

STN	Elektromagnetická kompatibilita (EMC). Časť 4-19: Metódy skúšania a merania. Skúška odolnosti proti symetrickým rušeniam a rušeniam od prenosu signálov šíreným vedením vo frekvenčnom pásme od 2 kHz do 150 kHz na portoch striedavého napájania.	STN EN 61000-4-19
		33 3432

Electromagnetic compatibility (EMC) - Part 4-19: Testing and measurement techniques - Test for immunity to conducted, differential mode disturbances and signalling in the frequency range 2 kHz to 150 kHz at a.c. power ports

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. 01/15

Obsahuje: EN 61000-4-19:2014, IEC 61000-4-19:2014

119930

Úrad pre normalizáciu, metrológiu a skúšobníctvo SR, odbor SÚTN, 2015
Podľa zákona č. 264/1999 Z. z. v znení neskorších predpisov sa môžu slovenské technické normy rozmnožovať a rozširovať iba so súhlasom Úradu pre normalizáciu, metrológiu a skúšobníctvo SR.

EUROPEAN STANDARD

EN 61000-4-19

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2014

ICS 33.100.20

English Version

Electromagnetic compatibility (EMC) - Part 4-19: Testing and measurement techniques - Test for immunity to conducted, differential mode disturbances and signalling in the frequency range 2 kHz to 150 kHz at a.c. power ports (IEC 61000-4-19:2014)

Compatibilité électromagnétique (CEM) - Partie 4-19: Techniques d'essai et de mesure - Essai pour l'immunité aux perturbations conduites en mode différentiel et à la signalisation dans la gamme de fréquences de 2 kHz à 150 kHz, aux accès de puissance à courant alternatif (CEI 61000-4-19:2014)

Elektromagnetische Verträglichkeit (EMV) - Teil 4-19: Prüf- und Messverfahren - Prüfung der Störfestigkeit an Wechselstrom-Netzanschlüssen gegen leitungsgeführte symmetrische Störgrößen und Störgrößen aus der Signalübertragung im Frequenzbereich von 2 kHz bis 150 kHz (IEC 61000-4-19:2014)

This European Standard was approved by CENELEC on 2014-06-11. 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Foreword

The text of document 77A/845/FDIS, future edition 1 of IEC 61000-4-19, prepared by SC 77A "EMC – Low frequency phenomena", of IEC/TC 77 "Electromagnetic compatibility" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61000-4-19:2014.

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) 2015-03-11
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-06-11

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

Endorsement notice

The text of the International Standard IEC 61000-4-19:2014 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60068-1	NOTE	Harmonized as EN 60068-1.
IEC 61000-2-2:2002	NOTE	Harmonized as EN 61000-2-2:2002 (not modified).
IEC 61000-2-12:2003	NOTE	Harmonized as EN 61000-2-12:2003 (not modified).
CISPR 14-1:2005 + A1:2008 + A2:2011	NOTE	Harmonized as EN 55014-1:2006 (not modified) + A1:2009 (not modified) + A2:2011 (not modified).
CISPR 15:2013	NOTE	Harmonized as EN 55015:2013 (not modified).

Annex ZA

(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When 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.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61000-4-13 + A1	2002 2009	Electromagnetic compatibility (EMC) - Part 4-13: Testing and measurement techniques - Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests	EN 61000-4-13 + A1	2002 2009
IEC 61000-4-16 + A1 + A2	1998 2001 2009	Electromagnetic compatibility (EMC) - Part 4-16: Testing and measurement techniques - Test for immunity to conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz	EN 61000-4-16 + A1 + A2	1998 2004 2011



INTERNATIONAL STANDARD

NORME INTERNATIONALE



BASIC EMC PUBLICATION
PUBLICATION FONDAMENTALE EN CEM

**Electromagnetic compatibility (EMC) –
Part 4-19: Testing and measurement techniques – Test for immunity to
conducted, differential mode disturbances and signalling in the frequency range
2 kHz to 150 kHz at a.c. power ports**

**Compatibilité électromagnétique (CEM) –
Partie 4-19: Techniques d'essai et de mesure – Essai pour l'immunité aux
perturbations conduites en mode différentiel et à la signalisation dans la gamme
de fréquences de 2 kHz à 150 kHz, aux accès de puissance à courant alternatif**





THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2014 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 Central Office
 3, rue de Varembe
 CH-1211 Geneva 20
 Switzerland

Tel.: +41 22 919 02 11
 Fax: +41 22 919 03 00
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 corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub

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 also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in 14 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

More than 55 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

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: csc@iec.ch.

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.

Catalogue IEC - webstore.iec.ch/catalogue

Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

Recherche de publications IEC - www.iec.ch/searchpub

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 aussi une fois par mois par email.

Electropedia - www.electropedia.org

Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 14 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary

Plus de 55 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

Service Clients - webstore.iec.ch/csc

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



INTERNATIONAL STANDARD

NORME INTERNATIONALE



BASIC EMC PUBLICATION
PUBLICATION FONDAMENTALE EN CEM

**Electromagnetic compatibility (EMC) –
Part 4-19: Testing and measurement techniques – Test for immunity to
conducted, differential mode disturbances and signalling in the frequency range
2 kHz to 150 kHz at a.c. power ports**

**Compatibilité électromagnétique (CEM) –
Partie 4-19: Techniques d'essai et de mesure – Essai pour l'immunité aux
perturbations conduites en mode différentiel et à la signalisation dans la gamme
de fréquences de 2 kHz à 150 kHz, aux accès de puissance à courant alternatif**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX



ICS 33.100.20

ISBN 978-2-8322-1565-4

**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
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Terms and definitions	8
3.1 Terms and definitions.....	8
3.2 Abbreviations.....	9
4 General	9
5 Test levels and wave profiles in the frequency range 2 kHz to 150 kHz	10
5.1 Test levels for differential voltage testing	10
5.1.1 General	10
5.1.2 Test wave profile with CW pulses with pause.....	11
5.1.3 Test wave profile with rectangularly modulated pulses.....	12
5.2 Test levels for differential current testing	12
5.2.1 General	12
5.2.2 Test wave profile with CW pulses with pause.....	13
5.2.3 Test wave profile with rectangularly modulated pulses.....	13
6 Test equipment.....	13
6.1 Test generators	13
6.1.1 General	13
6.1.2 Characteristics and performance of the generator for the differential voltage test.....	14
6.1.3 Characteristics and performance of the generator for the differential current test.....	14
6.2 Verification of the characteristics of the test generators	15
6.2.1 General	15
6.2.2 Verification of the generators.....	15
6.2.3 Verification of the coupling/decoupling network	16
7 Test setups.....	17
7.1 Test setup for differential mode voltage testing	17
7.2 Test setup for differential mode current test	18
8 Test procedure	18
8.1 General.....	18
8.2 Laboratory reference conditions	19
8.2.1 Climatic conditions	19
8.2.2 Electromagnetic conditions.....	19
8.3 Execution of the test	19
9 Evaluation of test results	19
10 Test report.....	20
Annex A (informative) Interference sources, victims and effects.....	21
Annex B (informative) Selection of test levels	25
Annex C (informative) Testing electricity meters guideline	27
C.1 Example of the basic structure of a test generator for differential current testing.....	27
C.2 Example of a test circuit.....	28

C.3 Example of a realized setup including schematics	29
Annex D (informative) Test wave profiles	30
Bibliography.....	31
Figure 1 – Frequency vs. amplitude profile for differential voltage testing	11
Figure 2 – Test wave profile with CW pulses with pause	12
Figure 3 – Test wave profile with rectangularly modulated pulses for differential voltage testing	12
Figure 4 – Example of a simplified circuit diagram with the major elements of the differential voltage test generator.....	14
Figure 5 – Test setup for verification of the CDN in a 10 Ω measurement system.....	16
Figure 6 – Limit for the damping characteristics measured in a 10 Ω measurement system	17
Figure 7 – Example of test setup for differential mode voltage testing with auxiliary equipment.....	17
Figure 8 – Example of test setup for differential mode current testing	18
Figure A.1 – Standards dealing with voltage levels due to non-intentional emissions in the frequency range 2 kHz to 150 kHz	23
Figure A.2 – Standards dealing with voltage levels due to intentional emissions in the frequency range 2 kHz to 150 kHz	24
Figure C.1 – Simplified circuit of a differential current test generator	27
Figure C.2 – Example of a test circuit	28
Figure C.3 – Example for a realized test set up.....	29
Table 1 – Test levels in the 2 kHz to 150 kHz frequency range for differential voltage testing	10
Table 2 – Test levels in the 2 kHz to 150 kHz frequency range for differential current testing	13

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTROMAGNETIC COMPATIBILITY (EMC) –**Part 4-19: Testing and measurement techniques – Test for immunity to conducted, differential mode disturbances and signalling in the frequency range 2 kHz to 150 kHz at a.c. power ports**

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

International Standard IEC 61000-4-19 has been prepared by subcommittee 77A: EMC – Low frequency phenomena, of IEC technical committee 77: Electromagnetic compatibility.

It forms Part 4-19 of IEC 61000. It has the status of a basic EMC publication in accordance with IEC Guide 107.

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

FDIS	Report on voting
77A/845/FDIS	77A/854/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 61000 series, published under the general title *Electromagnetic compatibility (EMC)*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

IEC 61000 is published in separate parts, according to the following structure:

Part 1: General

General considerations (introduction, fundamental principles)
Definitions, terminology

Part 2: Environment

Description of the environment
Classification of the environment
Compatibility levels

Part 3: Limits

Emission limits
Immunity limits (in so far as they do not fall under the responsibility of the product committees)

Part 4: Testing and measurement techniques

Measurement techniques
Testing techniques

Part 5: Installation and mitigation guidelines

Installation guidelines
Mitigation methods and devices

Part 6: Generic standards

Part 9: Miscellaneous

Each part is further subdivided into several parts, published either as international standards or as technical specifications or technical reports, some of which have already been published as sections. Others are published with the part number followed by a dash and a second number identifying the subdivision (example: IEC 61000-6-1).

ELECTROMAGNETIC COMPATIBILITY (EMC) –

Part 4-19: Testing and measurement techniques – Test for immunity to conducted, differential mode disturbances and signalling in the frequency range 2 kHz to 150 kHz at a.c. power ports

1 Scope

This part of IEC 61000 relates to the immunity requirements and test methods for electrical and electronic equipment to conducted, differential mode disturbances and signalling in the range 2 kHz up to 150 kHz at a.c. power ports.

The object of this standard is to establish a common and reproducible basis for testing electrical and electronic equipment with the application of differential mode disturbances and signalling to a.c. power ports. This standard defines:

- test waveforms;
- range of test levels;
- test equipment;
- test setup;
- test procedures;
- verification procedures.

These tests are intended to demonstrate the immunity of electrical and electronic equipment operating at a mains supply voltage up to 280 V (from phase to neutral or phase to earth, if no neutral is used) and a frequency of 50 Hz or 60 Hz when subjected to conducted, differential mode disturbances such as those originating from power electronics and power line communication systems (PLC).

NOTE In some countries, the maximum voltage can be as much as 350 V from phase to neutral.

The immunity to harmonics and interharmonics, including mains signalling, on a.c. power ports up to 2 kHz in differential mode is covered by IEC 61000-4-13.

Emissions in the frequency range 2 kHz to 150 kHz often have both differential mode and common mode components. This standard provides immunity tests only for differential mode disturbances and signalling. It is recommended to perform common mode tests as well, which are covered by IEC 61000-4-16.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61000-4-13:2002, *Electromagnetic compatibility (EMC) – Part 4-13: Testing and measurement techniques – Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests*
Amendment 1:2009

IEC 61000-4-16:1998, *Electromagnetic compatibility (EMC) – Part 4-16: Testing and measurement techniques – Test for immunity to conducted, common mode disturbances in*

the frequency range 0 Hz to 150 kHz
Amendment 1:2001
Amendment 2:2009

koniec náhľadu – text ďalej pokračuje v platenej verzii STN