



SLOVENSKI STANDARD

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Information technology - Data centre facilities and infrastructures -- Part 2-3:
Environmental control

Informationstechnik - Einrichtungen und Infrastrukturen von Rechenzentren -- Teil 2-3:
Überwachung der Umgebung

Technologie de l'information - Installation et infrastructures des centres de traitement de
données -- Partie 2-3: Contrôle environnemental

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ICS:

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35.110	Omreževanje	Networking

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Information technology - Data centre facilities and infrastructures - Part 2-3: Environmental control

Technologie de l'information - Installation et infrastructures
des centres de traitement de données - Partie 2-3: Contrôle
environnemental

Informationstechnik - Einrichtungen und Infrastrukturen von
Rechenzentren - Teil 2-3: Überwachung der Umgebung

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

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Foreword

This document (EN 50600-2-3:2014) has been prepared by CLC/TC 215 “Electrotechnical aspects of telecommunication equipment”.

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2015-09-01
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2017-09-01

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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) security level;
- c) physical size;
- d) 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:

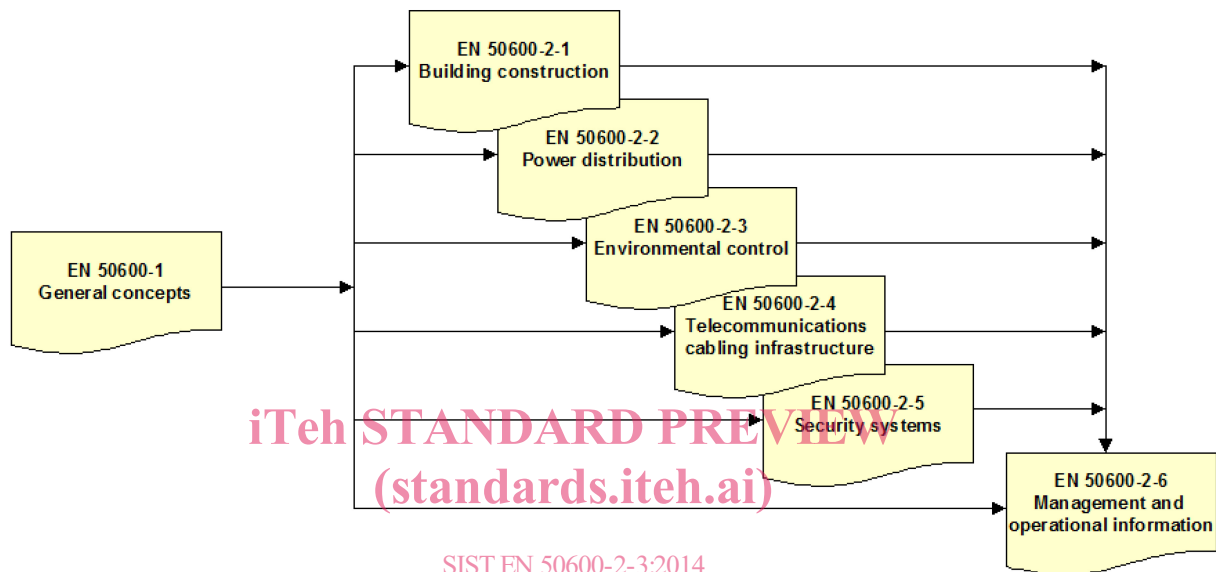
- 1) owners, facility managers, ICT managers, project managers, main contractors;
- 2) architects, building designers and builders, system and installation designers;
- 3) facility and infrastructure integrators, suppliers of equipment;
- 4) installers, maintainers.

At the time of publication of this European Standard, the 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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Figure 1 — Schematic relationship between the EN 50600 standards

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

This European Standard addresses the environmental control facilities and infrastructure within data centres together with the interfaces for monitoring the performance of those facilities and infrastructures in line with EN 50600-2-6 (in accordance with the requirements of EN 50600-1).

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

1 Scope

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

This European Standard specifies requirements and recommendations for the following:

- a) temperature control,
- b) fluid movement control,
- c) relative humidity control,
- d) particulate control,
- e) vibration,
- f) floor layout and equipment locations,
- g) energy saving practices,
- h) physical security of environmental control systems.

For issues related to electromagnetic environment, see EN 50600-2-5.

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 50600-1, *Information technology — Data centre facilities and infrastructures — Part 1: General concepts*

EN 50600-2-5¹⁾, *Information technology — Data centre facilities and infrastructures — Part 2-5: Security systems*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions in EN 50600-1 and the following apply.

3.1.1

adiabatic cooling

adiabatic cooling is a cooling system that is using the evaporative cooling principle to reduce the air temperature

3.1.2

absolute humidity

quantity of water vapour in a given volume of air, expressed by mass

1) Circulated for CENELEC enquiry.

3.1.3**access floor**

system consisting of completely removable and interchangeable floor panels that are supported on adjustable pedestals connected by stringers to allow the area beneath the floor to be used by building services

Note 1 to entry: Also known as raised floor.

[SOURCE: EN 50600-2-1:2014, 3.1.1]

3.1.4**comfort environmental controls**

controls which produce an environment which is appropriate for the effective performance of personnel in a given space

3.1.5**dew point**

temperature at which the water vapour in a gas begins to deposit as a liquid or ice, under standardized conditions

[SOURCE: IEC 60050-212:2010, 212-18-11]

3.1.6**exhaust air temperature**

the temperature of the air leaving the data centre building or the temperature of the air leaving the heat load

3.1.7**fresh air cooling**

cooling system that uses the external air to cool the data centre either directly or indirectly

3.1.8**heat load**

thermal power that is produced

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3.1.9**information technology equipment**

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

3.1.10**outdoor air temperature**

temperature of the air measured outside of the data centre building

3.1.11**relative humidity**

ratio, expressed as a percentage, of the vapour pressure of water vapour in moist air to the saturation vapour pressure with respect to water or ice at the same temperature

[SOURCE: IEC 60050-705:1995, 705-05-09]

3.1.12**return air temperature**

temperature of the air re-entering the environmental control system e.g. the air handling unit

3.1.13**supply air temperature**

temperature of the air entering the IT equipment

3.1.14

ventilation

supply of air motion in a space by circulation or by moving air through the space

Note 1 to entry: Ventilation can be produced by any combination of natural or mechanical supply and exhaust.

Note 2 to entry: Such systems may include partial treatment such as heating, relative humidity control, filtering or purification, and, in some cases, evaporative cooling.

3.2 Abbreviations

For the purposes of this document, the abbreviations given in EN 50600-1 and the following apply.

UPS	Uninterruptible Power Supply
CRAC	Computer Room Air Conditioning (Unit)
IT	Information Technology
ITE	Information Technology Equipment

4 Conformance

For a data centre to conform to this European Standard:

- it shall feature an environmental control solution that meets the requirements of Clauses 4 and 5;
- it shall feature an approach to physical security in relation to the environmental control solution that meets the requirements of Clause 6;
- it shall feature an energy efficiency enablement solution that meets the requirements of the relevant Granularity Level of Clause 7;
- local regulations, including safety, shall be met.

5 Environmental control within data centres

5.1 General

5.1.1 Functional Elements

The environmental control system is one of the most important parts of the data centre infrastructure. Excessive variations of temperature or relative humidity can directly affect the functional capability of the data centre and its infrastructures.

The functional elements of the environmental control system are divided into primary and secondary elements.

Primary elements relate to the mechanical generation of temperature controlled fluids. Secondary elements relate to the distribution of fluids generated by the primary elements. See Table 1 for examples of these elements.

Some environmental systems combine the function of primary and secondary elements.