



SLOVENSKI STANDARD
oSIST prEN IEC 61558-2-13:2022
01-januar-2022

Varnost transformatorjev, dušilk, napajalnikov in kombinacij teh elementov - 2-13. del: Posebne zahteve in preskusi za avtotransformatorje in napajalnike z avtotransformatorji za splošno uporabo

Safety of transformers, reactors, power supply units and combinations thereof - Part 2-13: Particular requirements and tests for auto transformers and power supply units incorporating auto transformers for general applications

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Sécurité des transformateurs, bobines d'inductance, blocs d'alimentation et combinaisons de ces éléments - Partie 2-13: Exigences particulières et essais pour les autotransformateurs et les blocs d'alimentation qui incorporent des autotransformateurs pour applications d'ordre généra

Ta slovenski standard je istoveten z: prEN IEC 61558-2-13:2021

ICS:

29.180 Transformatorji. Dušilke Transformers. Reactors

oSIST prEN IEC 61558-2-13:2022 en

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96/526/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: IEC 61558-2-13 ED3	
DATE OF CIRCULATION: 2021-11-12	CLOSING DATE FOR VOTING: 2022-02-04
SUPERSEDES DOCUMENTS: 96/520/RR	

IEC TC 96 : TRANSFORMERS, REACTORS, POWER SUPPLY UNITS, AND COMBINATIONS THEREOF	
SECRETARIAT: Germany	SECRETARY: Mr Wolfgang Reichelt
OF INTEREST TO THE FOLLOWING COMMITTEES: SC 3C,TC 14,TC 22,SC 22E,SC 34C,TC 51,TC 55,TC 61,SC 62A,TC 64,TC 66,TC 77,TC 85,TC 97,TC 106,TC 108,TC 109,TC 111,TC 112	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 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	
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TITLE:

Safety of transformers, reactors, power supply units and combinations thereof - Part 2-13: Particular requirements and tests for auto transformers and power supply units incorporating auto transformers for general applications

PROPOSED STABILITY DATE: 2025

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY OF TRANSFORMERS, REACTORS, POWER SUPPLY UNITS AND COMBINATIONS THEREOF –**Part 2-13: Particular requirements and tests for auto-transformers and power supply units incorporating auto-transformers for general applications**

FOREWORD

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International standard IEC 61558-2-13 has been prepared by IEC technical committee 96: Transformers, reactors, power supply units and combinations thereof.

This third edition cancels and replaces the second edition published in 2009. This edition constitutes a technical revision.

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

- a) Adjustment of structure and references in accordance with IEC 61558-1:2017;
- b) Description of constructions moved to IEC 61558-1:2017;
- c) New symbol for power supply unit with linearly regulated output voltage.

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

Draft	Report on voting
96/XXX/FDIS	96/XXX/RVD

99
100 Full information on the voting for its approval can be found in the report on voting indicated in
101 the above table.

102 The language used for the development of this International Standard is English.

103 This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in
104 accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available
105 at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are
106 described in greater detail at www.iec.ch/standardsdev/publications.

107 It has the status of a group safety publication in accordance with IEC Guide 104.

108 This International Standard is to be used in conjunction with IEC 61558-1:2017.

109 NOTE When "Part 1" is mentioned in this standard, it refers to IEC 61558-1:2017.

110 This document supplements or modifies the corresponding clauses in IEC 61558-1:2017, so as
111 to convert that publication into the IEC standard: *Particular requirements and tests for auto-*
112 *transformers and power supply units incorporating auto-transformers for general applications.*

113 A list of all parts in the IEC 61558 series published under the general title *Safety of*
114 *transformers, reactors, power supply units and combinations thereof*, can be found on the
115 IEC website.

116 Future standards in this series will carry the new general title as cited above. Titles of existing
117 standards in this series will be updated at the time of the next edition.

118 Where this document states "*addition*", "*modification*" or "*replacement*", the relevant text of
119 IEC 61558-1:2017 is to be adapted accordingly.

120 In this document, the following print types are used:

- 121 – requirements proper: in roman type;
- 122 – *test specifications: in italic type;*
- 123 – explanatory matter: in smaller roman type:

124 In the text of this document, the words in **bold** are defined in Clause 3.

125 Subclauses, notes, figures and tables additional to those in IEC 61558-1:2017 are numbered
126 starting from 101; supplementary annexes are entitled AA, BB, etc.

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

- 130 • reconfirmed,
- 131 • withdrawn,
- 132 • replaced by a revised edition, or
- 133 • amended.

134

135 NOTE Deleted

136

INTRODUCTION

137 IEC TC 96 has a group safety function in accordance with IEC Guide 104 for transformers other
138 than those intended to supply distribution networks, in particular transformers and power supply
139 units intended to allow the application of protective measures against electric shock as defined
140 by TC 64, but in certain cases including the limitation of voltage and horizontal safety function
141 for SELV, in accordance with IEC 60364-4-41.

142 The group safety function (GSF) is necessary because of responsibility for safety extra-low
143 voltage (SELV) in accordance with IEC 61140:2016, 5.2.6 and IEC 60364-4-41:2005, 414.3.1
144 or control circuits in accordance with IEC 60204-1:2016, 7.2.4.

145 The group safety function is needed for each part of IEC 61558-2 because different standards
146 of the IEC 61558 series can be combined in one construction but in certain cases with no
147 limitation of rated output power.

148 For example an auto-transformer in accordance with IEC 61558-2-13 can be designed with a
149 separate SELV-circuit in accordance with the particular requirements for IEC 61558-2-6 relating
150 to the general requirements of IEC 61558-1.

151

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152 **SAFETY OF TRANSFORMERS, REACTORS,**
153 **POWER SUPPLY UNITS AND COMBINATIONS THEREOF –**
154

155 **Part 2-13: Particular requirements and tests for auto-transformers and**
156 **power supply units incorporating auto-transformers for general**
157 **applications**
158
159

160 **1 Scope**

161 *Replacement*

162 This part of IEC 61558 deals with the safety of **auto-transformers** for general applications and
163 **power supply units** incorporating **auto-transformers** for general applications. **Transformers**
164 incorporating **electronic circuits** are also covered by this document.

165 NOTE 1 Safety includes electrical, thermal and mechanical aspects.

166 Unless otherwise specified, from here onward, the term **transformer** covers **auto-transformers**
167 for general applications and **power supply units** incorporating **auto-transformers** for general
168 applications.

169 For **power supply units** (linear) this document is applicable. For **switch mode power supply**
170 **units** IEC 61558-2-16 is applicable.

171 This document is applicable to **stationary** or **portable**, single-phase or polyphase, air-cooled
172 (natural or forced) **independent** or **associated dry-type transformers**. The windings may be
173 encapsulated or non-encapsulated.

174 The **rated supply voltage** does not exceed 1 000 V AC, and the **rated supply frequency** and
175 the **internal operating frequencies** do not exceed 500 Hz.

176 The **core power** does not exceed:

- 177 – 2 kVA for single-phase **transformers**;
- 178 – 10 kVA for polyphase **transformers**.

179 The **rated output** does not exceed:

- 180 – 40 kVA for single-phase **transformers**;
- 181 – 200 kVA for polyphase **transformers**.

182 This document is applicable to **transformers** without limitation of the **core power** and the **rated**
183 **output** both being subject to an agreement between the purchaser and the manufacturer.

184 Where applicable, the **no-load output voltage** or the **rated output voltage** does not exceed
185 1 000 V AC or 1 415 V ripple-free DC. For **independent transformers**, the **no-load output**
186 **voltage** and the **rated output voltage** is not less than 50 V AC or 120 V ripple-free DC.

187 This document is not applicable to external circuits and their components intended to be
188 connected to the input terminals and output terminals of the **transformers**.

189 NOTE 2 **Transformers** covered by this document are used only in applications where no **insulation** between
190 circuits is required by the installation rules or by the end product standard.

191

192

193 Attention is drawn to the following:

- 194 – for **transformers** intended to be used in vehicles, on board ships, and aircraft, additional
195 requirements (from other applicable standards, national rules, etc.);
- 196 – measures to protect the **enclosure** and the components inside the enclosure against
197 external influences such as fungus, vermin, termites, solar-radiation, and icing;
- 198 – the different conditions for transportation, storage, and operation of the **transformers**;
- 199 – additional requirements in accordance with other appropriate standards and national
200 rules may be applicable to **transformers** intended for use in special environments.

201 Future technological development of **transformers** may necessitate a need to increase the
202 upper limit of the frequencies. Until then this document may be used as a guidance document.

203 This GROUP SAFETY PUBLICATION focusing on SAFETY guidance is primarily intended to
204 be used as a PRODUCT SAFETY STANDARD for the products mentioned in the scope, but is
205 also intended to be used by TCs in the preparation of publications for products similar to those
206 mentioned in the scope of this GROUP SAFETY PUBLICATION, in accordance with the
207 principles laid down in IEC Guide 104 and ISO/IEC Guide 51.

208 One of the RESPONSIBILITIES of a TC is, wherever applicable, to make use of BSPs and/or
209 GSPs in the preparation of its publications.

210

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211 **2 Normative references (standards.iteh.ai)**

212 This clause of Part 1 is applicable except as follows:

213 *Addition* [https://standards.iteh.ai/catalog/standards/sist/035d8c91-83bc-411a-b7e7-
0809fcca2093/osist-pren-iec-61558-2-13-2022](https://standards.iteh.ai/catalog/standards/sist/035d8c91-83bc-411a-b7e7-0809fcca2093/osist-pren-iec-61558-2-13-2022)

214 IEC 61558-1:2017, *Safety of transformers, reactors, power supply units and combinations*
215 *thereof – Part 1: General requirements and tests*

216

217 **3 Terms and definitions**

218 For the purposes of this document, the terms and definitions given in Part 1 apply, except as
219 follows:

220 ISO and IEC maintain terminological databases for use in standardization at the following
221 addresses:

- 222 • IEC Electropedia: available at <http://www.electropedia.org/>
- 223 • ISO Online browsing platform: available at <http://www.iso.org/obp>

224

225 *Replacement*

226 **3.1.5**

227 **auto-transformer**

228 **transformer** in which **input** and **output windings** have a common part

229 NOTE 1 **Auto-transformers** may have supplementary windings (see Figure 101) or tapings (see Figure 102) for
230 adjustment purposes.

231 NOTE 2 Transformers with windings separated at least by functional insulation and electrically connected, will be
232 treated as **auto-transformers** (see Figure 103).

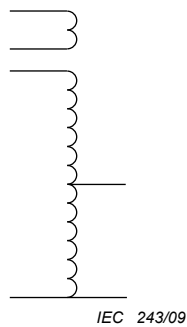


Figure 101 – Windings

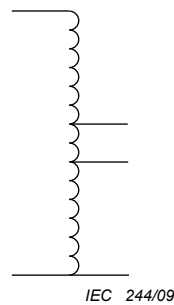


Figure 102 – Tappings

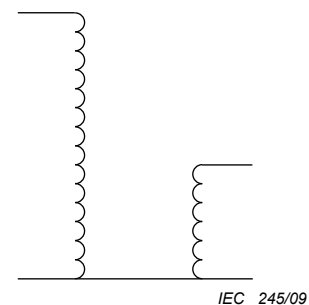


Figure 103 – Windings separated by functional isolation

233

234 *Addition***3.5.101****core power**

237 power transformed by the core, if this core was used in a **transformer** with separate windings
 238 at the same **supply voltage, output voltage, frequency, power factor** and thermal
 239 characteristics

240

4 General requirements [oSIST prEN IEC 61558-2-13:2022](https://standards.iteh.ai/catalog/standards/sist/035d8c91-83bc-411a-b7e7-c2093/osist-pren-iec-61558-2-13-2022)

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 242 This clause of Part 1 is applicable [ca2093/osist-pren-iec-61558-2-13-2022](https://standards.iteh.ai/catalog/standards/sist/035d8c91-83bc-411a-b7e7-c2093/osist-pren-iec-61558-2-13-2022)

243

5 General notes on tests

245 This clause of Part 1 is applicable.

246

6 Ratings

248 This clause of Part 1 is applicable except as follows:

249 *Addition*

250 **6.101** The **rated output voltage** shall not exceed 1 000 V AC or 1 415 V ripple-free DC For
 251 **independent transformers** the **rated output voltage** shall exceed 50 V AC or 120 V ripple-
 252 free DC.

253 **6.102** The **rated output** shall not exceed:

- 254 – 40 kVA for single-phase **transformers**;
- 255 – 200 kVA for polyphase **transformers**.

256 **Transformers** without limitation of the **rated output** shall be subject to agreement between the
 257 purchaser and the manufacturer.

258 **6.103** The **rated supply frequency** and the **internal operating frequencies** shall not exceed
 259 500 Hz.