

Single sideband power-line carrier terminals

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English version

Single sideband power-line carrier terminals

(IEC 495 : 1993)

Equipements terminaux à courants porteurs
sur lignes d'énergie, à bande latérale unique
(CEI 495 : 1993)

Geräte für die Einseitenband-Trägerfrequenz-
Nachrichtenübertragung über
Hochspannungsleitungen
(IEC 495 : 1993)

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CENELEC

European Committee for Electrotechnical Standardization
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Foreword

The text of document 57(CO)63, as prepared by IEC Technical Committee 57: Telecontrol, teleprotection and associated telecommunications for electric power systems, was submitted to the IEC-CENELEC parallel vote in October 1992.

The reference document was approved by CENELEC as EN 60495 on 8 December 1993.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1994-12-01
- latest date of withdrawal of conflicting national standards (dow) 1994-12-01

For products which have complied with the relevant national standard before 1994-12-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1999-12-01.

Annexes designated 'normative' are part of the body of the standard. Annexes designated 'informative' are given only for information. In this standard, annexes A and ZA are normative and annexes B, C and D are informative.

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INTRODUCTION

The complexity and extensive size of present-day electricity generation, transmission and distribution systems are such that it is possible to control them only by means of an associated and often equally large and complex telecommunication system having a high order of reliability. The facilities which can normally be provided as part of the telecommunication system can be listed as follows:

- telephony (operation, maintenance and administration speech circuits);
- facsimile transmission;
- telegraphy;
- telecontrol;
- load frequency control;
- teleprotection;
- data transmission.

The communication channels can be provided by circuits leased from public facilities, by means of utility-owned private circuits or, national regulations permitting, by a combination of both types of circuit. The need for a high availability on these circuits generally calls for the provision of multiple routing, preferable by geographically diverse routes.

In many countries, Power Line Carrier (PLC) channels represent a main part of the utility-owned telecommunication system. A circuit which would normally be routed via a PLC channel may also be routed via a channel using a different transmission medium, such as a point to point radio or open-wire circuit. Since, in many cases, automatic switching is used, the actual rerouting, although predetermined, is unpredictable. It is important, therefore, that the voice frequency input and output criteria of all equipment used in the communications system are compatible. This compatibility is also beneficial in creating the ability to interchange and interwork equipment from different sources.

This International Standard has been prepared to enable compatibility between PLC links from different sources or between PLC links and other transmission media to be achieved and to define the terminal performance required in PLC networks.

This International Standard covers basically 4 kHz and 2,5 kHz bandwidth single channel PLC equipments that use amplitude modulation with single sideband transmission.

The application of this International Standard to multichannel equipment is described in annex A.

SINGLE SIDEBAND POWER-LINE CARRIER TERMINALS

1 General

1.1 Scope and object

This International Standard applies to Single Sideband (SSB) Power Line Carrier (PLC) Terminals used to transmit information over High Voltage (HV) Lines.

The object of this standard is to establish recommended values for characteristic input and output quantities of single sideband PLC terminals (see figure 1) and the definitions essential for an understanding of these recommendations. All the tests verifying the requirements shall be considered as type tests as defined in the International Electrotechnical Vocabulary (IEV 151-04-15) .

This standard defines two versions of the PLC equipment intended for two different applications:

- **standard terminal**, i.e. equipment with a voice frequency side interface which offers transmission of a frequency band of 300 Hz to 3 400 Hz on a four-wire basis plus signalling facilities. This equipment is capable, via analog interfaces, of being connected to networks that may consist of transmission equipment of different types and from different manufacturers. There may be facilities for additional point-to-point connections (e.g. a teleprotection connection) which may fall outside the frequency band of 300 Hz to 3 400 Hz (see figure 2);
- **speech-plus terminal**, i.e. equipment where specific interfaces for signals like speech, data and teleprotection are present at the voice frequency side (see figure 3).

The two versions will have parts in common and the requirements of these common parts are dealt with in 5.2 and 5.3.1.

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid international standards.

IEC 38: 1983, *IEC standard voltages*.

IEC 50 (55): 1970, *International Electrotechnical Vocabulary (IEV) – Chapter 55: Telegraphy and telephony*.

IEC 50 (151): 1978, *International Electrotechnical Vocabulary (IEV) – Chapter 151: Electrical and magnetic devices*.

IEC 255-4: 1976, *Electrical relays – Part 4: Single input energizing quantity measuring relays with dependent specified time.*

IEC 255-5: 1977, *Electrical relays – Part 5: Insulation tests for electrical relays.*

IEC 255-22-1: 1988, *Electrical relays – Part 22: Electrical disturbance tests for measuring relays and protection equipment – Section one: 1 MHz burst disturbance tests.*

IEC 663: 1980, *Planning of (single-sideband) power line carrier systems.*

IEC 721-3-1: 1987, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Storage.*

IEC 721-3-2: 1985, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Transportation.*

IEC 721-3-3: 1987, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities – Stationary use at weatherprotected locations.*

IEC 721-3-4: 1987, *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities. Stationary use at non-weatherprotected locations.*

IEC 801-2: 1991, *Electromagnetic compatibility for industrial-process measurement and control equipment – Part 2: Electrostatic discharge requirements.*

IEC 801-3: 1984, *Electromagnetic compatibility for industrial-process measurement and control equipment – Part 3: Radiated electromagnetic field requirements.*

IEC 801-4: 1988, *Electromagnetic compatibility for industrial-process measurement and control equipment – Part 4: Electrical fast transient/burst requirements.*

IEC 834-1: 1988, *Performance and testing of teleprotection equipment of power systems – Part 1: Narrow-band command systems.*

CCITT Blue Book, Volume V, 1988. *Telephone transmission quality. Series P recommendations.*

CCITT Blue Book, Volume III, Fascicle III.1, 1988. *General characteristics of international telephone connections and circuits. Recommendations G.100 to G.181.*

CCITT Blue Book, Volume III, Fascicle III.2, 1988. *International analogue carrier systems. Recommendations G.211 to G.544.*