

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

**Insulation co-ordination –
Part 1: Definitions, principles and rules**

**Coordination de l'isolement –
Partie 1: Définitions, principes et règles**

<https://standards.iteh.ai/catalog/standards/sist/60071-1-2006/amd1-2010>

Withstand



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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

G

ICS 29.080.30

ISBN 978-2-88910-040-8

FOREWORD

This amendment has been prepared by IEC technical committee 28: Insulation co-ordination.

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

| FDIS | Report on voting |
|--------------|------------------|
| 28/198A/FDIS | 28/201/RVD |

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

The committee has decided that the contents of this amendment and the base 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- withdrawn,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.

5.6 List of standard rated short-duration power-frequency withstand voltages

Replace the existing text by the following new text:

The following r.m.s. values, expressed in kV, are standardized as withstand voltages: 10, 20, 28, 38, 50, 70, 95, 115, 140, 185, 230, 275, 325, 360, 395, 460, 510, 570, 630, 680.

The following r.m.s. values, expressed in kV, are under consideration as withstand voltages: 710, 790, 830, 880, 960, 975, 1 050, 1 100, 1 200.

5.7 List of standard rated impulse withstand voltages

Replace the existing text by the following new text:

The following peak values, expressed in kV, are standardized as withstand voltages: 20, 40, 60, 75, 95, 125, 145, 170, 200, 250, 325, 380, 450, 550, 650, 750, 850, 950, 1 050, 1 175, 1 300, 1 425, 1 550, 1 675, 1 800, 1 950, 2 100, 2 250, 2 400, 2 550, 2 700, 2 900, 3 100.

Table 3 – Standard insulation levels for range II ($U_m > 245$ kV)

Replace the existing Table 3 by the following new Table 3:

| Highest voltage for equipment U_m kV (r.m.s. value) | Standard rated switching impulse withstand voltage | | | Standard rated lightning impulse withstand voltage ^b kV (peak value) |
|---|--|--------------------------------------|--|---|
| | Longitudinal insulation ^a kV (peak value) | Phase-to-earth kV (peak value) | Phase-to-phase (ratio to the phase-to-earth peak value) | |
| 300 ^c | 750 | 750 | 1,50 | 850 |
| | 750 | 850 | 1,50 | 950 |
| 362 | 850 | 850 | 1,50 | 950 |
| | 850 | 950 | 1,50 | 1 050 |
| 420 | 850 | 850 | 1,60 | 1 050 |
| | 950 | 950 | 1,50 | 1 175 |
| 550 | 950 | 1 050 | 1,50 | 1 300 |
| | 950 | 950 | 1,70 | 1 425 |
| 800 | 1 175 | 1 300 | 1,70 | 1 675 |
| | 1 175 | 1 425 | 1,70 | 1 800 |
| 1 100 | 1 175 | 1 550 | 1,60 | 1 800 |
| | 1 300 | 1 550 | 1,60 | 1 950 |
| 1 100 | – | 1 425 ^d | – | 1 950 |
| | 1 425 | 1 550 | 1,70 | 2 100 |
| 1 100 | 1 550 | 1 675 | 1,65 | 2 100 |
| | 1 675 | 1 800 | 1,6 | 2 250 |
| 1 100 | 1 675 | 1 800 | 1,6 | 2 250 |
| | 1 675 | 1 800 | 1,6 | 2 400 |
| 1 100 | 1 675 | 1 800 | 1,6 | 2 400 |
| | 1 675 | 1 800 | 1,6 | 2 550 |

| Highest voltage for equipment U_m kV (r.m.s. value) | Standard rated switching impulse withstand voltage | | | Standard rated lightning impulse withstand voltage ^d kV (peak value) |
|---|--|--------------------------------------|--|---|
| | Longitudinal insulation ^a kV (peak value) | Phase-to-earth kV (peak value) | Phase-to-phase (ratio to the phase-to-earth peak value) | |
| 1 200 | 1 550 | 1 675 | 1,70 | 2 100 |
| | | | | 2 250 |
| | 1 675 | 1 800 | 1,65 | 2 250 |
| | | | | 2 400 |
| | 1 800 | 1 950 | 1,60 | 2 550 |
| | | | | 2 700 |

^a Value of the impulse voltage component of the relevant combined test while the peak value of the power-frequency component of opposite polarity is $U_m \times \sqrt{2} / \sqrt{3}$.

^b These values apply as for phase-to-earth and phase-to-phase insulation as well; for longitudinal insulation they apply as the standard rated lightning impulse component of the combined standard rated withstand voltage, while the peak value of the power-frequency component of opposite polarity is $0,7 \times U_m \times \sqrt{2} / \sqrt{3}$.

^c This U_m is a non-preferred value in IEC 60038.

^d This value is only applicable to the phase-to-earth insulation of single phase equipment not exposed to air.

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Table A.1 – Correlation between standard rated lightning impulse withstand voltages and minimum air clearances

Replace Table A.1 by the following new Table A.1:

| Standard rated lightning impulse withstand voltage kV | Minimum clearance mm | |
|---|-------------------------|---------------------|
| | Rod-structure | Conductor-structure |
| 20 | 60 | |
| 40 | 60 | |
| 60 | 90 | |
| 75 | 120 | |
| 95 | 160 | |
| 125 | 220 | |
| 145 | 270 | |
| 170 | 320 | |
| 200 | 380 | |
| 250 | 480 | |
| 325 | 630 | |
| 380 | 750 | |
| 450 | 900 | |
| 550 | 1 100 | |
| 650 | 1 300 | |
| 750 | 1 500 | |
| 850 | 1 700 | 1 600 |
| 950 | 1 900 | 1 700 |
| 1 050 | 2 100 | 1 900 |
| 1 175 | 2 350 | 2 200 |
| 1 300 | 2 600 | 2 400 |
| 1 425 | 2 850 | 2 600 |
| 1 550 | 3 100 | 2 900 |
| 1 675 | 3 350 | 3 100 |
| 1 800 | 3 600 | 3 300 |
| 1 950 | 3 900 | 3 600 |
| 2 100 | 4 200 | 3 900 |
| 2 250 | 4 500 | 4 150 |
| 2 400 | 4 800 | 4 450 |
| 2 550 | 5 100 | 4 700 |
| 2 700 | 5 400 | 5 000 |

NOTE The standard rated lightning impulse withstand voltages are applicable phase-to-phase and phase-to-earth.

For phase-to-earth, the minimum clearance for conductor-structure and rod-structure is applicable.

For phase-to-phase, the minimum clearance for rod-structure is applicable.

Table A.2 – Correlation between standard rated switching impulse withstand voltages and minimum phase-to-earth air clearances

Replace the existing Table A.2 by the following new Table A.2:

| Standard rated switching impulse withstand voltage kV | Minimum phase-to-earth clearance mm | |
|--|--|---------------------|
| | Rod-structure | Conductor-structure |
| 750 | 1 900 | 1 600 |
| 850 | 2 400 | 1 800 |
| 950 | 2 900 | 2 200 |
| 1 050 | 3 400 | 2 600 |
| 1 175 | 4 100 | 3 100 |
| 1 300 | 4 800 | 3 600 |
| 1 425 | 5 600 | 4 200 |
| 1 550 | 6 400 | 4 900 |
| 1 675 | 7 400 ^a | 5 600 ^a |
| 1 800 | 8 300 ^a | 6 300 ^a |
| 1 950 | 9 500 ^a | 7 200 ^a |

^a Tentative values still under consideration.

Table A.3 – Correlation between standard rated switching impulse withstand voltages and minimum phase-to-phase air clearances

Replace the existing Table A.3 by the following new Table A.3:

| Standard rated switching impulse withstand voltage | | | Minimum phase-to-phase clearance mm | |
|--|--|----------------------|--|---------------------|
| Phase-to-earth kV | Phase-to-phase value Phase-to-earth value | Phase-to-phase kV | Conductor-conductor parallel | Rod-conductor |
| 750 | 1,50 | 1 125 | 2 300 | 2 600 |
| 850 | 1,50 | 1 275 | 2 600 | 3 100 |
| 850 | 1,60 | 1 360 | 2 900 | 3 400 |
| 950 | 1,50 | 1 425 | 3 100 | 3 600 |
| 950 | 1,70 | 1 615 | 3 700 | 4 300 |
| 1 050 | 1,50 | 1 575 | 3 600 | 4 200 |
| 1 050 | 1,60 | 1 680 | 3 900 | 4 600 |
| 1 175 | 1,50 | 1 763 | 4 200 | 5 000 |
| 1 300 | 1,70 | 2 210 | 6 100 | 7 400 |
| 1 425 | 1,70 | 2 423 | 7 200 | 9 000 |
| 1 550 | 1,60 | 2 480 | 7 600 | 9 400 |
| 1 550 | 1,70 | 2 635 | 8 400 ^a | 10 000 ^a |
| 1 675 | 1,65 | 2 764 | 9 100 ^a | 10 900 ^a |
| 1 675 | 1,70 | 2 848 | 9 600 ^a | 11 400 ^a |
| 1 800 | 1,60 | 2 880 | 9 800 ^a | 11 600 ^a |
| 1 800 | 1,65 | 2 970 | 10 300 ^a | 12 300 ^a |
| 1 950 | 1,60 | 3 120 | 11 200 ^a | 13 300 ^a |

^a Tentative values still under consideration.

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AVANT-PROPOS

Le présent amendement a été établi par le comité d'études 28 de la CEI: Coordination de l'isolement.

Le texte de cet amendement est issu des documents suivants:

| FDIS | Rapport de vote |
|--------------|-----------------|
| 28/198A/FDIS | 28/201/RVD |

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cet amendement.

Le comité a décidé que le contenu de cet amendement et de la publication de base ne sera pas modifié avant la date de maintenance indiquée sur le site web de la CEI sous "http://webstore.iec.ch" dans les données relatives à la publication recherchée. A cette date, la publication sera

- reconduite,
- supprimée,
- remplacée par une édition révisée, ou
- amendée.

5.6 Liste des tensions de tenue assignées normalisées de courte durée à fréquence industrielle

Remplacer le texte existant par le nouveau texte suivant:

Les valeurs efficaces suivantes, exprimées en kV, sont normalisées comme tensions de tenue: 10, 20, 28, 38, 50, 70, 95, 115, 140, 185, 230, 275, 325, 360, 395, 460, 510, 570, 630, 680.

Les valeurs efficaces suivantes, exprimées en kV, sont à l'étude comme tensions de tenue: 710, 790, 830, 880, 960, 975, 1 050, 1 100, 1 200.

5.7 Liste des tensions de tenue assignées normalisées aux chocs

Remplacer le texte existant par le nouveau texte suivant:

Les valeurs de crête suivantes, exprimées en kV, sont normalisées comme tensions de tenue: 20, 40, 60, 75, 95, 125, 145, 170, 200, 250, 325, 380, 450, 550, 650, 750, 850, 950, 1 050, 1 175, 1 300, 1 425, 1 550, 1 675, 1 800, 1 950, 2 100, 2 250, 2 400, 2 550, 2 700, 2 900, 3 100.