TABLE 10

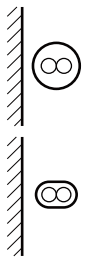
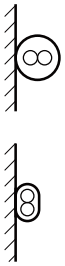
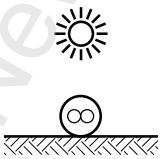
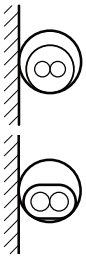
CURRENT-CARRYING CAPACITIES

CABLE TYPE: TWO-CORE SHEATHED (See Note 1)

INSULATION TYPE: THERMOPLASTIC (See Note 2)

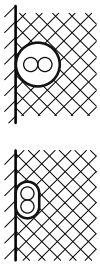
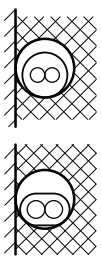
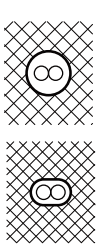
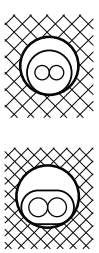
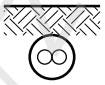
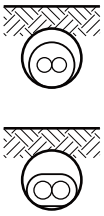
MAXIMUM CONDUCTOR TEMPERATURE: 75°C

REFERENCE AMBIENT TEMPERATURE: 30°C IN AIR, 15°C IN GROUND

1	2	3	4	5	6	7	8	9	10	11	12	13
Conductor size	Current-carrying capacity, A											
	Unenclosed									Enclosed		
	Spaced			Touching			Exposed to sun			Wiring enclosure in air		
												
	Cu		Al	Cu		Al	Cu		Al	Cu		Al
mm^2	Solid/ Stranded	Flexible		Solid/ Stranded	Flexible		Solid/ Stranded	Flexible		Solid/ Stranded	Flexible	
1	17	18	—	16	17	—	13	14	—	15	15	—
1.5	22	23	—	21	21	—	16	16	—	18	19	—
2.5	31	30	—	30	29	—	23	22	—	26	26	—
4	42	40	—	39	38	—	31	30	—	34	33	—
6	52	51	—	50	48	—	39	36	—	44	43	—
10	73	72	—	68	67	—	52	51	—	59	58	—
16	97	95	75	91	89	71	68	67	54	78	78	59
25	129	125	100	122	119	95	90	88	71	103	99	80
35	158	156	123	149	146	115	111	107	86	128	124	99
50	194	195	150	181	184	141	132	133	103	152	153	117
70	245	245	190	229	230	178	165	165	128	194	193	150
95	302	293	234	283	275	219	200	194	155	233	226	180
120	350	347	272	328	325	255	230	227	179	275	269	213
150	400	397	310	374	372	291	259	257	202	309	304	239
185	459	450	358	430	422	335	294	287	229	357	348	278
240	544	536	425	508	500	398	342	335	268	415	420	325
300	624	612	489	583	572	457	386	377	303	483	473	380
400	719	725	570	671	676	532	438	438	348	549	570	437
500	816	830	656	762	773	611	489	491	393	640	643	514

(*continued*)

TABLE 10 (*continued*)

14	15	16	17	18	19	20	21	22	23	24	25	26	27
	Current-carrying capacity, A												
	Thermal insulation								Buried direct		Underground wiring enclosure		
	Partially surrounded by thermal insulation, unenclosed		Partially surrounded by thermal insulation, in a wiring enclosure		Completely surrounded by thermal insulation, unenclosed		Completely surrounded by thermal insulation, in a wiring enclosure						
Conductor size													
mm²	Cu	Al	Cu	Al	Cu	Al	Cu	Al	Cu	Al	Cu		Al
											Solid/ Stranded	Flexible	
1	13	—	11	—	8	—	7	—	19	—	19	20	—
1.5	16	—	15	—	10	—	9	—	23	—	23	24	—
2.5	23	—	22	—	15	—	14	—	33	—	33	32	—
4	31	—	27	—	19	—	17	—	43	—	43	42	—
6	40	—	35	—	25	—	23	—	55	—	55	53	—
10	55	—	48	—	34	—	30	—	73	—	73	72	—
16	73	56	62	48	46	35	39	30	125	97	95	94	73
25	97	75	82	64	60	47	51	40	162	125	123	119	96
35	120	92	103	80	74	58	64	49	196	152	150	146	117
50	145	113	122	95	—	—	—	—	232	179	178	179	139
70	184	143	155	120	—	—	—	—	285	221	222	222	173
95	226	176	186	145	—	—	—	—	342	265	267	260	208
120	262	204	219	171	—	—	—	—	391	304	310	305	242
150	300	233	247	192	—	—	—	—	438	340	349	344	271
185	344	268	285	222	—	—	—	—	494	385	399	388	311
240	407	318	332	260	—	—	—	—	572	447	463	461	362
300	466	366	388	303	—	—	—	—	645	506	531	519	417
400	537	425	440	349	—	—	—	—	729	579	603	616	477
500	609	489	512	410	—	—	—	—	815	655	691	692	554

NOTES TO TABLE 10:

1 Applies to cables with or without earth core, armoured or unarmoured, including neutral screened cables.

2 The normal operating temperature of thermoplastic cables, including flexible cords installed as installation wiring, is based on a conductor temperature of 75°C. This is due to the risk of thermal deformation of insulation if the cables are clipped, fixed or otherwise installed in a manner that exposes the cable to severe mechanical pressure at higher temperatures.

V-90 and V-90HT insulated cables may be operated up to the maximum permissible temperatures 90°C and 105°C provided that the cable is installed in a manner that is not subject to, or is protected against, severe mechanical pressure at temperatures higher than 75°C. Such applications also allow for cables to be used in—

(a) locations where the ambient temperatures exceed the normal 30°C, e.g. equipment wiring in luminaires and heating appliances, or in roof spaces affected by high summer temperatures; and

(b) locations affected by bulk thermal insulation that restricts the dissipation of heat from the cable.

3 See Tables 3(1), 3(2), 3(3) and 3(4) for cable configurations deemed to have the same current-carrying capacities as those illustrated.

4 Derating factors may apply as follows:

(a) The current-carrying capacities apply to single circuits. For grouped cable circuits, see Clause 3.5.2 and Tables 22, 23, 25(1), 25(2), 26(1) and 26(2) for appropriate derating factors.

(b) For a single circuit fixed to the underside of a ceiling or similar horizontal surface, see Table 23 for the derating factor to be applied to the current-carrying capacities given in Columns 5 to 7.

(c) For a single circuit fixed to unperforated cable tray, see Table 24 for the derating factor to be applied to the current-carrying capacities given in Columns 2 to 4.

(d) For ambient temperature and depth of laying factors, see Tables 27(1), 27(2), 28(1) and 28(2).

5 To calculate the single-phase voltage drop of these configurations, multiply the appropriate three-phase voltage drop value in Table 42, Table 45 or Table 48 by 1.155.

6 These ratings are based on 30°C ambient air temperature and 15°C ambient soil temperature. For other conditions, see Clause 3.5.3.

7 For conductor sizes up to 10 mm^2 in Column 23, the values are based on ratings for wiring in underground wiring enclosures.

8 Cables within the scope of AS/NZS 5000 (up to 25 mm^2 and with a maximum permissible conductor operating temperature of not less than 90°C) may be rated to the values in the Table 11 covering 90°C insulated cables, subject to—

(a) information provided in Note 2; and

(b) any other relevant requirements of AS/NZS 3000.

9 Refer to Paragraph C3 of AS/NZS 3000 for details on simplified protective device selection (MCBs) for overload protection.

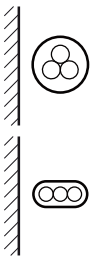
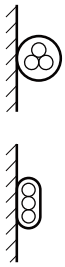
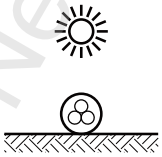
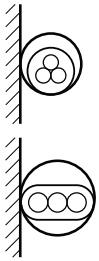
TABLE 13
CURRENT-CARRYING CAPACITIES

CABLE TYPES: THREE-CORE AND FOUR-CORE (See Note 1)

INSULATION TYPE: THERMOPLASTIC (See Note 2)

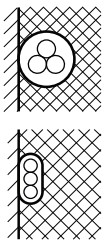
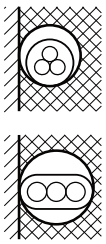
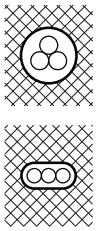
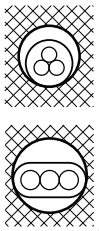
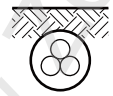
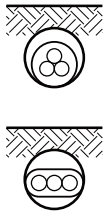
MAXIMUM CONDUCTOR TEMPERATURE: 75°C

REFERENCE AMBIENT TEMPERATURE: 30°C IN AIR, 15°C IN GROUND

1	2	3	4	5	6	7	8	9	10	11	12	13
Conductor size	Current-carrying capacity, A											
	Unenclosed									Enclosed		
	Spaced			Touching			Exposed to sun			Wiring enclosure in air		
												
	Cu		Al	Cu		Al	Cu		Al	Cu		Al
mm²	Solid/ Stranded	Flexible		Solid/ Stranded	Flexible		Solid/ Stranded	Flexible		Solid/ Stranded	Flexible	
1	15	15	—	14	15	—	10	11	—	13	13	—
1.5	18	19	—	17	18	—	14	14	—	16	16	—
2.5	26	25	—	25	24	—	19	18	—	23	22	—
4	35	34	—	33	32	—	26	25	—	29	27	—
6	46	43	—	42	41	—	33	32	—	38	36	—
10	62	62	—	58	58	—	44	43	—	50	49	—
16	82	81	64	78	76	60	58	57	46	66	65	51
25	111	107	86	104	101	81	76	74	59	87	83	67
35	137	133	106	128	125	99	93	91	73	107	105	83
50	166	169	129	156	157	121	113	114	88	128	128	99
70	211	211	163	196	197	153	140	140	109	162	162	127
95	260	253	202	243	236	188	171	165	132	202	196	156
120	302	299	235	282	278	219	196	193	153	230	227	179
150	345	343	268	321	319	250	221	219	172	260	261	202
185	397	390	310	369	363	288	251	245	196	300	293	235
240	470	464	368	437	431	343	292	286	228	360	352	283
300	538	529	424	499	490	393	328	321	259	—	—	—
400	620	626	495	575	579	458	372	372	296	—	—	—
500	702	715	568	651	661	526	414	416	335	—	—	—

(*continued*)

TABLE 13 (*continued*)

14	15	16	17	18	19	20	21	22	23	24	25	26	27
Conductor size	Current-carrying capacity, A												
	Thermal insulation								Buried direct		Underground wiring enclosure		
	Partially surrounded by thermal insulation, unenclosed		Partially surrounded by thermal insulation, in a wiring enclosure		Completely surrounded by thermal insulation, unenclosed		Completely surrounded by thermal insulation, in a wiring enclosure						
													
mm²	Cu	Al	Cu	Al	Cu	Al	Cu	Al	Cu	Al	Cu		Al
											Solid/ Stranded	Flexible	
1	10	—	10	—	7	—	6	—	15	—	15	17	—
1.5	14	—	13	—	9	—	8	—	20	—	20	20	—
2.5	19	—	18	—	13	—	11	—	28	—	28	26	—
4	26	—	23	—	17	—	15	—	36	—	36	35	—
6	34	—	30	—	22	—	18	—	46	—	46	44	—
10	47	—	40	—	29	—	25	—	61	—	61	59	—
16	62	48	54	41	39	30	33	26	106	83	80	78	62
25	83	65	68	54	52	40	43	33	138	107	103	100	80
35	103	79	86	66	64	49	54	41	165	129	125	123	98
50	124	97	101	79	—	—	—	—	196	152	150	151	116
70	157	122	130	100	—	—	—	—	241	187	187	186	145
95	194	150	162	125	—	—	—	—	289	224	229	221	177
120	226	176	185	144	—	—	—	—	330	256	261	255	202
150	258	200	207	162	—	—	—	—	370	287	293	292	228
185	295	231	241	188	—	—	—	—	417	326	334	326	261
240	350	274	288	226	—	—	—	—	482	378	395	386	309
300	—	—	—	—	—	—	—	—	542	427	444	433	350
400	—	—	—	—	—	—	—	—	613	488	515	514	411
500	—	—	—	—	—	—	—	—	682	551	574	575	464

NOTES TO TABLE 13:

1 Applies to cables with or without earth core, armoured or non-armoured, including neutral screened cables.

2 The normal operating temperature of thermoplastic cables, including flexible cords installed as installation wiring, is based on a conductor temperature of 75°C. This is due to the risk of thermal deformation of insulation if the cables are clipped, fixed or otherwise installed in a manner that exposes the cable to severe mechanical pressure at higher temperatures.

V-90 and V-90HT insulated cables may be operated up to the maximum permissible temperatures 90°C and 105°C provided that the cable is installed in a manner that is not subject to, or is protected against, severe mechanical pressure at temperatures higher than 75°C. Such applications also allow for cables to be used in—

(a) locations where the ambient temperatures exceed the normal 30°C, e.g. equipment wiring in luminaires and heating appliances, or in roof spaces affected by high summer temperatures; and

(b) locations affected by bulk thermal insulation that restricts the dissipation of heat from the cable.

3 See Tables 3(1), 3(2), 3(3) and 3(4) for cable configurations deemed to have the same current-carrying capacities as those illustrated.

4 Derating factors may apply as follows:

(a) The current-carrying capacities apply to single circuits. For grouped cable circuits, see Clause 3.5.2 and Tables 22, 24, 25(1), 25(2), 26(1) and 26(2) for appropriate derating factors.

(b) For a single circuit fixed to the underside of a ceiling or similar horizontal surface, see Table 22 for the derating factor to be applied to the current-carrying capacities given in Columns 5 to 7.

(c) For a single circuit fixed to unperforated cable tray, see Table 24 for the derating factor to be applied to the current-carrying capacities given in Columns 2 to 4.

(d) For ambient temperature and depth of laying factors, see Tables 27(1), 27(2), 28(1) and 28(2).

5 To determine the three-phase voltage drop of these configurations, refer to the appropriate value in Table 42, Table 45 or Table 48.

6 These ratings are based on 30°C ambient air temperature and 15°C ambient soil temperature. For other conditions, see Clause 3.5.3.

7 For conductor sizes up to 10 mm^2 in Column 23, the values are based on ratings for wiring in underground wiring enclosures.

8 Cables within the scope of AS/NZS 5000 (up to 25 mm^2) may be rated to the values in the Table 14 covering 90°C insulated cables, subject to—

(a) information provided in Note 2; and

(b) any other relevant requirements of AS/NZS 3000.

9 Refer to Paragraph C3 of AS/NZS 3000 for details on simplified protective device selection (MCBs) for overload protection.

TABLE 27(1)
RATING FACTORS

VARIANCE: AIR AND CONCRETE SLAB AMBIENT TEMPERATURES

INSTALLATION CONDITIONS: CABLES IN AIR OR HEATED CONCRETE SLABS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Conductor temperature °C	Rating factor																				
	Air and concrete slab ambient temperature (see Notes 1, 2 and 3), °C																				
	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	100	110	120	130	140
150	1.07	1.05	1.03	1.00	0.98	0.96	0.94	0.91	0.89	0.87	0.85	0.82	0.80	0.77	0.74	0.71	0.66	0.58	0.50	0.41	0.29
110	1.08	1.06	1.03	1.00	0.97	0.93	0.90	0.87	0.83	0.79	0.75	0.71	0.66	0.61	0.56	0.50	0.36	—	—	—	—
90	1.15	1.09	1.05	1.00	0.95	0.91	0.85	0.80	0.74	0.66	0.59	0.52	0.43	0.31	0.17	—	—	—	—	—	—
80	1.17	1.12	1.06	1.0	0.95	0.89	0.82	0.75	0.68	0.59	0.50	0.40	0.24	—	—	—	—	—	—	—	—
75	1.18	1.12	1.06	1.0	0.94	0.88	0.80	0.72	0.63	0.53	0.43	0.32		—	—	—	—	—	—	—	—

NOTES:

1 For heated concrete slabs, the ambient temperature shall be taken as the operating temperature of the slab.

2 The normal usage of high temperature insulation cables is in ambient air temperatures greater than 30°C, see Table 17.

3 For cables with a maximum permissible operating temperature above the normal use temperatures specified in Tables 3(1), 3(2), 3(3) and 3(4), derating may not be necessary, see Notes to Table 1 for further details.

TABLE 27(2)
RATING FACTORS

VARIANCE: SOIL AMBIENT TEMPERATURE

INSTALLATION CONDITIONS: CABLES BURIED DIRECT IN GROUND OR IN UNDERGROUND WIRING ENCLOSURES

1	2	3	4	5	6	7	8
Conductor temperature °C	Rating factor						
	Soil ambient temperature, °C						
	10	15	20	25	30	35	40
110	1.02	1.00	0.97	0.95	0.92	0.89	0.86
90	1.04	1.00	0.96	0.93	0.91	0.87	0.83
80	1.04	1.00	0.95	0.92	0.88	0.83	0.78
75	1.04	1.00	0.95	0.91	0.86	0.81	0.75

TABLE 42

THREE-PHASE VOLTAGE DROP (V_c) AT 50 Hz

CABLE TYPE: MULTICORE WITH CIRCULAR COPPER CONDUCTORS

1	2	3	4	5	6	7	8	9	10	11
Conductor size	Three-phase voltage drop (V_c) at 50 Hz, mV/A.m									
	Conductor temperature, °C									
	45		60		75		90		110	
mm²	Max.	0.8 p.f.	Max.	0.8 p.f.	Max.	0.8 p.f.	Max.	0.8 p.f.	Max.	0.8 p.f.
1	40.3	40.3	42.5	42.5	44.7	44.7	46.8	46.8	49.7	49.7
1.5	25.9	25.9	27.3	27.3	28.6	28.6	30.0	30.0	31.9	31.9
2.5	14.1	14.1	14.9	14.9	15.6	15.6	16.4	16.4	17.4	17.4
4	8.77	8.77	9.24	9.24	9.71	9.71	10.2	10.2	10.8	10.8
6	5.86	5.86	6.18	6.18	6.49	6.49	6.80	6.80	7.22	7.22
10	3.49	3.49	3.67	3.67	3.86	3.86	4.05	4.05	4.29	4.29
16	2.19	2.19	2.31	2.31	2.43	2.43	2.55	2.55	2.70	2.70
25	1.39	1.39	1.47	1.47	1.54	1.54	1.61	1.61	1.71	1.71
35	1.01	1.01	1.06	1.06	1.11	1.11	1.17	1.17	1.24	1.24
50	0.751	0.751	0.790	0.790	0.829	0.829	0.868	0.868	0.920	0.920
70	0.530	0.530	0.556	0.556	0.583	0.583	0.609	0.609	0.645	0.645
95	0.394	0.394	0.413	0.413	0.431	0.431	0.450	0.450	0.475	0.475
120	0.323	0.323	0.337	0.337	0.351	0.351	0.366	0.366	0.385	0.385
150	0.274	0.274	0.285	0.285	0.296	0.296	0.307	0.307	0.322	0.322
185	0.234	0.234	0.242	0.242	0.251	0.251	0.259	0.259	0.271	0.271
240	0.198	0.198	0.204	0.204	0.210	0.210	0.216	0.216	0.224	0.224
300	0.178	0.175	0.182	0.180	0.186	0.185	0.190	0.189	0.196	0.196
400	0.162	0.157	0.165	0.160	0.168	0.164	0.171	0.167	0.175	0.172
500	0.152	0.143	0.154	0.146	0.156	0.148	0.158	0.151	0.160	0.155

NOTE: These V_c values apply to a balanced three-phase circuit in which no current flows in the neutral conductor. To determine the single phase V_c the current in the neutral conductor needs to be considered by multiplying the three-phase value by $\frac{2}{\sqrt{3}} = 1.155$.