

TABLE BEC 107. Current ratings for 6350/11000 volts grade PILC/SWA/PVC cable to BS6480/69

The maximum sustained current ratings tabulated in the cable data pages are based on standard installation conditions. These are extracted from the Electrical Research Association Report ERA 69-30, Part 1. Reference to this report should be made for any special installation in order to derive the appropriate derating factors, but as a guide, the most common rating factors are given below.

Conditions of installation:

Ambient air temperature:	25°C
Ground thermal resistivity:	1.2K.m/W
Ground temperature:	15°C
Depth of laying:	0.8m
Maximum conductor temperature:	Single core - in ground and in air 70°C
	Single core - in ducts 50°C
	Multicore (belted) - 65°C

Nominal area of Conductor	IN GROUND		IN SINGLE WAY DUCTS		IN FREE AIR	
	Single core close trefoil formation	Three core (Belted)	Single core three cables in trefoil formation	Three core (Belted)	Single core close trefoil formation	Three core (Belted)
	amp	amp	amp	amp	amp	amp
25	-	115	-	99	-	105
35	-	140	-	120	-	130
50	190	165	155	140	200	155
70	235	205	190	175	250	195
95	280	245	225	210	305	240
120	320	280	255	240	355	275
150	360	315	285	265	405	315
185	405	355	320	300	465	360
240	470	410	365	355	550	425
300	530	460	410	395	630	490
400	600	520	455	445	730	560
500	660	-	500	-	840	-
630	740	-	550	-	960	-
800	810	-	590	-	1080	-
1000	880	-	630	-	1190	-

TABLE A: Cables carrying a constant load throughout the year.

For cable which must carry a constant load throughout the year, either sustained or cyclic, ratings must be based on extreme maximum values of thermal resistivity which might occur occasionally and for a relatively short period in late summer and autumn. Suitable values are.

ORIGINAL SOIL	THERMAL RESISTIVITY °K m/W
All soils except those noted below	1.5
Chalk soil with crushed chalk backfill	1.2
Peat	1.2
All the above soils if under impermeable cover	1.2
Very stony soil or ballast	1.5
Well drained sand	2.5+
Made-up soils	1.8+

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TABLE B: Cables carrying varying loads, maximum in summer period.

For cables carrying mixed loads, it is appropriate to take advantage of the probability that although there may be a heavy load at or near to maximum in some summers, that this will not necessarily coincide with particularly dry periods. Further, cables in networks arranged to give security by duplication or reticulation of circuits will be called upon to carry full rated current only in emergencies. Suitable values of thermal resistivity for the period from the beginning of May or the beginning of April for stony and friable soils, to the middle of November, are

ORIGINAL SOIL	THERMAL RESISTIVITY °K m/W
All soils ¹ except those noted below	1.2
Or, if under impermeable cover	1.0
Very stony soil or ballast	1.3
Well drained sand ²	2.0
Made-up soils ²	1.6

TABLE C: Cables carrying varying loads, maximum in winter.

For cables carrying a load which is pronounced maximum in the winter months the following values of thermal resistivity are applicable from the middle of November to the end of April, or from the middle of November to the end of March in the case of stony and friable soils.

ORIGINAL SOIL	THERMAL RESISTIVITY °K m/W
All soils except those noted below	1.0
Clay	0.9
All the above soils if under impermeable cover	0.8
Chalk soil with crushed chalk backfill	1.2
Well-drained sand	1.5
Made-up soils	1.2

¹ In chalk soil this assumes the use of crushed chalk backfill. Other natural backfill materials are not recommended.

² For installations in well-drained sand and made-up soils it is clearly advisable to consider special measures. In the case of made-up soils the values given should be used unless there is evidence that the nature of the major constituent of the soil and its density would classify it with certainty into another type.

CABLES LAID DIRECT IN THE GROUND

Group rating factors for cables in horizontal formation laid direct in the ground.

Voltage rating of cables V	Number of cables in group	Spacing - Metre Touching	SPACE BETWEEN CABLE CENTRES			
			0.15	0.30	0.45	0.60
6350/11000	2	0.80	0.85	0.89	0.90	0.92
	3	0.69	0.75	0.80	0.84	0.86
	4	0.63	0.70	0.77	0.80	0.84

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Rating factors for variation in ground temperatures for cables laid direct in the ground

MAXIMUM CONDUCTOR TEMPERATURE °C	GROUND TEMPERATURE °C					
	10	15	20	25	30	35
	APPLICABLE TO ALL CABLES					
90	1.04	1.00	0.97	0.93	0.90	0.86
80	1.04	1.00	0.96	0.92	0.88	0.83
70	1.04	1.00	0.95	0.90	0.85	0.80
65	1.00	1.00	0.95	0.89	0.84	0.74

Rating factors for variation in thermal resistivity of soil (average values) for cables laid direct in the ground.

NOMINAL AREA OF CONDUCTOR MM	VALUE OF 'G' °K M/W				
	0.8	0.9	1.0	1.5	2.0
16	1.09	1.06	1.04	0.95	0.87
from 25 to 150	1.14	1.10	1.07	0.93	0.84
from 185 to 400	1.16	1.11	1.07	0.92	0.82

CABLES LAID IN DUCTS

Cables are assumed to be installed in separate earthenware, fibre or ferrous pipes. Where applicable, the thermal resistivity of the duct material is assumed to be 1.2°K m/W.

Group rating factors for cables in single-way ducts, horizontal formation.

Voltage rating of cables V	SPACE BETWEEN CABLE CENTRES				
	Number of cables in group	Spacing - Metre Touching	0.30	0.45	0.60
6350/11000	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

Rating factors for variation in ground temperatures for cables laid direct in the ground

MAXIMUM CONDUCTOR TEMPERATURE °C	GROUND TEMPERATURE °C					
	10	15	20	25	30	35
	APPLICABLE TO ALL CABLES					
90	1.00	1.00	0.97	0.93	0.90	0.86
80	1.04	1.00	0.96	0.92	0.88	0.83
70	1.04	1.00	0.95	0.90	0.85	0.80
65	1.00	1.00	0.95	0.89	0.84	0.77

Rating factors for variation in thermal resistivity of soil (average values) for cables laid direct in the ground.

NOMINAL AREA OF CONDUCTOR MM	VALUE OF 'G' °K M/W				
	0.8	0.9	1.0	1.5	2.0
16	1.05	1.03	1.02	0.97	0.92
from 25 to 150	1.07	1.04	1.03	0.96	0.90
from 185 to 400	1.09	1.06	1.04	0.95	0.87

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CABLES LAID IN AIR:

The ratings given in the foregoing tables are based on an ambient temperature of 25°C.

It is recommended when cables are fixed to a wall, the distance between the wall and the surface of the cable should be 20mm

The horizontal spacing between circuits should be at least 150mm.

Cable should be shielded from direct rays of the sun to reduce the effect of heating due to solar radiation.

Rating factors for variation in ambient air temperature.

MAXIMUM CONDUCTOR TEMPERATURE °C	AIR TEMPERATURE °C				
	25	30	35	40	45
90	1.00	0.95	0.91	0.87	0.81
80	1.00	0.94	0.89	0.84	0.77
70	1.00	0.93	0.87	0.80	0.72
65	1.00	0.93	0.85	0.77	0.68

TABLE BEC 108. Current ratings for XLPE cable to IEC502

SUSTAINED CURRENT RATINGS (50 HZ A.C.)

Current ratings are given for the three customary methods of installation: Laid direct in ground, in ducts or in air.

Generally, the current rating will be reduced if there is a variation from the Standard conditions. The rating for most conditions can be calculated by multiplying the sustained current rating by the factor(s) given in the appropriate adjustment table(s) below.

STANDARD CONDITIONS

The following conditions have been used to calculate the current ratings given in the tables:

Thermal resistivity of soil (g) * = 1.2°K m/W

Standard ground temperature = 15°C

Ambient air temperature = 25°C

Maximum conductor temperature* = 90°C

Depth of burial, from ground surface to centre of cable, centre of duct or to centre of trefoil group of cables or ducts = 0.5m for 600/1000V and 0.8m for cables 3.3kv and above.

* if cables are buried in the ground and loaded continuously, consideration should be given to the possibility of a local increase in soil thermal resistivity due to moisture migration, making it desirable to reduce the maximum conductor operating temperature to 80°C. A conductor operating temperature of 90°C is only recommended if the thermal resistivity of the soil, in the dry condition, is known and is used in the calculation of the current rating.

See below for variations in standard conditions.

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