



**SLOVENSKI STANDARD**  
**SIST EN 62606:2014/oprA2:2021**  
**01-november-2021**

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**Splošne zahteve za obločne detektorje**

General requirements for arc fault detection devices

Allgemeine Anforderungen an Fehlerlichtbogen-Schutzeinrichtungen

Exigences générales des dispositifs pour la détection de défaut d'arcs

Ta slovenski standard je istoveten z: **EN 62606:2013/prA2:2021**

[SIST EN 62606:2014/oprA2:2021  
https://standards.iteh.ai/catalog/standards/sist/0f098844-67e9-4783-9019-4d94592a0d85/sist-en-62606-2014-opra2-2021](https://standards.iteh.ai/catalog/standards/sist/0f098844-67e9-4783-9019-4d94592a0d85/sist-en-62606-2014-opra2-2021)

**ICS:**

29.120.50	Varovalke in druga nadtokovna zaščita	Fuses and other overcurrent protection devices
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**SIST EN 62606:2014/oprA2:2021**      **en,fr,de**

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# 23E/1237/CDV

## COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: <b>IEC 62606/AMD2 ED1</b>	
DATE OF CIRCULATION: <b>2021-08-13</b>	CLOSING DATE FOR VOTING: <b>2021-11-05</b>
SUPERSEDES DOCUMENTS: <b>23E/1160/CD, 23E/1214A/CC</b>	

IEC SC 23E : CIRCUIT-BREAKERS AND SIMILAR EQUIPMENT FOR HOUSEHOLD USE	
SECRETARIAT: Italy	SECRETARY: Mr Giovanni Cassinelli
OF INTEREST TO THE FOLLOWING COMMITTEES: SC 121A	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 <input type="checkbox"/> NOT SUBMITTED FOR CENELEC PARALLEL VOTING	
<p><b>Attention IEC-CENELEC parallel voting</b></p> <p>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.</p> <p>The CENELEC members are invited to vote through the CENELEC online voting system.</p>	

This document is still under study and subject to change. It should not be used for reference purposes.

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

TITLE:

**Amendment 2 - General requirements for arc fault detection devices**

PROPOSED STABILITY DATE: 2024

NOTE FROM TC/SC OFFICERS:

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- 1 INTERNATIONAL ELECTROTECHNICAL COMMISSION  
 2 TECHNICAL COMMITTEE 23: ELECTRICAL ACCESSORIES  
 3 SUB-COMMITTEE 23E: Circuit breakers and similar equipment for household use

4  
 5  
 6

7

## FOREWORD

8 This amendment has been prepared by subcommittee 23E: Circuit-breakers and similar  
 9 equipment for household use, of IEC technical committee 23: Electrical accessories.

10 The text of this amendment is based on the following documents:

FDIS	Report on voting
23E/XX/FDIS	23E/XX/RVD

11

12 Full information on the voting for the approval of this amendment can be found in the report on  
 13 voting indicated in the above table.

14 The committee has decided that the contents of this amendment and the base publication will  
 15 remain unchanged until the stability date indicated on the IEC website under  
 16 "http://webstore.iec.ch" in the data related to the specific publication. At this date, the  
 17 publication will be

- 18 • reconfirmed, <https://standards.iteh.ai/catalog/standards/sist/0f098844-67e9-4783-9019-4d94592a0d85/sist-en-62606-2014-opra2-2021>
- 19 • withdrawn,
- 20 • replaced by a revised edition, or
- 21 • amended.

22

23

24

25

26

**INTRODUCTION**

27 *To replace the last paragraph by the following*

28 This document covers devices designed to be installed in a distribution board at the origin of  
29 one final circuits of a fixed installation.

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## 30 GENERAL REQUIREMENTS FOR ARC FAULT DETECTION DEVICES

31 *Replace the existing title of this document with the following new title:*

### 32 GENERAL REQUIREMENTS FOR ARC FAULT DETECTION AND 33 PROTECTION DEVICES (AFDDs)

34  
35

#### 36 1 Scope

37 *Replace the existing second dash of second paragraph by the following new second dash:*

- 38 – as a single device, with arc fault detection integrated in or assembled by manufacturer to a  
39 protective device; or

40 *In the second sentence of the last paragraph, after “pollution degree 2”, add “and overvoltage  
41 category III”*

#### 42 2 Normative references

43 *Replace the following existing normative references by the following new normative references:*

44 IEC 60898-1:2015, *Electrical accessories – Circuit-breakers for overcurrent protection for*  
45 *household and similar installations – Part 1: Circuit-breakers for a.c. operation*  
46 IEC 60898-1:2015/AMD1:2019

47 IEC 61008-1:2010, *Residual current operated circuit-breakers without integral overcurrent*  
48 *protection for household and similar uses (RCCBs) – Part 1: General rules*  
49 IEC 61008-1:2010/AMD1:2012  
50 IEC 61008-1:2010/AMD2:2013

51 IEC 61009-1:2010, *Residual current operated circuit-breakers with integral overcurrent*  
52 *protection for household and similar uses (RCBOs) – Part 1: General rules*  
53 IEC 61009-1:2010/AMD1:2012  
54 IEC 61009-1:2010/AMD2:2013

55 *Add the following normative references:*

56 IEC 61000-4-2, *Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement*  
57 *techniques - Electrostatic discharge immunity test*

58 IEC 61000-4-3, *Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement*  
59 *techniques - Radiated, radio-frequency, electromagnetic field immunity test*

60 IEC 61000-4-4, *Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement*  
61 *techniques - Electrical fast transient/burst immunity test*

62 IEC 61000-4-5:2014, *Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement*  
63 *techniques - Surge immunity test*  
64 IEC 61000-4-5:2014/AMD1:2017

65 IEC 61000-4-6, *Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement*  
66 *techniques - Immunity to conducted disturbances, induced by radio-frequency fields*

67 IEC 61000-4-8, *Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement*  
68 *techniques - Power frequency magnetic field immunity test*

69 IEC 61000-4-11, *Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement*  
 70 *techniques - Voltage dips, short interruptions and voltage variations immunity tests for*  
 71 *equipment with input current up to 16 A per phase*

72 IEC 61000-4-16:2015, *Electromagnetic compatibility (EMC) - Part 4-16: Testing and*  
 73 *measurement techniques - Test for immunity to conducted, common mode disturbances in the*  
 74 *frequency range 0 Hz to 150 kHz*

75 IEC 62873-2, *Residual current operated circuit-breakers for household and similar use – Part*  
 76 *2: Residual current devices (RDCs) – Vocabulary*

### 77 **3 Terms and definitions**

78 *Replace the first sentence by the following sentence*

79 For the purposes of this document, the terms and definitions given in IEC 62873-2 and the  
 80 following apply.

#### 81 **3.4 arc fault detection unit**

82 *Replace the existing Note 1 to entry by the following new Note 1 to entry:*

83 Note 1 to entry The interruption of the current can either be provided by opening means (see 4.1.1) or by a protective  
 84 device integrating an AFD unit (see 4.1.2.1) or by a protective device assembled with an AFD unit (see 4.1.2.2 or  
 85 4.1.3).

(standards.iteh.ai)

### 86 **4 Classification**

#### 87 **4.1 According to the method of construction**

88 *Replace the existing subclause 4.1.2 by the following new subclause:*

##### 89 **4.1.2 AFDD as one single device, comprising an AFD unit and a protective device.**

90 **4.1.2.1 AFD unit integrated in a protective device complying with one of the**  
 91 **following standards: IEC 60898-1, IEC 61008-1, IEC 61009-1 or IEC 62423.**

92 **4.1.2.2 AFD unit assembled by the manufacturer to a protective device complying**  
 93 **with one of the following standards: IEC 60898-1, IEC 61008-1, IEC 61009-1 or**  
 94 **IEC 62423.**

95 For this classification, the protective device is unchanged from the existing compliant version  
 96 except for marking and/or catalogue/serial number.

### 97 **5 Characteristics of AFDDs**

98

#### 99 **5.4 Standard values of rated impulse withstand voltage ( $U_{imp}$ )**

100 *Replace, after Table 4, the existing paragraph by the following new paragraph:*

101 In case an AFDD is intended to be connected (see 4.1.1) or integrated (see 4.1.2.1) or  
 102 assembled (see 4.1.2.2 or 4.1.3) with one or several declared protective devices whose  
 103 standard values of rated impulse withstand voltage are more severe than those mentioned in  
 104 Table 4, the standard conditions for operation in service and for installation of the most severe  
 105 protective device standard shall apply.

## 106 5.5 Coordination with short-circuit protective devices (SCPDs)

### 107 5.5.1 General

108 *Replace the first paragraph by the following:*

109 AFDDs classified according to 4.1.2 and 4.1.3 using an RCCB as protective device (IEC 61008-  
110 1 or IEC 62423) and AFDDs classified according to 4.1.1 shall be protected against short-  
111 circuits by means of circuit-breakers or fuses complying with their relevant standards according  
112 to the installation rules of IEC 60364 series.

## 113 6 Marking and other product information

114 *To remove the sentence “the markings shall be on the AFDD ...is installed” below Table 5*

115 *In the sixth paragraph after Table 5, to remove the sentence “provisionally the use of national*  
116 *indications only is allowed”*

117 *To replace the last but two paragraph by the following:*

118 The markings shall appear on the AFDD or, if the space available is not sufficient, on the  
119 smallest package unit or in technical information.

## 120 7 Standard conditions for operation in service and for installation (standards.iteh.ai)

### 121 7.1 Standard conditions

122 *Modify note b of Table 6 as follows* [SIST EN 62606:2014/oprA2:2021  
https://standards.iteh.ai/catalog/standards/sist/0f098844-67e9-4783-9019-  
4d94592a0d85/sist-en-62606-2014-opra2-2021](https://standards.iteh.ai/catalog/standards/sist/0f098844-67e9-4783-9019-4d94592a0d85/sist-en-62606-2014-opra2-2021)

123 Values outside the range are admissible where more severe climatic conditions prevail.

124 *Replace, after Table 6, the existing paragraph by the following new paragraph:*

125 In case an AFDD is connected (see 4.1.1) or integrated (see 4.1.2.1) or assembled (see 4.1.2.2  
126 or 4.1.3) with one or several associated declared protective devices whose standard conditions  
127 for operation in service and for installation are more severe than those mentioned in Table 6,  
128 the standard conditions for operation in service and for installation of the most severe protective  
129 device standard shall apply.

## 130 8 Requirements for construction and operation

### 131 8.1 General

132 *Replace the existing tenth and eleventh paragraphs with the following new text:*

133 AFDDs classified according to 4.1.2.1 shall comply with the relevant standard of the protective  
134 device with which it is integrated (according to IEC 60898-1, IEC 61008-1, IEC 61009-1, or  
135 IEC 62423 as applicable) and additionally to the requirements and tests given in this document.

136 Where tests included in this document are also included in IEC 60898-1, IEC 61008-1,  
137 IEC 61009-1, or IEC 62423, a selection of the most stringent requirements and tests among all  
138 applicable standards shall be applied only once.

139 AFDDs classified according to 4.1.2.2 shall comply with the requirements given in this document  
140 which include the verification (according to IEC 60898-1, IEC 61008-1, IEC 61009-1, or



141 IEC 62423 as applicable) of the correct operation of the protective device with which it is  
142 assembled.

### 143 **8.2.3 Clearances and creepage distances (see Annex B)**

144 *Remove in the third paragraph “e”.*

145 *Remove in the second dash after third paragraph “e”.*

## 146 **8.3 Protection against electric shock**

147 *To modify the third paragraph as follows*

148 For AFDDs other than those of the plug-in type, external parts, other than screws or other  
149 means for fixing covers and labels, which are accessible when the AFDDs are mounted and  
150 wired as in normal conditions of use, shall either be of insulating material, or be lined throughout  
151 with insulating material.

## 152 **8.5 Temperature rise**

### 153 **8.5.1 Temperature-rise limits**

154 *Replace, after Table 9, the existing paragraph by the following new paragraph:*

155 In case an AFDD is wired (see 4.1.1) or integrated (see 4.1.2.1) or assembled (see 4.1.2.2 or  
156 4.1.3) with one or several associated declared protective devices whose standard conditions  
157 for temperature rise are more severe than those mentioned in Table 9, the standard conditions  
158 for operation in service and for installation of the most severe protective device standard shall  
159 apply (IEC 60898-1, IEC 61008-1, IEC 61009-1 and IEC 62423).

[https://standards.iteh.ai/catalog/standards/sist/0f098844-67e9-4783-9019-](https://standards.iteh.ai/catalog/standards/sist/0f098844-67e9-4783-9019-2a0d85/sist-en-62606-2014-oprA2-2021)

160 **8.6 Operating characteristics** [2a0d85/sist-en-62606-2014-oprA2-2021](https://standards.iteh.ai/catalog/standards/sist/0f098844-67e9-4783-9019-2a0d85/sist-en-62606-2014-oprA2-2021)

### 161 **8.6.1 Operating characteristics of the protective device part**

162 *Replace the existing second paragraph by the following new paragraph:*

163 Compliance is checked by carrying out the relevant tests of the specified relevant standard,  
164 according to 9.1.1.

## 165 **8.15 Electromagnetic compatibility (EMC)**

166 *To replace the first paragraph by the following*

167 AFDDs shall comply with the EMC requirements of this document.

## 168 **9 Testing procedure**

### 169 **9.1 General**

#### 170 **9.1.1 General testing procedure for the different type of AFDDs**

171 *Replace the existing fourth paragraph with the three following new paragraphs:*

172 AFDDs classified according to 4.1.2.1 where the AFD unit is integrated in the MPD shall first  
173 be tested according to IEC 60898-1, IEC 61008-1, IEC 61009-1, or IEC 62423, as applicable.

174 AFDDs classified according to 4.1.2.2 where the AFD unit is assembled to the MPD, the MPD  
175 shall comply with IEC 60898-1, IEC 61008-1, IEC 61009-1 or IEC 62423, as applicable.

176 The AFD unit assembled to the MPD shall not inhibit the correct operation of the main protective  
 177 device. The following verifications of the mechanism and the operating characteristics of the  
 178 combination shall be made on the devices having the largest number of poles, highest  $I_n$  and  
 179 lowest  $I_{\Delta n}$ , as applicable:

- 180 a) 8.1.2, 9.10.2.1, 9.10.3 (only at the upper limit of instantaneous tripping current) and 9.11 of  
 181 IEC 60898-1:2015 and IEC 60898-1:2015/AMD1:2019 for circuit-breakers;
- 182 b) 8.1.2, 9.2.1, 9.9.2.2, 9.9.2.3a), 9.10 of IEC 61008-1:2010, IEC 61008-1:2010/AMD1:2012  
 183 and IEC 61008-1:2010/AMD2:2013 for RCCBs;
- 184 c) 8.1.2, 9.9.1.2a), 9.9.1.2b), 9.9.1.2c) 1), 9.9.2.1, 9.9.2.2 (only at the upper limit of  
 185 instantaneous tripping current), 9.10 of IEC 61009-1:2010, IEC 61009-1:2010/AMD1:2012  
 186 and IEC 61009-1:2010/AMD2:2013 for RCBOs.

187 For test according to 8.1.2 of relevant product standard, only inspection and manual tests apply.

188 *Replace the existing fifth paragraph with the following new paragraph:*

189 After completion of the required above tests of IEC 60898-1, IEC 61008-1, IEC 61009-1, or  
 190 IEC 62423, the additional tests given in this document shall be applied in order to show  
 191 conformity to this document.

## 192 **9.1.2 The characteristics of AFDDs are checked by means of type tests**

193 Table 10 - List of type tests

194 *Remove, in Table 10, eighth row, the existing footnote <sup>a</sup> after 9.10.*

195 *Replace, in Table 10, the existing footnote <sup>a</sup> by the following new footnote:*

196 <sup>a</sup> For AFDDs classified according to 4.1.2.1, these tests are already covered by the tests according to the relevant  
 197 standard for RCDs or circuit breakers and need not to be repeated here.

## 198 **9.7 Test of dielectric properties**

### 199 **9.7.3 Insulation resistance of the main circuit**

200 *Remove item d) and the note below*

201 *Rename item e) to item d)*

### 202 **9.7.4 Dielectric strength of the main circuit**

203 *Replace the fifth paragraph with the following paragraph:*

204 The values of the test voltage shall be as follows:

205 – 2 000 V for a) to c) of 9.7.3;

206 – 2 500 V for d) of 9.7.3.

### 207 **9.7.6 Capability of control circuits connected to the main circuit in respect of 208 withstanding high DC voltages due to insulation measurements**

209 *Replace the existing last paragraph by the following new paragraph:*

210 After this treatment, the functionality of the AFDD is verified by repeating the test of 9.9.2.4 at  
 211 the lowest current of Table 1 or Table 2, as applicable, without measurement of break time.

212 **9.7.7 Verification of impulse withstand voltages (across clearances and across solid**  
213 **insulation) and of leakage current across open contacts**

214 **9.7.7.2 Verification of clearances with the impulse withstand voltage**

215 *Remove in the first paragraph “e”.*

216 *Remove in the sixth paragraph “e”.*

217 **9.7.7.5 Verification of the behaviour of components bridging the basic insulation**

218 *Replace the existing last but one paragraph by the following new paragraph:*

219 Then, the AFDD is connected to the mains in accordance with the manufacturer's instructions.  
220 The functionality of the AFDD is verified by the test of 9.9.2.4 at the lowest current of Table 1  
221 or Table 2, as applicable, without measurement of break time.

222 **9.9.2 Series arc fault tests**

223 **9.9.2.1 General**

224 *Replace the content of subclause 9.9.2.1, modified by Amendment 1, by the following new text:*

225 A representative AFDD shall clear the arcing fault in the time specified in Table 1 or Table 2 for  
226 the arc current level being tested. AFDDs shall be tested up to their rated current.

227 The AFDD being supplied with all phases and neutral (if any) the tests shall be performed, if  
228 applicable, between one phase, chosen at random and neutral, and between two phases chosen  
229 at random.

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[https://standards.iteh.ai/catalog/standards/sist/0f098844-67e9-4783-9019-](https://standards.iteh.ai/catalog/standards/sist/0f098844-67e9-4783-9019-40462a0009/sist-en-62606-2014-oprA2-2021)

230 The tests shall be conducted by connecting a cable specimen (prepared in accordance with  
231 9.9.2.6) in series with the AFDD according to Figure 4 for tests of 9.9.2.2 to 9.9.2.5 and  
232 according to Figure 38 for tests of 9.9.2.8 and 9.9.2.9.

233 The adjustment of the test currents without arcing, in the line where the cable specimen is  
234 placed, is achieved by application of the line to neutral voltage reduced by 50 V to take into  
235 account the value of the arc voltage during the test. For two-pole AFDDs rated 400 V the  
236 adjustment of the test current without arcing is achieved by application of the line to line voltage  
237 reduced by 50 V. For three-pole AFDDs, and for the adjustment of the test current only, the  
238 mid-point of the resistors in Figure 38 shall be connected directly to the neutral. For tests of  
239 9.9.2.2, and at the rated current only, the adjustment of the test current in the cable specimen  
240 without arcing is achieved by application of the rated voltage.

241 The break time is measured at each arc current level and the measured value shall not exceed  
242 the times specified in Table 1 or Table 2.

243 When the break time exceeds the times specified in Table 1 or Table 2 because the arc is not  
244 persistent during this test, the test shall be repeated.

245 An arc is considered as not persistent if during at least 2 cycles, not necessarily consecutive,  
246 the arc peak current is less than 1.5 A or the arc peak voltage is less than 10 V.

247 Note: One cycle is 20ms for 50 Hz

248 **9.9.2.5 Test at the temperature limits**

249 *Add, at the end of the first dash, the following new text:*