

Specification for

Low-voltage switchgear and controlgear

**Part 3. Switches, disconnectors,
switch-disconnectors and
fuse-combination units**

The European Standard EN 60947-3 : 1992 with the incorporation of amendments A1 : 1995 and A2 : 1997 has the status of a British Standard

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Belgium	Luxembourg
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Greece	Sweden
Iceland	Switzerland
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The following table identifies the current issue of each page. Issue 1 indicates that a page has been introduced for the first time by amendment. Subsequent issue numbers indicate an updated page. Vertical sidelining on replacement pages indicates the most recent changes (amendment, addition, deletion).

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National foreword

This British Standard has been prepared under the direction of the Power Electrical Engineering Standards Policy Committee and is the English language version of EN 60947-3 *Low-voltage switchgear and controlgear Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units*, plus CENELEC corrigenda of June 1992, March 1993 and June 1997 and including amendments A1 : 1995 and A2 : 1997, published by the European Committee for Electrotechnical Standardization (CENELEC). It was derived by CENELEC from IEC 947-3 : 1990 and its corrigendum of December 1991, published by the International Electrotechnical Commission (IEC). The IEC corrigendum items have been indicated by a single line in the margin of this standard.

The CENELEC common modifications and other changes included in the introduction of the European Standard have been implemented at the appropriate places in the text and are indicated by a double side line in the margin. Parts of the original IEC text that have been modified by CENELEC have been quoted in national annex NA. This British Standard supersedes BS 5419 : 1977 which is withdrawn.

This British Standard is to be read in conjunction with BS EN 60947-1 : 1991 *General rules*, which it supplements.

The BS EN 60947 series currently comprises the following publications.

- Part 1 *General rules*
- Part 2 *Circuit breakers*
- Part 3 *Switches, disconnectors, switch-disconnectors and fuse-combination units*
- Part 4 *Contactors and motor-starters*
- Part 5 *Control circuit devices and switching elements*
 - Section 1 — *Electromechanical contactors and motor-starters*
 - Section 1 — *Electromechanical control circuit devices*
 - Section 2 — *Proximity switches*
- Part 6 *Multiple function equipment*
 - Section 1 — *Automatic transfer switching equipment*
- Part 7 *Ancillary equipment*
 - Section 1 — *Terminal blocks and copper conductors*

Additional information. For technical reasons, the symbols 'I' and 'U' which appear in the tables are printed in roman type instead of italics.

|| From 1 January 1997, all IEC publications have the number 60000 added to the old number. For instance, IEC 27-1 has been renumbered as 60027-1. For a period of time during the change over from one numbering system to the other, publications may contain identifiers from both systems.

|| This British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their application.

|| Compliance with a British Standard does not of itself confer immunity from legal obligations.

Descriptors: Low-voltage switchgear and controlgear, switches, disconnectors, switch-disconnectors, fuse-combination units

English version

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

(including amendments A1 : 1995 and A2 : 1997)
(IEC 60947-3 : 1990, modified + Corrigendum December 1991)

Appareillage à basse tension
Partie 3: Interrupteurs, sectionneurs,
interrupteurs-sectionneurs et combinés-fusibles
(inclut les amendements A1 : 1995 et A2 : 1997)
(CEI 60947-3 : 1990, modifiée + corrigendum
décembre 1991)

Niederspannung-Schaltgeräte
Teil 3: Lastschalter, Trennschalter,
Lasttrennschalter und
Schalter-Sicherungs-Einheiten
(enthält Änderungen A1 : 1995 und A2 : 1997)
(IEC 60947-3 1990, modifiziert + Corrigendum
Dezember 1991)

This European Standard was approved by CENELEC on 1992-03-24, amendment A1 was approved by CENELEC on 1994-12-06, amendment A2 was approved by CENELEC on 1997-03-11. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The CENELEC questionnaire procedure, performed for finding out whether or not the International Standard IEC 947-3 : 1990 and its corrigendum of December 1991 could be accepted without textual changes, has shown that some common modifications were necessary for the acceptance as European Standard.

The reference document, together with the common modifications prepared by the CENELEC Technical Committee TC 17B, was submitted to the CENELEC members for formal vote.

The text of the draft was approved by CENELEC as EN 60947-3 on 24 March 1992.

This European Standard replaces HD 422 S1 : 1982.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1993-03-01
- latest date of withdrawal of conflicting national standards (dow) 1993-03-01

For products which have complied with HD 422 S1 : 1982 before 1993-03-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1998-03-01.

Annexes designated 'normative' are part of the body of the standard. In this standard, annex ZA is normative.

Introduction

All subjects left 'under consideration' in IEC 947-3 : 1990 are not part of this European Standard.

This means that:

— for the following clauses the title and text are to be replaced by 'Vacant':

- 8.1.4 Sampling tests
- 8.3.3.3.4 Switching overvoltages
- 8.3.4.1.4 Switching overvoltages
- 8.3.6.1 Circuit-breaker protected short-circuit withstand

Up-to-date information concerning the subjects dealt with in these clauses can be obtained from the secretariat of CENELEC TC 17B.

Common modifications

1. General. Replace 'IEC Publication 947-1' by 'EN 60947-1' (corrigendum June 1992).

Clause 5.2 i) Replace 'IEC 947-3' by 'EN 60947-3' (corrigendum June 1992).

Clause 7.2.1.1. Replacement of text.

Clause 8.3.6.2.4. Additional paragraph.

Figure 2. New figure.

Foreword to amendment A1

The text of amendment 1 : 1994 to the International Standard IEC 947-3 : 1990, prepared by SC 17B, Low-voltage switchgear and controlgear, of IEC TC 17, Switchgear and controlgear, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as amendment A1 to EN 60947-3 : 1992 on 1994-12-06 without any modification.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1995-12-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 1995-12-01

Foreword to amendment A2

The text of document 17B/768/FDIS, future amendment 2 to IEC 60947-3 : 1990, prepared by SC 17B, low-voltage switchgear and controlgear, of IEC TC 17, Switchgear and controlgear, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A2 to EN 60947-3 : 1992 on 1997-03-11.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1997-10-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 1997-10-01

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR**Part 3: Switches, disconnectors, switch-disconnectors
and fuse-combination units****1. General**

The provisions of the general rules dealt with in Part 1 (EN 60947-1) are applicable to this standard, where specifically called for. Clauses and sub-clauses, tables, figures and appendices of the general rules thus applicable are identified by reference to Part 1, e.g., Sub-clause 1.2.3 of Part 1, Table IV of Part 1, or Appendix A of Part 1.

1.1 Scope

This standard applies to switches, disconnectors, switch-disconnectors and fuse-combination units to be used in distribution circuits and motor circuits of which the rated voltage does not exceed 1 000 V a.c. or 1 500 V d.c.

The manufacturer shall specify the type, ratings and characteristics according to the relevant standard of any incorporated fuses.

This standard does not apply to equipment coming within the scope of IEC Publications 947-2, 947-4-1 and 947-5-1; however, when switches and fuse-combination units coming into the scope of this standard are normally used to start, accelerate and/or stop an individual motor they shall also comply with the additional requirements given in Appendix A.

Auxiliary switches fitted to equipment within the scope of this standard shall comply with the requirements of IEC 60947-5-1.

This standard does not include the additional requirements necessary for electrical apparatus for explosive gas atmospheres.

- Notes**
- 1.- Depending on its design, a switch (or disconnector) can be referred to as "a rotary switch (disconnector)", "cam-operated switch (disconnector)", "knife-switch (disconnector)", etc.
 - 2.- If they are not manually operated, switches and disconnectors may have to comply with additional requirements.
 - 3.- In this standard, the word "switch" also applies to the apparatus referred to in French as "commutateurs", intended to modify the connections between several circuits and inter alia to substitute a part of a circuit for another.
 - 4.- In general, throughout this standard switches, disconnectors, switch-disconnectors and fuse-combination units will be referred to as "equipment".

1.2 Object

The object of this standard is to state:

- a) the characteristics of the equipment;
- b) the conditions with which the equipment shall comply with reference to:
 - 1) operation and behaviour in normal service;
 - 2) operation and behaviour in case of specified abnormal conditions, e.g. short circuit;
 - 3) dielectric properties;
- c) the tests for confirming that these conditions have been met and the methods to be adopted for these tests;
- d) the information to be marked on the equipment or made available by the manufacturer, e.g. in the catalogue.

2. Definitions

For the majority of the definitions required in connection with this standard, see Clause 2 of Part 1.

Necessary additional definitions are given in this clause together with pertinent device definitions. The device definitions are also summarised in Table I.

2.1 Switch (mechanical) (IEV 441-14-10)

A mechanical switching device capable of making, carrying and breaking currents under normal circuit conditions which may include specified operating overload conditions and also carrying for a specified time currents under specified abnormal circuit conditions such as those of short-circuit.

Note.- A switch may be capable of making, but not breaking, short-circuit currents.

2.2 Disconnecter

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

Notes 1.- This definition differs from IEV 441-14-05 by referring to isolating function instead of isolating distance.

- 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 *Switch-disconnector (IEV 441-14-12)*

A switch which, in the open position, satisfies the isolating requirements specified for a disconnector.

2.4 *Fuse-combination unit (IEV 441-14-04)*

A 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.

Note.- (Not included in IEV 441-14-04). This is a general term for fuse switching devices (see also Sub-clauses 2.5 to 2.10 and Table I).

2.5 *Switch-fuse (IEV 441-14-14)*

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

2.6 *Fuse-switch (IEV 441-14-17)*

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

2.7 *Disconnector-fuse (IEV 441-14-15)*

A disconnector in which one or more poles have a fuse in series in a composite unit.

2.8 *Fuse-disconnector (IEV 441-14-18)*

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

2.9 *Switch-disconnector-fuse (IEV 441-14-16)*

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

2.10 *Fuse-switch-disconnector (IEV 441-14-19)*

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

2.11 *Dependent manual operation (of a mechanical switching device) (IEV 441-16-13)*

An operation solely by means of directly applied manual energy such that the speed and force of the operation are dependent upon the action of the operator.

2.12 *Independent manual operation (of a mechanical switching device) (IEV 441-16-16)*

A stored energy operation where the energy originates from manual power, stored and released in one continuous operation, such that the speed and force of the operation are independent of the action of the operator.

2.13 Semi-Independent manual operation

An 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.

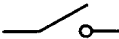
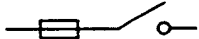
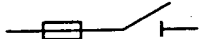
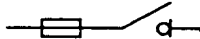
2.14 Stored energy operation (of a mechanical switching device) (IEV 441-16-15)

An operation by means of energy stored in the mechanism itself prior to the completion of the operation and sufficient to complete it under predetermined conditions.

Note.— This kind of operation may be subdivided according to:

1. the manner of storing the energy (spring, weight, etc.);
2. the origin of the energy (manual, electric, etc.);
3. the manner of releasing the energy (manual, electric, etc.).

TABLE I
Summary of equipment definitions

Function		
Making and breaking current	Isolating	Making, breaking and isolating
Switch 2.1 	Disconnecter 2.2 	Switch - disconnecter 2.3 
Fuse-combination unit 2.4		
Switch-fuse 2.5 1) 	Disconnecter-fuse 2.7 1) 	Switch-disconnector-fuse 2.9 1) 
Fuse-switch 2.6 	Fuse-disconnector 2.8 	Fuse-switch disconnecter 2.10 



- Notes**
- 1.- The fuse may be on either side of or in a stationary position between the contacts of the equipment.
 - 2.- All equipment may be single-break or multi-break.
 - 3.- Numbers are sub-clause references of the relevant definitions.
 - 4.- Symbols are based on IEC Publication 617-7.

3. Classification

3.1 *According to the utilization category*

See Sub-clause 4.4.

3.2 *According to the method of operation of manually operated equipment*

- dependent manual operation (see Sub-clause 2.11);
- independent manual operation (see Sub-clause 2.12);
- semi-independent manual operation (see Sub-clause 2.13).

Note.- The method of operation on closing may be different from the method for opening.

3.3 *According to suitability for isolation*

- suitable for isolation (see Sub-clause 7.1.6 of Part 1 and Sub-clause 7.1.6.1);
- not suitable for isolation.

3.4 *According to the degree of protection provided*

See Sub-clause 7.1.11 of Part 1.

4. Characteristics

4.1 *Summary of characteristics*

The characteristics of the equipment shall be stated in terms of the following as applicable:

- type of equipment (Sub-clause 4.2);
- rated and limiting values for the main circuit (Sub-clause 4.3);
- utilization category (Sub-clause 4.4);
- control circuits (Sub-clause 4.5);
- auxiliary circuits (Sub-clause 4.6);
- switching overvoltages (Sub-clause 4.9).

4.2 *Type of equipment*

The following shall be stated:

4.2.1 *Number of poles*

4.2.2 *Kind of current*

Kind of current (a.c. or d.c.) and, in the case of a.c., number of phases and rated frequency.

4.2.3 *Number of positions of the main contacts* (if more than two)

4.3 *Rated and limiting values for the main circuit*

Rated values are assigned by the manufacturer. They shall be stated in accordance with Sub-clauses 4.3.1 to 4.3.6.4 but it may not be necessary to establish all the rated values listed.

4.3.1 *Rated voltages*

An equipment is defined by the following rated voltages:

4.3.1.1 *Rated operational voltage (U_e)*

Sub-clause 4.3.1.1. of Part 1 applies.

4.3.1.2 *Rated insulation voltage (U_i)*

Sub-clause 4.3.1.2. of Part 1 applies.

4.3.1.3 *Rated impulse withstand voltage (U_{imp})*

Sub-clause 4.3.1.3. of Part 1 applies.

4.3.2 *Currents*

An equipment is defined by the following currents:

4.3.2.1 *Conventional free air thermal current (I_{th})*

Sub-clause 4.3.2.1 of Part 1 applies.

4.3.2.2 *Conventional enclosed thermal current (I_{the})*

Sub-clause 4.3.2.2 of Part 1 applies.

4.3.2.3 *Rated operational currents (I_e) (or rated operational powers)*

Sub-clause 4.3.2.3 of Part 1 applies.

4.3.2.4 *Rated uninterrupted current (I_u)*

Sub-clause 4.3.2.4 of Part 1 applies.

4.3.3 *Rated frequency*

Sub-clause 4.3.3 of Part 1 applies.

4.3.4 *Rated duty*

The rated duties considered as normal are as follows:

4.3.4.1 *Eight-hour duty*

Sub-clause 4.3.4.1 of Part 1 applies.

4.3.4.2 *Uninterrupted duty*

Sub-clause 4.3.4.2 of Part 1 applies.

4.3.5 *Normal load and overload characteristics*

4.3.5.1 *Ability to withstand motor switching overload currents*

See Appendix A.

4.3.5.2 *Rated making capacity*

Sub-clause 4.3.5.2 of Part 1 applies with the following additions:

The rated making capacity is stated by reference to the rated operational voltage and rated operational current and to the utilization category according to Table III, Sub-clause 7.2.4.1.

Note.- In the case of disconnectors having a making capacity, although they are of utilization category AC-20 or DC-20, this value may be stated separately by the manufacturer together with the relevant test parameters.

4.3.5.3 *Rated breaking capacity*

Sub-clause 4.3.5.3 of Part 1 applies with the following additions:

The rated breaking capacity is stated by reference to the rated operational voltage and rated operational current and to the utilization category according to Table III, Sub-clause 7.2.4.1.

Note.- In the case of disconnectors having a breaking capacity, although they are of utilization category AC-20 or DC-20, this value may be stated separately by the manufacturer together with the relevant test parameters.

4.3.6 *Short-circuit characteristics*

4.3.6.1 *Rated short-time withstand current (I_{cw})*

The rated short-time withstand current of a switch, a disconnecter or a switch-disconnector is the value of short-time withstand current, assigned by the manufacturer, that the equipment can carry without any damage under the test conditions of Sub-clause 8.3.5.1.

The value of the rated short-time withstand current shall be not less than twelve times the maximum rated operational current and, unless otherwise stated by the manufacturer, the duration of the current shall be 1 s.

For a.c., the value of the current is the r.m.s. value of the a.c. component and it is assumed that the highest peak value likely to occur does not exceed n times this r.m.s. value, the factor n being given by Table XVI of Part 1.

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

The rated short-circuit making capacity of a switch or a switch-disconnector is the value of short-circuit making capacity assigned to the equipment by the manufacturer for the rated operational voltage, at rated frequency (if any) and at a specified power-factor (or time-constant). It is expressed as the maximum prospective peak current.

For a.c., the relationship between power-factor, prospective peak current and r.m.s. current shall be in accordance with Table XVI Part 1.

4.3.6.3 *Vacant*

4.3.6.4 *Rated conditional short-circuit current*

Sub-clause 4.3.6.4 of Part 1 applies.

4.4 *Utilization category*

The utilization categories define the intended applications and are given in Table II.

Each utilization category is characterized by the values of the currents and voltages, expressed as multiples of the rated operational current and the rated operational voltage, as well as the power-factors or time-constants of the circuit. The conditions for making and breaking given in Table III correspond in principle to the applications listed in Table II.

The designation of utilization categories is completed by the suffix A or B according to whether the intended applications require frequent or infrequent operations (see Table IV).

Utilization categories with suffix B are appropriate for devices which, due to design or application, are only intended for infrequent operation. This could apply, for example, to disconnectors normally only operated to provide isolation for maintenance work or switching devices where the fuse-link blade forms the moving contact.

TABLE II
Utilization categories

Nature of current	Utilization category		Typical applications
	Frequent operation	Infrequent operation	
Alternating current	AC-20A(*)	AC-20B(*)	· Connecting and disconnecting under no-load conditions
	AC-21A	AC-21B	· Switching of resistive loads including moderate overloads
	AC-22A	AC-22B	· Switching of mixed resistive and inductive loads, including moderate overloads
	AC-23A	AC-23B	· Switching of motor loads or other highly inductive loads
Direct current	DC-20A(*)	DC-20B(*)	· Connecting and disconnecting under no-load conditions
	DC-21A	DC-21B	· Switching of resistive loads including moderate overloads
	DC-22A	DC-22B	· Switching of mixed resistive and inductive loads, including moderate overloads (e.g. shunt motors)
	DC-23A	DC-23B	· Switching of highly inductive loads (e.g. series motors)
(*) The use of these utilization categories is not permitted in the United States of America.			

Category AC-23 includes occasional switching of individual motors. The switching of capacitors or of tungsten filament lamps shall be subject to agreement between manufacturer and user.

The utilization categories referred to in Tables II and III do not apply to an equipment normally used to start, accelerate and/or stop individual motors. The utilization categories for such an equipment are dealt with in Appendix A.

4.5 Control circuits

Sub-clause 4.5 of Part 1 applies.

4.6 Auxiliary circuits

Sub-clause 4.6 of Part 1 applies.

4.7 *Relays and releases*

Sub-clause 4.7 of Part 1 applies.

4.8 *Vacant*

4.9 *Switching overvoltages*

Sub-clause 4.9 of Part 1 applies.

5. **Product information**

5.1 *Nature of information*

Sub-clause 5.1 of Part 1 applies as appropriate for a particular design.

5.2 *Marking*

Each equipment shall be marked in a durable and legible manner with the following data:

The markings for a), b) and c) below shall be on the equipment itself or on a name-plate or name-plates attached to the equipment, and shall be located at a place such that they are legible from the front after mounting the equipment in accordance with the manufacturer's instructions.

a) Indication of the open and closed position. The open or closed position shall be respectively indicated by the graphical symbols 417-IEC-5007 or 417-IEC-5008 of IEC 60417 (see 7.1.5.1 of Part 1).

b) Suitability for isolation.

The appropriate symbols of Table I shall be used.

c) Additional marking for disconnectors:

Devices of utilization category AC-20A, AC-20B, DC-20A and DC-20B shall be marked "Do not open under load" unless the device is interlocked to prevent such opening.

Note.— Symbols of the various types of equipment are given in Table I.

The markings shall be on the equipment itself or on a nameplate or nameplates attached to the equipment, and shall be located at a place such that they are visible and legible from the front after mounting (see Sub-clause 6.3 of Part 1).

The following data shall also be marked on the equipment but need not be visible from the front when the equipment is mounted:

d) manufacturer's name or trade mark;

e) type designation or serial number;

- f) rated operational currents (or rated powers) at the rated operational voltage and utilization category (see Sub-clauses 4.3.1, 4.3.2 and 4.4);
- g) value (or range) of the rated frequency or the indication "d.c." (or the symbol);
- h) for fuse-combination units, the fuse type and maximum rated current and the power loss of the fuse-link;
- i) EN 60947-3 , if the manufacturer claims compliance with this standard;
- j) degree of protection of enclosed equipment (see Appendix C of Part 1);

The following terminals shall be identified:

- k) line and load terminals unless the connection is immaterial (see Sub-clause 8.3.3.3.1);
- l) neutral pole terminal, if applicable, by the letter "N" (see Sub-clause 7.1.7.4 of Part 1);
- m) protective earth terminal (see Sub-clause 7.1.9.3 of Part 1);

The following data shall be made available in the manufacturer's published information:

- n) rated insulation voltage;
- o) rated impulse withstand voltage for equipment suitable for isolation or when determined;
- p) pollution degree, if different from 3;
- q) rated duty;
- r) rated short-time withstand current and duration, where applicable;
- s) rated short-circuit making capacity, where applicable;
- t) rated conditional short-circuit current, where applicable.

5.3 *Instructions for installation, operation and maintenance*

Sub-clause 5.3 of Part 1 applies.

6. Normal service, mounting, and transport conditions

Clause 6 of Part 1 applies with the following addition:

Pollution degree (see Sub-clause 6.1.3.2 of Part 1).

Unless otherwise stated by the manufacturer, the equipment is intended for installation under environmental conditions of pollution degree 3.

7. Constructional and performance requirements

7.1 Constructional requirements

Note.- Further requirements concerning materials and current-carrying parts are under consideration for Sub-clauses 7.1.1 and 7.1.2 of Part 1. Their application to this standard will be subject to further consideration.

Sub-clause 7.1 of Part 1 applies, with the following additions:

7.1.3 Clearances and creepage distances

For equipment for which the manufacturer has declared a value of rated impulse withstand voltage (U_{imp}), minimum values are given in Tables XIII and XV of Part 1.

For other equipment, guidance for minimum values is given in Appendix B.

7.1.6.1 Additional constructional requirements for equipment suitable for isolation of rated operational voltage greater than 50 V

The equipment shall be marked according to Sub-clause 5.2b).

When no indication of the position of the contacts is provided, e.g. by the actuator or a separate indicator, all the main contacts shall be clearly visible in the open position.

The strength of the actuating mechanism and the reliability of the indication of the open position shall be checked according to Sub-clause 8.2.5. Moreover, when means are provided by the manufacturer to lock the equipment in the open position, locking shall only be possible when the main contacts are in the open-position (See Sub-clause 8.2.5).

This requirement does not apply to equipment where the main contact position is visible in the open position and/or the open position is indicated by other means than the actuator.

Notes. — 1 Locking in the closed position is permitted for particular applications.

The clearance across the open contacts of the same pole when in the open position shall not be less than the minimum clearance given in Table XIII of Part 1 and shall also comply with the requirements of Sub-clause 7.2.3.1b) of Part 1.

If auxiliary contacts are provided for interlocking purposes, the operating time of the auxiliary contacts should be declared by the manufacturer.