

Australian Standard

**TERMINALS FOR
SWITCHGEAR ASSEMBLIES
FOR ALTERNATING VOLTAGES
ABOVE 1 kV**

[Title Allocated by Defence Cataloging Authority—Terminal,
Lug (for switchgear assemblies with a.c. voltage above 1 kV)]

The following scientific, industrial and governmental organizations and departments were officially represented on the committee entrusted with the preparation of this standard:

Australian-British Trade Association
Australian Electrical and Electronics Manufacturers Association
Confederation of Australian Industry
Electricity Supply Association of Australia
Institution of Engineers, Australia
Railways of Australia Committee
Testing Authorities

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PREFACE

This standard was prepared by the Association's Committee on Power Switchgear.

The standard covers the requirements for terminals for indoor and outdoor switchgear assemblies and ancillary equipment for alternating voltages above 1 kV such as are employed in connection with the generation, transmission, distribution and utilization of electric power. It specifies dimensions and current ratings for terminals, and deals with the basis for the design of terminals and recommendations for joint design in appendices.

In the preparation of the standard consideration was given to IEC Report 518, Dimensional Standardization of Terminals for High-voltage Switchgear and Controlgear, and an ESAA document on the standardization of equipment palm terminals, and acknowledgement is made of the assistance received therefrom.

IEC 518 gives dimensions of terminals of cylindrical shape and the IEC sizes have been adopted herein. For terminals of rectangular shape, IEC 518 gives only the diameters of and distances between holes. These dimensions have been retained herein, except for terminal number 12 where the 60 mm spacing does not accommodate the conductor terminal; in this case a spacing of 70 mm has been used. Additionally an alternative hole diameter of 18 mm has been included for terminal numbers 7 to 12 for the reason given in Appendix A.

This standard may require reference to the following documents:

- AS 1025 High-voltage Switches
- AS 1033 High-voltage Expulsion and Similar Fuses

- AS 1034 High-voltage Current-limiting Fuses
- AS 1100 Drawing Practice
Part 11—Indication of Surface Texture
- AS 1110 ISO Metric Hexagon Precision Bolts and Screws
- AS 1111 ISO Metric Hexagon Commercial Bolts and Screws
- AS 1237 Flat Metal Washers for General Engineering Purposes (Metric Series)
- AS 1306 High Voltage Isolators (Disconnectors) and Earthing Switches
- AS 1444 Wrought Alloy Steels—AISI-SAE H and Standard Steels Types
- AS 1865 Wrought Aluminium and Aluminium Alloy Drawn Wire, Rod, Bar and Strip for General Engineering Purposes
- AS 1968 Helical Spring Lock Washers (Metric Series)
- AS 2006 High Voltage Alternating Current Circuit-breakers
- AS 2067 Switchgear Assemblies and Ancillary Equipment for A.C. Voltages Above 1 kV
- AS 2338 Preferred Dimensions of Wrought Metal Products
- AS 3000 SAA Wiring Rules
- SAA MP19 Report on Preferred Numbers and Their Use

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Australian Standard

for

TERMINALS FOR SWITCHGEAR ASSEMBLIES FOR ALTERNATING
VOLTAGES ABOVE 1 kV

1 SCOPE. This standard specifies dimensions and configuration for terminals intended for use on indoor and outdoor switchgear assemblies for alternating voltages above 1 kV such as are employed in connection with the generation, transmission and distribution of electric power. It also applies to the ancillary equipment used in conjunction with the switchgear.

2 APPLICATION. This standard applies to terminals on electrical equipment and on ancillary connections such as busbars. It does not apply to terminals internal to switchgear, switchboards and similar, where the connection may be an integral part of the design.

This standard does not require all connections on to terminals to be made with fasteners. Other methods may be more appropriate and reference should be made to AS 2067, Appendix C, for a description of these.

NOTE: The intention of the standard is that of establishing a set of dimensions of terminations for equipment for ease of assembly and interchangeability. In this context, it is appreciated that equipment to which the terminals are applicable will have a current rating in accordance with the particular standard to which it is tested. Service experience has indicated that despite the various metals and their alloys used in equipment terminals, it is practicable to assign nominal current ratings to terminals of various sizes and coordinate a terminal to an item of equipment having the same current rating.

3 DIMENSIONAL REQUIREMENTS.

3.1 General. Terminals shall comply with the details and dimensions shown in Figs 1 to 3 and Tables 1 and 2 as appropriate, and with the requirements given in Clauses 3.2 to 3.4.

3.2 Surface Areas of Terminals. The current-carrying surface(s) of terminals shall be flat or cylindrical as applicable, free from blemishes and with a surface roughness as defined in AS 1100, Part 11 not greater than 3.2 μm .

The contact and rear surface areas of palm terminals shall be parallel. If the rear surface is required as a current-carrying surface, this shall be specified by the purchaser.

3.3 Thickness of Palm Terminals. The palm terminal thicknesses given in Table 1 are considered

to be minimum practical values for the current ratings nominated and for normal mechanical loading. Where special conditions apply, such as abnormal mechanical loading, the thickness shall be as specified by the purchaser, or where applicable shall be subject to his approval.

3.4 Space Orientation of Major and Minor Axes of Palm Terminals. The space orientation of the major and minor axes of equipment palm terminals shall be as specified by the purchaser.

4 CURRENT RATINGS. The current ratings assigned to the terminals in Figs 1 to 3 are those specified in the various Australian standards for electrical equipment, are in accordance with the R10 series of preferred numbers in SAA MP19, and reflect common usage.

The assigned values for palm terminals may be exceeded provided that the current density at the joint face, i.e. 0.17 A/mm² for aluminium or 0.32 A/mm² for copper, is not exceeded and that the joint is designed and prepared in accordance with Appendix B.

NOTE: Palm terminals having current ratings exceeding 5000 A and cylindrical terminals having current ratings exceeding 3150 A are not covered by this standard and are a matter for agreement between purchaser and manufacturer.

5 MATERIAL. The terminal may be made from any material acceptable to the purchaser.

6 TERMINAL APPLICATION.

6.1 Palm Terminals (See Figs 1 and 2). All palm terminals except numbers 6 and 11 may be used either as equipment palm terminals or as conductor palm terminals. Terminal number 7 is intended for use as conductor palm terminal with equipment palm terminal number 12.

Terminal numbers 6 and 11 are intended for use as conductor palm terminals.

6.2 Cylindrical Terminals (See Fig. 3). Where terminal numbers 13 to 17 are supplied on equipment, suitable adaptor palm terminals shall be provided by the equipment manufacturer if specified by the purchaser.