BS EN 41003:2009

BSI British Standards

Particular safety requirements for equipment to be connected to telecommunication networks and/or a cable distribution system

raising standards worldwide™

BSI British Standards

National foreword

This British Standard is the UK implementation of EN 41003:2008. It supersedes BS EN 41003:1999, which will be withdrawn on 1 July 2011.

The UK participation in its preparation was entrusted to Technical Committee EPL/108, Safety of electronic equipment within the field of audio/video, information technology and communication technology.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

ISBN 978 0 580 61043 1

ICS 33.040.01

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 28 February 2009.

Amendments issued since publication

Amd. No.	Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 41003

November 2008

ICS 33.040.00

Supersedes EN 41003:1998

English version

Particular safety requirements for equipment to be connected to telecommunication networks and/or a cable distribution system

Règles particulières de sécurité pour les matériels de sécurité destinés à être reliés aux réseaux de télécommunications et/ou aux systèmes de distribution par câbles

Besondere Sicherheitsanforderungen an Geräte zum Anschluss an Telekommunikationsnetze und/oder Kabelverteilsysteme

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

Ref. No. EN 41003:2008 E

Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 108X, Safety of electronic equipment within the fields of audio/video, information technology and communication technology.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 41003 on 2008-07-01.

This European Standard supersedes EN 41003:1998 + corrigendum September 2000.

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)	2009-07-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2011-07-01

The first edition of this European Standard was prepared by CENELEC TC 74X, in close cooperation with a number of international organizations, e.g. IEC, ECMA, CEPT, CCITT, ETSI. In 1993 TC 74X was disbanded and responsibility for this European Standard passed to the Technical Committee CENELEC TC 74, Safety and energy efficiency of information technology equipment. CENELEC TC 74 was disbanded by D112/112 in 2002 and merged with CENELEC TC 92 into new CENELEC TC 108, which was renumbered CENELEC TC 108X by 130 BT.

At that time, a standard was needed for uniform application by network operators in Europe when approving subscribers' equipment for attachment to their networks, and for purchasing purposes by network operators.

In February 1986 the CENELEC Technical Board formed a working group 'Telecom Safety' which became CENELEC TC 74X in early 1987. IEC TC 74 established WG7 to amend IEC 60950 for a similar purpose.

ENV 41003 was ratified by the CENELEC Technical Board in March 1988 and subsequently amended and converted into this EN 41003 which was ratified in September 1990. In June 1992 the CENELEC Technical Board approved the reprint of EN 41003, which was technically unchanged from EN 41003:1991 and refers to EN 60950:1992 wherever possible.

The edition of EN 41003:1996 was deemed necessary following the publication of EN 60950:1992/A3:1995 to reflect further convergence of the two standards.

The edition of EN 41003:1998 was deemed necessary following the publication of EN 60950:1992/A4:1997, to reflect further convergence of the two standards.

This edition of EN 41003 was deemed necessary following the publication of EN 60950-1:2006 Information technology equipment – Safety – Part 1: General requirements (IEC 60950-1:2005, modified), to reflect further convergence of the two standards.

_____

Contents

Figure

Introduction

This European Standard is needed for products intended to be connected to a TELECOMMUNICATION NETWORK and/or a CABLE DISTRIBUTION SYSTEM not covered by the scope of EN 60950-1. It is to be used in conjunction with other product safety standards; examples of which are listed in Annex A.

Upper levels for TELECOMMUNICATION/CABLE DISTRIBUTION SYSTEM signals have been defined. They include also telephone ringing signals which have been defined taking into account voltages commonly used in the different networks. The electrical hazard criteria have been chosen to accord with the IEC/TS 60479 series.

Test levels used for the equipment take account of the possibility that overvoltages may occur on TELECOMMUNICATION AND CABLE DISTRIBUTION NETWORKS. Special consideration has been given to equipment parts expected to be held or touched during normal use, e.g. telephone handsets.

It is recognised that in high overvoltages risk areas, requirements of this European Standard may not be sufficient; additional protective devices, not covered by this European Standard, may be installed in the COMMUNICATION NETWORKS to better meet extreme conditions.

For the adoption of this European Standard, the relevant special national conditions and A-deviations apply that are listed in Annexes ZB and ZC of EN 60950-1.

1 Scope

This European Standard applies to equipment designed and intended to be connected as a terminal to a TELECOMMUNICATION NETWORK and/or a CABLE DISTRIBUTION SYSTEM termination. It does not apply to equipment covered by EN 60950-1 and EN 60065.

This European Standard specifies the safety requirements of the interface to the TELECOMMUNICATION NETWORK and/or the CABLE DISTRIBUTION SYSTEM only and it does not specify any other safety requirements.

It applies regardless of ownership or responsibility for installation or maintenance of the equipment, and regardless of the source of power.

This European Standard, in accordance with the 'principles of safety' given in the introduction of EN 60950-1, covers the requirements and compliance criteria under three headings.

- Protection of equipment USERS from hazards in the equipment. The USER is considered to be protected from hazards in the equipment if the equipment complies with a relevant safety standard, for example one of those listed in Annex A, but compliance with those standards is not part of this European Standard.
- Protection of SERVICE PERSONNEL working on a TELECOMMUNICATION NETWORK and/or a CABLE DISTRIBUTION SYSTEM and other USERS of a TELECOMMUNICATION NETWORK and/or a CABLE DISTRIBUTION SYSTEM, from hazardous conditions on a TELECOMMUNICATION NETWORK and/or a CABLE DISTRIBUTION SYSTEM resulting from the connection of the equipment.
- Protection of equipment USERS from voltages on a TELECOMMUNICATION NETWORK and/or a CABLE DISTRIBUTION SYSTEM.

Requirements additional to those specified in this European Standard may be necessary for

- equipment intended for operation while exposed, for example, to extremes of temperature, to excessive dust, moisture, or vibration, to flammable gases, to corrosive or explosive atmospheres,
- electromedical applications with physical connections to the patient.

The requirements for the following items are not covered by this European Standard:

- functional reliability of equipment;
- communication facilities with remote supply using hazardous voltage;
- protection of equipment, TELECOMMUNICATION NETWORKS and/or CABLE DISTRIBUTION SYSTEMS from damage.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 60950-1	2006	Information technology equipment – Safety – Part 1: General requirements (IEC 60950-1:2005, mod)

NOTE Lists of other related documents can be found in Annex A and in the Bibliography.

3 Definitions

For the purposes of this document, the terms and definitions of EN 60950-1 apply.

NOTE 1 Defined terms are printed in SMALL CAPITALS.

NOTE 2 For information about TELECOMMUNICATION NETWORK voltages and signals, see Annex B.

4 Safety requirements and compliance criteria

NOTE It is assumed that adequate measures according to ITU-T Recommendation K.11 have been taken to reduce the likelihood that the overvoltages presented to the equipment exceed 1,5 kV peak. In installations where overvoltages presented to the equipment may exceed 1,5 kV peak, additional measures such as surge suppression may be necessary.

The general conditions for tests of EN 60950-1, 1.4 apply.

The references to the requirements of EN 60950-1, 4.2.2 and 4.2.3 may be replaced by the corresponding requirements in other relevant safety standards listed in Annex A, if the equipment is designed to comply with one of these standards.

4.1 Interconnection of equipment – General requirements

EN 60950-1, 3.5.1 applies.

4.1.1 Types of interconnection circuits

EN 60950-1, 3.5.2 applies.

4.1.2 ELV circuits as interconnection circuits

EN 60950-1, 3.5.3 applies.

4.1.3 Safety statements

The safety status (SELV CIRCUIT, TNV-1 CIRCUIT; TNV-2 CIRCUIT; TNV-3 CIRCUIT, LIMITED CURRENT CIRCUIT, ELV CIRCUIT AND HAZARDOUS VOLTAGE) of interconnection points for the connection to other equipment shall be stated in the manufacturer's documentation supplied with the equipment.

4.2 TNV circuits

4.2.1 Limits

EN 60950-1, 2.3.1 applies.

4.2.2 Separation of TNV circuits from other circuits and from accessible parts

EN 60950-1, 2.3.2 applies.

The WORKING VOLTAGE of the insulation shall be specified by the manufacturer of the equipment.

4.2.3 Separation from hazardous voltages

EN 60950-1, 2.3.3 applies.

4.2.4 Connection of TNV circuits to other circuits

EN 60950-1, 2.3.4 applies.

4.2.5 Test for operating voltages generated externally

EN 60950-1, 2.3.5 applies.

4.3 Protection against contact with TNV circuits

4.3.1 Protection in operator access areas

4.3.1.1 Access to energized parts

For TNV CIRCUITS EN 60950-1, 2.1.1.1 applies.

4.3.1.2 Battery compartments

For TNV CIRCUITS EN 60950-1, 2.1.1.2 applies.

4.3.2 Protection in service access areas

For TNV CIRCUITS EN 60950-1, 2.1.2 applies.

4.3.3 Protection in restricted access location

For TNV CIRCUITS EN 60950-1, 2.1.3 applies.

4.4 Protection of TELECOMMUNICATION NETWORK and/or cable distribution network service persons, and users of other equipment connected to the network, from hazards in the equipment

4.4.1 Protection from hazardous voltages

EN 60950-1, 6.1.1 or relevant parts of 7 respectively applies.

4.4.2 Use of protective earthing

EN 60950-1, 2.6.5.8 applies.

For the protective earthing of TNV CIRCUITS EN 60950-1, 2.6.1 (items c), d), and f)), 2.6.3, and 2.6.4 apply.

4.4.3 Separation of the TELECOMMUNICATION NETWORK from earth

EN 60950-1, 6.1.2 or relevant parts of 7 respectively applies.

4.4.4 Touch current to TELECOMMUNICATION NETWORKS and CABLE DISTRIBUTION SYSTEM and from TELECOMMUNICATION NETWORKS

EN 60950-1, 5.1.8 applies.

4.4.5 Summation of touch currents from TELECOMMUNICATION NETWORKS

EN 60950-1, 5.1.8.2 applies.

4.5 Protection of equipment users from overvoltages on TELECOMMUNICATION NETWORKS and/or CABLE DISTRIBUTION SYSTEMS

EN 60950-1, 6.2.1 and 6.2.2 or relevant parts of 7 respectively apply.

4.6 Protection of the telecommunication wiring system from overheating

EN 60950-1, 6.3 applies.

Annex A
(informative)

Relevant safety standards for the application of this European Standard

This Annex lists some examples of IEC and CENELEC product safety standards with which this European Standard may be used.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60335 (mod)	Series	Household and similar electrical appliances - Safety	EN 60335	Series
IEC 60601-1	1988	Medical electrical equipment - Part 1: General requirements for safety	EN 60601-1 + corr. July	1990 1994
A1	1991		A1 + corr. July	1993 1994
A2 + corr. June	1995 1995		A2 A13	1995 1996
IEC 60601-1	2005	Medical electrical equipment - Part 1: General requirements for basic safety and essential performance	EN 60601-1	2006
IEC 60601-1-1	2000	Medical electrical equipment - Part 1-1: General requirements for safety - Collateral standard: Safety requirements for medical electrical systems	EN 60601-1-1	2001
IEC 60730 (mod)	Series	Automatic electrical controls for household and similar use	EN 60730	Series
IEC 61010-1	2001	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements	EN 61010-1	2001

Annex B
(informative)

Telecommunication network voltages and signals

B.1 General

Certain voltages within TELECOMMUNICATION NETWORKS often exceed the steady state, safe to touch limits set within general safety standards. Years of practical experience by world-wide network operators have found ringing and other operating voltages to be electrically safe. Records of accident statistics indicate that electrical injuries are not caused by operating voltages.

Access to connectors carrying such signals with the standard test finger is permitted, provided that inadvertent access is unlikely. The likelihood of inadvertent access is limited by forbidding access with the test probe (EN 60950-1:2006, Figure 2c) which has a 6 mm radius tip.

This requirement ensures that:

a) contact by a large part of the human body, such as the back of the hand, is impossible;

b) contact is possible only by deliberately inserting a small part of the body, less than 12 mm across, such as a fingertip, which presents a high impedance;

c) the possibility of being unable to let-go the part in contact does not arise.

This applies both to contact with signals arriving from the network (EN 60950-1:2006, 6.2.1 and 6.2.2) and to signals generated internally in the equipment.

Ventricular fibrillation of the heart is considered to be the main cause of death by electric shock.

Curve A of Figure B.1 (curve c1 of IEC/TS 60479-1, Figure 20) is the threshold of ventricular fibrillation. The point 500 mA/100 ms has been found to correspond to a fibrillation probability of the order of 0,14 %. Curve B on Figure B.1 (curve b of IEC TS 60479-1, Figure 20) may be described as the 'let-go' limit curve. Some experts consider curve A to be the appropriate limit for safe design, but use of this curve must be considered as an absolute limit.

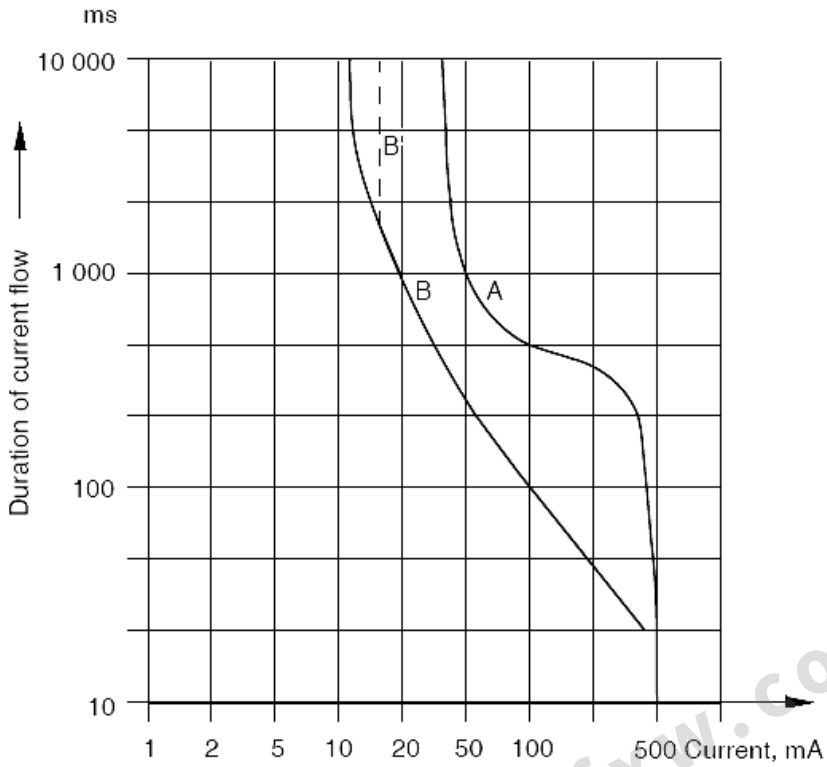

Figure B.1 – Current limit curves

B.2 Contact with telecommunication operating voltages

Total body impedance consists of two parts, the internal body resistance of blood and tissue and the skin impedance. Telecommunication voltages hardly reach the level where skin impedance begins to rapidly decrease due to breakdown. The skin impedance is high at low voltages, its value varying widely. The effects of skin capacitance are negligible at ringing frequencies.

IEC/TS 60479-1 body impedance figures are based upon a relatively large contact area of 50 cm² to 100 cm^2, which is a realistic value for mains operated domestic appliances. Practical telecommunication contact is likely to be much less than this, typically 10 cm² to 15 cm² for uninsulated wiring pliers or similar tools and less than 1 cm² for finger contact with pins of a telephone wall socket. For contact with thin wires, wiring tags or contact with tools where fingers move beyond insulated handles, the area of contact will again be of the order of 1 cm² or less. These much smaller areas of contact with the body produce significantly higher values of body impedance than the IEC/TS 60479-1 figures.

In EN 60950-1:2006, 2.3.4, a body model value of 5 kΩ is used, to provide a margin of safety compared with the higher practical values of body impedance for typical telecommunication contact areas.

The curve B' (Figure B.1) used within the HAZARDOUS VOLTAGE definition is a version of curve B modified to cover practical situations, where the current limit is maintained constant at 16 mA above 1 667 ms. This 16 mA limit is still well within the minimum current value of curve A.

The difficulties of defining conditions which will avoid circumstances that prevent let-go have led to a very restricted contact area being allowed.

Contact with areas up to 10 cm² can be justified and means of specifying this and still ensuring let-go are for further study.

Bibliography

EN 60529 + corr. May	1991 1993	Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)
EN 60664-1	2007	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests (IEC 60664-1:2007)
HD 60364	Series	Low-voltage electrical installations (IEC 60364 series, mod)
HD 366 S1 [1)]	1977	Classification of electrical and electronic equipment with regard to protection against electric shock (IEC 60536:1976)
IEC/TS 60479-1	2005	Effects of current on human beings and livestock - Part 1: General aspects
IEC 62151	2000	Safety of equipment electrically connected to a telecommunication network
ITU-T K.11	1993	Principles of protection against overvoltages and overcurrents

1) HD 366 S1 is superseded by EN 61140:2001, which is itself superseded by EN 61140:2002, based on IEC 61140:2001.

British Standards Institution (BSI)

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level.

It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover.

Tel: +44 (0)20 8996 9000 Fax: +44 (0)20 8996 7400

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to BSI Customer Services.

Tel: +44 (0)20 8996 9001 Fax: +44 (0)20 8996 7001
Email: orders@bsigroup.com

You may also buy directly using a debit/credit card from the BSI Shop on the website **www.bsigroup.com/shop**

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library.

Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre.

Tel: +44 (0)20 8996 7111
Fax: +44 (0)20 8996 7048 Email: info@bsigroup.com

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration.

Tel: +44 (0)20 8996 7002 Fax: +44 (0)20 8996 7001
Email: membership@bsigroup.com

Information regarding online access to British Standards via British Standards Online can be found at **www.bsigroup.com/BSOL**

Further information about BSI is available on the BSI website at **www.bsigroup.com**

Copyright

BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK

Tel +44 (0)20 8996 9001
Fax +44 (0)20 8996 7001
www.bsigroup.com/standards

raising standards worldwide™

British Standards