

To be reviewed (see memo inside)

See also POWER/AC

1989 ED.

AS 3008.1—1984
UDC 621.315.3:696.6

Amend 1.

Australian Standard 3008.1—1984

ELECTRICAL INSTALLATIONS— SELECTION OF CABLES

Part 1—CABLES FOR ALTERNATING VOLTAGES UP TO AND INCLUDING 0.6/1 kV

STANDARDS ASSOCIATION
OF AUSTRALIA
22 AUG 1984
MELBOURNE LIBRARY



STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

This Australian standard was prepared by Committee EL/1, Wiring Rules. It was approved on behalf of the Council of the Standards Association of Australia on 18 April 1984 and published on 3 August 1984.

The following interests are represented on Committee EL/1:

Association of Consulting Engineers Australia
Australian Consumers Association
Australian Electrical and Electronic Manufacturers Association
Confederation of Australian Industry
Department of Housing and Construction
Electrical Contractors Associations of Australia
Electrical Regulatory Authorities
Electrical Trades Union of Australia
Electricity Supply Association of Australia
Institute of Electrical Inspectors
Institution of Engineers Australia
Insurance Council of Australia
Telecom Australia

Review of Australian Standards. To keep abreast of progress in industry, Australian standards are subject to periodic review and are kept up-to-date by the issue of amendments or new editions as necessary. It is important, therefore that standards users ensure that they are in possession of the latest edition, and any amendments thereto.

Full details of all SAA publications will be found in the Catalogue of Australian Standards; this information is supplemented each month by SAA's journal 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn standards.

Suggestions for improvements to Australian standards, addressed to the head office of the Association, are welcomed. Notification of any inaccuracy or ambiguity found in an Australian standard should be made without delay in order that the matter may be investigated and appropriate action taken.

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

AMENDMENT No 1

to

AS 3008.1—1984

ELECTRICAL INSTALLATIONS—SELECTION OF CABLES

Part 1—CABLES FOR ALTERNATING VOLTAGES UP TO AND INCLUDING 0.6/1 kV

CORRECTION

SUMMARY: The following sections of the standard are covered by this amendment: Clauses 2.4, 2.5, Tables 22, 23, Fig. 2, Tables 44, and Appendix B.

Published on 5 October 1984.

AMDT
No 1
OCT.
1984

Page 7. Clause 2.4(e).

Third line *delete* 'Tables 40 to 58' and *substitute*
'Tables 40 to 57'.








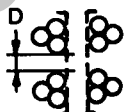
AMDT
No 1
OCT.
1984

Page 8. Clause 2.5(b).

Last line *delete* 'Table 59' and *substitute* 'Table 58'.


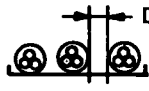

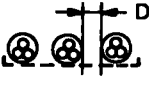




Currently in preview, click buy full version

TABLE 22
DERATING FACTORS FOR CIRCUITS OF SINGLE-CORE CABLES
INSTALLED ON TRAYS, RACKS, CLEATS, OR OTHER SUPPORTS IN AIR

1	2	3	4	5, 6, 7			
				Derating factors <i>b,c,d,h</i>			
				Number of circuits			
			1	2	3		
Unperforated trays		1	2 or 3 cables in horizontal formation	0.95	0.85	0.85	
				2	0.92	0.83	0.77
				3	0.91	0.82	0.76
Perforated trays		1	2 or 3 cables in horizontal formation	0.95	0.89	0.87	
				2	0.94	0.85	0.81
				3	0.93	0.84	0.79
Ladder supports, racks and cleats		1	2 or 3 cables in horizontal formation	1.0	0.95	0.94	
				2	0.95	0.90	0.88
				3	0.94	0.89	0.85
Vertical perforated trays		1	2 or 3 cables in vertical formation	0.94	0.85	—	
		2	0.92	0.83	—		
Unperforated trays		1	2 or 3 cables in trefoil formation	0.98	0.96	0.94	
				2	0.95	0.91	0.87
				3	0.94	0.90	0.85
Perforated trays		1	2 or 3 cables in trefoil formation	1.0	0.98	0.96	
				2	0.97	0.93	0.89
				3	0.96	0.92	0.86
Ladder supports		1	2 or 3 cables in trefoil formation	1.0	1.0	1.0	
				2	0.97	0.95	0.93
				3	0.97	0.94	0.90
Vertical perforated trays		1	2 or 3 cables in trefoil formation	1.0	0.91	0.89	
		2	1.0	0.90	0.86		

- a* Earthing conductors, lightly loaded neutral conductors of three-phase circuits and conductors subject only to momentary loading, such as control wiring, shall not be taken into account when considering the number of circuits.
- b* These derating factors are to be applied to groups of two, three or four single-core cables for which the current-carrying capacity for a single circuit is obtained from columns 4 and 5 of Tables 4 to 7, and Tables 12 to 17. The factors are also applicable to groups of single-core cables making up parallel circuits in accordance with Clause 3.5.2.7.
- c* These factors are based on uniform groups of cables, equally loaded. In accordance with Clause 3.5.6 the factors for circuits subject to intermittent or varying loads may be higher.
- d* These factors are applicable to single layers of cables or trefoil groups, as shown in column 2. Where there is more than one layer on the same tray or ladder support, Table 21 may be used.
- e* The vertical spacing of horizontal trays and ladder supports shall be not less than 300 mm.
- f* The horizontal spacing of vertical trays mounted back-to-back shall be not less than 230 mm.
- g* A perforated tray is a tray having not less than 30 percent of its surface area removed by the perforation.
- h* No derating factor is applicable for the minimum spacings specified in Clause 3.5.2.2(c) and Fig. 1(a).

TABLE 23
DERATING FACTORS FOR CIRCUITS OF MULTICORE CABLES
INSTALLED ON TRAYS, RACKS, CLEATS OR OTHER SUPPORTS IN AIR

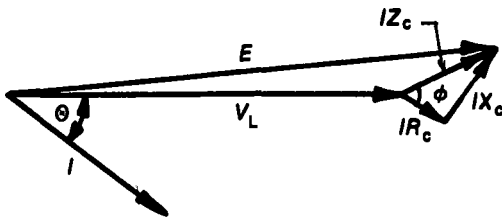
1	2	3	4	5	6	7	8	9						
			Derating factors <i>a,b,c,d,h</i>											
			Number of cables						1	2	3	4	5	6
Unperforated trays	 Touching <i>e</i>	1	0.97	0.85	0.78	0.75	0.71	0.68						
		2	0.97	0.84	0.76	0.73	0.68	0.63						
		3	0.97	0.83	0.75	0.72	0.66	0.61						
	 Spaced <i>e</i>	1	0.97	0.96	0.94	0.93	0.90	—						
		2	0.97	0.95	0.92	0.90	0.86	—						
		3	0.97	0.94	0.91	0.89	0.84	—						
Perforated trays	 Touching <i>e,g</i>	1	1.0	0.88	0.82	0.77	0.73	0.73						
		2	1.0	0.87	0.80	0.76	0.72	0.68						
		3	1.0	0.86	0.79	0.75	0.71	0.66						
	 Spaced <i>e,g</i>	1	1.0	1.0	0.98	0.95	0.91	—						
		2	1.0	0.99	0.96	0.92	0.87	—						
		3	1.0	0.98	0.95	0.91	0.85	—						
Ladder supports racks and cleats	 Touching	1	1.0	0.87	0.82	0.80	0.79	0.78						
		2	1.0	0.86	0.80	0.78	0.76	0.73						
		3	1.0	0.85	0.79	0.76	0.73	0.70						
	 Spaced <i>e,g</i>	1	1.0	1.0	1.0	1.0	1.0	—						
		2	1.0	0.99	0.98	0.97	0.96	—						
		3	1.0	0.98	0.97	0.96	0.93	—						
Vertical perforated trays	 Touching <i>f,g</i>	1	1.0	0.88	0.82	0.77	0.73	0.72						
		2	1.0	0.88	0.81	0.76	0.72	0.70						
	 Spaced <i>f,g</i>	1	1.0	0.91	0.89	0.88	0.87	—						
		2	1.0	0.91	0.88	0.87	0.86	—						

- a* Earthing conductors, lightly loaded neutral conductors of three-phase circuits and conductors subject only to momentary loading, such as control wiring, shall not be taken into account when considering the number of circuits.
- b* These derating factors are to be applied to groups of multicore cables for which the current-carrying capacity for a single circuit is obtained from columns 2 and 3 of Tables 8 to 11, Tables 12 to 16 and Table 18. The factors are also applicable to groups of multicore cables making up parallel circuits in accordance with Clause 3.5.2.7.
- c* These factors are based on uniform groups of cables, equally loaded. In accordance with Clause 3.5.6 the factors for circuits subject to intermittent or varying loads may be higher.
- d* These factors are applicable to single layers of cables as shown in column 2. Where there is more than one layer on the same tray or ladder support, Table 21 may be used.
- e* The vertical spacing of horizontal trays and ladder supports shall be not less than 300 mm.
- f* The horizontal spacing of vertical trays mounted back-to-back shall be not less than 230 mm.
- g* A perforated tray is a tray having not less than 30 percent of its surface area removed by the perforation.
- h* No derating factor is applicable for the minimum spacings specified in Clause 3.5.2.2(c) and Fig. 1(b).

AMDT
No 1
OCT.
1984

Page 42. Fig. 2(a).

Delete existing Fig. 2(a) and substitute:



(a) $\cos \Theta = 0.8$ lagging

AMDT
No 1
OCT.
1984

Page 50. Table 42.

Delete existing table and substitute:

TABLE 42
THREE-PHASE VOLTAGE DROP AT 50 Hz OF MULTICORE CABLE WITH
CIRCULAR COPPER CONDUCTORS

Conductor size mm ²	Three-phase voltage drop at 50 Hz (mV/m)							
	Conductor temperature (°C)							
	45		60		75		90	
	Max	0.8 p.f.	Max	0.8 p.f.	Max	0.8 p.f.	Max	0.8 p.f.
1.0	34.5		36.2		8.1		40.0	
1.5	23.4		24.2		5.5		26.7	
2.5	13.8		14.7		3.3		16.1	
4	8.76		9.23		2.1		10.2	
6	5.85		6.17		1.4		6.81	
10	3.48		3.65		0.86		4.04	
16	2.18		2.28		0.53		2.55	
25	1.29		1.35		0.31		1.49	
35	1.01		1.06		0.23		1.17	
50	0.750		0.790		0.17		0.866	
70	0.528		0.554		0.12		0.608	
95	0.404		0.421		0.09		0.461	
120	0.322		0.336		0.07		0.365	
150	0.272		0.282		0.05		0.305	
185	0.23		0.241		0.04		0.258	
240	0.19	0.194	0.199	0.199	0.206	0.206	0.211	0.211
300	0.17	0.172	0.178	0.177	0.182	0.182	0.187	0.187
400	0.15	0.153	0.163	0.157	0.166	0.161	0.169	0.164
500	0.14	0.135	0.146	0.138	0.149	0.141	0.151	0.144
630	0.13	0.123	0.139	0.126	0.140	0.128	0.141	0.130

AMDT Page 51. Table 44.
 No 1
 OCT. Delete existing table and substitute:
 1984

TABLE 44
THREE-PHASE VOLTAGE DROP AT 50 Hz OF SINGLE-CORE
INSULATED AND SHEATHED TINNED COPPER CONDUCTOR,
LAI D FLAT TOUCHING

Conductor size	Three-phase voltage drop at 50 Hz, mV/A.m								
	Conductor temperature, °C								
	45		60		75		90		
	mm ²	Max	0.8 p.f.	Max	0.8 p.f.	Max	0.8 p.f.	Max	0.8 p.f.
1.0	33.9		35.9		37.6		39.5		
1.5	22.9		24.1		25.3		26.7		
2.5	13.7		14.4		15.2		15.9		
4	8.68		9.14		9.62		10.1		
6	5.80		6.11		6.42		6.7		
10	3.43		3.64		3.83		4.00		
16	2.18		2.30		2.41		2.53		
25	1.29		1.35		1.42		1.49		
35	1.01		1.06		1.11		1.16		
50	0.755		0.793		0.831		0.868		
70	0.542		0.566		0.592		0.614		
95	0.424		0.443		0.461		0.478		
120	0.342		0.357		0.37		0.383		
150	0.301		0.317		0.326		0.333		
185	0.262	0.260	0.268	0.267	0.275	0.275	0.284	0.284	0.284
240	0.232	0.224	0.236	0.231	0.241	0.237	0.246	0.243	0.243
300	0.215	0.202	0.218	0.208	0.22	0.212	0.225	0.217	0.217
400	0.201	0.183	0.204	0.187	0.206	0.197	0.208	0.194	0.194
500	0.192	0.169	0.194	0.172	0.196	0.175	0.197	0.178	0.178
630	0.183	0.156	0.184	0.161	0.185	0.160	0.189	0.166	0.166

AMDT Page 62. Clause B1.1(a).
 No 1
 OCT. Delete '(a) All cables in one circuit or duct' and sub-
 1984 stitute '(a) All cables in one conduit or duct.'

Please circulate AS 15, a SF, ~~BY~~ ~~EE~~
mic

STANDARDS ASSOCIATION
OF AUSTRALIA

Date..... File No.....

Memo. by *Anne* To: *All*

Re Letter..... of date.....

AS 3008.1 - 1984

*this is going to be revised
next year to put it in line*

with AS 3000 - 1986. It will

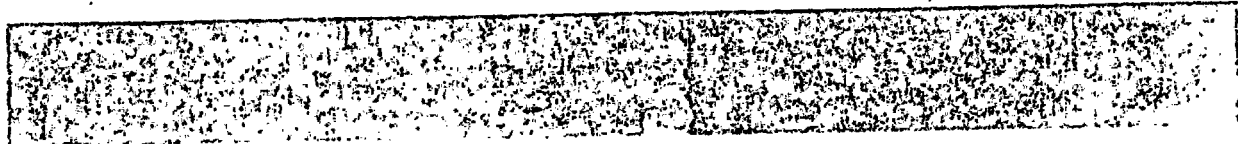
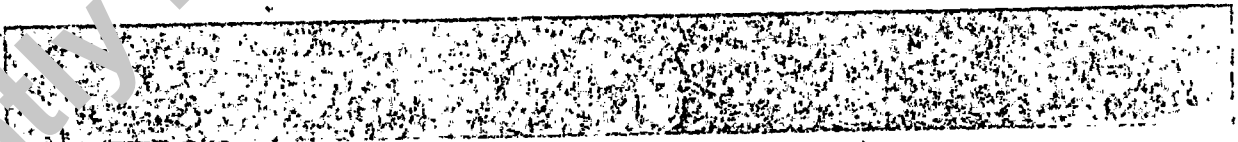
be at least 6 months from

now. Information from Jim

Tinsley 26 12 77.

Anne

A31



AUSTRALIAN STANDARD

**ELECTRICAL INSTALLATIONS—
SELECTION OF CABLES**

Part 1

**CABLES FOR ALTERNATING
VOLTAGES UP TO AND
INCLUDING 0.6/1 kv**

AS 3008.1—1984

First published 1984

PUBLISHED BY THE STANDARDS ASSOCIATION OF AUSTRALIA
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY, N.S.W.

ISBN 0 7262 3490 7

PREFACE

This standard was prepared by a specialist subcommittee of the Association's Wiring Rules Committee. Its preparation was undertaken to provide a comprehensive standard on cable selection for use in conjunction with AS 3000, SAA Wiring Rules. It is Part 1 of a two-part standard, this part dealing with cables for use with alternating voltages up to and including 0.6/1 kV. Part 2 in course of preparation will deal with cables for use with alternating voltages over 1 kV.

This standard provides sustained current-carrying capacities and voltage drop values for those types of electrical cable and installation practices in common use in Australia. Also provided in Clause 5 is information on cable selection based on short-circuit temperature limits.

This standard does not take into account the effects that may occur owing to temperature rise at the terminals of equipment and reference is necessary to AS 3000 and the individual equipment standards. In this regard, special provisions are being evaluated for inclusion in the 1986 edition of AS 3000.

The contents of the standard are a development of the limited provision of Appendix B to AS 3000 and it is expected that at the next revision of AS 3000, Appendix B will be modified and reduced in size and reference made to this standard.

A significant amount of explanatory material is also provided on the application of rating factors which arise from the particular installation conditions of a single circuit or groups of circuits. Furthermore a number of worked examples on cable selection are included in Appendix B.

©Copyright — STANDARDS ASSOCIATION OF AUSTRALIA 1984

Users of standards are reminded that copyright subsists in all SAA publications. No part of this publication may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing of the Standards Association of Australia.

CONTENTS

	<i>Page</i>
1. SCOPE AND APPLICATION	
1.1 Scope	6
1.2 Application and Alternative Specifications	6
1.3 Referenced Documents	6
1.4 Definitions	6
2. CABLE SELECTION PROCEDURE	
2.1 General	7
2.2 Selection Process	7
2.3 Determination of Minimum Cable Size Based on Current-carrying Capacity Considerations	7
2.4 Determination of Minimum Cable Size Based on Voltage Drop Considerations	7
2.5 Determination of Minimum Cable Size Based on the Short-circuit Temperature Considerations	8
3. CURRENT-CARRYING CAPACITY	
3.1 General	8
3.2 Types of Conductors	8
3.3 Types of Cable	8
3.4 Installation Conditions	10
3.5 External Influences on Cables	11
4. VOLTAGE DROP	
4.1 General	41
4.2 Determination of Voltage Drop from mV/A.m Values	41
4.3 Determination of Voltage Drop from Circuit Impedance	41
4.4 Determination of Voltage Drop from Cable Operating Temperature	42
4.5 Determination of Voltage Drop from Load Power Factor	42
4.6 Determination of Voltage Drop in Unbalanced Multiphase Circuits	43
5. SHORT-CIRCUIT PERFORMANCE	
5.1 General	58
5.2 Factors Governing the Application of the Temperature Limits	58
5.3 Calculation of Permissible Short-circuit Currents	58
5.4 Influence of Method of Installation	59
5.5 Maximum Permissible Short-circuit Temperatures	59
APPENDICES	
A Recommended Circuit Configurations for the Installation of Single-core Cables in Parallel	61
B Examples on the Selection of Cables to Satisfy Current-carrying Capacity, Voltage Drop and Short-circuit Performance Requirements	62
C Related Standards	69
LIST OF TABLES	
1 Dimensions, Mass and Resistance of Standard Copper and Aluminium Conductors	9
2 Limiting Temperatures for Insulated Cables	10
3 Schedule of Installation Methods for Cables Deemed to Have the Same Current-carrying Capacity and Cross-references to Applicable Derating Tables	16
4 Current-carrying Capacities of Two Single-core 0.6/1 kV Sheathed and Unsheathed Non-armoured Cables With R75, V75 or V90 Insulation	20
5 Current-carrying Capacities of Two Single-core 0.6/1 kV Sheathed and Unsheathed Non-armoured Cables With XLPE, R-EP-90 or R-CSP-90 Insulation	21

	<i>Page</i>
6 Current-carrying Capacities of Three Single-core 0.6/1 kV Sheathed and Unsheathed Non-armoured Cables With R75, V75 or V90 Insulation.....	22
7 Current-carrying Capacities of Three Single-core 0.6/1 kV Sheathed and Unsheathed Non-armoured Cables With XLPE, R-EP-90 or R-CSP-90 Insulation	23
8 Current-carrying Capacities of Two-core 0.6/1 kV Insulated and Sheathed (Including Neutral Screened) Cables With or Without Earth Conductor, Armoured or Non-armoured With R75, V75 or V90 Insulation.....	24
9 Current-carrying Capacities of Two-core 0.6/1 kV Insulated and Sheathed (Including Neutral Screened) Cables With or Without Earth Conductor, Armoured or Non-armoured With XLPE, R-EP-90 or R-CSP-90 Insulation	25
10 Current-carrying Capacities of Three and Four-core 0.6/1 kV Insulated and Sheathed (Including Neutral Screened) Cables With or Without Earth Conductor, Armoured or Non-armoured With V75 or V90 Insulation	26
11 Current-carrying Capacities of Three and Four-core 0.6/1 kV Insulated and Sheathed (Including Neutral Screened) Cables With or Without Earth Conductor, Armoured or Non-armoured With XLPE, R-EP-90 or R-CSP-90 Insulation	27
12 Current-carrying Capacities of 0.6/1 kV Flexible Cables	28
13 Current-carrying Capacities of Flexible Cords	29
14 Current-carrying Capacities of Cables and Flexible Cords With R-S-150, Type 150 Fibrous or 150 Type PTFE Insulation	29
15 Current-carrying Capacities of Mineral-insulated Copper-sheathed Cables With Copper Conductors	30
16 Current-carrying Capacities of 1/1 kV Mineral-insulated Aluminium-sheathed PVC-served Cables With Aluminium Conductors	30
17 Current-carrying Capacities for Single-core 0.6/1 kV Paper-insulated Lead-sheathed Cables in Trefoil Formation	31
18 Current-carrying Capacities for Three-core and Four-core 0.6/1 kV Paper-insulated Lead-sheathed and Armoured or Aluminium-sheathed Cables	31
19 Current-carrying Capacities of Aerial Cables With Bare or Insulated Copper Conductors	32
20 Current-carrying Capacities of Aerial Cables With Bare or Insulated Aluminium Conductors	33
21 Derating Factors for Circuits of Single-core or Multicore Cables Bunched in Air or in Conduit or Similar Enclosures	34
22 Derating Factors for Circuits of Single-core Cables Installed on Trays, Racks, Cleats, or Other Supports in Air	35
23 Derating Factors for Circuits of Multicore Cables Installed on Trays, Racks, Cleats or Other Supports in Air	36
24 Derating Factors for Groups of Circuits of Single-core or Multicore Cables Installed Directly in the Ground	37
25 Derating Factors for Groups of Circuits of Single-core or Multicore Cables Installed in Underground Conduits, Pipes or Ducts	38
26 Rating Factors for Variations in Ambient Temperature for Cables in Air or Heated Concrete Slabs, and for Cables Buried Direct in Ground or in Underground Ducts	39
27 Rating Factors for Variations in Depth of Laying for Cables Buried Direct in the Ground and for Cables Installed in Underground Conduits, Pipes or Ducts	40
28 Rating Factors for Cables Buried Direct in Ground and for Cables Installed in Underground Enclosures Where the Thermal Resistivity of the Soil Varies from 1.2°C.m/W	40
29 Reactance at 50 Hz of all Cables Excluding Flexible Cords and Cables, Mineral-insulated Metal-sheathed Cables, Paper Insulated Cables and Aerial Conductors	44
30 Reactance at 50 Hz of Flexible Cords and Cables	44
31 Reactance at 50 Hz of Mineral-insulated Metal-sheathed Cables	45
32 Reactance at 50 Hz of Paper Insulated Lead Sheathed Cables	45

	<i>Page</i>
33 Reactance at 50 Hz of Single-core Aerial Cables With Bare or Insulated Conductors	46
34 A.C. Resistance at 50 Hz of Single-core Cable	46
35 A.C. Resistance at 50 Hz of Multicore Cable With Circular Conductors	47
36 A.C. Resistance at 50 Hz of Multicore Cable With Shaped Conductors	47
37 A.C. Resistance at 50 Hz of Flexible Cable and Cord With Copper Conductors	48
38 A.C. Resistance at 50 Hz of Mineral-insulated Metal-sheathed Cable ..	48
39 A.C. Resistance at 50 Hz of Single-core Aerial Cables With Bare or Insulated Conductors	49
40 Three-phase Voltage Drop at 50 Hz of Single-core Insulated and Sheathed Copper Conductor, Laid in Trefoil	49
41 Three-phase Voltage Drop at 50 Hz of Single-core Insulated and Sheathed Copper Conductor, Laid Flat Touching	50
42 Three-phase Voltage Drop at 50 Hz of Multicore Cable With Circular Copper Conductors	50
43 Three-phase Voltage Drop at 50 Hz of Single-core Insulated and Sheathed Tinned Copper Conductor, Laid in Trefoil	51
44 Three-phase Voltage Drop at 50 Hz of Single-core Insulated and Sheathed Tinned Copper Conductor, Laid Flat Touching	51
45 Three-phase Voltage Drop at 50 Hz of Multicore Cable With Circular Tinned Copper Conductors	52
46 Three-phase Voltage Drop at 50 Hz of Single-core Insulated and Sheathed Aluminium Conductor, Laid in Trefoil	52
47 Three-phase Voltage Drop at 50 Hz of Single-core Insulated and Sheathed Aluminium Conductor, Laid Flat Touching	53
48 Three-phase Voltage Drop at 50 Hz of Multicore Cable With Circular Aluminium Conductors	53
49 Three-phase Voltage Drop at 50 Hz of Single-core Flexible Cable and Cord With Copper Conductors, Laid in Trefoil	54
50 Three-phase Voltage Drop at 50 Hz of Multicore Flexible Cable and Cord With Copper Conductors	54
51 Three-phase Voltage Drop at 50 Hz of Single-core and Multicore Mineral-insulated Metal-sheathed Cables, Laid in Trefoil	55
52 Three-phase Voltage Drop at 50 Hz of Single-core Paper Insulated Cable With Copper Conductors, Laid in Trefoil	55
53 Three-phase Voltage Drop at 50 Hz of Single-core Paper Insulated Cables With Aluminium Conductors, Laid in Trefoil	56
54 Three-phase Voltage Drop at 50 Hz of Multicore Paper Insulated Cable With Copper Conductors	56
55 Three-phase Voltage Drop at 50 Hz of Multicore Paper Insulated Cable With Aluminium Conductors....	56
56 Three-phase Voltage Drop at 50 Hz of Aerial Conductors Bare and Insulated With Copper Conductors	57
57 Three-phase Voltage Drop at 50 Hz of Aerial Conductors Bare and Insulated With Aluminium Conductors	57
58 Values of Constant <i>K</i> for Determination of Permissible Short-circuit Currents	58
59 Temperature Limits for Insulating Materials in Contact With Conductors	59
60 Temperature Limits for Outer Sheath and Bedding Materials	59
61 Temperature Limits for Conductor and Metallic Sheath Materials and Components	60

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

for

ELECTRICAL INSTALLATIONS—SELECTION OF CABLES

PART 1—CABLES FOR ALTERNATING VOLTAGES UP TO AND INCLUDING 0.6/1 kV

1. SCOPE AND APPLICATION

1.1 SCOPE. This standard sets out a method for cable selection for those types of electrical cables and methods of installation which are in common use at working voltages up to and including 0.6/1 kV a.c.

Three criteria are given for cable selection as follows:

- (a) Current-carrying capacity.
- (b) Voltage-drop.
- (c) Short-circuit temperature rise.

1.2 APPLICATION AND ALTERNATIVE SPECIFICATIONS. AS 3000 gives current-carrying capacities for a limited number of cable installation conditions. These conditions are included in this standard but, in some cases where recalculations have been performed, the tabulated values differ slightly between the standards. Where this occurs the current-carrying capacity given in this standard is considered to be more accurate but either value is acceptable for the application of any appropriate requirements of AS 3000, e.g. maximum current rating of a circuit-protective device.

Where the type of cable or method of installation is not specifically covered in the tables of this standard, current-carrying capacities obtained from alternative specifications such as ERA Report 69-30, may be employed.

ERA Report 69-30, particularly Part III, gives information on the following areas which are not covered by this standard:

- (a) The d.c. current-carrying capacities of two single-core cables and one two-core cable.
- (b) The current-carrying capacity of armoured single-core cables.
- (c) Group rating factors for underground cables laid in tier formation.

Current-carrying capacities may also be determined by calculation using IEC 287 and appropriate cable data.

This standard gives the sustained or continuous constant current which is sufficient to produce the maximum permissible cable temperature under specified ambient conditions. The time taken to reach this steady state temperature will vary depending on the type of cable and installation conditions. There will be many cable installations where, because of cable selection practices or demand patterns, the current is not sustained at the maximum specified in this standard. Under these conditions care should be taken in the application of the correction factors included in Tables 21 to 25; it may be possible to derive other appropriate correction factors for these installations.

The subject of assigning a current-carrying capacity to a cyclically or intermittently loaded cable is not covered in this standard. However reference may be made to ERA Report F/T 186 for information on the determination of such cable ratings by calculation.

1.3 REFERENCED DOCUMENTS.

1.3.1 Standards. The following standards are referred to in this standard:

- AS 1125 Conductors in Insulated Cables and Flexible Cords (metric units)
- AS 3000 SAA Wiring Rules
- AS 3191 Approval and Test Specification for Electric Flexible Cords
- AS 3300 Approval and Test Specification for General Requirements for Household and Similar Electrical Appliances.

1.3.2 ERA Reports. The following ERA Technology Ltd (UK) Reports are referred to in this standard. *available from Syd. 23.8.84*

- 69-30 Current Rating Standards for Distribution Cables
- Part I Sustained Current Ratings for Paper-insulated Lead-sheathed Cables
- Part II Sustained Current Ratings for Paper-insulated Cables With Aluminium Sheath/Neutral Conductor and Three Shaped Solid Aluminium Phase Conductors
- Part III Sustained Current Ratings for PVC-insulated Cables
- Part IV (Not yet allocated)
- Part V Sustained Current Ratings for Armoured Cables with Thermo-setting Insulation

F/T 186 Methods for the Calculation of Cyclic Rating Factors and Emergency Loading for Cables Laid Direct in the Ground or in Ducts.

NOTE: For related Australian standard approval and test specification and IEC standards see Appendix C.

1.4 DEFINITIONS. For the purpose of this standard, the definitions of AS 3000 apply in addition to, and except as varied by the following definitions:

1.4.1 Ambient temperature—the temperature of the medium in the immediate neighbourhood of the installed cable—

- (a) including any increase in temperature due to materials or equipment to which the cables are connected, or are to be connected; but
- (b) excluding any increase in temperature which may be due to the heat arising from the cables at that point.

1.4.2 Continuous loading—under consideration.

1.4.3 Cyclic loading—under consideration.

1.4.4 Route length—the distance measured along a run of wiring from the origin of the circuit to the point of consideration, e.g. the distance measured between a switchboard and a motor.