SLOVENSKI STANDARD
oSIST prEN 50065-4-1:2021

01-julij-2021

Signalizacija po nizkonapetostnih električnih napeljavah v frekvenčnem območju od 3 kHz do 148,5 kHz - 4-1. del: Splošne specifikacije

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

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

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

Ta slovenski standard je istoveten z: **prEN 50065-4-1**

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31.160	Električni filtri	Electric filters
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ICS

Will supersede EN 50065-4-1:2001 and all of its amendments and corrigenda (if any)

English Version

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This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2021-07-16.

It has been drawn up by CLC/TC 219.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CENELEC 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.

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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.

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

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Contents

European foreword

This document (prEN 50065-4-1:2021) has been prepared by WG 12 “Filters” of CLC/TC 205A “Mains communicating systems”.

This document is currently submitted to the Enquiry.

The following dates are proposed:

• latest date by which the existence of this document has to be announced at national level	(doa)	dor + 6 months
• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	dor + 12 months
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	dor + 36 months (to be confirmed or modified when voting)

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

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

prEN 50065-4-1:2021 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.

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

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

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

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

63 Part 7 Equipment impedance

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:

a) to limit the transmission area of wanted signals to the area in which the mains communication system operates.

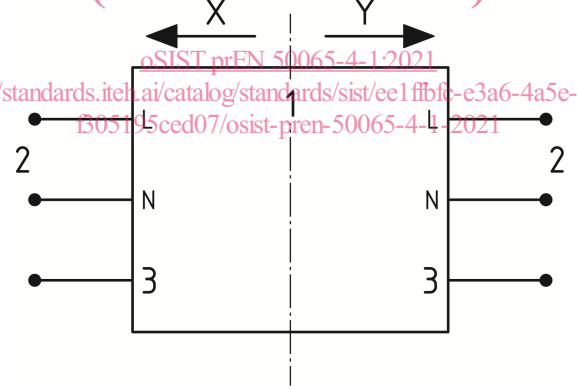
b) to reduce unwanted signals coming from the other side of the mains port.

c) to allow simultaneous communication on both sides of the filter.

d) to set a suitable impedance to the mains power ports at the signalling frequency.

e) 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

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 http://www.electropedia.org/

3.1
decoupling filter
device installed in an electrical network or installation in order to make possible reliable data transmission over the low voltage mains network

3.2
nominal current of the decoupling filter
maximum power frequency continuous current for which the decoupling filter is declared by the manufacturer to be suitable in defined conditions

3.3
nominal voltage of the decoupling filter
maximum voltage (for three-phase supply, the voltage between phases) for which the decoupling filter is operated

Note 1 to entry: The definition of IEC 60038:1983[1] has been the basis for the present definition.

3.4
operating frequency range
fmin, fmax
decoupling filters may operate in either of the frequency bands:

— 3 to 95 kHz, for utility applications,

— 95 to 148,5 kHz, for consumer applications,

and each side is a sub range of either of the frequency bands:

— for utility side: $f_{min} \geq 3$ kHz, $f_{max} \leq 95$ kHz;

— for consumer side: $f_{min} \geq 95$ kHz, $f_{max} \leq 148{,}5$ kHz

3.5
decoupling filter impedance
impedance of the decoupling filter, considered as a two port device, is defined as the impedance which can be measured on either side of the filter

Note 1 to entry: The termination shall be specified R_{Load}.

3.6
transfer function
ratio between the output signal and the input signal, depending on the frequency with given load conditions

3.7
leakage current
electric current which, under normal operating conditions, flows in an unwanted conducting path

3.8
voltage drop at 50 Hz
difference between the RMS value of the input voltage and the RMS value of the output voltage at nominal current at 50 Hz

3.9
power dissipation
power dissipation at the nominal current

3.10
overcurrent
current exceeding nominal current that can occur during fault condition until protective devices (e.g. circuit-breakers) operate

3.11.1
overvoltage
voltage exceeding nominal voltage that can occur during normal operation

3.11.2
surge
surge voltage that can occur during normal operation due to lightning effects or opening/closing line equipment

3.12
mechanical shock
refers to EN 60068-2-27

4 Symbols and abbreviations

Letter symbols, signs, abbreviations and graphical symbols shall comply with IEC 60027 series, EN 60417-1, EN 60417-2, EN 60617 series or IEC 80416 series, as appropriate.

5 Requirements

5.1 Marking

5.1.1 General information

The marking is done in accordance with EN 50065-4-2 or EN 50065-4-7, depending on filter type.

5.1.2 Instruction sheet

An instruction sheet shall be supplied by the manufacturer with the filter unit showing:

a) its installation circuit diagram;

b) the precautions to be observed during the installation;

c) the transmission characteristics: operating frequency range, attenuation, impedance;

d) ambient operating condition such as operating temperature range;

e) electrical operating conditions such as current derating curve;

f) safety conditions.

5.2 Requirements of decoupling filter

5.2.1 Nominal current

Selected from: 1, 3, 6, 10, 16, 20, 25, 32, 40, 50, 63, 80, 90,100, 125 A.

5.2.2 Nominal voltage

Selected from 230 V single phase and 400 V three phase system.