



NATIONAL RULES FOR ELECTRICAL INSTALLATIONS

Fourth Edition

ET 101:2008

Extracts from Amendment No.1:2011

22 June 2011

Page vi: Insert after 1st Paragraph: Section 710: “Medical Locations” was prepared by Technical Committee No.10 “Electrical Equipment in Medical Practice”.

Page 61: 442: Foreword, Second paragraph, second line: Delete “sstem”, insert “system”.

Page 69: Delete 462.2 and replace with the following:
462.2: A main isolating switch shall be provided for every installation, located within 2m of the main supply point.

Where a premises contains two or more installations their means of isolation shall comply with the requirements of 539.2.

Where the main isolating switch is located in a switch room, it shall comply with 539.3.

Note. An installation is defined as one requiring a completion certificate in accordance with the provisions of Chapter 63.

Page 74: 514.3.1: Insert the following sentence after the first paragraph:: This sub-clause does not apply to cables used solely for control circuits.

Page 89: 523.6.3, third line, delete “ten per cent”, insert” fifteen per cent”.

Page 99: 530.5.3: Delete the text and insert the following:
A distribution board shall be located in a location where it is readily accessible. A distribution board located in a switch room shall comply with 539.

A wall-mounted distribution board shall be mounted at a height not greater than 2.25m measured from the floor to the top surface of the board.

In addition, where a wall-mounted distribution board is mounted at a height less than 1.4m measured from the floor to the bottom surface of the distribution board, it shall be accessible only by authorized persons.

Note 1: The intention of the third paragraph is to prevent ready access by young children (i.e. in areas with External Influence Classification BA2 in accordance with Annex 51D).

Note 2: This sub-clause does not apply in situations where an alteration consists of the replacement of an existing distribution board without alterations to associated wiring terminating there.

Page 100: 530.6: Add the following to the end on the clause as a new paragraph:
The above requirements do not apply to certain control devices, such as for thermostatic control, for which the manufacturer’s instructions shall be observed.

Page 114: 537.5.5: Insert the following new paragraph;

A wall-mounted switch-assembly connected to more than one circuit shall be provided with an appropriate permanent, indelibly-marked warning notice, which may be affixed inside the enclosure.

Page 120: Replace the existing Table 54A with the following:

TABLE 54A: MINIMUM CROSS-SECTIONAL AREAS OF EARTHING CONDUCTORS

Cross-sectional area of largest phase/line conductor $S \text{ mm}^2$	Cross-sectional area of earthing conductor of the same material as the phase conductor $S_E \text{ mm}^2$	Cross-sectional area of earthing conductor not of the same material as the phase conductor $S_E \text{ mm}^2$
$S \leq 16$	10	$k_1/k_2 \times 10$
$16 < S \leq 35$	16	$k_1/k_2 \times 16$
$35 < S \leq 120$	$S/2$	$k_1/k_2 \times S/2$
$S > 120$	70	$k_1/k_2 \times 70$

Note 1: The largest phase (or line) conductors are the “meter tails” in domestic and similar installations.

Note 2: k_1 is the value of k for the phase (or line conductor) selected from Table 43A in Chapter 43 according to the materials of the conductor and insulation. k_2 is the value of k for the earthing conductor selected from Annex 54B.

Page 121: 542.4.1: add an indent: lightning protection system, where required.

Page 122: Replace the existing Table 54C with the following:

TABLE 54C: MINIMUM CROSS-SECTIONAL AREAS OF PROTECTIVE CONDUCTORS

Cross-sectional area of phase/line conductor $S \text{ mm}^2$	Cross-sectional area of the protective conductor of the same material as the phase/line conductor $S_E \text{ mm}^2$	Cross-sectional area of the protective conductor not of the same material as the phase/line conductor $S_E \text{ mm}^2$
$S \leq 16$	S	$k_1/k_2 \times S$
$16 < S \leq 35$	16 *	$k_1/k_2 \times 16$
$S > 35$	$S/2$	$k_1/k_2 \times S/2$
	*For PEN conductors, see 543.5	

Note 1: k_1 is the value of k for the phase conductor selected from Table 43A in Chapter 43 according to the materials of the conductor and insulation. k_2 is the value of k for the protective conductor selected from Annex 54B.

Note 2: Table 54C does not apply to PVC/PVC twin-core cable with bare protective conductor type N05VVH4 (see Annex 52D). In smaller installations, the cable will be found to satisfy the formula in 543.1.2.

Note 3: Some sizes of cable armouring do not comply with Table 54C. Compliance with 543.1.2 must be verified in some cases.

Page 133: 551.6.2: Add the following at the end of the clause:

c) All control units shall be de-energised e.g. control circuits of night storage installations.

Page 136: 554.1.1: Delete second paragraph and insert:

Socket-outlets for general purposes shall be mounted at a height not lower than 400mm and not higher than 1200mm above floor-level. This requirement does not apply to the following:

- i) Proprietary socket-outlet systems specifically designed for mounting on the floor, in skirting or on a pedestal and normally intended for use in a commercial premises,
- ii) Socket-outlets complying with 554.4.2,
- iii) Socket-outlets providing dedicated connection for specific electrical appliances or equipment and normally not accessible for general purposes. Such socket-outlets shall be mounted at a height not lower than 400 mm above floor level.

554.1.4: Line 1: Delete "supplementary", insert "additional".

Replace the Note with the following:

In some situations specified in Part 7, protection against indirect contact is required, by means of RCDs having rated residual operating currents exceeding 30mA, e.g. as in 704.410.02 and 705.411.3.01

Page 138: 555.1.2, second line: Delete "600mm, insert "1200mm".

Page 138: 555.3.1: Addition:

Where simultaneous operation of shower units is not required, two units may be fed from the same circuit provided only one unit is supplied at a time. This may be achieved by an arrangement of interlocked contactors.

Page 138: 555.3.2: Addition:

This requirement does not apply to equipment used for industrial and similar purposes.

Page 153: 613.6.2.1 i) First line: Delete Z_L , insert Z_a ,

v) Replace the formula with the following:

$$Z_L \times I_a \leq U_0.$$

Page 159: 63.3.1 : Last sentence, add "abused." after "it is not".

Page 164: 701.30.02 - second indent: Delete. Insert instead: "the vertical plane at a radius of

1200mm measured horizontally from the centre point of the fixed water- inlet on the wall or ceiling".

701.30.03: second paragraph,

first indent: Delete "water outlet", insert instead "water- inlet".

third indent: Delete "water outlet", insert instead "water inlet"

fourth indent: Delete "600mm", insert instead "1200mm".

Note: For shower units without a basin, Zones 0 and 1 extend horizontally to replace Zone 2.

Page 164: 701.30.03 – second paragraph, first indent: Replace text with the following:

The horizontal plane 2.25 metres above the finished floor level, or the horizontal plane corresponding to the highest fixed shower head or water inlet, whichever is higher.

Page 164: 701.30.04: Addition: There is no Zone 2 for shower units without a basin.

Page 165: 701.30.05: Addition: fourth indent:

- for a shower unit without a basin, the vertical plane 2400mm from Zone 1 measured horizontally.

Page 165: 701.416.1: First line: Delete “an”. Insert “a dedicated” before “RCD”.

The note becomes Note 1.

Add a Note 2: A separate dedicated RCD is required for a shower unit (see 555.3).

Page 168: 701.555.07 Note: Delete 555.6, insert 555.5

Page 168: 701.559.03: Delete this sub-clause.

Page 171: Fig.701.3: Diagram at bottom left of page: Delete “Shower without basin and fixed water outlet”, insert “Shower without basin and fixed water inlet”. Delete “Zone 2”, insert radial dimension “1.2 m” from centre of water inlet to boundary with Zone 3.
Diagram at bottom right of page: Delete “Shower without basin but with permanent partition and fixed water outlet”, insert “Shower without basin but with fixed partition and fixed water inlet. Delete “Zone 2”, insert radial dimension “1.2 m” from centre of water inlet to boundary with Zone 3.

Page 172: Fig.701.4: Top and middle diagram: After double asterisk, insert “Zone 1 or Zone3. See 701.30.02 and 701.30.05.”

Page 172: Fig.701.4: Bottom diagram: Delete “Shower without basin but with permanent partition”, insert “Shower without basin but with fixed water inlet”. Delete vertical dimension “0.05m”, insert vertical dimension “0.1m”. Delete “Zone 2” and partition between Zone 1 and Zone 2. Insert horizontal dimension “1.2 m” for Zone 1 to boundary with Zone 3.

Page 175: 702.52.01: Insert “an accessible” before “metal”.

Page 178: Replace Fig.702.2: Replace horizontal dimension “h” with “1.5m”. Delete the vertical dimension “h” and its associated arrows.

Page 182: Fig.703.1: Delete “Zone 4” and vertical dimension “0.3m”. Delete vertical dimension “2.1m”.

Page 184: 704.410.03: Delete (415), insert (413).

Page 200: Section 710: Insert the following paragraph after the heading titled “Introduction”

Please refer to ET 218, *Electricity in the Medical Workplace: An Educational Guide for Users of Electrical Equipment in Medical Practice*. This guidance should be applied in hospitals, private clinics, medical and dental practices, health care centres and dedicated medical rooms in the workplace.

Page 208: 710.562.1.03: Delete “see 710.563”, insert “see 710.52”.

Page 210: 710.62.01 f): delete “not less than”, insert “not more than”.

Page 213: 711.559.5.01: Insert full-stop after “materials”. 711.559.5.02 should be in bold type, and the text following is a separate sub-clause.

Page 236: 753.2: Definitions

Heating Element: Replace the definition with: “A cable, with or without a screen or sheath, intended to emit heat.”

Heating Mat: After “electrical” delete “or other”.

Page 246: Annex 51A

Paragraph 1: Delete “S.I. No. 732 of 2007: Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2007” and substitute “S.I. No. 299 of 2007: Safety, Health and Welfare at Work (General Application) Regulations 2007, Part 3 (Electricity), amended by S.I. No. 732 of 2007: Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2007”.

Paragraph 3: Delete “S.I. No. 299 of 2007”, insert “Directive 2006/95/EC”.

Page 250: Last sentence “Example: First line: Delete “IP45”, insert “IP55”.

Page 252: Table A51D: Third column, 1st panel: The word “vibrations” should be in italics.

Page 253: **EXEMPTIONS:** Addition: **Control cable used solely for control circuits.**

Page 259: Annex 52C, Title: Delete “Normative”, insert “Informative”.

Page 283: Table A52-F19: Replace “70⁰C” with “90⁰C”

Page 286: GENERAL: First line: Delete Table A52D, insert Table A52H

CENELEC CABLE CODE SYSTEM FOR POWER CABLES: First digit: Delete A, insert N.

Page 291: Table A52-J4, replace the title with:

Voltage drop mV/ampere/metre for XLPE-insulated multi-core and single-core* cables with copper conductors .

Page 291: Table A52-J5, replace the title with:

Voltage drop mV/ampere/metre for armoured PVC-insulated multi-core cable and single core* cables with copper conductors.

Page 292: Below Table A52-J6, add: Non-magnetic armouring.

Page 297: Annex 53A Application of RCD:

4: Second sentence, replace “In some cases” with “In all cases” before “a 300mA RCD Type S”.

5: Replace “300mA” with “30mA”

Page 305: Annex 55A, Title: Delete “Normative”, insert “Informative”.

Page 308: Annex 55A, 4.2 b): Final paragraph, second line, delete “double pole”, insert “isolating”.

Page 308: Annex 55A, 4.2 d): Add the following sentence: See sub-clause 531.2.5.4.

Page 309: Annex 55A, Clause 8.1: Delete the third paragraph and insert the following:

Mounting heights for socket outlets shall comply with the requirements of Clause 554.1.1

Page 310: **Second line of page: Delete “(Normative)”**

ANNEX 61A: After “VISUAL INSPECTION” insert “(Normative)” on line below.

Page 312: ANNEX 61B: After “**VERIFICATION OF CONTINUITY OF A CONDUCTOR (613.2)**” insert “**(Normative)**” on line below.

ANNEX 61C: After “**DETERMINATION OF FAULT-LOOP IMPEDANCE BY CALCULATION WITH MEASUREMENT OF RESISTANCE OF THE PROTECTIVE CONDUCTOR (613.6.2.1)**” insert “**(Normative)**” on line below.

Page 313: Delete Clause (iv) and replace with the following:

Applying the following formula using the values obtained above.

$$Z_L \leq U_0 / I_a \Omega$$

Page 313: ANNEX 61D: After “**MEASUREMENT OF EARTH ELECTRODE RESISTANCE (TT Systems)**” insert “**(Normative)**” on line below.

Page 314: ANNEX 61E: After “**MEASUREMENT OF THE INSULATION RESISTANCE OF FLOORS AND WALLS**” insert “**(Normative)**” on line below.

Page 315: ANNEX 61F: After “**MEASUREMENT OF FAULT LOOP IMPEDANCE OF CIRCUITS**” insert “**(Informative)**” on line below

Page 316: 5th paragraph: Replace the formula “ $Z_{L...}$ ” with the following:

$$Z_L = 230/I_f \Omega$$

In some limited situations ohmic values in excess of the maximum values stated in Tables A61-1 or 2 may be recorded. Compliance with the requirement may still be possible subject to the tester’s consulting the technical specification provided by the manufacturer of the particular devices and obtaining the maximum stated values for those devices that ensure a disconnecting time of 0.4 or 5 sec, whichever is applicable. . The values obtained by test shall not exceed those maximum stated values

Page 316-318: Replace Tables A62-C1 and A61-C2 with the following:

**TABLE A61C-1: MAXIMUM VALUES OF FAULT-LOOP IMPEDANCE Z_L FOR 230V AC CIRCUITS
WITH RATINGS NOT EXCEEDING 35A
Maximum Disconnecting time: 0.4s (Table 41A)**

FUSES

1.

Fuse: VDE 0635 (DZ) (Class gL) General purpose

Rating A:	6	10	16	20	25	35
$Z_L \Omega$	7.5	4.5	2.2	1.5	1.3	0.8

2.

Fuse: VDE 0636 (NO) (NEOZED) General purpose, domestic

Rating A	6	10	16	20	25	35
$Z_L \Omega$:	7.0	3.0	2.2	1.4	1.3	0.8

3.

Fuse: VDE 0636 (NH)

Rating A:	6	10	16	20	25	35
$Z_L \Omega$	6.4	3.5	2.2	1.5	1.2	1.0

4.

Fuse: BS 88 Part 2 (gG) General purpose

Rating A:	6	10	16	20	25	32
$Z_L \Omega$:	8.9	5.3	2.8	1.85	1.5	1.1

MCBs AND RCBOs

(An RCBO is a combined MCB and RCD)

Type B: General Purpose, Instantaneous tripping current $3 - 5 I_n$.

Type C: Instantaneous tripping current $5 - 10 I_n$.

Type D: Instantaneous tripping current $10 - 20 I_n$.

I_n is the nominal current setting of the MCB or RCBO.

5

MCB Type B (I.S. EN 60898) and RCBO Type B (I.S. EN 61009-1)

Rating A:	6	10	16	20	25	32
$Z_L \Omega$:	7.67	4.60	2.87	2.30	1.84	1.44

6.

MCB Type C (I.S. EN 60898) and RCBO Type C (I.S. EN 61009)

Rating A	6	10	16	20	25	32
$Z_L \Omega$:	3.83	2.3	1.44	1.15	0.92	0.72

7.

MCB Type D (I.S. EN 60898) and RCBO Type D (I.S. EN 61009)

Rating A:	6	10	16	20	25	32
$Z_L \Omega$:	1.92	1.15	0.72	0.57	0.46	0.36

TABLE A61C-2: MAXIMUM VALUES OF FAULT-LOOP IMPEDANCE Z_L FOR CIRCUITS

WITH RATINGS EXCEEDING 35A

Maximum disconnecting time: 5s

FUSES

1.

Fuse: VDE 0635 (DZ) (Class gL) General purpose

Rating A	50	63	80	100
$Z_L \Omega$:	1.1	0.8	0.5	0.4

2.

Fuse: VDE 0636 (NO) (NEOZED) General purpose, domestic

Rating A:	50	63	80	100
$Z_L \Omega$:	0.9	0.7	0.5	0.4

3.

Fuse: VDE 0636 (NH)

Rating A:	50	63	80	100
$Z_L \Omega$:	1.1	1.0	0.5	0.4

4.

Fuse: BS 88 Part 2 (gG) General purpose

Rating A:	40	50	63
$Z_L \Omega$:	1.4	1.1	0.86

MCBs AND RCBOs

(An RCBO is a combined MCB and RCD)

Type B: General Purpose, Instantaneous tripping current $3 - 5 I_n$.

Type C: Instantaneous tripping current $5 - 10 I_n$.

Type D: Instantaneous tripping current $10 - 20 I_n$.

I_n is the nominal current setting of the MCB or RCBO.

5.

MCB Type B (I.S. EN 60898) and RCBO Type B (I.S. EN 61009-1)

Rating A:	40	50	63	80	100	125
$Z_L \Omega$:	1.15	0.92	0.73	0.57	0.46	0.37

6.

MCB Type C (I.S. EN 60898) and RCBO Type C (I.S. EN 61009-1)

Rating A:	40	50	63	80	100	125
$Z_L \Omega$:	0.57	0.46	0.36	0.29	0.23	0.18

7.

MCB Type D (I.S. EN 60898) and RCBO Type D (I.S. EN 61009-1)

Rating A:	40	50	63	80	100	125
$Z_L \Omega$:	0.29	0.23	0.18	0.14	0.11	0.09

Page 318: ANNEX 61G: After “**VERIFICATION OF OPERATION OF RCDs**” insert “**(Normative)**” on line below.

Page 318: Annex 61G: Replace both tables with the following:

STANDARD VALUES OF OPERATING TIME FOR RCDs - GENERAL TYPE

Test current	$0.5 \times I_{\Delta n}$	$1 \times I_{\Delta n}$	$5 \times I_{\Delta n}^*$
Maximum operating times	∞ (must not operate)	0.3s	0.04s

STANDARD VALUES OF OPERATING TIMES FOR RCDs - SPECIAL TYPE S

Test current	$0.5 \times I_{\Delta n}$	$1 \times I_{\Delta n}$	$5 \times I_{\Delta n}^*$
Maximum operating times:	∞ (must not operate)	0.5s	0.15s
Maximum non-actuating times	∞ (must not operate)	0.13s	0.05s

*This test is not required for RCDs rated above 100mA

Page 330: Declaration of Compliance: 4th line: Delete Annex 43B. Insert Annex 63B.

Page 340: Boxes – for light-switches: Replace 537.5.2.7 with 537.5.5.

Page 343: Earth-free local equipotential bonding: Delete 410.4.3.

Page 345: Gas meters – near distribution boards: Replace 530.7.6 with 530.5.6.

Page 346: Information Technology: Delete Annex 54D. Insert Annex 54C.

Page 347: After Main overcurrent device (fuse/circuit-breaker): Delete 533.3.4, insert 533.3.5

Page 347: After Meter Cabinet: Delete 533.5, insert 533.3.5

Page 347: After Meter Tails: Delete 533.5, insert 533.3.5
