



SLOVENSKI STANDARD

SIST EN 50600-2-3:2019

01-september-2019

Nadomešča:
SIST EN 50600-2-3:2014

**Informacijska tehnologija - Naprave in infrastruktura podatkovnega centra - 2-3.
del: Nadzor okolja**

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

Informationstechnik - Einrichtungen und Infrastrukturen von Rechenzentren - Teil 2-3:
Regelung der Umgebungsbedingungen

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

<https://standards.iteh.ai/catalog/standards/sist/5c0d1a38-adc9-4670-8ed2-3430ded35d9f/sist-en-50600-2-3-2019>

Ta slovenski standard je istoveten z: EN 50600-2-3:2019

ICS:

13.020.99	Drugi standardi v zvezi z varstvom okolja	Other standards related to environmental protection
35.110	Omreževanje	Networking

SIST EN 50600-2-3:2019 en,fr

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 50600-2-3:2019

<https://standards.iteh.ai/catalog/standards/sist/5c0d1a38-adc9-4670-8ed2-3430ded35d9f/sist-en-50600-2-3-2019>

EUROPEAN STANDARD

EN 50600-2-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2019

ICS 35.020; 35.110; 35.160

Supersedes EN 50600-2-3:2014

English Version

**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: Regelung der
Umgebungsbedingungen

This European Standard was approved by CENELEC on 2019-04-29. 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.

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.

This European Standard exists 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

[SIST EN 50600-2-3:2019](https://standards.iteh.ai/catalog/standards/sist/5c0d1a38-adc9-4670-8ed2-3430ded35d9f/sist-en-50600-2-3-2019)

<https://standards.iteh.ai/catalog/standards/sist/5c0d1a38-adc9-4670-8ed2-3430ded35d9f/sist-en-50600-2-3-2019>



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

European foreword	4
Introduction	5
1 Scope	8
2 Normative references	8
3 Terms, definitions and abbreviations	9
3.1 Terms and definitions	9
3.2 Abbreviations	10
4 Conformance	11
5 Environmental control within data centres	11
5.1 General	11
5.1.1 Design input.....	11
5.1.2 Functional Elements	11
5.1.3 Requirements	12
5.1.4 Recommendations.....	13
5.2 Environmental control of data centre spaces	13
5.2.1 Building entrance facilities.....	13
5.2.2 Personnel entrance(s)	13
5.2.3 Docking/loading bay(s).....	13
5.2.4 Generator space(s) including fuel storage	13
5.2.5 Transformer space(s)	13
5.2.6 Electrical distribution space(s).....	14
5.2.7 Telecommunication spaces(s).....	14
5.2.8 Main Distributor spaces(s).....	14
5.2.9 Computer room space(s) and associated testing space(s).....	14
5.2.10 Electrical space(s)	15
5.2.11 Mechanical space(s).....	15
5.2.12 Control room space(s).....	15
5.2.13 Office space(s).....	15
5.2.14 Storage and holding space(s).....	15
5.2.15 Accommodation of UPS equipment.....	16
6 Availability	16
6.1 General	16
6.2 Availability Class design options	16
6.2.1 General	16
6.2.2 Computer room and telecom space(s)	17
6.2.3 UPS space.....	23
6.3 Environmental control system capacity planning with respect to expansion.....	24

6.4	Environmental control system capacity planning with respect to resilience	24
7	Physical security	24
7.1	General	24
7.2	Protection against unauthorized access	24
8	Energy efficiency enablement	24
8.1	General	24
8.2	Measurement of temperature	25
8.2.1	External temperature	25
8.2.2	Computer room temperature	25
8.3	Measurement of relative humidity	26
8.3.1	External relative humidity	26
8.3.2	Computer room relative humidity	26
8.4	Measurement of air pressure	26
8.5	Coolant flow rates	26
8.6	Heat removal	26
8.7	Outside air	26
Annex A (informative)	Overview of the requirements for environmental conditions	27
Bibliography	(standards.iteh.ai)	29

[SIST EN 50600-2-3:2019](https://standards.iteh.ai/catalog/standards/sist/5c0d1a38-adc9-4670-8ed2-3430ded35d9f/sist-en-50600-2-3-2019)
<https://standards.iteh.ai/catalog/standards/sist/5c0d1a38-adc9-4670-8ed2-3430ded35d9f/sist-en-50600-2-3-2019>

EN 50600-2-3:2019 (E)

European foreword

This document (EN 50600-2-3:2019) 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) 2020-04-29
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2022-04-29

This document supersedes EN 50600-2-3:2014.

The following technical changes have been made:

- a) Clause 5 on environmental control revised, e.g. requirements in 5.2 for environmental control in various data centre spaces;
- b) availability requirements in Clause 6 revised and aligned with EN 50600-1:2019 and EN 50600-2-3:2019, in particular, enhanced Class 4 removed;
- c) measurement requirements for granularity levels in Clause 8 revised;
- d) Annex A and B removed;
- e) new informative Annex A added to summarize requirements for environmental conditions;
- f) minor technical and editorial improvements to the whole document.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission 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 usually 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 environmental 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, telecommunications cabling and physical security as well as the operation of the data centre. Effective management and operational information is required to monitor achievement of the defined needs and objectives.

Recognizing the substantial resource consumption, particularly of energy, of larger data centres, it is also important to provide tools for the assessment of that consumption both in terms of overall value and of source mix and to provide Key Performance Indicators (KPIs) to evaluate trends and drive performance improvements.

At the time of publication of this European Standard, EN 50600 series is designed as a framework of standards and technical reports covering the design, the operation and management as well as the key performance indicators for energy efficient operation of the data centre.

The EN 50600-2 series defines the requirements for the data centre design.

The EN 50600-3 series defines the requirements for the operation and the management of the data centre.

The EN 50600-4 series defines the key performance indicators for the data centre.

The CLC/TR 50600-99-X Technical Reports cover recommended practices and guidance for specific topics around data centre operation and design.

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, operators, facility managers, IT managers, project managers, main contractors;
- 2) consulting engineers, architects, building designers and builders, system and installation designers, auditors, test and commissioning agents;
- 3) facility and infrastructure integrators, suppliers of equipment;
- 4) installers, maintainers.

At the time of publication of this European Standard, the EN 50600-2 series comprises the following standards:

EN 50600-2-3:2019 (E)

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 supply and 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*;

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

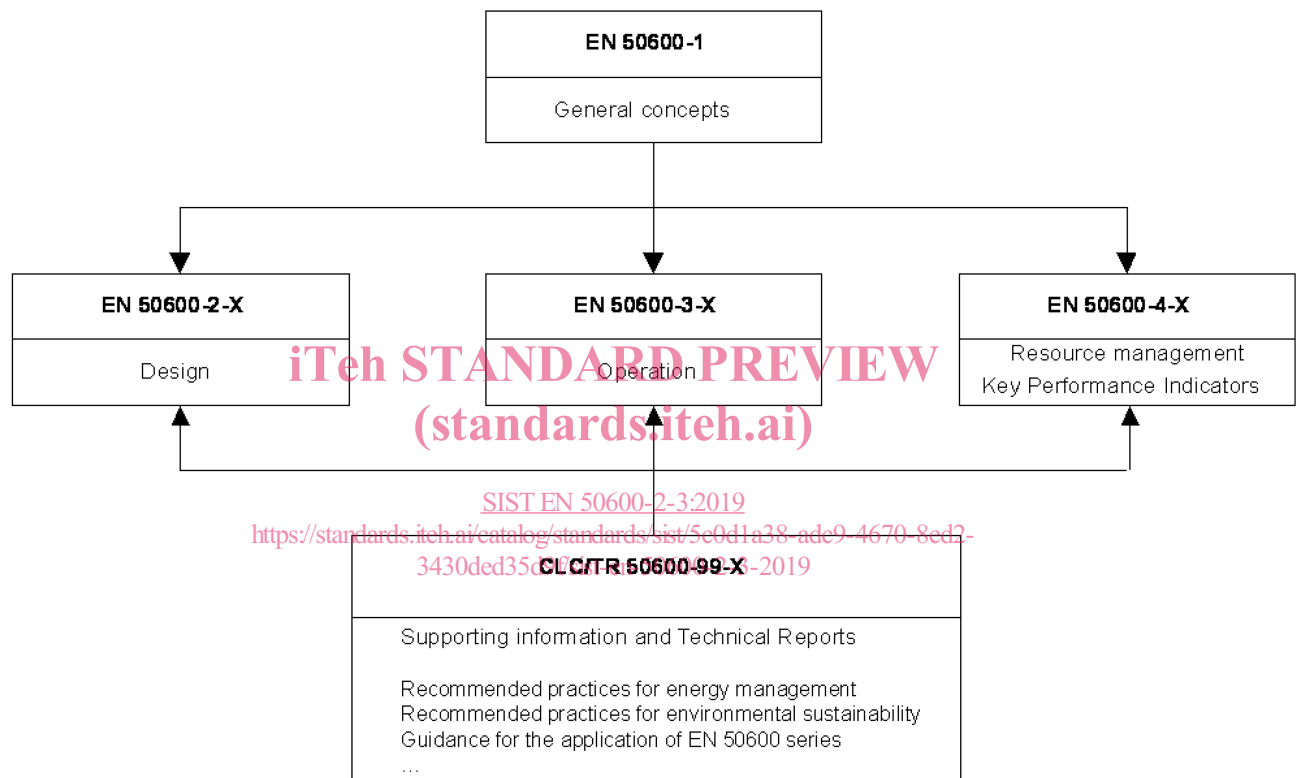


Figure 1 — Schematic relationship between the EN 50600 standards

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.

EN 50600-3-X documents specify requirements and recommendations for data centre operations, processes and management.

EN 50600-4-X documents specify requirements and recommendations for key performance indicators (KPIs) used to assess and improve the resource usage efficiency and effectiveness, respectively, of a data centre.

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 50600-3-1 (in accordance with the requirements of EN 50600-1).

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

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

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 50600-2-3:2019](https://standards.iteh.ai/catalog/standards/sist/5c0d1a38-adc9-4670-8ed2-3430ded35d9f/sist-en-50600-2-3-2019)

<https://standards.iteh.ai/catalog/standards/sist/5c0d1a38-adc9-4670-8ed2-3430ded35d9f/sist-en-50600-2-3-2019>

EN 50600-2-3:2019 (E)

1 Scope

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

This document specifies requirements and recommendations for the following:

- a) temperature control;
- b) fluid movement control;
- c) relative humidity control;
- d) particulate control;
- e) vibration;
- f) physical security of environmental control systems.

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.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 50600-1, *Information technology - Data centre facilities and infrastructures - Part 1: General concepts*

EN 50600-2-2:2019, *Information technology - Data centre facilities and infrastructures - Part 2-2: Power supply and distribution*

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

CLC/TR 50600-99-1, *Information technology - Data centre facilities and infrastructures - Part 99-1: Recommended practices for energy management*

EN 61439-1, *Low-voltage switchgear and controlgear assemblies - Part 1: General rules*

EN 62040-3, *Uninterruptible power systems (UPS) - Part 3: Method of specifying the performance and test requirements*

EN ISO 14644-8, *Cleanrooms and associated controlled environments - Part 8: Classification of air cleanliness by chemical concentration (ACC) (ISO 14644-8)*

EN ISO 16890-1:2016, *Air filters for general ventilation - Part 1: Technical specifications, requirements and classification system based upon particulate matter efficiency (ePM) (ISO 16890-1:2016)*

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.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1.1

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 – modified: added note 1 to entry]

3.1.2

adiabatic cooling

reducing the temperature of a given medium (usually air) using the principle of evaporative cooling

3.1.3

comfort environmental controls

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

<https://standards.iteh.ai/catalog/standards/sist/5c0d1a38-adc9-4670-8ed2-3430ded35d9f/sist-en-50600-2-3-2019>

3.1.4

dew point

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

3.1.5

direct fresh air cooling

cooling system that uses the external air that might be filtered to cool the IT equipment in the data centre

3.1.6

exhaust air temperature

temperature of the air leaving the data centre building

3.1.7

heat load

thermal power that is produced

3.1.8

indirect fresh air cooling

cooling system that uses the external air to cool the data centre. The external air is passed through a heat exchanger to separate the external from the internal air which passes by the IT equipment

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

EN 50600-2-3:2019 (E)

3.1.10

inlet air temperature

temperature of the (cold) air entering the rack or IT equipment

3.1.11

outdoor air temperature

temperature of the air measured outside of the data centre building

3.1.12

outlet air temperature

temperature of the (warm) air leaving the rack or IT equipment

3.1.13

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]

3.1.14

return air temperature

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

3.1.15

supply air temperature

temperature of the (cold) air leaving the environmental control system e.g. the air handling unit

3.1.16

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.

AHU	Air Handling Unit
CRAC	Computer Room Air Conditioning (Unit)
CRAH	Computer Room Air Handler units
DRUPS	Dynamic Rotary Uninterruptible Power System
IT	Information Technology
ITE	Information Technology Equipment
UPS	Uninterruptible Power System