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*Degrees of Protection Provided by Enclosures (IP Code)  
(identical national adoption)*

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## INTRODUCTION

This standard describes a system for classifying the degrees of protection provided by enclosures of electrical equipment for two conditions: 1) the protection of persons against access to hazardous parts and protection of equipment against the ingress of solid foreign objects and 2) the ingress of water. The degree of protection against these two conditions is designated by an IP Code.

Enclosures as used in this standard are as defined in the standard. This includes not only traditional metallic or polymeric enclosures but any enclosing part of electrical equipment that provides a degree of protection as defined in the scope. As such the use of this system allows specific ratings to be applied to different parts of the equipment. For example a component with an IP20 rating indicating only a degree of protection against contact with live parts within that component could be used within an overall enclosure with an IP43 rating that provides a degree of protection against probes and solid foreign objects as well as splashing water.

While the IP Code system is suitable for most types of electrical equipment, it must be noted that this standard is a horizontal standard and not a product standard. The product standards for different equipment may include other requirements for enclosures Types. The determination of the acceptability of the IP Code system as well as the applicability and use of these requirements is a subject for the end product standard. This system is only acceptable when adopted by the end product standard and as specified in the end product standard.



# INTERNATIONAL STANDARD

# IEC 60529

**Edition 2.1**  
2001-02

Edition 2:1989 consolidated with amendment 1:1999

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## Degrees of protection provided by enclosures (IP Code)



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# INTERNATIONAL ELECTROTECHNICAL COMMISSION

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## **DEGREES OF PROTECTION PROVIDED BY ENCLOSURES (IP Code)**

### FOREWORD

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International Standard IEC 60529 has been prepared by technical committee 70: Degrees of protection by enclosures.

This second edition cancels and replaces the first edition published in 1976 and constitutes a technical revision.

This consolidated version of IEC 60529 is based on the second edition (1989) [documents 70(CO)13 + 70(CO)16 and 70(CO)15 + 70(CO)17], and its amendment 1 (1999) [documents 70/91/FDIS and 70/92/RVD].

It bears the edition number 2.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

Annexes A and B are for information only.

The contents of the corrigendum of January 2003 have been included in this copy.

## INTRODUCTION

This standard describes a system for classifying the degrees of protection provided by the enclosures of electrical equipment. Whilst this system is suitable for use with most types of electrical equipment, it should not be assumed that all the listed degrees of protection are applicable to a particular type of equipment. The manufacturer of the equipment should be consulted to determine the degrees of protection available and the parts of equipment to which the stated degree of protection applies.

The adoption of this classification system, wherever possible, will promote uniformity in methods of describing the protection provided by the enclosure and in the tests to prove the various degrees of protection. It should also reduce the number of types of test devices necessary to test a wide range of products.

This second edition of IEC 60529 takes account of experiences with the first edition, and clarifies the requirements. It provides for an optional extension of the IP Code by an additional letter A, B, C, or D if the actual protection of persons against access to hazardous parts is higher than that indicated by the first characteristic numeral.

In general, enclosures with an IP coding to the first edition would be eligible for the same code according to this edition.

## DEGREES OF PROTECTION PROVIDED BY ENCLOSURES (IP Code)

### 1 Scope and object

This standard applies to the classification of degrees of protection provided by enclosures for electrical equipment with a rated voltage not exceeding 72,5 kV.

The object of this standard is to give:

- a) *Definitions* for degrees of protection provided by enclosures of electrical equipment as regards:
  - 1) protection of persons against access to hazardous parts inside the enclosure;
  - 2) protection of the equipment inside the enclosure against ingress of solid foreign objects;
  - 3) protection of the equipment inside the enclosure against harmful effects due to the ingress of water.
- b) *Designations* for these degrees of protection.
- c) *Requirements* for each designation.
- d) *Tests* to be performed to verify that the enclosure meets the requirements of this standard.

It will remain the responsibility of individual technical committees to decide on the extent and manner in which, the classification is used in their standards and to define “enclosure” as it applies to their equipment. However, it is recommended that for a given classification the tests do not differ from those specified in this standard. If necessary, complementary requirements may be included in the relevant product standard. A guide for the details to be specified in relevant product standards is given in annex B.

For a particular type of equipment, a technical committee may specify different requirements provided that at least the same level of safety is ensured.

This standard deals only with enclosures that are in all other respects suitable for their intended use as specified in the relevant product standard and which from the point of view of materials and workmanship ensure that the claimed degrees of protection are maintained under the normal conditions of use.

This standard is also applicable to empty enclosures provided that the general test requirements are met and that the selected degree of protection is suitable for the type of equipment to be protected.

Measures to protect both the enclosure and the equipment inside the enclosure against external influences or conditions such as

- mechanical impacts
- corrosion
- corrosive solvents (for example, cutting liquids)
- fungus
- vermin
- solar radiation
- icing
- moisture (for example, produced by condensation)
- explosive atmospheres

and the protection against contact with hazardous moving parts external to the enclosure (such as fans), are matters for the relevant product standard to be protected.