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Standards

Irish Standard
I.S. EN 60940:2015

Guidance information on the application of capacitors, resistors, inductors and complete filter units for electromagnetic interference suppression

I.S. EN 60940:2015

Incorporating amendments/corrigenda/National Annexes issued since publication:

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EUROPEAN STANDARD

EN 60940

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2015

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English Version

**Guidance information on the application of capacitors, resistors,
inductors and complete filter units for electromagnetic
interference suppression
(IEC 60940:2015)**

Guide d'emploi des condensateurs, résistances,
inductances et filtres complets d'antiparasitage
(IEC 60940:2015)

Grundlagen für die Anwendung von Kondensatoren,
Widerständen, Drosseln und vollständigen Filtereinheiten
zur Unterdrückung elektromagnetischer Störungen
(IEC 60940:2015)

This European Standard was approved by CENELEC on 2015-04-14. 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.

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Europäisches Komitee für Elektrotechnische Normung

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

Foreword

The text of document 40/2337/FDIS, future edition 2 of IEC 60940, 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 60940:2015.

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) 2016-01-14
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-04-14

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

IEC 60068-2-78	NOTE	Harmonized as EN 60068-2-78.
IEC 60204-1	NOTE	Harmonized as EN 60204-1.
IEC 60384-14-1	NOTE	Harmonized as EN 60384-14-1.
IEC 60384-14-2	NOTE	Harmonized as EN 60384-14-2.
IEC 60384-14-3	NOTE	Harmonized as EN 60384-14-3.
IEC 60664-1	NOTE	Harmonized as EN 60664-1.
IEC 60938-1	NOTE	Harmonized as EN 60938-1.
IEC 60938-2	NOTE	Harmonized as EN 60938-2.
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IEC 60939-1	NOTE	Harmonized as EN 60939-1.
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IEC 60939-2-2	NOTE	Harmonized as EN 60939-2-2.
IEC 60950-1	NOTE	Harmonized as EN 60950-1.
IEC 62368-1	NOTE	Harmonized as EN 62368-1.
CISPR 11	NOTE	Harmonized as EN 55011.
CISPR 17	NOTE	Harmonized as EN 55017.

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 60335-1	-	Household and similar electrical appliances - Safety - Part 1: General requirements	EN 60335-1	-
IEC 60384-14	-	Fixed capacitors for use in electronic equipment - Part 14: Sectional specification - Fixed capacitors for electromagnetic interference suppression and connection to the supply mains	EN 60384-14	-

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IEC 60940

Edition 2.0 2015-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Guidance information on the application of capacitors, resistors, inductors and complete filter units for electromagnetic interference suppression

Guide d'emploi des condensateurs, résistances, inductances et filtres complets d'antiparasitage





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Edition 2.0 2015-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Guidance information on the application of capacitors, resistors, inductors and complete filter units for electromagnetic interference suppression

Guide d'emploi des condensateurs, résistances, inductances et filtres complets d'antiparasitage

INTERNATIONAL
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**GUIDANCE INFORMATION ON THE APPLICATION OF CAPACITORS,
RESISTORS, INDUCTORS AND COMPLETE FILTER UNITS FOR
ELECTROMAGNETIC INTERFERENCE SUPPRESSION**

FOREWORD

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International Standard IEC 60940 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment.

This second edition cancels and replaces the first edition published in 1988. This second edition is a result of maintenance activities related to the previous edition. All changes that have been agreed upon can be categorized as minor revisions.

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

FDIS	Report on voting
40/2337/FDIS	40/2362/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.

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GUIDANCE INFORMATION ON THE APPLICATION OF CAPACITORS, RESISTORS, INDUCTORS AND COMPLETE FILTER UNITS FOR ELECTROMAGNETIC INTERFERENCE SUPPRESSION

1 Scope

This international standard provides guidance applicable to information on application of capacitors, resistors, inductors, and complete filter units for electromagnetic interference suppression.

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 60335-1, *Household and similar electrical appliances – Safety – Part 1: General requirements*

IEC 60384-14, *Fixed capacitors for use in electronic equipment – Part 14: Sectional specification – Fixed capacitors for electromagnetic interference suppression and connection to the supply mains*

3 Electromagnetic and Radio frequency interference suppression (EMI/RFI)

3.1 General

Electromagnetic interference, EMI, is any electromagnetic emission or any electric or electronic disturbance which causes an undesirable response, malfunctioning or degradation in the performance of electrical equipment.

Radio frequency interference, RFI, is any electrical energy with content within the frequency range dedicated to radio frequency transmission.

Conducted RFI is most often found in the low frequency range from 150 kHz to 30 MHz.

Radiated RFI is most often found in the frequency range from 30 MHz to 10 GHz.

EMI or RFI propagate through conduction over signal and power lines and through radiation in free space.

Electrical machines and apparatus may generate electromagnetic interferences (EMI) which are fed back into power supply mains. These electromagnetic interferences may be picked up by apparatus connected to or placed close to the same power system up to a certain distance from the machine or apparatus.

The radio-frequency voltages may be generated both between conductors (phases) of the power system (symmetrical interference) and also between conductors (phases) and earth (asymmetrical interference). These voltages can cause electromagnetic radiation from the power lines.

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