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Standards

Irish Standard  
I.S. EN IEC 60917-1:2019

# Modular order for the development of mechanical structures for electrical and electronic equipment practices - Part 1: Generic standard

**I.S. EN IEC 60917-1:2019**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

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## National Foreword

I.S. EN IEC 60917-1:2019 is the adopted Irish version of the European Document EN IEC 60917-1:2019, Modular order for the development of mechanical structures for electrical and electronic equipment practices - Part 1: Generic standard

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EUROPEAN STANDARD

**EN IEC 60917-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2019

ICS 31.240

Supersedes EN 60917-1:1998 and all of its amendments  
and corrigenda (if any)

English Version

**Modular order for the development of mechanical structures for  
electrical and electronic equipment practices - Part 1: Generic  
standard  
(IEC 60917-1:2019)**

Ordre modulaire pour le développement des structures  
mécaniques pour les infrastructures électriques et  
électroniques - Partie 1: Norme générique  
(IEC 60917-1:2019)

Modulordnung für die Entwicklung von Bauweisen für  
elektrische und elektronische Einrichtungen - Teil 1:  
Fachgrundnorm  
(IEC 60917-1:2019)

This European Standard was approved by CENELEC on 2019-10-18. 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.

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Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

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

## **EN IEC 60917-1:2019 (E)**

### **European foreword**

The text of document 48D/703/FDIS, future edition 2 of IEC 60917-1, prepared by SC 48D "Mechanical structures for electrical and electronic equipment" of IEC/TC 48 "Electrical connectors and mechanical structures for electrical and electronic equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60917-1:2019.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-07-18
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-10-18

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## Annex ZA

### (normative)

### Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-581	-	International Electrotechnical Vocabulary - Part 581: Electromechanical components for electronic equipment	-	-
IEC 60297	series	Dimensions of mechanical structures of the 482,6 mm (19 in) series	-	-
IEC 60297-3-100	-	Mechanical structures for electronic equipment - Dimensions of mechanical structures of the 482,6 mm (19 in) series - Part 3-100: Basic dimensions of front panels, subracks, chassis, racks and cabinets	EN 60297-3-100	-
IEC 60297-3-101	-	Mechanical structures for electronic equipment - Dimensions of mechanical structures of the 482,6 mm (19 in) series - Part 3-101: Subracks and associated plug-in units	EN 60297-3-101	-
IEC 60297-3-102	-	Mechanical structures for electronic equipment - Dimensions of mechanical structures of the 482,6 mm (19 in) series - Part 3-102: Injector/extractor handle	EN 60297-3-102	-
IEC 60297-3-103	-	Mechanical structures for electronic equipment - Dimensions of mechanical structures of the 482,6 mm (19 in) series - Part 3-103: Keying and alignment pin	EN 60297-3-103	-
IEC 60297-3-104	-	Mechanical structures for electronic equipment - Dimensions of mechanical structures of the 482,6 mm (19 in) series - Part 3-104: Connector dependent interface dimensions of subracks and plug-in units	EN 60297-3-104	-

## EN IEC 60917-1:2019 (E)

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60297-3-105	-	Mechanical structures for electronic equipment - Dimensions of mechanical structures of the 482,6 mm (19 in) series - Part 3-105: Dimensions and design aspects for 1U high chassis	EN 60297-3-105	-
IEC 60297-3-106	-	Mechanical structures for electronic equipment - Dimensions of mechanical structures of the 482,6 mm (19 in) series - Part 3-106: Adaptation dimensions for subracks and chassis applicable with metric cabinets or racks in accordance with IEC 60917-2-1	EN 60297-3-106	-
IEC 60297-3-107	-	Mechanical structures for electronic equipment - Dimensions of mechanical structures of the 482,6 mm (19 in) series - Part 3-107: Dimensions of subracks and plug-in units, small form factor	EN 60297-3-107	-
IEC 60297-3-108	-	Mechanical structures for electronic equipment - Dimensions of mechanical structures of the 482,6 mm (19 in) series - Part 3-108: Dimensions of R-type subracks and plug-in units	EN 60297-3-108	-
IEC 60297-3-109	-	Mechanical structures for electrical and electronic equipment – Dimensions of mechanical structures of the 482,6 mm (19 in) series – Part 3-109: Dimensions of chassis for embedded computing devices	EN 60297-3-109	-
IEC 60297-3-110	-	Mechanical structures for electrical and electronic equipment - Dimensions of mechanical structures of the 482,6 mm (19 in) series - Part 3-110: Residential racks and cabinets for smart houses	EN IEC 60297-3-110	-
IEC/TR 60668	-	Dimensions of panel areas and cut-outs for panel and rack-mounted industrial-process measurement and control instruments	-	-
IEC 60917-2	-	Modular order for the development of mechanical structures for electronic equipment practices - Part 2: Sectional specification - Interface co-ordination dimensions for the 25 mm equipment practice	EN 60917-2	-
IEC 60917-2-1	-	Modular order for the development of mechanical structures for electronic equipment practices - Part 2: Sectional specification - Interface co-ordination dimensions for the 25 mm equipment practice - Section 1: Detail specification - Dimensions for cabinets and racks	EN 60917-2-1	-



<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60917-2-2	-	Modular order for the development of mechanical structures for electronic equipment practices - Part 2: Sectional specification - Interface co-ordination dimensions for the 25 mm equipment practice - Section 2: Detail specification - Dimensions for subracks, chassis, backplanes, front panels and plug-in units	EN 60917-2-2	-
IEC 60917-2-3	-	Modular order for the development of mechanical structures for electronic equipment practices - Part 2-3: Sectional specification - Interface co-ordination dimensions for the 25 mm equipment practice - Extended detail specification - Dimensions for subracks, chassis, backplanes, front panels and plug-in units	EN 60917-2-3	-
IEC 60917-2-4	-	Modular order for the development of mechanical structures for electronic equipment practices - Part 2-4: Sectional specification - Interface co-ordination dimensions for the 25 mm equipment practice - Adaptation dimensions for subracks or chassis applicable in cabinets or racks in accordance with IEC 60297-3-100 (19 in)	EN 60917-2-4	-
IEC 60917-2-5	-	Modular order for the development of mechanical structures for electronic equipment practices - Part 2-5: Sectional specification - Interface co-ordination dimensions for the 25 mm equipment practice - Cabinet interface dimensions for miscellaneous equipment	EN 60917-2-5	-
IEC 61554	-	Panel mounted equipment - Electrical measuring instruments - Dimensions for panel mounting	-	-
IEC 61587	series	Mechanical structures for electronic equipment - Tests for IEC 60917 and IEC 60297 series	EN 61587	series
IEC 61969-1	-	Mechanical structures for electronic equipment - Outdoor enclosures - Part 1: Design guidelines	EN 61969-1	-
IEC 61969-2	-	Mechanical structures for electronic equipment - Outdoor enclosures - Part 2: Coordination dimensions	EN 61969-2	-
IEC 61969-3	-	Mechanical structures for electronic equipment - Outdoor enclosures - Part 3: Environmental requirements, tests and safety aspects	EN 61969-3	-
IEC 62194	-	Method of evaluating the thermal performance of enclosures	EN 62194	-

**EN IEC 60917-1:2019 (E)**

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC/TS 62454	-	Mechanical structures for electronic equipment - Design guide: Interface dimensions and provisions for water cooling of electronic equipment within cabinets of the IEC 60297 and IEC 60917 series	-	-
IEC 62610	series	Mechanical structures for electrical and electronic equipment – Thermal management for cabinets in accordance with IEC 60297 and IEC 60917 series	EN 62610	series
IEC Guide 103	1980	Guide on dimensional co-ordination	-	-
ISO 1006	-	Building construction; Modular coordination; Basic module	-	-
ISO 1040	-	Building construction - Modular coordination - Multimodules for horizontal coordinating dimensions	-	-
ISO 1791	-	Building construction - Modular co-ordination - Vocabulary	-	-
ISO 2848	-	Building construction - Modular coordination - Principles and rules	-	-
ISO 3394	-	Dimensions of rigid rectangular packages; Transport packages	-	-
ISO 3676	-		-	-
ISO 6514	-	Building construction - Modular coordination - Sub-modular increments	-	-
ISO 80000-1	2009	Quantities and units -- Part 1: General	EN ISO 80000-1	2013
ISO 80000-3	2006	Quantities and units -- Part 3: Space and time	EN ISO 80000-3	2013



**IEC 60917-1**

Edition 2.0 2019-09

# **INTERNATIONAL STANDARD**

## **NORME INTERNATIONALE**

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**Modular order for the development of mechanical structures for electrical and  
electronic equipment practices –  
Part 1: Generic standard**

**Ordre modulaire pour le développement des structures mécaniques pour les  
infrastructures électriques et électroniques –  
Partie 1: Norme générique**



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**IEC 60917-1**

Edition 2.0 2019-09

# **INTERNATIONAL STANDARD**

# **NORME INTERNATIONALE**

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**Modular order for the development of mechanical structures for electrical and electronic equipment practices –  
Part 1: Generic standard**

**Ordre modulaire pour le développement des structures mécaniques pour les infrastructures électriques et électroniques –  
Partie 1: Norme générique**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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### **MODULAR ORDER FOR THE DEVELOPMENT OF MECHANICAL STRUCTURES FOR ELECTRICAL AND ELECTRONIC EQUIPMENT PRACTICES –**

#### **Part 1: Generic standard**

#### **FOREWORD**

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60917-1 has been prepared by subcommittee 48D: Mechanical structures for electrical and electronic equipment, of IEC technical committee 48: Electrical connectors and mechanical structures for electrical and electronic equipment.

This second edition cancels and replaces the first edition published in 1998 and its Amendment 1:2000. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) added information on newly developed detail specification standards of mechanical structures for the electrical and electronic equipment practices;
- b) added information on newly developed performance test standards for the verifications of environmental performances and safety aspects and issues of the thermal performance and thermal management for the electrical and electronic equipment practices;



- c) introduced the relations between the mechanical structure for electrical and electronic system, the verification of environmental performance and safety aspects and issues of the thermal performance and thermal management for the electrical and electronic equipment practices.

The text of this standard is based on the following documents:

FDIS	Report on voting
48D/703/FDIS	48D/708/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

A list of all parts in the IEC 60917 series, published under the general title *Modular order for the development of mechanical structures for electrical and electronic equipment practices*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

## INTRODUCTION

There is a continuous trend towards higher functional integration and smaller electronic components and integrated circuits. At the same time, new manufacturing methods, automatic manufacturing and testing equipment, and Computer Aided Engineering (CAE) systems have created commercial advantages for their users.

For users to take technical and economic advantage of these new components and technologies during planning, design, manufacturing, and testing, it is necessary for equipment practices to meet the following requirements (see IEC Guide 103): arrangement of products with a minimum loss of area and space;

- dimensional interchangeability of products, e.g. regarding overall dimensions, mounting dimensions (fixing holes, cut-out, etc.);
- dimensional compatibility and determination of interface dimensions of products which:
  - are combined with other products, e.g. instruments, racks, panels and cabinets, etc.;
  - are used in buildings that have been built in accordance with a modular system, e.g. column spacing, room height, door height, etc.

An obstacle arises from the use of two systems of dimensioning (inch – metre) that are not compatible with each other. The use of an interface between both dimensioning systems represents one way around this obstacle. The recommendation is:

- to use only one dimensioning system and to use SI units.

The dimensions given in 5.3 of this document have been taken from System I of IEC Guide 103 in consideration with other documents on dimensional coordination.

In accordance with the above considerations, IEC 60917-1 Ed.1 was published in 1998. This generic standard for mechanical structures for electronic equipment practices has been used to meet advanced requirements for various industrial applications of micro-electronics technology.

After publication of this generic standard, development of dimensional sectional and detail specifications consisting of the metric 25 mm modular standards, IEC 60917-2-X, and 19 inch (in) conventional standards, IEC 60297-3-XXX, was undertaken. In parallel, standards to address environmental performance and safety aspects of the mechanical structures were developed as the IEC 61587 series. All these standards are based on indoor system applications. The next step for the mechanical structure was the developments of the IEC 61969 series for outdoor applications.

In the first decade of the 21st century, the IEC 62194 and IEC 62610 series were developed to define the verification of the thermal performance of enclosures and address thermal management issues of the electrical and electronic equipment practices.

This document describes the relationships between the mechanical structure for electrical and electronic systems, the verification of environmental performance and safety aspects, and the issues of the thermal performance and of the thermal management for the electrical and electronic equipment practices.

# MODULAR ORDER FOR THE DEVELOPMENT OF MECHANICAL STRUCTURES FOR ELECTRICAL AND ELECTRONIC EQUIPMENT PRACTICES –

## Part 1: Generic standard

### 1 Scope

This part of IEC 60917 specifies the relationships between equipment practices and the modular order which are applicable to the main structural dimensions of electronic and electrical equipment mounted in various installations where dimensional interfaces have to be considered for mechanical compatibility.

This document also established terms for parts and assemblies of mechanical structures for electrical and electronic equipment, to clarify the specific relations between equipment practices and modular order.

### 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.

IEC 60050-581, *International Electrotechnical Vocabulary – Part 581: Electromechanical components for electronic equipment*

IEC 60297 (all parts), *Mechanical structures for electronic equipment*

IEC 60297-3-100, *Mechanical structures for electronic equipment – Dimensions of mechanical structures of the 482,6 mm (19 in) series – Part 3-100: Basic dimensions of front panels, subracks, chassis, racks and cabinets*

IEC 60297-3-101, *Mechanical structures for electronic equipment – Dimensions of mechanical structures of the 482,6 mm (19 in) series – Part 3-101: Subracks and associated plug-in units*

IEC 60297-3-102, *Mechanical structures for electronic equipment – Dimensions of mechanical structures of the 482,6 mm (19 in) series – Part 3-102: Injector/extractor handle*

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