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High voltage A.C. switchgear and controlgear—Common requirements

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PREFACE

This standard was prepared by the Association's Committee on High Voltage Switchgear to supersede AS 2650-1983.

The standard specifies those requirements which are common to most items of high voltage a.c. switchgear and controlgear and it is intended that standards for individual high voltage switchgear and controlgear equipment will refer to it.

The requirements of this standard specifically apply to the following standards as appropriate:

AS 1025	High Voltage A.C. Switchgear and Controlgear—Switches and Switch-disconnectors
AS 1306	High Voltage A.C. Switchgear and Controlgear—Disconnectors (Isolators) and Earthing Switches
AS 2006	High Voltage A.C. Switchgear and Controlgear—Circuit-breakers for Rated Voltages Above 1000 V
AS 2067	Switchgear Assemblies and Ancillary Equipment for Alternating Voltages Above 1 kV
AS 2086	High Voltage A.C. Switchgear and Controlgear—Metal-enclosed—Rated Voltages Above 1 kV Up to and Including 72.5 kV
AS 2263	High Voltage A.C. Switchgear and Controlgear—Gas-insulated Metal-enclosed Switchgear for Rated Voltages of 72.5 kV and Above
AS 2264	High Voltage A.C. Switchgear and Controlgear—Insulation-enclosed for Rated Voltages above 1 kV Up to and Including 36 kV

It is expected that a number of other Australian equipment standards will make reference to requirements in this standard, but this standard has no application to such standards except as referred to therein.

This standard is based on IEC 694*, including its Amendment No 1 and, to facilitate cross-reference thereto, the clause numbering here closely follows that of IEC 694. It is intended, that, where appropriate, the same clause numbering will also be used in switchgear and controlgear equipment standards making extensive reference to this standard.

Where this standard deviates technically from IEC 694 by way of additional or different requirements, this fact is indicated by underlining or a rule in the margin against the clause, or part thereof, affected. A summary of technical variations between this standard and IEC 694 including omissions of IEC text is given in the Annex.

This edition of AS 2650 has been necessary to clarify the application of the values in Tables 1 and 2 and the acceptance criteria for the short-time withstand tests in Clause 6.5.3 with regard to mechanical damage. The referenced documents have also been updated.

Amendment No. 1 to IEC 694 is covered by the second paragraph of Clause 5.3.

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* IEC 694, Common Clauses for High-voltage Switchgear and Controlgear Standards.

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Australian Standard
for
HIGH VOLTAGE A.C. SWITCHGEAR AND CONTROLGEAR—COMMON REQUIREMENTS

1. SCOPE AND GENERAL

1.1 SCOPE. This standard applies to a.c. switchgear and controlgear, designed for indoor and outdoor installation and for operation at service frequencies up to and including 60 Hz in systems having voltages above 1000 V, except as otherwise specified in relevant standards for particular types of switchgear and controlgear.

1.2 APPLICATION. This standard incorporates those clauses which have a common application to the various high voltage switchgear and controlgear standards and is intended to be read in conjunction with such standards when referred to therein.

1.3 REFERENCED DOCUMENTS. The following documents are referred to in this standard:

AS 1018	Partial Discharge Measurements
AS 1102	Graphical Symbols for Electrotechnology Part 1—General, Qualifying and Supplementary Symbols
AS 1767	Insulating Oil for Transformers and Switchgear
AS 1821	Suppliers Quality Systems For Design Development and Installation
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 1852	International Electrotechnical Vocabulary 1852(441)—Switchgear, Controlgear and Fuses
AS 1931	High Voltage Testing Techniques Part 1—General Definitions, Test Requirements, Test Procedures and Measuring Devices
AS 2467	Maintenance of Electrical Switchgear
AS 2752	Preferred Numbers and Their Use
AS 2768	Electrical Insulating Materials—Evaluation and Classification Based on Thermal Endurance
IEC 376	Specification and Acceptance of New Sulphur Hexafluoride
IEC 507	Artificial Pollution Tests on High-voltage Insulators to be Used on A.C. Systems
CISPR 16	CISPR Specification for Radio Interference Measuring Apparatus and Measurement Methods

2. SERVICE CONDITIONS

2.0 GENERAL. Unless otherwise specified, high voltage switchgear and controlgear, including the operating devices and the auxiliary equipment which form an integral part of it, is intended to be used at its rated characteristics under the normal service conditions stated in Clause 2.1.

If the actual service conditions differ from these normal service conditions, high voltage switchgear and controlgear and associated operating devices and auxiliary equipment shall be designed to comply with any special service conditions required by the purchaser, or appropriate arrangements shall be made (see Clause 2.2).

2.1 NORMAL SERVICE CONDITIONS.

2.1.1 Indoor switchgear and controlgear.

(a) The ambient air temperature does not exceed 40°C and its average value, measured over a period of 24 h, does not exceed 35°C.

The minimum ambient air temperature is – 5°C.

(b) The altitude does not exceed 1000 m.

(c) The ambient air is not significantly polluted by dust, smoke, corrosive or flammable gases, vapours or salt.

(d) The conditions of humidity are under consideration but the following figures may be used as a guide:

(i) The average value of the relative humidity, measured during a period of 24 h, does not exceed 95 percent.

(ii) The average value of the vapour pressure, for a period of 24 h, does not exceed 22 mbar.

(iii) The average value of the relative humidity, for a period of 1 month, does not exceed 90 percent.

(iv) The average value of the vapour pressure, for a period of 1 month, does not exceed 18 mbar.

For these conditions, condensation may occasionally occur.

NOTES:

1. Condensation can be expected where sudden temperature changes occur in periods of high humidity.
2. To withstand the effects of humidity and occasional condensation, such as breakdown of insulation or corrosion of metallic parts, indoor switchgear designed for such conditions and tested accordingly or outdoor switchgear may be used.
3. Condensation may be prevented by special design of the building or housing, by suitable ventilation and heating of the station, or by use of dehumidifying equipment.

(e) Vibrations due to causes external to the switchgear and controlgear or earth tremors are negligible.