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Installations électriques des bâtiments

Cinquième partie: Choix et mise en œuvre des matériels électriques

Chapitre 53: Appareillage

Section 537 — Dispositifs de sectionnement et de commande

Electrical installations of buildings

Part 5: Selection and erection of electrical equipment

Chapter 53: Switchgear and controlgear

Section 537 — Devices for isolation and switching

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Key words: electrical installations in buildings;
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installations; safety requirements;
devices for isolation and switching;
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ELECTRICAL INSTALLATIONS OF BUILDINGS

Part 5: Selection and erection of electrical equipment

Chapter 53: Switchgear and controlgear

Section 537 – Devices for isolation and switching

FOREWORD

- 1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

PREFACE

This standard has been prepared by IEC Technical Committee No. 64: Electrical Installations of Buildings.

Drafts of this standard were discussed at the meetings held in Moscow in 1977 and in Sydney in 1979. As a result of the latter meeting, a draft, Document 64(Central Office)81, was submitted to the National Committees for approval under the Six Months' Rule in September 1979.

The National Committees of the following countries voted explicitly in favour of publication:

Argentina	Korea (Republic of)
Australia	Netherlands
Austria	Poland
Belgium	Romania
Canada	South Africa (Republic of)
China	Sweden
Denmark	Switzerland
Egypt	Turkey
Israel	Union of Soviet Socialist Republics
Italy	United Kingdom
Japan	United States of America

In addition, the wording of Sub-clause 537.4.3, Document 64(Central Office)97, was circulated for approval under the Two Months' Procedure in September 1980.

The National Committees of the following countries voted explicitly in favour of publication:

Australia	New Zealand
Belgium	Poland
Canada	Romania
Denmark	Spain
Egypt	Sweden
France	Switzerland
Germany	Turkey
Italy	Union of Soviet Socialist Republics
Japan	United Kingdom
Netherlands	United States of America

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Section 537 – Devices for isolation and switching

53. SWITCHGEAR AND CONTROLGEAR

537. DEVICES FOR ISOLATION AND SWITCHING

537.1 General

Any device for isolation and switching according to Sections 462 to 465 shall comply with the relevant requirements. If a device is used for more than one function, it shall comply with the requirements for each of these functions.

Note. — In certain instances, additional requirements may be necessary for combined functions.

537.2 Devices for isolation

537.2.1 The devices for isolation shall effectively isolate all live supply conductors from the circuit concerned, subject to the provisions of Clause 461.2.

Equipment used for isolation shall comply with Sub-clauses 537.2.1.1 to 537.2.5.

537.2.1.1 The isolation distances between contacts or other means of isolation, when in the open position, shall be no less than those specified in the following table.

TABLE 53A

Minimum isolating distances
(Under consideration.)

537.2.1.2 The isolating distance between open contacts of the device shall be visible or be clearly and reliably indicated by “Off” or “Open” marking. Such indication shall only occur when the isolating distance between open contacts on each pole of the device has been attained.

Note. — The marking required by this sub-clause may be achieved by the use of the symbols “O” and “I” to indicate the open and closed positions respectively.

537.2.1.3 Semiconductor devices shall not be used as isolating devices.

537.2.2 Devices for isolation shall be designed and/or installed so as to prevent unintentional closure.

Note. — Such closure might be caused for example by shocks and vibrations.

537.2.3 Provision shall be made for securing off-load isolating devices against inadvertent and unauthorized opening.

Note. — This may be achieved by locating the device in a lockable space or enclosure or by padlocking. Alternatively, the off-load device may be interlocked with a load-breaking one.

537.2.4 Means of isolation shall preferably be provided by a multipole switching device which disconnects all poles of the relevant supply but single-pole devices situated adjacent to each other are not excluded.

Note. — Isolation may be achieved, for example, by means of:

- disconnectors (isolators), switch-disconnectors, multipole or single-pole;
- plugs and socket outlets;
- fuse-links;
- links;
- special terminals which do not require the removal of a wire.

537.2.5 All devices used for isolation shall be clearly identified, for example by marking, to indicate the circuit which they isolate.

537.3 Devices for switching-off for mechanical maintenance

537.3.1 Devices for switching-off for mechanical maintenance shall be inserted preferably in the main supply circuit.

Where for this purpose switches are provided, they shall be capable of cutting off the full-load current of the relevant part of the installation. They need not necessarily interrupt all live conductors.

Interruption of a control circuit of a drive or the like is permitted only where

- supplementary safeguards, such as mechanical restrainers, or
- requirements of an IEC specification for the control devices used,

provide a condition equivalent to the direct interruption of the main supply.

Note. — Switching-off for mechanical maintenance may be achieved, for example, by means of:

- multipole switches;
- circuit breakers;
- control switches operating contactors;
- plugs and sockets.

537.3.2 Devices for switching-off for mechanical maintenance or control switches for such devices shall require manual operation.

The clearance between open contacts of the device shall be visible or be clearly and reliably indicated by “off” or “open” marking. Such indication shall only occur when the “off” or “open” position on each pole of the device has been attained.

Note. — The marking required by this sub-clause may be achieved by the use of the symbols “O” and “I” to indicate the open and closed positions respectively.

537.3.3 Devices for switching-off for mechanical maintenance shall be designed and/or installed so as to prevent unintentional closure.

Note. — Such closure might be caused for example by shocks and vibrations.

537.3.4 Devices for switching-off for mechanical maintenance shall be placed and marked so as to be readily identifiable and convenient for their intended use.

537.4 Devices for emergency switching (including emergency stopping)

537.4.1 The devices for emergency switching shall be capable of breaking the full-load current of the relevant parts of the installation taking account of stalled motor currents where appropriate.

537.4.2 Means for emergency switching may consist of:

- one switching device capable of directly cutting off the appropriate supply or
- a combination of equipment activated by a single action for the purpose of cutting off the appropriate supply.

For emergency stopping, retention of the supply may be necessary, for example, for braking of moving parts.

Note. — Emergency switching may be achieved, for example, by means of:

- switches in the main circuit;
- push-buttons and the like in the control (auxiliary) circuit.

537.4.3 Hand-operated switching devices for direct interruption of the main circuit shall be selected where practicable.

Circuit-breakers, contactors, etc., operated by remote control shall open on de-energization of coils, or other equivalent failure-to-safety techniques shall be employed.

537.4.4 The means of operating (handles, push-buttons, etc.) for devices for emergency switching shall be clearly identified, preferably coloured red with a contrasting background.

537.4.5 The means of operating shall be readily accessible at places where a danger might occur and, where appropriate, at any additional remote position from which that danger can be removed.

537.4.6 The means of operation of a device for emergency switching shall be capable of latching or being restrained in the “off” or “stop” position unless both the means of operation for emergency switching and for re-energizing are under the control of the same person.

The release of an emergency switching device shall not re-energize the relevant part of the installation.

537.4.7 Devices for emergency switching, including emergency stopping, shall be so placed and marked as to be readily identifiable and convenient for their intended use.

537.5 Functional switching devices

537.5.1 Functional switching devices shall be suitable for the most onerous duty they may be called upon to perform.

537.5.2 Functional switching devices may control the current without necessarily opening the corresponding poles.

Notes 1. — Semiconductor switching devices are examples of devices capable of interrupting the current in the circuit but not opening the corresponding poles.

2. — Functional switching may be achieved, for example by means of:

- switches;
- semiconductor devices;
- circuit-breakers;
- contactors;
- relays;
- plugs and socket-outlets up to 16 A.

537.5.3 Disconnectors, fuses and links shall not be used for functional switching.

364-5-537

Reserve

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Chapitre 53: Appareillage

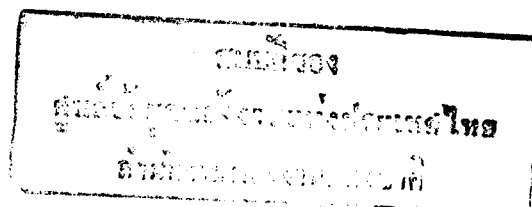
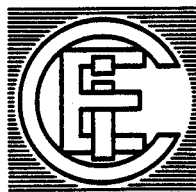
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PREFACE

This amendment has been prepared by IEC Technical Committee No. 64: Electrical installations of buildings.

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

Six Months' Rule	Report on Voting	Two Months' Procedure	Report on Voting
64(C0)165	64(C0)178	64(C0)179	64(C0)187

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

Page 5

537.2 Devices for isolation

Replace Sub-clause 537.2.1.1 by the following:

537.2.1.1 Devices for isolation shall comply with the following two conditions:

- a) withstand in the new, clean and dry condition, when in the open position, across the terminals of each pole, the impulse voltage value given in Table 53A in relation to the nominal voltage of the installation.

Note.- Greater distances than those corresponding to the impulse-withstand voltages may be necessary from consideration of aspects other than isolation.

Table 53A

Impulse-withstand voltage as a function of the nominal voltage

Nominal voltage of the installation *		Impulse-withstand voltage (kV) for isolating devices	
Three-phase systems (V)	Single-phase systems with middle point (V)	Overvoltage category III	Overvoltage category IV
230/400, 277/480 400/690, 577/1 000	120-240	3	5
		5 **	8 **
		8	10

* According to IEC Publication 38: IEC standard voltages (1983); for other values see table of Appendix B of IEC Publication 364-4-443: Part 4: Protection for safety, Chapter 44: Protection against overvoltages, Section 443 - Protection against overvoltages of atmospheric origin or due to switching (19..).

** See table of Appendix B of IEC Publication 364-4-443 for voltages of corner earthed systems.

Notes 1.- As regards transient atmospheric overvoltages no distinction is made between earthed and unearthed systems.

2.- The impulse withstand voltages are referred to an altitude of 2 000 m.

b) have a leakage current across open poles not exceeding:

- 0.5 mA per pole in the new, clean and dry condition, and
- 6 mA per pole at the end of the conventional service life of the device as determined in the relevant standard,

when tested, across the terminals of each pole, with a voltage value equal to 110% of the phase to neutral value corresponding to the nominal voltage of the installation. In the case of d.c. testing, the value of the d.c. voltage shall be the same as the r.m.s. value of the a.c. test voltage.
