

Electricity metering — Tariff and load controls — Particular requirements for time switches

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Committees responsible for this British Standard

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- BEAMA Ancillary Metering Equipment Manufacturers' Association
- BEAMA Meter Association
- Department of Energy (Electricity Division)
- Electricity Supply Industry in England and Wales
- Energy System Trade Association
- Institution of Electrical Engineers

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National foreword

This British Standard has been prepared by Technical Committee PEL/14 and is the English language version of EN 61038:1992, including amendments A1:1996 and A2:1998 and corrigendum December 1997, published by the European Committee for Electrotechnical Standardization (CENELEC). It was derived by CENELEC from IEC 61038:1990, including amendments 1:1996 and 2:1998, published by the International Electrotechnical Commission (IEC).

NOTE 1 Corrigendum December 1997 removed the penultimate paragraph from the EN foreword which read “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 to production until 1998-06-01.”.

NOTE 2 The CENELEC common modification to subclause 5.6.5 has been superseded by the text of amendment A1.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1**. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 is indicated by **A1** **A1**. Tags indicating changes to EN text carry the number of the EN amendment. For example, text altered by EN amendment A1 is indicated by **A1** **A1**.

Cross references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index” or by using the “Find” facility of the BSI Standards Electronic Catalogue.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 23 and a back cover.

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English version

Electricity metering — Tariff and load controls — Particular requirements for time switches

(includes amendments A1:1996 and A2:1998)
(IEC 61038:1990 + A1:1996 + A2:1998, modified)

Comptage de l'électricité — Tarification et
contrôle de charge — Prescriptions
particulières pour horloges de tarification
(inclut les amendements A1:1996 et A2:1998)
(CEI 61038:1990 + A1:1996 + A2:1998, modifiée)

Messung der elektrischen Energie — Tarif- und
Laststeuerung — Besondere Anforderungen für
Schaltuhren
(enthält Änderungen A1:1996 und A2:1998)
(IEC 61038:1990 + A1:1996 + A2:1998,
modifiziert)

This European Standard was approved by CENELEC on 1992-09-15. Amendment A1 was approved by CENELEC on 1996-03-05, and amendment A2 on 1998-08-01. 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

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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 1038:1990, 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 61038 on 15 September 1992.

The following dates are fixed:

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

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 and ZA are normative and annex D is informative.

Statement

The International Standard IEC 1038:1990, 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 1038, draft which should then be submitted to the parallel IEC/CENELEC voting procedure (this amendment could also include the common modifications).

Foreword to amendment A1

The text of document 13/1092/FDIS, future amendment 1 to IEC 1038:1992, prepared by IEC TC 13, Equipment for electrical energy measurement and load control, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 61038:1992 on 1996-03-05.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1996-12-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dop) 1996-12-01

Annexes designated “normative” are part of the body of the standard.

In this standard, annex ZA is normative.

Annex ZA has been added by CENELEC.

Foreword to amendment A2

The text of document 13/1154/FDIS, future amendment 2 to IEC 61038:1990, prepared by IEC TC 13, Equipment for electrical energy measurement and load control, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A2 to EN 61038:1992 on 1998-08-01.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1999-05-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dop) 2001-05-01

Annexes designated “normative” are part of the body of the standard.

In this standard, annex ZA is normative.

Annex ZA has been added by CENELEC.

1 Scope

This International Standard specifies requirements for the type test of newly manufactured indoor time switches with operation reserve that are used to control electrical loads, multi-tariff registers and maximum demand devices at certain days and hours throughout the year. These time switches may employ various types of operation including the use of electronic circuits. This Standard does not apply to time switches operated by remote control or synchronized by radio-frequency.

This Standard includes time switches with analogue dials or digital display that are:

- synchronous;
- crystal-controlled.

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 D.)

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

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

IEC 60: *High-voltage test techniques*.

^[A2] IEC 60068-2-1:1990, *Environmental testing — Part 2: Tests — Tests A: Cold*. ^[A2]

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*.

^[A1]

^[A1]

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). (First supplement: Appendix A: Examples of standardized fuses for domestic and similar applications.)*

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

^[A2] IEC 60417-2, *Graphical symbols for use on equipment. Part 2: Symbol originals*.¹⁾ ^[A2]

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

^[A1]

^[A1]

^[A2] IEC 60695-2-1/1:1994, *Fire hazard testing — Part 2: Test methods — Section 1/Sheet 1: Glow-wire end-product test and guidance*. ^[A2]

^[A2] IEC 60721-3-3:1994, *Classification of environmental conditions — Part 3: Classification of groups of environmental parameters and their severities — Section 3: Stationary use at weatherprotected locations*. ^[A2]

^[A1] IEC 1000-4-2:1995²⁾, *Electromagnetic compatibility (EMC) — Part 4: Testing and measurement techniques — Section 2: Electrostatic discharge immunity test — Basic EMC publication*.

IEC 1000-4-3:1995, *Electromagnetic compatibility (EMC) — Part 4: Testing and measurement techniques — Section 3: Radiated, radio-frequency, electromagnetic field immunity test*. ^[A1]

^[A2] IEC 61000-4-4:1995, *Electromagnetic compatibility (EMC) — Part 4: Testing and measurement techniques — Section 4: Electrical fast transient/burst immunity test — Basic EMC publication*. ^[A2]

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

^[A1] CISPR 22:1993, *Limits and methods of measurement of radio disturbance characteristics of information technology equipment*. ^[A1]

¹⁾ ^[A2] To be published. ^[A2]

²⁾ ^[A1] International Standard IEC 1000-4-2 replaces (and is technically equivalent to) IEC 801-2:1991: *Electromagnetic compatibility for industrial-process measurement and control equipment — Part 2: Electrostatic discharge requirements*. ^[A1]

3 Definitions

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

3.1 General definitions

3.1.1

time switch

a device which may be set to make or break or change over circuits at pre-determined times

3.1.2

synchronous time switch

a time switch having as its main time base the network frequency

3.1.3

crystal-controlled time switch

a time switch having as its main time base a crystal-controlled oscillator

3.1.4

rated supply voltage (U_n)

value of the supply voltage for which the time switch is designed

3.1.5

rated supply frequency (f_n)

value of the supply frequency for which the time switch is designed

3.2 Definitions related to functional elements

3.2.1

time-based element

that part of the time switch which produces an output proportional to the time

3.2.1.1

time indication discrepancy

the difference between the time displayed by the time switch and the actual time or, in the case of synchronous time switches, the difference between the time displayed by the time switch and the time determined by the network frequency

3.2.1.2

time-keeping accuracy

the increase or decrease in the time indication discrepancy within a specified time interval

3.2.1.3

operation reserve

the maximum period of time for which the supply voltage may be interrupted without affecting the correct timekeeping of the time switch

3.2.1.4

reserve restoration time

the period of time required for restoring the full operation reserve from the point where the operation reserve has been completely exhausted

3.2.2 Setting and display elements

3.2.2.1

dial

an analogue device for facilitating the setting and observation of the settings of the time switch and for the display of indicated time. The dials are designated according to their period of rotation (e.g. the day dial has a period of rotation of 1 day)

3.2.2.2

display

a digital device for facilitating the setting and observation of the settings of the time switch and for the display of indicated time and switch status

3.2.3

output element

element comprising one or more switches controlled according to the information provided by the time-based element

3.2.3.1

load switch

that part of the time switch comprising the contacts, or their electronic equivalent, for switching loads, together with the parts directly operating the contacts

3.2.3.2

tariff register switch

that part of the time switch comprising the contacts, or their electronic equivalent, for switching tariff registers, together with the parts directly operating the contacts

3.2.3.3

maximum demand indicator switch

that part of the time switch comprising the contacts, or their electronic equivalent, for switching maximum demand indicators, together with the parts directly operating the contacts

3.2.3.4

rated breaking voltage (U_c)

value of the voltage for which a switch is designed

3.2.3.5

rated breaking current (I_c)

value of current for which a switch is designed and which it can close, carry continuously and break under specified conditions

3.2.3.6

maximum total current (I_{tot})

value of total current that all the output switches of a time switch can carry continuously at the same time under specified conditions

3.2.3.7**operation**

a pair of changes of state of an output element, closure followed by opening or vice versa

3.3 Definitions of mechanical elements**3.3.1****base**

back of the time switch by which it is generally fixed, and to which are attached the frame or the electronic board(s), the output element(s), the terminals, or the terminal block and the cover

3.3.2**cover**

enclosure on the front of the time switch made either wholly of transparent material or of opaque material provided with a window(s) through which the dial and/or display can be read

3.3.3**case**

this comprises the base and the cover

3.3.4**accessible conductive part**

conductive part which can be touched by the standard test finger, when the time switch is installed and ready for use

3.3.5**protective earth terminal**

terminal connected to accessible conductive parts of a time switch, for safety purposes

3.3.6**terminal block**

support made of insulating material on which all or some of the terminals of the time switch are grouped together

3.3.7**terminal cover**

cover which covers the time switch terminals, and generally the ends of the external wires or cables connected to the terminals

3.3.8**clearance**

shortest distance measured in air between two conductive parts

3.3.9**creepage distance**

shortest distance measured over the surface of insulation between two conductive parts

3.4 Definitions of insulations**3.4.1****basic insulation**

insulation applied to live parts to provide basic protection against electric shock

NOTE Basic insulation does not necessarily include insulation used exclusively for functional purposes.

3.4.2**supplementary insulation**

independent insulation applied in addition to the basic insulation, in order to provide protection against electric shock in the event of a failure of the basic insulation

3.4.3**double insulation**

insulation comprising both basic insulation and supplementary insulation

3.4.4**reinforced insulation**

a single insulation system applied to live parts, which provides a degree of protection against electric shock equivalent to double insulation

NOTE The term "insulation system" does not imply that the insulation should be one homogeneous piece. It may comprise several layers which cannot be tested singly as supplementary or basic insulation.

3.4.5**insulation encased time switch of protective class II**

a time switch with a case of insulating material in which protection against electric shock does not rely on basic insulation only, but in which additional safety precautions, such as double insulation or reinforced insulation, are provided, there being no provision for protective earthing or reliance upon installation conditions

3.5 Definitions of influence quantities**3.5.1****influence quantity**

any quantity generally external to the time switch, which may affect its working performance

3.5.2**reference conditions**

an appropriate set of influence quantities and performance characteristics, with reference values, their tolerances and reference ranges, with respect to which the working performances are specified