BRITISH STANDARD

BS 5311:1996

Incorporating Amendment No. 1

High-voltage alternating-current circuit-breakers —

(Implementation of CENELEC HD 348 S7:1998)

ICS 29.120.50

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee PEL/17, Switchgear, controlgear and high voltage/low-voltage co-ordination, 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

ERA Technology Ltd.

Electricity Association

GAMBICA (BEAMA Ltd.)

Health and Safety Executive

Ministry of Defence

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

British Cable Makers Confederation

Electrical Installation Equipment Manufacturers' Association (BEAMA Ltd.)

Engineering Equipment and Materials Users' Association

Institution of Incorporated Executive Engineers

This British Standard, having been prepared under the direction of the Electrotechnical Sector Board, was published under the authority of the Standards Board and comes into effect on
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to BS 5311-7:1976
Second (combined) edition as
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The following BSI references relate to the work on this standard:
Committee reference PEL/17
Draft for comment 88/25931 DC

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Amendments issued since publication

Amd. No.	Date	Comments
10268	March 1999	Indicated by a sideline in the margin (see also national foreword)

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National foreword

This British Standard has been prepared by Technical Committee PEL/17. It implements HD 348 S7:1998 which supersedes HD 348 S6:1995, published by the European Committees for Electrotechnical Standardization (CENELEC). It was derived by CENELEC from IEC 56:1987, *High-voltage alternating-current circuit-breakers* and its amendments 1:1992, 2:1995 and 3:1996 published by the International Electrotechnical Commission (IEC).

CENELEC common modifications have been implemented at the appropriate places in the text and are indicated by a sideline 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 5311:1988 which is withdrawn.

Cross-references

Publication referred to	Corresponding British Standard
	BS 4727 *Glossary of electrotechnical, power; telecommunication, electronics, lighting and colour terms* Part 1 *Terms common to power, telecommunications and electronics*
IEC 50(151):1978	Group 02:1980 *Electrical and magnetic devices terminology* (Technically equivalent) Part 2 *Terms particular to power engineering*
IEC 50(441):1974	Group 06:1985 *Switchgear and controlgear terminology (including fuse terminology)* (Technically equivalent)
HD 323.2.5 S1:1988 (IEC 68-2-5:1975)	BS 2011 *Environmental testing* Part 2.1 Sa:1977 Test Sa. *Simulated solar radiation at ground level*
HD 540.2 S1:1991 (IEC 71-2:1976)	BS 5622 *Guide for insulation co-ordination* Part 2:1979 *Application guide* (Identical)
IEC 77:1968	BS 2618:1975 *Specification for electric traction equipment* (Technically equivalent)
EN 60129:1994 (IEC 129:1984)	BS EN 60129:1994 *Specification for alternating current disconnectors and earthing switches* (Identical)
IEC 137:1984	BS 223:1985 *Specification for bushings for alternating voltages above 1 000 V* (Technically equivalent)
HD 553 S2:1993 (IEC 185:1987)	BS 7626:1993 *Specification for current transformers* (Technically equivalent)
HD 448 S2:1989 (IEC 694:1980)	BS 6581:1985 *Specification for common requirements for high-voltage switchgear and controlgear standards* (Technically equivalent)

IEC 60-1:1973 has been superseded by IEC 601:1989. An identical British Standard to IEC 60-1:1989 is BS 923-1:1990, which implements HD 588.1 S1.

IEC 68-2-17:1978 has been superseded by IEC 68-2-17:1994 which has been adopted by CENELEC as EN 60068-2-17:1994 and published as BS EN 60068-2-17:1995.

IEC 427:1973 has been superseded by IEC 427:1989 which has been adopted by CENELEC as EN 60427:1992 and published as BS EN 60427:1992.

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

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

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, the HD title page, pages 2 to 166, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

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HARMONIZATION DOCUMENT
DOCUMENT D'HARMONISATION
HARMONISIERUNGSDOKUMENT

HD 348 S7

April 1998

ICS 29.120.40

Supersedes HD 348 S6:1995

Descriptors: Switchgear and controlgear, high voltage, circuit-breaker, characteristic, design, test

English version

High-voltage alternating-current circuit-breakers

(IEC 56:1987 + A1:1992 + A2:1995 + A3:1996, modified)

Disjoncteurs à courant alternatif à haute tension
(CEI 56:1987 + A1:1992 + A2:1995 + A3:1996, modifiée)

Hochspannungs-Wechselstrom-Leistungsschalter
(IEC 56:1987 + A1:1992 + A2:1995 + A3:1996, modifiziert)

This Harmonization Document was approved by CENELEC on 1998-04-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for implementation of this Harmonization Document on a national level.

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 Harmonization Document exists in three official versions (English, French, German).

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

Ref. No. HD 348 S7:1998 E

Foreword to HD 384 S6

The text of the International Standard IEC 56:1987 and its amendment 1:1992, prepared by SC 17A, High-voltage switchgear and controlgear, of IEC TC 17. Switchgear and controlgear, together with common modifications prepared by Technical Committee CENELEC TC 17A, was submitted to the formal vote and was approved by CENELEC as HD 348 S5.

The text of document 17A(CO)249, future amendment 2 to IEC 56:1987, was submitted to the IEC-CENELEC parallel vote.

As CENELEC TC 17A had decided to postpone the conversion of the HD into an EN to the next edition of IEC 56, the combined text of HD 348 S5 and amendment 2:1995 to IEC 56:1987 was approved by CENELEC as HD 348 S6 on 1995-07-04.

The following dates were fixed:

— latest date by which the existence of the HD has to be announced at national level (doa) 1995-08-15

— latest date by which the HD has to be implemented at national level by publication of a harmonized national standard or by endorsement (dop) 1996-02-15

— latest date by which the national standards conflicting with the HD have to be withdrawn (dow) 1996-02-15

Annexes designated “normative” are part of the body of the standard. In this standard, Appendix AA, Appendix BB, Appendix CC, Appendix DD, Appendix EE, Appendix FF, Appendix GG, Appendix HH, Appendix JJ, Annex ZA and Annex ZB are normative.

Annex ZA and Annex ZB have been added by CENELEC.

Foreword to HD 384 S7

The text of the International Standard IEC 60056:1987 and its amendment 3:1996, prepared by SC 17A, High-voltage switchgear and controlgear, of IEC TC 17, Switchgear and controlgear, together with common modifications prepared by the Technical Committee CENELEC TC 17A, High-voltage switchgear controlgear, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as HD 348 S7 on 1998-04-01.

This European Standard supersedes HD 348 S6:1995.

The following dates were fixed:

— latest date by which the existence of the HD has to be announced at national level (doa) 1998-07-01

— latest date by which the HD has to be implemented at national level by publication of a harmonized national standard or by endorsement (dop) 1999-01-01

— latest date by which the national standards conflicting with the HD have to be withdrawn (dow) 1999-01-01

Annexes designated “normative” are part of the body of the standard. Annexes designated “informative” are given for information only. In this standard, Appendix AA, Appendix BB, Appendix CC, Appendix DD, Appendix EE, Appendix FF, Appendix GG, Appendix HH, Annex ZA and Annex ZB are normative and Appendix JJ and Annex KK are informative. Annex ZA and Annex ZB have been added by CENELEC.

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1 Scope

This standard is applicable to a.c. circuit-breakers designed for indoor or outdoor installation and for operation at frequencies up to and including 60 Hz on systems having voltages above 1 000 V.

It is only applicable to three-pole circuit-breakers for use in three-phase systems and single-pole circuit-breakers for use in single-phase systems. Two-pole circuit-breakers for use in single-phase systems are subject to agreement between manufacturer and user.

This standard is also applicable to the operating devices of circuit-breakers and to their auxiliary equipment. However, a circuit-breaker with a closing mechanism for dependent manual operation is not covered by this standard, as a rated short-circuit making-current cannot be specified, and such dependent manual operation may be objectionable because of safety considerations.

This standard does not cover circuit-breakers intended for use on motive power units of electrical traction equipment; these are covered by IEC Publication 77: Rules for Electric Traction Equipment.

Circuit-breakers for use with overhead lines which include series capacitors are not within the scope of this standard.

NOTE Tests to prove the performance under abnormal conditions should be subject to agreement between manufacturer and user. Such abnormal conditions are, for instance, cases where the voltage is higher than the rated voltage of the circuit-breaker, conditions which may occur due to sudden loss of load on long lines or cables.

This standard is not necessarily applicable to circuit-breakers for special conditions, for example, those produced by two earth faults on two different phases one of which occurs on one side of the circuit-breaker and the other on the other side.

2 Normal and special service conditions

Clause **2** of IEC Publication 694: Common Clauses for High-voltage Switchgear and Controlgear Standards, is applicable.

3 Definitions

In this clause reference is made to definitions in the following publications of the International Electrotechnical Vocabulary (IEV):

— 50(151) (1978): Chapter 151: Electrical and Magnetic Devices,

— 50(441) (1984): Chapter 441: Switchgear; Controlgear and Fuses,

— 50(604) (—): Chapter 604: Generation, Transmission and Distribution of Electricity: Operation (being printed).

For the purpose of this standard, the following definitions are applicable.

3.101 General terms

3.101.1
switchgear and controlgear (441-11-01)

3.101.2
indoor switchgear and controlgear (441-11-04)

3.101.3
outdoor switchgear and controlgear (441-11-05)

3.101.4
short-circuit current (441-11-07)

3.101.5
isolated neutral system

a system which has no intentional connection to earth except through indicating, measuring or protective devices of very high impedance