
**Information technology — Data centre
facilities and infrastructures —**

**Part 3:
Power distribution**

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

Partie 3: Distribution de puissance





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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.

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 or www.iec.ch/members_experts/refdocs).

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) or the IEC list of patent declarations received (see patents.iec.ch).

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

For an explanation of 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 www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 39, *Sustainability, IT & Data Centres*.

This first edition cancels and replaces the first edition (ISO/IEC TS 22237-3:2018), which has been technically revised.

The main changes are as follows:

- availability requirements have been aligned with ISO/IEC 22237-1 and ISO/IEC 22237-4;
- figures have been updated.

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

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 economic 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; and
- d) accommodation (mobile, temporary and permanent constructions).

NOTE Cloud services can be provided by all data centre types mentioned.

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. Effective management and operational information are required to monitor achievement of the defined needs and objectives.

The ISO/IEC 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, operators, facility managers, ICT managers, project managers, main contractors;
- 2) consultants, architects, building designers and builders, system and installation designers, auditors and commissioning agents;
- 3) suppliers of equipment; and
- 4) installers, maintainers.

At the time of publication of this document, the ISO/IEC 22237 series comprises the following documents:

- ISO/IEC 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 22237-3 (this document), *Information technology — Data centre facilities and infrastructures — Part 3: Power distribution*;
- ISO/IEC 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*;
- 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 22237 series is shown in [Figure 1](#).

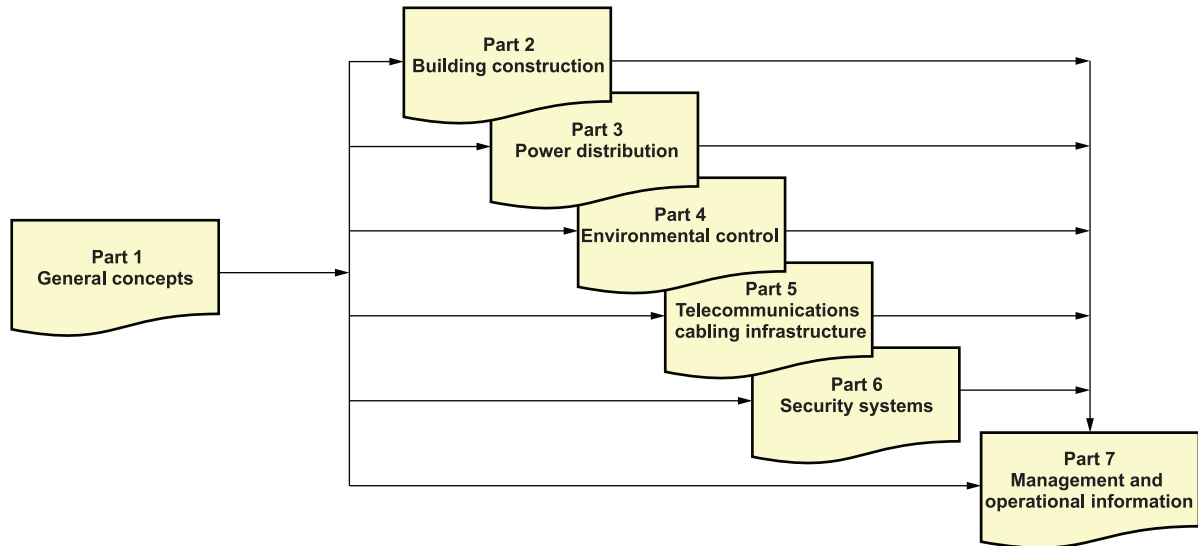


Figure 1 — Schematic relationship between the ISO/IEC 22237 series of documents

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 22237-1.

This document, ISO/IEC 22237-3, addresses facilities and infrastructures for power supplies to, and power distribution 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 22237-1). The line diagrams used in certain figures are not intended to replace the more familiar electrical circuit diagrams associated with power supply and distribution systems, which are included where relevant.

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

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

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

Information technology — Data centre facilities and infrastructures —

Part 3: Power distribution

1 Scope

This document addresses power supplies to, and power distribution within, data centres based upon the criteria and classifications for “availability”, “physical security” and “energy efficiency enablement” within ISO/IEC 22237-1.

This document specifies requirements and recommendations for the following:

- a) power supplies to data centres;
- b) power distribution systems to all equipment within data centres;
- c) telecommunications infrastructure bonding;
- d) lightning protection;
- e) devices for the measurement of the power consumption and power quality 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 document and are covered by other standards and regulations. However, information given in this document can be of assistance in meeting these standards and regulations.

Conformance of data centres to the present document is covered in [Clause 4](#).

The use of the data centre stored energy or alternate sources to be used by the grid is not in the scope of this document and is for consideration in future specifications.

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 13160 (all parts), *Leak detection systems*

IEC 60076-11, *Power transformers — Part 11: Dry-type transformers*

IEC 60364 (all parts), *Low-voltage electrical installations*

IEC 60947 (all parts), *Low-voltage switchgear and controlgear*

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

IEC 61439 (all parts), *Low-voltage switchgear and controlgear assemblies*

ISO/IEC 22237-3:2021(E)

IEC 61557-12, *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. — Equipment for testing, measuring or monitoring of protective measures — Part 12: Performance measuring and monitoring devices (PMD)*

IEC 61869-2:2012, *Instrument transformers — Part 2: Additional requirements for current transformers*

IEC 62040 (all parts), *Uninterruptible power systems (UPS)*

IEC 62053-21, *Electricity metering equipment (a.c.) — Particular requirements — Part 21: Static meters for active energy (classes 1 and 2)*

IEC 62053-22, *Electricity metering equipment (a.c.) — Particular requirements — Part 22: Static meters for active energy (classes 0,2 S and 0,5 S)*

IEC 62271-200, *High-voltage switchgear and controlgear — Part 200. AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV*

IEC 62305 (all parts), *Protection against lightning*

IEC 62586-1, *Power quality measurement in power supply systems — Part 1: Power quality instruments (PQI)*

IEC 62586-2, *Power quality measurement in power supply systems — Part 2: Functional tests and uncertainty requirements*

IEC 62974-1, *Monitoring and measuring systems used for data collection, gathering and analysis — Part 1: Device requirements*

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

IEC/TS 62749, *Assessment of power quality — Characteristics of electricity supplied by public networks*

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

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

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

ISO/IEC 30129, *Information technology — Telecommunications bonding networks for buildings and other structures*