



**RATING FACTOR FOR VARIATION IN GROUND AND DUCT TEMPERATURE**

TABLE- 41

Temperature °C Rating Factor (Maximum conductor temperature 90°C)	15	20	25	30	35	40	45	50	55
		1.12	1.08	1.04	1.00	0.96	0.91	0.87	0.82
<b>For 70°C PVC</b>	1.17	1.1	1.06	1.00	0.94	0.87	0.79	0.71	0.61
<b>For 85°C HRPVC</b>	1.13	1.09	1.04	1.00	0.95	0.90	0.85	0.80	0.74

**RATING FACTOR FOR VARIATION IN AMBIENT AIR TEMPERATURE FOR XLPE CABLES**

TABLE- 42

Temperature °C Rating Factor (Maximum conductor temperature 90°C)	25	30	35	40	45	50	55	60
		1.16	1.11	1.06	1.00	0.94	0.88	0.81
<b>For 70°C PVC</b>	1.25	1.16	1.09	1.00	0.90	0.80	0.74	-
<b>For 85°C HRPVC</b>	1.17	1.12	1.06	1.00	0.94	0.87	0.80	0.73

**RATING FACTOR  
FOR DEPTH OF LAYING  
(CABLES LAID DIRECT  
IN THE GROUND)**

TABLE- 43

Depth of Laying Cm	1.1/11 KV XLPE Cables
90	1.00
105	0.99
120	0.97
150	0.95
180	0.94
200	0.93
250	0.91
300	0.90
or more	

**GROUP RATING FACTORS FOR CIRCUITS OF  
THREE SINGLE - CORE CABLES,  
IN TREFOIL LAID 'DIRECT IN THE GROUND**

TABLE - 44

No. of Circuits	Spacing between Trefoil Group Centres (Cm)				
	Touching	20	40	60	80
2	0.76	0.83	0.87	0.90	0.92
3	0.64	0.72	0.79	0.83	0.86
4	0.58	0.67	0.75	0.80	0.84
5	0.53	0.63	0.71	0.77	0.81
6	0.50	0.60	0.69	0.76	0.80
7	0.47	0.58	0.67	0.74	0.79
8	0.45	0.56	0.66	0.73	-
9	0.43	0.55	0.65	0.73	-
10	0.42	0.54	0.64	-	-
11	0.41	0.53	0.64	-	-
12	0.40	0.52	0.63	-	-



**RATING FACTORS FOR CABLES LAID ON RACKS IN AIR WITH CABLE TOUCHING, TRAYS ARE IN TIERS SPACED BY 30cm AND CLEARANCE BETWEEN THE WALL AND CABLE IS 25cm**

TABLE - 45

No. of Racks	Number of Cables per Rack				
	1	2	3	6	9
1	1.00	0.84	0.80	0.75	0.73
2	1.00	0.80	0.76	0.71	0.69
3	1.00	0.78	0.74	0.70	0.68
6	1.00	0.76	0.72	0.68	0.66

**RATING FACTORS FOR THREE SINGLE CORE CABLES IN TREFOIL ON RACKS IN AIR (WITH SPACING BETWEEN CABLES EQUAL TO TWICE THE CABLE DIAMETER)**

TABLE - 46

No. of Racks	Number of Cables per Rack		
	1	2	3
1	1.00	0.98	0.96
2	1.00	0.95	0.93
3	1.00	0.94	0.92
6	1.00	0.93	0.90

**GROUP RATING FACTORS FOR MULTICORE CABLES IN GROUND HORIZONTAL FORMATION**

TABLE - 47

Number of Cables in group	Spacing			
	Touching	15 cm	30 cm	45 cm
2	0.78	0.81	0.85	0.88
3	0.68	0.71	0.76	0.79
4	0.61	0.65	0.71	0.75
5	0.56	0.60	0.67	0.72
6	0.53	0.57	0.64	0.69
7	0.50	0.55	0.62	0.67
8	0.48	0.53	0.60	0.66
9	0.46	0.51	0.59	0.65
10	0.45	0.50	0.58	0.64

**RATING FACTORS FOR MULTICORE CABLES LAID ON RACKS IN AIR (WITH CABLE SPACING BETWEEN CABLES EQUAL TO DIAMETER OF CABLE)**

TABLE - 48

Number of racks	Number of cables per rack				
	1	2	3	6	9
1	1.00	0.98	0.96	0.93	0.92
2	1.00	0.95	0.93	0.90	0.89
3	1.00	0.94	0.92	0.89	0.88
6	1.00	0.93	0.90	0.87	0.86

**RATING FACTORS FOR VARIATION IN THERMAL RESISTIVITY OF SOIL FOR THREE SINGLE - CORE CABLES AND THREE CORE XLPE CABLES LAID DIRECT IN THE GROUND**

TABLE - 49

Nominal size of conductor	Three single core cables Thermal Resistivity of Soil in °C CM/W						Three core cables Thermal Resistivity of Soil in °C CM/W					
	Sq. mm	100	120	150	200	250	300	100	120	150	200	250
25	1.17	1.09	1.00	0.88	0.80	0.74	1.16	1.08	1.00	0.90	0.82	0.75
35	1.18	1.10	1.00	0.88	0.80	0.74	1.16	1.08	1.00	0.90	0.81	0.75
50	1.19	1.10	1.00	0.88	0.80	0.73	1.16	1.08	1.00	0.88	0.81	0.75
70	1.19	1.10	1.00	0.88	0.80	0.73	1.16	1.09	1.00	0.88	0.81	0.75
95	1.19	1.10	1.00	0.88	0.79	0.73	1.16	1.09	1.00	0.88	0.81	0.75
120	1.19	1.10	1.00	0.88	0.79	0.73	1.16	1.09	1.00	0.88	0.81	0.75
150	1.19	1.10	1.00	0.88	0.79	0.73	1.16	1.09	1.00	0.88	0.81	0.75
185	1.19	1.10	1.00	0.88	0.79	0.72	1.16	1.09	1.00	0.88	0.81	0.75
240	1.20	1.11	1.00	0.88	0.79	0.72	1.17	1.09	1.00	0.88	0.81	0.75
300	1.20	1.11	1.00	0.87	0.79	0.72	1.17	1.09	1.00	0.88	0.81	0.75
400	1.20	1.11	1.00	0.87	0.79	0.72	1.17	1.09	1.00	0.88	0.81	0.75
500	1.20	1.11	1.00	0.87	0.79	0.72	1.17	1.09	1.00	0.88	0.81	0.74
630	1.21	1.11	1.00	0.87	0.78	0.72	-	-	-	-	-	-
800	1.21	1.11	1.00	0.87	0.78	0.72	-	-	-	-	-	-
1000	1.21	1.11	1.00	0.87	0.78	0.72	-	-	-	-	-	-



**Estimated Voltage Drops in XLPE Cables (Aluminium Conductor)**  
(Voltage drop unit: Volts/Km/Amps)

TABLE- 50

Cores	Cable Sqmm.																		
	4	6	10	16	25	35	50	70	95	120	150	185	240	300	400	500	630	800	1000
Single Core	18.98	11.80	7.88	4.90	3.08	2.23	1.65	1.15	0.83	0.66	0.55	0.44	0.35	0.30	0.24	0.23	0.21	0.20	0.18
Multi Core	16.44	10.22	6.82	4.24	2.67	1.94	1.44	1.00	0.70	0.56	0.48	0.40	0.30	0.26	0.22	0.20	0.18	----	----

\* Above voltage drops (volts/km/amps) to be multiplied with rated current and length of cable in K.M. to calculate total voltage drop in particular length and size of Cables.

**Estimated Voltage Drops in XLPE Cables 1100 Volts Armoured Control Cables (Copper Conductor)**  
(Voltage drop unit: Volts/Km)

TABLE- 51

Sqmm.	No. of Cores																			
	2	3	4	5	6	7	8	9	10	12	14	16	19	24	27	30	37	44	52	61
1.5	725	859	859	644	564	537	510	483	483	456	430	403	376	349	322	295	295	268	268	242
2.5	584	691	691	522	445	430	415	399	384	369	338	322	307	276	261	230	230	215	215	200

\* Above voltage drops (volts/km/amps) to be multiplied with rated current and length of cable in K.M. to calculate total voltage drop in particular length and size of Cables.

"The above Data are approximate and subject to manufacturing tolerance"

**GROUP RATING FACTORS FOR TWIN AND MULTI - CORE CABLES IN HORIZONTAL FORMATION, LAID DIRECT IN THE GROUND**

TABLE - 52

No. of Cables	Spacing of Cables (Centre to Centre)				
	Touching	15 Cm	30 Cm	45 Cm	60 Cm
2	0.80	0.84	0.87	0.90	0.91
3	0.68	0.74	0.79	0.83	0.86
4	0.62	0.69	0.75	0.80	0.83
5	0.58	0.65	0.72	0.77	0.80
6	0.55	0.62	0.69	0.75	0.78
7	0.52	0.59	0.67	0.73	0.77
8	0.50	0.57	0.66	0.72	0.75
9	0.48	0.55	0.65	0.71	0.75
10	0.46	0.54	0.64	0.70	0.74
11	0.45	0.53	0.63	0.70	0.74
12	0.44	0.52	0.62	0.69	0.73

**GROUP RATING FACTORS FOR TWIN AND MULTI - CORE CABLES IN TIER FORMATION, LAID DIRECT IN THE GROUND**

TABLE - 53

No. of Cables	No. of Tiers	Spacing of Cables (Centre to Centre)				
		Touching	15 Cm	30 Cm	45 Cm	60 Cm
2	1	0.88	0.84	0.87	0.90	0.91
3	1	0.68	0.74	0.79	0.83	0.86
4	2	0.60	0.66	0.73	0.77	0.79
5	2	0.55	0.61	0.68	0.71	0.73
6	2	0.51	0.57	0.63	0.67	0.69
7	3	0.48	0.54	0.59	0.63	0.64
8	3	0.46	0.51	0.56	0.60	0.61
9	3	0.44	0.48	0.53	0.57	0.58
10	4	0.42	0.47	0.52	0.55	0.56
11	4	0.41	0.46	0.50	0.54	0.55
12	4	0.40	0.45	0.49	0.53	0.54