DRAFT International Standard

IEC/DIS 80000-17

ISO/TC **12**

Secretariat: **SIS**

Voting begins on:
2026-08-21

Voting terminates on:
2026-11-13

Quantities and units —

Part 17: **Time dependency**

Grandeurs et unités —

Partie 17: Dépendance vis-à-vis du temps

ICS: 01.060

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENTS AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

This document has not been edited by the ISO Central Secretariat.

This draft is submitted to a parallel vote in ISO and in IEC.

Reference number
IEC/DIS 80000-17:2026(en)

© IEC 2026

CONTENTS

Contact 3
CONTENTS 1
FOREWORD 2
INTRODUCTION 5
1 Scope 6
2 Normative references 6
3 Terms and Definitions 6
4 Names and symbols for time-dependent quantities 6
4.1 General 6
4.2 Quantities that vary with time periodically 7
4.2.1 General 7
4.2.2 Sinusoidal quantities 7
4.2.3 Root-mean-square value ,RMS value, effective value 7
4.3 Succession and position of information subscripts 7
5 Tables for time-dependent quantities 8
Annex A (informative) Examples of time-dependent quantities 12
A.1 Examples of alternating quantities 12
A.2 Examples of transient quantities 17
A.3 Example of a random quantity 19
Bibliography 20

Figure A.1 – Sum of a constant component $X0$ and an alternating component xa 12
Figure A.2 – Sum of two alternating components 13
Figure A.3 – Product of two alternating components 14
Figure A.4 – Sum of a constant component and two alternating components 15
Figure A.5 – Sum of a constant component and three alternating components 16
Figure A.6 – Product of a varying component and an alternating component 17
Figure A.7 – Sum of two varying components and one alternating component 18
Figure A.8 – Sum of a constant component and a random variable 19

Table 1 – Symbols for time-dependent quantities 8
Table 2 – Symbols for average quantities 9
Table 3 – Symbols for components of a combined quantity 9
Table 4 – Symbols for some instantaneous or average values of a component 10
Table 5 – Distributions, singularity functions 10

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

Quantities and units - Part 17: Time dependency

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.

3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.

4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.

5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.

6) All users should ensure that they have the latest edition of this publication.

7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.

8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.

9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC [had/had not] received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest

information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 80000-17:202X has been prepared by TC 25/JWG 2: Revision and amendments of IEC-related parts of ISO/IEC 80000 series of IEC technical committee TC25: Quantities and units. It is an International Standard.

This 1st edition together with the future forthcoming Part 16 (Printing and writing rules) will cancel and replace IEC 60027-1:1992+COR1:1993+AMD1:1997+AMD2:2005 ED6.0, Letter symbols to be used in electrical technology - Part 1: General.

This new part is an excerpt from IEC 60027-1 according to IEC/TC 25 decision 2017/25-07 (Document 25/614/DL). This draft contains Clause 2, tables 9 and 10, and Annex C of publication IEC 60027-1 Ed 6: 1995.

IEC 80000 consists of the following parts, under the general title *Quantities and units*:

Part 6: Electromagnetism

Part 13: Information science and technology

Part 15: Logarithmic and related quantities, and their units

Part 16: Printing and writing rules

Part 17: Time dependency

The following parts are published by ISO:

Part 1: General

Part 2: Mathematics

Part 3: Space and time

Part 4: Mechanics

Part 5: Thermodynamics

Part 7: Light

Part 8: Acoustics

Part 9: Physical chemistry and molecular physics

Part 10: Atomic and nuclear physics

Part 11: Characteristic numbers

Part 12: Condensed matter physics

The text of this International Standard is based on the following documents:

Draft	Report on voting
25/XX/FDIS	25/XX/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English .

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

INTRODUCTION

Time-dependent quantities can be periodic, transient or random and can be often represented by a combination, e.g. sum, product, polynomial, etc., of components which are functions such as trigonometric functions, exponentials, distributions, etc. They are denoted by specific symbols which also can express specific characteristics like maximum, minimum, average by various graphemes like subscripts, superscripts, diacritics, underscore, etc.

For time-dependent quantities, several different systems have been developed and used depending on the number and the choice of base quantities on which the system is based. However, in time dependency and electrical engineering, only the International System of Quantities, ISQ, and the associated International System of Units, SI, are acknowledged and are reflected in the standards of ISO and IEC. The SI has seven base units, among them meter, symbol m, kilogram, symbol kg, second, symbol s, and ampere, symbol A.

The various possibilities for symbols for time-dependent quantities are presented in tables with examples. No specific quantities are considered but place holders or abstract quantities.

All symbols and graphemes are language independent.

The items given in IEC 80000-17 are generally in conformity with the International Electrotechnical Vocabulary (IEV).

The font used for text is sans serif; that used for quantities is serif.

The following items were listed in the bibliography but not cited in the text. Please find a suitable place to cite them to justify their inclusion in the bibliography:

The International System of Units, 9th edition, BIPM, 2019 (SI Brochure)[1]

IEC 60375:2018, *Conventions concerning electric circuits*IEC 60375:2018 [2]

IEC 60050-131, *International Electrotechnical Vocabulary (IEV) - Part 131: Circuit theory*IEC 60050-131 [3]

IEC 60050-112, *International Electrotechnical Vocabulary (IEV) - Part 112: Quantities and units*IEC 60050-112 [4]

ISO 80000-3:2019, *Quantities and units — Part 3: Space and time*ISO 80000-3:2019 [5]

1 Scope

This document is a part of the ISO/IEC 80000 series. It establishes principles for writing and printing of symbols for quantities which are time-dependent.

The aim of this standard is to codify additional symbols for the components of a combination of functions or for special values (e.g. instantaneous, root-mean-square) of more complicated time-dependent quantities (e.g. modulated waves, sets of impulses). In this connection, it is considered highly desirable to have a language-independent system of symbols.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 80000-2:2019, *Quantities and units - Part 2: Mathematics*

ISO 80000-6:2022, *Quantities and units - Part 6: Electromagnetism*

IEC 60050-103, *International Electrotechnical Vocabulary (IEV) - Part 103: Mathematics - Functions*

3 Terms and Definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

– IEC Electropedia: available at https://www.electropedia.org/
– ISO Online browsing platform: available at https://www.iso.org/obp

4 Names and symbols for time-dependent quantities

4.1 General

Definitions of special values or components of a time-dependent quantity are those of IEC 60050-103. No definitions are given here; the meaning of the symbols being illustrated by the figures.

Two types of symbols are given: one using additional marks, the other using only letter subscripts as they appear on an ordinary typewriter. A combination of both systems is possible. Most examples given in the tables and the appendix use one set of those symbols only.

The symbol for a time-dependent quantity implies inherent dependency on time and indicates therefore the instantaneous value.

When both upper case and lower-case letters are used, the lower-case letter indicates an instantaneous value and the upper-case letter an average value.

EXAMPLE 1 i instantaneous value of a time-dependent electric current,

I its RMS value.