BRITISH STANDARD

BS EN 50102:1995

Implementing Amendment No. 1, not published separately

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

The European Standard EN 50102:1995 with the incorporation of amendment A1:1998 has the status of a British Standard

ICS 29.020

BSI British Standards

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee GEL/70, upon which the following bodies were represented:

Association of Manufacturers of Domestic Electrical Appliances

Consumer Policy Committee of BSI

Department of Trade and Industry (Consumer Safety Unit, CA Division)

Electrical Installation Equipment Manufacturers' Association (BEAMA Ltd.)

Electricity Association

GAMBICA (BEAMA Ltd.)

Health and Safety Executive

This British Standard, having been prepared under the direction of the Electrotechnical Sector Board, was published under the authority of the Standards Board and comes into effect on 15 October 1995

Amendments issued since publication

Amd. No.	Date	Comments
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The following BSI references relate to the work on this standard:
Committee reference GEL/70
Draft for comment 92/30103 DC

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Contents

National foreword

This British Standard has been prepared by Technical Committee GEL/70 and is the English language version of EN 50102, *Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)*, including amendment A1:1998 published by the European Committee for Electrotechnical Standardization (CENELEC).

The foreword of EN 50102 makes reference to the "date of withdrawal" (dow) of the relevant national standard. In this case there is no relevant national standard.

Cross-references

Publication referred to	Corresponding British Standard
IEC 68-1:1988	BS 2011 *Environmental testing* Part 1.1:1989 *General and guidance*

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 6, an inside back cover and a back cover.

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50102
March 1995
+ A1
October 1998

ICS 29.020

Descriptors: Electrical equipment, enclosure for electrical equipment, degree of protection, mechanical impact, classification, tests, test conditions, control

English version

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

(includes amendment A1:1998)

Degrés de protection procurés par les enveloppes de matériels électriques contre les impacts mécaniques externes (code IK)
(inclut l'amendement A1:1998)

Schutzarten durch Gehäuse für elektrische Betriebsmittel (Ausrüstung) gegen äußere mechanische Beanspruchungen (IK-Code)
(enthält Änderung A1:1998)

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B-1050 Brussels

Foreword

This European Standard was prepared by CENELEC BTTF 68-3, Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code).

The text of the draft, based on document BT(FR/NOT)141, was submitted to the formal vote in June 1994 and was approved by CENELEC as EN 50102 on 1994-12-06.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1997-04-15
- latest date by which national standards conflicting with the EN have to be withdrawn (dow) 1997-04-15

Foreword to amendment A1

This amendment was prepared by CENELEC BTTF 68-3, IK code.

This text of the draft was submitted to the formal vote and was approved by CENELEC as amendment A1 to EN 50102:1995 on 1998-10-01.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1999-10-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 1999-10-01

Contents

Introduction

This standard describes a system for classifying the degrees of protection provided by enclosures for electrical equipment against external mechanical impacts. 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, should 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.

1 Scope

This standard refers to the classification of the degrees of protection provided by enclosures against external mechanical impacts when the rated voltage of the protected equipment is not greater than 72,5 kV.

This standard is only applicable to enclosures of equipment where the specific standard establishes degrees of protection of the enclosure against mechanical impacts (expressed in this standard as impacts).

The object of this standard is to give:

a) the *definitions* for degrees of protection provided by enclosures of electrical equipment as regards protection of the equipment inside the enclosure against harmful effects of mechanical impacts;

b) the *designations* for the degrees of protection;

c) the *requirements* for each designation;

d) the *tests* to be performed to verify that 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.

For a particular type of equipment a Product 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.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

Publication	Year	Title	EN/HD	Year
IEC 50 (826)	1982	*International Electrotechnical Vocabulary* Chapter 826: *Electrical installations of buildings*	—	—
IEC 68-1	1988	*Environmental testing* Part 1: *General and guidance*	HD 323.1 S2 EN 60068-1	1988 1994
IEC 60068-2-75	1997	Environmental testing Part 2: *Tests — test Eh: Hammer tests*	EN 60068-2-75	1997

3 Definitions

For the purpose of this standard, the following definitions apply.

3.1
enclosure[1)]
a part providing protection of equipment against certain external influences and, in any direction, protection against contact (IEV 826-03-12)

NOTE This definition from the existing International Electrotechnical Vocabulary (IEV) needs the following explanations under the scope of this standard:

1) Enclosures provide protection of equipment against harmful effects of mechanical impacts.

2) Barriers, shapes of openings or any other means — whether attached to the enclosure or formed by the enclosed equipment — suitable to prevent or limit the penetration of the specified test probes are considered as a part of the enclosure, except when they can be removed without the use of a key or tool.

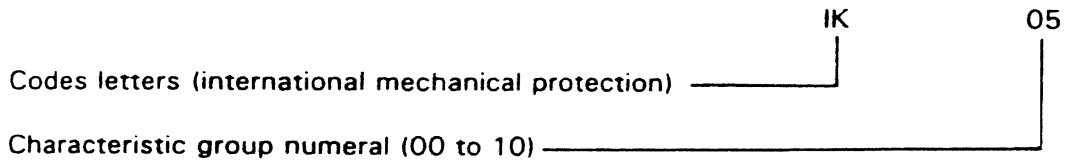
3.2
degree of protection against mechanical impacts
the extent (level) of protection of the equipment provided by an enclosure against harmful mechanical impacts and verified by standardized test methods

3.3
IK code
a coding system to indicate the degree of protection provided by an enclosure against harmful mechanical impacts

4 Designations

The degree of protection provided by an enclosure against impacts is indicated by the IK code in the following way.

4.1 Arrangement of the IK code



4.2 Characteristic group numerals of the IK code and their meanings

Each characteristic group numeral, represents an impact energy value as shown in Table 1.

Table 1 — Relation between IK code and impact energy

IK code	IK00	IK01	IK02	IK03	IK04	IK05	IK06	IK07	IK08	IK09	IK10
Impact energy Joule	[a]	0,14	0,2	0,35	0,5	0,7	1	2	5	10	20
[a] not protected according to this standard											

NOTE 1 When higher impact energy is required the value of 50 Joules is recommended.

NOTE 2 A characteristic group numeral of two figures has been chosen to avoid confusion with some former national standards which used a single numeral for a specific impact energy.

4.3 Application of the IK code

In general the degree of protection applies to the complete enclosure. If parts of the enclosure have differing degrees of protection, the latter shall be separately indicated.

[1)] This definition is identical to **3.1** of EN 60529.

4.4 Marking

In case where the relevant product committee decides that marking of the IK-code shall be required, the marking requirements shall be detailed in the relevant product standard.

Where appropriate, such a standard should also specify the method of marking which is to be used when:

— one part of an enclosure has different degree of protection to that of another part of the same enclosure;

— the mounting position has an influence on the degree of protection.

5 General requirements for tests

5.1 Atmospheric conditions for tests

Unless otherwise specified in the relevant product standard, the test shall be carried out under the standard atmospheric conditions for tests described in IEC 68-1 as:

Temperature range	15 °C to 35 °C
Air pressure	86 kPa to 106 kPa (860 mbar to 1 060 mbar)

When the altitude at which the test is performed is higher than 2 000 m the height of fall shall be adjusted where necessary to result in the specified impact energy.

5.2 Enclosures under test

Each enclosure under test shall be in a clean and new condition, complete with all their parts in place unless otherwise specified in the relevant product standard.

5.3 Specifications to be given in the relevant product standard

The relevant product standard shall specify:

— the definition of “enclosure” as it applies to the particular type of equipment;

— the test equipment (e.g. pendulum hammer, spring hammer or vertical hammer, see Clause **7**);

— the number of samples to be tested;

— the conditions for mounting, assembling and positioning the samples, e.g. by the use of an artificial surface (ceiling, floor or wall), in order to stimulate intended service conditions as far as possible;

— the pre-conditioning, if any, which is to be used;

— whether to be tested energized;

— whether to be tested with any moving parts in motion;

— the number of impacts and their points of application (see **6.3**).

In the absence of such specifications in the relevant product standard, conditions of this standard shall apply.

6 Test to verify the protection against mechanical impacts

6.1 The tests specified in this standard are type tests.

6.2 In order to verify the protection against mechanical impacts blows shall be applied to the enclosure to be tested. The device to be used for this test are described in Clause **7**.

6.3 During the test the enclosure shall be mounted, according to the manufacturer instructions for use, on a rigid support. A support is considered to be sufficiently rigid if its displacement is less than or equal to 0,1 mm under the effect of an impact directly applied and whose energy corresponds to the degree of protection. Alternative mounting and support, suitable for the product, may be specified in the relevant product standard.

6.4 The number of impacts shall be five on each exposed face unless otherwise specified in the relevant product standard. The impacts shall be evenly distributed on the faces of the enclosure(s) under test. In no case shall more than three impacts be applied in the surroundings of the same point of the enclosure. The relevant product standard shall specify the points of application of impacts.

6.5 Test evaluation

The relevant product standard shall specify the criteria upon which the acceptance or rejection of the enclosure is to be based on particularly:

— admissible damages;

— verification criteria relative to the continuity of the safety and reliability of the equipment.

7 Test apparatus

The test shall be done by using one of the test apparatus as described in EN 60068-2-75.

List of references

See national foreword.

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