



SLOVENSKI STANDARD

oSIST prEN IEC 61439-3:2022

01-oktober-2022

Sestavi nizkonapetostnih stikalnih in krmilnih naprav - 3. del: Električni razdelilniki, s katerimi lahko ravnajo nestrokovnjaki (DBO)

Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons (DBO)

Niederspannungs-Schaltgerätekombinationen - Teil 3: Installationsverteiler für die Bedienung durch Laien (DBO)

Ensembles d'appareillage à basse tension - Partie 3: Tableaux de répartition destinés à être utilisés par des personnes ordinaires (DBO)

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SECRETARIAT: Germany	SECRETARY: Mr Jörg Hußmann
OF INTEREST TO THE FOLLOWING COMMITTEES: TC 18,TC 44,TC 64,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.
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TITLE:

Low-voltage switchgear and controlgear assemblies - Part 3: Distribution boards intended to be operated by ordinary persons (DBO)

PROPOSED STABILITY DATE: 2026

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR ASSEMBLIES –

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**Part 3: Distribution boards intended to be operated
by ordinary persons (DBO)**

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FOREWORD

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8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

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International Standard IEC 61439-3 has been prepared by subcommittee 121B: Low-voltage switchgear and controlgear assemblies, of IEC technical committee 121: Switchgear and controlgear and their assemblies for low voltage.

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This second edition cancels and replaces the first edition published in 2012, corrigendum 1 (2013) and corrigendum 2 (2019). It constitutes a technical revision.

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

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- a) XX
- b) XX
- c) alignment with the structure of IEC 61439-1, 2020;
- d) general editorial review.

120

The text of this standard is based on the following documents:

FDIS	Report on voting
121B/XXX/FDIS	121B/XXX/RVD

121
122 Full information on the voting for the approval of this standard can be found in the report on
123 voting indicated in the above table.

124 This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

125 This standard is to be read in conjunction with IEC 61439-1:2020. The provisions of the general
126 rules dealt with in IEC 61439-1 are only applicable to this standard insofar they are specifically
127 cited. When this standard states “addition” “modification” or “replacement”, the relevant text in
128 IEC 61439-1:2020 is to be adapted accordingly.

129 Subclauses that are numbered with a 101 (102, 103, etc.) suffix are additional to the same
130 subclause in Part 1.

131 Tables and figures in this document that are new are numbered starting with 101.

132 New annexes in this document are lettered AA, BB, etc.

133 The reader’s attention is drawn to the fact that Annex DD lists all of the “in some-country”
134 clauses on differing practices of a less permanent nature relating to the subject of this standard.

135 A list of all parts of the IEC 61439 series, under the general title *Low-voltage switchgear and*
136 *controlgear assemblies* can be found on the IEC website.

137 The committee has decided that the contents of this publication will remain unchanged until the
138 stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to
139 the specific publication. At this date, the publication will be

- 140 • reconfirmed,
- 141 • withdrawn,
- 142 • replaced by a revised edition, or
- 143 • amended.

144 <https://standards.iteh.ai/catalog/standards/sist/054aef11-0d56-4ad3-acc6-1e8fd04d89ab/osist-pren-iec-61439-3-2022>
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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR ASSEMBLIES –

Part 3: Distribution boards intended to be operated by ordinary persons (DBO)

1 Scope

Clause 1 of IEC 61439-1:2020 is applicable except as follows.

Replacement:

This part of IEC 61439 defines the specific requirements for distribution boards intended to be operated by ordinary persons (abbreviated DBO throughout this document see 3.1.101) as follows:

- assemblies intended to be operated by ordinary persons (e.g. switching operations and replacing fuse-links), e.g. in domestic (household) applications;
- assemblies containing outgoing circuits with protective devices intended to be operated by ordinary persons, complying e.g. with IEC 60898-1, IEC 61008, IEC 61009, IEC 62606, IEC 62423 and IEC 60269-3;
- assemblies for applications where the nominal voltage to earth does not exceed 300 V AC (see table G.1 of Annex G of IEC 61439-1 :2020);
- assemblies with a rated current (I_{nc}) of the outgoing circuits not exceeding 125 A and the rated current (I_{nA}) not exceeding 250 A;
- assemblies intended for use in connection with the generation, transmission, distribution and conversion of electrical energy, and for the control of equipment consuming electrical energy and for associated data processing;
- enclosed, stationary assemblies;
- assemblies for indoor or outdoor use.

DBOs can contain only: protection devices, control / signalling devices, or a combination of devices .e.g. circuit-breakers, WI/Fi router, load shedding relay, energy management, communication devices, lighting control.

This standard does not apply to an empty enclosure nor to individual devices and self-contained components, such as circuit-breakers, fuse switches, electronic equipment, etc. which comply with the relevant product standards, it describes the integration of devices and / or self-contained components into a DBO or into an empty enclosure forming a DBO.

This standard applies to DBOs designed, manufactured and verified on a one-off basis or fully standardised and manufactured in quantity.

DBOs may be assembled outside the factory of the original manufacturer. DBOs may be assembled by the original manufacturer or by an assembly manufacturer.

This standard does not apply to the specific types of assemblies covered by other parts of IEC 61439.

NOTE Enclosures for electrical accessories for household and similar fixed electrical installations are covered in IEC 60670-24

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Clause 2 of IEC 61439-1:2020 is applicable in addition to the following.

192 *Addition:*

193 IEC 60068-2-75, *Environmental testing – Part 2: Tests – Test Eh: Hammer tests*

194 IEC 60269-3, *Low-voltage fuses – Part 3: Supplementary requirements for fuses for use by*
 195 *unskilled persons (fuses mainly for household and similar applications) – Examples of*
 196 *standardized systems of fuses A to F*

197 IEC 60364-8-2, *Low-voltage electrical installations - Part 8-2: Prosumer's low-voltage electrical*
 198 *installations*

199 IEC 60898-1, *Electrical accessories – Circuit-breakers for overcurrent protection for household*
 200 *and similar installations – Part 1: Circuit-breakers for a.c. operation*

201 IEC 60669-2-4, *Switches for household and similar fixed electrical installations - Part 2-4:*
 202 *Particular requirements - Isolating switches*

203 IEC 60947-3, *Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-*
 204 *disconnectors and fuse-combination units*

205 IEC 61008 (all parts), *Residual current operated circuit-breakers without integral overcurrent*
 206 *protection for household and similar uses (RCCBs)*

207 IEC 61009 (all parts), *Residual current operated circuit-breakers with integral overcurrent*
 208 *protection for household and similar uses (RCBOs)*

209 IEC 61439-1:2020, *Low-voltage switchgear and controlgear assemblies – Part 1: General rules*

210 IEC 62423:2009, *Type F and type B residual current operated circuit-breakers with and without*
 211 *integral overcurrent protection for household and similar uses*

212 IEC 62262, *Degrees of protection provided by enclosures for electrical equipment against*
 213 *external mechanical impacts (IK code)*

214 IEC 62606:2017, *General requirements for arc fault detection devices*

215 **3 Terms and definitions**

216 For the purposes of this document, the terms and definitions given in IEC 61439-1:2020 and
 217 the following apply.

218 ISO and IEC maintain terminological databases for use in standardization at the following
 219 addresses:

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

222

223 Clause 3 of IEC 61439-1:2020 is applicable except as follows.

224 **3.1 General terms**

225 *Additional terms and definitions:*

226 **3.1.101**

227 **distribution board intended to be operated by ordinary persons**

228 **DBO**

229 assembly used to distribute and control electrical energy for all types of electrical supplies and
 230 loads, intended for operation by ordinary persons (see 8.4.6.1 IEC 61439-1:2020)

231 Note 1 to entry: Switching operations and replacing fuse-links are examples of operations intended to be carried out
 232 by ordinary persons.

233 Note 2 to entry: This does not preclude the DBO being operated by skilled / instructed persons and also being used
234 in non-domestic installations.

235 **4 Symbols and abbreviations**

236 Clause 4 of IEC 61439-1:2020 is applicable.

237 **5 Interface characteristics**

238 Clause 5 of IEC 61439-1:2020 is applicable except as follows.

239 **5.1 General**

240 *Addition:*

241 This objective can be achieved through one of two typical processes; the user will either select
242 a catalogue product, the characteristics of which meet the required user needs, or make a
243 specific agreement with the manufacturer.

244 In both cases, the specification schedule according to Annex AA is intended to help the user to
245 provide all data necessary to specify, and to help the manufacturer to characterize the actual
246 DBO. In some cases information declared by the DBO manufacturer may take the place of an
247 agreement.

248 **5.2.4 Rated impulse withstand voltage (U_{imp}) (of the assembly)**

249 *Replacement:*

250 The rated impulse withstand voltage of the assembly shall be equal to or higher than the values
251 stated for the transient overvoltage's occurring in the electrical system(s) to which the circuit is
252 designed to be connected.

253 DBO's shall comply with a minimum overvoltage category III (see IEC 60364-4-44) according
254 to Table G.1 of Annex G of IEC 61439-1:2020.

255 **5.3.1 Rated current of an assembly (I_{nA})**

256 *Addition:*

257 See Annex CC.1 for when a generator e.g. photovoltaic systems, wind turbines, batteries is used as
258 an additional source of supply in parallel with another source that is connected to the DBO. .

259 **5.4 Rated diversity factor (RDF)**

260 *Addition:*

261 In the absence of an agreement between the DBO manufacturer and user concerning the actual
262 load currents, the type of load, the assumed loading of the outgoing circuits of the DBO or group
263 of outgoing circuits may be based on the values in Table 101.

264 The assumed load current is the rated current of the protective device, I_n , as required by the user,
265 multiplied with the loading factor of Table 101.

266 **6 Information**

267 Clause 6 of IEC 61439-1:2020 is applicable except as follows.

268 **6.1 Assembly designation marking**

269 *Addition to first paragraph:*

270 The test of 10.2.7.1 only applies to DBOs intended for outdoor installation.

271 *Addition of the following new items:*

272 h) degree of protection if greater than IP 2XC.

273 **6.2.2 Instructions for handling, installation, operation and maintenance**

274 *Addition to first paragraph:*

275 If required, the original or assembly manufacturer shall provide in their documentation, any
276 routine verification required to be carried out by the installer for the DBO to conform to IEC
277 61439-3.

278 **6.3 Device and/or component identification**

279 *Addition:*

280 For RCDs supplying more than one final circuit, it shall be possible for ordinary persons to identify
281 which outgoing circuits the RCD supplies e.g. by providing labels for the installer to apply to the DBO
282 after installation. The identification means shall be visible without accessing live parts.

283 **7 Service conditions**

284 Clause 7 of IEC 61439-1:2020 is applicable except as follows.

285 **7.1.2 Pollution degree**

286 *Addition:*

287 A minimum pollution degree 2 applies.

288 **8 Constructional requirements**

289 Clause 8 of IEC 61439-1:2020 is applicable except as follows.

290 **8.1.3.2.2 Resistance of insulating materials to normal heat**

291 *Addition:*

292 *Note* This clause applies to covers and enclosures made of insulating materials.

293 **8.2.1 Protection against mechanical impact (IK code)**

294 *Replacement:* <https://standards.iteh.ai/catalog/standards/sist/054aef11-0d56-4ad3-acc6-1e8fd04d89ab/osist-pren-iec-61439-3-2022>

295 The DBO shall comply with the following IK codes according to IEC 62262

296 – IK 05 for a DBO for indoor use.

297 – IK 07 for a DBO for outdoor use.

298 Compliance shall be verified according to 10.2.6.

299 **8.2.2 Protection against contact with live parts, ingress of solid foreign bodies and water**
300 **(IP code)**

301 *Replacement of the second paragraph:*

302 The degree of protection of a DBO shall be at least IP 2XC after installation in accordance with
303 the DBO manufacturer's instructions.

304 IP 2XC shall be maintained when operating devices e.g. switching and operating test buttons
305 in normal use. The degree of protection can be temporarily reduced when permitted in a product
306 standard for use by ordinary / unskilled persons e.g. IEC 60269-3 for replacing a fuse-link, the
307 degree of protection may temporarily be reduced to IP1X.

308 Deletion of 5th and 6th paragraphs and the associated EXAMPLES

309 **8.4.2.3 Barriers or enclosures**

310 *Replacement of first paragraph:*

311 Air-insulated live parts shall be inside enclosures or behind barriers. The enclosures or barriers
312 shall provide a degree of protection of at least IPXXC.

313 **8.5.3 Selection of switching devices and components**

314 *Addition:*

315 When a switch-disconnector, circuit-breaker without overcurrent protection or an isolating
316 switch is incorporated in the DBO, it shall conform to IEC 60947-3, IEC 60947-2 or IEC 60669-
317 2-4 as appropriate to the DBO ratings.

318 Outgoing circuits shall contain protective devices, intended to be operated by ordinary persons,
319 e.g. conforming to IEC 60898-1, IEC 61008, IEC 61009, IEC 62423, IEC 62606 and
320 IEC 60269-3.

321 An incoming protective device incorporated within the DBO not conforming to a product
322 standard intended to be operated by ordinary persons, shall require a key or tool for re-closing
323 after tripping and for the replacement of a fuse. Alternatively, a label shall be located in the
324 vicinity of the incoming protective device stating that re-closing of the tripped device and the
325 replacement of a fuse shall only be carried out by an instructed or skilled person.

326 Circuit-breakers shall be designed or installed in a way that it shall not be possible to modify
327 their settings or calibration without a deliberate act involving the use of a key or tool.

328 **8.6.1 Main circuits**

329 *Replacement of second paragraph:*

330 Each of the conductors between the incoming unit and outgoing unit as well as the components
331 included in these units may be rated on the basis of the reduced short-circuit stresses occurring
332 on the load side of the respective outgoing short-circuit protective device, provided that these
333 conductors are arranged so that under normal operation an internal short-circuit between
334 phases and/or between phases and earth is not to be expected (see 8.6.4 of IEC 61439-1:2020).

335 **8.8 Terminals for external cables**

336 *Addition:*

337 When a device or component in an out-going circuit does not incorporate a neutral terminal, the
338 number of neutral terminals of a DBO shall be not less than one outgoing terminal for each
339 outgoing circuit requiring a neutral terminal. These terminals shall be located or identified in the
340 same sequence as their respective line conductor terminals.

341 The maximum number of neutral conductor's that are permitted to be connected to each device
342 or component neutral terminal, shall be as stated in the manufacturer's instructions.

343 DBOs shall have a minimum of two terminals for electrical installation protective bonding
344 conductors.

345 **9 Performance requirements**

346 Clause 9 of IEC 61439-1:2020 is applicable except as follows.

347 **9.1.1 General**

348 Add, at the end of the existing text, the following new note:

349 NOTE IEC 60664-1:2020 contains the requirements for supplementary and reinforced insulation
350 (Class II).

351 **10 Design verification**

352 Clause 10 of IEC 61439-1:2020 is applicable except as follows.

353 **10.2.2.2 Severity test A**

354 *Addition:*

355 The following is an alternative test.

356 All grease is removed from the parts or representative samples of the steel enclosures of the
357 DBO to be tested, by immersion in a cold chemical degreaser such as methyl chloroform or
358 refined petrol for 10 min. The parts are then immersed for 10 min in a 10 % solution of
359 ammonium chloride in water at a temperature of $(20 \pm 5) ^\circ\text{C}$.

360 Without drying but after shaking off any drops, the parts are placed for 10 min in a box
361 containing air saturated with moisture at a temperature of $(20 \pm 5) ^\circ\text{C}$.

362 After the parts have dried for 10 min in a heating cabinet at a temperature of $(100 \pm 5) ^\circ\text{C}$ and
363 have been left at room temperature for 24 h, their surfaces shall show no signs of iron
364 oxidization.

365 Traces of iron oxide on sharp edges and any yellowish film removable by rubbing are ignored.

366 For small helical springs and the like, and for inaccessible parts exposed to abrasion, a layer
367 of grease may provide sufficient protection against iron oxidization. Such parts are subjected
368 to the test only if there is doubt about the effectiveness of the grease film, and the test is then
369 made without previous removal of the grease.

370 **10.2.2.4 Results to be obtained**

371 The first paragraph of IEC 61439-1:2020 does not apply to the alternative test of this standard.

372 **10.2.3.2.1 Verification by test**

373 *Addition:*

374 NOTE 3 $850 ^\circ\text{C}$ does not apply to accessible parts of the enclosure after mounting in hollow walls e.g. covers,
375 doors.

376 **10.2.6 Verification of protection against mechanical impact (IK code)**

377 *Replacement:*

378 Verification of the degree of protection against mechanical impacts shall be carried out in
379 accordance with IEC 62262.

380 The test shall be carried out by means of a hammer test apparatus as described in IEC 60068-
381 2-75, e.g. impact spring hammer at an ambient air temperature between $10 ^\circ\text{C}$ and $40 ^\circ\text{C}$
382 immediately after the DBO has been kept for 2 h at a temperature of $-5 ^\circ\text{C} \pm 1 \text{ K}$ for indoor use
383 and $-25 ^\circ\text{C} \pm 1 \text{ K}$ for outdoor use.

384 Note A test at $-25 ^\circ\text{C}$ for outdoor use also validates the $-5 ^\circ\text{C}$ for indoor use, so only one test at $-25 ^\circ\text{C}$ is required.

385 Compliance is checked on those exposed parts of the DBO which may be subjected to
386 mechanical impact when mounted as in normal use.

387 The sample with cover, or the enclosure, if any, shall be fixed as in normal use or placed against
388 a rigid support.

389 Three blows shall be applied on separate places of each of the accessible faces and door (if
390 provided). The impacts shall be evenly distributed on the faces of the enclosure(s) under test.
391 In no case shall the impacts be applied in the surroundings of the same point of the enclosure.
392 A new sample for each accessible face is used, unless the previous test has not influenced the
393 results of the subsequent test(s), then the sample may be reused. They shall not be applied to
394 knock-outs, built-in components complying with other standards, or other fastening means
395 which are recessed below the surface so as not to be subject to impact.

396 Cable entries which are not provided with knock-outs shall be left open. If they are provided
397 with knock-outs, two of them shall be opened.

398 Before applying the blows, fixing screws of bases, covers and the like shall be tightened with a
399 torque equal to that specified in Table 102.

400 After the test, a visual inspection shall verify that: