# IEC 60939-3

Edition 2.0 2024-02

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

**Passive filter units for electromagnetic interference suppression –**
**Part 3: Passive filter units for which safety tests are appropriate**

**Filtres passifs d'antiparasitage –**
**Partie 3: Filtres passifs pour lesquels des essais de sécurité sont appropriés**



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# PASSIVE FILTER UNITS FOR ELECTROMAGNETIC INTERFERENCE SUPPRESSION –

## Part 3: Passive filter units for which safety tests are appropriate

## FOREWORD

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IEC 60939-3 has been prepared by of IEC technical committee 40: Capacitors and resistors for electronic equipment. It is an International Standard.

This second edition cancels and replaces the first edition published in 2015, Corrigendum 1:2016 and Corrigendum 2:2018. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) Separated clauses for safety and performance tests;
b) Added note for use of multiple X capacitors bridging basic insulation in 3 phase filters;
c) Characteristics and conditions to substitute X and Y capacitors are now described in a separate Subclause 4.1;

d) Creepage and clearance tables updated and in line with the latest editions of IEC 60938-2 and IEC 60664-1;

e) Allowing voltage measurement for inductance measurements (7.3);

f) Added requirements for marking depending on remaining energy after disconnection;

g) Added content of CTL DSH 2044:2016 for temperature test of IEC filters;

h) Added note about temperature rise required specimens for safety testing;

i) Changed index of capacitors in Annex A to avoid confusion between index name and capacitor class;

j) Moved tests from group 1A to 2. Now, samples in group 1A need to be submitted without potting;

k) Revision of all parts of the document has taken place based on the ISO/IEC Directives, Part 2:2021, and harmonization with other similar kinds of documents. Annex X contains all cross-references of changes in clause/subclause numbers.

The text of this International Standard is based on the following documents:

| Draft | Report on voting |
|---|---|
| 40/3102/FDIS | 40/3118/RVD |

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 60939 series, published under the general title *Passive filter units for electromagnetic interference suppression*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

# PASSIVE FILTER UNITS FOR ELECTROMAGNETIC INTERFERENCE SUPPRESSION –

## Part 3: Passive filter units for which safety tests are appropriate

## 1 Scope

This part of IEC 60939 covers passive filters used to attenuate unwanted radio-frequency signals (such as noise or interference) generated from electromagnetic sources.

Both single and multi-channel filters within one enclosure or which are built on a printed circuit board forming a compact entity are included within the scope of this document.

Filters constructed of capacitive elements where the inductance is inherent in the construction of the filter are within the scope of this document. Similarly, filters constructed of inductive elements where the capacitance is inherent in the construction of the filter are also within the scope of this document. It is up to the manufacturer to state whether a given component is to be designed as a capacitor, an inductor or a filter. Filters can include also other components such as resistors and/or varistors or similar components.

This document applies to passive filter units for electromagnetic interference suppression for which safety tests are appropriate. This implies that filters specified according to this document will either be connected to mains supplies, when compliance with the mandatory tests of Table B.1 is necessary, or used in other circuit positions where the equipment specification specifies that some or all of these safety tests are required.

This document applies to passive filter units, which will be connected to an AC mains or other supply (DC or AC) with a nominal voltage not exceeding 1 000 V AC, with a nominal frequency not exceeding 400 Hz, or 1 500 V DC.

NOTE For AC use, IEC 60384-14 applies to capacitors which will be connected to AC mains with a nominal frequency not exceeding 100 Hz.

This document covers appliance filters (US) but does not cover facility filters, cord-connected filters or direct plug-in filters. These other filters will be covered by another sectional specification.

## 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.

IEC 60060-1:2010, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60062:2016, *Marking codes for resistors and capacitors*

IEC 60068-1:2013, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-1:2007, *Environmental testing – Part 2-1: Tests – Test A: Cold*