

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

**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**

**Filtres passifs d'antiparasitage –
Partie 2: Spécification intermédiaire – Filtres passifs pour lesquels des essais de
sécurité sont appropriés – Méthodes d'essai et exigences générales**



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IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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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**

AMENDMENT 1

FOREWORD

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Amendment 1 to IEC 60939-2:2005 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment.

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

Draft	Report on voting
40/3059/FDIS	40/3072/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 Amendment 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- withdrawn,
- replaced by a revised edition, or
- amended.

1.2 Normative references

In this subclause, change the following references to dated references:

IEC 60335-1:2020, *Household and similar electrical appliances – Safety – Part 1: General requirements*

<https://standards.iteh.ai/catalog/standards/sist/96bc3e40-72d3-415c-bc03-2715ac492e1d/iec-60384-14:2023>, *Fixed capacitors for use in electronic equipment – Part 14: Sectional specification – Fixed capacitors for electromagnetic interference suppression and connection to the supply mains*

IEC 60939-1:2010, *Passive filter units for electromagnetic interference suppression – Part 1: Generic specification*

Move the following references to Bibliography because they are not referred to normatively:

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

IEC 60938-1:2021, *Fixed inductors for electromagnetic interference suppression – Part 1: Generic specification*

Entry 1.4.3 and Table 2 shall be modified as below to reflect the content of IEC 60384-14:2023:

1.4.3

class Y capacitor

capacitor or RC-unit of a type suitable for use in situations where failure of the capacitor could lead to danger of electric shock.

Class Y capacitors are further divided into three subclasses, Y1, Y2 and Y4, as shown in Table 2.

Table 2 – Classification of Class Y capacitors

Subclass	Type of insulation bridged	Range of rated voltages	Peak impulse voltage U_p applied before endurance test	
Y1	Double insulation or reinforced insulation	≤500 V	8,0 kV	
Y2	Basic insulation or supplementary insulation	≥150 V ≤500 V	$C_N \leq 1,0 \mu\text{F}$	$C_N > 1,0 \mu\text{F}$
			5 kV	$U_p = \frac{5}{\sqrt{\frac{C_N}{10^{-6}}}} \text{ kV}$
Y4	Basic insulation or supplementary insulation	<150 V	2,5 kV	
Y2 capacitors may be substituted by Y1 capacitors of the same or higher U_R				
NOTE 1 For definitions of basic, supplementary, double, and reinforced insulation, see IEC 61140.				
NOTE 2 The factor used for the reduction of U_p for capacitance values above 1,0 μF maintains $0,5 \times C_N U_p^2$ constant for these capacitance values; C_N is in F.				
NOTE 3 Overvoltage categories in association with rated impulse voltage and rated mains voltage are found in IEC 60664-1.				

One Y1-capacitor may bridge double insulation or reinforced insulation.

The enclosure of a Y1-capacitor shall not contain other components.

Assemblies, like Delta by-pass or T-connected by-pass capacitors, may be constructed from Y-capacitors and X-capacitors provided these capacitors fulfil the requirements for the relevant X and Y subclasses.

One Y-capacitor may bridge basic insulation. One Y-capacitor may bridge supplementary insulation. If combined basic and supplementary insulations are bridged by two or more Y2- or Y4-capacitors in series, they shall have the same class and sub-class, the same rated voltage, and the same nominal capacitance value.

4.1 Earth inductors incorporated in filters

Change the existing text of 4.1 with the following including the new Table 13:

4.1 Earth inductors incorporated in filters

Earth inductors incorporated in filters shall meet the requirements of the relevant specification(s).

The cross-section of the copper winding shall be not less than the value specified in Table 13. Additional information can also be found in IEC 60938-1:2021, Annex B.

Table 13 – Minimum copper cross-sectional area of earth inductor’s winding

Rated current in A	≤10	≤16	≤25	≤35	≤50	≤63	≤80	≤100	≤125	≤160
Minimum wire cross section in mm ²	1,0	1,5	2,5	4,0	6,0	10,0	16,0	25,0	35,0	50,0

The cross-sectional area of the leads to the earth inductor shall be at least of the same copper cross section as the winding.

Earth inductors shall be so designed that the voltage between input and output termination does not exceed 4 V when four times the rated current is applied.

4.3.2 Creepage distances and clearances

Replace, in the second paragraph, the phrase “Further information may be obtained by reference to the full table in IEC 60335-1.” by the following:

Further information can be obtained by reference to IEC 60335-1:2020, Clause 29 with its Tables 15 to 19.

Add the dates of publication to the following references within the text:

Referenced Document	Clause / Table	Paragraph	Sentence
60335-1:2020	4.3.2	2 nd	1 st sentence
		3 rd	1 st sentence
60384-14:2023	4.22 / Table 12		1 st sentence
			2 nd column, 1 st row (below column heading)
60939-1:2010	1.1		1 st sentence
	1.4		1 st sentence
	1.5.1		1 st sentence
	3.1		1 st sentence
	3.2		1 st sentence
	3.3		1 st sentence
	3.4.1	1 st	2 nd sentence
	3.4.2	2 nd	1 st sentence
	3.5.4	1 st	1 st sentence
	4		1 st sentence
	4.3.1		1 st sentence
	4.4		1 st sentence
	4.4.2	1 st	1 st sentence
		2 nd	2 nd sentence
	4.5	1 st	
	2 nd	2 nd sentence	
4.7		1 st sentence	
4.8		1 st sentence	

Referenced Document	Clause / Table	Paragraph	Sentence
	4.9		1 st sentence
	4.10		2 nd sentence
	4.11		2 nd sentence
	4.11.2		1 st sentence
	4.12		1 st sentence
	4.13		1 st sentence
	4.14		2 nd sentence
	4.15		2 nd sentence
	4.16		2 nd sentence
	4.17		1 st sentence
	4.17.2		1 st sentence
	4.17.3		1 st sentence
	4.17.4		1 st sentence
	4.17.5		3 rd sentence
	4.17.6		1 st sentence
	4.17.7		1 st sentence
	4.18		1 st sentence
	4.18.2		1 st sentence
	4.19		Last sentence
	4.21		2 nd sentence
	4.22		Sentence after Table 12
	4.23	1 st	2 nd sentence
		2 nd	2 nd sentence
	4.24		2 nd sentence
	4.25		2 nd sentence
			3 rd sentence
	4.26		2 nd sentence
	4.27		2 nd sentence

Bibliography

Add the following reference:

IEC 60664-1, *Insulation coordination for equipment within low-voltage supply systems – Part 1: Principles, requirements and tests*

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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