

XLPE INSULATED ARMoured CABLES

- Application**
- Indoors or Outdoors in cable ducts, cable trays, conduits or underground locations under mechanical stresses in power and switching stations.
 - Local distribution systems, Industrial and Commercial units for basic power & lighting purpose.

Standards	BS 5467, IEC 60502-1& VDE 0276
Operating Temperature	90° C
Short Circuit Temp.	250° C
Working Voltage	600 / 1000 Volts
Test Voltage	3 KV r m s for 5 minutes



CONSTRUCTION

Conductor Aluminium / Annealed plain copper solid* / stranded conductor conform to BS 6360 and IEC 60228 Class 2 (Circular / Sector shaped)

Insulation Cross linked polyethylene (XLPE)

Core Colour	
Single core	Red, Yellow, Blue, Black, Grey or Natural
2 Core	Red , Black
3 Core	Red , Yellow , Blue
4 Core	Red , Yellow, Blue, Black
5 Core	Red , Yellow, Blue, Black & Grey
6 Core & above	Blue, Yellow and remaining core Grey each layer.

Assembly Insulated conductors are laid up together, if necessary interstices may be filled with fillers.

Fillers Non-hygroscopic Poly propylene fillers are included between laid up cores wherever required.

A separator tape of non-hygroscopic poly propylene material is applied over laid up core wherever necessary.

Bedding Extruded PVC compatible with operating temperature

Armour For Single Core - Aluminium round wire / flat wire. For Multicore - Galvanised Steel round wire / flat wire / tape.

Outer Sheath Extruded PVC / Special PVC compound such as Flame Retardant (FR), Flame Retardant Low Smoke (FRLS), Low Smoke Zero Halogen (LSOH) can be used for outer sheath to suit a variety of environment and fire risk conditions. Flamability test confirms to IEC 332 & Swidish chimney. For installation where fire and associated problems such as emission of smoke and toxic fumes offer a serious potential threat, special LSF (Low smoke & fumes) compound can be provided. LSF compound is Halogen free (Flourine, Chlorine, Bromine) when tested as per BS 6425 (Pt 1) & IEC 60754 (Pt 1). The acid gas evolved during combustion is less than 0.5% by weight of material.

Minimum Bending radius :12 times the cable diameter

Admissible Pulling Force : Aluminium-30/mm²

Advantages

Advantages of XLPE cable as compared to thermoplastic cable like PVC are listed below:

- Higher power rating.
- Higher emergency overload rating.
- Higher short circuit rating.
- Higher insulation resistance (100 times more than that of PVC).
- Higher resistance to moisture (100 times more than that of PVC).
- Better resistance to surge currents.
- Capacity to withstand localised hot spot temperature (very important for industrial wiring in steel power stations etc.)
- Resistant to chemicals and corrosive gases etc. - hence suitable for installation in polluted atmosphere.
- Resistant to vibration, impact etc. - no hazard of hot deformation.
- Quick method of joining and termination with simple, non-expensive accessories.
- Longer cable life.

COMPARATIVE CURRENT RATINGS OF 1.1 KV PVC AND XLPE CABLES continues current rating of 3 & 4 core cables armoured & unarmoured laid Direct in the ground or in air 650/1100V Aluminium conductor.

NOMINAL AREA OF CONDUCTOR	3 or 4 core cables to IS:1554/1/1988 (PVC)				3 or 4 core cables to IS:7098/1/1988 (XLPE)			
	In Ground	In Air	Approx. Voltage Drop	kA	In Ground	In Air	Approx. Voltage Drop	kA
	(Amps)	(Amps)	(mv/Amps/m)	Sec.	(Amps)	(Amps)	(mv/Amps/m)	Sec.
16	60	51	4.0	1.22	73	70	4.2	1.50
25	76	70	2.5	1.90	94	96	2.7	2.35
35	92	86	1.8	2.66	113	117	1.9	3.29
50	110	105	1.3	3.80	133	142	1.4	4.70
70	135	130	0.9	5.32	164	179	0.99	6.58
95	165	155	0.7	7.22	196	221	0.72	8.93
120	185	180	0.5	9.12	223	257	0.58	11.28
150	210	205	0.5	11.40	249	292	0.48	14.10
185	235	240	0.4	14.06	282	337	0.39	17.39
240	275	280	0.3	18.24	326	399	0.31	22.56
300	305	315	0.2	22.80	367	456	0.26	28.20
400	335	375	0.2	30.40	418	530	0.21	37.60

Table-1: Single Core XLPE insulated armoured & unarmoured cable with Aluminium/ Copper Conductor conf. to IS: 7098(P-1)/1988

Area mm ²	Thickness of PVC Insulation		Dimension of Armour		Thickness of PVC Outer sheath		Approx. overall diameter		Approx. Net Wt. of Cable				Max D.C. resistance at 20°C		A.C. resistance at operating temp. 70°C		Reactance at 50Hz.		Current rating						Short Circuit rating for 1 Sec.				
	Arm	Un-Arm	Wire	Strip	Arm	Un-Arm	Arm	Un-Arm	Armoured		Un-Armoured		Ohm/km	Cu	Ohm/km	Al	Ohm/km	Cu	Arm	Un-Arm	Direct in Ground		in duct		in Air		kA(rms)	Al	Cu
									kg/km	kg/km	kg/km	kg/km									Amps	Amps	Amps	Amps					
1.5	1.0	0.7	-	-	1.8	1.8	7	-	-	-	66	12.1	15.43	-	0.158	-	25	-	21	-	22	-	-	-	22	-	-	0.21	
2.5	1.0	0.7	-	-	1.8	1.8	7.5	-	-	-	80	7.41	9.45	-	0.146	-	34	-	33	-	30	-	-	-	30	-	-	0.36	
4	1.0	0.7	1.4	-	1.8	1.8	8	130	155	75	100	4.61	5.88	0.152	0.136	35	44	34	43	30	39	30	39	30	39	0.38	0.57		
6	1.0	0.7	1.4	-	1.8	1.8	9	155	190	90	125	3.08	3.93	0.143	0.127	44	56	42	55	39	49	39	49	39	49	0.56	0.86		
10	1.0	1.7	1.4	-	1.8	1.8	10	175	235	105	170	1.83	2.33	0.132	0.118	58	74	58	73	53	67	53	67	53	67	0.94	1.43		
16	1.0	0.7	1.4	-	1.8	1.8	11	210	300	130	225	1.15	1.47	0.125	0.112	75	97	74	95	72	92	72	92	72	92	1.50	2.29		
25	1.2	0.9	1.4	-	1.8	1.8	12	275	425	170	320	0.727	0.927	0.119	0.107	93	125	96	125	94	123	94	123	94	123	3.58	5.01		
35	1.2	0.9	1.4	-	1.8	1.8	13	325	540	205	420	0.524	0.668	0.114	0.102	114	143	114	143	118	146	118	146	118	146	3.29	5.01		
50	1.3	1.0	1.4	-	1.8	1.8	15	385	670	260	545	0.387	0.494	0.109	0.100	138	180	139	180	152	203	152	203	152	203	4.70	7.15		
70	1.4	1.1	1.4	-	1.8	1.8	17	485	910	345	770	0.443	0.568	0.101	0.092	170	222	169	217	194	260	194	260	194	260	6.58	10.01		
95	1.4	1.1	-	4x0.8	1.40	1.8	18	550	1130	430	1010	0.320	0.411	0.095	0.089	203	265	199	255	238	319	238	319	238	319	8.93	13.6		
120	1.5	1.2	-	4x0.8	1.40	1.8	20	650	1380	535	1265	0.253	0.325	0.093	0.087	231	301	225	290	276	370	276	370	276	370	11.28	17.2		
150	1.7	1.4	-	4x0.8	1.40	2.0	22	755	1660	655	1565	0.206	0.265	0.092	0.088	258	337	246	309	319	425	319	425	319	425	14.1	21.5		
185	1.9	1.6	-	4x0.8	1.40	2.0	25	915	2030	785	1915	0.164	0.211	0.089	0.085	292	379	273	341	367	488	367	488	367	488	17.4	26.5		
240	2.0	1.7	-	4x0.8	1.40	2.0	27	1115	2540	990	2410	0.125	0.162	0.087	0.083	338	436	310	382	435	576	435	576	435	576	22.6	34.3		
300	2.1	1.8	-	4x0.8	1.56	2.0	29	1350	3185	1160	2985	0.100	0.130	0.085	0.081	379	486	342	417	498	656	417	498	417	498	28.2	42.9		
400	2.4	2.0	-	4x0.8	1.56	2.2	33	1680	4050	1515	3895	0.0778	0.1023	0.083	0.080	430	539	366	443	565	749	443	565	443	565	37.6	57.2		
500	2.6	2.2	-	4x0.8	1.56	2.2	37	2060	5050	1890	4890	0.0605	0.0809	0.082	0.079	487	597	440	480	640	847	480	640	480	640	47.0	71.5		
630	2.8	2.4	-	4x0.8	1.72	2.2	41	2590	6480	2325	6285	0.0469	0.0644	0.080	0.077	553	657	499	518	727	954	518	727	518	727	59.2	90.1		
800	3.1	2.6	-	4x0.8	1.88	2.4	46	3210	7970	2930	7965	0.0367	0.0524	0.079	0.077	626	693	565	540	822	1037	540	822	540	822	75.2	114.4		
1000	3.3	2.8	-	4x0.8	2.04	2.6	51	3955	10110	3650	9705	0.0291	0.0438	0.075	0.077	703	735	634	574	923	1125	634	574	634	923	94.0	143.0		

Table-2: 2 Core XLPE Insulated armoured & unarmoured cable with Aluminium / Copper Conductor conf. to IS:7098 (P-1)/1988

mm ²	Strip		Approx. overall diameter		Approx. resistance at 20°C		Max D.C. resistance at 20°C		A.C. resistance at operating temp. 70°C		Resistance at 50Hz		Current rating		Short Circuit rating for 1 Sec.						
	Arm	Un-Arm	Arm	Un-Arm	Net Wt. of Cable		Ohm/km		Ohm/km		Ohm/km		Al	Cu	Al	Cu					
					Armoured	kg/km	Al	Cu	Al	Cu	Al	Cu					kA(rms)	kA(rms)			
1.5	0.7	0.3	1.4	1.8	13	11	—	150	—	12.1	—	15.43	—	30	—	24	—	27	—	0.21	—
2.5	0.7	0.3	1.4	1.8	14	12	—	185	—	7.41	—	9.45	—	38	—	32	—	36	—	0.36	—
4	0.7	0.3	1.4	1.8	15	13	—	240	—	4.61	—	5.88	—	51	—	41	—	48	—	0.57	—
6	0.7	0.3	1.4	1.8	16	14	—	300	—	3.08	—	3.93	—	63	—	52	—	62	—	0.86	—
10	0.7	0.3	1.4	1.8	17	15	—	415	—	1.83	—	2.33	—	85	—	69	—	84	—	1.43	—
16	0.7	0.3	1.4	1.8	18	16	—	585	—	1.15	—	1.47	—	110	—	90	—	111	—	2.29	—
25	0.9	0.3	—	4x0.8	1.4	2.0	19	600	900	325	625	1.54	0.927	108	143	116	107	144	144	3.58	—
35	0.9	0.3	—	4x0.8	1.4	2.0	21	705	1145	400	825	1.11	0.668	129	171	105	139	131	178	3.29	5.01
50	1.0	0.3	—	4x0.8	1.4	2.0	23	825	1410	500	1060	0.822	0.494	153	202	125	165	158	215	4.70	7.15
70	1.1	0.4	—	4x0.8	1.56	2.2	29	1300	2450	880	2000	0.443	0.268	188	247	154	203	200	269	6.58	10.01
95	1.1	0.4	—	4x0.8	1.56	2.2	31	1540	3015	1080	2550	0.325	0.197	225	297	185	244	235	333	8.93	13.6
120	1.2	0.4	—	4x0.8	1.72	2.4	34	1800	3625	1330	3100	0.265	0.160	274	379	252	313	269	439	14.1	21.5
150	1.4	0.4	—	4x0.8	1.72	2.4	37	2165	4400	1600	3800	0.211	0.128	314	427	288	355	308	507	17.4	26.5
185	1.6	0.5	—	4x0.8	1.88	2.6	41	2600	5500	2000	4800	0.162	0.0989	365	493	330	411	364	598	22.6	34.3
240	1.7	0.6	—	4x0.8	2.04	2.8	45	3275	6990	2520	6100	0.130	0.08	405	553	366	462	409	682	28.2	42.9
300	1.8	0.6	—	4x0.8	2.36	3.0	51	4040	8825	3120	7900	0.0778	0.0470	439	624	414	522	470	785	37.6	57.2
400	2.0	0.7	—	4x0.8	2.52	3.4	54	4950	11000	3900	10000	0.0605	0.0366	498	707	469	592	533	890	47.0	71.5
500	2.2	0.7	—	4x0.8	2.68	3.6	60	6060	13800	4950	12600	0.0469	0.0283	565	804	533	673	606	1012	59.2	90.1

Table-3: 3 Core XLPE Insulated armoured & unarmoured cable with Aluminium / Copper Conductor conf. to IS:7098 (P-1)/1988

mm ²	Strip		Approx. overall diameter		Approx. resistance at 20°C		Max D.C. resistance at 20°C		A.C. resistance at operating temp. 70°C		Resistance at 50Hz		Current rating		Short Circuit rating for 1 Sec.						
	Arm	Un-Arm	Arm	Un-Arm	Net Wt. of Cable		Ohm/km		Ohm/km		Ohm/km		Al	Cu	Al	Cu					
					Armoured	kg/km	Al	Cu	Al	Cu	Al	Cu					kA(rms)	kA(rms)			
1.5	0.7	0.3	1.4	1.8	14	12	—	170	—	12.1	—	15.43	—	22	—	20	—	23	—	0.21	—
2.5	0.7	0.3	1.4	1.8	15	13	—	215	—	7.41	—	9.45	—	29	—	27	—	31	—	0.36	—
4	0.7	0.3	1.4	1.8	16	14	—	280	—	4.61	—	5.88	—	38	—	35	—	42	—	0.57	—
6	0.7	0.3	1.4	1.8	17	15	—	360	—	3.08	—	3.93	—	47	—	44	—	52	—	0.86	—
10	0.7	0.3	1.4	1.8	19	17	—	510	—	1.83	—	2.33	—	63	—	59	—	72	—	1.43	—
16	0.7	0.3	—	4x0.8	1.24	1.8	19	575	865	335	625	1.47	0.927	71	93	58	75	94	150	2.29	—
25	0.9	0.3	—	4x0.8	1.4	2.0	21	740	1195	450	900	1.15	0.668	91	119	74	97	93	123	3.58	—
35	0.9	0.3	—	4x0.8	1.4	2.0	23	900	1560	550	1200	0.822	0.494	109	142	88	116	114	151	3.29	5.01
50	1.0	0.3	—	4x0.8	1.56	2.2	24	1075	1950	720	1530	0.641	0.367	129	169	105	138	138	184	4.70	7.15
70	1.1	0.4	—	4x0.8	1.56	2.2	30	1400	2700	990	2220	0.443	0.268	158	208	130	170	174	231	6.58	10.01
95	1.1	0.4	—	4x0.8	1.56	2.2	33	1720	3500	1260	2910	0.320	0.197	191	249	157	205	215	285	8.93	13.6
120	1.2	0.4	—	4x0.8	1.72	2.4	36	2030	4250	1440	3660	0.265	0.160	225	298	180	234	249	331	11.3	17.2
150	1.4	0.5	—	4x0.8	1.72	2.4	40	2430	5200	1800	4500	0.211	0.128	276	358	230	298	330	436	17.4	26.5
185	1.6	0.6	—	4x0.8	1.88	2.6	44	2950	6350	2220	5610	0.162	0.0989	319	413	267	345	391	514	22.6	34.3
240	1.7	0.6	—	4x0.8	2.04	2.8	50	3750	8100	2700	7200	0.130	0.08	360	462	301	387	447	586	28.2	42.9
300	1.8	0.6	—	4x0.8	2.2	3.0	55	4440	9990	3600	9000	0.0641	0.0366	406	521	342	445	461	674	37.6	57.2
400	2.0	0.7	—	4x0.8	2.52	3.4	61	5550	12825	4500	11700	0.0469	0.0283	460	591	388	505	523	764	47.0	71.5
500	2.2	0.7	—	4x0.8	2.68	3.6	66	6600	15900	5550	14700	0.0366	0.0228	523	571	440	573	594	868	59.2	90.1
630	2.4	0.7	—	4x0.8	2.84	3.8	75	8400	20100	7200	18900	0.0283	0.0197	565	804	533	673	606	1012	59.2	90.1

• The above data is indicative & may be changed without prior information.
 • Conductor up to 16 mm² will be non-compacted. • Above 16mm² compacted sector conductor.
 • Cables can be supplied in multiple of 250/500/1000 mtrs. or as per customers requirements.

Operating Conditions
 • Ambient Air Temp.: 40°C • Ground temp.: 30°C • Depth of laying: 75cm • Thermal resistivity of soil : 150°C cm/W

Table-4: 3 1/2 Core PVC Insulated armoured & unarmoured cable with Aluminium / Copper Conductor conf. to IS:1554 (P-1)/1988

Area mm ²	Thick. of XLPE Ins.	Thick. of inner sheath	Dimens of Armour	Dimension of Armour	Strip	Thickness of PVC Outer sheath		Approx. overall diameter		Approx. Net Wt. of Cable		Max D.C. resistance at 20°C		A.C. resistance at operating temp. 70°C		Reactance at 50Hz		Current rating		Short Circuit rating for 1 Sec						
						Arm	Un-Arm	Arm	Un-Arm	kg/km	AI	Cu	AI	Cu	AI	Cu	AI	Cu	AI	Cu	AI	Cu	AI	Cu	AI	Cu
16	0.9	0.7	0.3	4.0 x 0.8	-	1.40	2.0	23	22	860	1400	540	1080	1.20	0.727	1.54	0.927	0.081	91	119	74	97	93	123	2.35	3.58
35	1.6	1.1	0.5	4.0 x 0.8	-	1.40	2.0	25	24	1000	1760	660	1440	0.868	0.524	1.11	0.668	0.079	109	142	88	116	114	151	3.29	5.01
50	2.5	1.0	0.9	4.0 x 0.8	-	1.40	2.0	27	26	1235	2225	810	1890	0.641	0.387	0.822	0.494	0.078	129	169	105	138	138	184	4.70	7.15
70	3.5	1.1	0.9	4.0 x 0.8	-	1.56	2.2	32	31	1600	3100	1110	2700	0.443	0.268	0.568	0.342	0.0742	158	208	170	217	205	214	6.58	10.01
95	5.0	1.1	1.1	4.0 x 0.8	-	1.56	2.2	35	34	1900	4000	1440	3510	0.320	0.193	0.411	0.247	0.0725	191	249	157	205	214	285	8.93	13.6
120	7.0	1.2	1.1	4.0 x 0.8	-	1.72	2.4	39	38	2390	5040	1710	4440	0.253	0.153	0.325	0.197	0.0722	217	283	180	234	249	331	11.28	17.2
150	10.0	1.4	1.1	4.0 x 0.8	-	1.88	2.4	43	42	2770	5975	2160	5400	0.206	0.124	0.265	0.160	0.0727	243	317	202	264	285	378	14.1	21.5
185	15.0	1.6	1.1	4.0 x 0.8	-	2.04	2.8	48	45	3400	7380	2610	6690	0.164	0.0991	0.211	0.128	0.072	276	358	230	298	330	436	17.4	26.5
240	22.0	1.7	1.2	4.0 x 0.8	-	2.12	3.0	54	52	4200	9300	3420	8550	0.125	0.0754	0.162	0.0989	0.0713	319	413	267	345	391	514	22.6	34.3
300	30.0	1.8	1.4	4.0 x 0.8	-	2.20	3.0	59	56	5100	11400	4140	10620	0.100	0.0601	0.130	0.08	0.071	360	462	301	387	447	586	28.2	42.9
400	40.0	2.0	1.6	4.0 x 0.8	-	2.52	3.4	67	65	6300	14820	5400	13900	0.0778	0.0470	0.102	0.0641	0.070	406	521	342	445	461	674	37.6	57.2
500	50.0	2.2	1.7	4.0 x 0.8	-	2.68	3.6	74	73	7770	18300	6660	17400	0.0605	0.0366	0.081	0.0519	0.070	460	591	388	505	523	764	47.0	71.5
630	63.0	2.4	1.8	4.0 x 0.8	-	3.00	4.0	84	82	9900	23400	8100	22200	0.0605	0.0366	0.0644	0.0424	0.0697	523	671	440	573	594	868	59.2	90.1

The above data is indicative & may be changed without prior information.
 • Conductor can be Solid or stranded conductor

Operating Conditions
 • Ambient Air Temp.: 40°C • Ground temp.: 30°C • Thermal resistivity of soil : 150°C cm/W

Operating Conditions
 • Ambient Air Temp.: 40°C • Ground temp.: 30°C • Thermal resistivity of soil : 150°C cm/W

Table-5: 4 Core XLPE Insulated armoured & unarmoured cable with Aluminium / Copper Conductor conf. to IS:7098 (P-1)/1988

Area mm ²	Thick. of XLPE Ins.	Thick. of inner sheath	Dimens of Armour	Dimension of Armour	Strip	Thickness of PVC Outer sheath		Approx. overall diameter		Approx. Net Wt. of Cable		Max D.C. resistance at 20°C		A.C. resistance at operating temp. 70°C		Reactance at 50Hz		Current rating		Short Circuit rating for 1 Sec					
						Arm	Un-Arm	Arm	Un-Arm	kg/km	AI	Cu	AI	Cu	AI	Cu	AI	Cu	AI	Cu	AI	Cu	AI	Cu	AI
1.5	0.7	0.3	1.4	4x0.8	-	1.24	1.8	15	12	440	200	200	12.1	15.43	0.106	0.099	0.099	22	29	20	27	23	23	0.21	0.36
2.5	0.7	0.3	1.4	4x0.8	-	1.24	1.8	16	13	515	250	250	7.41	9.45	0.099	0.099	0.099	29	38	27	35	31	31	0.38	0.57
4	0.7	0.3	1.4	4x0.8	-	1.24	1.8	17	15	625	335	335	4.61	5.88	0.089	0.089	0.089	34	42	28	35	29	42	0.56	0.86
6	0.7	0.3	1.4	4x0.8	-	1.24	1.8	18	16	750	435	435	3.08	3.93	0.084	0.084	0.084	42	47	36	44	38	52	0.94	1.43
10	0.7	0.3	1.4	4x0.8	-	1.4	1.8	21	18	1000	625	625	1.83	2.33	0.081	0.081	0.081	55	63	47	59	50	72	1.50	2.29
16	0.7	0.3	1.4	4x0.8	-	1.4	1.8	21	19	1050	795	795	1.15	1.47	0.081	0.081	0.081	71	81	58	75	71	94	2.35	3.58
25	0.9	0.3	1.4	4x0.8	-	1.4	2.0	24	23	1500	1200	1200	0.868	1.11	0.079	0.079	0.079	91	119	74	97	93	123	3.29	5.01
35	0.9	0.3	1.4	4x0.8	-	1.56	2.0	29	28	2000	1590	1590	0.641	0.822	0.078	0.078	0.078	109	142	88	116	114	151	4.70	7.15
50	1.1	0.4	1.4	4x0.8	-	1.56	2.2	34	33	2500	2100	2100	0.443	0.568	0.0742	0.0742	0.0742	129	169	105	138	138	184	6.58	10.01
70	1.1	0.4	1.4	4x0.8	-	1.72	2.4	37	36	3000	2700	2700	0.320	0.411	0.0725	0.0725	0.0725	158	208	130	170	170	231	8.93	13.6
95	1.1	0.4	1.4	4x0.8	-	1.72	2.4	41	40	3500	3000	3000	0.253	0.325	0.0722	0.0722	0.0722	191	249	157	205	215	285	11.3	17.2
120	1.2	0.5	1.4	4x0.8	-	1.88	2.6	46	45	4000	3600	3600	0.206	0.265	0.0727	0.0727	0.0727	217	283	202	264	285	378	14.1	21.5
150	1.4	0.5	1.4	4x0.8	-	2.04	2.8	51	50	4500	4000	4000	0.164	0.211	0.072	0.072	0.072	243	317	230	298	330	436	17.4	26.5
240	1.7	0.6	1.4	4x0.8	-	2.20	3.0	58	56	5000	4500	4500	0.125	0.162	0.0713	0.0713	0.0713	276	358	230	298	330	436	22.6	34.3
300	1.8	0.7	1.4	4x0.8	-	2.36	3.2	64	62	5700	5000	5000	0.100	0.130	0.070	0.070	0.070	319	413	267	345	391	514	28.2	42.9
400	2.0	0.7	1.4	4x0.8	-	2.68	3.6	71	70	7200	6000	6000	0.0778	0.102	0.0641	0.0641	0.0641	360	462	301	387	447	586	37.6	57.2
500	2.2	0.7	1.4	4x0.8	-	2.84	3.8	80	79	8880	7500	7500	0.0605	0.081	0.0519	0.0519	0.0519	406	521	342	445	461	674	47.0	71.5
630	2.4	0.7	1.4	4x0.8	-	3.00	4.0	89	88	10800	9600	9600	0.0469	0.0644	0.0424	0.0424	0.0424	460	591	388	505	523	764	59.2	90.1

The above data is indicative & may be changed without prior information.
 • Conductor up to 16 mm² will be non-compacted. • Above 16mm² compacted sector conductor.
 • Cables can be supplied in multiple of 250/500/1000 mtrs. or as per customers requirements.

Operating Conditions
 • Ambient Air Temp.: 40°C • Ground temp.: 30°C • Thermal resistivity of soil : 150°C cm/W

Operating Conditions
 • Ambient Air Temp.: 40°C • Ground temp.: 30°C • Thermal resistivity of soil : 150°C cm/W

Table-6 : XLPE Insulated armoured & unarmoured Control cable with Copper Conductor of 1.5 mm² conf. to IS:7098 (P-1)/1988

No. x mm ²	(Nom)	(Min)	Thick of PVC Outer Sheath		Wire	Strip	Arm	Un-Arm	kg/km	Ohm/km	A.C. resistance at operating temp 70°C	Reactance at 50Hz.	Current Rating			Short circuit rating for 1 Sec.		
			kg/km	Ohm/km									Direct in Ground	In Duct	In Air			
2x1.5	0.7	0.3	1.4	-	1.4	-	1.24	1.8	13	11	365	150	12.1	0.106	30	24	27	0.215
3x1.5	0.7	0.3	1.4	-	1.4	-	1.24	1.8	14	12	400	170	12.1	0.106	22	20	23	0.215
4x1.5	0.7	0.3	1.4	-	1.4	-	1.24	1.8	15	12	440	200	12.1	0.106	22	20	23	0.215
5x1.5	0.7	0.3	1.4	-	1.4	-	1.24	1.8	15	13	510	225	12.1	0.106	22	20	23	0.215
6x1.5	0.7	0.3	1.4	-	1.4	-	1.24	1.8	16	14	570	250	12.1	0.106	20	16	18	0.215
7x1.5	0.7	0.3	1.4	-	1.4	-	1.24	1.8	16	14	585	275	12.1	0.106	19	15	17	0.215
10x1.5	0.7	0.3	1.4	-	1.4	-	1.40	1.8	19	17	750	360	12.1	0.106	17	13	15	0.215
12x1.5	0.7	0.3	1.4	-	1.4	-	1.24	1.8	20	18	800	400	12.1	0.106	16	13	14	0.215
14x1.5	0.7	0.3	1.4	-	1.4	-	1.4	1.8	21	19	790	500	12.1	0.106	15	12	13	0.215
16x1.5	0.7	0.3	1.4	-	4x0.8	-	1.4	1.8	21	19	790	500	12.1	0.106	14	11	12	0.215
19x1.5	0.7	0.3	1.4	-	4x0.8	-	1.4	2.0	22	20	880	575	12.1	0.106	13	11	12	0.215
24x1.5	0.7	0.3	1.4	-	4x0.8	-	1.4	2.0	25	24	1060	725	12.1	0.106	12	10	11	0.215
27x1.5	0.7	0.3	1.4	-	4x0.8	-	1.4	2.0	26	24	1125	780	12.1	0.106	11	9	10	0.215
30x1.5	0.7	0.3	1.4	-	4x0.8	-	1.4	2.0	27	25	1200	850	12.1	0.106	11	9	10	0.215
37x1.5	0.7	0.3	1.4	-	4x0.8	-	1.4	2.0	28	27	1375	1000	12.1	0.106	10	8	9	0.215
44x1.5	0.7	0.3	1.4	-	4x0.8	-	1.4	2.0	32	30	1600	1110	12.1	0.106	9	7	9	0.215
52x1.5	0.7	0.3	1.4	-	4x0.8	-	1.56	2.2	33	31	1800	1350	12.1	0.106	9	7	8	0.215
61x1.5	0.7	0.4	1.4	-	4x0.8	-	1.56	2.2	35	34	2070	1600	12.1	0.106	8	7	8	0.215

• The above data is indicative & may be changed without prior information. • Above 16mm² compacted sector conductor.

• Cables can be supplied in multiple of 250/500/1000 mtrs. or as per customers requirements.

Operating Conditions

• Ambient Air Temp.: 40°C

• Ground temp.: 30°C

• Depth of laying: 75cm

• Thermal resistivity of soil : 150°C cm/W

Table-7 : XLPE Insulated armoured & unarmoured Control cable with Copper Conductor of 1.5 mm² conf. to IS:7098 (P-1)/1988

No. x mm ²	(Nom)	(Min)	Thick of PVC Outer Sheath		Wire	Strip	Arm	Un-Arm	kg/km	Ohm/km	A.C. resistance at operating temp 70°C	Reactance at 50Hz.	Current Rating			Short circuit rating for 1 Sec.		
			kg/km	Ohm/km									Direct in Ground	In Duct	In Air			
2x1.5	0.7	0.3	1.4	-	1.4	-	1.24	1.8	14	12	405	185	7.41	0.099	38	32	36	0.358
3x1.5	0.7	0.3	1.4	-	1.4	-	1.24	1.8	15	13	465	215	7.41	0.099	29	27	31	0.358
4x1.5	0.7	0.3	1.4	-	1.4	-	1.24	1.8	16	13	515	250	7.41	0.099	22	20	23	0.358
5x1.5	0.7	0.3	1.4	-	1.4	-	1.24	1.8	17	14	600	295	7.41	0.099	22	20	23	0.358
6x1.5	0.7	0.3	1.4	-	1.4	-	1.24	1.8	18	15	660	325	7.41	0.099	25	21	24	0.358
7x1.5	0.7	0.3	1.4	-	1.4	-	1.24	1.8	18	15	700	350	7.41	0.099	24	20	23	0.358
10x1.5	0.7	0.3	1.4	-	4x0.8	-	1.24	1.8	20	19	750	480	7.41	0.099	21	18	20	0.358
12x1.5	0.7	0.3	1.4	-	4x0.8	-	1.4	1.8	21	20	825	550	7.41	0.099	20	17	19	0.358
14x1.5	0.7	0.3	1.4	-	4x0.8	-	1.4	1.8	22	20	925	600	7.41	0.099	19	16	17	0.358
16x1.5	0.7	0.3	1.4	-	4x0.8	-	1.4	1.8	23	22	1000	700	7.41	0.099	18	15	16	0.358
19x1.5	0.7	0.3	1.4	-	4x0.8	-	1.4	2.0	24	23	1100	800	7.41	0.099	17	14	16	0.358
24x1.5	0.7	0.3	1.4	-	4x0.8	-	1.4	2.0	28	26	1350	1000	7.41	0.099	16	13	15	0.358
27x1.5	0.7	0.3	1.4	-	4x0.8	-	1.4	2.0	28	27	1450	1050	7.41	0.099	14	12	13	0.358
30x1.5	0.7	0.3	1.4	-	4x0.8	-	1.4	2.0	29	28	1550	1150	7.41	0.099	14	12	13	0.358
37x1.5	0.7	0.3	1.4	-	4x0.8	-	1.4	2.0	31	30	1825	1400	7.41	0.099	13	11	12	0.358
44x1.5	0.7	0.4	1.4	-	4x0.8	-	1.56	2.0	35	34	2150	1700	7.41	0.099	12	10	12	0.358
52x1.5	0.7	0.4	1.4	-	4x0.8	-	1.56	2.2	37	36	2450	1950	7.41	0.099	12	10	11	0.358
61x1.5	0.7	0.4	1.4	-	4x0.8	-	1.56	2.2	39	38	2750	2220	7.41	0.099	11	9	11	0.358

• The above data is indicative & may be changed without prior information. • Above 16mm² compacted sector conductor.

• Cables can be supplied in multiple of 250/500/1000 mtrs. or as per customers requirements.

Operating Conditions

• Ambient Air Temp.: 40°C

• Ground temp.: 30°C

• Depth of laying: 75cm

• Thermal resistivity of soil : 150°C cm/W

Group Rating Factors for Circuits for Three Single Core Cables in Trefoil formation

Table 8 A : Touching Horizontal Formation laid Direct in Ground

No. of Circuit	Spacing (Between Centres of Circuits)				
	Touching	45 cm	60 cm	75 cm	90 cm
2	0.78	0.81	0.85	0.88	0.90
3	0.68	0.71	0.77	0.81	0.83
4	0.61	0.65	0.72	0.76	0.79
5	0.56	0.61	0.68	0.73	0.78

Table 8 B : Cables laid in Trefoil Ducts in horizontal formation

No. of Circuit	Spacing (Between Centres of Circuits)		
	Touching	45 cm	60 cm
2	0.87	0.90	0.91
3	0.79	0.83	0.86
4	0.74	0.79	0.82
5	0.71	0.76	0.79

Table 8 C : Cables laid on Racks/Trays in covered trench with removable covers where air circulation is restricted, Trefoil are separated by two cable dia horizontally and the trays are in tiers with 30cm. gap between them.

No. of Racks Trays in tiers	No. of Trefoils in horizontal formation		
	Touching	45 cm	60 cm
1	0.95	0.90	0.88
2	0.90	0.85	0.83
3	0.88	0.83	0.81
6	0.86	0.81	0.79

Table 8 D : Cables laid as in 'C' but open air

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

Group Rating Factors for Circuits for Multi-Core Cables

Table 9 A : Cables laid inside concrete trench with removable covers, on cable trays where air circulation is restricted. The cables spaced by one cable diameter and trays in tiers by 300mm. The clearance of the cable from the wall is 25mm

No. of cables trays in tier	No. of cables				
	Touching	300mm	450mm	600mm	900mm
1	0.95	0.90	0.88	0.85	0.84
2	0.90	0.85	0.83	0.81	0.80
3	0.88	0.83	0.81	0.79	0.78
6	0.86	0.81	0.79	0.77	0.76

Table 9 B : Cables laid on cable trays exposed to air, the cables spaced by one cable diameter & trays in tier by 300mm. The clearance between the wall & the cable is 25mm.

No. of Cable Trays in tiers	No. of cables per Rack			
	2	3	6	9
1	0.98	0.96	0.93	0.92
2	0.95	0.93	0.90	0.89
3	0.94	0.92	0.89	0.88
6	0.93	0.90	0.87	0.86

Table 9 C : Cables laid on cable trays exposed to air, the cables are touching & trays in tiers by 300mm. The clearance between the wall & the cable is 25mm.

No. of Cable Trays in tiers	No. of cables per Rack			
	2	3	6	9
1	0.84	0.80	0.75	0.73
2	0.80	0.76	0.71	0.69
3	0.78	0.74	0.70	0.68
6	0.76	0.72	0.68	0.66

Table 9 D : Cables laid Direct in Ground in horizontal formation

No. of Cable in group	Spacing of cables			
	Touching	15cm	30cm	45cm
2	0.79	0.82	0.87	0.90
3	0.69	0.75	0.79	0.83
4	0.62	0.69	0.74	0.79
5	0.58	0.65	0.72	0.76
6	0.54	0.61	0.69	0.75

Table 9 E : Cables laid Direct in Single way Ducts/pipes in horizontal formation.

No. of Cable in group	Spacing of cables			
	Touching	30cm	45cm	60cm
2	0.88	0.90	0.92	0.94
3	0.82	0.84	0.87	0.89
4	0.77	0.80	0.84	0.87
5	0.74	0.78	0.82	0.85
6	0.71	0.76	0.81	0.84

Table 10 : Rating Factor for variation in Dept. of Laying in Ground

Dept. of laying (cm)	75	90	105	120	150	180 & Above
Rating Factor upto 25mm ²	1	0.99	0.98	0.97	0.96	0.95
Rating Factor upto 25mm ² and upto 300mm ²	1	0.98	0.97	0.96	0.94	0.93
Rating Factor above 300mm ²	1	0.97	0.96	0.95	0.92	0.91

Table 11 : Rating Factors for variation in Ambient Air Temperature

Air temp °C	15	20	25	30	35	40	45	50	55
Rating Factor	1.22	1.18	1.41	1.10	1.05	1.0	0.95	0.89	0.84

Table 12 : Rating Factors for variation in ground temperature

Group temp °C	15	20	25	30	35	40	45	50	55
Rating Factor	1.12	1.08	1.04	1.0	0.96	0.91	0.87	0.82	0.76

Table 13 : Rating factor for variation in thermal resistivity of soil (multicore cables laid Direct in the Ground)

Nominal area of conductor mm ²	For Value of thermal resistivity of soil in °C-cm/W					
	100	120	150	200	250	300
1.5	1.10	1.05	1.0	0.92	0.86	0.81
2.5	1.10	1.05	1.0	0.92	0.86	0.81
4	1.10	1.05	1.0	0.92	0.86	0.81
6	1.10	1.05	1.0	0.92	0.86	0.81
10	1.10	1.06	1.0	0.92	0.85	0.80
16	1.12	1.06	1.0	0.91	0.84	0.79
25	1.14	1.08	1.0	0.91	0.84	0.78
35	1.15	1.08	1.0	0.91	0.84	0.77
50	1.15	1.08	1.0	0.91	0.84	0.77
70	1.15	1.08	1.0	0.90	0.83	0.76
95	1.15	1.08	1.0	0.90	0.83	0.76
120	1.17	1.09	1.0	0.90	0.82	0.76
150	1.17	1.09	1.0	0.90	0.82	0.76
185	1.18	1.09	1.0	0.89	0.81	0.75
240	1.18	1.09	1.0	0.89	0.81	0.75
300	1.18	1.09	1.0	0.89	0.81	0.75
400	1.19	1.1	1.0	0.89	0.81	0.75
500	1.21	1.1	1.0	0.88	0.80	0.74
630	1.22	1.1	1.0	0.88	0.80	0.74

Table 14 : Rating factor for variation in thermal resistivity of soil, three single core cables laid direct in the ground (three cables in trefoil touching).

Nominal area of conductor mm ²	For Value of thermal resistivity of soil in °C-cm/W					
	100	120	150	200	250	300
1.5	1.18	1.09	1.0	0.90	0.82	0.76
2.5	1.18	1.09	1.0	0.90	0.82	0.76
4	1.18	1.09	1.0	0.90	0.82	0.76
6	1.18	1.09	1.0	0.90	0.82	0.76
10	1.18	1.09	1.0	0.89	0.81	0.75
16	1.19	1.09	1.0	0.89	0.81	0.74
25	1.19	1.09	1.0	0.88	0.80	0.74
35	1.2	1.09	1.0	0.88	0.80	0.74
50	1.2	1.09	1.0	0.88	0.80	0.74
70	1.21	1.1	1.0	0.88	0.80	0.74
95	1.22	1.1	1.0	0.88	0.80	0.74
120	1.22	1.1	1.0	0.88	0.79	0.74
150	1.22	1.1	1.0	0.88	0.79	0.73
185	1.22	1.1	1.0	0.88	0.79	0.73
240	1.22	1.1	1.0	0.88	0.79	0.73
300	1.22	1.1	1.0	0.88	0.79	0.72
400	1.24	1.11	1.0	0.88	0.79	0.72
500	1.24	1.11	1.0	0.88	0.79	0.72
630	1.24	1.11	1.0	0.88	0.79	0.72

