment to influence its safety, performance and/or service life.

194 Note 2 to entry: Cut-off or disconnection due to overdischarge is not mandatory if there is an agreement between  
 195 the cell manufacturer and the GCPC manufacturer.

196 Note 3 to entry: The function of the BMS can be assigned to the battery pack or to equipment that uses the battery.  
 197 Note 4 to entry: The BMS can be divided and it can be found partially in the battery pack and partially on the  
 198 equipment that uses the battery.

199 Note 5 to entry: The BMS is sometimes also referred to as a BMU (battery management unit)

200 [SOURCE: IEC 62619:2017, 3.12, modified – The definition, Note 1 and Note 2 have been  
 201 rephrased.]

### 202 **3.104** 203 **battery system** 204 **BS**

205 system which comprises one or more cells, modules or battery packs

206 Note 1 to entry: It has a battery management system to cut off or disconnect it in case of overcharge, overcurrent,  
 207 overdischarge, and overheating.

208 Note 2 to entry: Cut-off or disconnection due to overdischarge is not mandatory if there is an agreement between  
 209 the cell manufacturer and the GCPC manufacturer

210 Note 3 to entry: The battery system may have cooling or heating units.

211 [SOURCE: IEC 62619:2017, 3.11, modified – Note 1 and Note 2 have been rephrased.]

### 212 **3.105** 213 **BS section**

214 the part of a GCPC between the DC-connection interface and a BS DC-port interface

### 215 **3.106** 216 **BS DC-port interface**

217 DC-port interface connected to a battery system

### 218 **3.107** 219 **charge/discharge switch**

220 a component of the EV section located between the DC-connection interface and a DC/DC  
 221 converter, or between a DC/DC converter and an EV DC-port interface

### 222 **3.108** 223 **charging connector**

224 means of enabling the manual connection of a flexible cable to an EV for the purpose of  
 225 charging the traction batteries

226 [SOURCE: IEC 61851-1:2010, 3.5.12, modified – The term “vehicle coupler” has been  
 227 replaced by “charging connector”.]

### 228 **3.109** 229 **DC-connection interface**

230 internal system DC bus between the DC/DC converters and the bi-directional inverter

231 [SOURCE: IEC 62909-1:2017, 3.4]

### 232 **3.110** 233 **DC/DC converter**

234 equipment that converts one DC voltage to another DC voltage

235 [SOURCE: IEC 62909-1:2017, 3.6]

### 236 **3.111** 237 **DC-port interface**

238 interface between the DC/DC converter and distributed energy resources or, in the case  
 239 where the DC-connection interface is directly connected to distributed energy resources  
 240 without the DC/DC converter, between the DC-connection interface and the distributed energy  
 241 resources

242 [SOURCE: IEC 62909-1:2017, 3.5]

**3.112****dedicated auxiliary power port**

a special port to supply auxiliary power

**3.113****distributed energy resources**

DC power sources generating and/or storing electricity near the consuming area

[SOURCE: IEC 62909-1:2017, 3.9]

**3.114****earth fault**

occurrence of an accidental conductive path between a live conductor and the Earth

[SOURCE: IEC 60050-826:2004, 826.14.13 and IEC 195-04-14]

**3.115****electric vehicle****EV**

any vehicle propelled by an electric motor drawing current from a rechargeable storage battery or from other portable energy storage devices (rechargeable, using energy from a source off the vehicle such as a residential or public electric service), which is manufactured primarily for use on public streets, roads or highways

[SOURCE: IEC 60364-7-722:2015, 722.3.1]

**3.116****EV DC/DC converter**

a component of the EV section that converts one DC voltage to another DC voltage

**3.117****EV DC-port interface**

DC-port interface connected to an EV

**3.118****EV section**

the part of a GCPC between the DC-connection interface and an EV DC-port interface

**3.119****fault status signal**

signal indicating that failures are present which could cause a hazard covered by this standard

**3.120****bi-directional grid-connected power converter****grid-connected power converter****GCPC**

power converter connected to the grid by the bi-directional inverter with multiple DC-port interfaces

[SOURCE: IEC 62909-1:2017, 3.19]

**3.121****GCPC fault detection circuit**

the circuit that detects functional faults in a GCPC