

STN	Potenciometre na použitie v elektronických zariadeniach Časť 3: Rámcová špecifikácia Otočné presné potenciometre	STN EN IEC 60393-3 35 8195
------------	---	--

Potentiometers for use in electronic equipment - Part 3: Sectional specification: Rotary precision potentiometers

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 11/23

Obsahuje: EN IEC 60393-3:2023, IEC 60393-3:2023

137723

EUROPEAN STANDARD

EN IEC 60393-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2023

ICS 31.040.20

English Version

**Potentiometers for use in electronic equipment - Part 3:
Sectional specification: Rotary precision potentiometers
(IEC 60393-3:2023)**

Potentiomètres utilisés dans les équipements électroniques
- Partie 3: Spécification intermédiaire: Potentiomètres de
précision rotatifs
(IEC 60393-3:2023)

Potentiometer zur Verwendung in Geräten der Elektronik -
Teil 3: Rahmenspezifikation: Drehpräzisionspotentiometer
(IEC 60393-3:2023)

This European Standard was approved by CENELEC on 2023-09-22. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN IEC 60393-3:2023 (E)**European foreword**

The text of document 40/3058/FDIS, future edition 3 of IEC 60393-3, prepared by IEC/TC 40 "Capacitors and resistors for electronic equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60393-3:2023.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2024-06-22
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-09-22

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

A preceding document on the subject covered by this specification has been:

— CECC 41400:1979

Endorsement notice

The text of the International Standard IEC 60393-3:2023 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60915 NOTE Approved as EN 60915

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60062	-	Marking codes for resistors and capacitors	EN 60062	-
IEC 60068-1	2013	Environmental testing - Part 1: General and guidance	EN 60068-1	2014
IEC 60068-2-1	-	Environmental testing - Part 2-1: Tests - Test A: Cold	EN 60068-2-1	-
IEC 60068-2-2	-	Environmental testing - Part 2-2: Tests - Test B: Dry heat	EN 60068-2-2	-
IEC 60393-1	2008	Potentiometers for use in electronic equipment - Part 1: Generic specification	EN 60393-1	2009
IEC 61193-2	-	Quality assessment systems - Part 2: Selection and use of sampling plans for inspection of electronic components and packages	EN 61193-2	-



IEC 60393-3

Edition 3.0 2023-08

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Potentiometers for use in electronic equipment –
Part 3: Sectional specification: Rotary precision potentiometers**

**Potentiomètres utilisés dans les équipements électroniques –
Partie 3: Spécification intermédiaire: Potentiomètres de précision rotatifs**





THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2023 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, 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 either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, 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'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC -

webstore.iec.ch/advsearchform

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, ...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 300 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 19 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

**IEC 60393-3**

Edition 3.0 2023-08

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Potentiometers for use in electronic equipment –
Part 3: Sectional specification: Rotary precision potentiometers**

**Potentiomètres utilisés dans les équipements électroniques –
Partie 3: Spécification intermédiaire: Potentiomètres de précision rotatifs**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 31.040.20

ISBN 978-2-8322-7359-3

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references	6
3 Terms and definitions	6
4 Preferred characteristics.....	6
4.1 General.....	6
4.2 Style and dimensions	7
4.2.1 Style.....	7
4.2.2 Outline drawing and dimensions	7
4.3 Preferred climatic categories.....	9
4.4 Resistance law.....	9
4.5 Nominal total resistance.....	9
4.6 Tolerances on nominal total resistance	9
4.7 Rated dissipation	9
4.8 Limiting element voltage	10
4.9 Insulation voltage.....	11
4.10 Resolution (when applicable)	11
5 Test and test severities.....	11
5.1 General.....	11
5.2 Mounting.....	11
5.3 Drying.....	11
5.4 Vibration	11
5.5 Bump	11
5.6 Shock	12
5.7 Solderability.....	12
5.7.1 Solder bath method (Method 1).....	12
5.7.2 Soldering iron method (Method 2).....	12
5.8 Linearity.....	12
5.9 Angle of effective travel	12
5.10 Dither.....	13
6 Preferred characteristics.....	13
6.1 General.....	13
6.2 Temperature coefficients of resistance.....	13
6.3 Limits for change in resistance or output voltage ratio.....	14
6.4 Limits for insulation resistance	14
6.5 Limits for resistance law	14
6.6 Solderability.....	14
7 Marking, packaging and ordering information.....	15
7.1 General.....	15
7.2 Marking for potentiometers	15
7.3 Marking for packaging.....	15
7.4 Additional marking	15
7.5 Ordering information	15
8 Preferred values of ratings.....	16
8.1 General.....	16
8.2 Information to be specified in a detail specification	16

8.2.1	Outline drawing or illustration	16
8.2.2	Style and dimensions.....	16
8.3	Ratings and characteristics	16
8.3.1	General	16
8.3.2	Nominal total resistance range	16
8.4	Additional information	16
9	Quality assessment procedures	17
9.1	General.....	17
9.2	Definitions.....	17
9.2.1	Primary stage of manufacture	17
9.2.2	Structurally similar components	17
9.3	Assessment level EZ.....	17
10	Qualification approval	17
10.1	General.....	17
10.2	Qualification approval on the basis of the fixed sample size procedure	17
10.3	Tests	18
11	Quality conformance inspection	29
11.1	Formation of inspection lots	29
11.2	Test schedule	29
11.3	Assessment levels	29
11.4	Delayed delivery	31
Annex A (normative)	Symbols and abbreviated terms	32
A.1	Symbols.....	32
A.2	Abbreviated terms.....	33
Bibliography	34
Figure 1	– Outline drawing and dimensions.....	8
Figure 2	– Rated dissipation curve	10
Figure 3	– Rated dissipation curve (examples of lager area).....	10
Table 1	– Temperature coefficients	13
Table 2	– Limits for change in resistance or output voltage ratio	14
Table 3	– Test schedule for qualification approval.....	19
Table 4	– Quality conformance inspection: lot-by-lot inspection	30
Table 5	– Quality conformance inspection: periodic testing	31

INTERNATIONAL ELECTROTECHNICAL COMMISSION

POTENTIOMETERS FOR USE IN ELECTRONIC EQUIPMENT –**Part 3: Sectional specification: Rotary precision potentiometers**

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 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 60393-3 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment. It is an International Standard.

This third edition cancels and replaces the second edition published in 1992. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) revised all parts of the document based on the ISO/IEC Directives, Part 2:2018 (eighth edition) and harmonized with other similar kinds of documents;
- b) the document structure has been organized to follow new sectional specification structure decided in TC 40;
- c) revision of the information on the assessment level EZ (zero nonconforming).

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

Draft	Report on voting
40/3058/FDIS	40/3071/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.

A list of all parts in the IEC 60393 series, published under the general title *Potentiometers for use in electronic equipment*, can be found on the IEC website.

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,
- replaced by a revised edition, or
- amended.

POTENTIOMETERS FOR USE IN ELECTRONIC EQUIPMENT –

Part 3: Sectional specification: Rotary precision potentiometers

1 Scope

This part of IEC 60393 applies to rotary precision potentiometers for use in electronic equipment.

The object of this document is to prescribe preferred ratings and characteristics and to select from IEC 60393-1, the appropriate quality assessment procedures, tests and measuring methods and to give general performance requirements for this type of potentiometer.

This document gives the minimum performance requirements and test severities.

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.

IEC 60062, *Marking codes for resistors and capacitors*

IEC 60068-1:2013, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-1, *Environmental testing – Part 2-1: Tests – Test A: Cold*

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

IEC 60393-1:2008, *Potentiometers for use in electronic equipment – Part 1: Generic specification*

IEC 61193-2, *Quality assessment systems – Part 2: Selection and use of sampling plans for inspection of electronic components and packages*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN