

SLOVENSKI STANDARD oSIST prEN IEC 61439-5:2022

01-september-2022

Sestavi nizkonapetostnih stikalnih in krmilnih naprav - 5. del: Sestavi za distribucijo električne energije v javnih omrežjih

Low-voltage switchgear and controlgear assemblies - Part 5: Assemblies for power distribution in public networks

Niederspannungs-Schaltgerätekombinationen - Teil 5: Schaltgerätekombinationen in öffentlichen Energieverteilungsnetzen

Ensembles d'appareillage à basse tension - Partie 5: Ensembles pour réseaux de distribution publique

Ta slovenski standard je istoveten z: prEN IEC 61439-5:2022

<u>ICS:</u>

29.130.20	Nizkonapetostne stikalne in krmilne naprave	Low voltage switchgear and controlgear
29.240.99	Druga oprema v zvezi z omrežji za prenos in distribucijo električne energije	Other equipment related to power transmission and distribution networks

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oSIST prEN IEC 61439-5:2022 https://standards.iteh.ai/catalog/standards/sist/a0d97343-add6-4965-a276e4dbe2837991/osist-pren-iec-61439-5-2022



121B/155/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

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121B/143/CD, 121B/153/CC	

IEC SC 121B : LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR ASSEMBLIES		
SECRETARIAT:	SECRETARY:	
Germany	Mr Jörg Hußmann	
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD:	
SC 17B,TC 18,TC 44,TC 64,SC 121A		
	Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.	
FUNCTIONS CONCERNED:		
	QUALITY ASSURANCE SAFETY	
	NOT 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. <i>Josist-pren-iec-61439-5-2022</i>		
The CENELEC members are invited to vote through the CENELEC online voting system.		

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:

Low-voltage switchgear and controlgear assemblies - Part 5: Assemblies for power distribution in public networks

PROPOSED STABILITY DATE: 2026

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45		INTERNATIONAL ELECTROTECHNICAL COMMISSION
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47 48 49 50		LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR ASSEMBLIES – Part 5: Assemblies for power distribution in public networks
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87 88 89	Int vo an	ternational Standard IEC 61439-5 has been prepared by subcommittee SC121B: Low- Itage switchgear and controlgear assemblies, of IEC technical committee 121: Switchgear id controlgear.
90 91	Th teo	is third edition cancels and replaces the second edition published in 2014. It constitutes a chnical revision.
92 93	Th ed	nis edition includes the following significant technical changes with respect to the latest lition:
94	Th	ne text of this document is based on the following documents:

CDV Report on voting

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

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This publication has been drafted in accordance with the ISO/IEC Directives, Part 2. 98

This document is to be read in conjunction with IEC 61439-1. The provisions of the general 99 rules dealt with in IEC 61439-1 are only applicable to this document insofar as they are 100 specifically cited. When this document states "addition", "modification" or "replacement", the 101 relevant text in IEC 61439-1:2020 is to be adapted accordingly. Subclauses that are 102 numbered with a 101 (102, 103 etc.) suffix are additional to the same subclause in IEC 61439-103 1:2020. 104

105 Tables and figures in this Part 5 that are new are numbered starting with 101.

New annexes in this Part 5 are lettered AA, BB, etc. 106

The reader's attention is drawn to the fact that Annex DD lists all of the "in-some-country" 107 clauses on differing practices of a less permanent nature relating to the subject of this 108 document. 109

A list of all parts of the IEC 61439 series, under the general title Low-voltage switchgear and 110 controlgear assemblies can be found on the IEC website. 111

The committee has decided that the contents of this publication will remain unchanged until 112 the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data 113 related to the specific publication. At this date, the publication will be 114

- reconfirmed, 115 •
- withdrawn, 116 •
- replaced by a revised edition, or ndards.iteh.ai) 117 •
- amended. 118 •
- 119
- 120

121 LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR ASSEMBLIES –

122

Part 5: Assemblies for power distribution in public networks

- 123 124
- 125
- 126

127 **1 Scope**

128 This part of IEC 61439 defines the specific requirements for public electricity network 129 distribution assemblies (PENDAs).

- 130 PENDAs have the following criteria:
- used for the distribution of electrical energy in three phase systems for which the rated
 voltage does not exceed 1 000 V AC (see Figure 101 for a typical distribution network)
 and DC systems not exceeding 1500 V DC;
- 134 stationary;
- 135 open type assemblies are not covered by this document;
- suitable for installation in places where only skilled persons have access for their use,
 however, outdoor types may be installed in situations that are accessible to ordinary
 persons;
- intended for in energy distribution in public power grids 139 use - indoor use: assemblies for installation inside of electric power substations 140 outdoor use: assemblies containing an enclosure suitable for open air installation -141
- The object of this document is to state the definitions and to specify the service conditions, construction requirements, technical characteristics and tests for PENDAs. Network parameters may require tests at higher performance levels.

Design of the de

- PENDAs may also include control and or signalling devices associated with the distribution of electrical energy. e4dbe2837991/osist-pren-iec-61439-5-2022
- 147 NOTE Control and monitoring devices can be used in smart grid applications or the transmission of smart grid data.
- 148 This document applies to all PENDAs whether they are designed, manufactured on a one-off 149 basis or fully standardised and manufactured in quantity.
- The manufacture and/or assembly may be carried out other than by the original manufacturer (see 3.10.1 of IEC 61439-1:2020).
- This document does not apply to individual devices and self-contained components, such as motor starters, fuse switches, electronic equipment, etc. which comply with the relevant product standards.
- If the substation is owned or operated by a public distribution system operator (DSO),
 PENDA's which are used as LV distribution panels in transformer substations are within the
 scope of this standard,
- This document does not apply to specific types of assemblies covered by other parts of IEC 61439 series.

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162

Figure 101 – Typical distribution network

- 163 NOTE 1 If a PENDA is equipped with additional equipment (for example meters), in such a way that the main function is changed considerably, then other standards can also apply as agreed between user and manufacturer
- 164 (see 8.5 of IEC 61439-1:2020). 165
- 166 NOTE 2 Where local regulations and practices permit, a PENDA according to this standard can be used in other than public networks. 167
- NOTE 3 DSO's may define additional requirements for their PENDA's 168
- Normative references h.ai/catalog/standards/sist/a0d97343-add6-4965-a276-2 169
- This clause of IEC 61439-1:2020 applies except as follows. 170
- 171 Addition:
- 172 IEC 60695-11-10:2013, Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods 173
- IEC 61439-1:2020, Low-voltage switchgear and controlgear assemblies Part 1: General 174 rules 175
- ISO 9223:2012, Corrosion of metals and alloys Corrosivity of 176 atmospheres — Classification, determination and estimation 177
- ISO 6506-1:2014:2014, Metallic materials Brinell hardness test Part 1: Test method 178

Terms and definitions 179 3

This clause of IEC 61439-1:2020 applies except as follows. 180

3.1 General terms 181

182 Additional terms:

183 **3.1.101**

184 public electricity network distribution assembly

185 **PENDA**

Assembly, generally for installation in a public electricity network which in use, receives

- electrical energy from one or more supplies and distributes that energy through one or more cables to other equipment
- 189 Note 1 to entry: A PENDA is installed, operated and maintained solely by skilled persons.
- 190 Note 2 to entry: Some types of a PENDA were previously known as a cable distribution cabinet (CDC).
- 191 **3.1.101.1**

192 outdoor public electricity network distribution assembly

- 193 **PENDA-O**
- 194 cubicle type public electricity network distribution assembly that is suitable for outdoor 195 installation in places that may, or may not, be accessible to the public

196 **3.1.101.2**

197 indoor public electricity network distribution assembly

198 **PENDA-I**

public electricity network distribution assembly suitable for installation indoors, generally
 without an enclosure, but including all structural parts necessary to support busbars,
 functional units and other ancillary devices, necessary to complete the assembly.

202 **3.1.102**

203 **Design life**

- Minimum duration for which specified performance characteristics of equipment are expected when the equipment is operated as intended and regularly maintained by instructed persons in accordance with the manufacturer's instructions.
- ISOURCE: IEC 60050-: 2014, 395-07-93, modified Note to entry omitted and 'granted'
- replaced by 'expected when instructions.']

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210 3.3 External design of assemblies

211 **3.3.1**

209

- 212 open-type assembly
- This term of IEC 61439-1:2020 does not apply.

214 3.9 Verification

- 215 *Modifications*:
- 216 **3.9.1**
- 217 design verification
- 218 Delete the note.

219 **3.9.1.2**

220 verification comparison

This term of IEC 61439-1:2020 does not apply.

222 **3.9.1.3**

- 223 verification assessment
- This term of IEC 61439-1:2020 does not apply.

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4 Symbols and abbreviations

This clause of IEC 61439-1:2020 applies.

227 5 Interface characteristics

This clause of IEC 61439-1:2020 applies except as follows.

229 5.4 Rated diversity factor (RDF)

230 Addition:

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

For distribution and final circuits, it is assumed load current is the rated current of the protective device, *I*n, as required by the user, multiplied with the loading factor of Table 101.

236

Table 101 – Values of assumed loading

Application	Assumed	
	Loading	
iTeh STANDAR	factor DRRV	
Regular distribution grid connections 2-3 circuits	0.9 siteh ai)	
Regular distribution grid connections 4-5 circuits	0.8	
Regular distribution grid connections OSISS PTEN PTEN	6 <mark>.7</mark> 39-5:2022 ds/sist/a0d97343-add6	4965-a27
Regular distribution grid connections 283/991/081st-pro	10.6°C-01439-5-2022	
≥ 10 circuits		
Generation supply (e,g. PV, wind farm, biomass)	1.0]
Charging infrastructure for EV	1.0	

237

238 6 Information

This clause of IEC 61439-1:2020 applies except as follows.

240 6.1 Assembly designation marking

241 Addition to first paragraph:

Designation plates may be placed inside an enclosure of an assembly provided their intended place ensures good legibility and visibility when the door(s) is open or the cover is removed.

- 244 Replacement of item d):
- 245 d) IEC 61439-5.
- 246 6.3 Device and/or component identification
- 247 Additional paragraph:

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In the case of removable fuse-carriers which are specific to a fuseway, a label shall be placed on the fuse carrier as well as on the fuse base, to avoid incorrect interchangeability of the fuse-carrier.

251 Additional subclause:

252 6.101 Circuit identification

It shall be possible to identify each functional unit in a clearly visible manner.

254 **7** Service conditions

This clause of IEC 61439-1:2020 applies except as follows.

7.1 Normal service conditions

257 **7.1.1 Climatic conditions**

258 Addition to the first paragraph:

Unless the user specifies a PENDA shall be suitable for use in an arctic climate, the lower limit of ambient air temperature is -25 °C as specified in Table 15 of IEC 61439-1:2020. For an arctic climate the lower limit of ambient temperature is -50 °C.

262 7.2 Special service conditions

- Addition of the following note to item h):
- 264 Additional paragraph:

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Additional requirements for a PENDA-O, to be installed where heavy snowfalls occur and where they are adjacent to areas where there is snow clearance by ploughing, are subject to agreement between manufacturer and user.

268 8 Constructional requirements

This clause of IEC 61439-1:2020 applies except as follows.

8.1 Strength of materials and parts

- 271 8.1.1 General
- 272 Addition:

A PENDA-O shall be arranged for ground mounting, transformer mounting, pole mounting, surface wall mounting or mounting within a recess within a wall, as agreed between user and manufacturer.

A PENDA may be direct coupled to a transformer by means of a flange coupling or it may connect to its supply by means of cable or via busbars as agreed between user and manufacturer. Outgoing circuits shall be suitable for connection by means of cables.

A reliable locking device shall be provided on outdoor enclosures which prevents access by

- unauthorized persons. The fixings of any covers etc. which are removable for installation or
- maintenance operations shall only be accessible while the door(s) are open

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Doors, lids and covers shall be so designed that, after they are locked, they do not open due to subsequent moderate ground settlement, nor due to exposure to vibration arising from traffic and/or ground excavation and reinstatement works.

Any auxiliary equipment, e.g. meters, relays, instruments, circuit breaker trip units, communications equipment, that can be readily replaced, are excluded from the minimum design life of a PENDA.

Note Typically the design live of a PENA is 30 years, assuming it is operated as intended and regularly maintained by instructed personnel in accordance with the manufacturer's instructions.

290 **8.1.3.2** Resistance of insulating materials to heat and fire

291 Additional subclause:

292 8.1.3.2.101 Verification of category of flammability

The insulating materials used for enclosures, barriers and other insulating parts shall have flame retardant properties in accordance with 10.2.3.101 of this document.

295 8.1.5 Mechanical strength

296 Additional subclause:

297 8.1.5.101 Verification of mechanical strength

- The mechanical properties of a PENDA-O shall comply with 10.2.101 of this standard.
- Parts of the PENDA-O intended to be embedded in the ground shall withstand the stresses imposed on them during installation and normal service and comply with 10.2.101.9.
- 301 Additional subclause:
- oSIST prEN IEC 61439-5:2022
- https://standards.iteh.ai/catalog/standards/sist/a0d97343-add6-4965-a276-
- **8.2 Degree of protection provided by an assembly enclosure**

8.2.1 Protection against mechanical impact

- 304 Subclause 8.2.1 of IEC 61439-1:2020 does not apply.
- The mechanical impact tests required by this document are at least equal to IK10 in accordance with IEC 62262 (see 8.1.5.101).

3078.2.2 Protection against contact with live parts, ingress of solid foreign bodies and
water308water

- 309 Addition:
- Open type assemblies (IP00) are not covered by this document.

When a PENDA-O is intended to be installed in places accessible to the public, its enclosure shall, when fully-installed in accordance with the manufacturer's instructions, provide a degree of protection of at least IP34D according to IEC 60529. In other locations, the minimum level of protection shall be at least IP33.

PENDA-O's that are intended to be installed in places accessible to the public shall, unless otherwise stated by the user, be designed such that when any temporary cables are connected, the enclosure shall provide a degree of protection of at least IP23C according to IEC 60529. See 8.8 of this document.