TECHNICAL SPECIFICATION

ISO/IEC TS 22237-4

First edition
2018-05

Information technology — Data centre facilities and infrastructures —

Part 4: Environmental control

Technologie de l'information — Installation et infrastructures de centres de traitement de données —

Partie 4: Contrôle environnemental

This document is a preview generated by EVS

Reference number
ISO/IEC TS 22237-4:2018(E)

© ISO/IEC 2018

This document is a preview generated by EVS



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2018

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ..... **v**
Introduction ..... **vi**
1 Scope **1**
2 Normative references **1**
3 Terms, definitions and abbreviated terms **1**
3.1 Terms and definitions 1
3.2 Abbreviated terms 3
4 Conformance **3**
5 Environmental control within data centres **3**
5.1 General 3
5.1.1 Functional elements 3
5.1.2 Requirements 4
5.1.3 Recommendations 4
5.2 Environmental control of data centre spaces 5
5.2.1 Building entrance facilities 5
5.2.2 Personnel entrance(s) 5
5.2.3 Docking/loading bay(s) 5
5.2.4 Generator space(s) including fuel storage 5
5.2.5 Transformer space(s) 5
5.2.6 Electrical distribution space(s) 6
5.2.7 Telecommunication spaces(s) 6
5.2.8 Main distributor spaces(s) 6
5.2.9 Computer room space(s) and associated testing space(s) 6
5.2.10 Electrical space(s) 7
5.2.11 Mechanical space(s) 7
5.2.12 Control room space(s) 7
5.2.13 Office space(s) 7
5.2.14 Storage and holding space(s) 7
5.2.15 Accommodation of UPS equipment 7
6 Availability **8**
6.1 General 8
6.2 Design options by space 8
6.2.1 General 8
6.2.2 Spaces excluded from the availability classification 9
6.2.3 Main distributor space(s) 9
6.2.4 Computer room space(s) and associated testing space(s) 10
6.2.5 UPS space 11
6.3 Environmental control system capacity planning with respect to expansion 12
6.4 Environmental control system capacity planning with respect to resilience 12
7 Physical security **12**
7.1 General 12
7.2 Access 12
8 Energy efficiency enablement **12**
8.1 General 12
8.2 Measurement of temperature 12
8.2.1 External temperature 12
8.2.2 Computer room temperature 13
8.3 Measurement of relative humidity 14
8.3.1 External relative humidity 14
8.3.2 Computer room relative humidity 14
8.4 Measurement of air pressure 15

This document is a preview generated by EVS

© ISO/IEC 2018 – All rights reserved

8.5 Coolant flow rates 15
8.6 Heat removal 15
8.7 Outside air 15
8.8 Provision of alarms 15
8.9 Measurement requirements by Granularity Level 15
Annex A (normative) **Distribution methodologies for temperature-controlled airin computer room space** **17**
Annex B (informative) **Control system concepts** **20**
Bibliography **21**

This document is a preview generated by EVS

 © ISO/IEC 2018 – All rights reserved

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommitte SC 39, *Sustainability for and by Information Technology.*

A list of all parts in the ISO/IEC TS 22237 series can be found on the ISO website.

This document is a preview generated by EVS

© ISO/IEC 2018 – All rights reserved

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.

The ISO/IEC TS 22237 series 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 document, the ISO/IEC TS 22237 series will comprise the following documents:

ISO/IEC TS 22237-1, *Information technology — Data centre facilities and infrastructures — Part 1: General concepts*;

ISO/IEC TS 22237-2, *Information technology — Data centre facilities and infrastructures — Part 2: Building construction*;

ISO/IEC TS 22237-3, *Information technology — Data centre facilities and infrastructures — Part 3: Power distribution*;

ISO/IEC TS 22237-4, *Information technology — Data centre facilities and infrastructures — Part 4: Environmental control*;

ISO/IEC TS 22237-5, *Information technology — Data centre facilities and infrastructures — Part 5: Telecommunications cabling infrastructure*;

ISO/IEC TS 22237-6, *Information technology — Data centre facilities and infrastructures — Part 6: Security systems*;

This document is a preview generated by EVS

 © ISO/IEC 2018 – All rights reserved

ISO/IEC TS 22237-7, *Information technology — Data centre facilities and infrastructures — Part 7: Management and operational information*.

The inter-relationship of the specifications within the ISO/IEC TS 22237 series is shown in Figure 1.

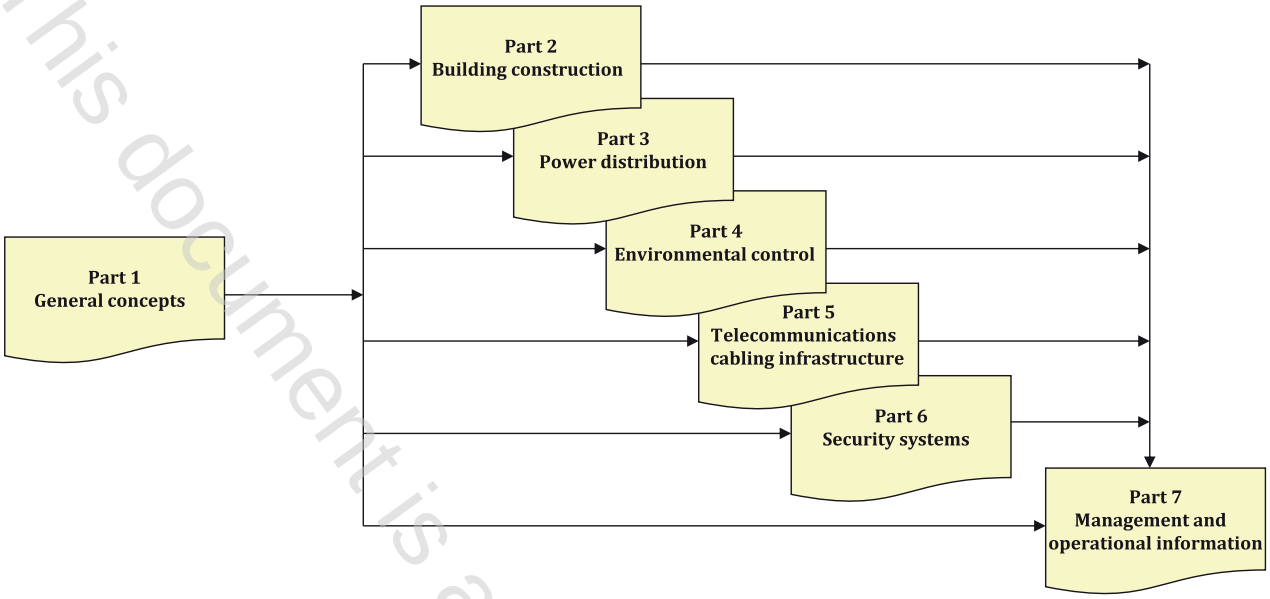


Figure 1 — Schematic relationship between the ISO/IEC TS 22237 series of documents

ISO/IEC TS 22237-2 to ISO/IEC TS 22237-6 specify requirements and recommendations for particular facilities and infrastructures to support the relevant classification for "availability", "physical security" and "energy efficiency enablement" selected from ISO/IEC TS 22237-1.

This document 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 ISO/IEC TS 22237-7 (in accordance with the requirements of ISO/IEC TS 22237-1).

ISO/IEC TS 22237-7 addresses the operational and management information (in accordance with the requirements of ISO/IEC TS 22237-1.

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

The ISO/IEC TS 22237 series does not address the selection of information technology and network telecommunications equipment, software and associated configuration issues.

This document is a preview generated by EVS

© ISO/IEC 2018 – All rights reserved

This document is a preview generated by EVS

Information technology — Data centre facilities and infrastructures —

Part 4: Environmental control

This document is a preview generated by EVS

1 Scope

This document addresses environmental control within data centres based upon the criteria and classifications for "availability", "security" and "energy efficiency enablement" within ISO/IEC TS 22237-1.

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) floor layout and equipment locations;

g) energy saving practices;

h) physical security of environmental control systems.

Issues related to electromagnetic environment can be found in ISO/IEC TS 22237-6.

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.

ISO/IEC TS 22237-1, *Information technology — Data centre facilities and infrastructures — Part 1: General concepts*

ISO/IEC TS 22237-6, *Information technology — Data centre facilities and infrastructures — Part 6: Security systems*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions in ISO/IEC TS 22237-1 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/IEC 2018 – All rights reserved