SLOVENSKI STANDARD
SIST EN 61037:1997

01-april-1997

Elektronski zvočno frekvenčni omrežni sprejemniki za krmiljenje tarif in bremen (IEC 1037:1990, spremenjen)

Electronic ripple control receivers for tariff and load control (IEC 1037:1990 modified)

Messung der elektrischen Energie - Tarif- und Laststeuerung - Besondere Anforderungen für elektronische Rundsteuerempfänger

Comptage de l'électricité - Tarification et contrôle de charge - Prescriptions particulières pour récepteurs électroniques de télécommande centralisée

Ta slovenski standard je istoveten z: **EN 61037:1992**

ICS:

29.240.30	Krmilna oprema za elektroenergetske sisteme	Control equipment for electric power systems

SIST EN 61037:1997 **en**

EUROPEAN STANDARD

NORME EUROPEENNE

EUROPÄISCHE NORM

EN 61037

November 1992

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Descriptors: Electrical energy, tariff control, load control, ripple control, centralized ripple control, electronic ripple control receiver

ENGLISH VERSION

Electronic ripple control receivers for tariff and load control
(IEC 1037:1990, modified)

Récepteurs électroniques de télécommande centralisée pour tarification et contrôle de charge
(CEI 1037:1990, modifiée)

Elektronische Rundsteuerempfänger für Tarife und Laststeuerung

(IEC 1037:1990, modifiziert)

This European Standard was approved by CENELEC on 1992-09-15. 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

FOREWORD

Following the advice of CENELEC Technical Committee TC 13, Equipment for electrical energy measurement and load control, the CENELEC 69 Technical Board decided to submit the text of IEC 1037:1990, together with some common modifications prepared by TC 13, to the CENELEC formal vote.

The text of the draft was approved by CENELEC as EN 61037 on 15 September 1992.

The following dates were fixed:

- latest date of publication of an identical national standard	(dop)	1993-06-01
- latest date of withdrawal of conflicting national standards	(dow)	1993-06-01

For products which have complied with the relevant national standard before 1993-06-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1998-06-01.

Annexes designated "normative" are part of the body of the standard. Annexes designated "informative" are given only for information. In this standard, annexes A, B, C, D, E, F and ZA are normative and annexes G, H, J and K are informative.

STATEMENT

The International Standard IEC 1037:1990, together with the common modifications attached can be used in its present state. However the answers received from the members to the Primary Questionnaire showed that a number of complementary studies (which do not affect fundamentally the present text) were needed; these complementary studies have been proposed to IEC TC 13. They could lead to a draft amendment to IEC 1037, draft which should then be submitted to the parallel IEC/CENELEC voting procedure (this amendment could also include the common modifications).

In addition, it is to be noted that the harmonics levels specified in 4.6.2, as well as the EMC requirements might have to be reconsidered in the future in the light of the studies carried out in CENELEC TC 110 and CENELEC BTTF 68-6 (DISNORM 12).

Endorsement notice

The text of the International Standard IEC 1037:1990 was approved by CENELEC as a European Standard with agreed common modifications as given below.

COMMON MODIFICATIONS

4.4.6 Number of operations of the output equipment : *add, at the end* "or 75 000 operations under no load conditions"

5.4.3 Test of the number of operations of the output equipment : *after the title, add a subclause :*

"5.4.3.1 Endurance test under no load conditions

The test is carried out under no load conditions ; it consists of 45 000 operations at 23°C, followed by 24 000 operations at 60°C and 6 000 operations at -20°C."

add then a second subtitle :

"5.4.3.2 Endurance test under the specified load conditions"

followed by the present clause. At the end of the 3rd paragraph, add, after "carried out" :

"(24 000 operations at 60°C and 6 000 operations at -20°C)"

2.1 and 5.6.5 Test of immunity to electrostatic discharges : *refer to the latest edition (1991) of IEC 801-2. Replace* "test voltage : 15 kV" *by* "severity level 4"

5.6.6 Test of immunity to HF electromagnetic fields : *refer to the latest version of Publication IEC 801-3 (currently under révision, and at the DIS stage), which in particular extends the frequency range to 26-1000 MHz .*

ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD WITH THE REFERENCES OF THE RELEVANT EUROPEAN PUBLICATIONS

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

IEC Publication	Date	Title	EN/HD	Date
50(301)	1983	International Electrotechnical Vocabulary (IEV) - Chapter 301: General terms on measurements in electricity	-	-
50(302)	1983	Chapter 302: Electrical measuring instruments	-	-
50(303)	1983	Chapter 303: Electronic measuring instruments	-	-
60	-	High-voltage test techniques	-	-
68-2-1	1974	Environmental testing	HD 323.2.1 S2	1987
68-2-1A + A1	1976 1983	Part 2: Tests - Tests A: Cold		
68-2-2	1974	Part 2: Tests - Test B: Dry heat	HD 323.2.2 S1*	1988
68-2-6	1982	Part 2: Tests - Test Fc and guidance: Vibration (sinusoidal)	HD 323.2.6 S2*	1988
68-2-27	1987	Part 2: Tests - Test Ea and guidance: Shock	HD 323.2.27 S2	1988
68-2-30	1980	Part 2: Tests - Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle)	HD 323.2.30 S2*	1987
85	1984	Thermal evaluation and classification of electrical insulation	HD 566 S1	1990
255-4 + A1	1976 1979	Electrical relays - Part 4: Single input energizing quantity measuring relays with dependent specified time	-	-
269-3	1987	Low-voltage fuses - Part 3: Supplementary requirements for fuses for use by unskilled persons (Fuses mainly for household and similar applications)	-	-

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* HD 323.2.2 S1:1988 includes IEC 68-2-2A:1976
HD 323.2.6 S2:1988 includes A1:1983 + A2:1985 to IEC 68-2-6
HD 323.2.30 S2:1987 includes A1:1985 to IEC 68-2-30

IEC Publication	Date	Title	EN/HD	Date
410	1973	Sampling plans and procedures for inspection by attributes	-	-
417	1973	Graphical symbols for use on equipment Index, survey and compilation of the single sheets	HD 243 S9*	1991
529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529	1991
664	1980	Insulation co-ordination within low-voltage systems including clearances and creepage distances for equipment (First supplement: 1981)	-	-
695-2-1	1980	Fire hazard testing - Part 2: Test methods - Glow-wire test and guidance	HD 444.2.1 S1	1983
721-3-3	1987	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Stationary use at weatherprotected locations (Corrigendum April 1988)	HD 478.3.3 S1	1989
801-2	1984	Electromagnetic compatibility for industrial-process measurement and control equipment - Part 2: Electrostatic discharge requirements	HD 481.2 S1	1987
801-3	1984	Part 3: Radiated electromagnetic field requirements	HD 481.3 S1	1987
801-4	1988	Part 4: Electrical fast transient/burst requirements	-	-
817	1984	Spring-operated impact-test apparatus and its calibration	HD 495 S1	1987
CISPR 14 (mod) + A1 (mod) + A2 (mod)	1985 1987 1989	Limits and methods of measurement of radio interference characteristics of household electrical appliances, portable tools and similar electrical apparatus	EN 55014 + A2	1987 1990

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* HD 243 S9:1991 includes supplements A:1974 to J:1990 to IEC 417

NORME INTERNATIONALE
INTERNATIONAL STANDARD

CEI
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1037

Première édition
First edition
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Récepteurs électroniques de télécommande centralisée pour tarification et contrôle de charge

Electronic ripple control receivers for tariff and load control

Bureau Central de la Commission Electrotechnique Internationale 3, rue de Varembé Genève, Suisse

Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRONIC RIPPLE CONTROL RECEIVERS FOR TARIFF AND LOAD CONTROL

FOREWORD

1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.

2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.

3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

This standard has been prepared by IEC Technical Committee No. 13: Equipment for electrical energy measurement and load control.

The text of this standard is based upon the following documents:

Six Months' Rule	Report on Voting
13(CO)1007	13(CO)1010

Full information on the voting for the approval of this standard can be found in the Voting Report indicated in the above table.

The annexes A, B, C, D, E and F are normative.

The annexes G, H, J and K are informative.

INTRODUCTION

Ripple control receivers are components of a system of remote control permitting the simultaneous operation of a large number of receivers from a central point. The signal generally used for this purpose is an audio frequency voltage superimposed on the mains frequency and coded in the form of pulses which can provide a multiplicity of control functions. Other types of signals, such as frequency modulation, deformation of the mains frequency, etc. can be used. These signals are propagated through the electricity supply network, from the injection point to the receiver sites.

Some characteristics of such systems, for example, the value of the frequency or the method of coding, are not standardized here.

To facilitate the application of this standard the following principles should be applied:

1) The requirements of this standard are not limiting. If it is absolutely unavoidable, a user can add additional technical requirements in his specification.

The technical requirements and tests relate to the general functioning of the receiver. The method of operation of the functional elements is not specified. These requirements and tests may, however, be the subject of additional technical agreements.

2) Ripple control systems are auxiliary equipment for network operation. Their design is determined by the network characteristics and other factors. At the present time rapid development of power electronic equipment is leading to a parallel increase in the amount of harmonic distortion in the supply voltage. The harmonic levels indicated in this standard take account of this development. They are not to be considered as values that could be regarded as permissible on the network but as recommended values for designing and testing receivers. These recommended levels could be adapted to particular characteristics of networks under consideration.

Receivers designed for use with existing transmitters and having a control frequency equal or very close to a harmonic, need not conform to the whole of the requirements of this standard.

ELECTRONIC RIPPLE CONTROL RECEIVERS FOR TARIFF AND LOAD CONTROL

1 Scope

This International Standard specifies requirements for the type test of indoor electronic ripple control receivers for the reception and interpretation of pulses of a single audio frequency superimposed on the voltage of the electricity distribution network and for the execution of the corresponding switching operations. In this system the mains frequency is generally used to synchronize the transmitter and receivers. Neither the control frequency, nor the encoding are standardized in this standard.

This standard gives no requirements for constructional details internal to the receiver.

This standard does not cover the acceptance tests and the conformity tests. (Nevertheless, an example of what could be an acceptance test is given in annex G (informative).)

The reliability aspect also is not covered in this standard as there are no short term procedures available which would fit into type test documents to satisfactorily check this requirement.

2 Normative references

The following standards 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 standards 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 standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 50(301, 302, 303): 1983, *International Electrotechnical Vocabulary (IEV), Chapter 301: General terms on measurements in electricity.*

IEC 60: *High-voltage test techniques.*

IEC 68-2-1: 1974, *Environmental testing, Part 2: Tests. Tests A: Cold. (Amendment No. 1: 1983, First supplement; 1976.)*

IEC 68-2-2: 1974, *Environmental testing, Part 2: Tests.Tests B: Dry Heat.*

IEC 68-2-6: 1982, *Environmental testing, Part 2: Tests.Test Fc and guidance: Vibration (sinusoidal).*

IEC 68-2-27: 1987, *Environmental testing, Part 2: Tests.Test Ea and guidance: Shock.*

IEC 68-2-30: 1980, *Environmental testing, Part 2: Tests.Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle).*

IEC 85: 1984, *Thermal evaluation and classification of electrical insulation.*

IEC 255-4: 1976, *Electrical relays. Single input energizing quantity measuring relays with dependent specified time. (Amendment No. 1: 1979.)*

IEC 269-3, 1987, *Low voltage fuse, Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household and similar applications).*

IEC 410: 1973, *Sampling plans and procedures for inspection by attributes.*

IEC 417: 1973, *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets.*

IEC 529: 1989, *Classification of degrees of protection provided by enclosures (IP Code).*

IEC 664: 1980, *Insulation co-ordination within low-voltage systems including clearances and creepage distances for equipment. (First supplement: 1981.)*

IEC 695-2-1: 1980, *Fire hazard testing, Part 2: Test methods. Glow-wire test and guidance.*

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 801-2: 1984, *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 817: 1984, *Spring-operated impact-test apparatus and its calibration.*

IEC/CISPR 14: 1985, *Limits and methods of measurement of radio interference characteristics of household electrical appliances, portable tools and similar electrical apparatus. (Amendment No. 1: 1987.)*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 *General definitions*

3.1.1 electronic ripple control receiver: Instrument with a solid state input and decoder circuit for the reception and interpretation of pulses of a single audio frequency superimposed on the voltage of an electricity distribution network and for the execution of the corresponding switching operations.

3.1.2 standard receiver: Receiver for mounting on an equipment board, a meter board or instrument rail (or which is a part of the meter).

3.1.3 special receiver: Receiver intended for particular applications, for example street lighting receivers.

3.1.4 rated supply voltage (U_n): Value of the supply voltage for which the receiver is designed.

3.1.5 rated supply frequency (f_n): Value of the supply frequency for which the receiver is designed.

3.2 *Definitions related to the functional elements*

3.2.1 input element: Functional element that separates the control signals from the supply voltage and transmits them to the decoding element.

3.2.1.1 rated control voltage (U_s): Audio-frequency voltage superimposed on the supply system voltage. Throughout this document its steady r.m.s. value is used and is expressed as a percentage of the rated supply voltage U_n of the receiver.

3.2.1.2 operate voltage (U_f): Minimum value of the control voltage that, under prescribed conditions, is sufficient to ensure correct operation of the receivers, the message being coded according to the system considered.

3.2.1.3 non-operate voltage (U_{nf}): Maximum value of the control voltage for which, under prescribed conditions, the receivers do not operate, the message being coded according to the system considered.

3.2.1.4 maximum control voltage (U_{max}): Maximum value of the control voltage that, under prescribed conditions, ensures correct operation of the receivers receiving a message coded according to the system considered.

3.2.1.5 rated control frequency (f_s): Frequency of the control voltage for which the receiver is designed.