



SLOVENSKI STANDARD
SIST EN 60477-2:2000

01-september-2000

Laboratorijski upori – 2. del: Laboratorijski upori za izmenični tok (IEC 60477-2:1979)

Laboratory resistors -- Part 2: Laboratory a.c. resistors

Meßwiderstände -- Teil 2: Wechselstrom-Meßwiderstände

Résistances de laboratoire -- Partie 2: Résistances de laboratoire à courant alternatif

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Ta slovenski standard je istoveten z: EN 60477-2:1997

SIST EN 60477-2:2000
<https://standards.iteh.ai/catalog/standards/sist/8538ed18-fe12-42b5-a330-925262caa311/sist-en-60477-2-2000>

ICS:

17.220.20	Merjenje električnih in magnetnih veličin	Measurement of electrical and magnetic quantities
-----------	---	---

SIST EN 60477-2:2000

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60477-2:2000

<https://standards.iteh.ai/catalog/standards/sist/8538ed18-f612-42b5-a330-925262caa311/sist-en-60477-2-2000>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 60477-2

October 1997

ICS 17.220.20

Supersedes HD 249.2 S1:1981

Descriptors: Laboratory alternating-current resistors, requirements, definitions

English version

Laboratory resistors
Part 2: Laboratory a.c. resistors
(IEC 60477-2:1979)

Résistances de laboratoire
Partie 2: Résistances de laboratoire à
courant alternatif
(CEI 60477-2:1979)

Meßwiderstände
Teil 2: Wechselstrom-Meßwiderstände
(IEC 60477-2:1979)

This European Standard was approved by CENELEC on 1997-10-01. 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.

[SIST EN 60477-2:2000](https://standards.iteh.ai/catalog/standards/sist/8538ed18-fe12-42b5-a330-925262caa311/sist-en-60477-2-2000)

<https://standards.iteh.ai/catalog/standards/sist/8538ed18-fe12-42b5-a330-925262caa311/sist-en-60477-2-2000>

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

The text of the International Standard IEC 60477-2:1979, prepared by IEC TC 85, Measuring equipment for electromagnetic quantities, was approved by CENELEC as HD 249.2 S1 on 1981-02-19.

This Harmonization Document was submitted to the formal vote for conversion into a European Standard and was approved by CENELEC as EN 60477-2 on 1997-10-01.

The following date was fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1998-09-01

Endorsement notice

The text of the International Standard IEC 60477-2:1979 was approved by CENELEC as a European Standard without any modification.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60477-2:2000

<https://standards.iteh.ai/catalog/standards/sist/8538ed18-fe12-42b5-a330-925262caa311/sist-en-60477-2-2000>

Annex ZA (normative)**Normative references to international publications
with their corresponding European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60477	1974	Laboratory d.c. resistors	EN 60477	1997

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60477-2:2000

<https://standards.iteh.ai/catalog/standards/sist/8538ed18-fe12-42b5-a330-925262caa311/sist-en-60477-2-2000>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 60477-2:2000

<https://standards.iteh.ai/catalog/standards/sist/8538ed18-f612-42b5-a330-925262caa311/sist-en-60477-2-2000>

**NORME
INTERNATIONALE
INTERNATIONAL
STANDARD**

**CEI
IEC**

477-2

Première édition
First edition
1979

Résistances de laboratoire

Deuxième partie:

Résistances de laboratoire à courant alternatif

iTeh STANDARD PREVIEW
Laboratory resistors
(standards.iteh.ai)

Part 2:

Laboratory a.c. resistors

<https://standards.iteh.ai/catalog/standards/sist/8538ed18-1e12-42b5-a330-925262caa311/sist-en-60477-2-2000>

© CEI 1979 Droits de reproduction réservés — Copyright - all rights reserved

Aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'éditeur.

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher

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



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE

N

● Pour prix, voir catalogue en vigueur
For price, see current catalogue

CONTENTS

	Page
FOREWORD	5
PREFACE	5
Clause	
1. Scope	7
2. Definitions	7
3. Resistor characterization	11
4. General requirements	11
5. Permissible variations	13
6. Further electrical and mechanical requirements	15
7. Markings and symbols	17
APPENDIX A – Examples of markings	19
APPENDIX B – General considerations regarding laboratory a. c. resistors	23
APPENDIX C – Equivalent circuits of an a. c. resistor	27

iTeh STANDARD PREVIEW

(standards.iteh.ai)

SIST EN 60477-2:2000
<https://standards.iteh.ai/catalog/standards/sist/8538ed18-fe12-42b5-a330-925262caa311/sist-en-60477-2-2000>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

LABORATORY RESISTORS

Part 2: Laboratory a. c. resistors

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.

PREFACE

This standard has been prepared by Sub-Committee 13B, Electrical Measuring Instruments, of IEC Technical Committee No. 13, Electrical Measuring Equipment.

It forms Part 2 of IEC Publication 477 which, after revision, will be issued as Publication 477-1.

Drafts were discussed at the meetings held in The Hague in 1975 and in Warsaw in 1976. As a result of this latter meeting, a draft, Document 13B(Central Office)54, and a corrigendum to it, Document 13B(Central Office)54A, were submitted to the National Committees for approval under the Six Months' Rule in November 1976 and in April 1977 respectively. Though the Six Months' Rule document together with the corrigendum were approved by the National Committees, further modifications became necessary. Therefore, these amendments, Document 13B(Central Office)63, were submitted to the National Committees for approval under the Two Months' Procedure in July 1978.

The National Committees of the following countries voted explicitly in favour of publication:

Argentina	Hungary
Australia	Italy
Austria	Japan
Belgium	Poland
Brazil	Romania
Canada	South Africa (Republic of)
China	Sweden
Denmark	Switzerland
Egypt	Turkey
Finland	United Kingdom
France	United States of America
Germany	

Other IEC publication quoted in this standard:

Publication No. 477: Laboratory D.C. Resistors (quoted in Sub-clauses 1.2, 2.6, 3.1, 4.1.1, 4.5.1, 4.5.2, Clause 5, Sub-clauses 5.1, 6.1, 7.3, 7.4, Appendix A: Clauses A1 and A2 and Appendix B of this standard).

LABORATORY RESISTORS

Part 2: Laboratory a.c. resistors

1. Scope

- 1.1 This standard applies to resistors intended as laboratory a.c. resistors for use over a range of frequencies from d.c. up to a stated frequency which is not in excess of 100 kHz. Such resistors are hereinafter referred to as “a.c. resistors”.
- 1.2 In addition to satisfying the requirements of IEC Publication 477, resistors satisfying the requirements of this standard are designed to have a small variation of resistance and a small phase displacement over the stated frequency range.
- 1.3 Because of the uncertainties in a.c. properties which can result from stray inductances, stray capacitances, eddy currents and dielectric absorption effects, the a.c. resistors to which this standard applies are classified according to their construction, as follows:
- 1.3.1 According to the number of main terminals, into one of the following types:
- a) Resistors having a pair of terminals at each point of connection.
 - b) Resistors having a single terminal at each point of connection.
- 1.3.2 According to the method of protection against externally produced electric fields, into one of the following types:
- a) Resistors not having an electric screen*.
 - b) Resistors having an electric screen which is permanently connected to one of the points of connection.
 - c) Resistors having an electric screen which is not connected to the terminals of the resistor but which is provided with a separate terminal, sometimes called the “guard terminal”.
- 1.4 In this standard, a.c. voltages and currents are assumed to have a substantially sinusoidal waveform.

Note. – For general information about a.c. resistors, see Appendices B and C.

2. Definitions

For the purposes of this standard, the following definitions apply:

2.1 *Representation of the a.c. properties of a resistor*

The a.c. characteristics of a resistor are given by:

* The a.c. properties of an unscreened resistor are dependent on the stray capacitances which exist, in effect, across the resistor. Testing conditions can thus considerably affect the a.c. properties. Sub-clause 4.5.6 therefore lays down the testing conditions concerning electric screening.

2.1.1 either an equivalent a. c. resistance, R_s , in series with an equivalent inductance, L_s , or

2.1.2 an equivalent a. c. resistance, R_p , in parallel with an equivalent capacitance, C_p .

2.2 Equivalent a. c. resistance

The value of resistance (R_s or R_p) which is the a. c. resistive component of the resistor (see Sub-clause 2.1).

2.3 Time constant

The time constant is denoted by τ^* ; it is defined as either:

2.3.1 L_s/R_s , or

2.3.2 $R_p C_p$, whichever yields a positive value (see Appendix C).

Notes 1. – The unit for time constant is the second, L_s being expressed in henrys, R_s and R_p in ohms and C_p in farads.

2. – For determining the time constant, the d. c. resistance may be used instead of the equivalent a. c. resistance.

3. – The phase displacement of the current flowing through the resistor from the voltage appearing across it with a time constant L_s/R_s is such that the current is lagging, and that with a time constant $R_p C_p$ is leading when L_s and C_p have positive values.

4. – For those cases where the simple representation would lead to an apparently negative time constant (see Clause C2 of Appendix C), the time constant is not used and the reactive component is stated instead.

2.4 Time constant index

The number which designates the permissible upper limit of the time constant of a group of resistors, all of which can be designated by the same number if they comply with all the requirements of this standard concerning time constant. It is expressed in seconds using the appropriate SI prefix.

2.5 Variation due to frequency

The difference between the equivalent a. c. resistance at a stated frequency and the d. c. resistance. It is expressed in percentage (%) or in parts per million (ppm) of the d. c. resistance.

2.6 Upper limit of the nominal range of use for frequency

The specified frequency up to which the variation due to frequency does not exceed the permissible intrinsic d. c. resistance error corresponding to the (d. c.) resistance class index (see IEC Publication 477).

2.7 Frequency index

The number which designates the upper limit of the nominal range of use for frequency, expressed in kilohertz (see Table I).

* Lower-case Greek tau.