
Uporaba kondenzatorjev, uporov, tuljav in celotnih filtrskih enot za dušenje elektromagnetnih motenj - Splošna pravila in varnostne zahteve

Application of capacitors, resistors, inductors and complete filter units for electromagnetic interference suppression - General rules and safety requirements

Grundlagen für die Anwendung von Kondensatoren, Widerständen, Drosseln und vollständigen Filtereinheiten zur Unterdrückung elektromagnetischer Störungen

Emploi des condensateurs, résistances, inductances et filtres complets d'antiparasitage - Règles générales et exigences de sécurité

Ta slovenski standard je istoveten z: prEN IEC 60940:2025

oSIST prEN IEC 60940:2025

<https://standards.sist.si/catalog/standards/sist/iec/60940-2025-0001-4015-4043-984d49c3-100a-0001-prEN-IEC-60940-2025>

ICS:

31.020	Elektronske komponente na splošno	Electronic components in general
33.100.01	Elektromagnetna združljivost na splošno	Electromagnetic compatibility in general

oSIST prEN IEC 60940:2025

en



40/3221/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:

IEC 60940 ED3

DATE OF CIRCULATION:

2025-06-06

CLOSING DATE FOR VOTING:

2025-08-29

SUPERSEDES DOCUMENTS:

40/3174/CD, 40/3210/CC

IEC TC 40 : CAPACITORS AND RESISTORS FOR ELECTRONIC EQUIPMENT

SECRETARIAT:

Netherlands

SECRETARY:

Mr Ronald Drenthen

OF INTEREST TO THE FOLLOWING COMMITTEES:

TC 9, SC 22H, TC 23, SC 23B, SC 23E, SC 23J, SC 23K, SC 34C, SC 34D, TC 56, TC 61, SC 62A, SC 62D, TC 65, TC 72, TC 78, TC 96, TC 105, TC 108, TC 116

HORIZONTAL FUNCTION(S):

ASPECTS CONCERNED:

☒ SUBMITTED FOR CENELEC PARALLEL VOTING☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING**Attention IEC-CENELEC parallel voting**

The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.

The CENELEC members are invited to vote through the CENELEC online voting system.

oSIST prEN IEC 60940:2025

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any relevant "In Some Countries" clauses to be included should this proposal proceed. Recipients are reminded that the CDV stage is the final stage for submitting ISC clauses. (SEE [AC/22/2007](#) OR [NEW GUIDANCE DOC](#)).

TITLE:

Application of capacitors, resistors, inductors and complete filter units for electromagnetic interference suppression - General rules and safety requirements

PROPOSED STABILITY DATE: 2033

NOTE FROM TC/SC OFFICERS:

Copyright © 2025 International Electrotechnical Commission, IEC. All rights reserved. It is permitted to download this electronic file, to make a copy and to print out the content for the sole purpose of preparing National Committee positions. You may not copy or "mirror" the file or printed version of the document, or any part of it, for any other purpose without permission in writing from IEC.

CONTENTS

1	2	3	4
1		FOREWORD	4
2	1	Scope	6
3	2	Normative references	6
4	3	Terms and definitions	6
5	3.1	Voltage terms	6
6	3.2	Safety terms	7
7	4	Electromagnetic and Radio frequency interference suppression (EMI/RFI)	8
8	4.1	General.....	8
9	4.2	Limits of interference	8
10	4.3	Classification of suppression components	9
11	4.3.1	Suppression components.....	9
12	4.3.2	Capacitors	9
13	4.3.3	Resistors	10
14	4.3.4	Inductors	10
15	4.3.5	Filters	10
16	5	General safety aspects	11
17	5.1	EMI suppression components as a protective provision.....	11
18	5.1.1	General considerations	11
19	5.1.2	Single fault conditions	11
20	5.1.3	Series connection of components	11
21	5.2	Earth leakage current.....	12
22	5.3	Hazards related to EMI suppression components caused by failures	12
23	5.4	Information requirements	12
24	6	Selection of EMI suppression components	13
25	6.1	Choice of ratings for specific applications	13
26	6.1.1	General aspects	13
27	6.1.2	Voltages	13
28	6.1.3	Current	15
29	6.1.4	Environmental classification	15
30	6.1.5	Insertion loss	15
31	6.1.6	Capacitors	16
32	6.1.7	Inductors	17
33	6.1.8	Complete filter units.....	17
34	6.2	Rules for capacitors in three phase EMI suppression filters	17
35	7	Rules for determination of clearance and creepage distances	18
36	7.1	General rules	18
37	7.1.1	Dimensioning of clearances	18
38	7.1.2	Dimensioning of creepage distances.....	18
39	7.1.3	Component body and terminal insulation	19
40	7.1.4	Precautions in handling and operation	19
41	7.2	Rules for cased or conformal coated components with leads.....	20
42	7.2.1	Measurement principle	20
43	7.2.2	Creepage distance between terminals	20
44	7.2.3	Clearance between terminals.....	21
45	7.2.4	Clearance in mounted stage	22

48	7.2.5	Conductors between terminals	23
49	7.3	Rules for surface mounted components	23
50	7.3.1	Clearances and creepage distances – component body	23
51	7.3.2	Clearances and creepage distances – components in mounted stage	24
52	7.3.3	Requirements	24
53	8	Passive and active flammability	25
54	9	Use of X and Y capacitors in AC mains up to 400 Hz	25
55	9.1	Overview	25
56	9.2	Background	25
57	9.3	Guidelines	25
58	9.3.1	General	25
59	9.3.2	Capacitors >10µF	25
60	9.3.3	Voltage derating with. frequency	25
61		Annex A Bibliography	27
62			
63		Figure 1 – Example use of suppression components in an EMI-filter	9
64		Figure 2 – EMI capacitors star-connected	17
65		Figure 3 – Cased and conformal coated types	19
66		Figure 4 – Description	20
67		Figure 5 – Creepage distance – cased style	21
68		Figure 6 – Creepage distance – conformal coated style	21
69		Figure 7 – Clearance between terminals	21
70		Figure 8 – Clearance in mounted stage – cased style	22
71		Figure 9 – Clearance - component body larger than lead pitch	22
72		Figure 10 – Clearance – component body smaller than lead pitch	23
73		Figure 11 – Clearance and creepage distances - different component styles	23
74		Figure 12 – Clearance and creepage distances in mounted stage	24
75			
76		Table 1 – Criteria for cases where in OVC III and OVC IV C2 shall be class Y	17
77			
78			
79			