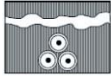
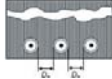


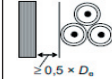
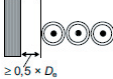
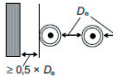


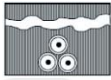
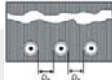


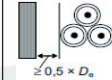
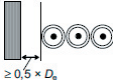
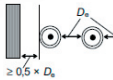
CURRENT CARRYING CAPACITY AND RATING FACTORS FOR MV CABLES

Current ratings for single core copper cables with rated voltage 3.6/6kV to 18/30kV *

Nominal cross section	Buried direct in the ground		In single way ducts		In air		
	Trefoil	Flat spaced	Trefoil ducts	Flat touching ducts	Trefoil	Flat touching	Flat space
							
mm ²	A	A	A	A	A	A	A
16	109	113	103	104	125	128	150
25	140	144	132	133	163	167	196
35	166	172	157	159	198	203	238
50	196	203	186	188	238	243	286
70	239	246	227	229	296	303	356
95	285	293	271	274	361	369	434
120	323	332	308	311	417	426	500
150	361	366	343	347	473	481	559
185	406	410	387	391	543	550	637
240	469	470	447	453	641	647	745
300	526	524	504	510	735	739	846
400	590	572	564	571	845	837	938
500	662	629	630	640	946	937	1030
630	741	692	695	705	1060	1050	1135

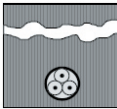
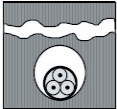
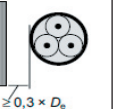
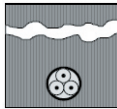
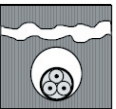
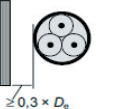
Maximum conductor temperature : 90°C
 Ambient air temperature : 30°C
 Ground temperature : 20°C
 Depth of laying : 0.8m
 Thermal resistivity of soil : 1.5 K.m/W
 Thermal resistivity of earthenware ducts : 1.2 K.m/W
 Screens bonded at both ends
 * : current rating calculated for cables having a rated voltage of 6/10kV

Current ratings for single core aluminum cables with rated voltage 3.6/6kV to 18/30kV *

Nominal cross section	Buried direct in the ground		In single way ducts		In air		
	Trefoil	Flat spaced	Trefoil ducts	Flat touching ducts	Trefoil	Flat touching	Flat space
							
mm ²	A	A	A	A	A	A	A
16	84	88	80	81	97	99	116
25	108	112	102	103	127	130	153
35	129	134	122	123	154	157	185
50	152	157	144	146	184	189	222
70	186	192	176	178	230	236	278
95	221	229	210	213	280	287	338
120	252	260	240	242	324	332	391
150	281	288	267	271	368	376	440
185	317	324	303	307	424	432	504
240	367	373	351	356	502	511	593
300	414	419	397	402	577	586	677
400	470	466	451	457	673	676	769
500	526	517	505	512	774	770	869
630	590	574	565	563	866	878	980

Maximum conductor temperature : 90°C
 Ambient air temperature : 30°C
 Ground temperature : 20°C
 Depth of laying : 0.8m
 Thermal resistivity of soil : 1.5 K.m/W
 Thermal resistivity of earthenware ducts : 1.2 K.m/W
 Screens bonded at both ends
 * : current rating calculated for cables having a rated voltage of 6/10kV

Current ratings for three core copper cables with rated voltage 3.6/6kV to 18/30kV*

Nominal cross section	Unarmored			armored		
	Buried direct in ground	In a buried duct	In air	Buried direct in ground	In a buried duct	In air
						
mm ²	A	A	A	A	A	A
16	101	87	109	101	88	110
25	129	112	142	129	112	143
35	153	133	170	154	134	172
50	181	158	204	181	158	205
70	221	193	253	220	194	253
95	262	231	304	263	232	307
120	298	264	351	298	264	352
150	334	297	398	332	296	397
185	377	336	455	374	335	453
240	434	390	531	431	387	529
300	489	441	606	482	435	599
400	553	501	696	541	492	683

Maximum conductor temperature : 90°C

Ambient air temperature : 30°C

Ground temperature : 20°C

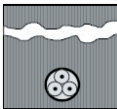
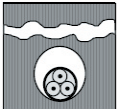
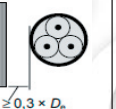
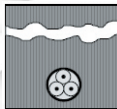
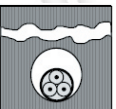
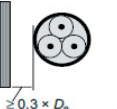
Depth of laying : 0.8m

Thermal resistivity of soil : 1.5 K.m/W

Thermal resistivity of earthenware ducts : 1.2 K.m/W

* : current rating calculated for cables having a rated voltage of 6/10kV

Current ratings for three core aluminum cables with rated voltage 3.6/6kV to 18/30kV*

Nominal cross section	Unarmored			armored		
	Buried direct in ground	In a buried duct	In air	Buried direct in ground	In a buried duct	In air
						
mm ²	A	A	A	A	A	A
16	78	67	84	78	68	85
25	100	87	110	100	87	111
35	119	103	132	119	104	133
50	140	122	158	140	123	159
70	171	150	196	171	150	196
95	203	179	236	204	180	238
120	232	205	273	232	206	274
150	260	231	309	259	231	309
185	294	262	355	293	262	354
240	340	305	415	338	304	415
300	384	346	475	380	343	472
400	438	398	552	432	393	545

Maximum conductor temperature : 90°C

Ambient air temperature : 30°C

Ground temperature : 20°C

Depth of laying : 0.8m

Thermal resistivity of soil : 1.5 K.m/W

Thermal resistivity of earthenware ducts : 1.2 K.m/W

* : current rating calculated for cables having a rated voltage of 6/10kV

RATING FACTOR FOR AMBIENT AIR TEMPERATURE

Maximum conductor temperature (°C)	Ambient air temperature (°C)								
	20	25	30	35	40	45	50	55	60
90	1.08	1.04	1	0.96	0.91	0.87	0.82	0.76	0.71

RATING FACTOR FOR GROUND TEMPERATURE

Maximum conductor temperature (°C)	Ambient ground temperature (°C)								
	10	15	20	25	30	35	40	45	50
90	1.07	1.04	1	0.96	0.93	0.89	0.85	0.80	0.76

RATING FACTOR FOR DEPTH OF LAYING (for direct buried cables)

Depth of laying (m)	Single core cables		Three core cables
	Nominal conductor size		
	≤ 185 mm ²	> 185 mm ²	
0.5	1.04	1.06	1.04
0.6	1.02	1.04	1.03
0.8	1	1	1
1	0.98	0.97	0.98
1.25	0.96	0.95	0.96
1.5	0.95	0.93	0.95
1.75	0.94	0.91	0.94
2	0.93	0.90	0.93
2.5	0.91	0.88	0.91
3	0.90	0.86	0.90

RATING FACTOR FOR DEPTH OF LAYING (for cables in ducts)

Depth of laying (m)	Single core cables		Three core cables
	Nominal conductor size		
	≤ 185 mm ²	> 185 mm ²	
0.5	1.04	1.05	1.03
0.6	1.02	1.03	1.02
0.8	1	1	1
1	0.98	0.97	0.99
1.25	0.96	0.95	0.97
1.5	0.95	0.93	0.96
1.75	0.94	0.92	0.95
2	0.93	0.91	0.94
2.5	0.91	0.89	0.93
3	0.90	0.88	0.92

RATING FACTOR FOR SOIL THERMAL RESISTIVITY (for direct buried single core cables)

Conductor cross section (mm ²)	Soil thermal resistivity (K.m/W)							
	0.7	0.8	0.9	1	1.5	2	2.5	3
16	1.29	1.24	1.19	1.15	1	0.89	0.82	0.75
25	1.30	1.25	1.20	1.16	1	0.89	0.81	0.75
35	1.30	1.25	1.21	1.16	1	0.89	0.81	0.75
50	1.32	1.26	1.21	1.16	1	0.89	0.81	0.74
70	1.33	1.27	1.22	1.17	1	0.89	0.81	0.74
95	1.34	1.28	1.22	1.18	1	0.89	0.80	0.74
120	1.34	1.28	1.22	1.18	1	0.88	0.80	0.74
150	1.35	1.28	1.23	1.18	1	0.88	0.80	0.74
185	1.35	1.29	1.23	1.18	1	0.88	0.80	0.74
240	1.36	1.29	1.23	1.18	1	0.88	0.80	0.73
300	1.36	1.30	1.24	1.19	1	0.88	0.80	0.73
400	1.37	1.30	1.24	1.19	1	0.88	0.79	0.73

RATING FACTOR FOR SOIL THERMAL RESISTIVITY (for single core cables in buried ducts)

Conductor cross section (mm ²)	Soil thermal resistivity (K.m/W)							
	0.7	0.8	0.9	1	1.5	2	2.5	3
16	1.20	1.17	1.14	1.11	1	0.92	0.85	0.79
25	1.21	1.17	1.14	1.12	1	0.91	0.85	0.79
35	1.21	1.18	1.15	1.12	1	0.91	0.84	0.79
50	1.21	1.18	1.15	1.12	1	0.91	0.84	0.78
70	1.22	1.19	1.15	1.12	1	0.91	0.84	0.78
95	1.23	1.19	1.16	1.13	1	0.91	0.84	0.78
120	1.23	1.20	1.16	1.13	1	0.91	0.84	0.78
150	1.24	1.20	1.16	1.13	1	0.91	0.83	0.78
185	1.24	1.20	1.17	1.13	1	0.91	0.83	0.78
240	1.25	1.21	1.17	1.14	1	0.90	0.83	0.77
300	1.25	1.21	1.17	1.14	1	0.90	0.83	0.77
400	1.25	1.21	1.17	1.14	1	0.90	0.83	0.77

RATING FACTOR FOR SOIL THERMAL RESISTIVITY (for direct buried three core cables)

Conductor cross section (mm ²)	Soil thermal resistivity (K.m/W)							
	0.7	0.8	0.9	1	1.5	2	2.5	3
16	1.23	1.19	1.16	1.13	1	0.91	0.84	0.78
25	1.24	1.20	1.16	1.13	1	0.91	0.84	0.78
35	1.25	1.21	1.17	1.13	1	0.91	0.83	0.78
50	1.25	1.21	1.17	1.14	1	0.91	0.83	0.77
70	1.26	1.21	1.18	1.14	1	0.90	0.83	0.77
95	1.26	1.22	1.18	1.14	1	0.90	0.83	0.77
120	1.26	1.22	1.18	1.14	1	0.90	0.83	0.77
150	1.27	1.22	1.18	1.15	1	0.90	0.83	0.77
185	1.27	1.23	1.18	1.15	1	0.90	0.83	0.77
240	1.28	1.23	1.19	1.15	1	0.90	0.83	0.77
300	1.28	1.23	1.19	1.15	1	0.90	0.82	0.77
400	1.28	1.23	1.19	1.15	1	0.90	0.82	0.76

RATING FACTOR FOR SOIL THERMAL RESISTIVITY (for three core cables in ducts)

Conductor cross section (mm ²)	Soil thermal resistivity (K.m/W)							
	0.7	0.8	0.9	1	1.5	2	2.5	3
16	1.12	1.11	1.09	1.08	1	0.94	0.89	0.84
25	1.14	1.12	1.10	1.08	1	0.94	0.89	0.84
35	1.14	1.12	1.10	1.08	1	0.94	0.88	0.84
50	1.14	1.12	1.10	1.08	1	0.94	0.88	0.84
70	1.15	1.13	1.11	1.09	1	0.94	0.88	0.83
95	1.15	1.13	1.11	1.09	1	0.94	0.88	0.83
120	1.15	1.13	1.11	1.09	1	0.93	0.88	0.83
150	1.16	1.13	1.11	1.09	1	0.93	0.88	0.83
185	1.16	1.14	1.11	1.09	1	0.93	0.87	0.83
240	1.16	1.14	1.12	1.10	1	0.93	0.87	0.82
300	1.17	1.14	1.12	1.10	1	0.93	0.87	0.82
400	1.17	1.14	1.12	1.10	1	0.92	0.86	0.81

RATING FACTOR FOR GROUPS OF THREE CORE CABLES (in horizontal formation laid direct in the ground)

Number of cables in groups	Spacing between cable centres (mm)				
	Touching	200	400	600	800
2	0.80	0.86	0.90	0.92	0.94
3	0.69	0.77	0.82	0.86	0.89
4	0.62	0.72	0.79	0.83	0.87
5	0.57	0.68	0.76	0.81	0.85
6	0.54	0.65	0.74	0.80	0.84
7	0.51	0.63	0.72	0.78	0.83
8	0.49	0.61	0.71	0.78	0.83
9	0.47	0.60	0.70	0.77	-
10	0.46	0.59	0.69	-	-
11	0.45	0.57	0.69	-	-
12	0.43	0.56	0.68	-	-

RATING FACTOR FOR GROUPS OF THREE PHASE CIRCUITS (for single core cables laid direct in the ground)

Number of cables in groups	Spacing between cable centres (mm)				
	Touching	200	400	600	800
2	0.73	0.83	0.88	0.90	0.92
3	0.60	0.73	0.79	0.83	0.86
4	0.54	0.68	0.75	0.80	0.84
5	0.49	0.63	0.72	0.78	0.82
6	0.46	0.61	0.70	0.76	0.81
7	0.43	0.58	0.68	0.75	0.80
8	0.41	0.57	0.67	0.74	-
9	0.39	0.55	0.66	0.73	-
10	0.37	0.54	0.65	-	-
11	0.36	0.53	0.64	-	-
12	0.35	0.52	0.64	-	-

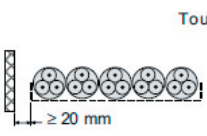
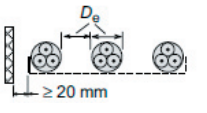
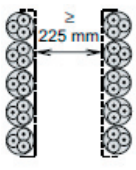
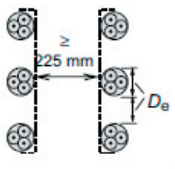
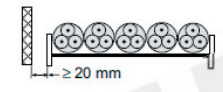
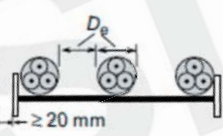
RATING FACTOR FOR GROUPS OF THREE CORE CABLES
(for three core cables in single way ducts in horizontal formation)

Number of cables in groups	Spacing between cable centres (mm)				
	Touching	200	400	600	800
2	0.85	0.88	0.92	0.94	0.95
3	0.75	0.80	0.85	0.88	0.91
4	0.69	0.75	0.82	0.86	0.89
5	0.65	0.72	0.79	0.84	0.87
6	0.62	0.69	0.77	0.83	0.87
7	0.59	0.67	0.76	0.82	0.86
8	0.57	0.65	0.75	0.81	-
9	0.55	0.64	0.74	0.80	-
10	0.54	0.63	0.73	-	-
11	0.52	0.62	0.73	-	-
12	0.51	0.61	0.72	-	-

RATING FACTOR FOR GROUPS OF THREE PHASE CIRCUITS
(for single core cables in single way ducts)

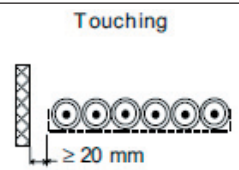
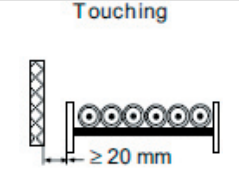
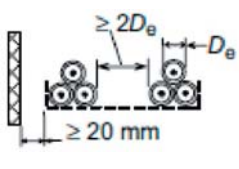
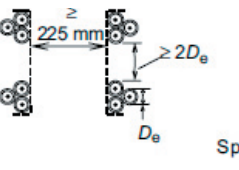
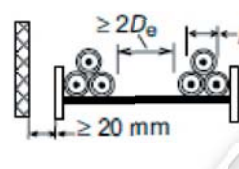
Number of cables in groups	Spacing between cable centres (mm)				
	Touching	200	400	600	800
2	0.78	0.85	0.89	0.91	0.93
3	0.66	0.75	0.81	0.85	0.88
4	0.59	0.70	0.77	0.82	0.86
5	0.55	0.66	0.74	0.80	0.84
6	0.51	0.64	0.72	0.78	0.83
7	0.48	0.61	0.71	0.77	0.82
8	0.46	0.60	0.70	0.76	-
9	0.44	0.58	0.69	0.76	-
10	0.43	0.57	0.68	-	-
11	0.42	0.56	0.67	-	-
12	0.40	0.55	0.67	-	-

RATING FACTOR FOR GROUPS OF MORE THAN ONE MULTI CORE CABLE IN AIR
(to be applied to the current carrying capacity for one multi core cable in free air)

Method of installation		Number of trays	Number of cables					
			1	2	3	4	6	9
Cables on perforated trays	 <p align="center">Touching</p>	1	1.00	0.88	0.82	0.79	0.76	0.73
		2	1.00	0.87	0.80	0.77	0.73	0.68
		3	1.00	0.86	0.79	0.76	0.71	0.66
	 <p align="center">Spaced</p>	1	1.00	1.00	0.98	0.95	0.91	-
		2	1.00	0.99	0.96	0.92	0.87	-
		3	1.00	0.98	0.95	0.91	0.85	-
Cables on vertical perforated trays	 <p align="center">Touching</p>	1	1.00	0.88	0.82	0.78	0.73	0.72
		2	1.00	0.88	0.81	0.76	0.71	0.70
	 <p align="center">Spaced</p>	1	1.00	0.91	0.89	0.88	0.87	-
		2	1.00	0.91	0.88	0.87	0.85	-
Cables on ladder supports, cleats, etc.	 <p align="center">Touching</p>	1	1.00	0.87	0.82	0.80	0.79	0.78
		2	1.00	0.86	0.80	0.78	0.76	0.73
		3	1.00	0.85	0.79	0.76	0.73	0.70
	 <p align="center">Spaced</p>	1	1.00	1.00	1.00	1.00	1.00	-
		2	1.00	0.99	0.98	0.97	0.96	-
		3	1.00	0.98	0.97	0.96	0.93	-

- 1- Factors apply to single layer groups of cables as shown above and do not apply when cables are installed in more than one layer touching each other. Values for such installations may be significantly lower and must be determined by an appropriate method.
- 2- Value are given for vertical spacing between trays of 300mm and at least 20mm between trays and wall. For closer spacing, the factors should be reduced.
- 3- Values are given for horizontal spacing between trays of 225mm with trays mounted back to back. For closer spacing, the factors should be reduced.

RATING FACTOR FOR GROUPS OF MORE THAN ONE CIRCUIT OF SINGLE CORE CABLES (1)
 (to be applied to the current carrying capacity for one circuit of single core cable in free air)

Method of installation		Number of trays	Number of three phase circuits			Use as a multiplier to rating for
			1	2	3	
Perforated trays (2)	 <p style="text-align: center;">Touching</p>	1	0.98	0.91	0.87	Three cables in horizontal formation
		2	0.96	0.87	0.81	
		3	0.95	0.85	0.78	
Ladder supports, cleats, etc. (2)	 <p style="text-align: center;">Touching</p>	1	1.00	0.97	0.96	Three cables in horizontal formation
		2	0.98	0.93	0.89	
		3	0.97	0.90	0.86	
Perforated trays (2)		1	1.00	0.98	0.96	Three cables in trefoil formation
		2	0.97	0.93	0.89	
		3	0.96	0.92	0.86	
Vertical perforated trays (3)	 <p style="text-align: center;">Spaced</p>	1	1.00	0.91	0.89	Three cables in trefoil formation
		2	1.00	0.90	0.86	
Ladder supports, cleats, etc. (2)		1	1.00	1.00	1.00	Three cables in trefoil formation
		2	0.97	0.95	0.93	
		3	0.96	0.94	0.90	

- 1- Factors are given for single layer of cables (or trefoil groups) as shown in the table and do not apply when cables are installed in more than one layer touching each other. Values for such installations may be significantly lower and should be determined by an appropriate method.
- 2- Values are given for vertical spacing between trays of 300mm.
- 3- For closer spacing, the factors should be reduced.
- 4- Values are given for horizontal spacing between trays of 225mm with trays mounted back to back. For closer spacing, the factors should be reduced.
- 5- For circuits having more than one cable in parallel per phase, each three phase set of conductors should be considered as a circuit for the propose of this table.