



# SLOVENSKI STANDARD

## SIST EN 50300:2004

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### Low-voltage switchgear and controlgear assemblies - General requirements for low-voltage substation cable distribution boards

Low-voltage switchgear and controlgear assemblies - General requirements for low-voltage substation cable distribution boards

Niederspannungs-Schaltgerätekombinationen - Allgemeine Anforderungen an Niederspannungsverteilungen in Netzstationen

Ensembles d'appareillage à basse tension - Règles générales pour les tableaux de poste basse tension

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#### **ICS:**

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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EUROPEAN STANDARD

**EN 50300**

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English version

**Low-voltage switchgear and controlgear assemblies –  
General requirements for low-voltage  
substation cable distribution boards**

Ensembles d'appareillage à basse tension -  
Règles générales pour les tableaux  
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Allgemeine Anforderungen an  
Niederspannungsverteilungen in  
Netzstationen

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**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**

## Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 17D, Low-voltage switchgear and controlgear assemblies.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50300 on 2004-03-01.

This European Standard is to be used in conjunction with EN 60439-1:1999.

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) 2005-03-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2007-03-01

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## Introduction

The clauses of this standard supplement, modify or replace clauses in EN 60439-1:1999, Low-voltage switchgear and controlgear assemblies - Part 1: Type-tested and partially type-tested assemblies.

Where there is no corresponding clause or subclause in this standard, the clause or subclause of the main document applies without modification.

In view of the fact that this publication is to be read in conjunction with EN 60439-1, the numbering of its clauses and subclauses correspond with the latter.

Subclauses, figures and tables which are additional to those in EN 60439-1 are numbered starting from 101.

## 1 General

### 1.1 Scope and object

This standard gives supplementary requirements for low voltage switchgear and controlgear assemblies for public distribution transforming sub-stations. They are stationary, type tested assemblies (TTA) for installation in places where only authorised persons have access for their use, however, outdoor types may be installed in situations which may be accessible to the public.

They are connected to the low voltage terminals of distribution transformers by means of connecting bars, rods or cables and are for use in low voltage public three phase systems.

Individual components such as fuses and switching devices complying with other standards, shall also comply with the supplementary requirements of this standard.

The object of this standard is to state the definitions and to specify the service conditions, construction requirements, technical characteristics and tests for Substation Cable Distribution Boards. Network parameters may require type tests at higher performance levels.

NOTE Where local regulations and practices permit, a Substation Cable Distribution Board to this standard may be used in other than public networks as agreed between the manufacturer and the user.

### 1.2 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.

EN 60068-2-11:1999	Environmental testing -- Part 2: Tests - Test Ka: Salt mist (IEC 60068-2-11:1981)
EN 60068-2-30:1999	Environmental testing -- Part 2: Tests - Test Db and guidance: Damp heat, cyclic (12 + 12 hour cycle) (IEC 60068-2-30:1980 + A1:1985)
EN 60238:1998	Edison screw lampholders (IEC 60238:1998)
EN 60269-1:1989	Low-voltage fuses -- Part 1: General requirements (IEC 60269-1:1986)
EN 60439-1:1999	Low-voltage switchgear and controlgear assemblies -- Part 1: Type-tested and partially type-tested assemblies (IEC 60439-1:1999)

and partially type-tested assemblies (IEC 60439-1:1999)

EN 60445:2000	Basic and safety principles for man-machine interface, marking and identification - Identification of equipment terminals and of terminations of certain designated conductors, including general rules for an alphanumeric system (IEC 60445:1999)
EN 60446:1999	Basic and safety principles for man-machine interface, marking and identification - Identification of conductors by colours or numerals (IEC 60446:1999)
EN 60529:1991	Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)
EN 60695-11-10:1999	Fire hazard testing -- Part 11-10: Test flames - 50 W horizontal and vertical flame test methods (IEC 60695-11-10:1999)
EN ISO 3231:1997	Paints and varnishes - Determination of resistance to humid atmospheres containing sulfur dioxide (ISO 3231:1993)
EN ISO 4892-2:1999	Plastics - Methods of exposure to laboratory light sources - Part 2: Xenon-arc sources (ISO 4892-2:1994)
EN ISO 6506 (series)	Metallic materials - Brinell hardness test (ISO 6506 series)
ISO 4628-3:1982	Paints and varnishes - Evaluation of degradation of paint coatings - Designation of intensity, quantity and size of common types of defect – Part 3: Designation of degree of rusting
ISO 9223:1992	Corrosion of metals and alloys - Corrosivity of atmospheres - Classification

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## 2 Definitions

For the majority of the definitions required in connection with this standard see Clause 2 of EN 60439-1.

For the purpose of this standard the following additional definitions shall apply.

### 2.1.100 Additional general definitions

#### 2.1.101

##### **substation cable distribution board (SCDB)**

ASSEMBLY for stationary installation connected directly or through an incoming circuit to a distribution transformer. The ASSEMBLY contains busbars connected to the incoming circuit to enable electrical energy to be distributed to one or more outgoing circuits which may have current breaking and/or switching devices for the protection and isolation of the outgoing cable or overhead line. It is installed, operated and maintained solely by skilled persons

#### 2.1.102

##### **SCDB - indoor (SCDB-I)**

substation cable distribution board (SCDB) for installation indoors, generally without an enclosure, or outdoors, in a weather protected enclosure. It comprises structural parts which are suitable for supporting busbars, a group of functional units, with fuses or switching devices and other ancillary devices, for the purposes of protecting, controlling and/or connecting one or more outgoing circuits fed from one or more incoming circuits

**2.1.103****substation cable distribution board - outdoor cable connected (SCDB-CCO)**

cubicle type substation cable distribution board (SCDB) for outdoor installation which is independently mounted and connected to the distribution transformer by means of cables

**2.1.103.1****SCDB-CCO - ground mounted**

SCDB-CCO suitable for outdoor installation at or slightly above ground level in a situation which may be accessible to the public

**2.1.103.2****SCDB-CCO - pole mounted**

SCDB-CCO suitable for outdoor installation above ground level on a pole

**2.1.104****substation cable distribution board - outdoor transformer mounted (SCDB-TMO)**

cubicle type substation cable distribution board (SCDB) for outdoor installation, which is suitable for fixing to the low voltage flange of a distribution transformer

**2.1.104.1****SCDB-TMO - ground mounted**

SCDB-TMO which is suitable for fixing to the low voltage flange of a ground mounted distribution transformer

**2.1.104.2****SCDB-TMO - pole mounted**

SCDB-TMO which is suitable for fixing to the low voltage flange of a pole mounted distribution transformer

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**2.2 Constructional units of ASSEMBLIES**

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**2.2.1**

**section** (see Figure C.4)

Not applicable.

**2.2.2**

**sub-section**

Not applicable.

**2.2.3**

**compartment**

Not applicable.

**3 Classification of ASSEMBLIES**

*Delete:*

- the conditions of installation with respect to mobility (see 2.5.3 and 2.5.4);



## 4 Electrical characteristics of ASSEMBLIES

### 4.101 Rated current (of a SCDB)

The rated current of a SCDB is that stated by the manufacturer as the rated current of the incoming circuit. If there is more than one incoming circuit, the rated current of that SCDB is either, the arithmetic sum of the rated currents of all incoming circuits that are intended to be used simultaneously, or the rated current of the main phase busbars, whichever is the lower value. This current shall be carried without the temperature rise of the individual parts exceeding the limits specified in 7.3 when tested according to 8.2.1.

## 5 Information to be given regarding the ASSEMBLY

### 5.1 Nameplates

*Replace t) by u) in the third paragraph.*

*Add to the list at end of the subclause:*

u) rated current of the SCDB as defined in 4.101 of this standard.

Nameplates may be placed inside enclosures of SCDB provided their intended place provides good legibility and visibility when the door is open or the cover is removed.

NOTE Further information may be included by agreement between the user and the manufacturer.

### 5.2 Markings

*Add at the end of the subclause:* [SIST EN 50300:2004  
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It shall be possible to identify the circuit designation of each functional unit in a position clearly visible from the front of the ASSEMBLY when the door(s), if any, giving access to the operating face, are open.

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 interchanging of the fuse-carrier.

## 6 Service conditions

### 6.2 Special service conditions

#### 6.2.8 Exposure to heavy vibration and shocks

*Add the following note:*

NOTE Exposure to traffic vibration is a normal service condition for all ground mounted types of SCDB.

## 7 Design and construction

### 7.1 Mechanical design

#### 7.1.1 General

*Add the following paragraphs at the end of the subclause:*

##### **Design requirements**

The insulating materials used for enclosures, barriers and other parts shall have a resistance to abnormal heat and flame in accordance with 8.2.102.

A metal frame or enclosure shall incorporate a suitable earth terminal of an appropriate size to provide a connection for an external protective conductor, except in case of protection by total insulation.

When the SCDB does not have the means of measurement incorporated, it shall be possible, by the use of a portable instrument, to readily and safely measure the voltage in all phases of incoming units and on both sides of all current breaking and/or switch devices of outgoing units, also the current in one phase of outgoing units. During this operation all live parts of the SCDB shall be protected sufficiently to retain the required degree of protection in accordance with 7.2.1.5. Instructions concerning the procedure to be adopted shall be provided by the manufacturer.

NOTE 1 The type of protection required for measuring may be subject to agreement between the user and the manufacturer.

NOTE 2 Provisions for current measurements in more than one phase or in the incoming units may be agreed between the user and the manufacturer.

If the switchgear is to be connected to live reserve power, for example a standby generator, the switchgear's connecting device shall be designed so that the connection can be made with the live parts having a degree of protection IP1X according to EN 60529.

NOTE 3 An alternative degree of protection may be applied, subject to agreement between the user and the manufacturer.

For a SCDB which is expected to feed overhead cable lines, outgoing units shall be designed in such a way that an attached cable(s) can be earthed at the termination(s).

##### **Protection against corrosion**

The materials or coatings shall be subject to agreement between the user and the manufacturer and shall be sufficient to pass the appropriate tests of 8.2.103.

##### **Mechanical strength**

The mechanical properties of the enclosure of a SCDB-CCO or a SCDB-TMO shall comply with 8.2.101.

In the case of a SCDB-I, a torsionally rigid frame construction shall be provided which is sufficiently rigid to avoid any permanent distortion during installation. The frame together with its mounting shall be sufficiently rigid to prevent distortion during the operation of its main circuits.

Parts of a SCDB-CCO intended to be embedded into the ground shall withstand the stresses imposed during installation and normal service.

## Ease of operation and maintenance and safety

All parts of the SCDB shall, as far as practicable, be readily accessible and replaceable without extensive dismantling. The conditions for interchangeability of parts of the SCDB may be subject to an agreement between the user and the manufacturer.

The design shall be such that the cables can be readily connected from the front.

If necessary, the protective conductor shall have a safely and easily accessible link to permit disconnection when testing the circuit.

Locking arrangements shall be provided on a SCDB-CCO or SCDB-TMO to secure the door(s) and prevent unauthorised access. The fixings of any other covers etc. which are removable for installation or maintenance operations shall only be accessible while the door(s) are open.

NOTE The top cover or other appropriate surface of a SCDB-TMO may be designed to be removable in order to facilitate the installation and maintenance operations.

### 7.1.2 Clearances, creepage distances and isolating distances

#### 7.1.2.1 Clearances and creepage distances

*Add at the end of the subclause:*

Specific creepage distances shall be subject to agreement between the user and the manufacturer.

#### 7.1.3 Terminals for external conductors

**7.1.3.2** *Replace paragraphs 1 and 2 by the following paragraphs:*

In the absence of a special agreement between the user and the manufacturer, terminals shall be capable of accommodating cables having copper or aluminium conductors from the smallest to the largest cross-sectional area corresponding to the appropriate rated current (see Annex A, Table A.1).

Incoming circuits:

The design of a SCDB-I shall permit the use of incoming connections of either bare or insulated bars or single-core or multi-core cables.

Outgoing circuits:

The terminations shall be located so that adequate spacing is provided and to facilitate terminating the phase conductors of a cable irrespective of their lay.

## 7.2 Enclosure and degree of protection

**7.2.1.2** Not applicable.

**7.2.1.3** *Replace the subclause by:*

When a SCDB-CCO or SCDB-TMO is installed in accordance with the manufacturer's instructions and in an area which may be accessible to the public, its enclosure shall have a degree of protection of at least IP33D according to EN 60529.

NOTE For the purposes of this subclause the enclosure of a SCDB-CCO or SCDB-TMO is defined in note 2 of subclause 3.1 of EN 60529. The note in subclause 13.3 of this stated publication does not apply for a SCDB-CCO or SCDB-TMO.