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FOREWORD

The Third Edition of the National Rules was published in January 2000 as part of a policy for keeping the Rules up-to-date.

This Amendment No. 1 was prepared by TC/2 for the purpose of

- implementing CENELEC Harmonization Documents issued subsequently
- including other amendments that were considered necessary

This Amendment was circulated for public comment in April 2001 and comments received were taken in account in the preparation of this document.

INTRODUCTION

Following the publication in January 2000 of the Third Edition of the National Rules for Electrical Installations three new sections have been produced by CENELEC (European Committee for Electrotechnical Standardization) and these are implemented in this Amendment, namely:-

704: Construction and demolition sites
714: Outdoor lighting installations

In addition, amendments have been made to Chapters 51, 52, 53, 55 and section 701.

In Chapter 51, the new Harmonized European Colour Code for cables has been included as an alternative until a future date when it will become mandatory.

704 is included for the first time.

714 was previously published as a separate document titled “External lighting installations”. In this Amendment, it forms part of ET101:2000.

Chapter 43: Protection against over current

436: Correction Table 43A heading: Replace “434.3.2” with “434.5.2”

Chapter 46: Isolation and Switching

436: Addition

Note: A changeover switch controlling a neutral conductor connected to equipment is not considered to be a single pole device.
Chapter 51: Common Rules and environmental requirements

514.3.1 Identification of conductors by colour

Addition:

**Table 51AA - Alternative colour code for cable cores and insulated wires for fixed installations**

<table>
<thead>
<tr>
<th>Function</th>
<th>Identifying colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earth, protective, bonding</td>
<td>Green/yellow</td>
</tr>
<tr>
<td>Neutral</td>
<td>Blue</td>
</tr>
<tr>
<td>First phase</td>
<td>Brown</td>
</tr>
<tr>
<td>Second</td>
<td>Black</td>
</tr>
<tr>
<td>Third Phase</td>
<td>Grey</td>
</tr>
<tr>
<td>PEN Conductor</td>
<td>Green/yellow with blue at the terminations or blue with green/yellow at the terminations</td>
</tr>
<tr>
<td>D.C. positive</td>
<td>Red</td>
</tr>
<tr>
<td>D.C. negative</td>
<td>Black</td>
</tr>
<tr>
<td>D.C. middle wire</td>
<td>Blue</td>
</tr>
</tbody>
</table>

**Table 51BA - Alternative colour code for flexible cables**

<table>
<thead>
<tr>
<th>No. of Cores</th>
<th>Conductor function</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Neutral</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Phase</td>
<td>Brown</td>
</tr>
<tr>
<td>3</td>
<td>Protective/earthing</td>
<td>Green/Yellow</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Phase</td>
<td>Brown</td>
</tr>
<tr>
<td>4</td>
<td>Protective/earthing</td>
<td>Green/Yellow</td>
</tr>
<tr>
<td></td>
<td>Phase</td>
<td>Brown</td>
</tr>
<tr>
<td></td>
<td>Phase</td>
<td>Black</td>
</tr>
<tr>
<td></td>
<td>Phase</td>
<td>Grey</td>
</tr>
<tr>
<td>5</td>
<td>Protective/earthing</td>
<td>Green/Yellow</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td>Phase</td>
<td>Brown</td>
</tr>
<tr>
<td></td>
<td>Phase</td>
<td>Black</td>
</tr>
<tr>
<td></td>
<td>Phase</td>
<td>Grey</td>
</tr>
</tbody>
</table>

Note: In the case of 4 and 5 core cables which are used for purposes other than three-phase circuits, the brown and black cores may be used for any purpose other than neutral or earth.

Installations shall comply either with Tables 51A and 51B, or with Tables 51AA and 51BA until the eventual withdrawal of Tables 51A or 51B. (This date is under consideration)

514.3.2 Fifth indent: Add “and DIN VDE 0472”
Chapter 52: Wiring Systems

522.8.1.6 Replace the third sentence with the following:

In attic spaces care shall be taken to lay wiring in an orderly manner and in such a way as to minimize the risk of damage to the wiring.

Chapter 53: Switchgear and control gear

530.4 Addition: This clause shall apply from 1st January 2002.

531.5 Addition: Insulation monitoring devices
Insulation monitoring devices shall comply with EN 61557-8

533.3 Replace the text with the following:

A main overcurrent protective device, shall consist of one of the following:

i) a circuit breaker having a service short-circuit breaking capacity of at least 40 kA rms at a power factor of 0.2,

ii) a fuse or other current-limiting device having a rated prospective short-circuit current of at least 40kA,

iii) in the case of installations with a supply rating not exceeding 100A, a miniature circuit breaker rated not less than 63A and having a service short-circuit breaking capacity of at least 9 kA rms.

Note: The supply rating is considered to be that of the supply authority fuse.

Chapter 55: Other equipment

555.3.2: Add the following:

Note: Bathroom zones extend to airing cupboards that open directly to a bathroom See 701.1

555.3.4: Replace the text with the following:

Wiring shall be so arranged and fixed that it cannot be used to support items such as clothing.

554.1 Addition

554.1.6 The earthing contact in a socket-outlet shall be connected to the protective conductor. The metal enclosure of a socket-outlet shall also be connected to the protective conductor; fixing screws shall not be used for this purpose.
Note: See also Chapter 54.

557.1 Wall Mounted Switches

Addition
Note: Attention is drawn to the revised Part M of the Building Regulations 2000 “Access for People with Disabilities”. Electric light switches must be between 900mm and 1200mm above floor level.
Chapter 61: Verification and Certification

612.3.1 Note 2: Replace “may” with “must”

612.6.2.1 Correction: First line: replace “413.4.4” with “413.1.4”

PART 7: REQUIREMENTS FOR SPECIAL INSTALLATIONS OR LOCATIONS

704: Delete “(future)”

714: Delete “(future)”

Foreword

Last sentence, add “704” and “714” after “sections”, in correct sequence.

701: Location containing a bath or shower basin

701.1 Scope

Addition:

Bathroom zones extend to airing cupboards that open directly to a bathroom.

701.55 OTHER EQUIPMENT

701.55.01 Add the following:

“the source being outside Zones 0, 1 and 2”

701.55.07 Replace the entire text with the following:

“In Zone 3, socket outlets are permissible only if they are protected by SELV complying with 411.1”

704: Construction and Demolition Sites

704.1 SCOPE

704.1.1 The particular requirements of this section apply to temporary electrical installations provided for:

- building operations
- construction work of new buildings;
- repair, alteration, extension, or demolition of existing buildings;
- works of engineering construction;
- earthworks;
- works of a similar nature.

Parts of buildings that undergo structural alterations, such as extension, major repair or demolition, are considered to be construction sites during the period of relevant work that necessitates the provision of a temporary installation.
The rules of this Section do not apply to mining installations or to other installations where equipment of a similar nature to that used in surface mining applications is involved.

The rules of this Section do not apply to the administrative locations of construction sites (for example offices, cloakrooms, meeting rooms, canteens, restaurants, dormitories, toilets) to which the general rules of Parts 1 to 6 apply.

Note: For special situations, more severe requirements apply, e.g. Section 706 for restrictive conductive locations.

704.1.2 The requirements of this Section are applicable to:

- fixed installations comprising the main controlgear and the principal protective devices (705.537);
  
  Note: The place where such an assembly is located is considered to be the interface between the supply system and the construction site installations.

- installations on the load side of the above assembly comprising mobile and transportable electrical equipment as part of moveable installations.

704.3 Assessment of general characteristics

704.3.13 Supplies

Equipment shall be identified with the particular supply from which it is energized, and shall contain only components connected to one and the same installation, except for control or signalling circuits and input from standby supplies.

Note: One construction site may be served by several sources of supply, including fixed or mobile power generators.

704.41 Protection against electric shock

704.410 Application of protective measures against electric shock

704.410.01 Only following protective measures against electric shock in case of a fault are permissible in construction and demolition sites:

(i) SELV (411) For portable tools, reduced low voltage (413.6)

(ii) For hand-held lamps either
  - reduced low voltage not exceeding 25V a.c. rms, or
  - SELV having a nominal voltage not exceeding 12V a.c. rms or 40V d.c

(iii) Protection by automatic disconnection of supply except where above items (i) to (iii) apply (413.1)
  
  Note: IT Systems are not normally used.

(iv) Protection by the use of Class II equipment (413.2) having the necessary degree of protection against external influences.
  
  Note: See also 481.3

704.410.02 Where an IT earthing system (413.1.5) is used, insulation monitoring shall be provided in accordance with 413.1.5.4

Note: IT Systems are not normally used on construction or demolition sites.
704.51 Common rules

704.51.01 Equipment shall have degrees of protection appropriate to the external influences.

704.52 Wiring Systems

704.522 External influences

704.522.01 To avoid damage, cables shall preferably not be run across site roads or walkways. Where this is unavoidable supplementary protection shall be provided against mechanical damage and collision with construction plant.

704.522.02 Flexible cables shall be of the H07 RN-F type or equivalent cables resistant to abrasion and to water.

704.53 Switchgear and controlgear

704.537 Devices for isolation and switching

704.537.01 A device or devices shall be provided on the incoming cable to each supply assembly and each distribution assembly for switching and isolating.

704.537.02 Means of emergency switching shall be provided on the supply to all current-using equipment on which it may be necessary to disconnect all live conductors in order to remove a hazard.

704.537.03 The isolating and protective devices of each distribution circuit may be contained in the main assembly or in separate assemblies fed from the main assembly.

704.537.04 Incoming power isolating devices shall be suitable for securing in the “off” position (see 462.3) (for example, a padlock or location inside lockable enclosure).

704.538 Distribution boards

704.538.01 Distribution boards on construction and demolition sites shall comply with EN 60309-2.

704.538.02 At the origin of each installation, a distribution board containing the main controlgear and the principal protective devices shall be provided.

704.538.03 Every circuit supplying current-using equipment shall be fed from a distribution assembly containing the following:

- overcurrent protective devices;
- devices affording protection against indirect contact;
- socket-outlets, if required.

704.538.04 Enclosures for switchgear and for the supply authority’s equipment shall be made of non-conductive material and have a degree of protection not less than IP 55.

704.554 Socket-outlets

704.554.01 Socket-outlets shall comply with EN 60309-1 and –2 and shall have enclosures of non-conductive material.
704.56 Safety services

704.562.01 Safety and standby supplies shall be connected by means of devices arranged to prevent interconnection of the different supplies.

714: Outdoor lighting installations

714.11 SCOPE

The particular requirements of this section apply to fixed outdoor lighting installations.

NOTE: Outdoor lighting comprises luminaires, wiring systems and accessories located outside buildings.

They apply particularly to:

- lighting installations e.g. for roads, parks, gardens, places open to the public, sporting areas, illumination of monuments, and floodlighting;

- other equipment incorporating lighting such as telephone kiosks, bus shelters, advertising panels, town plans, roads signs.

They do not apply to:

- public lighting installations owned and operated by the supply authority;
- temporary festoon lighting;
- road traffic signal systems;
- luminaires fixed to the outside of a building and supplied directly from the internal wiring of that building.

Note: For lighting installations for swimming pools, see 702.

714.2 DEFINITIONS

Replacement

Main Supply Point

For public lighting, the point at which the supply authority makes the electricity supply available. This will normally be at the consumer’s service-pillar for underground supplies or at the first column for overhead supplies.

Note: Some city and town installations have the supply point at an external lighting column. In filling or re-positioning of lighting columns in these areas may continue with this practice.

In some areas, the supply authority may require supplies to be taken direct from the underground mains.

Bracket

Support projecting from a column or wall on which the lantern is mounted.

Column

Vertical support pole for lighting fittings.
Control Discharge Gear

Circuit electrical equipment necessary for the starting and operation of discharge lamps.

Lantern

A luminaire designed for road or area lighting and comprising a housing for a light source or sources together with any refraction, reflector, dispersive surround or enclosure which may be associated with the source or sources in order to modify the light distribution or other lighting characteristics.

Service-pillar

Ground mounted equipment containing control and distribution equipment.

Note: This is the property of the consumer.

714.3 Assessment of general characteristics

714.30 General

Addition

714.32 Classification of external influences

Classes of external influences for ambient temperature and climatic conditions depend on local conditions.

Note: See 714.51 and Annex 51D

714.41 Protection against electric shock

714.412 Protection against electric shock in normal service (protection against direct contact)

714.412.01 All live parts of electrical equipment shall be protected by insulation or by enclosures preventing direct contact.

714.412.02 Cabinets housing accessible live parts shall be lockable with a key or a tool, unless they are in a location where only skilled or instructed persons may obtain access.

714.412.03 Doors giving access to electrical equipment shall be lockable with a key or a tool. In addition, protection against direct contact shall be provided when the door is open either by the use of equipment having at least the degree of protection IP20 by construction or by installation, or by placing a barrier or an enclosure giving the same degree of protection.

714.412.04 For luminaires at heights less than 2.80 m above ground level, access to the light source shall only be possible after removing a barrier or an enclosure requiring the use of a tool.

714.412.05 Socket-outlets shall be protected by a residual current operated device having a rated residual operating current not exceeding 30 mA a.c. r.m.s.
Where lighting is not necessary for safety, e.g. in telephone kiosks, bus shelters, advertising panels, town plans and road signs, the entire installation shall be protected by a residual current-operated device having a rated residual operating current of 30mA a.c. r.m.s.

Note: The use of a single residual current protective device at the origin of the outdoor lighting installation in case of a single fault in one part of the lighting installation will cause the disconnection of the whole lighting installation and may create safety risks for the users.

714.413 Protection against electric shock in case of a fault (protection against indirect contact)

714.413.1 Only protection by automatic disconnection of supply or protection by use of Class II equipment or equivalent insulation may be used.

Note: See also 714.54

714.413.02 Where only Class II equipment is installed, no protective conductor shall be provided and the conductive parts of the lighting column shall not be connected to the earthing system.

Note: Metal column roots or foundations are not required to be isolated from the surrounding earth in this case.

714.51 Common rules

714.512 Operational conditions and external influences

714.512.2.01 Electrical equipment in general shall have, by construction or by installation, at least the degree of protection IP33.

Electrical equipment installed externally on outdoor lighting columns shall have at least the degree of protection IP44.

Note: It may be necessary in some cases, due to operational or cleaning conditions, to provide higher degrees of protection.

714.514 Identification and marking

714.514.3 Identification of conductors by colour

514.3 applies with the following exception:

714.514.3.01 Ducting, marker tape or cable tiles used with outdoor lighting supply cable shall be suitably colour coded or marked for the purpose of identification and shall be distinct from other services.

714.52 Selection and erection of wiring systems

714.522 Selection and erection in relation to external influences

714.522.6 Impact

714.522.6.01 Cables fixed externally to outdoor lighting columns shall have additional mechanical protection with metal enclosure against damage within 3m from ground level.
714.522.6.02 Underground cables shall be mechanically protected by concrete pipe, High Density Polyethylene, or equivalent, within a minimum distance of one metre from the column.

714.522.8 Other mechanical stresses

714.522.8.01 Overhead lines shall have a vertical clearance from the ground of at least 5.5m.

Note: Greater clearances may be required for thoroughfares such as roads, railways and waterways.

714.522.8.02 Where conductors run overhead, they shall be hard-drawn or otherwise suitable for catenary erection. They shall have a cross-sectional area of not less than 6mm².

Note 1: Where columns are to be erected close to overhead networks, the supply authority should be contacted so that clearance can be given in writing.

Note 2: Particular care should be taken where external lighting is adjacent to overhead networks. Under high voltage networks, external lighting wiring should be placed underground to avoid contact with falling conductors.

714.53 Switchgear and control gear

714.533 Devices for protection against overcurrent

714.533.1 General requirements

Addition:

714.533.01 A consumer’s main protective device shall be installed at the Main Supply Point for the protection of the lighting circuits concerned.

Note: The neutral and earthing connections should also be located at the Main Supply Point (See 714.54)

The main overcurrent protective device shall have a minimum short circuit breaking capacity of not less than 16kA.

714.54 Earthing arrangements and protective conductors

714.542 Connections to earth

714.542.2 Earth electrodes

Additions

714.542.2.01 The main earth electrode shall be installed close to the Main Supply Point.

714.542 Earthing conductors

Addition

714.542.3.4 The connection of the main earth electrode to the earthing conductor shall be accessible for initial inspection and testing.

Note: This connection may subsequently be buried for security and to prevent interference. See 542.3.4
Main Earthing terminals or bars.

Replacement

The main earthing terminal shall be located at the Main Supply Point and shall have facilities for the connection of the following conductors:

- earthing conductors
- main protective conductor, (for TN systems by the ESB)
- lantern protective conductors, where the Main Supply Point is at the column
- bonding/protective conductors of the metal of reinforced concrete columns, where accessible.

In each external lighting circuit, underground or overhead, the earthing terminals of individual columns shall be connected to the main earthing terminal at the Main Supply Point, by a protective conductor having a minimum cross-sectional area of:

- 6mm² for a separate conductor, or
- 2.5mm² for a conductor forming a core of a multicore cable

Protective conductors

Selection of cross-sectional area of protective conductor.

The cross-sectional area of each protective conductor shall comply with the requirements of Table 54H, except that it shall have minimum cross-sectional areas as follows:

- external cables: 6mm²
- internal cables: 2.5mm²

Main protective ("neutralising") conductor

The main protective conductor shall be connected between the main earthing terminals and the neutral at the Main Supply Point. This connection shall be made only by the supply authority.

Equipotential Bonding Conductors

Supplementary (or local) bonding conductors

In each column an equipotential bonding conductor shall interconnect the extraneous conductive parts of the lantern to the column earthing terminal bar.

Where the control gear is located in the base of the column, separate equipotential bonding conductors shall connect the extraneous conductive parts to the main earth terminal.

Such equipotential bonding conductors shall have cross-sectional areas equal to those of the live conductors and shall not form part of multicore cables.
Metal structures (such as fences, grids etc.), which are in the proximity of, but are not part of, the outdoor lighting installation need not be bonded to the earthing terminal.

**Luminaires and lighting installation**

Luminaires shall comply with the appropriate parts of EN 60598.
Luminaires for road and street lighting shall comply with EN 60598-2-3: 1993.

Annex 43A

2.: Shower units with instantaneous heater.

Replace the last two sentences with the following:
“A shower unit must be protected by a separate mcb/rcb combination”.

Annex 52C

Corrections:

Table A52-F10: Column 4 upper Table: Replace “288” with “228”

Table A52-F14: Column 8: Replace “163” with “153” and “IR” with “188”

Annex 52E

Correction:

Table A52J-6: Column 3: Replace “0.37” with “0.87”

Annex 61

Introduction: Correction
In last line, replace “(413.6.2)” with “(413.1.6.2)”