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CONTROL CABLES FOR ELECTRICITY SUPPLY SYSTEMS

Part 1—GENERAL CONTROL CABLES

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Australian Electrical and Electronic Manufacturers Association
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Electrical Approvals Authorities
Electrical Contractors Associations of Australia
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Electricity Supply Association of Australia
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Telecom Australia

AUSTRALIAN STANDARD

CONTROL CABLES FOR ELECTRICITY SUPPLY SYSTEMS

Part 1
GENERAL CONTROL CABLES

AS 2373, Part 1—1983

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PREFACE

This edition of this standard was prepared by the Association's Committee on Electric Wires and Cables, to supersede AS 2373, Part 1, 1980.

This edition includes changes to Table 1 to further clarify the colour code scheme for twisted-pair cables and changes to the presentation of details for high voltage tests.

In addition a flame propagation test has been included as well as recommendations for bending radii, which were under consideration in the 1980 edition.

The standard is Part 1 of a two-part standard for multicore and twisted-pair cables used for control, supervisory, protection and instrumentation circuits both within power station and substation confines and to and from these stations. Part 2 covers aerial control cables.

The nominal cross-sectional areas of conductors 0f 0.5 mm^2 and above are taken from AS 1125, Conductors in Insulated Electric Cables and Flexible Cords, and are identical with the values recommended in IEC 228, Nominal Cross-sectional Areas and Composition of Conductors of Insulated Cables. For areas below 0.5 mm^2 solid conductors have been specified, namely 0.2 mm^2 and 0.35 mm^2.

Only two types of insulation are provided for in this standard, namely polyethylene (PE) and PVC. The thickness of insulation for cables having conductors of nominal cross-sectional area of 0.5 mm^2 and above are based on values specified in AS 3191, Electric Flexible Cords, and AS 3147, PVC Insulated Electric Cables and Flexible Cables for Working Voltages 0.6/1 kV.

Two non-metallic sheath materials are provided in the standard, namely polyethylene and moisture resistant PVC compound.

The standard also provides for bedding, armouring, moisture barriers, metal sheaths and oversheaths.

Appendix D sets out details of an environmental stress cracking test. It is intended that Appendix D will be deleted when the test is included in AS 1660.

CONTENTS

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
CONTROL CABLES FOR ELECTRICITY SUPPLY SYSTEMS

PART 1—GENERAL CONTROL CABLES

1 SCOPE. This standard specifies requirements for screened and unscreened PVC insulated multicore control cable and screened polyethylene (PE) insulated twisted-pair control cables for voltages up to and including 0.6/1 kV for use in conjunction with electricity supply systems.

It applies to cables intended for use in control, supervisory, protection and instrumentation circuits within power station and substation confines, between one station and another and radiating from stations. Control cables complying with this standard may be used in industrial applications.

It does not apply to cables used solely for telecommunication purposes.

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

AS 1026	Impregnated Paper Insulated Cables for Electricity Supply at Working Voltages up to and Including 33 kV
AS 1049	Polyethylene Insulation and Sheath of Telecommunication Cables
AS 1125	Conductors in Insulated Electric Cables and Flexible Cords
AS 1660	Methods of Test for Electric Cables and Flexible Cords (including Conductors, Insulation and Sheath)
AS 1931	High Voltage Testing Techniques
AS 3147	PVC Insulated Electric Cables and Flexible Cables
AS 3191	Electric Flexible Cords
AS C91	Lead and Lead Alloy Sheaths of Electric Cable
SAA MP49	Register of Colours of Manufacturers' Identification Threads for Electric Cables and Flexible Cords

3 DEFINITIONS. For the purpose of this standard the definitions relating to conductors in AS 1125 and the following definitions apply:

3.1 Core—the conductor with its insulation but not including any protective covering.

3.2 Wavelength or length of lay—the axial distance between each successive crest of the waveform or turn of the helix formed by a core of a multicore cable or core of a pair or pairs of twisted-pair cable.

3.3 Lay-up—the assembling of cores.

3.4 Control cable—a cable used for control, measuring, protection and communication circuits.

3.5 Voltage designation—for cables for a.c. systems, the rated voltages U_o and U expressed in the form U_o/U; or for cables for d.c. systems, the rated voltage U_o:

where

U_o is the r.m.s. power frequency voltage to earth of the supply system or d.c. voltage of the supply system for which the cable is designed; and

U is the r.m.s. power frequency voltage between phases of the supply system and for which the cable is designed.

3.6 Routine tests—tests made by the manufacturer on all finished cable lengths to demonstrate the integrity of the cable.

3.7 Special tests—tests made by the manufacturer on samples of completed cable, or components taken from a completed cable, so as to verify that the finished product meets the design specifications.

3.8 Type tests—tests required to be made by the manufacturer before supplying on a general commercial basis a type of cable covered by this standard in order to demonstrate satisfactory performance characteristics to meet the intended application. These tests are of such a nature that, after they have been made, they need not be repeated, unless changes are made in the cable materials or design which might change the performance characteristics.

4 VOLTAGE DESIGNATION. The rated voltage U_o/U recognized for the purpose of this standard is 0.6/1 kV.

5 CONDUCTORS. Conductors shall be of annealed copper of the type indicated in the appropriate tables of dimensions (Tables 5 and 6) and for conductor sizes of 0.5 mm² and above shall comply with the appropriate requirements and dimensions in AS 1125. Conductors below 0.5 mm² shall comply with the relevant requirements of AS 1125 and the maximum d.c. resistance at 20°C shall be as given in Table 8.

Although acceptable, the tinning of conductors is not required by this standard. Where such tinning is provided, the wires taken from the finished conductor shall not be required to pass the tinning test specified in AS 1125.

6 INSULATION.

6.1 Material. The insulation material shall be one of the following compounds:

(a) PE — 03 grade polyethylene, complying with the appropriate requirements of AS 1049 (for twisted-pair control cables).

(b) PVC — V-75 moisture-resistant grade polyvinyl chloride complying with the appropriate requirements of AS 3147 (for multicore control cables).