

Specification for

High-voltage alternating current switch-fuse combinations

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Power Electrical Engineering Standards Policy Committee (PEL/-) to Technical Committee PEL/92, upon which the following bodies were represented:

- ASTA Certification Services
- Association of Manufacturers Allied to the Electrical and Electronic Industry (BEAMA Ltd.)
- British Railways Board
- Copper Development Association
- Department of the Environment (Property Services Agency)
- ERA Technology Ltd.
- Electricity Supply Industry in England and Wales
- GAMBICA (BEAMA Ltd.)
- Health and Safety Executive
- Transmission and Distribution Association (BEAMA Ltd.)

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- Association of Consulting Engineers
- Association of Supervisory and Executive Engineers
- British Gas plc
- Electrical Installation Equipment Manufacturers' Association (BEAMA Ltd.)
- Engineering Equipment and Materials Users' Association (BEAMA Ltd.)

This British Standard, having been prepared under the direction of the Power Electrical Engineering Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 28 February 1991

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Amendment No. 1
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Specification for high-voltage alternating current switch-fuse combinations

NOTE. The European Committee for Electrotechnical Standardization (CENELEC) has accepted IEC 420 : 1990 as a European Standard designated as EN 60420 : 1993. This amendment implements EN 60420 : 1993 as a British Standard in the BS EN series.

Implementation of European Standard

Front cover

Delete the existing cover page and substitute the attached.

AMD 8059/December 1993

Contents

Immediately after the list of tables, insert the following.

'Annex ZA

Other International publications quoted in this standard with the references of the relevant European publications'

AMD 8059/December 1993

National foreword

Delete the existing national foreword entirely and substitute the following.

National foreword

This British Standard has been prepared by the Power Electrical Engineering Standards Policy Committee.

In 1993 the European Committee for Electrotechnical Standardization (CENELEC) accepted IEC 420 : 1990 as European Standard EN 60420 : 1993. As a consequence of implementing the European Standard this British Standard is renumbered as BS EN 60420 and any reference to BS 7426 should be read as a reference to BS EN 60420.

Cross-references

International standard	Corresponding British Standard
	BS 4727 <i>Glossary of electrotechnical, power, telecommunication, electronics, lighting and colour terms</i>
IEC 50(151) : 1978	Part 1 : Group 02 : 1980 <i>Electrical and magnetic devices terminology</i> (Technically equivalent)
IEC 50(441) : 1984	Part 2 : Group 06 : 1985 <i>Switchgear and controlgear terminology (including fuse terminology)</i> (Technically equivalent)
IEC 56 : 1987	BS 5311 : 1988 <i>Specification for high-voltage alternating-current circuit-breakers</i> (Identical)
IEC 129 : 1984	BS 5253 : 1990 <i>Specification for alternating current disconnectors and earthing switches</i> (Identical)
IEC 137 : 1984	BS 223 : 1985 <i>Specification for bushings for alternating voltages above 1000 V</i> (Technically equivalent)
IEC 265-1 : 1985	BS 5463 <i>Specification for high-voltage switches</i> Part 1 : 1991 <i>High-voltage switches for rated voltages above 1 kV and less than 52 kV</i> (Identical)
IEC 282-1 : 1985	BS 2692 <i>Fuses for voltages exceeding 1000 V a.c</i> Part 1 : 1986 <i>Specification for current-limiting fuses</i> (Identical)
IEC 694 : 1980	BS 6581 : 1985 <i>Specification for common requirements for high-voltage switchgear and controlgear standards</i> (Identical)
IEC 787 : 1983	BS 6553 : 1984 <i>Guide for selection of fuse links of high-voltage fuses for transformer circuit applications</i> (Identical)

The Technical Committee has reviewed the provisions of IEC 298 : 1981 and IEC 466 : 1987 to which reference is made in the text and has decided that they are acceptable for use in conjunction with this British Standard.

IEC 298 : 1981 has been superseded by IEC 298 : 1990.

A related British Standard to IEC 298 : 1990 is BS 5227 : 1992 *Specification for a.c. metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV*. There is no British Standard corresponding to IEC 466.

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

New EN title page and foreword

Immediately after the national foreword, insert the attached new EN title page and foreword page.

AMD 8059/December 1993

Annex ZA

Immediately after figure 12, insert the attached new annex ZA.

AMD 8059/December 1993

Specification for

High-voltage alternating current switch-fuse combinations

The European Standard EN 60420 : 1993 has the status of a
British Standard

Combinés interrupteurs-fusibles à haute tension
pour courant alternatif

Hochspannungs-Lastschalter-
Sicherungs-Kombination

UDC 621.316.923 : 621.3.025.027.5 : 620.1

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Descriptors: High-voltage, switch fuse combinations

English version

High-voltage alternating current switch-fuse combinations

(IEC 420 : 1990)

Combinés interrupteurs-fusibles à haute tension
pour courant alternatif
(CEI 420 : 1990)

Hochspannungs-Lastschalter-
Sicherungs-Kombination
(IEC 420 : 1990)

This European Standard was approved by CENELEC on 1993-07-06. 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

Central Secretariat: rue de Stassart 35, B-1050 Brussels

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Ref. No. EN 60420 : 1993 E



Documents

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Foreword

The CENELEC questionnaire procedure, performed for finding out whether or not the international standard IEC 420 : 1990 could be accepted without textual changes, has shown that no common modifications were necessary for the acceptance as European Standard.

The reference document was submitted to the CENELEC members for formal vote and was approved by CENELEC as EN 60420 on 6 July 1993.

The following dates were fixed:

- latest date of publication of
an identical national standard (dop) 1994-04-01
- latest date of withdrawal of
conflicting national standards (dow) 1994-04-01

For products which have complied with the relevant national standard before 1994-04-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1999-04-01.

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

Annex ZA (normative)

Other international publications quoted in this standard with the references of the relevant European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

NOTE. When the international publication has been modified by CENELEC common modifications, indicated by (mod), the relevant EN/HD applies.

IEC Publication	Date	Title	EN/HD	Date
50 (151)	1978	<i>International Electrotechnical Vocabulary (IEV) – Chapter 151: Electrical and magnetic devices</i>	–	–
50 (441)	1984	<i>Chapter 441: Switchgear, controlgear and fuses</i>	–	–
56 (mod)	1987	<i>High-voltage alternating-current circuit-breakers</i>	HD 348 S4	1991
129	1984	<i>Alternating current disconnectors (isolators) and earthing switches</i>	HD 408 S2	1990
137	1984	<i>Bushings for alternating voltages above 1000 V</i>	–	–
265-1	1983	<i>High-voltage switches – Part 1: High-voltage switches for rated voltages above 1 kV and less than 52 kV (+ corrigendum February 1990)</i>	HD 355.1 S2*	1991
282-1	1985	<i>High-voltage fuses – Part 1: Current-limiting fuses</i>	EN 60282-1	1993
298 (mod)	1981	<i>A.C. metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 72.5 kV</i>	HD 187 S4*	1989
466	1987	<i>A.C. insulator-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 38 kV</i>	–	–
694	1980	<i>Common clauses for high-voltage switchgear and controlgear standards</i>	HD 448 S2*	1989
787	1983	<i>Application guide for the selection of fuse-links of high-voltage fuses for transformer circuit applications</i>	–	–

*HD 355.1 S2 includes A1 : 1984 to IEC 265-1.

HD 187 S4 is superseded by HD 187 S5 : 1982, which is based on IEC 298 : 1990.

HD 448 S2 includes A1 : 1985 to IEC 694.

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National foreword

This British Standard has been prepared by the Electrical Engineering Standards Policy Committee. It is identical with IEC 420 : 1990 'High-voltage alternating current switch-fuse combinations' published by the International Electrotechnical Commission (IEC).

Cross-references

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	BS 4727 Glossary of electrotechnical, power, telecommunication, electronics, lighting and colour terms
IEC 50(151) : 1978	Part 1 : Group 02 : 1980 Electrical and magnetic devices terminology (Technically equivalent)
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IEC 137 : 1984	BS 223 : 1985 Specification for bushings for alternating voltages above 1000 V (Technically equivalent)
IEC 282-1 : 1985	BS 2692 Fuses for voltages exceeding 1000 V a.c. Part 1 : 1986 Specification for current-limiting fuses (Identical)
IEC 694 : 1980	BS 6581 : 1985 Specification for common requirements for high-voltage switchgear and controlgear standards (Identical)
IEC 787 : 1983	BS 6553 : 1984 Guide for selection of fuse links of high-voltage fuses for transformer circuit applications (Identical)

The Technical Committee has reviewed the provisions of IEC 56 : 1987, IEC 129 : 1984, IEC 265-1 : 1983, IEC 298 : 1981 and IEC 466 : 1987 to which reference is made in the text and has decided that they are acceptable for use in conjunction with this British Standard. A related British Standard to IEC 56 : 1987 is BS 5311 : 1988 'Specification for high-voltage alternating-current circuit-breakers'. A related British Standard to IEC 129 is BS 5253 : 1975 'Specification for a.c. disconnectors (isolators) and earthing switches of rated voltage above 1kV'. A related British Standard to IEC 265-1 is BS 5463 : 1977 'Specification for a.c. switches of rated voltage above 1kV'. A related British Standard to IEC 298 is BS 5227 : 1984 'Specification for a.c. metal-enclosed switchgear and controlgear for rated voltages above 1kV and up to and including 72.5kV'. There is no British Standard corresponding to IEC 466.

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

HIGH-VOLTAGE ALTERNATING CURRENT SWITCH-FUSE COMBINATIONS

1 General

1.1 Scope

This standard applies to three-pole units for public and industrial distribution systems which are functional assemblies of switches including switch-disconnectors and current-limiting fuses and thus able to interrupt:

- any load current up to the rated breaking current of the switch;
- any over-current up to the rated short-circuit breaking current of the combination by which automatic interruption is initiated.

NOTE 1 - Besides by the fuse and its striker operation, automatic interruption may be caused by an over-current release and by self-protecting devices.

It does not apply to fuse-circuit-breakers, fuse-contactors, combinations for motor-circuits or to combinations incorporating single capacitor bank switches.

NOTE 2 - In this standard, the word "combination" is used in the following sense: a combination in which the components constitute a functional assembly.

The fuses are incorporated in order to extend the short-circuit rating of the combination beyond that of the switch alone. They are fitted with strikers in order both to open automatically all three poles of the switch on the operation of a fuse and to achieve a correct operation at values of fault current below the minimum breaking current of the fuses. In addition to the fuse strikers, the combination may be fitted with either an over-current release or a shunt release.

NOTE 3 - In this standard the term "fuse" is used to designate either the fuse or the fuse-link where the general meaning of the text does not result in ambiguity.

This standard applies to combinations designed with rated voltages above 1 kV and below 52 kV for use on three-phase alternating current systems of either 50 Hz or 60 Hz.

The individual components of the combinations shall comply, in all relevant respects, with IEC 265-1, 282-1 and 787 quoted below.

NOTE 4 - Switches shall be in accordance with IEC 265-1 except for the short-time current and short-circuit making requirements where the current limiting effects of the fuses are taken into account.

NOTE 5 - Earthing switches forming an integral part of a combination are covered by IEC 129. If the earthing switch has a rated short-circuit making current, the making tests should be made in accordance with the requirements of IEC 265-1.

NOTE 6 - This standard also applies to switch-fuse combinations when included in ring main unit format.

1.2 Normative references

This standard refers to IEC 694 which is applicable unless otherwise specified in this standard. In order to simplify the indication of corresponding requirements, the same numbering of clauses and sub-clauses is used as in IEC 694. Amendments to these clauses and sub-clauses are given under the same references whilst additional sub-clauses are numbered from 101.

IEC Publications quoted in this standard:

IEC 50(151): (1978), *International Electrotechnical Vocabulary (IEV), Chapter 151: Electrical and magnetic devices.*

IEC 50(441): (1984), *Chapter 441: Switchgear, controlgear and fuses.*

IEC 56: (1987), *High-voltage alternating current circuit-breakers.*

IEC 129: (1984), *Alternating current disconnectors (isolators) and earthing switches.*

IEC 137: (1984), *Bushings for alternating voltages above 1 000 V.*

IEC 265-1: (1983), *High-voltage switches, Part 1: High-voltage switches for rated voltages above 1 kV and less than 52 kV.*

IEC 282-1: (1985), *High-voltage fuses, Part 1: Current-limiting fuses.*

IEC 298: (1981), *A.C. Metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 72.5 kV.*

IEC 466: (1987), *A.C. insulation-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 38 kV.*

IEC 694: (1980), *Common clauses for high-voltage switchgear and controlgear standards.*

IEC 787: (1983), *Application guide for the selection of fuse-links of high-voltage fuses for transformer circuit applications.*

2 Normal and special service conditions

IEC 694 applies.

3 Definitions

For the purpose of this standard, the following definitions shall apply.

3.1 Devices and general terms

3.1.1 Switch-fuse combinations (includes fuse-switch combinations)

A combination of a three-pole switch with three fuses provided with strikers, the operation of any striker causing all three poles of the switch to open automatically.

3.1.2 *Switch-fuse*

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

3.1.3 *Fuse-switch*

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

3.1.4 *Switch-disconnector*

IEV 441-14-12.

3.1.5 *Fuse-base fuse-mount*

IEV 441-18-02.

3.1.6 *Striker*

IEV 441-18-18.

3.1.7 *Release-operated combination*

A combination in which automatic opening of the switch can also be initiated by either an over-current release or a shunt release.

NOTE - The release may be operated by either an over-current or an earth-fault relay.

3.1.8 *Release*

IEV 441-15-17.

3.1.9 *Over-current release*

IEV 441-16-33.

3.1.10 *Shunt release*

IEV 441-16-41.

3.1.11 *Ambient air temperature*

IEV 441-11-13.

3.2 *Operation*

3.2.1 *Independent manual operation (of the switch)*

IEV 441-16-16.

3.2.2 *Dependent power operation (of the switch)*

IEV 441-16-14.