



National Standards Authority of Ireland

IRISH STANDARD

I.S. HD 625.1 S1:1999

ICS 29 080

**INSULATION COORDINATION FOR  
EQUIPMENT WITHIN LOW-VOLTAGE  
SYSTEMS. PART 1: PRINCIPLES,  
REQUIREMENTS AND TESTS  
(IEC 664-1:1992, MODIFIED)**

National Standards  
Authority of Ireland  
NSAI

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HARMONIZATION DOCUMENT  
DOCUMENT D'HARMONISATION  
HARMONISIERUNGSDOKUMENT

**HD 625.1 S1**

September 1996

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ICS 29.040.20

Descriptors: Low-voltage equipment, insulation, definitions, coordination, requirements, dimensioning rules, tests, measurements

English version

**Insulation coordination for equipment within low-voltage systems**  
**Part 1: Principles, requirements and tests**  
(IEC 664-1:1992, modified)

Coordination de l'isolement des  
matériels dans les systèmes  
(réseaux) à basse tension  
Partie 1: Principes, prescriptions  
et essais  
(CEI 664-1:1992, modifiée)

Isolationskoordination für elektrische  
Betriebsmittel in  
Niederspannungsanlagen  
Teil 1: Grundsätze, Anforderungen  
und Prüfungen  
(IEC 664-1:1992, modifiziert)

This Harmonization Document was approved by CENELEC on 1996-03-05. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this Harmonization Document on a national level.

Up-to-date lists and bibliographical references concerning such national implementation may be obtained on application to the Central Secretariat or to any CENELEC member.

This Harmonization Document exists in three official versions (English, French, German).

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

**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

The text of the International Standard IEC 664-1:1992, prepared by SC 28A, Insulation coordination for low-voltage equipment, of IEC TC 28, Insulation coordination, together with common modifications prepared by the Technical Committee CENELEC TC 28A, Insulation coordination for low-voltage equipment, was submitted to the formal vote and was approved by CENELEC as HD 625.1 S1 on 1996-03-05.

The following dates were fixed:

- latest date by which the existence of the HD  
has to be announced at national level (doa) 1996-09-01
- latest date by which the HD has to be implemented  
at national level by publication of a harmonized  
national standard or by endorsement (dop) 1997-03-01
- latest date by which the national standards conflicting  
with the HD have to be withdrawn (dow) 1997-03-01

For products which have complied with the relevant national standard before 1997-03-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2002-03-01.

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annex ZA is normative and annexes A, B, C, and D are informative. Annex ZA has been added by CENELEC.

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### Endorsement notice

The text of the International Standard IEC 664-1:1992 was approved by CENELEC as a Harmonization Document with agreed common modifications as given below.

#### COMMON MODIFICATIONS

##### 1.3.10 **Overvoltage category**

A numeral defining an impulse withstand level.  
No change in the note.

##### 2.2 **Voltages and voltage ratings**

Second alinea:

Instead of "an overvoltage category according ..."  
Read "an impulse withstand category (overvoltage category) ..."

##### 2.2.2.1 **Impulse withstand categories (overvoltage categories)**

Impulse withstand categories are means to distinguish different degrees of availability of equipment with regard to required expectations on continuity of service and on an acceptable risk of failure. By selection of impulse withstand levels of equipment, insulation coordination can be achieved in the whole installation, reducing the risk of failure to an acceptable level providing a basis for overvoltage control.

A higher characteristic numeral of an impulse withstand category indicates a higher specific impulse withstand of the equipment and offers a wider choice of methods for overvoltage control.

The concept of impulse withstand categories is used for equipment energised directly from the mains. The application of impulse withstand categories is based on the requirement with regard to additional protection against overvoltages as specified in IEC 364-4-443.

**NOTE:** Overvoltages of atmospheric origin are not significantly physically attenuated downstream in most installations. Investigations have shown that the concept of a probabilistic approach has proven reasonable and useful.

##### 2.2.2.1.1 **Equipment energised directly from the low-voltage mains**

Specification of a specific impulse withstand category (overvoltage category) shall be based on the following general explanation:

- Equipment of impulse withstand category I is equipment which is intended to be connected to the fixed electrical installations of buildings. Protective means are taken outside the equipment - either in the fixed installation or between the fixed installation and the equipment - to limit transient overvoltages to the specific level.
- Equipment of impulse withstand category II is equipment to be connected to the fixed electrical installations of buildings.

**NOTE:** Examples of such equipment are household appliances, portable tools and similar loads.

- Equipment of impulse withstand category III is equipment which is part of the fixed electrical installations and other equipment where a higher degree of availability is expected.

NOTE: Examples of such equipment are distribution boards, circuit breakers, wiring systems (IEV 826-06-01, including cables, bus-bars, junction boxes, switches, socket-outlets) in the fixed installation, and equipment for industrial use and some other equipment, e.g. stationary motors with permanent connection to the fixed installation.

- Equipment of impulse withstand category IV is for use at or in the proximity of the origin of the electrical installations of buildings upstream of the main distribution board.

NOTE: Examples of such equipment are electricity meters, primary overcurrent protection devices and ripple control units.

2.2.2 Table I

Table I - Rated impulse voltage of equipment

Nominal voltage of the installation * (V)		Required impulse withstand voltage (kV) for			
Three-phase systems	Single-phase systems with middle point	Equipment at the origin of the installation (impulse withstand category IV)	Equipment which is part of the fixed installation (impulse withstand category III)	Equipment to be connected to the fixed installation (impulse withstand category II)	Specially protected equipment (impulse withstand category I)
	120- 240	4	2,5	1,5	0,8
230/400 277/480		6	4	2,5	1,5
400/690		8	6	4	2,5
1000		Values subject to systems engineers or for lack of information, the values of the above line can be chosen			
* According to IEC 38					
Category I is addressed to particular equipment engineering, category II is addressed to product committees for equipment for connection to the mains, category III is addressed to product committees of installation material and some special product committees, category IV is addressed to supply authorities and systems engineers (see also introduction).					

4.1.2 Paragraph above the last one - Read:

"Partial discharge tests shall be specified unless it can be shown that PD are not likely to appear (the peak value of the voltage is below 500 V) or that insulation, for example ceramics, has an adequate life in the presence of partial discharges.

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