

<b>STN</b>	<b>Stavebnicové konštrukcie pre elektrické a elektronické zariadenia Vonkajšie kryty Časť 1: Návod na navrhovanie</b>	<b>STN EN IEC 61969-1</b>  18 8003
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Mechanical structures for electrical and electronic equipment - Outdoor enclosures - Part 1: Design guidelines

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 09/20

Obsahuje: EN IEC 61969-1:2020, IEC 61969-1:2020

Oznámením tejto normy sa od 16.06.2023 ruší  
STN EN 61969-1 (18 8003) z júna 2012

**131700**

EUROPEAN STANDARD

**EN IEC 61969-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2020

ICS 31.240

Supersedes EN 61969-1:2012 and all of its amendments  
and corrigenda (if any)

English Version

**Mechanical structures for electrical and electronic equipment -  
Outdoor enclosures - Part 1: Design guidelines  
(IEC 61969-1:2020)**

Structures mécaniques pour équipement électrique et  
électronique - Enveloppes de plein air - Partie 1: Lignes  
directrices pour la conception  
(IEC 61969-1:2020)

Mechanische Bauweisen für elektrische und elektronische  
Einrichtungen - Außengehäuse - Teil 1:  
Konstruktionsleitfaden  
(IEC 61969-1:2020)

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

**EN IEC 61969-1:2020 (E)****European foreword**

The text of document 48D/720/FDIS, future edition 3 of IEC 61969-1, 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 61969-1:2020.

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) 2021-03-16
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-06-16

This document supersedes EN 61969-1:2012 and all of its amendments and corrigenda (if any).

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**Endorsement notice**

The text of the International Standard IEC 61969-1:2020 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60068-2-1	NOTE	Harmonized as EN 60068-2-1
IEC 60068-2-2	NOTE	Harmonized as EN 60068-2-2
IEC 60068-2-5	NOTE	Harmonized as EN IEC 60068-2-5
IEC 60068-2-6	NOTE	Harmonized as EN 60068-2-6
IEC 60068-2-10	NOTE	Harmonized as EN 60068-2-10
IEC 60068-2-11	NOTE	Harmonized as EN 60068-2-11
IEC 60068-2-14	NOTE	Harmonized as EN 60068-2-14
IEC 60068-2-27	NOTE	Harmonized as EN 60068-2-27
IEC 60068-2-30	NOTE	Harmonized as EN 60068-2-30
IEC 60068-2-31	NOTE	Harmonized as EN 60068-2-31
IEC 60068-2-60	NOTE	Harmonized as EN 60068-2-60
IEC 60068-2-78	NOTE	Harmonized as EN 60068-2-78
IEC 60297 (series)	NOTE	Harmonized as EN IEC 60297 (series)
IEC 60297-3-100	NOTE	Harmonized as EN 60297-3-100
IEC 60917 (series)	NOTE	Harmonized as EN 60917 (series)
IEC 60917-1	NOTE	Harmonized as EN IEC 60917-1
IEC 60917-2	NOTE	Harmonized as EN 60917-2
IEC 61587-2	NOTE	Harmonized as EN 61587-2
IEC 61587-3	NOTE	Harmonized as EN 61587-3
IEC 61969-2	NOTE	Harmonized as EN 61969-2
IEC 61969-3	NOTE	Harmonized as EN 61969-3

## 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 60068-2-75	-	Environmental testing - Part 2-75: Tests - Test Eh: Hammer tests	EN 60068-2-75	-
IEC 60417	-	Graphical symbols for use on equipment. Index, survey and compilation of the single sheets.	-	-
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	-	-
IEC 60695-11-10	-	Fire hazard testing - Part 11-10: Test flames - 50 W horizontal and vertical flame test methods	EN 60695-11-10	-
IEC 60721-3-2	-	Classification of environmental conditions - Part 3-2: Classification of groups of environmental parameters and their severities - Transportation and handling	EN IEC 60721-3-2	-
IEC 60721-3-4	-	Classification of environmental conditions - Part 3-4: Classification of groups of environmental parameters and their severities - Stationary use at non-weatherprotected locations	EN IEC 60721-3-4	-
IEC 60825-1	-	Safety of laser products - Part 1: Equipment classification and requirements	EN 60825-1	-
IEC 60950-1	-	Information technology equipment - Safety - Part 1: General requirements	EN 60950-1	-
IEC 61010-1	-	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements	EN 61010-1	-

**EN IEC 61969-1:2020 (E)**

IEC 61140	-	Protection against electric shock - Common aspects for installation and equipment	EN 61140	-
IEC 61439-5	-	Low-voltage switchgear and controlgear assemblies - Part 5: Assemblies for power distribution in public networks	EN 61439-5	-
IEC 61587-1	-	Mechanical structures for electronic equipment - Tests for IEC 60917 and IEC 60297 series - Part 1: Environmental requirements, test set-up and safety aspects for cabinets, racks, subracks and chassis under indoor condition use and transportation	EN 61587-1	-
IEC 62194	-	Method of evaluating the thermal performance of enclosures	EN 62194	-
IEC 62262	-	Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)	EN 62262	-
IEC 62305-4	-	Protection against lightning - Part 4: Electrical and electronic systems within structures	EN 62305-4	-
ISO 15181-1	-	Paints and varnishes - Determination of release rate of biocides from antifouling paints - Part 1: General method for extraction of biocides	EN ISO 15181-1	-
ISO 3864-2	-	Graphical symbols - Safety colours and safety signs - Part 2: Design principles for product safety labels	-	-
ISO 7779	-	Acoustics - Measurement of airborne noise emitted by information technology and telecommunications equipment	EN ISO 7779	-
ETSI EN 300 019-1-4	-	Equipment Engineering (EE) - Environmental conditions and environmental tests for telecommunications equipment - Part 1-4: Classification of environmental conditions - Stationary use at non-weatherprotected locations	-	-
ETSI EN 300 019-2-4	-	Equipment Engineering (EE) - Environmental conditions and environmental tests for telecommunications equipment - Part 2-4: Specification of environmental tests - Stationary use at non-weatherprotected locations	-	-
ETSI EN 300 753	-	Equipment Engineering (EE) - Acoustic noise emitted by telecommunications equipment	-	-



IEC 61969-1

Edition 3.0 2020-05

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

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**Mechanical structures for electrical and electronic equipment –  
Outdoor enclosures –  
Part 1: Design guidelines**

**Structures mécaniques pour équipement électrique et électronique –  
Enveloppes de plein air –  
Partie 1: Lignes directrices pour la conception**





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IEC Central Office  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

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#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

#### IEC Glossary - [std.iec.ch/glossary](http://std.iec.ch/glossary)

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La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

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Edition 3.0 2020-05

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Partie 1: Lignes directrices pour la conception**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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ICS 31.240

ISBN 978-2-8322-8336-3

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## CONTENTS

FOREWORD .....	3
INTRODUCTION .....	5
1 Scope .....	6
2 Normative references .....	7
3 Terms and definitions .....	8
4 Coordination dimensions .....	9
5 Environmental requirements, tests and safety aspects .....	9
5.1 Classification of environmental conditions .....	9
5.2 Static load .....	10
5.3 Dynamic stress .....	10
5.4 Seismic performance .....	10
6 Electromagnetic shielding .....	11
7 Thermal management and acoustic noise suppression .....	11
Bibliography .....	12
Figure 1 – Typical outdoor enclosure .....	6
Figure 2 – Locations of outdoor enclosures .....	8
Table 1 – Environmental conditions .....	9
Table 2 – Safety aspects .....	10

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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### **MECHANICAL STRUCTURES FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – OUTDOOR ENCLOSURES –**

#### **Part 1: Design guidelines**

#### **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 61969-1 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 third edition cancels and replaces the second edition published in 2011. This edition constitutes a technical revision.

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

- a) alignment with the content of ETSI EN 300 019 and IEC 60721 series latest editions, particularly with the actualization of climate conditions;
- b) new requirements added to reflect market requirements on environmental issues;
- c) improvement on terminology and overall editorial improvement.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
48D/720/FDIS	48D/723/RVD

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

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

A list of all parts in the IEC 61969 series, published under the general title *Mechanical structures for electrical and electronic equipment – Outdoor enclosures*, can be found on the IEC website.

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.

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

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

## INTRODUCTION

This part of IEC 61969 is intended as a generic guide for the development of further parts within this series of standards, and it provides design guidelines for outdoor enclosures.

The products covered by IEC 61969 (all parts) are empty enclosures for outdoor locations, to be equipped with application-specific combinations of electrical and electronic equipment, and to be used at non-weather protected locations above ground.

IEC 61969 (all parts) consists of:

- a design guidelines general part (IEC 61969-1);
- a coordination dimension standard (IEC 61969-2);
- an environmental requirements and tests, safety aspects standard (IEC 61969-3).

IEC 61969-2 and IEC 61969-3 should be read in conjunction with this document.

# MECHANICAL STRUCTURES FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – OUTDOOR ENCLOSURES –

## Part 1: Design guidelines

### 1 Scope

This part of IEC 61969 contains design guidelines for outdoor enclosures and is applicable over a wide field of mechanical, electromechanical and electronic equipment and its installation where a modular design is used.

The objectives of this document are:

- to provide an overview of specifications for enclosures focused on requirements for outdoor applications for stationary use at non-weather protected locations, and
- to achieve product integrity under outdoor conditions and to ease product selection for the sourcing of outdoor enclosures from different vendors.

These enclosures are considered to contain any equipment and provide protection for the outdoor installed facilities against unwanted environmental impacts. The installed equipment can be, but is not limited to, subracks or chassis according to IEC 60917 (all parts) or IEC 60297 (all parts). A typical outdoor enclosure is shown in Figure 1.

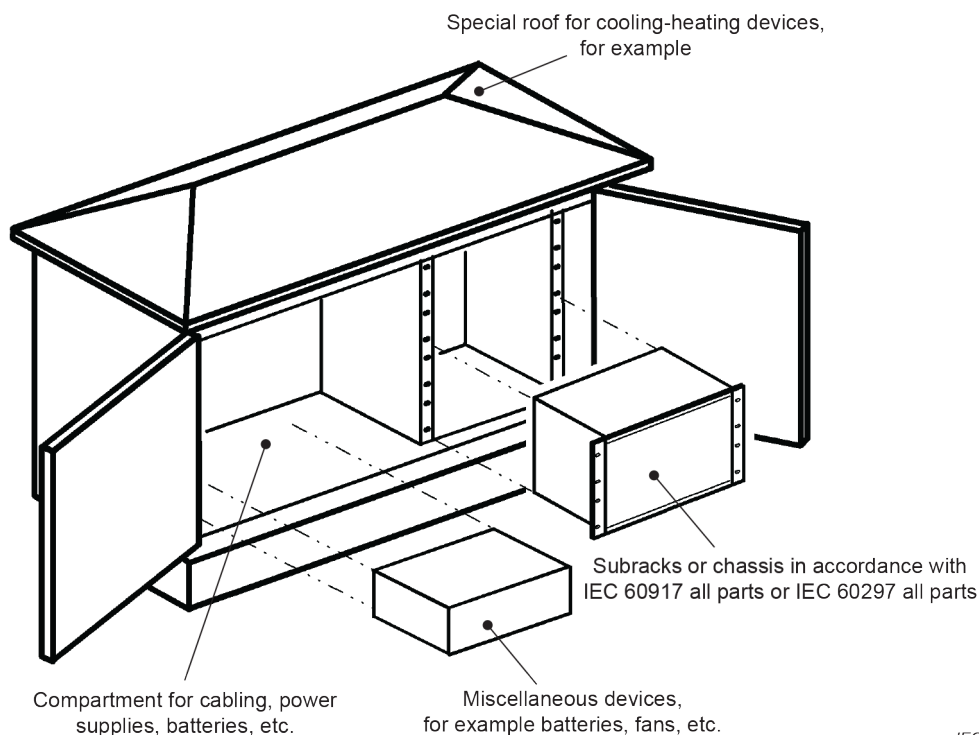


Figure 1 – Typical outdoor enclosure

## 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 60068-2-75, *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

IEC 60417, *Graphical symbols for use on equipment* (available at <http://www.graphical-symbols.info/equipment>)

IEC 60529, *Degrees of protection provided by enclosures (IP code)*

IEC 60695-11-10, *Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods*

IEC 60721-3-2, *Classification of environmental conditions – Part 3-2: Classification of groups of environmental parameters and their severities – Transportation and handling*

IEC 60721-3-4, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Stationary use at non-weatherprotected locations*

IEC 60825-1, *Safety of laser products – Part 1: Equipment specification and requirements*

IEC 60950-1, *Information technology equipment – Safety – Part 1: General requirements*

IEC 61010-1, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements*

IEC 61140, *Protection against electric shock – Common aspects for installation and equipment*

IEC 61439-5, *Low-voltage switchgear and controlgear assemblies – Part 5: Assemblies for power distribution in public networks*

IEC 61587-1, *Mechanical structures for electronic equipment – Tests for IEC 60917 and IEC 60297 series – Part 1: Environmental requirements, test set-up and safety aspects for cabinets, racks, subracks and chassis under indoor condition use and transportation*

IEC 62194, *Methods of evaluating the thermal performance of enclosures*

IEC 62262, *Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)*

IEC 62305-4, *Protection against lightning – Part 4: Electrical and electronic systems within structures*

ISO 1518-1, *Paints and varnishes – Determination of scratch resistance – Part 1: Constant-loading method*

ISO 3864-2, *Graphical symbols – Safety colours and safety signs*

ISO 7779, *Acoustics – Measurement of airborne noise emitted by information technology and telecommunications equipment*

ETSI EN 300 019-1-4, *Equipment Engineering (EE) – Environmental conditions and environmental tests for telecommunications equipment – Part 1-4: Classification of environmental conditions – Stationary use at non-weatherprotected locations*

ETSI EN 300 019-2-4, *Equipment Engineering (EE) – Environmental conditions and environmental tests for telecommunications equipment – Part 2-4: Specification of environmental tests – Stationary use at non-weatherprotected locations*

ETSI EN 300 753, *Equipment Engineering (EE) – Acoustic noise emitted by telecommunications equipment*

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**