

---

**Visokonapetostne stikalne in krmilne naprave - 3. del: Digitalni vmesniki, ki temeljijo na IEC 61850**

High-voltage switchgear and controlgear - Part 3: Digital interfaces based on IEC 61850

Hochspannungs-Schaltgeräte und -Schaltanlagen - Teil 3: Digitale Schnittstellen nach IEC 61850

Appareillage à haute tension - Partie 3: Interfaces numériques basées sur l'IEC 61850

**Ta slovenski standard je istoveten z: prEN IEC 62271-3:2025**

---

[oSIST prEN IEC 62271-3:2026](https://standards.iteh.ai/catalog/standards/sist/a93b52d6-216b-4131-acb2-92161e4888da/osist-pren-iec-62271-3-2026)

<https://standards.iteh.ai/catalog/standards/sist/a93b52d6-216b-4131-acb2-92161e4888da/osist-pren-iec-62271-3-2026>

**ICS:**

29.130.10	Visokonapetostne stikalne in krmilne naprave	High voltage switchgear and controlgear
35.200	Vmesniška in povezovalna oprema	Interface and interconnection equipment

**oSIST prEN IEC 62271-3:2026**

**en**





17/1189/CDV

## COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:

**IEC 62271-3 ED3**

DATE OF CIRCULATION:

**2025-12-05**

CLOSING DATE FOR VOTING:

**2026-02-27**

SUPERSEDES DOCUMENTS:

**17/1159/CD, 17/1170A/CC**

IEC TC 17 : HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR

SECRETARIAT:

Sweden

SECRETARY:

Mr Arjan Bronsveld

OF INTEREST TO THE FOLLOWING COMMITTEES:

SC 17A, TC 38, TC 57, TC 77, TC 95

HORIZONTAL FUNCTION(S):

ASPECTS CONCERNED:

Electromagnetic Compatibility, Safety

☒ 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.

☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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.

Recipients of this document are invited to submit, with their comments, notification of any relevant "In Some Countries" clauses to be included should this proposal proceed. Recipients are reminded that the CDV stage is the final stage for submitting ISC clauses. (SEE [AC/22/2007](#) OR [NEW GUIDANCE DOC](#)).

TITLE:

**High-voltage switchgear and controlgear – Part 3: Digital interfaces based on IEC 61850**

PROPOSED STABILITY DATE: 2032

NOTE FROM TC/SC OFFICERS:

**Copyright © 2025 International Electrotechnical Commission, IEC.** All rights reserved. It is permitted to download this electronic file, to make a copy and to print out the content for the sole purpose of preparing National Committee positions. You may not copy or "mirror" the file or printed version of the document, or any part of it, for any other purpose without permission in writing from IEC.

## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
0.1    General.....	6
0.2    Position of this standard in relation to the IEC 61850 series.....	6
0.3    Position of this standard in relation to IEC 60255-216-2.....	6
1.    Scope.....	7
1.1.    General.....	7
1.1.1.    Particular subjects within the scope of this standard: .....	8
1.1.2.    Particular subjects outside the scope of this standard: .....	8
1.2.    Data model Namespace name and version .....	8
1.3.    Data model Namespace Code Component distribution .....	9
2.    Normative references .....	10
3.    Terms and definitions .....	11
4.    Normal and special service conditions .....	15
5.    Ratings and classifications / logical node classes .....	16
5.1.    General.....	16
5.2.    Package LNGroupX .....	17
5.2.1.    General .....	17
5.2.2.    Classes list.....	18
5.2.3.    LN: Circuit breaker / Name: XCBRExt.....	18
5.2.4.    LN: Circuit switch / Name: XSWIExt.....	20
5.3.    LNs on the process level of a high-voltage switchgear .....	21
5.4.    Communication services .....	23
5.4.1.    Conformance classes .....	23
5.4.2.    ACSI basic conformance statement .....	23
5.4.3.    ACSI models conformance statement .....	25
5.4.4.    ACSI service conformance statement .....	27
5.5.    Timing requirements .....	27
5.5.1.    General .....	27
5.5.2.    Opening and closing times for circuit-breakers.....	29
5.6.    Cyber security.....	32
5.7.    Performance requirements.....	32
5.7.1.    Performance classes .....	32
5.7.2.    Dependability.....	32
5.7.3.    Maximum expansion of the network .....	33
6.    Design and construction .....	33
6.1.    General.....	33
6.1.1.    Typical location of switchgear controllers and communication devices .....	33
6.1.2.    Typical system topology .....	36
6.1.3.    Typical controller system redundancy .....	39
6.2.    Technological boundaries .....	39
6.2.1.    General .....	39
6.2.2.    Interface point .....	40
6.2.3.    Transmission systems .....	40
6.2.4.    Human machine interface .....	40

## IEC CDV 62271-3 © IEC 2025

6.3.	Mechanical requirements .....	40
6.3.1.	Mechanical stresses .....	40
6.3.2.	Degree of protection provided by enclosures .....	40
6.3.3.	Degree of protection for connectors .....	40
6.3.4.	Accessibility .....	41
6.4.	Electrical requirements .....	41
6.5.	EMC .....	41
6.6.	Electronic nameplates .....	41
6.7.	Implementation of IEC 61850 interface .....	41
7.	Type tests .....	42
7.1.	General.....	42
7.2.	Switchgear communication interface conformance tests .....	42
7.3.	Time measurement of switchgear .....	43
7.3.1.	Circuit-breakers .....	43
7.3.2.	Other switchgear .....	46
8.	Routine tests .....	46
9.	Information to be given with enquiries, tenders and orders .....	47
10.	Rules for transport, storage, installation, operation and maintenance .....	47
11.	Safety .....	47
Annex A (normative)	Test overview table .....	48
Annex B (normative)	Electronic nameplates .....	49
B.1	General.....	49
B.2	Electronic nameplate for circuit breaker .....	49
B.3	Electronic nameplate for switchgear other than circuit breakers .....	49
Annex C (informative)	Test procedures .....	52
C.1	Performance type testing – operation time .....	52
C.2	Performance type testing – make and break time .....	52
Annex D (informative)	Communication device – use case examples.....	54
Annex E (informative)	Specific model to highlight the scope of standard IEC 62271-3.....	56
Annex F (informative)	Treatment of three-position switches .....	57
Annex G (informative)	Data Model for Circuit Breaker .....	59
Annex H (informative)	Data Model for Disconnectors .....	63
Bibliography.....		66
Figure 1 – Scope of standard IEC 62271-3 .....		7
Figure 2 – Class diagram LogicalNodes_62271_3: LogicalNodes_62271_3 .....		16
Figure 3 – Class diagram LNGroupX::LNGroupX.....		17
Figure 4 – Calculation of intelligent switchgear operating times (example 1) .....		28
Figure 5 – Calculation of intelligent switchgear operating times (example 2) .....		29
Figure 6 – Opening or closing signal to intelligent switchgear .....		30
Figure 7 – Opening or closing signal to conventional switchgear .....		30
Figure 8 – Opening operation of an intelligent circuit-breaker .....		31
Figure 9 – Closing operation of an intelligent circuit-breaker .....		32
Figure 10 – GIS (example 1) .....		33

## IEC CDV 62271-3 © IEC 2025

Figure 11 – Secondary system in medium voltage cubicle (example 2) .....	34
Figure 12 – AIS circuit-breaker (example 3) .....	35
Figure 13 – AIS circuit-breaker (example 4) .....	36
Figure 14 – GIS (example 1) with Ethernet based communication network .....	37
Figure 15 – GIS (example 2) with Ethernet based communication network .....	38
Figure 16 – AIS circuit-breaker (example 3) with Ethernet based communication network .....	38
Figure 17 – AIS circuit-breaker (example 4) with Ethernet based communication network .....	39
Figure 18 – Performance test of an intelligent switchgear (configuration 1) .....	43
Figure 19 – Performance test of an intelligent switchgear (configuration 2) .....	45
Figure C.1 – Performance test of an intelligent switchgear operation time .....	52
Figure C.2 – Performance test of an intelligent switchgear – CB make and break time .....	53
Figure D.1 - Switchgear controllers connected to Com device via Ethernet link .....	54
Figure D.2 - Switchgear controllers as part of communication device .....	55
Figure E.1- Specific model to highlight the scope of standard IEC 62271-3 .....	56
Figure F.1 – Combination of two instances of LN class XSWI .....	57
Figure F.2 – Derivation of intermediate position .....	57
Table 1 – Attributes of IEC 62271-3:2025A namespace .....	9
Table 2 – Normative abbreviations for data object names .....	15
Table 3 – List of classes defined in LNGroupX package .....	18
Table 4 – Data objects of XCBRExt .....	19
Table 5 – Data objects of XSWIExt .....	21
Table 6 – LNs in switchgear communication interface .....	22
Table 7 – ACSI basic conformance statement .....	24
Table 8 – ACSI models conformance statement .....	26
Table 9 – ACSI service conformance statement .....	27
Table A.1 – Test overview table .....	48
Table B.1 – Common data class VSD .....	49
Table B.2 – Mapping of IEC 61850 data objects on IEC 62271 (1 of 2) .....	50
Table B.3 – Mapping of IEC 61850 data objects on IEC 62271 (2 of 2) .....	51
Table F.1 – Summary of all possible switching states .....	58
Table G.1 – LN used for circuit breaker data model .....	59
Table G.2 – Data model of phase segregated circuit breaker .....	59
Table G.3 – Data model of circuit breaker with coupled poles .....	61
Table H.1 – LN used for disconnecter data model .....	63
Table H.2 – Data model of phase segregated disconnecter .....	63
Table H.3 – Data model of disconnecter with coupled poles .....	64

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

## Part 3: Digital interfaces based on IEC 61850

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 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.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62271-3 has been prepared by IEC technical committee 17: Switchgear and controlgear. This third edition cancels and replaces the second edition published in 2015. This edition constitutes a technical revision.

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

- a) Scope of this standard is explained in more detail (subclauses 1.1.1 and 1.1.2)
- b) Logical node classes, constructed classes structure and descriptions (subclause 5.2)
- c) Definition of the term “communication devices” in the context of this standard has been added (subclause 3.23)
- d) an update to the latest edition(s) of IEC 61850 series
- e) an update of normative references
- f) the Annex C gives an additional simplified example for performance type testing
- g) the definition of switchgear controller was improved (subclause 3.21)