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SURGE ARRESTERS (DIVERTERS)
Part 1—SILICON CARBIDE TYPE FOR A.C. SYSTEMS

This Australian standard was prepared by Committee EL/7, Power Switchgear. It was approved on behalf of the Council of the Standards Association of Australia on 13 January 1986 and published on 7 April 1986.

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Australian-British Chamber of Commerce
Australian Electrical and Electronic Manufacturers' Association
Confederation of Australian Industry
Electricity Supply Association of Australia
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Part 1—SILICON CARBIDE TYPE FOR A.C. SYSTEMS

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PREFACE

This standard was prepared by the Association's Committee on Power Switchgear to supersede AS 1307—1974, Surge Diverters—Non-linear Resistor Type.

NOTE: The internationally accepted term arrester is now used in place of 'diverter' as used in AS 1307—1974.

Due to the development in surge arresters, it is now necessary to have two standards, one for silicon carbide type and one for metal-oxide type. These standards now form the AS 1307 series and are as follows:

Part 1—Silicon Carbide Type for A.C. Systems

Part 2—Metal-oxide Type for A.C. Systems

This standard (i.e. AS 1307.1) is based generally on the IEC standards listed below. Acknowledgement is made of the assistance received therefrom.

IEC 99-1 (1970) Lightning Arresters Part 1. Non-linear Resistor Type for A.C. Systems

IEC 99-1A (1965) First Supplement to Publication 99-1 (First Edition, 1958)

This standard differs from AS 1307-1974 in a number of ways. These include:

(a) Incorporation of Australian submissions to IEC for the revision of the above IEC Standards.

(b) Appendices based on Appendices A, D and E of IEC 99-1 omitted from AS 1307—1974, are now included as Appendices F, H and G respectively.

(c) The definition of homogeneous series of arresters (Clause 2.2.7) and amendments to requirements associated therewith, are now included.

(d) The specification of rated continuous operating voltage and the test for its verification (Clauses 3.2 and 5.6) are included.

(e) Arresters are no longer required to withstand their rated voltage continuously.

(f) Introduction of pressure-relief Types S and HNS (Clause 5.7).

(g) The pressure-relief classes in Table 5.5 are now extended by the addition of classes for 63 000 A and 50 000 A minimum prospective symmetrical fault current.

(h) Revised requirement for the determination of current amplitude in the first major loop (Clause 5.7.2.3).

(j) Amendment to Appendix B based on IEC document 37(Central Office)30 and incorporating an Australian submission concerning temporary overvoltages due to earth faults and for the determination of earth fault factors.

(k) Cross-references to other standards have been updated.

Where this standard deviates technically from IEC 99-1 and 99-1A by way of different or additional requirements, this is indicated by a rule in the margin against the Clause, or part thereof, affected. A summary of such technical variations is given in the Annex.

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SURGE ARRESTERS (DIVERTERS)

PART 1—SILICON CARBIDE TYPE FOR A.C. SYSTEMS

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard specifies requirements for non-linear silicon carbide resistor gap type surge arresters (diverters) designed for repeated operation to limit voltage surges on a.c. power circuits and to interrupt power follow-current. In particular, for use on high voltage a.c. power circuits, it applies to surge arresters consisting of single or multiple spark gaps in series with one or more silicon carbide type non-linear resistors.

It does not specify requirements for non-linear metal-oxide type surge arresters; requirements for such arresters are specified in AS 1307.2.

1.2 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 1824	Insulation Coordination (Phase-to-earth and Phase-to-phase, Above 1 kV) Part 1—Basic Principles, Standard Insulation Levels and Test Procedures Part 2—Application Guide
AS 1931	High Voltage Testing Techniques Part 1—General Definitions, Test Requirements, Test Procedures and Measuring Devices
AS 2650	High-voltage A.C. Switchgear and Controlgear—Common Requirements
AS 1307.2	Surge Arresters (Diverters) Part 2—Metal-oxide Type for A.C. Systems*
IEC 99-1	Lightning Arresters Part 1—Non-linear Resistor Type for A.C. Systems
ASTM D2000	Classification System for Rubber Products in Automotive Applications

1.3 SERVICE CONDITIONS.

1.3.1 Normal service conditions. Surge arresters which comply with this standard shall be suitable for outdoor operation under the following conditions:

(a) Ambient temperature within the range of −10°C to +50°C.

(b) Maximum solar radiation does not exceed 1.1 kW/m^2. (This is equivalent to a black body temperature of 80°C.)

(c) The ambient air not excessively (or abnormally) polluted by dust, smoke, corrosive or flammable gases, vapour or salt.

(d) Altitude not exceeding 1000 m.

(e) Frequency of the a.c. power supply not less than 48 Hz and not greater than 52 Hz.

(f) The power-frequency voltage applied continuously between the live and earth terminals of the arrester shall not exceed its continuous operating voltage.

(g) Wind pressure not exceeding 1.2 kPa.

NOTE: The wind pressure is the free stream dynamic pressure and corresponds to a wind velocity of 45 m/s (on a projected flat surface).

(h) Vibrations due to causes external to the surge arrester and earth tremors are negligible.

1.3.2 Special service conditions. Arresters subjected to other than normal application or service conditions may require consideration in manufacture or application and each such case should be subject to discussion between the purchaser and the manufacturer. See Appendix A for special service conditions, and Appendix C for special applications of surge arresters.

* In course of preparation.