SVENSK STANDARD SS-EN 62271-3

Fastställd	Utgåva	Sida	Ansvarig kommitté
2006-12-18	1	1 (1+48)	SEK TK 17AC

Kopplingsapparater för spänning över 1 kV – Del 3: Digitala gränssnitt baserade på IEC 61850

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

Som svensk standard gäller europastandarden EN 62271-3:2006. Den svenska standarden innehåller den officiella engelska språkversionen av EN 62271-3:2006.

Nationellt förord

Europastandarden EN 62271-3:2006[*)]

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 62271-3, First edition, 2006 - High-voltage switchgear and controlgear - Part 3: Digital interfaces based on IEC 61850**

utarbetad inom International Electrotechnical Commission, IEC.

Standarden ska användas tillsammans med samtliga delar av SS-EN 61850 och SS-EN 62271.

[*)] EN 62271-3:2006 ikraftsattes 2006-12-18 som SS-EN 62271-3 genom offentliggörande, d v s utan utgivning av något svenskt dokument.

ICS 29.130.10

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62271-3

November 2006

ICS 29.130.10

English version

High-voltage switchgear and controlgear
Part 3: Digital interfaces based on IEC 61850
(IEC 62271-3:2006)

Appareillage à haute tension
Partie 3: Interfaces numériques
basées sur la CEI 61850
(CEI 62271-3:2006)

Hochspannungs-Schaltgeräte
und -Schaltanlagen
Teil 3: Digitale Schnittstellen
nach IEC 61850
(IEC 62271-3:2006)

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 62271-3:2006 E

SEK Svensk Elstandard

Foreword

The text of document 17C/369/FDIS, future edition 1 of IEC 62271-3, prepared by SC 17C, High-voltage switchgear and controlgear assemblies, of IEC TC 17, Switchgear and controlgear, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62271-3 on 2006-09-01.

This standard has the status of a product family standard and may be used as a normative reference in a dedicated product standard for highvoltage switchgear and controlgear.

This standard is to be read in conjunction with the following documents:

– EN 61850 series "Communication networks and systems in substations"

– EN 62271 series "High-voltage switchgear and controlgear".

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2007-06-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2009-09-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62271-3:2006 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60050-191	1990	International Electrotechnical Vocabulary (IEV) Chapter 191: Dependability and quality of service	-	-
IEC 60265-2	-[1)]	High-voltage switches Part 2: High-voltage switches for rated voltages of 52 kV and above	EN 60265-2	1993[2)]
IEC 60694	-[1)]	Common specifications for high-voltage switchgear and controlgear standards	EN 60694 + corr. May	1996[2)] 1999
IEC 60794	Series	Optical fibre cables	-	-
IEC 60870-4	1990	Telecontrol equipment and systems Part 4: Performance requirements	HD 546.4 S1	1992
IEC 60874-10-3	1997	Connectors for optical fibres and cables Part 10-3: Detail specification for fibre optic adaptor type BFOC/2,5 for single and multimode fibre	-	-
IEC/TR 61850-1	2003	Communication networks and systems in substations Part 1: Introduction and overview	-	-
IEC/TS 61850-2	2003	Communication networks and systems in substations Part 2: Glossary	-	-
IEC 61850-3	2002	Communication networks and systems in substations Part 3: General requirements	EN 61850-3	2002
IEC 61850-4	2002	Communication networks and systems in substations Part 4: System and project management	EN 61850-4	2002
IEC 61850-5	2003	Communication networks and systems in substations Part 5: Communication requirements for functions and device models	EN 61850-5	2003

[1)] Undated reference.

[2)] Valid edition at date of issue.

Publication	Year	Title	EN/HD	Year
IEC 61850-6	2004	Communication networks and systems in substations Part 6: Configuration description language for communication in electrical substations related to IEDs	EN 61850-6	2004
IEC 61850-7-1	2003	Communication networks and systems in substations Part 7-1: Basic communication structure for substation and feeder equipment - Principles and models	EN 61850-7-1	2003
IEC 61850-7-2	2003	Communication networks and systems in substations Part 7-2: Basic communication structure for substation and feeder equipment - Abstract communication service interface (ACSI)	EN 61850-7-2	2003
IEC 61850-7-3	2003	Communication networks and systems in substations Part 7-3: Basic communication structure for substation and feeder equipment - Common data classes	EN 61850-7-3	2003
IEC 61850-7-4	2003	Communication networks and systems in substations Part 7-4: Basic communication structure for substation and feeder equipment - Compatible logical node classes and data classes	EN 61850-7-4	2003
IEC 61850-8-1	2004	Communication networks and systems in substations Part 8-1: Specific Communication Service Mapping (SCSM) - Mappings to MMS (ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3	EN 61850-8-1	2004
IEC 61850-9-1	2003	Communication networks and systems in substations Part 9-1: Specific Communication Service Mapping (SCSM) - Sampled values over serial unidirectional multidrop point to point link	EN 61850-9-1	2003
IEC 61850-9-2	2004	Communication networks and systems in substations Part 9-2: Specific Communication Service Mapping (SCSM) - Sampled values over ISO/IEC 8802-3	EN 61850-9-2	2004
IEC 61850-10	2005	Communication networks and systems in substations Part 10: Conformance testing	EN 61850-10	2005
IEC 62271-102	-[1)]	High-voltage switchgear and controlgear Part 102: Alternating current disconnectors and earthing switches	EN 62271-102 + corr. March	2002[2)] 2005
ISO/IEC 7498	Series	Information technology - Open systems interconnection - Basic reference model	EN ISO/IEC 7498	Series

Publication	Year	Title	EN/HD	Year
ISO/IEC 8802-3	2001	Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications	-	-
ITU-T V.24	2000	List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE)	-	-

CONTENTS

0 Introduction

0.1 General

This standard is a product family standard for high-voltage switchgear and controlgear and assemblies thereof. It provides an application of the horizontal standard series IEC 61850 which details a layered substation communication architecture, in the world of high-voltage switchgear and controlgear.

By providing tutorial material such as examples and explanations, it also gives an access for switchgear experts to concepts and methods applied in the IEC 61850 series.

Compared to switchgear equipment, digital communication technology is subject to ongoing changes which are expected to continue in the future. Profound experience with electronics integrated directly into switchgear has yet to be gathered on a broader basis, as this type of equipment is not widely spread in the industry and a change of metabolism has not yet occurred.

This situation is taken into account in this standard by setting an appropriate validity date and by specifying several options to most of the communication-related requirements, such as connectors or fibres.

0.2 Position of this standard in relation to the IEC 61850 series

The IEC 61850 series is a horizontal standard intended to be used for communication and systems in the substation. The most important parts of this series define:

1. Information models for the substation automation system.
   These information models include both the models of the switchgear (like circuit-breakers and disconnectors) and other process equipment (like instrument transformers), and the models of the substation automation system (like protection relays).
2. The communication between intelligent electronic devices (IEDs) of the substation automation system.
3. A configuration language used to describe the configuration aspects of the substation automation system.
4. Conformance testing of the communication interfaces of the IEDs of the substation automation system including their data models.

Typically, IEDs like bay level controllers interface to switchgear. In that case, the data models of the switchgear are implemented in these devices. However, this is not the only realization. In the case where electronics are integrated direct into switchgear, the above-mentioned data models should be implemented within the switchgear and the switchgear needs to support a communication interface.

IEC 61850, being a horizontal standard series, leaves many options open in order to support present and future requirements of all sizes of substations at all voltage levels.

HIGH-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

Part 3: Digital interfaces based on IEC 61850

1 Scope

This International Standard is applicable to high-voltage switchgear and controlgear (scope of IEC SC 17A) and assemblies thereof (scope of IEC SC 17C) and specifies equipment for digital communication with other parts of the substation and its impact on testing. This equipment for digital communication, replacing metal parallel wiring, can be integrated into the high-voltage switchgear, controlgear, and assemblies thereof, or can be an external equipment in order to provide compliance for existing switchgear and controlgear and assemblies thereof with the standards of the IEC 61850 series.

This International Standard is a product standard based on the IEC 61850 series. It deals with all relevant aspects of switchgear and controlgear, and assemblies thereof with a serial communication interface according to the IEC 61850 series. In particular it defines:

a) A selection of the information models from the IEC 61850 series that shall be supported by such switchgear and controlgear, and assemblies thereof.

b) Conformance classes for the set of communication services that shall be supported by the switchgear and controlgear, and assemblies thereof.

c) Modifications and extensions to type and routine tests of switchgear and controlgear, and assemblies thereof that are required due to the serial communication interface.

d) An extension of the IEC 61850 series' object model for switchgear monitoring.

NOTE 1 It is intended to integrate the extension of the IEC 61850 series' object model for switchgear monitoring into a further revision of the IEC 61850 series. Once this integration is completed, the relevant parts will be removed from this standard.

The document is based on the IEC 61850 series, the horizontal standard series for communication, and specifies the requirements for digital communication equipment used within high-voltage switchgear, controlgear, and assemblies thereof, as well as the relevant testing requirements.

The relevant switchgear standards of the IEC 62271 series are applicable in general, with the additional specifications described in this standard.

NOTE 2 There is a limited activity today concerning switchgear with digital interface for rated voltage levels less than, or equal to, 52 kV. Such switchgear usually does not have integrated digital communication interfaces. If such products are to be developed, this should be done in accordance with the present standard.

NOTE 3 This standard intends to promote interoperability of communication interfaces. Interchangeability is outside the scope of this standard, as there is no requirement for it. Interchangeability is also outside the scope of the IEC 61850 series.

NOTE 4 For an introduction to substation communication and the related terms, definitions and models, refer to IEC 61850-1 which provides an overview of the objectives and requirements of the IEC 61850 series in general. IEC 61850-7-1 provides an overview of modelling techniques.

2 Normative references

The following referenced documents are indispensable for the application 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.

IEC 60050-191:1990, *International Electrotechnical Vocabulary, Chapter 191: Dependability and quality of service*

IEC 60265-2, *High-voltage switches – Part 2: High-voltage switches for rated voltages of 52 kV and above*

IEC 60694, *Common specifications for high-voltage switchgear and controlgear standards*

IEC 60794:2001, *Optical fibre cables*

IEC 60870-4:1990, *Telecontrol equipment and systems – Part 4: Performance requirements*

IEC 60874-10-3: 1998, *Connectors for optical fibres and cables – Detail specification for fibre optic adaptor type BFOC/2,5 for single and multimode fibre*

IEC 61850-1:2003, *Communication networks and systems in substations – Part 1: Concept and principles*

IEC 61850-2:2003, *Communication networks and systems in substations – Part 2: Glossary*

IEC 61850-3:2002, *Communication networks and systems in substations – Part 3: General requirements*

IEC 61850-4:2002, *Communication networks and systems in substations – Part 4: System and project management*

IEC 61850-5:2003, *Communication networks and systems in substations – Part 5: Communication requirements for functions and device models*

IEC 61850-6:2004, *Communication networks and systems in substations – Part 5: Configuration description language for communication in electrical substations related to IEDs*

IEC 61850-7-1:2003, *Communication networks and systems in substations – Part 7-1: Basic communication structure for substation and feeder equipment – Principles and models*

IEC 61850-7-2:2003, *Communication networks and systems in substations – Part 7-2: Basic communication structure for substation and feeder equipment – Abstract communication service interface (ACSI)*

IEC 61850-7-3:2003, *Communication networks and systems in substations – Part 7-3: Basic communication structure for substation and feeder equipment – Common data classes and attributes*

IEC 61850-7-4:2003, *Communication networks and systems in substations – Part 7-4: Basic communication structure for substation and feeder equipment – Compatible logical node and data object addressing*

IEC 61850-8-1:2004, *Communication networks and systems in substations – Part 8-1: Specific communication service mapping (SCSM) – Mappings to MMS (ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3*

IEC 61850-9-1:2003, *Communication networks and systems in substations – Part 9-1: Specific communication service mapping (SCSM) – Sampled values over serial unidirectional multidrop point to point link 2*

IEC 61850-9-2:2004, *Communication networks and systems in substations – Part 9-2: Specific communication service mapping (SCSM) – Sampled values over ISO/IEC 8802-3*

IEC 61850-10:2004, *Communication networks and systems in substations – Part 10: Conformance testing*

IEC 62271-103, *High-voltage switchgear and controlgear – Part 103: Switches for rated voltages above 1 kV and less than 52 kV*

ISO/IEC 7498:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The Basic Model*

ISO/IEC 8802-3:2001, *Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications*

ITU-T V.24:2000, *List of definitions for interchange circuits between data terminal equipment (DTE) and data circuit-terminating equipment (DCE)*