

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

**Low-voltage switchgear and controlgear –
Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination
units**

**Appareillage à basse tension –
Partie 3: Interrupteurs, sectionneurs, interrupteurs-sectionneurs et combinés-
fusibles**



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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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FOREWORD

This amendment has been prepared by subcommittee 17B: Low-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

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

FDIS	Report on voting
17B/1758/FDIS	17B/1763/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 publication will remain unchanged until the stability 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- withdrawn,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.

The contents of the corrigendum of November 2013 have been included in this copy.

1.2 Normative references

Replace the existing reference to IEC 60947-1 by the following new reference and footnote:

IEC 60947-1:2007, *Low-voltage switchgear and controlgear – Part 1: General rules* Amendment 1:2010¹⁾

1) A consolidated edition 3:1 exists, including IEC 60947-1:2007 and its Amendment 1:2010.

2 Terms and definitions

Replace the text of the existing Clause 2 by the following new text:

2.1 General

For the purposes of this document, the terms and definitions given in IEC 60050-441, IEC 60947-1 and the following apply.

2.2 Alphabetical index of terms

	Reference
D	
Disconnecter.....	2.3.1
Disconnecter-fuse.....	2.3.5
F	
Fuse-combination unit.....	2.3.2
Fuse-disconnector	2.3.6
Fuse-switch	2.3.4
Fuse-switch-disconnector	2.3.8
S	
Semi-independent manual operation.....	2.3.10
Single pole operated three pole switch.....	2.3.9
Switch-disconnector-fuse.....	2.3.7
Switch-fuse.....	2.3.3

2.3 Terms and definitions

2.3.1

disconnecter

mechanical switching device which, in the open position, complies with the requirements specified for the isolating function

[IEC 60050-441:1984, 441-14-05, modified]

NOTE 1 This definition differs from IEC 60050-441:1984, 441-14-05 by referring to isolating function instead of isolating distance.

NOTE 2 A disconnecter is capable of opening and closing a circuit when either a negligible current is broken or made, or when no significant change in the voltage across the terminals of each of the poles of the disconnecter occurs. It is also capable of carrying currents under normal circuit conditions and carrying, for a specified time, currents under abnormal conditions such as those of short circuit.

2.3.2

fuse-combination unit

combination of a mechanical switching device and one or more fuses in a composite unit, assembled by the manufacturer or in accordance with his instructions

[IEC 60050-441:1984, 441-14-04]

2.3.3

switch-fuse

switch in which one or more poles have a fuse in series in a composite unit

[IEC 60050-441:1984, 441-14-14]

2.3.3.1

switch-fuse single break

switch-fuse which opens the circuit on one side of the fuse-link only

2.3.3.2

switch-fuse double break

switch-fuse which opens the circuit on both sides of the fuse-link

2.3.4

fuse-switch

switch in which a fuse-link or fuse-carrier with fuse-link forms the moving contact

[IEC 60050-441:1984, 441-14-17]

2.3.4.1

fuse-switch single break

fuse-switch which opens the circuit on one side of the fuse link only

2.3.4.2

fuse-switch double break

fuse-switch which opens the circuit on both sides of the fuse link

2.3.5

disconnecter-fuse

disconnecter in which one or more poles have a fuse in series in a composite unit

[IEC 60050-441:1984, 441-14-15]

2.3.5.1

disconnecter-fuse single break

disconnecter-fuse which opens the circuit on one side of the fuse-link only

2.3.5.2

disconnecter-fuse double break

disconnecter-fuse which opens the circuit on both sides of the fuse-link

2.3.6

fuse-disconnector

disconnecter in which a fuse-link or fuse-carrier with fuse-link forms the moving contact

[IEC 60050-441:1984, 441-14-18]

2.3.6.1

fuse-disconnector single break

fuse-disconnector which opens the circuit on one side of the fuse link only

2.3.6.2

fuse-disconnector double break

fuse-disconnector which opens the circuit on both sides of the fuse link

2.3.7

switch-disconnector-fuse

switch-disconnector in which one or more poles have a fuse in series in a composite unit

[IEC 60050-441:1984, 441-14-16]

2.3.7.1

switch-disconnector-fuse single break

switch-disconnector-fuse which opens the circuit on one side of the fuse-link only

2.3.7.2

switch-disconnector-fuse double break

switch-disconnector-fuse which opens the circuit on both sides of the fuse-link

2.3.8

fuse-switch-disconnector

switch-disconnector in which a fuse-link or fuse-carrier with fuse-link forms the moving contact

[IEC 60050-441:1984, 441-14-19]

2.3.8.1**fuse-switch-disconnector single break**

fuse-switch-disconnector which opens the circuit on one side of the fuse link only

2.3.8.2**fuse-switch-disconnector double break**

fuse-switch-disconnector which opens the circuit on both sides of the fuse link

2.3.9**single pole operated three pole switch**

device consisting of three individually operable single pole switch disconnecting devices according to this part, rated as a complete unit for use in a three-phase system

NOTE These devices are intended for power distribution systems where switching and/or isolation of an individual phase may be necessary and they should not be used for the switching of the primary circuit of three-phase equipment.

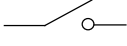
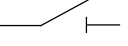

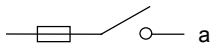
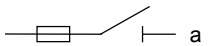
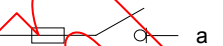
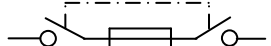
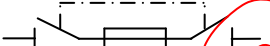
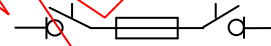
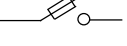

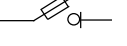
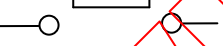
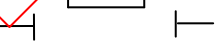
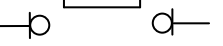
2.3.10**semi-independent manual operation**

operation solely by means of directly applied manual energy such that the manual force is increased up to a threshold value beyond which the independent switching operation is achieved unless deliberately delayed by the operator

2.4 Summary of the equipment types

A summary of equipment definitions and relevant diagrams is given in Table 1.

Table 1 – Summary of equipment definitions

Functions		
Making and breaking current	Isolating	Making, breaking and isolating
Switch 	Disconnecter 	Switch-disconnector 
Fuse-combination units		
Switch-fuse single break 	Disconnecter-fuse single break ^b 	Switch-disconnector-fuse single break ^b 
Switch-fuse double break 	Disconnecter-fuse double break ^b 	Switch-disconnector-fuse double break ^b 
Fuse-switch single break 	Fuse-disconnector single break ^b 	Fuse-switch-disconnector single break ^b 
Fuse-switch double break 	Fuse-disconnector double break ^b 	Fuse-switch-disconnector double break ^b 
NOTE 1 Equipment shown as single break may be double break. NOTE 2 Symbols are based on IEC 60617-7.		
^a The fuse may be on either side of the contacts of the equipment or in a stationary position between these contacts. ^b Disconnection between line and load terminals only is verified by test.		

3.2 According to the method of operation of manually operated equipment

Replace the existing reference "(see 2.13)" by the following new reference "(see 2.4.12 of IEC 60947-1)".

Replace the existing reference "(see 2.14)" by the following new reference "(see 2.4.15 of IEC 60947-1)".

Replace the existing reference "(see 2.15)" by the following new reference "(see 2.3.10)".

4.2 Type of equipment

Replace the existing text of this subclause by the following new text:

The following information shall be stated:

- number of poles;
- kind of current (a.c. or d.c.);
- in the case of a.c., number of phases and rated frequency;
- number of positions of the main contacts (if more than two);
- breaking arrangement for fused devices (single break or double break).

4.3.6.2 Rated short-circuit making capacity (I_{cm})

Replace the existing text of this subclause by the following new text:

Subclause 4.3.6.2 of IEC 60947-1 applies with the following addition.

NOTE I_{cm} is not applicable to fused devices.

Add, after the existing subclause 4.7, the following new subclause 4.8:

4.8 Co-ordination with short circuit protective devices (SCPD)

Subclause 4.8 of IEC 60947-1 applies.

7.1.2 Materials

Replace the existing text of this subclause by the following new text:

(Void)

7.1.4 Clearances and creepage distances

Replace the existing text of this subclause by the following new text:

(Void)

7.1.7.2 Supplementary requirements for equipment with provision for electrical interlocking with contactors or circuit-breakers

Replace the existing text of this subclause by the following new text:

(Void)

7.1.7.3 Supplementary requirements for equipment provided with means for padlocking the open position

Replace the existing text of this subclause by the following new text:

(Void)

7.1.12 Degrees of protection of enclosed equipment

Replace the existing text of this subclause by the following new text:

(Void)

7.2.1.1 General

In the second paragraph, replace the existing references "see 2.13 and 2.15" by the following new references "see 2.4.12 of IEC 60947-1 and 2.3.10".

Add, after the existing subclause 7.2.1.1, the following new subclauses 7.2.1.2, 7.2.1.3 and 7.2.1.4:

7.2.1.2 Limits of operation of power operated equipment

Subclause 7.2.1.2 of IEC 60947-1 applies.

7.2.1.3 Limits of operation of under-voltage relays and releases.

Subclause 7.2.1.3 of IEC 60947-1 applies.

7.2.1.4 Limits of operation of shunt releases

Subclause 7.2.1.4 of IEC 60947-1 applies.

7.3.2 Immunity

Replace the existing text of this subclause, including subclauses 7.3.2.1 and 7.3.2.2, by the following new text:

Subclause 7.3.2 of IEC 60947-1 applies with the following change and addition.

7.3.2.1 Equipment not incorporating electronic circuits

Subclause 7.3.2.1 of IEC 60947-1 applies.

7.3.2.2 Equipment incorporating electronic circuits

Equipment incorporating electronic circuits (for example fuse-blowing indicator) shall have satisfactory immunity to electromagnetic disturbances (see 8.4.1.2).

For the appropriate tests to verify the compliance with these requirements, see 8.4 of IEC 60947-1.

Specific performance criteria shall be given in the relevant product standard based on the acceptance criteria given in Table 24 of IEC 60947-1.

Table 6 provides the specific immunity performance criteria to be considered.

Table 6 – Immunity tests

Types of test	Test level required	Acceptance criteria (as defined in Table 24 of IEC 60947-1)
Electrostatic discharge immunity test IEC 61000-4-2	8 kV / air discharge or 4 kV / contact discharge	B
Radiated radio-frequency electromagnetic field immunity test IEC 61000-4-3	10 V/m	A
Electrical fast transient/burst immunity test IEC 61000-4-4	2 kV / 5 kHz on power ports 1 kV / 5 kHz on signal ports	B
Surge immunity test IEC 61000-4-5	2 kV (common mode) 1 kV (differential mode)	B
Conducted disturbances induced by radio- frequency fields immunity test IEC 61000-4-6	10 V	A
NOTE 1 A simple rectifier is not sensitive to electromagnetic disturbances in normal service conditions and does not therefore require immunity tests.		
NOTE 2 Where an acceptance criteria B is specified there shall be no change of the status of the main contacts as a result of the disturbance.		

7.3.3.1 Equipment not incorporating electronic circuits

Replace the existing text of this subclause by the following new text:

Subclause 7.3.3.1 of IEC 60947-1 applies.

8.2.5.2 Method of test

Replace the existing text of this subclause, including subclauses 8.2.5.2.1 to 8.2.5.2.3, by the following new text:

(Void)

8.2.5.3 Condition of equipment during and after test

Replace the existing text of this subclause, including subclauses 8.2.5.3.1, 8.2.5.3.2, Table 8 and Figure 1, by the following new text:

(Void)