



**SLOVENSKI STANDARD**  
**oSIST prEN IEC 60384-14:2022**  
**01-april-2022**

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**Nespremenljivi kondenzatorji za uporabo v elektronskih napravah - 14. del:  
Področna specifikacija - Nespremenljivi kondenzatorji za dušenje  
elektromagnetnega motenja in za povezovanje z omrežnim napajanjem**

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

**iTeh STANDARD**

Festkondensatoren zur Verwendung in Geräten der Elektronik - Teil 14:  
Rahmenspezifikation - Festkondensatoren zur Unterdrückung elektromagnetischer  
Störungen, geeignet für Netzbetrieb

Condensateurs fixes utilisés dans les équipements électroniques - Partie 14:  
Spécification intermédiaire - Condensateurs fixes d'antiparasitage et accordement à  
l'alimentation

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**Ta slovenski standard je istoveten z: prEN IEC 60384-14:2022**

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**ICS:**

31.060.10      Fiksni kondenzatorji      Fixed capacitors

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OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: <input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY	
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TITLE:

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

PROPOSED STABILITY DATE: 2030

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –

**Part 14: Sectional specification –  
Fixed capacitors for electromagnetic interference  
suppression and connection to the supply mains**

## 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 60384-14 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment.

This fifth edition is based on the consolidated IEC 60384-14, Ed. 4.1 and constitutes both an editorial and a technical revision. The document structure has been organized to follow new sectional specification structure decided in TC 40.

Most important technical changes are:

- a) In damp heat steady state test all capacitor types are tested both with and without rated voltage. The number of test pieces has been increased;
- b) Tangent of loss angle is added In Group 0 tests, in safety tests only testing;

- 305 c) Qualification approval based on safety and performance tests has been removed  
306 from the main text to a normative Annex;
- 307 d) The range of rated voltages is given instead of exact rated voltage values;
- 308 e) Normative annex for description of capacitor styles and of creepage/clearance  
309 distance measurement has been added;
- 310 f) The importance of mechanical failures (cracks) in component encapsulation as a  
311 safety feature is highlighted in handling instructions and requirements after all  
312 relevant tests.

313

314 A list of all the parts of the IEC 60384 series, published under the general title *Fixed capacitors*  
315 *for use in electronic equipment*, can be found on the IEC website.

316 This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

317 The committee has decided that the contents of the base publication and its amendment will  
318 remain unchanged until the stability date indicated on the IEC web site under  
319 "http://webstore.iec.ch" in the data related to the specific publication. At this date, the  
320 publication will be

- 321 • reconfirmed,
- 322 • withdrawn,
- 323 • replaced by a revised edition, or
- 324 • amended.

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## FIXED CAPACITORS FOR USE IN ELECTRONIC EQUIPMENT –

### Part 14: Sectional specification – Fixed capacitors for electromagnetic interference suppression and connection to the supply mains

#### 1 Scope

This part of IEC 60384 applies to capacitors and resistor-capacitor combinations which will be connected to an AC mains or other supply with nominal voltage not exceeding 1 000 V AC (RMS) or 1 500 V DC, and with a nominal frequency not exceeding 100 Hz.

The principal object of this part of IEC 60384 is to prescribe preferred ratings and characteristics and to select from IEC 60384-1, the appropriate quality assessment procedures, tests and measuring methods and to give general performance requirements for this type of capacitor. Test severities and requirements prescribed in detail specifications referring to this sectional specification will be of equal or higher performance level; lower performance levels are not permitted.

This document also provides a schedule of safety tests to be used by national testing stations in countries where approval by such stations is required.

The overvoltage categories in combination with the AC mains voltages for the capacitors classified in this document should be taken from IEC 60664-1.

#### 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 60063, *Preferred number series for resistors and capacitors*

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

IEC 60068-2-17:1994, *Basic environmental testing procedures – Part 2-17: Tests – Test Q: Sealing*

IEC 60384-1:2021, *Fixed capacitors for use in electronic equipment – Part 1: Generic specification*

IEC 60417:2002, *Graphical symbols for use on equipment*

364 IEC 60664-1:2020, *Insulation coordination for equipment within low-voltage systems – Part 1:*  
365 *Principles, requirements, and tests*

366 IEC 60695-11-10:2013, *Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and*  
367 *vertical flame test methods*

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

370 IEC 61193-2:2007, *Quality assessment systems – Part 2: Selection and use of sampling plans*  
371 *for inspection of electronic components and packages*

372 IEC 61210:2010, *Connecting devices – Flat quick-connect terminations for electrical copper*  
373 *conductors – Safety requirements*

374 IEC 62368-1:2018+COR1:2020, *Audio/video, information, and communication technology*  
375 *equipment - Part 1: Safety requirements*

376 CISPR 17:2011, *Methods of measurement of the suppression characteristics of passive EMC*  
377 *filtering devices*

378 ISO 7000:2004, *Graphical symbols for use on equipment – Index and synopsis*

### 379 **3 Terms and definitions and classification**

#### 380 **3.1 Terms and definitions**

381 For the purposes of this document, the terms and definitions of IEC 60384-1, as well as the  
382 following, apply. <https://standards.iteh.ai/catalog/standards/sist/c50767a4-0def-4a1f-96d7-9335c1e06c85/osist-pren-iec-60384-14-2022>

383 ISO and IEC maintain terminological databases for use in standardization at the following  
384 addresses:

- 385 • IEC Electropedia: available at <http://www.electropedia.org/>
- 386 • ISO Online browsing platform: available at <http://www.iso.org/obp>

387 NOTE Some definitions of IEC 60384-1 have been expanded, as is indicated by a note.

#### 388 **3.1.1**

##### 389 **AC capacitor**

390 capacitor designed essentially for application with a power-frequency alternating voltage

391 Note 1 to entry: AC capacitors may be used on DC supplies having the same voltage as the AC RMS rated voltage  
392 of the capacitor. For use of capacitors with rated DC voltage greater than the rated AC voltage, see Annex H.

#### 393 **3.1.2**

##### 394 **electromagnetic interference suppression capacitor**

##### 395 **radio interference suppression capacitor**

396 AC capacitor used for the reduction of electromagnetic interference caused by electrical or  
397 electronic apparatus, or other sources

#### 398 **3.1.3**

##### 399 **capacitor of Class X**

##### 400 **RC unit of Class X**

401 capacitor or RC unit of a type suitable for use in situations where failure of the capacitor or  
402 RC unit would not lead to danger of electrical shock but could result in a risk of fire

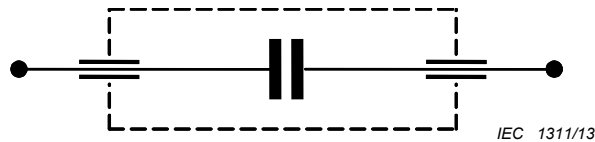
403 **3.1.4**404 **capacitor of Class Y**405 **RC unit of Class Y**

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

408 **3.1.5**409 **two-terminal capacitor**

410 electromagnetic interference suppression capacitor having two terminals

411 Note1 to entry: See Figure 1.



412

413 **Figure 1 – Two-terminal EMI suppression capacitor**

414 **3.1.6**415 **series RC unit**

416 functional combination of a resistor in series with a capacitor of Class X or Y

417 Note 1 to entry: See Figure 2.



418

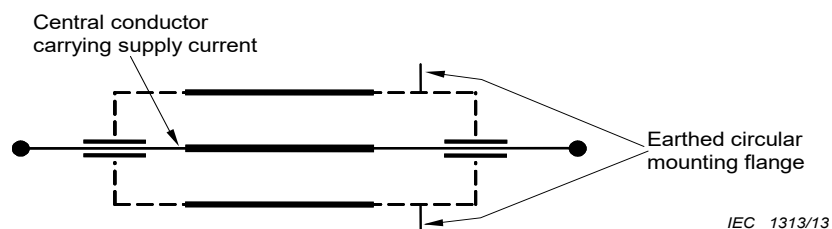
419 **Figure 2 – RC unit**

420 Note 2 to entry: In this document, where the word "capacitor" appears, the words "capacitor or RC unit" should be  
421 understood where the context permits.

422 **3.1.7**423 **lead-through capacitor**

424 <coaxial> capacitor with a central current-carrying conductor surrounded by a capacitor element  
425 which is symmetrically bonded to the central conductor and to the outer casing to form a coaxial  
426 construction; it is coaxially mounted

427 Note1 to entry: See Figure 3.



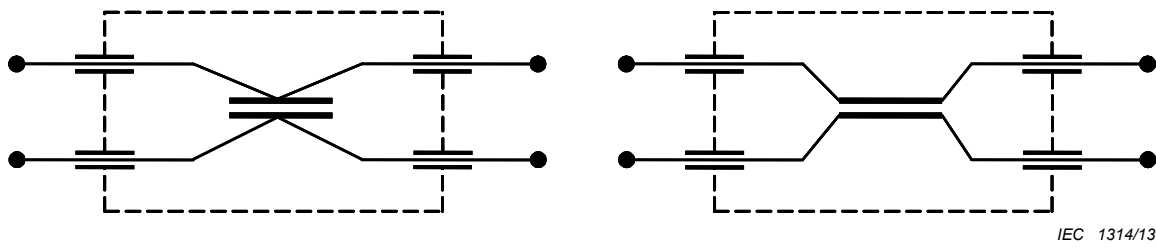
428

429 **Figure 3 – Lead-through capacitor (coaxial)**

430 **3.1.8**431 **lead-through capacitor**

432 <non-coaxial> capacitor in which the supply currents flow through or across the electrodes

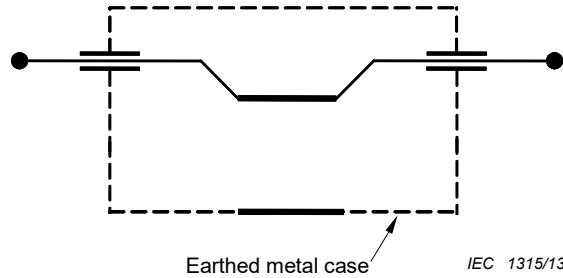
433 Note1 to entry: See Figures 4 a), 4 b), 4 c) and 4 d).



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435

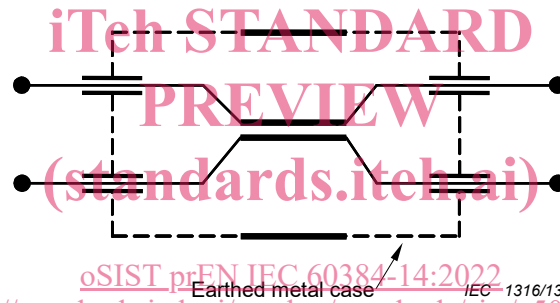
a) – Lead-through capacitor for symmetrical use (non-coaxial)



436

437

b) – Lead-through capacitor for asymmetrical use (non-coaxial)

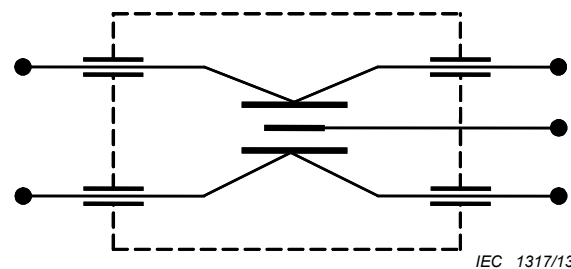


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439

440

c) – Multiple unit lead-through capacitor (non-coaxial) for symmetrical and asymmetrical use



441

442

d) – Multiple unit lead-through capacitor

443

Figure 4 – Lead-through capacitors

### 3.1.9

#### by-pass capacitor

capacitor where radiofrequency interference currents are by-passed

Note 1 to entry: There are three common forms: single, delta and T-connected. The single capacitor consists of a capacitor in a metal case with one termination connected to the case as in Figure 5 a); the delta form consists of an X-capacitor and two Y2-capacitors arranged in a delta network as in Figure 5 b); the T-connected form consists of three capacitors  $C_A$ ,  $C_B$  and  $C_C$  connected in T as shown in Figure 5 c).

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