



**SLOVENSKI STANDARD**  
**SIST EN IEC 60947-4-2:2023/oprA1:2023**  
**01-september-2023**

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**Nizkonapetostne stikalne in krmilne naprave - 4-2. del: Kontaktorji in motorski zaganjalniki - Polprevodniški krmilniki motorjev, zaganjalniki motorjev in mehki zaganjalniki na izmenični tok - Dopolnilo A1**

Amendment 1 - Low-voltage switchgear and controlgear - Part 4-2: Contactors and motor-starters - Semiconductor motor controllers, starters and soft-starters

Niederspannungsschaltgeräte - Teil 4-2: Schütze und Motorstarter - Halbleiter-Motor-Steuergeräte, Starter und Sanftstarter

Amendement 1 - Appareillage à basse tension - Partie 4-2: Contacteurs et démarreurs de moteurs - Gradateurs, démarreurs et démarreurs progressifs de moteurs à semiconducteurs

**Ta slovenski standard je istoveten z: EN IEC 60947-4-2:2023/prA1:2023**

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**ICS:**

29.130.20	Nizkonapetostne stikalne in krmilne naprave	Low voltage switchgear and controlgear
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**SIST EN IEC 60947-4-2:2023/oprA1:2023 en**





# 121A/562/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: <b>IEC 60947-4-2/AMD1 ED4</b>	
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IEC SC 121A : LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR	
SECRETARIAT: France	SECRETARY: Mr Michaël LAHEURTE
OF INTEREST TO THE FOLLOWING COMMITTEES: SC 22G	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: <input checked="" type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input checked="" type="checkbox"/> SAFETY	
<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING <b>Attention IEC-CENELEC parallel voting</b> 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.	<input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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TITLE:

**Amendment 1 - Low-voltage switchgear and controlgear – Part 4-2: Contactors and motor-starters – Semiconductor motor controllers, starters and soft-starters**

PROPOSED STABILITY DATE: 2027

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NOTE FROM TC/SC OFFICERS:

SC121A Officers support circulation of CDV for project IEC 60947-4-2/AMD1 ED4.

Secretary Note: NC experts are kindly requested to refer their comments to line number.

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

**Part 4-2: Contactors and motor-starters –  
Semiconductor motor controllers, starters and soft-starters****AMENDMENT 1****FOREWORD**

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Amendment 1 to IEC 60947-4-2:2020 has been prepared by subcommittee 121A: Low-voltage switchgear and controlgear, of IEC technical committee 121: Switchgear and controlgear and their assemblies for low voltage.

This amendment includes the following significant technical changes with respect to the current edition:

- Requirement for starter intended to be used with high efficiency motors
- Requirements and tests for abnormal conditions equivalent to Annex DVE of the UL version,
- Alignment to the EMC environments defined in IEC TR 63216 and more detailed emission limit requirements,
- Reference to IEC TS 63058 for environmental information,
- Reference to IEC 63404 for the integration of radio communication

56 The text of this Amendment is based on the following documents:

Draft	Report on voting
121A/XX/FDIS	121A/XX/RVD

57  
58 Full information on the voting for its approval can be found in the report on voting indicated in  
59 the above table.

60 The language used for the development of this Amendment is English.

61 This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in  
62 accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available  
63 at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are  
64 described in greater detail at [www.iec.ch/publications/](http://www.iec.ch/publications/).

65 The committee has decided that the contents of this document will remain unchanged until the  
66 stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the  
67 specific document. At this date, the document will be

- 68 • reconfirmed,
  - 69 • withdrawn,
  - 70 • replaced by a revised edition, or
  - 71 • amended.
- 72

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**LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –**  
**Part 4-2: Contactors and motor-starters –**  
**Semiconductor motor controllers, starters and soft-starters**  
**Amendment 1**

112 **1 Scope**

113 *Delete footnote 1.*

114 **2 Normative references**

115 *Add the following reference to the list:*

116 IEC 63404:2023<sup>1</sup>, *Integration method of radiocommunication device into an equipment*

117 **5.3.5.4.1 Starting characteristics of squirrel cage and hermetic refrigeration motors**

118 *Replace the third paragraph by the following:*

119 Two directions of rotation are not covered by this document.

120 *Delete the fourth paragraph.*

121 **5.4 Utilization category**

122 **5.4.1 General**

123 *Replace the second paragraph by the following:*

124 For semiconductor motor controllers, starters and softstarters, the utilization categories are  
125 given in Table 1.

126 **5.6 Auxiliary circuits**

127 *Delete the second sentence of the third paragraph.*

128 **6.2 Marking**

129 *Replace in the third paragraph “k)” by “j)”.*

130 *Add the following new paragraph at the end of the existing text.*

131 When a radiocommunication device is embedded into the equipment, additional information  
132 according to 6.1 and 6.2 of IEC 63404:2023 applies.

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<sup>1</sup> Under preparation. Stage at the time of publication: IEC/CDM 63404:2022



133 **6.3 Instructions for installation, operation, maintenance, decommissioning and**  
134 **dismantling**

135 *Add after the fourth paragraph the following:*

136 The instructions shall also cover other specific application limitations, when applicable, such as  
137 altitude above 1 000 m and two direction starters.

138 When the embedded radiocommunication device can be upgraded, additional information  
139 according to 6.3 of IEC 63404:2023 applies.

140 **6.4 Environmental information**

141 *Replace the existing text by the following:*

142 When declared, the material declarations shall be provided according to IEC TS 63058.

143 Hazardous substances used by design in the equipment shall be declared in the product  
144 documentation. See also 8.1.1.

145 IEC TS 63058 replaces Annex O of IEC 60947-1:2020. It should be considered carefully  
146 especially for substitution or reduction in use of hazardous substances or if not possible for  
147 providing measures to prevent emission and contact with them.

148 NOTE IEC TS 63058 provides methods for assessing the environmental impact of switchgear and controlgear,  
149 guidance on environmentally conscious design and on information needed for end-of-life treatments.

150 **7.1.2 Altitude**

151 *Add in the first paragraph after “maximum altitude” “in 6.1 t)”.*

152 *Replace the second paragraph by the following:*

153 For the use of the equipment above 1000 m, specific instruction can be necessary for the  
154 cooling of the power semiconductor.

155 **7.1.3.2 Degrees of pollution**

156 *Replace in second paragraph. “by the manufacturer” by “in 6.1 k)”.*

157 **8.1.1 General**

158 *Add at the end of the first sentence of the fourth paragraph: “if tested under conditions that fulfil*  
159 *the conditions of this document.”*

160 *Replace in the last sentence of the fourth paragraph “should” by “shall”*

161 *Add at the end of the 4<sup>th</sup> paragraph the following:*

162 When a radiocommunication device is embedded into the equipment, C.4.1 of IEC 63404:2023  
163 applies. The interruption of the radiocommunication link shall not affect the current operation of  
164 the equipment.

165 **8.1.8.2 Terminal identification and marking**

166 *Add in the second paragraph “Clause 5 of” before “IEC 60445”.*

167 **8.1.16 Fault and abnormal conditions**

168 *Add at the end of text the following:*

169 In case of an abnormal operating condition leading to a loss of phase, polyphase products shall  
170 not present a hazard. Compliance shall be checked by the test of 9.2.7.2.

#### 171 **8.2.1.5.1.1 General tripping requirements of overload relays**

172 *Delete* NOTE 1

#### 173 **8.2.1.5.1.2 Limits of operation of three-pole time-delay overload relays energized on two** 174 **poles**

175 *Replace in the third paragraph* “Moreover, when ...” by “Then, one pole shall be disconnected.  
176 When ...”

177 *Add after the third paragraph the following new paragraph:*

178 This test shall be repeated with the relay energized on two poles only. At B times the current  
179 setting, tripping operation shall occur in less than 2 h, starting from the cold state.

#### 180 **8.2.1.6 Mechanical switching devices used in semiconductor motor controllers and** 181 **starters**

182 *Add the following new paragraph after the existing text as follows:*

183 The effectiveness of the interlocking shall be demonstrated during the thermal stability test or  
184 overload capability test in 9.3.3.6.1 or be verified by any other test covering the interlocking  
185 function for example by oscillographic means.

#### 186 **8.2.4.1 Operating capability requirements**

187 *Delete the 6<sup>th</sup> paragraph and the NOTE.* [60947-4-2:2023/oprA1:2023](https://standards.iteh.ai/catalog/standards/sist/0b4887fa-589e-4368-b1f3-ec-60947-4-2-2023-opra1-2023)  
[https://standards.iteh.ai/catalog/standards/sist/0b4887fa-589e-4368-b1f3-](https://standards.iteh.ai/catalog/standards/sist/0b4887fa-589e-4368-b1f3-ec-60947-4-2-2023-opra1-2023)

188 *Replace the 7<sup>th</sup> paragraph by the following:* [ec-60947-4-2-2023-opra1-2023](https://standards.iteh.ai/catalog/standards/sist/0b4887fa-589e-4368-b1f3-ec-60947-4-2-2023-opra1-2023)

189 *Where  $X \times I_e$  is greater than 1 000 A, the overload capability verification may be provided by*  
190 *other methods such as computer modelling simulation. The method and the result shall be*  
191 *described in the test report.*

192 *Add to Table 9 the following new footnote a referring to cell of  $8 \times I_e$*

193 <sup>a</sup> For devices with no controlled acceleration (DOL) and intended for use with an asynchronous motor of design NE  
194 or HE according to IEC 60034-12:2016,  $I_{LRP}$  is equal to  $8,5 \times I_e$

195 *Add to footnote d of Table 10 the following:*

196 For devices with no controlled acceleration (DOL) and intended for use with an asynchronous motor of design NE or HE  
197 according to IEC 60034-12:2016,  $\cos \varphi = 0,35$  for  $I_e \leq 100$  A :  $\cos \varphi = 0,25$ ; for  $I_e > 100$  A

#### 198 **8.2.4.3 Requirements for an induction motor test load**

199 *Delete items b) to d).*

200 *Add the footnote reference c to Table 11 in the cell of column  $I_c/I_e$  for AC-3a, b with the following*  
201 *new footnote:*

202 <sup>c</sup> For devices with no controlled acceleration (DOL) and intended for use with an asynchronous motor of design  
203 NE or HE according to IEC 60034-12:2016,  $I_c/I_e$  is equal to 8,5.

#### 204 **8.2.5.1 Performance under short-circuit conditions**

205 *Delete the sentence at the end of the first paragraph.*