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01-julij-2024

Sistem menjave baterij v električnih vozilih - 1. del: Splošno in smernice

Electric vehicle battery swap system - Part 1: General and guidance

iTeh Standards

Ta slovenski standard je istoveten z: **prEN IEC 62840-1:2024**

Document Preview

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43.120 Električna cestna vozila Electric road vehicles

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69/951/CDV

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IEC TC 69 : ELECTRICAL POWER/ENERGY TRANSFER SYSTEMS FOR ELECTRICALLY PROPELLED ROAD VEHICLES AND INDUSTRIAL TRUCKS

SECRETARIAT:

Belgium

SECRETARY:

Mr Peter Van den Bossche

OF INTEREST TO THE FOLLOWING COMMITTEES:

SC 23H, TC 64

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**

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

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TITLE:

Electric vehicle battery swap system - Part 1: General and guidance

PROPOSED STABILITY DATE: 2027

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112 INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRIC VEHICLE BATTERY SWAP SYSTEM –

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Part 1: General and guidance

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FOREWORD

120 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization
121 comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to
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155 exceptional circumstances, a technical committee may propose the publication of a
156 Technical Specification when

- 157 • the required support cannot be obtained for the publication of an International Standard,
158 despite repeated efforts, or

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

161 IEC 62840-1, which is an International Standards, has been prepared by IEC technical
162 committee 69: Electrical power/energy transfer systems for electrically propelled road
163 vehicles and industrial trucks.

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

165 A list of all parts in the IEC 62840 series, published under the general title *Electric vehicle*
166 *battery swap system*, can be found on the IEC website.

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

170 • reconfirmed,

171 • withdrawn,

172 • replaced by a revised edition, or

173 • amended.

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

175

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.

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INTRODUCTION

178 The purpose of the battery swap system is to provide energy partly or in total to electric
179 road vehicles (EVs) through fast replacement of their swappable battery system (SBS) or
180 removable battery system (RBS). The battery swap system aims to provide energy to
181 electric road vehicles (EVs) by quickly replacing their swappable battery system (SBS) or
182 removable battery system (RBS). This may help alleviate range anxiety and make longer
183 distance travel more convenient.

184 As there is a possibility to charge the batteries after their removal from the vehicle in various
185 ways, the impact of this process on the critical infrastructure of the electrical grid is
186 minimized.

187 Battery swap stations mainly include one or more of the following functions:

- 188 • swap of EV SBS or RBS ;
- 189 • storage of EV SBS or RBS;
- 190 • charging and cooling of EV SBS or RBS;
- 191 • testing, maintenance and safety management of EV SBS or RBS.

192 This document serves as generic requirements for battery swap systems for EVs, e-Motor
193 vehicles.

194 This document is published in separate parts according to the following structure:

- 195 – IEC 62840-1: Electric vehicle battery swap system Part 1: General and guidance;
- 196 – IEC 62840-2: Electric vehicle battery swap system Part 2: Safety requirements;
- 197 – IEC PAS 62840-3: Electric vehicle battery swap system Part 3: Particular safety and
198 interoperability requirements for battery swap systems operating with removable
199 RESS/battery systems.

200

201 IEC PAS 62840-3 derives from IEC 61851-3 all parts and was established as a
202 referencing document to IEC 61851-3-1.

203 NOTE IEC TC69 decided to publish the document as PAS based on IEC TS 61851-3-3 as an intermediate
204 specification, which responds to particular market needs according to 2.4.8 of ISO/IEC DIR 1:2020, published
205 prior to the development of a full International Standard.

206 By the upcoming revision of IEC 62840 all parts, IEC PAS 62840-3 will be fully integrated
207 into IEC 62840 series.

208 For the purposes of this document, the terms and definitions given in this document
209 apply.

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

212 – IEC Electropedia: available at <http://www.electropedia.org/>

213 ISO Online browsing platform: available at <http://www.iso.org/obp>

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ELECTRIC VEHICLE BATTERY SWAP SYSTEM –

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Part 1: General and guidance

1 Scope

219 This part of IEC 62840, which is an International Standard, gives the general overview for
220 battery swap systems, for the purposes of swapping batteries of electric road vehicles when
221 the vehicle powertrain is turned off and when the battery swap system is connected to the
222 supply network at standard supply voltages according to IEC 60038 with a rated voltage up
223 to 1 000 V AC and up to 1 500 V DC.

224 This document is applicable for battery swap systems for EV equipped with one or more:

- 225 – swappable battery system (SBS), or
- 226 – removeable battery systems(RBS) .

227 This document provides guidance for interoperability.

228 This document applies to:

- 229 • battery swap systems supplied from on-site storage systems (for example buffer
230 batteries etc);
- 231 • manual, mechanically assisted and automatic systems;
- 232 • battery swap systems intended to supply swappable/removable battery systems having
233 communication allowing to identify the battery system characteristics;
- 234 • battery swap systems intended to be installed at an altitude of up to 2000 m.

235 This document is not applicable to:

- 236 • aspects related to maintenance and service of the battery swap station (BSS);
- 237 • trolley buses, rail vehicles and vehicles designed primarily for use off-road;
- 238 • maintenance and service of EVs;
- 239 • safety requirements for mechanical equipment covered by ISO 10218 series;
- 240 • locking compartments systems providing AC socket-outlets for the use of manufacturer
241 specific voltage converter units and manufacturer specific battery systems;
- 242 • electrical devices and components which are covered by their specific product
243 standards;
- 244 • any fix-installed equipment of EV which is covered by ISO;
- 245 • EMC requirements for on-board equipment of EV while connected to the BSS.

2 Normative references

247 The following documents, in whole or in part, are normatively referenced in this document
248 and are indispensable for its application. For dated references, only the edition cited applies.
249 For undated references, the latest edition of the referenced document (including any
250 amendments) applies.

251 IEC 60038, *IEC standard voltages*

252 IEC 60364, *Low-voltage electrical installations*

253 IEC 60950-1:2005+AMD1:2009+AMD2:2013, *Information technology equipment - Safety -*
254 *Part1: General requirements*

255 IEC 61439-7:2022 [RLV](#), *Low-voltage switchgear and controlgear assemblies - Part 7:*
256 *Assemblies for specific applications such as marinas, camping sites, market squares,*
257 *electric vehicle charging stations*

258 **3 Terms and definitions**

259 For the purposes of this document, the terms and definitions given in this document apply.

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

- 262 – IEC Electropedia: available at <http://www.electropedia.org/>
- 263 – ISO Online browsing platform: available at <http://www.iso.org/obp>

264 **3.1**

265 **electric vehicle**

266 **EV**

267 **electric road vehicle**

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

272 [SOURCE: ISO 17409:2015, 3.19, modified — Some precisions have been added.]

273 **3.2**

274 **battery swap system**

275 battery swap station and supporting systems

276 **3.3**

277 **supporting system**

278 system which serves the battery swap station

279 **3.4**

280 **battery swap station**

281 **BSS**

282 facility that provides EVs with a swappable/removable battery system (SBS/RBS)

283 **3.5**

284 **battery pack**

285 energy storage device that includes cells or cell assemblies normally connected with cell
286 electronics, overcurrent shut-off device, including electrical interconnections, and
287 interfaces for external systems

288 Note 1 to entry: For further explanation, see ISO 12405-4:2018, 3.23 and Clause 3.24

289 Note 2 to entry: Examples of external systems are cooling, voltage class B, auxiliary voltage class A and
290 communication.

291 [SOURCE: ISO 12405-4:2018, 3.23 and 3.24]

292 **3.6**

293 **battery system**

294 energy storage device that includes cells or cell assemblies or battery pack(s) as well as
295 electrical circuits and electronics

296 Note 1 to entry: For further explanation, see ISO 12405-1:2011, 5.5.2, 5.5.3, A.3.1 and A.3.2. Battery system
297 components can also be distributed in different devices within the vehicle.

298 Note 2 to entry: Examples of electronics are the BCU and contactors.

299 [SOURCE: ISO 12405-1:2011, 3.3]