

---

---

**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*

*iteh Standards*  
**(<https://standards.iteh.ai>)**  
**Document Preview**

[ISO/IEC 22237-3:2021](https://standards.iteh.ai/catalog/standards/iso/cd3e32db-4d33-46de-bfa0-009af783596e/iso-iec-22237-3-2021)

<https://standards.iteh.ai/catalog/standards/iso/cd3e32db-4d33-46de-bfa0-009af783596e/iso-iec-22237-3-2021>



**iTeh Standards**  
**(<https://standards.iteh.ai>)**  
**Document Preview**

[ISO/IEC 22237-3:2021](https://standards.iteh.ai/catalog/standards/iso/cd3e32db-4d33-46de-bfa0-009af783596e/iso-iec-22237-3-2021)

<https://standards.iteh.ai/catalog/standards/iso/cd3e32db-4d33-46de-bfa0-009af783596e/iso-iec-22237-3-2021>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO/IEC 2021

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  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

	Page
Foreword.....	v
Introduction.....	vi
<b>1 Scope.....</b>	<b>1</b>
<b>2 Normative references.....</b>	<b>1</b>
<b>3 Terms, definitions and abbreviated terms.....</b>	<b>2</b>
3.1 Terms and definitions.....	2
3.2 Abbreviated terms.....	6
3.3 Symbols.....	6
<b>4 Conformance.....</b>	<b>7</b>
<b>5 Power supply and distribution within data centres.....</b>	<b>7</b>
5.1 Functional elements.....	7
5.1.1 General.....	7
5.1.2 Power supply to the data centre.....	8
5.1.3 Power distribution within the data centre.....	9
5.2 Dimensioning of power distribution systems.....	10
<b>6 Availability.....</b>	<b>11</b>
6.1 General requirements.....	11
6.2 Power supply.....	11
6.2.1 Capacity planning.....	11
6.2.2 Availability of the utility supply.....	13
6.2.3 Power quality.....	14
6.2.4 Load presented to the utility supply.....	15
6.2.5 Equipment.....	15
6.2.6 Availability Class design options.....	17
6.3 Power distribution.....	23
6.3.1 Capacity planning.....	23
6.3.2 Power quality.....	24
6.3.3 Equipment.....	25
6.3.4 Availability Class design options.....	25
6.4 Incorporation of low voltage direct current distribution.....	29
6.5 Additional considerations.....	29
6.5.1 Residual current measurement.....	29
6.5.2 Lightning and surge protection.....	29
6.5.3 Segregation of power distribution cabling and information technology cabling.....	30
6.6 Emergency power off (EPO).....	30
6.6.1 Requirements.....	30
6.6.2 Recommendations.....	30
<b>7 Physical security.....</b>	<b>30</b>
7.1 General.....	30
7.2 Access.....	30
7.2.1 Power supply.....	30
7.2.2 Power distribution.....	30
7.2.3 Attachment of unauthorized end-equipment.....	30
7.3 Internal environmental events.....	31
7.3.1 Power supply.....	31
7.3.2 Power distribution.....	31
7.4 External environmental events.....	31
<b>8 Energy efficiency enablement and power distribution.....</b>	<b>31</b>
8.1 General.....	31
8.2 Granularity Level 1.....	32

8.2.1	Requirements.....	32
8.2.2	Recommendations.....	33
8.3	Granularity Level 2.....	33
8.3.1	Requirements.....	33
8.3.2	Recommendations.....	33
8.4	Granularity Level 3.....	34
8.4.1	Requirements.....	34
8.4.2	Recommendations.....	34
8.5	Cabling infrastructure to support energy efficiency enablement.....	34
<b>Bibliography.....</b>		<b>35</b>

**iTeh Standards**  
**(<https://standards.iteh.ai>)**  
**Document Preview**

[ISO/IEC 22237-3:2021](https://standards.iteh.ai/catalog/standards/iso/cd3e32db-4d33-46de-bfa0-009af783596e/iso-iec-22237-3-2021)

<https://standards.iteh.ai/catalog/standards/iso/cd3e32db-4d33-46de-bfa0-009af783596e/iso-iec-22237-3-2021>

## 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](http://www.iso.org/directives) or [www.iec.ch/members\\_experts/refdocs](http://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](http://www.iso.org/patents)) or the IEC list of patent declarations received (see [patents.iec.ch](http://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](http://www.iso.org/iso/foreword.html). In the IEC, see [www.iec.ch/understanding-standards](http://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](http://www.iso.org/members.html) and [www.iec.ch/national-committees](http://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*;