SLOVENSKI STANDARD
oSIST prEN 50600-2-2:2012

01-december-2012

Informacijska tehnologija - Naprave in infrastruktura podatkovnega centra - 2-2. del: Distribucija električne energije

Information technology - Data centre facilities and infrastructures - Part 2-2: Power distribution

Informationstechnik - Einrichtungen und Infrastrukturen von Rechenzentren - Teil 2-2: Stromversorgung

Ta slovenski standard je istoveten z: **prEN 50600-2-2:2012**

ICS:

35.020	Informacijska tehnika in tehnologija na splošno	Information technology (IT) in general
35.110	Omreževanje	Networking
91.140.50	Sistemi za oskrbo z elektriko	Electricity supply systems

oSIST prEN 50600-2-2:2012 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT prEN 50600-2-2

September 2012

ICS 35.020; 35.110; 91.140.50

English version

Information technology - Data centre facilities and infrastructures - Part 2-2: Power distribution

To be completed

Informationstechnik - Einrichtungen und Infrastrukturen von Rechenzentren - Teil 2-2: Stromversorgung

This draft European Standard is submitted to CENELEC members for CENELEC enquiry. Deadline for CENELEC: 2013-03-01.

It has been drawn up by CLC/TC 215.

If this draft becomes a European Standard, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CENELEC in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Project: 23543 Ref. No. prEN 50600-2-2:2012 E

1 **Content**

Figures

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58 **Foreword**

59 This document (prEN 50600-2-2:2012) has been prepared by CLC/TC 215 "Electrotechnical aspects of
60 telecommunication equipment".

61 This document is currently submitted to the Enquiry.

62 This document has been prepared under a mandate given to CENELEC by the European Commission
63 and the European Free Trade Association.

Introduction

The unrestricted access to internet-based information demanded by the information society has led to an exponential growth of both internet traffic and the volume of stored/retrieved data. Data centres are housing and supporting the information technology and network telecommunications equipment for data processing, data storage and data transport. They are required both by network operators (delivering those services to customer premises) and by enterprises within those customer premises.

Data centres need to provide modular, scalable and flexible facilities and infrastructures to easily accommodate the rapidly changing requirements of the market. In addition, energy consumption of data centres has become critical both from an environmental point of view (reduction of carbon footprint) and with respect to economical considerations (cost of energy) for the data centre operator.

The implementation of data centres varies in terms of:

a) purpose (enterprise, co-location, co-hosting, or network operator facilities);

b) physical size;

c) accommodation (mobile, temporary and permanent constructions).

The needs of data centres also vary in terms of availability of service, the provision of security and the objectives for energy efficiency. These needs and objectives influence the design of data centres in terms of building construction, power distribution, environmental control and physical security. Effective management and operational information is required to monitor achievement of the defined needs and objectives.

This series of European Standards specifies requirements and recommendations to support the various parties involved in the design, planning, procurement, integration, installation, operation and maintenance of facilities and infrastructures within data centres. These parties include:

1) owners, facility managers, ICT managers, project managers, main contractors;

2) architects, building designers and builders, system and installation designers;

3) facility and infrastructure integrators, suppliers of equipment;

4) installers, maintainers.

At the time of publication of this European Standard, EN 50600 series will comprise the following standards:

– EN 50600-1: Information technology – Data centre facilities and infrastructures – Part 1: General concepts;

– EN 50600-2-1: Information technology – Data centre facilities and infrastructures – Part 2-1: Building construction;

– EN 50600-2-2: Information technology – Data centre facilities and infrastructures – Part 2-2: Power distribution;

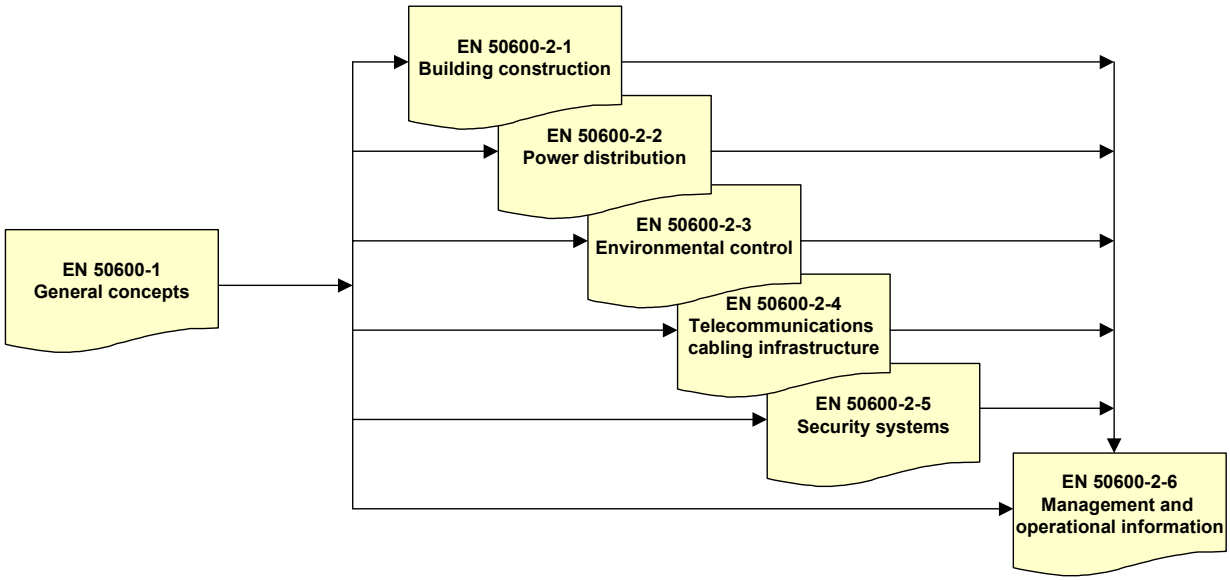
– EN 50600-2-3: Information technology – Data centre facilities and infrastructures – Part 2-3: Environmental control;

– EN 50600-2-4: Information technology – Data centre facilities and infrastructures – Part 2-4: Telecommunications cabling infrastructure;

– EN 50600-2-5: Information technology – Data centre facilities and infrastructures – Part 2-5: Security systems;

– EN 50600-2-6: Information technology – Data centre facilities and infrastructures – Part 2-6: Management and operational information.

The inter-relationship of the standards within the EN 50600 series is shown in Figure 1.



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108 **Figure 1 – Schematic relationship between the EN 50600 standards**

109 EN 50600-2-X standards specify requirements and recommendations for particular facilities and
110 infrastructures to support the relevant classification for “availability”, “physical security” and ‘energy
111 efficiency enablement” selected from EN 50600-1.

112 This European Standard addresses the power distribution facilities and infrastructure within data centres
113 together with the interfaces for monitoring the performance of those facilities and infrastructures in line
114 with EN 50600-2-6 (in accordance with the requirements of EN 50600-1). The line diagrams used in
115 certain Figures are not intended to replace the more familiar electrical circuit diagrams associated with
116 power supply and distribution systems which are included where relevant.

117 This European Standard is intended for use by and collaboration between architects, building designers
118 and builders, system and installation designers.

119 This series of European Standards does not address the selection of information technology and network
120 telecommunications equipment, software and associated configuration issues.

1 Scope and conformance

1.1 Scope

This European Standard addresses power distribution within data centres based upon the criteria and classifications for “availability”, “physical security” and “energy efficiency enablement” within EN 50600-1.

This European Standard specifies requirements and recommendations for the following:

a) power supplies to data centres;

b) power distribution systems within data centres;

c) facilities for both normal and emergency lighting;

d) equipotential bonding and earthing (by reference to EN 50310);

e) lightning protection (by reference to EN 50310);

f) electrostatic discharge;

g) devices for the measurement of the power consumption characteristics at points along the power distribution system and their integration within management tools.

Safety and electromagnetic compatibility (EMC) requirements are outside the scope of this European Standard and are covered by other standards and regulations. However, information given in this European Standard may be of assistance in meeting these standards and regulations.

1.2 Conformance

For a data centre to conform to this European Standard:

a) it shall feature a power supply and distribution design solution that meets the required Availability Class of Clause 5 (and is predicted to meet the relevant availability requirements of that clause);

b) the environmental controls applied to the spaces accommodating the power supply and distribution system within the premises and serving the data centre shall be in accordance with EN 50600-2-3;

c) it shall feature an approach to physical security in relation to the power supply and distribution solution that meets the requirements of Clause 6;

d) it shall feature an energy efficiency enablement solution that meets the requirements of the relevant Complexity Level of Clause 7;

e) the equipotential bonding system within the data centre shall be in accordance with the local mesh earthing requirements of EN 50310;

f) where lightning protection is required, it shall be in accordance with the EN 62305 series applied with reference to EN 50310;

g) local regulations, including safety, shall be met.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50174-2, *Information technology – Cabling installation – Part 2: Installation planning and practices inside buildings*

EN 50174-3, *Information technology – Cabling installation – Part :3 Installation planning and practices outside buildings*

EN 50310, *Application of equipotential bonding and earthing in buildings with information technology equipment*

FprEN 50600-1:2012 [1], *Information technology – Data centre facilities and infrastructures – Part 1: General concepts*

EN 50600-2-1 [2], *Information technology – Data centre facilities and infrastructures – Part 2-1: Building construction*

EN 50600-2-3 [3], *Information technology – Data centre facilities and infrastructures – Part 2-3: Environmental control*

EN 50600-2-4 [3], *Information technology – Data centre facilities and infrastructures – Part 2-4: Telecommunications cabling infrastructure*

EN 50600-2-5 [3], *Information technology – Data centre facilities and infrastructures – Part 2-5: Security systems*

EN 60044-1:1999, *Instrument transformers – Part 1: Current transformers (IEC 60044-1:1996, modified)*

EN 61000-2-4:2002, *Electromagnetic compatibility (EMC) – Part 2-4: Environment – Compatibility levels in industrial plants for low-frequency conducted disturbances (IEC 61000-2-4:2002)*

EN 62040 series, *Uninterruptible power systems (UPS) (IEC 62040 series)*

EN 62305 series, *Protection against lightning (IEC 62305 series)*

EN 62305-4, *Protection against lightning – Part 4: Electrical and electronic systems within structures (IEC 62305-4)*

EN 88528-11, *Reciprocating internal combustion engine driven alternating current generating sets – Part 11: Rotary uninterruptible power systems – Performance requirements and test methods (IEC 88528-11)*

HD 60364-4-444, *Low-voltage electrical installations – Part 4-444: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances (IEC 60364-4-44, Clause 444)*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in FprEN 50600-1:2012 and the following apply.

3.1.1
active power
real power
product of r.m.s. voltage, r.m.s. current and power factor

3.1.2
additional supply
backup supply
power supply that provides power in the event of failure of primary and/or secondary supply

3.1.3
apparent power
product of r.m.s. voltage and r.m.s current (expressed as VA)

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1) To be published.

2) Circulated for CENELEC enquiry.

3) Under consideration.

3.1.4
capacitative load
load that is capacitive, so that the alternating current is out of phase with and leads the voltage

3.1.5
catenary
wire hung at a specific tension between supporting power cabling

3.1.6
diverse route
alternative, separate, pathway intended to provide adequate segregation from, in the event of physical damage to, another pathway in order to provide resilient service provision

3.1.7
emergency power off
EPO
device intended to provide emergency switching to remove, as quickly as possible, danger that may have occurred unexpectedly

3.1.8
fire compartment
discrete zone designed to contain a fire within that zone

3.1.9
inductive load
load that is inductive, so that the alternating current is out of phase with and lags behind the voltage

3.1.10
information technology equipment
ITE
equipment providing data storage, processing and transport services together with equipment dedicated to providing direct connection to core and/or access networks

3.1.11
IT load
electrical consumption of all the information technology equipment measured at its input terminals including all on-board integrated power supplies and cooling fans

3.1.12
load factor
ratio of the average load to the peak load over a period of time

3.1.13
locally protected supply provision
sockets which continue to deliver power to connected equipment for a defined period following failure of power supply and distribution equipment by means of a battery supply or UPS adjacent to, or co-located with, that socket (e.g. emergency lighting)

3.1.14
mechanical cooling load
electrical consumption of all the plant and components used to provide environmental control within the data centre, generally comprising compressors, controls, fans, pumps and humidifiers

3.1.15
medium voltage
voltage lying between the limits for low and high voltage which, for the purposes of this document, are AC 1 kV to AC 72,5 kV