SLOVENSKI STANDARD

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Signalizacija po nizkonapetostnih električnih napeljavah v frekvenčnem območju od 3 kHz do 148,5 kHz – 4-6. del: Nizkonapetostni ločilni filtri – Fazni ločilnik

Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz – Part 4-6: Low voltage decoupling filters – Phase coupler

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English version

Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz Part 4-6: Low voltage decoupling filters – Phase coupler

Transmission de signaux sur les réseaux électriques basse tension dans la bande de fréquences de 3 kHz à 148,5 kHz Partie 4-6: Filtres basse tension de découplage – Coupleur de phase

Signalübertragung auf elektrischen Niederspannungsnetzen im Frequenzbereich 3 kHz bis 148,5 kHz Teil 4-6: Niederspannungs-Entkopplungsfilter – Phasenkoppler

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

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Foreword

This European Standard was prepared by SC 205A, Mains communicating systems, of Technical Committee CENELEC TC 205, Home and Building Electronic Systems (HBES).

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50065-4-6 on 2004-03-01.

The following dates were 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) 2005-03-01

- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2007-03-01

EN 50065 consists of several 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 part covers the extended frequency ranges 3 kHz to 148,5 kHz and 1,6 MHz to 30 MHz.

Contents

1 Scope

This European Standard applies to phase couplers in a mains communication system for phase to neutral voltage not exceeding 250 V a.c. and a nominal current not exceeding 125 A, intended for household and similar fixed installation including residential, commercial and light industrial buildings.

This European Standard applies to phase couplers used to control the coupling of communication signals between phases or sections of a mains communication system.

A “phase coupler” may be used to achieve coupling between the phases of a multiphase installation, or to provide bridging of signals around other system components.

The standard defines

– the requirements to ensure a minimum coupling between the sections, and

– the requirements to ensure no change on the safety of the electrical installation.

2 Normative references

The following referenced documents are indispensable for the application 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 50065-2-1 Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz – 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

EN 50065-2-2 Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz – 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

EN 50065-2-3 Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz – 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

EN 50065-4-1 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

EN 50065-4-2 Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz – Part 4-2: Low voltage decoupling filters – Safety requirements

3 Definitions

For the purposes of this document, the terms and definitions given in EN 50065-1, EN 50065-4-1 and the following apply.

3.1
phase terminal (PT)
connection to a phase conductor of the electrical installation in which the phase coupler is used

3.2
neutral terminal (NT)
connection to a neutral conductor of the electrical installation in which the phase coupler is used (may or may not be provided)

3.3
mains frequency leakage current
r.m.s. value of any mains frequency current flowing between phase terminals

4 Classification

The classification is made according to the “mains frequency leakage current” of the phase coupler.

The filter shall meet the requirements given in Part 4-2: Low voltage decoupling filters – Safety requirements.

4.1 Type 1 (standard type)

The coupling may be achieved with suitable capacitors. Due to significant mains frequency leakage current the use of this type of phase coupler may be limited for safety reasons.

4.2 Type 2 (low leakage type)

The coupling may be achieved using a transformer.

5 Requirements

5.1 Marking

In addition and in accordance with EN 50065-4-2, Clause 8,

– the operating frequency range f_{min} to f_{max} shall be marked, and

– the attenuation within the frequency range with a 10 Ω load at the output port shall be marked.

5.2 Electrical characteristics at mains frequency

The filter shall meet the requirements given in Part 4-1: Low voltage decoupling filters – Generic specification.

5.2.1 Over voltage

The phase coupler shall meet the requirements in accordance with EN 50065-4-2, subclause 7.1.5:

– overvoltage category III for phase couplers used on the consumer network;

– overvoltage category IV for phase couplers used on the utility network.

5.2.2 Immunity

The phase coupler shall conform to the relevant specification:

– according to EN 50065-2-1 for phase coupler in residential, commercial and light industrial environments,

– according to EN 50065-2-2 for phase coupler in industrial environments,

– according to EN 50065-2-3 for phase coupler in the utility networks.

5.2.3 Mains frequency leakage current

The mains frequency leakage current, at the nominal voltage, is measured according to Figure 1. All terminals of the phase coupler are connected to the appropriate voltage, except one phase terminal that is connected to neutral through a gauge.

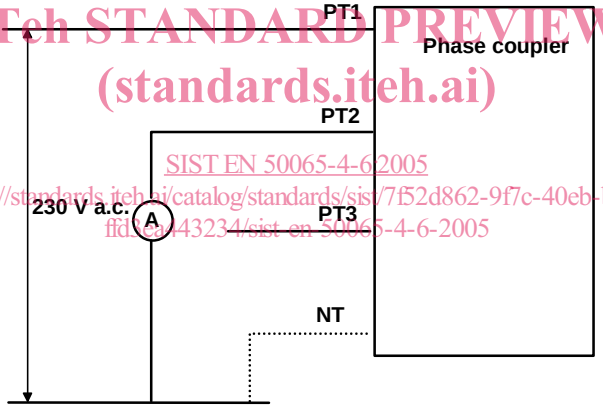

Figure 1 – Mains frequency leakage current test set up

NOTE 1 Repeat this measurement for all phase terminals provided by the phase coupler.

NOTE 2 For multiport/multiphase device, each phase port is tested independently.

The mains frequency leakage current of the phase coupler shall not exceed the following limits:

Table 1 – Mains frequency leakage current limits

Type of phase coupler	Mains frequency leakage current (r.m.s. value)
Type 1	30 mA
Type 2	200 µA

5.3 Electrical characteristics at signalling frequency

5.3.1 Operating frequency range

The operating frequency range shall be specified by the manufacturer within the relevant frequency band:

– 3 kHz to 95 kHz for utility phase couplers,

– 95 kHz to 148,5 kHz for consumer phase couplers.

5.3.2 Transfer function

The maximum attenuation between phase terminals measured according to EN 50065-4-1 subclause 6.2 with 10 Ω resistive load shall not exceed the value specified by the manufacturer.

5.3.3 Impedance

All active phase terminals are connected with a 10 Ω resistive load. On one phase, the load is disconnected and the impedance is measured. The modulus of this impedance shall not be less than all resistors connected in parallel.