

CURRENT CARRYING CAPACITY AND RATING FACTORS FOR HV AND EHV CABLES

Current rating for 63-400kV cables with copper conductor (95mm² screen)

Cross sectional area	Cables in ground								Cables in air							
	Flat formation				Trefoil formation				Flat formation				Trefoil formation			
	Cross bonded		Both ends		Cross bonded		Both ends		Cross bonded		Both ends		Cross bonded		Both ends	
mm ²	65°C	90°C	65°C	90°C	65°C	90°C	65°C	90°C	65°C	90°C	65°C	90°C	65°C	90°C	65°C	90°C
185	410	490	375	455	385	465	385	460	445	600	405	555	385	520	380	520
240	475	570	425	515	450	540	440	530	525	710	465	640	450	615	445	610
300	530	640	440	535	505	610	480	580	600	805	500	685	525	710	500	685
400	600	720	485	595	575	690	540	650	680	915	565	775	605	820	575	785
500	685	825	530	650	655	785	600	730	790	1060	625	860	695	945	650	895
630	780	940	570	705	740	890	660	810	915	1235	685	950	800	1085	735	1010
800	870	1055	610	755	825	995	720	885	1045	1415	745	1040	905	1235	815	1130
1000	960	1165	645	800	900	1095	770	950	1175	1590	800	1125	1005	1380	895	1245
1200	1115	1345	690	860	1060	1280	855	1055	1395	1880	880	1240	1210	1650	1025	1425
1600	1280	1550	735	920	1215	1470	930	1155	1655	2235	960	1355	1420	1940	1150	1615
2000	1410	1705	765	955	1320	1605	980	1220	1845	2500	1000	1425	1565	2145	1230	1740
2500	1540	1875	795	1000	1445	1755	1025	1285	2095	2845	1065	1515	1750	2410	1330	1890

Current rating for 63-400kV cables with aluminum conductor (95mm² screen)

Cross sectional area	Cables in ground								Cables in air							
	Flat formation				Trefoil formation				Flat formation				Trefoil formation			
	Cross bonded		Both ends		Cross bonded		Both ends		Cross bonded		Both ends		Cross bonded		Both ends	
mm ²	65°C	90°C	65°C	90°C	65°C	90°C	65°C	90°C	65°C	90°C	65°C	90°C	65°C	90°C	65°C	90°C
185	320	380	300	365	300	360	300	360	350	470	330	445	300	405	300	405
240	370	445	345	420	350	420	350	420	410	555	380	520	355	480	350	480
300	415	495	365	445	395	475	385	460	465	625	415	565	410	550	400	540
400	470	565	410	500	450	540	435	525	535	715	470	640	475	640	460	625
500	540	645	455	555	515	620	490	595	620	835	530	725	550	745	530	720
630	620	740	500	610	590	710	550	670	730	975	595	820	640	865	605	830
800	700	845	540	665	670	805	610	745	840	1130	660	910	735	995	685	940
1000	785	950	585	720	745	900	670	820	960	1295	720	1005	830	1135	765	1055
1200	850	1025	610	755	805	970	710	870	1055	1420	765	1070	905	1235	825	1140
1600	960	1165	655	815	900	1095	775	955	1220	1650	836	1170	1035	1420	925	1285
2000	1050	1275	685	855	975	1190	820	1015	1355	1840	885	1250	1140	1570	1000	1395

RATING FACTORS FOR CALCULATION OF CURRENT CARRYING CAPACITY IN DIFFERENT CONDITIONS

RATING FACTOR FOR CROSS SECTIONAL AREA OF METAL SCREEN

Conductor (mm ²)		Copper screen (mm ²)						
		25	35	50	95	150	240	300
Al	Cu							
300		1.02	1.02	1.01	1	0.99	0.98	0.97
500	300	1.03	1.03	1.02	1	0.98	0.96	0.96
800	500	1.05	1.04	1.02	1	0.97	0.94	0.94
1200	630	1.06	1.05	1.02	1	0.97	0.93	0.92
2000	800	1.07	1.06	1.02	1	0.96	0.92	0.91
	1200	1.12	1.1	1.02	1	0.94	0.89	0.88
	2000	1.16	1.13	1.02	1	0.93	0.87	0.86
	3000	1.17	1.14	1.02	1	0.93	0.87	0.85

RATING FACTOR FOR GROUND TEMPERATURE

Conductor temperature (°C)	Ground temperature (°C)							
	10	15	20	25	30	35	40	45
90	1.07	1.04	1	0.96	0.93	0.89	0.84	0.80
65	1.11	1.05	1	0.94	0.88	0.82	0.74	0.66

RATING FACTOR FOR GROUND THERMAL RESISTIVITY

Thermal resistivity (Km/W)	0.7	1.0	1.2	1.5	2.0	2.5	3.0
Rating factor	1.14	1.00	0.93	0.84	0.74	0.67	0.61

RATING FACTOR FOR PHASE SPACING, ONE GROUP IN FLAT FORMATION WITH CROSS BONDED OR SINGLE BONDED SCREENS

Spacing (mm)	D	D+70	200	250	300	350	400
Rating factor	0.93	1	1.03	1.05	1.07	1.08	1.10

D: Cable outer diameter

RATING FACTOR FOR LAYING DEPTH

Laying depth (m)	Rating factor
0.50	1.10
0.70	1.05
0.90	1.01
1.00	1.00
1.20	0.98
1.50	0.95

RATING FACTOR FOR GROUPS OF CABLES IN THE GROUND

Distance between groups (axial) (mm)	Number of groups								
	1	2	3	4	5	6	7	8	9
100	1	0.76	0.67	0.59	0.55	0.51	0.49	0.47	0.46
200	1	0.81	0.71	0.65	0.61	0.49	0.56	0.53	0.52
400	1	0.85	0.77	0.72	0.69	0.66	0.64	0.63	0.62
600	1	0.88	0.81	0.77	0.74	0.72	0.71	0.70	0.69
800	1	0.90	0.84	0.81	0.79	0.77	0.76	0.75	0.75
2000	1	0.96	0.93	0.92	0.91	0.91	0.91	0.90	0.90

RATING FACTOR FOR AMBIENT AIR TEMPERATURE

Air temperature (°C)	5	10	15	20	25	30	35	40	45	50	55
Rating factor	1.28	1.24	1.19	1.15	1.10	1.05	1.0	0.95	0.89	0.83	0.77

