

Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz Part 4-1: Low voltage decoupling filters - Generic specification

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 50065-4-1:2023 sisaldab Euroopa standardi EN 50065-4-1:2023 ingliskeelset teksti.	This Estonian standard EVS-EN 50065-4-1:2023 consists of the English text of the European standard EN 50065-4-1:2023.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 24.03.2023.	Date of Availability of the European standard is 24.03.2023.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 31.160, 33.040.30, 97.120

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardimis- ja Akrediteerimiskeskusele. Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardimis-ja Akrediteerimiskeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardimis-ja Akrediteerimiskeskusega: Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation and Accreditation. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation and Accreditation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation and Accreditation: Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

Signalling on low-voltage electrical installations in the frequency
range 3 kHz to 148,5 kHz Part 4-1: Low voltage decoupling
filters - Generic specification

Transmission de signaux sur les réseaux électriques basse
tension dans la bande de fréquences de 3 kHz à 148,5 kHz
- Partie 4-1: Filtres de découplage basse tension -
Spécification générique

Signalübertragung auf elektrischen Niederspannungsnetzen
im Frequenzbereich 3 kHz bis 148,5 kHz Teil 4-1:
Niederspannungs-Entkopplungsfilter -
Fachgrundspezifikation

This European Standard was approved by CENELEC on 2022-10-03. 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

Contents	Page
European foreword	3
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	6
4 Symbols and abbreviations	8
5 Requirements	8
5.1 Marking	8
5.1.1 General information	8
5.1.2 Instruction sheet	8
5.2 Requirements of decoupling filter	8
5.2.1 Nominal current	8
5.2.2 Nominal voltage	8
5.2.3 Impedance	9
5.2.4 Transfer function	9
5.2.5 Leakage current	9
5.2.6 Voltage drop at 50 Hz	9
5.2.7 Power dissipation	9
5.2.8 Overcurrent	9
5.2.9 Overvoltage / surges	9
5.2.10 Mechanical shocks	9
6 Test method	9
6.1 Decoupling filter impedance	9
6.2 Transfer function	10
6.3 Leakage current	12
6.4 Voltage drop at 50 Hz	13
6.5 Power dissipation	14
6.6 Mechanical shocks	14
Bibliography	15

European foreword

This document (EN 50065-4-1:2023) has been prepared by WG 12 “Filters” of CLC/TC 219 “Mains communicating systems”.

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2023-09-24
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2026-03-24

This document supersedes EN 50065-4-1:2001 and all of its amendments and corrigenda (if any).

EN 50065-4-1:2022 includes the following significant technical changes with respect to EN 50065-4-1:2001:

The main changes introduced in this draft are in the specification of the requirements, test methods and setup regarding the decoupling filter impedance, transfer function, leakage current, voltage drop, power dissipation, overcurrent, overvoltage and endurance to mechanical shocks.

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.

EN 50065 consists of the following parts, under the general title: *Signalling on low voltage electrical installations in the frequency range 3 kHz to 148,5 kHz*:

Part 1: General requirements, frequency bands and electromagnetic disturbances

Part 2-1: Immunity requirements for mains communications equipment and systems operating in the range of frequencies 95 kHz to 148,5 kHz and intended for use in residential, commercial and light industrial environments

Part 2-2: Immunity requirements for mains communications equipment and systems operating in the range of frequencies 95 kHz to 148,5 kHz and intended for use in industrial environments

Part 2-3: Immunity requirements for mains communications equipment and systems operating in the range of frequencies 3 kHz to 95 kHz and intended for use by electricity suppliers and distributors

Part 4-1: Low voltage decoupling filters – Generic specification

Part 4-2: Low voltage decoupling filters – Safety requirements

Part 4-3: Low voltage decoupling filters – Incoming filter

Part 4-4: Low voltage decoupling filters – Impedance filter

Part 4-5: Low voltage decoupling filters – Segmentation filter

Part 4-6: Low voltage decoupling filters – Phase coupler

Part 4-7: Portable low voltage decoupling filters – Safety requirements

Part 7: Equipment impedance

This document has been prepared under a Standardization Request given to CENELEC by the European Commission and the European Free Trade Association.

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

Introduction

Electrical networks, in spite of being a difficult medium for data communication due to signal attenuation, noise level and coupling side impedance, are considered as an important transmission medium for supporting Distribution Automation and Home and Building Electronic Systems (HBES).

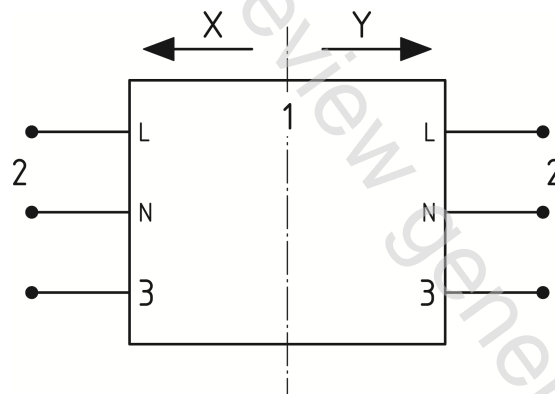
In order to avoid unwanted interference among mains communication equipment and/or low impedance issues on low voltage networks, a suitable device called “decoupling filter” may be installed either on the public supply network or within installations in consumers' premises.

A decoupling filter is a generic name given to incoming filters, impedance filters, segmentation filters and phase couplers.

The decoupling filter may be used:

- to limit the transmission area of wanted signals to the area in which the mains communication system operates.
- to reduce unwanted signals coming from the other side of the mains port.
- to allow simultaneous communication on both sides of the filter.
- to set a suitable impedance to the mains power ports at the signalling frequency.
- to provide a return path for the signal when needed (e.g. common mode propagation).

A decoupling filter may perform all the functions listed above or some of them.



Key

1	Filter
2	Mains port
3	Earth (optional)

X	Y
Utility	Consumer
Utility	Utility (*)
Consumer	Consumer (*)

(*) in this case, the filter may be reversed

Figure 1 — Decoupling filter ports and environment

1 Scope

This document applies to decoupling filters installed on the low voltage mains network and operating in the frequency range 3 kHz to 148,5 kHz.

It does not apply to EMI suppression filters incorporated in household equipment or other general electric equipment.

It specifies the definitions, requirements and test methods of the functional, technical and environmental characteristics of the decoupling filter, e.g. impedance, transfer function, voltage drop, leakage current and power dissipation.

The impedance and the transfer function are referred to the decoupling filter mains power ports (see Figure 1).

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.

EN 50065-1, *Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz - Part 1: General requirements, frequency bands and electromagnetic disturbances*

EN 50065-4 series, *Signalling on low voltage electrical installations in the frequency range 3 kHz to 148,5 kHz*

EN 60068-2-27, *Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock (IEC 60068-2-27)*

EN 60417-1, *Graphical symbols for use on equipment – Part 1: Overview and application (IEC 60417-1)*

EN 60417-2, *Graphical symbols for use on equipment – Part 2: Symbol originals (IEC 60417-2)*

EN 60617 series, *Graphical symbols for diagrams (IEC 60617 series)*

IEC 60027 series, *Letter symbols to be used in electrical technology*

IEC 60050-161, *International Electrotechnical Vocabulary (IEV) – Part 161: Electromagnetic compatibility*

IEC 80416 series, *Basic principles for graphical symbols for use on equipment*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-161 and EN 50065-1 and the following apply.

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

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