

Caledonian Medium Voltage Cables

Three Core Cables to VDE 0276-

www.caledonian-cables.com www.addison-cables.com

Rating factor for variation in thermal resistivity of soil depth

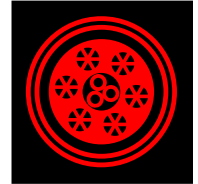
Nom.Cross-Section Area	Soil thermal resistivity K.m/W						
	0.8	0.9	1.0	1.5	2.0	2.5	3.0
Single							
50	1.15	1.11	1.07	0.91	0.81	0.73	0.68
70	1.16	1.12	1.07	0.91	0.81	0.73	0.68
95	1.16	1.12	1.07	0.91	0.81	0.73	0.68
120	1.16	1.12	1.07	0.91	0.81	0.73	0.68
150	1.17	1.12	1.07	0.91	0.81	0.73	0.68
185	1.17	1.12	1.07	0.91	0.81	0.73	0.68
240	1.17	1.12	1.07	0.91	0.80	0.73	0.68
300	1.18	1.12	1.07	0.91	0.80	0.73	0.68
400	1.18	1.12	1.07	0.91	0.80	0.73	0.67
500	1.18	1.12	1.07	0.91	0.80	0.73	0.67
630	1.18	1.12	1.07	0.91	0.80	0.73	0.67
800	1.18	1.12	1.07	0.91	0.80	0.72	0.67
1000	1.18	1.12	1.07	0.91	0.80	0.72	0.67
multicore							
16	1.12	1.08	1.05	0.93	0.84	0.77	0.72
25	1.13	1.09	1.05	0.93	0.83	0.77	0.71
35	1.13	1.09	1.06	0.92	0.83	0.76	0.71
50	1.13	1.09	1.06	0.92	0.83	0.76	0.71
70	1.14	1.09	1.06	0.92	0.83	0.75	0.70
95	1.14	1.09	1.06	0.92	0.83	0.75	0.70
120	1.14	1.10	1.06	0.92	0.82	0.75	0.69
150	1.14	1.10	1.06	0.92	0.82	0.75	0.69
185	1.14	1.10	1.06	0.92	0.82	0.74	0.69
240	1.15	1.10	1.07	0.92	0.82	0.74	0.69
300	1.15	1.10	1.07	0.92	0.82	0.74	0.69
400	1.15	1.10	1.07	0.92	0.82	0.74	0.69

Group rating factor for circuits of three single core cables. In trefoil and laid flat touching, horizontal formation (average values).

	No. of circuits	Spacing of circuits					
		Touching		0.15m*	0.3m	0.45m	0.6m
		Trefoil	Laid Flat				
1.9/3.3KV(1.8/3KV) to 12.7/22KV (12/20KV) Cables	2	0.78	0.80	0.81	0.85	0.88	0.90
	3	0.66	0.68	0.71	0.76	0.80	0.83
	4	0.59	0.62	0.65	0.72	0.76	0.80
	5	0.55	0.58	0.61	0.68	0.73	0.77
	6	0.52	0.55	0.58	0.66	0.72	0.76
19/33KV(18/30KV) Cables	2	0.79	0.81	0.81	0.85	0.88	0.90
	3	0.67	0.70	0.71	0.76	0.80	0.83
	4	0.62	0.65	0.65	0.72	0.76	0.80
	5	0.57	0.60	0.60	0.68	0.73	0.77
	6	0.54	0.57	0.57	0.66	0.70	0.76

*This configuration, at 0.15m spacing, may not be practical for the larger size cables.

Caledonian Medium Voltage Cables -Three Core Cables to VDE 0276



www.caledonian-cables.com www.addison-cables.com

Group rating factor for multicore cables in horizontal formation (average values).

	No. of cables in group	Spacing				
		Touching	0.15m	0.3m	0.45m	0.6m
1.9/3.3KV(1.8/3KV) to 12.7/22KV (12/20KV) Cables	2	0.80	0.85	0.89	0.90	0.92
	3	0.68	0.75	0.80	0.84	0.86
	4	0.62	0.70	0.77	0.80	0.84
	5	0.57	0.66	0.73	0.78	0.81
	6	0.55	0.63	0.71	0.76	0.80
19/33KV(18/30KV) Cables	2	0.80	0.83	0.87	0.89	0.91
	3	0.70	0.73	0.78	0.82	0.85
	4	0.64	0.68	0.74	0.78	0.82
	5	0.59	0.63	0.70	0.75	0.79
	6	0.56	0.60	0.68	0.74	0.78

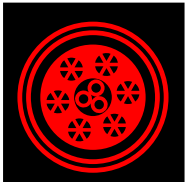
Cables laid direct in single way ducts:
(The term “ducts” applies to single earthenware, fibre or plastic pipes).

Variation in ground temperature

Ground Temperature	15	20	25	30	35	40	45
Cable Type	Rating Factor						
All Cables	1.00	0.97	0.93	0.89	0.86	0.82	0.76

Rating Factor for depth of laying (To center of cable or trefoil group of cables)

Depth of laying m	600/1000V cables		1900/3300V to 19000/33000V cables	
	Single Core	Multicore	Single Core	Multicore
0.50	1.00	1.00	-	-
0.60	0.98	0.99	-	-
0.80	0.95	0.97	1.00	1.00
1.00	0.93	0.96	0.98	0.99
1.25	0.90	0.95	0.95	0.97
1.50	0.89	0.94	0.93	0.96
1.75	0.88	0.94	0.92	0.95
2.00	0.87	0.93	0.90	0.95
2.50	0.86	0.92	0.89	0.93
3.00 or more	0.85	0.91	0.88	0.92



Caledonian Medium Voltage Cables

Technical information-

www.caledonian-cables.com www.addison-cables.com

Rating factor for variation in thermal resistivity of soil depth

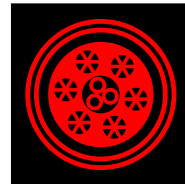
Nom. Cross-Section Area mm ²	Soil thermal resistivity K.m/W						
	0.8	0.9	1.0	1.5	2.0	2.5	3.0
Single Core							
50	1.08	1.06	1.04	0.94	0.87	0.82	0.77
70	1.09	1.06	1.04	0.94	0.87	0.81	0.76
95	1.09	1.06	1.04	0.94	0.87	0.81	0.76
120	1.10	1.07	1.04	0.94	0.86	0.80	0.75
150	1.10	1.07	1.04	0.94	0.86	0.80	0.75
185	1.10	1.07	1.04	0.93	0.86	0.79	0.75
240	1.11	1.07	1.05	0.93	0.86	0.79	0.74
300	1.11	1.08	1.05	0.93	0.85	0.79	0.74
400	1.11	1.08	1.05	0.93	0.85	0.78	0.73
500	1.11	1.08	1.05	0.93	0.85	0.78	0.73
630	1.12	1.08	1.05	0.93	0.84	0.78	0.72
800	1.12	1.09	1.05	0.93	0.84	0.77	0.72
1000	1.13	1.09	1.05	0.93	0.84	0.77	0.71
multicore							
16	1.04	1.03	1.02	0.97	0.92	0.88	0.85
25	1.05	1.03	1.02	0.96	0.92	0.88	0.84
35	1.05	1.03	1.02	0.96	0.92	0.87	0.83
50	1.05	1.03	1.02	0.96	0.91	0.87	0.83
70	1.05	1.04	1.02	0.96	0.91	0.86	0.82
95	1.06	1.04	1.02	0.96	0.91	0.86	0.82
120	1.06	1.04	1.03	0.95	0.90	0.85	0.81
150	1.06	1.04	1.03	0.95	0.90	0.85	0.80
185	1.07	1.05	1.03	0.95	0.89	0.84	0.80
240	1.07	1.05	1.03	0.95	0.89	0.84	0.79
300	1.07	1.05	1.03	0.95	0.88	0.83	0.78
400	1.07	1.05	1.03	0.95	0.88	0.83	0.78

Group rating factor for circuits of three single core cables.
In trefoil single way ducts, horizontal formation (average values).

	No. of circuits	Spacing		
		Touching	0.45m	0.60m
1.9/3.3KV(1.8/3KV) to 12.7/22KV(12/20KV) Cables	2	0.85	0.88	0.90
	3	0.75	0.80	0.83
	4	0.70	0.76	0.80
	5	0.67	0.73	0.77
	6	0.64	0.71	0.76
	19/33KV(18/30KV) Cables	2	0.85	0.88
3		0.76	0.80	0.83
4		0.71	0.76	0.80
5		0.67	0.73	0.77
6		0.65	0.71	0.76

Caledonian Medium Voltage Cables

-Technical information



www.caledonian-cables.com www.addison-cables.com

Group rating factor for multicore cables in single way ducts, horizontal formation (average values).

	No. of ducts in group	Spacing			
		Touching	0.30m	0.45m	0.60m
1.9/3.3KV(1.8/3KV) to 12.7/22KV(12/20KV) Cables	2	0.88	0.91	0.93	0.94
	3	0.80	0.84	0.87	0.89
	4	0.75	0.81	0.84	0.87
	5	0.71	0.77	0.82	0.85
	6	0.69	0.75	0.80	0.84
19/33KV(18/30KV) Cables	2	0.87	0.89	0.92	0.93
	3	0.78	0.82	0.85	0.87
	4	0.73	0.78	0.82	0.85
	5	0.69	0.75	0.79	0.83
	6	0.67	0.73	0.78	0.82

Cables laid direct in free airs:

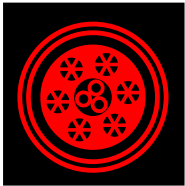
Variation in air temperature

Ground Temperature	25	30	35	40	45	50	55
Cable Type	Rating Factor						
Cables type up to 3.3KV	1.02	1.00	0.96	0.91	0.87	0.82	0.76
6.6Kv or above	1.00	0.95	0.91	0.86	0.80	0.75	0.69

Effect of grouping cables

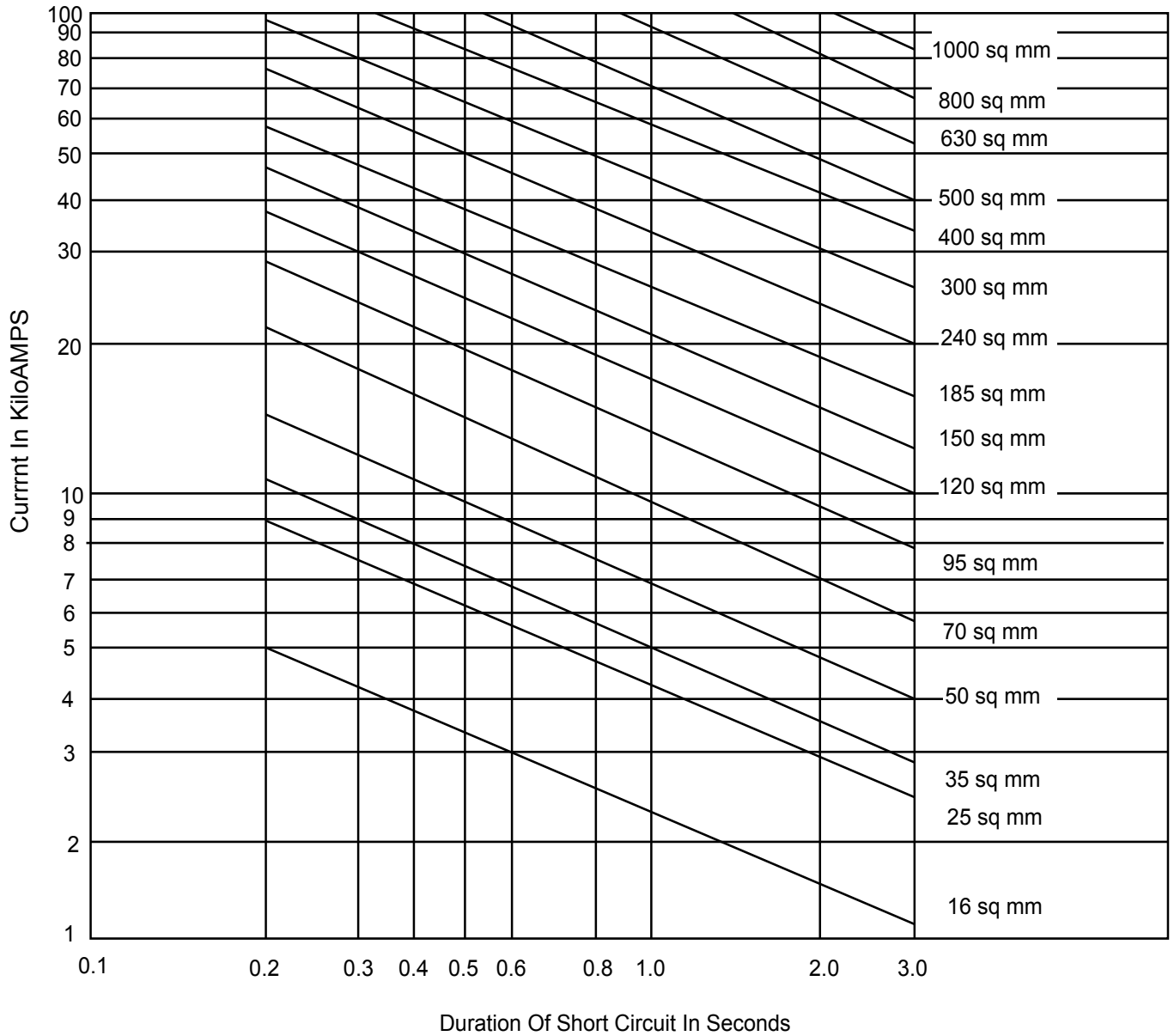
No reduction in rating is necessary where there is free circulation of air around the circuits providing that:

- 1) The horizontal clearance between circuits is not less than twice the overall diameter of an individual cable.
- 2) The vertical clearance between circuits is not less than four times the diameter of an individual cable.
- 3) If the number of circuits exceeds three, they are installed in a horizontal plane.

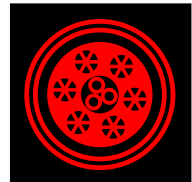


Short Circuit Ratings

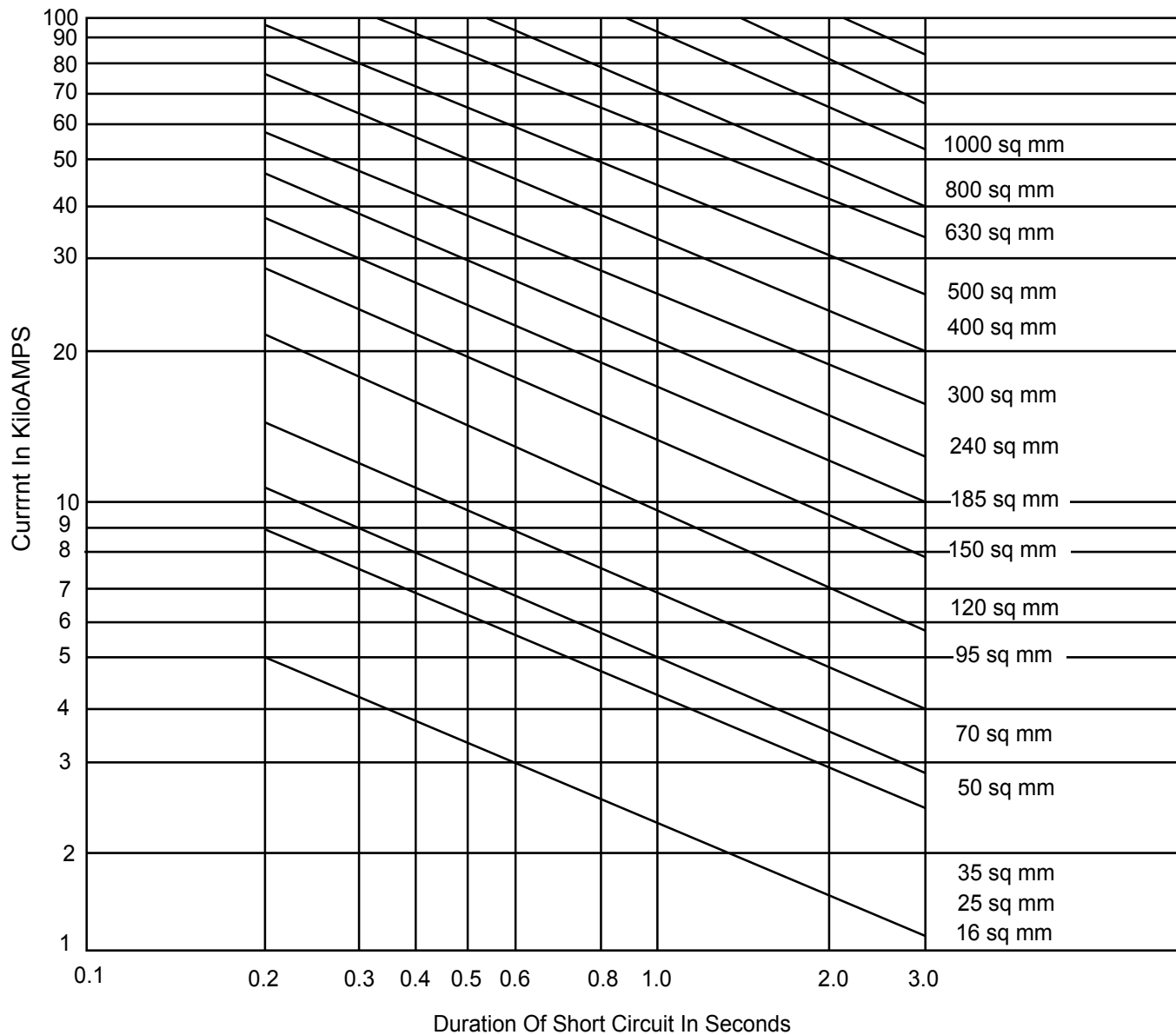
Short circuit rating –Copper conductor current in kiloamps



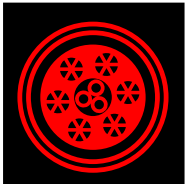
- Basis:
1. Cable fully located at start of short circuit. (Conductor temperature: 90°C)
 2. Conductor temperature at end of short circuit: 250°C



Short circuit rating –Aluminium conductor current in kiloamps



- Basis:
1. Cable fully located at start of short circuit. (Conductor temperature: 90°C)
 2. Conductor temperature at end of short circuit: 250°C



Caledonian Medium Voltage Cables

Technical information-

www.caledonian-cables.com www.addison-cables.com

Armour fault current

Nom. Cross-Section Area mm ²	Aluminium Wire Armoured Cables					Steel Wire Armoured Cables				
	3.8/6.6 (3.6/6) KV	6.35/11 (6/12) KV	8.7/15 KV	12.7/22 (12/20) KV	18/30 (19/33) KV	3.8/6.6 (3.6/6) KV	6.35/11 (6/12) KV	8.7/15KV	12.7/22 (12/20) KV	18/30 (19/33) KV
25						7370	10160	11510		
35						7800	10830	11960	13090	
50	6150	6660	7340	7860	12010	10380	11290	12640	13770	21500
70	6660	7170	7860	10680	12810	11290	12190	13540	14670	22580
95	7170	7690	10410	11210	13350	12190	13320	14450	19710	24010
120	7520	8030	10940	11750	13880	13090	14220	15350	20790	25090
150	8030	10680	11480	12280	18350	13770	14900	16030	21860	25810
185	10680	11480	12280	12810	19190	14900	15800	21860	23300	27240
240	11750	12280	13060	13880	20020	16480	21860	23660	25090	29030
300	12550	13080	13880	18770	21690	22580	23660	25090	26520	30830
400	13880	14150	19190	20020	22940	25090	25810	27240	28670	
500	19190	19610	20440	21690	24610					
630	21270	21270	22530	23360	26280					
800	23360	23360	24610	25450	28790					
1000	25450	25450	26700	27530	30870					

Wire Screen

Nom. Cross-Section Area	Maximum dc resistance at 20°C	Short Circuit Rating
mm ²	Ohm/km	A
16	1.19	2040
25	0.759	3200
35	0.542	4480

Copper wire applied helically or tape screen applied individually to each screened core, or collectively over laid up provide an earth fault current path.



Address:

**Marchants Industrial Centre, Mill Lane, Laughton, Lewes,
East Sussex, BN8 6AJ, UK**

Tel: 44-207-4195087

Fax: 44-207-8319489

E-mail: sales@caledonian-cables.com

www.caledonian-cables.com