



SLOVENSKI STANDARD
oSIST prEN IEC 61558-2-23:2023

01-februar-2023

**Varnost transformatorjev, dušilk, napajalnikov in kombinacij teh elementov - 2-23.
del: Posebne zahteve in preskusi za transformatorje in napajalnike za gradbišča**

Safety of transformers, reactors, power supply units and combinations thereof - Part 2-23: Particular requirements and tests for transformers and power supply units for construction sites

Sicherheit von Transformatoren, Drosseln, Netzgeräten und entsprechenden Kombinationen - Teil 2-23: Besondere Anforderungen und Prüfungen für Transformatoren und Netzgeräte für Baustellen

Sécurité des transformateurs, bobines d'inductance, blocs d'alimentation et des combinaisons de ces éléments - Partie 2-23: Règles particulières et essais pour les transformateurs et les blocs d'alimentation pour chantiers

Ta slovenski standard je istoveten z: prEN IEC 61558-2-23:2022

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29.180	Transformatorji. Dušilke	Transformers. Reactors
91.200	Gradbena tehnologija	Construction technology

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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.
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<input checked="" type="checkbox"/> SUBMITTED FOR CENELEC PARALLEL VOTING Attention IEC-CENELEC parallel voting 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:

Safety of transformers, reactors, power supply units and combinations thereof - Part 2-23: Particular requirements and tests for transformers and power supply units for construction sites

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NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SAFETY OF TRANSFORMERS, REACTORS,
POWER SUPPLY UNITS AND COMBINATIONS THEREOF –****Part 2-23: Particular requirements and tests for transformers and
power supply units for construction sites**

FOREWORD

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International standard IEC 61558-2-23 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 2010. 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) New symbol for power supply units with linearly regulated output voltage

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

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

95
96 Full information on the voting for its approval can be found in the report on voting indicated in
97 the above table.

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

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

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

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

105 This document supplements or modifies the corresponding clauses in IEC 61558-1:2017, so as
106 to convert that publication into the IEC standard: *Particular requirements and tests for*
107 *transformers and power supply units for construction sites*.

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

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

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

114 In this document, the following print types are used: *sist/fd6ebd83-5186-4a27-96ae-*

115 – requirements proper: in roman type;

116 – *test specifications: in italic type;*

117 – explanatory matter: in smaller roman type.

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

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

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

- 124 • reconfirmed,
- 125 • withdrawn,
- 126 • replaced by a revised edition, or
- 127 • amended.

128

INTRODUCTION

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

134 The group safety function (GSF) is used because of responsibility for safety extra-low voltage
135 (SELV) in accordance with IEC 61140:2016, 5.2.6 and IEC 60364-4-41:2017, 414.3.1 or control
136 circuits in accordance with IEC 60204-1:2016, 7.2.4.

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

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

143

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[oSIST prEN IEC 61558-2-23:2023](https://standards.iteh.ai/catalog/standards/sist/fd6ebd83-5186-4a27-96ae-a8a26ad103d4/osist-pren-iec-61558-2-23-2023)

<https://standards.iteh.ai/catalog/standards/sist/fd6ebd83-5186-4a27-96ae-a8a26ad103d4/osist-pren-iec-61558-2-23-2023>

144 **SAFETY OF TRANSFORMERS, REACTORS,**
145 **POWER SUPPLY UNITS AND COMBINATIONS THEREOF –**

146
147 **Part 2-23: Particular requirements and tests for transformers and**
148 **power supply units for construction sites**
149
150

151 **1 Scope**

152 *Replacement*

153 This part of IEC 61558 deals with the safety of **transformers** for construction sites and **power**
154 **supply units** incorporating **transformers** for construction sites. **Transformers** incorporating
155 **electronic circuits** are also covered by this document.

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

157 Unless otherwise specified, from here onward, the term **transformer** covers **transformers** for
158 construction sites and **power supply units** incorporating **transformers** for construction sites.

159 This document is applicable to **stationary** or **portable**, single-phase or polyphase, air-cooled
160 (natural or forced) **independent** or **associated transformers**, being **isolating** or **safety**
161 **isolating dry-type transformers** for the use on construction sites. The windings can be
162 encapsulated or non-encapsulated.

163 For **power supply units** (linear) this document is applicable. For **switch mode power supply**
164 **units**, IEC 61558-2-16 is applicable together with this document. Where two requirements are
165 in conflict, the most severe take precedence.

166 The **rated supply voltage** does not exceed 1 000 V AC, and the **rated supply frequency** and
167 the **internal operating frequencies** do not exceed 500 Hz. ²⁰²³

168 The **rated output** does not exceed: <https://standards.iteh.ai/catalog/standards/sist/fd6ebd83-5186-4a27-96ae-d4/osist-pren-iec-61558-2-23-2023>

- 169 – 25 kVA for single-phase **transformers**;
- 170 – 40 kVA for polyphase **transformers**.

171 This document is applicable to **transformers** without limitation of the **rated output** subject to
172 an agreement between the purchaser and the manufacturer.

173 NOTE 2 **Transformers** intended to supply distribution networks are not included in the scope.

174 **Isolating transformers** for construction sites have a **no-load output voltage** and a **rated**
175 **output voltage** exceeding 50 V AC and not exceeding 250 V AC.

176 **Safety isolating transformers** for construction sites have a **no-load output voltage** and a
177 **rated output voltage** not exceeding 50 V AC.

178 NOTE 3 This standard is applicable to **transformers** for the supply of electricity in locations as specified in
179 IEC 60364-7-704. The latter also specifies the protection by using an earthed midpoint or starpoint of the **output**
180 **winding**.

181 NOTE 4 **Transformers** covered by this document are used in applications where it is required by the installation
182 rules or by the appliance specification for protection purposes.

183 NOTE 5 When the **transformers** are incorporated into **low voltage switchgear and controlgear assemblies for**
184 **construction sites** as specified in IEC 60439-4, the additional requirements of IEC 60439-4 will apply to the
185 assembly.

186 NOTE 6 For **transformers** filled with liquid dielectric or pulverised material, such as sand, additional requirements
187 are under consideration.

188 Attention is drawn to the following if necessary:

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

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

198 This group safety publication focusing on safety guidance is primarily intended to be used as a
199 product safety standard for the products mentioned in the scope, but is also intended to be used
200 by technical committees in the preparation of publications for products similar to those
201 mentioned in the scope of this group safety publication, in accordance with the principles laid
202 down in IEC Guide 104 and ISO/IEC Guide 51.

203 One of the responsibilities of a technical committee is, wherever applicable, to make use of
204 basic safety publications and/or group safety publications in the preparation of its publications.

205

206 **2 Normative references**

207 This clause of IEC 61558-1 is applicable, except as follows:

208 *Addition*

209 IEC 60068-2-27:2008, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

210 IEC 60439-4:2012, *Low-voltage switchgear and controlgear assemblies – Part 4: Particular*
211 *requirements for assemblies for construction sites (ACS)*

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

214 IEC 61558-2-16:2021, *Safety of transformers, reactors, power supply units and combinations*
215 *thereof – Part 1: Particular requirements and tests for switch mode power supply units and*
216 *transformers for switch mode power supply units for general applications*

217

218 **3 Terms and definitions**

219 For the purposes of this document, the terms and definitions given in IEC 61558-1 apply.

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

226 **3.2 General terms**

227 *Addition*

228 **3.2.101**229 **low voltage switchgear and controlgear assembly for construction sites (ACS)**

230 combination of one or several transforming or switching devices with associated control,
231 measuring, signalling, protective and regulating equipment complete with all their internal
232 electrical and mechanical connections and structural parts, designed and built for use on all
233 construction sites, indoors or outdoors

234

235 **4 General requirements**

236 This clause of IEC 61558-1 is applicable.

237

238 **5 General notes on tests**

239 This clause of IEC 61558-1 is applicable.

240

241 **6 Ratings**

242 This clause of IEC 61558-1 is applicable except as follows:

243 *Addition*

244 **6.101** The **rated output voltage** shall not exceed:

- 245 – 250 V AC for **isolating transformers** with a non-earthed mid-point (single-phase) or a
246 non-earthed star-point (three-phase) or delta connection (three-phase);
- 247 – 115 V AC for **isolating transformers** with a mid-point (single-phase) earthed in the
248 construction or a star-point (three-phase) earthed in the construction;
- 249 – 50 V AC for **safety isolating transformers**.

250 The **rated output voltage** shall exceed:

- 251 – 50 V AC for **isolating transformers**

252 Preferred values for the **rated output voltage** are

- 253 – 115 V and 230 V for **portable**, single-phase **isolating transformers**;
- 254 – 72 V, 115 V and 230 V for other **isolating transformers**;
- 255 – 6 V, 12 V, 24 V, 42 V and 48 V for **safety isolating transformers**.

256

257 **6.102** The **rated output** shall not exceed:

- 258 – 25 kVA for single-phase **isolating** and **safety isolating transformers**;
- 259 – 40 kVA for polyphase **isolating** and **safety isolating transformers**;

260

261 Preferred values for the **rated output** are

- 262 – 25 VA, 40 VA, 63 VA, 100 VA, 160 VA, 250 VA, 400 VA, 630 VA, 1 000 VA, 1 600 VA,
263 2 500 VA, 4 000 VA, 6 300 VA, 10 kVA, 16 kVA and 25 kVA for single-phase
264 **transformers**;

265 – 630 VA, 1 000 VA, 1 600 VA, 2 500 VA, 4 000 VA, 6 300 VA, 10 kVA, 16 kVA, 25 kVA
266 and 40 kVA for polyphase **transformers**.

267 **Intermittent duty cycle** can be assigned only to **portable transformers** having a **rated output**
268 not exceeding 6,3 kVA.

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

271

272 **6.103** The **rated supply frequency** shall not exceed 500 Hz.

273

274 **6.104** The **rated supply voltage** shall not exceed 1 000 V AC.

275

276 **6.105 Transformers** with **intermittent duty cycle** shall be intended for a **rated** operating time
277 of 5 min "on" and a resting time of 15 min "off".

278

279 **6.106** The supply current is limited to a maximum of 125 A, and in the case of flexible cable or
280 socket outlet, to 63 A.

281 *Compliance with 6.101 to 6.106 is checked by inspection of the marking.*

282

283 **7 Classification**

284 This clause of IEC 61558-1 is applicable, except as follows:

285

286 *Replacement*

287 **7.5 Transformers** are classified in accordance with their duty type:

288 – **continuous duty**;

289 – **intermittent duty cycle**.

290

291 **8 Marking and other information**

292 This clause of IEC 61558-1 is applicable, except as follows:

293

294 **8.1** h)

295 *Replacement of the content up to the first semi-colon by the following:*

296 relevant graphical symbols shown in Table 101 that indicate the kind of **transformer**

297

298 **8.11**

299 *Addition*

300 The symbol for linear **power supply units** shall be used in conjunction with the symbol
301 indicating the kind of **transformer**.

302