

Voltage characteristics of electricity supplied by public distribution systems

The European Standard EN 50160:1994 has the status of a
British Standard

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee GEL/110, Electromagnetic compatibility, to Subcommittee GEL/110/8, Electromagnetic compatibility — Low frequency disturbances, upon which the following bodies were represented:

- Association of Control Manufacturers (TACMA) (BEAMA Ltd.)
- Association of Manufacturers of Domestic Electrical Appliances BEAMA Ltd.
- British Lighting Association for the Preparation of Standards (BRITLAPS)
- British Radio and Electronic Equipment Manufacturers' Association
- British Telecommunications plc
- Building Automation and Mains Signalling Association (BAMSA) (BEAMA Ltd.)
- Electrical Contractors' Association
- Electrical Installation Equipment Manufacturers' Association (BEAMA Ltd.)
- Electricity Association
- ERA Technology Ltd.
- Federation of the Electronics Industry
- GAMBICA (BEAMA Ltd.)
- Heating, Ventilating and Air Conditioning Association
- Institution of Electrical Engineers
- Lighting Industry Federation Ltd.
- Power Supply Manufacturers' Association (PSMA) (BEAMA Ltd.)
- Professional Lighting and Sound Association
- Sound and Communications Industries Federation
- Radiocommunications Agency

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 August 1995

© BSI 12-1998

The following BSI references relate to the work on this standard:
Committee reference GEL/110/8
Draft for comment 93/213133 DC

ISBN 0 580 24631 0

Amendments issued since publication

Amd. No.	Date	Comments

Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
Foreword	2
Text of EN 50160	3
List of references	Inside back cover

National foreword

This British Standard has been prepared by Subcommittee GEL/110/8 and is the English language version of EN 50160:1994 *Voltage characteristics of electricity supplied by public distribution systems*, published by the European Committee for Electrotechnical Standardization (CENELEC).

Cross-references

Publication referred to	Corresponding British Standard
EN 50065-1:1991	BS EN 50065 <i>Specification for signalling on low-voltage electrical installations in the frequency range 3 kHz to 148.5 kHz</i> Part 1:1992 <i>General requirements, frequency bands and electromagnetic disturbances</i>
EN 60555-1:1987	BS 5406 <i>Disturbances in supply systems caused by household appliances and similar electrical equipment</i> Part 1:1988 <i>Glossary of Terms</i>
EN 60868:1993	BS EN 60868:1993 <i>Flickermeter. Functional and design specifications</i>
ENV 61000-2-2:1993	DD ENV 61000 <i>Electromagnetic compatibility (EMC)</i> Part 2 <i>Environment</i> Section 2:1993 <i>Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems</i>
EN 61000-4-7:1993	BS EN 61000 <i>Electromagnetic compatibility (EMC)</i> Part 4 <i>Testing and measurement techniques</i> Section 7:1993 <i>General guide on harmonics and interharmonics measurements and instrumentation, for power supply systems and equipment connected thereto</i>
HD 472 S1:1988	BS 7697:1993 <i>Nominal voltages for low voltage public electricity supply systems</i>
IEC 50 (161):1990	BS 4727 <i>Glossary of electrotechnical, power, telecommunication, electronics, lighting and colour terms</i> Part 1 <i>Terms common to power, telecommunications and electronics</i> Group 09:1991 <i>Electromagnetic compatibility</i>

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 12, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

ICS 29.020

Descriptors: Electrical network, electrical energy distribution, electrical supply, electrical voltage, low voltage, medium voltage, characteristics

English version

Voltage characteristics of electricity supplied by public distribution systems

Caractéristiques de la tension fournie par les réseaux publics de distribution

Merkmale der Spannung in öffentlichen Elektrizitätsversorgungsnetzen

This European Standard was approved by CENELEC on 1994-07-05. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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

© 1994 Copyright reserved to CENELEC members

Foreword

This European Standard has been prepared by CENELEC BTTF 68-6, Physical characteristics of electrical energy.

The draft was submitted to the Unique Acceptance Procedure (UAP) in September 1993 and was approved by CENELEC as EN 50160 on 1994-07-05.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1995-07-15
- latest date of withdrawal of conflicting national standards (dow) 1995-07-15

Contents

	Page		Page
Foreword	2	Annex A (informative) Special nature of electricity	11
1 General	3	Figure 1 — Voltage levels of signal frequencies in percent of U_n used in public LV distribution systems	8
1.1 Scope	3	Figure 2 — Voltage levels of signal frequencies in percent of U_c used in public MV distribution systems	10
1.2 Object	3	Table 1 — Values of individual harmonic voltages at the supply-terminals for orders up to 25 given in percent of U_n	7
1.3 Definitions	3	Table 2 — Values of individual harmonic voltages at the supply-terminals for orders up to 25 given in percent of U_c	10
1.4 Normative References	5		
2 Low-voltage Supply-Characteristics	6		
2.1 Power frequency	6		
2.2 Magnitude of the supply voltage	6		
2.3 Supply voltage variations	6		
2.4 Rapid voltage changes	6		
2.5 Supply voltage dips	6		
2.6 Short interruptions of the supply voltage	6		
2.7 Long interruptions of the supply voltage	7		
2.8 Temporary power frequency overvoltage between live conductors and earth	7		
2.9 Transient overvoltages between live conductors and earth	7		
2.10 Supply voltage unbalance	7		
2.11 Harmonic voltage	7		
2.12 Interharmonic voltage	8		
2.13 Mains signalling voltage on the supply voltage	8		
3 Medium-Voltage Supply-Characteristics	8		
3.1 Power frequency	8		
3.2 Magnitude of the supply voltage	8		
3.3 Supply voltage variations	8		
		3.4 Rapid voltage changes	9
		3.5 Supply voltage dips	9
		3.6 Short interruptions of the supply voltage	9
		3.7 Long interruptions of the supply voltage	9
		3.8 Temporary power frequency overvoltages between live conductors and earth	9
		3.9 Transient overvoltages between live conductors and earth	9
		3.10 Supply voltage unbalance	9
		3.11 Harmonic voltage	10
		3.12 Interharmonic voltage	10
		3.13 Mains signalling voltage on the supply voltage	10