



SLOVENSKI STANDARD
oSIST prEN 50171:2013

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Nadomešča:
SIST EN 50171:2002

Centralni varnostni napajalni sistemi

Central safety power supply systems

Zentrale Sicherheitsstromversorgungssysteme

Systèmes d'alimentation à source centrale

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Ta slovenski standard je istoveten z: prEN 50171:2013

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Stabilizirano električno
napajanje

Rectifiers. Convertors.
Stabilized power supply

oSIST prEN 50171:2013

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Central safety power supply systems

Systèmes d'alimentation à source centrale

Zentrale
Sicherheitsstromversorgungssysteme

This draft European Standard is submitted to CENELEC members for CENELEC enquiry.
Deadline for CENELEC: 2013-10-25.

It has been drawn up by CLC/TC 22X.

If this draft becomes a European Standard, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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

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CENELEC

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

50 This document (prEN 50171:2013) has been prepared by CLC/TC 22X "Power electronics".

51 This document is currently submitted to the Enquiry.

52 This document will supersede EN 50171:2001 + corrigendum August 2001.

53 This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for
54 Use within Certain Voltage Limits (LVD - 2006/95/EC).

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55 1 Scope

56 This European Standard specifies the general requirements for central power supply systems for an
57 independent energy supply to essential safety equipment. This standard covers systems that are
58 permanently connected to AC supply voltages not exceeding 1 000 V and use batteries as an alternative
59 power source.

60 Central safety power supply systems are intended to ensure energy supply to emergency escape lighting in
61 the event of normal supply failure and may be suitable for energising other essential safety equipment, for
62 example:

- 63 – electric circuits of automatic fire extinguishing installations;
- 64 – paging systems and signalling safety installations;
- 65 – smoke extraction equipment;
- 66 – carbon monoxide warning systems;
- 67 – special safety installations related to specific buildings, e.g. high-risk areas.

68 Combination of the aforementioned equipment types should not be mixed together on the same central
69 safety power supply system.

70 Schematic representations of typical central safety power supply equipment are depicted in Clause 4.

71 Power supply systems for fire alarm equipment that are covered by EN 54 are excluded.

72 2 Normative references

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

- <https://standards.iteh.ai/catalog/standards/sist/3a6e59be-7b8d-402f-9c6b-227c6571b9fd/sist-pr-en-50171-2015>
- 76 EN 1838, *Lighting applications – Emergency lighting*
 - 77 EN 50272-2:2001, *Safety requirements for secondary batteries and battery installations – Part 2: Stationary*
78 *batteries*
 - 79 EN 50274, *Low-voltage switchgear and controlgear assemblies – Protection against electric shock –*
80 *Protection against unintentional direct contact with hazardous live parts*
 - 81 EN 60051 (series), *Direct acting indicating analogue electrical measuring instruments and their accessories*
 - 82 EN 60146-1-1, *Semiconductor converters – General requirements and line commutated converters –*
83 *Part 1-1: Specification of basic requirements*
 - 84 EN 61951-1, *Secondary cells and batteries containing alkaline or other non-acid electrolytes - Portable*
85 *sealed rechargeable single cells – Part 1: Nickel-cadmium*
 - 86 EN 60417 (series), *Graphical symbols for use on equipment*
 - 87 EN 60598-1, *Luminaires – Part 1: General requirements and tests (IEC 60598-1, modified)*
 - 88 EN 60622, *Sealed nickel-cadmium prismatic rechargeable single cells*
 - 89 EN 60623, *Vented nickel-cadmium prismatic rechargeable single cells*
 - 90 EN 60721-3-3, *Classification of environmental conditions – Part 3: Classification of groups of environmental*
91 *parameters and their severities – Section 3: Stationary use at weatherprotected locations*
 - 92 EN 60896-11, *Stationary lead-acid batteries – Part 11: Vented types – General requirements and methods of*
93 *test*
 - 94 EN 60896-21, *Stationary lead-acid batteries – Part 21: Valve regulated types – Methods of test*

- 95 EN 60896-22, *Stationary lead-acid batteries – Part 22: Valve regulated types – Requirements*
- 96 EN 60947-2, *Low-voltage switchgear and controlgear – Part 2: Circuit-breakers*
- 97 EN 60947-4-1, *Low-voltage switchgear and controlgear – Part 4-1: Contactors and motor-starters – Electro-*
98 *mechanical contactors and motor-starters*
- 99 EN 61000-6-2, *Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial*
100 *environments*
- 101 EN 61000-6-3, *Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standard for*
102 *residential, commercial and light-industrial environments*
- 103 EN 61032:1998, *Protection of persons and equipment by enclosures – Probes for verification*
- 104 EN 61558-2-4, *Safety of transformers, reactors, power supply units and similar products for supply voltages*
105 *up to 1 100 V – Part 2-4: Particular requirements and tests for isolating transformers and power supply units*
106 *incorporating safety isolating transformers*
- 107 EN 62040-1, *Uninterruptible power systems (UPS) - Part 1: General and safety requirements for UPS*
- 108 EN 62079, *Preparation of instructions – Structuring, content and presentation*
- 109 EN 50525-2-31, *Electric cables - Low voltage energy cables of rated voltages up to and including 450/750 V*
110 *(U0/U) - Part 2-31: Cables for general applications - Single core non-sheathed cables with thermoplastic*
111 *PVC insulation*
- 112 EN 60038, *CENELEC standard voltages*
- 113 HD 60364-6:2007, *Erection of low-voltage installations – Part 6: Verification*

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114 **3 Terms and definitions** (standards.iteh.ai)

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

[kSIST FprEN 50171:2015](https://standards.iteh.ai/catalog/standards/sist/3a6e59be-7b8d-402f9c6b-027e659b912/ksist-fpren-50171-2015)

116 **3.1** [https://standards.iteh.ai/catalog/standards/sist/3a6e59be-7b8d-402f9c6b-](https://standards.iteh.ai/catalog/standards/sist/3a6e59be-7b8d-402f9c6b-027e659b912/ksist-fpren-50171-2015)
117 **automatic transfer switching device (ATSD)** [027e659b912/ksist-fpren-50171-2015](https://standards.iteh.ai/catalog/standards/sist/3a6e59be-7b8d-402f9c6b-027e659b912/ksist-fpren-50171-2015)
118 device arranged to connect the emergency supply automatically to the essential safety equipment circuit(s)
119 on failure of the normal supply or to transfer the load from the normal supply to the battery

120 **3.2**
121 **battery charger**
122 part of the equipment that provides the charge to the battery from the normal supply

123 **3.3**
124 **Inverter**
125 device for the conversion of direct current (DC) to alternating current (AC)

126 **3.4**
127 **changeover mode**
128 mode in which the emergency power supply source is kept on standby and will, in the event of a failure of the
129 normal supply, automatically be transferred to the essential safety equipment

130 **3.5**
131 **converter**
132 device for changing the voltage of a direct current supply

133 **3.6**
134 **mode without interruption**
135 mode in which the emergency power supply source operates in parallel to the normal supply, is connected to
136 the load and supplies power without interruption when the normal supply fails

- 137 **3.7**
138 **control switch device (CSD)**
139 device intended to automatically supply one or several circuits from the emergency power source on failure
140 of the normal supply. This device may be manually controlled as required by the application standard
- 141 **3.8**
142 **deep discharge protection device**
143 device to protect the battery against deep discharge
- 144 **3.9**
145 **rated supply voltage (mains input)**
146 supply voltage or supply voltages assigned to the equipment by the manufacturer for the specified operating
147 conditions of the equipment
- 148 **3.10**
149 **rated output current (of a system)**
150 current, in amperes, supplied by a system at nominal voltage
- 151 **3.11**
152 **normal supply**
153 source of electrical energy that is intended to provide normal power supply
- 154 **3.12**
155 **rated operating time**
156 design period of time during which the load can be supplied whilst the system stays within specified voltage
157 limits
- 158 **3.13**
159 **nominal battery voltage**
160 suitable approximate voltage value of a system calculated using 2 V per cell for lead acid cells and 1,2 V per
161 cell for nickel cadmium cells
- 162 **3.14**
163 **nominal system voltage**
164 specified output voltage of a central safety power supply system
- 165 **3.15**
166 **minimum voltage**
167 voltage of the central safety power supply system at the end of the rated operating time
- 168 **3.16**
169 **earth fault indication**
170 device to indicate earth faults from either pole of the battery or from a load circuit if connected to the battery
- 171 **3.17**
172 **mains failure indication**
173 device to indicate failure of the normal supply
- 174 **3.18**
175 **central safety power supply system (CPS system)**
176 central power supply system which supplies the required power to essential safety equipment without any
177 restriction in power output
- 178 **3.19**
179 **low power safety supply system (LPS system)**
180 central power supply system where the power output is limited to 500 W for a duration of 3 h or to 1 500 W
181 for a duration of 1 h
- 182 **3.20**
183 **essential safety equipment**
184 devices required by the relevant authority to protect people in the event of a hazard

185 **3.21**
 186 **central inverter**
 187 inverter which supplies the total number of essential safety equipment circuit(s)

188 **3.22**
 189 **group inverter**
 190 inverter which supplies a part of the essential safety equipment circuit(s)

191 4 Types of central safety power supply systems

192 4.1 General provisions

193 In order to comply with the different operating requirements of the essential safety equipment, various types
 194 of central safety power supply systems are necessary.

195 This clause describes the basic types and their essential characteristics.

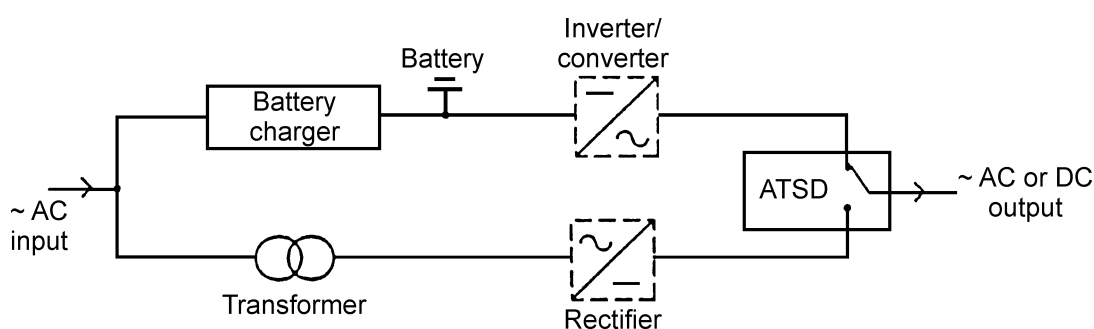
196 In general, two different modes of power supply are defined, i.e. the changeover mode and the mode without
 197 interruption. The main difference is the response (changeover) time. In changeover mode, the response time
 198 shall be no more than 0,5 s whereas, in the mode without interruption, the supply is permanent so, naturally,
 199 there is no response time.

200 The load, the level of discharge and the capacity of the battery determine the rated operating time in the
 201 case of a power failure. For application cases where the load requires an AC supply, an inverter shall be
 202 used. For application cases where a DC supply is required, a direct current adjusted to the load shall be
 203 supplied.

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204 4.2 Changeover mode

205 In the changeover mode, the essential safety equipment shall be fed directly by the power supply system
 206 (see Figure 1). When the load voltage differs from the normal supply voltage, an isolating transformer shall
 207 be used for supply matching. In the event of a mains power failure, the voltage monitor in the automatic
 208 transfer switching device (ATSD) shall transfer the supply to the battery. A controlled battery charger shall be
 209 provided for charging and float charging of the battery.



210
 211 **Figure 1**

212 4.3 Parallel standby mode

213 When in the mode without interruption, the charger shall be able to energise the essential safety equipment
 214 and to ensure the charging and/or float charging of the battery (see Figure 2).

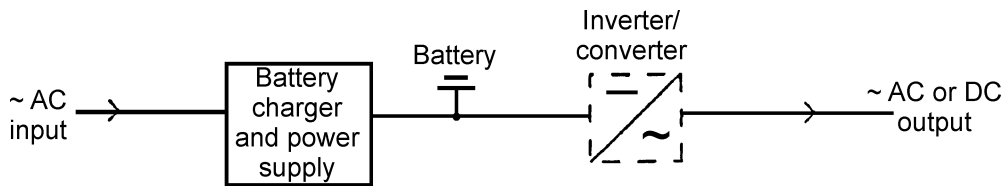


Figure 2

215

216

217 In the event of a mains failure, the battery shall take over the power supply to the load without interruption or
 218 decay in output voltage. See section 6.5.11.

219 4.4 Changeover mode with an additional control switching device for central switching of 220 the load

221 In addition to the devices detailed in 4.2, the equipment includes a control switch device(s) (CSD) which is
 222 (are) activated automatically or manually and is (are) dependent upon normal supply being available. For
 223 this, it shall be ensured that the emergency power supply is effective throughout the time required for
 224 operation.

225 A number of control switch devices may be used to switch sections of the load.

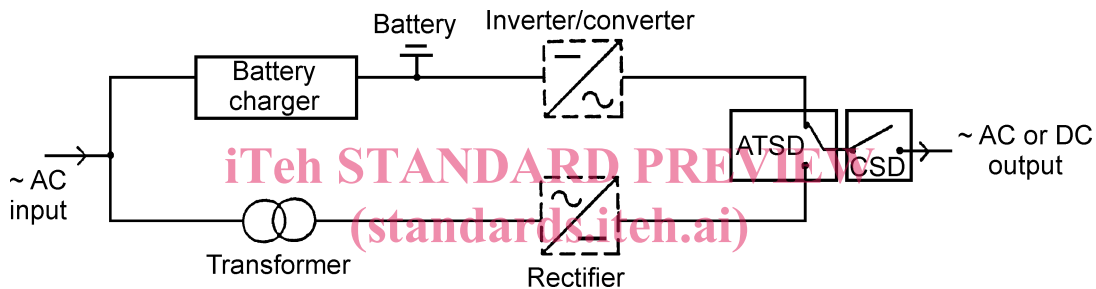


Figure 3

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227

<https://standards.iteh.ai/catalog/standards/sist/3a6e59be-7b8d-402f-9c6b-027e653b912/ksist-fpren-50171-2015>

228 4.5 Changeover mode with additional control switching device for partial switching of the 229 load

230 In addition to the devices detailed in 4.2, the equipment includes a control switching device for the section-
 231 wise switching of the loads which is activated by the normal supply (see 4.4).

232 However, deviating from the design specified in 4.4, part of the load is energised continuously (see Figure 4).

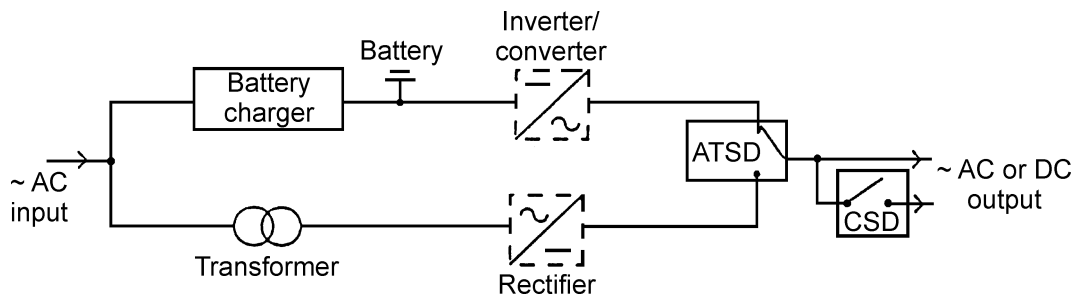


Figure 4

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