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**Pasivni filtri za dušenje elektromagnetnega motenja – 2. del: Področna  
specifikacija: Pasivni filtri, za katere varnostni preskusi ustrezajo – Preskusne  
metode in splošne zahteve (IEC 60939-2:2005)**

Passive filter units for electromagnetic interference suppression – Part 2: Sectional  
specification: Passive filter units for which safety tests are appropriate – Test  
methods and general requirements (IEC 60939-2:2005)

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English version

**Passive filter units for electromagnetic interference suppression**  
**Part 2: Sectional specification:**  
**Passive filter units for which safety tests are appropriate –**  
**Test methods and general requirements**  
(IEC 60939-2:2005)

Filtres passifs d'antiparasitage  
Partie 2: Spécification intermédiaire:  
Filtres passifs pour lesquels des essais  
de sécurité sont appropriés –  
Méthodes d'essai et règles générales  
(CEI 60939-2:2005)

Passive Filter für die Unterdrückung von  
elektromagnetischen Störungen  
Teil 2: Rahmenspezifikation:  
Filter, für die Sicherheitsprüfungen  
vorgeschrieben sind –  
Prüfverfahren und allgemeine  
Anforderungen  
(IEC 60939-2:2005)

SIST EN 60939-2:2005

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This European Standard was approved by CENELEC on 2005-03-01. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

## Foreword

The text of document 40/1510/FDIS, future edition 2 of IEC 60939-2, prepared by IEC TC 40, Capacitors and resistors for electronic equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60939-2 on 2005-03-01.

This European Standard supersedes EN 133200:1999.

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) 2005-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2008-03-01

Annex ZA has been added by CENELEC.

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### Endorsement notice

The text of the International Standard IEC 60939-2:2005 was approved by CENELEC as a European Standard without any modification.

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## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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.

NOTE Where an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

| <u>Publication</u>   | <u>Year</u>     | <u>Title</u>  | <u>EN/HD</u>        | <u>Year</u>                              |
|----------------------|-----------------|---|---------------------|--|
| IEC 60060-1          | - <sup>1)</sup> | High-voltage test techniques<br>Part 1: General definitions and test requirements   | HD 588.1 S1         | 1991 <sup>2)</sup>                       |
| IEC 60062            | - <sup>1)</sup> | Marking codes for resistors and capacitors  | EN 60062            | 2005 <sup>2)</sup>                       |
| IEC 60068-1          | - <sup>1)</sup> | Environmental testing<br>Part 1: General and guidance   | EN 60068-1          | 1994 <sup>2)</sup>                       |
| IEC 60068-2-17       | - <sup>1)</sup> | Part 2: Tests - Test Q: Sealing   | EN 60068-2-17       | 1994 <sup>2)</sup>                       |
| IEC 60085            | - <sup>1)</sup> | Electrical insulation - Thermal classification  | EN 60085            | 2004 <sup>2)</sup>                       |
| IEC 60335-1<br>(mod) | - <sup>1)</sup> | Household and similar electrical appliances - Safety<br>Part 1: General requirements  | EN 60335-1<br>+ A11 | 2002 <sup>2)</sup><br>2004 <sup>2)</sup> |
| IEC 60384-9          | - <sup>1)</sup> | Fixed capacitors for use in electronic equipment. Part 9: Sectional specification: Fixed capacitors of ceramic dielectric, Class 2. | -                   | -  |
| IEC 60384-14         | - <sup>1)</sup> | Part 14: Sectional specification: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains  | -                   | -  |
| IEC 60664            | Series          | Insulation coordination for equipment within low-voltage systems  | EN 60664            | Series                                   |
| IEC 60938-1          | - <sup>1)</sup> | Fixed inductors for electromagnetic interference suppression<br>Part 1: Generic specification                                       | EN 60938-1          | 1999 <sup>2)</sup>                       |
| IEC 60939-1          | - <sup>1)</sup> | Passive filter units for electromagnetic interference suppression<br>Part 1: Generic specification                                  | EN 60939-1          | 2005 <sup>2)</sup>                       |

1) Undated reference.

2) Valid edition at date of issue.

| <u>Publication</u> | <u>Year</u>     | <u>Title</u>   | <u>EN/HD</u> | <u>Year</u>        |
|--------------------|-----------------|--|--------------|--------------------|
| IEC 60940          | - <sup>1)</sup> | Guidance information on the application of capacitors, resistors, inductors and complete filter units for radio interference suppression | -            | -                  |
| IEC 61140          | - <sup>1)</sup> | Protection against electric shock - Common aspects for installation and equipment  | EN 61140     | 2002 <sup>2)</sup> |

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# INTERNATIONAL STANDARD

# IEC 60939-2

Second edition  
2005-02

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## Passive filter units for electromagnetic interference suppression –

### Part 2:

### Sectional specification –

### Passive filter units for which safety tests are appropriate –

### Test methods and general requirements

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**PASSIVE FILTER UNITS FOR ELECTROMAGNETIC  
INTERFERENCE SUPPRESSION –****Part 2: Sectional specification –  
Passive filter units for which safety tests are appropriate –  
Test methods and general requirements**

## 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.
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International Standard IEC 60939-2 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 constitutes a technical revision.

The major changes that have been made between the first and the second edition are :

- Capacitance and  $\tan \delta$  measurements, d.c. line resistance or voltage drop at rated current, impulse voltage, passive flammability, current overload, solvent resistance of marking, component solvent resistance and active flammability have been added to Clause 4, test and measurement procedures.

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

| FDIS         | Report on voting |
|--------------|------------------|
| 40/1510/FDIS | 40/1537/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.

IEC 60939 consists of the following parts, under the general title *Passive filter units for electromagnetic interference suppression*

- Part 1: Generic specification
- Part 2: Sectional specification: Test methods and general requirements
- Part 2-1: Blank detail specification – Passive filter units for electromagnetic interference suppression – Filters for which safety tests are required (Assessment level D / DZ)
- Part 2-2: Blank detail specification – Passive filter units for electromagnetic interference suppression – Filters for which safety tests are required (Safety tests only)

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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.

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A bilingual version of this publication may be issued at a later date.

# PASSIVE FILTER UNITS FOR ELECTROMAGNETIC INTERFERENCE SUPPRESSION –

## Part 2: Sectional specification – Passive filter units for which safety tests are appropriate – Test methods and general requirements

### 1 General

#### 1.1 Scope

This Sectional specification applies to passive filter units for electromagnetic interference suppression which fall within the scope of the Generic Specification IEC 60939-1.

The scope of this Sectional specification is restricted to passive filter units for which safety tests are appropriate. This implies that filters specified according to this Sectional specification will either be connected to mains supplies, when compliance with the mandatory tests of Table 3 is necessary, or used in other circuit positions where the equipment specification prescribes that some or all of these safety tests are required.

This Sectional specification applies to passive filter units which will be connected to an a.c. mains or other supply with a nominal voltage not exceeding 1 000 V a.c., with a nominal frequency not exceeding 400 Hz, or 1 000 V d.c.

#### 1.2 Normative references

[SIST EN 60939-2:2005](https://standards.iteh.ai/catalog/standards/sist/3a398019-e781-47de-95ec-ent/3a398019-e781-47de-95ec-ent)

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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.

NOTE Components other than inductors and capacitors in the filter unit should fulfil requirements in the relevant IEC Standard.

IEC 60060-1, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60062, *Marking codes for resistors and capacitors*

IEC 60068-1, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-17, *Basic environmental testing procedures – Part 2: Tests – Test Q: Sealing*

IEC 60085, *Thermal evaluation and classification of electrical insulation*

IEC 60335-1, *Safety of household and similar electrical appliances – Part 1: General requirements*

IEC 60384-9, *Fixed capacitors for use in electronic equipment – Part 9: Sectional specification: Fixed capacitors of ceramic dielectric, Class 2*

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*

IEC 60664 (all parts), *Insulation coordination for equipment within low-voltage systems*

IEC 60938-1, *Fixed inductors for electromagnetic interference suppression – Part 1: Generic specification*

IEC 60939-1, *Passive filter units for electromagnetic interference suppression – Part 1: Generic specification*

IEC 60940, *Guidance information on the application of capacitors, resistors, inductors and complete filter units for radio interference suppression*

IEC 61140, *Protection against electric shock – Common aspects for installation and equipment*

### **1.3 Information to be given in a detail specification**

#### **1.3.1 General**

The detail specifications shall be derived from the relevant blank detail specification.

Detail specifications shall not specify requirements inferior to those of the generic, sectional or blank detail specification. When more severe requirements are included, they shall be listed in 1.9 of the detail specification, and indicated in the test schedules, for example by an asterisk.

NOTE The information given in 1.3.2 may, for convenience, be presented in tabular form.

The following information shall be given in each detail specification and the values quoted shall preferably be selected from the appropriate clause of this sectional specification.

#### **1.3.2 Outline drawing and dimensions**

There shall be an illustration of the filter as an aid to easy recognition and for comparison of the filter with others. Dimensions and their associated tolerances, which affect interchangeability and mounting, shall be given in the detail specification. All dimensions shall preferably be stated in millimetres.

Normally, the numerical values shall be given for the length of the body, the width and height of the body and the wire spacing, or for cylindrical types, the body diameter and the length and diameter of the terminations. When necessary, for example when a range of filters is covered by a single detail specification, their dimensions and their associated tolerances shall be placed in a table following the drawing.

In addition, the detail specification shall state such other dimensional information as will adequately describe the filter outline.

#### **1.3.3 Mounting**

The detail specification shall specify the method of mounting recommended for normal use and the method which is mandatory for the application of the vibration, bump, shock and endurance tests. The design of the filter may be such that special mounting fixtures or heat sinks are required in its use. In this case, the detail specification shall describe the mounting fixtures and they shall be used in the application of the vibration, bump or shock tests. The specified heat sink shall be used in the application of the endurance test.