LSZH Flame Retardant Cables

KEYSTONE CABLE
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0.6/1kV Single-Core
XLPE Insulated, Unarmoured & Armoured, LSZH Sheathed Cable

Description: CU/XLPE/LSZH-AT-UV or CU/XLPE/LSZH/AWA/LSZH-AT-UV
Model Code: XL-AT-UV or XLAL-AT-UV

Application :	This cable is mainly used in power stations, mass transit underground passenger systems, airports, petrochemical plants, hotels, hospitals, and high-rise buildings.
Voltage rating :	0.6/1kV
Construction :	Plain annealed copper (IEC 60228 Class 2), XLPE compound insulated, unarmoured or aluminium wires armoured, anti-termite and UV resistant LSZH compound sheathed cable
Insulation colour :	Natural
Sheath colour :	Black (Other colour upon request)
Specification :	IEC 60502-1, BS 6724, IEC 60332-1-2, IEC 60332-3, IEC 60754, IEC 61034-2
Operating temperature :	90˚C

Conductor		Insulation	Unarmoured Cable			Armoured Cable		
Nominal Area	No./Diam. of Strand	Thickness	**Part No.**	Approx. Overall Diam.	Approx. Weight	**Part No.**	Approx. Overall Diam.	Approx. Weight
(mm^2)	(no./mm)	(mm)		(mm)	(kg/km)		(mm)	(kg/km)
1.5	7/0.53	0.7	**07018590**	6.1	52	**-**	-	-
2.5	7/0.67	0.7	**08018590**	6.6	67	**-**	-	-
4	7/0.85	0.7	**09018590**	7.0	85	**-**	-	-
6	7/1.04	0.7	**10018590**	7.5	110	**-**	-	-
10	7/1.35	0.7	**11018590**	8.5	155	**-**	-	-
16	7/1.70	0.7	**12018590**	9.5	225	**-**	-	-
25 (cs)	7/2.14	0.9	**13018590**	11.2	335	**-**	-	-
35 (cs)	19/1.53	0.9	**14018590**	12.3	435	**-**	-	-
50 (cs)	19/1.78	1.0	**15018590**	13.5	570	**15018543**	20.5	815
70 (cs)	19/2.14	1.1	**16018590**	15.3	800	**16018543**	22.2	1065
95 (cs)	19/2.52	1.1	**17018590**	17.4	1080	**17018543**	24.3	1355
120 (cs)	37/2.03	1.2	**18018590**	18.8	1330	**18018543**	26.3	1680
150 (cs)	37/2.25	1.4	**19018590**	20.8	1630	**19018543**	28.3	1990
185 (cs)	37/2.52	1.6	**20018590**	23.1	2030	**20018543**	30.5	2400
240 (cs)	61/2.25	1.7	**21018590**	26.3	2650	**21018543**	33.6	3005
300 (cs)	61/2.52	1.8	**22018590**	29.1	3260	**22018543**	36.2	3600
400 (cs)	61/2.85	2.0	**23018590**	32.9	4140	**23018543**	41.4	4765
500 (cs)	61/3.20	2.2	**24018590**	36.7	5200	**24018543**	45.3	5865
630	127/2.52	2.4	**25018590**	42.8	6650	**25018543**	51.4	7410
800	127/2.85	2.6	**26018590**	48.0	8450	**26018543**	57.5	9460
1000	127/3.20	2.8	**27018590**	53.0	10600	**27018543**	62.3	11750

Current rating and voltage drop
For Unarmoured Cable, please refer to Table 10 & 11 (Page 58)
For Armoured Cable, please refer to Table 12 & 13 (Page 59)

(cs) : Circular Compact Stranded Conductor

Current Rating and Voltage Drop

XLPE (or LSZH) Insulated Cables
Single-Core, Unarmoured

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Single-Core Cables with XLPE (or LSZH) Insulation, with or without PVC (or LSZH) Outersheath 450/750V or 0.6/1kV

Table 10 : Current-Carrying Capacities (Amp)

[CU/LSZH, CU/XLPE/PVC, CU/XLPE/LSZH, CU/MT/LSZH or CU/MT/XLPE/LSZH Cables]

Conductor Operating Temperature : 90°C
Ambient Temperature : 30°C

BS EN 50525-3-41 (BS 7211)
BS 8592
IEC 60502-1

Conductor Cross-sectional Area	Reference Method 4 (enclosed in conduit in thermally insulating wall etc)		Reference Method 3 (enclosed in conduit on a wall or in trunking etc)		Reference Method 1 (clipped direct)		Reference Method 11 (on a perforated cable tray, horizontal or vertical)		Reference Method 12 (in free air)		
									Horizontal flat spaced	Vertical flat spaced	Trefoil
	2 cables, 1-phase a.c. or d.c.	3 or 4 cables, 3-phase a.c.	2 cables, 1-phase a.c. or d.c	3 or 4 cables, 3-phase a.c.	2 cables, 1-phase a.c. or d.c. flat and touching	3 or 4 cables, 3-phase a.c. flat and touching or trefoil	2 cables, 1-phase a.c. or d.c. flat and touching	3 or 4 cables, 3-phase a.c. flat and touching or trefoil	2 cables, 1-phase a.c. or d.c. or 3 cables 3-phase a.c.	2 cables, 1-phase a.c. or d.c. or 3 cables 3-phase a.c.	3 cables trefoil, 3-phase a.c.
1	2	3	4	5	6	7	8	9	10	11	12
mm²	A	A	A	A	A	A	A	A	A	A	A
1.5	18	17	22	19	25	23	-	-	-	-	-
2.5	24	23	30	26	34	31	-	-	-	-	-
4	33	30	40	35	46	41	-	-	-	-	-
6	43	39	51	45	59	54	-	-	-	-	-
10	58	53	71	63	81	74	-	-	-	-	-
16	76	70	95	85	109	99	-	-	-	-	-
25	100	91	126	111	143	130	158	140	183	163	138
35	124	111	156	138	176	161	195	176	226	203	171
50	149	135	189	168	228	209	239	215	274	246	209
70	189	170	240	214	293	268	308	279	351	318	270
95	228	205	290	259	355	326	375	341	426	389	330
120	263	235	336	299	413	379	436	398	495	453	385
150	300	270	375	328	476	436	505	461	570	524	445
185	341	306	426	370	545	500	579	530	651	600	511
240	400	358	500	433	644	590	686	630	769	711	606
300	459	410	573	493	743	681	794	730	886	824	701
400	-	-	683	584	868	793	915	849	1065	994	820
500	-	-	783	666	990	904	1044	973	1228	1150	936
630	-	-	900	764	1130	1033	1191	1115	1423	1338	1069
800	-	-	-	-	1288	1179	1358	1275	1581	1485	1214
1000	-	-	-	-	1443	1323	1520	1436	1775	1671	1349

Note : For rating factors of ambient temperature other than 30°C, please refer to Table 25 (Page 66)

Table 11 : Voltage Drop (Per Amp Per Meter)

[CU/LSZH, CU/XLPE/PVC, CU/XLPE/LSZH, CU/MT/LSZH or CU/MT/XLPE/LSZH Cables]

Conductor Operating Temperature : 90°C

BS EN 50525-3-41 (BS 7211)
BS 8592
IEC 60502-1

Conductor Cross-sectional Area	2 cables, d.c.	2 cables, 1-phase a.c.						3 or 4 cables, 3-phase a.c.								
		Reference Methods 3 and 4 (enclosed in conduit etc, in or on a wall)			Reference Methods 1 and 11 (clipped direct or on trays touching)			Reference Methods 3 and 4 (enclosed in conduit etc, in or on a wall)			Reference Methods 1, 11 and 12 (trefoil)			Reference Methods 1 and 11 (flat and touching)		
1	2	3			4			5			6			7		
mm²	mV/A/m	mV/A/m			mV/A/m			mV/A/m			mV/A/m			mV/A/m		
1.5	31	31			27			27			27			27		
2.5	19	19			16			16			16			16		
4	12	12			10			10			10			10		
6	7.9	7.9			6.8			6.8			6.8			6.8		
10	4.7	4.7			4.7			4.0			4			4		
16	2.9	2.9			2.9			2.5			2.5			2.5		
		r	x	z	r	x	z	r	x	z	r	x	z	r	x	z
25	1.85	1.85	0.31	1.90	1.85	0.190	1.85	1.60	0.27	1.65	1.60	0.165	1.60	1.60	0.190	1.60
35	1.35	1.35	0.29	1.35	1.35	0.180	1.35	1.15	0.25	1.15	1.15	0.155	1.15	1.15	0.180	1.15
50	0.99	1.00	0.29	1.05	0.99	0.180	1.00	0.87	0.25	0.90	0.86	0.155	0.87	0.86	0.180	0.87
70	0.68	0.70	0.28	0.75	0.68	0.175	0.71	0.60	0.24	0.65	0.59	0.150	0.61	0.59	0.175	0.62
95	0.49	0.51	0.27	0.58	0.49	0.170	0.52	0.44	0.23	0.50	0.43	0.145	0.45	0.43	0.170	0.46
120	0.39	0.41	0.26	0.48	0.39	0.165	0.43	0.35	0.23	0.42	0.34	0.140	0.37	0.34	0.165	0.38
150	0.32	0.33	0.26	0.43	0.32	0.165	0.36	0.29	0.23	0.37	0.28	0.140	0.31	0.28	0.165	0.32
185	0.25	0.27	0.26	0.37	0.26	0.165	0.30	0.23	0.23	0.32	0.22	0.140	0.26	0.22	0.165	0.28
240	0.190	0.21	0.26	0.33	0.20	0.160	0.25	0.185	0.22	0.29	0.170	0.140	0.22	0.170	0.165	0.24
300	0.155	0.175	0.25	0.31	0.160	0.160	0.22	0.150	0.22	0.27	0.140	0.140	0.195	0.135	0.160	0.21
400	0.12	0.140	0.25	0.29	0.130	0.155	0.20	0.125	0.22	0.25	0.110	0.135	0.175	0.110	0.160	0.195
500	0.093	0.120	0.25	0.28	0.105	0.155	0.185	0.100	0.22	0.24	0.090	0.135	0.160	0.088	0.160	0.180
630	0.072	0.100	0.25	0.27	0.086	0.155	0.175	0.088	0.21	0.23	0.074	0.135	0.150	0.071	0.160	0.170
800	0.056	-	-	-	0.072	0.150	0.170	-	-	-	0.062	0.130	0.145	0.059	0.155	0.165
1000	0.045	-	-	-	0.063	0.150	0.165	-	-	-	0.055	0.130	0.140	0.050	0.155	0.165

Note : r = resistive component; x = reactive component; z = impedance value

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Single-Core Cables with XLPE or LSZH Insulation, Armoured, PVC or LSZH Outersheath 0.6/1kV

Table 12 : Current-Carrying Capacities (Amp)

[CU/XLPE/PVC/AWA/PVC, CU/XLPE/LSZH/AWA/LSZH, CU/MT/XLPE/LSZH/AWA/LSZH Cables]

Conductor Operating Temperature : 90°C — BS 6724
Ambient Temperature : 30°C — IEC 60502-1
Ground Temperature : 15°C — Depth of Laying : 0.5m — Soil Thermal Resistivity : 1.2 k•m/W

Conductor Cross-sectional Area	Reference Method 1 (clipped direct)		Reference Method 11 (on a perforated cable tray)		Reference Method 12 (in free air)	In single-way ducts		Laid direct in ground	
	2 cables, 1-phase a.c. or d.c. flat and touching	3 or 4 cables, 3-phase a.c. flat and touching	2 cables, 1-phase a.c. or d.c. flat and touching	3 or 4 cables, 3-phase a.c. flat and touching	3 cables, 3-phase a.c. trefoil touching	2 cables, 1-phase a.c. or d.c. ducts touching	3 cables, 3-phase a.c. trefoil touching	2 cables, 1-phase a.c. or d.c. touching	3 cables, 3-phase a.c. trefoil touching
1	2	3	4	5	6	7	8	9	10
mm^2	A	A	A	A	A	A	A	A	A
50	237	220	253	232	222	255	235	275	235
70	303	277	322	293	285	310	280	340	290
95	367	333	389	352	346	365	330	405	345
120	425	383	449	405	402	410	370	460	389
150	488	437	516	462	463	445	405	510	435
185	557	496	587	524	529	485	440	580	490
240	656	579	689	612	625	550	500	670	560
300	755	662	792	700	720	610	550	750	630
400	853	717	899	767	815	640	580	830	700
500	962	791	1016	851	918	690	620	910	770
630	1082	861	1146	935	1027	750	670	1000	840
800	1170	904	1246	987	1119	828	735	1117	931
1000	1261	961	1345	1055	1214	919	811	1254	1038

Note : For rating factors of ambient temperature other than 30°C, please refer to Table 25 (Page 66)
For rating factors of ground temperature other than 15°C, please refer to Table 26 (Page 66)

Table 13 : Voltage Drop (Per Amp Per Meter)

[CU/XLPE/PVC/AWA/PVC, CU/XLPE/LSZH/AWA/LSZH, CU/MT/XLPE/LSZH/AWA/LSZH Cables]

Conductor Operating Temperature : 90°C — BS 6724 IEC 60502-1

Conductor Cross-sectional Area	2 cables, d.c.	2 cables, 1-phase a.c.			3 or 4 cables, 3-phase a.c.						2 cables, 1-phase a.c.		3 or 4 cables, 3-phase a.c. touching	
		Reference Method 1 & 11 (touching)			Reference Method 1, 11 & 12 (trefoil touching)			Reference Method 1 & 11 (flat touching)			In ducts	In ground	In ducts	In ground
1	2	3			4			5			6	7	8	9
mm^2	mV/A/m	mV/A/m			mV/A/m			mV/A/m			mV/A/m	mV/A/m	mV/A/m	mV/A/m
		r	x	z	r	x	z	r	x	z				
50	0.98	0.99	0.21	1.00	0.86	0.180	0.87	0.84	0.25	0.88	1.10	0.99	0.93	0.86
70	0.67	0.68	0.200	0.71	0.59	0.170	0.62	0.60	0.25	0.65	0.80	0.70	0.70	0.61
95	0.49	0.51	0.195	0.55	0.44	0.170	0.47	0.46	0.24	0.52	0.65	0.53	0.56	0.46
120	0.39	0.41	0.190	0.45	0.35	0.165	0.39	0.38	0.24	0.44	0.55	0.43	0.48	0.37
150	0.31	0.33	0.185	0.38	0.29	0.160	0.33	0.31	0.23	0.39	0.50	0.37	0.43	0.32
185	0.25	0.27	0.185	0.33	0.23	0.160	0.28	0.26	0.23	0.34	0.45	0.31	0.39	0.27
240	0.195	0.21	0.180	0.28	0.180	0.155	0.24	0.21	0.22	0.30	0.40	0.26	0.35	0.23
300	0.155	0.170	0.175	0.25	0.145	0.150	0.21	0.170	0.22	0.28	0.37	0.24	0.32	0.21
400	0.115	0.145	0.170	0.22	0.125	0.150	0.195	0.160	0.21	0.27	0.35	0.21	0.30	0.19
500	0.093	0.125	0.170	0.21	0.105	0.145	0.180	0.145	0.20	0.25	0.33	0.20	0.28	0.18
630	0.073	0.105	0.165	0.195	0.092	0.145	0.170	0.135	0.195	0.24	0.30	0.19	0.26	0.17
800	0.056	0.090	0.160	0.190	0.086	0.140	0.165	0.130	0.180	0.23	0.28	0.18	0.24	0.16
1000	0.045	0.092	0.155	0.180	0.080	0.135	0.155	0.125	0.170	0.21	0.26	0.17	0.22	0.15

Note : r = resistive component; x = reactive component; z = impedance value

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Table 25 : Correction Factor for Ambient Air Temperature Other Than 30°C to be Applied to the Current-Carrying Capacities for Cables in Free Air

Ambient Temperature	Insulation				
	PVC	XLPE	HT-PVC	Rubber	Rubber
(°C)	(70°C)	(90°C)	(90°C)	(85°C)	(60°C)
10	1.22	1.15	-	-	-
15	1.17	1.12	-	-	-
20	1.12	1.08	-	-	-
25	1.06	1.04	1.03	1.02	-
30	1.00	1.00	1.00	1.00	1.00
35	0.94	0.96	0.97	0.95	0.91
40	0.87	0.91	0.94	0.90	0.82
45	0.79	0.87	0.91	0.85	0.71
50	0.71	0.82	0.87	0.80	0.58
55	0.61	0.76	0.84	0.74	0.41
60	0.50	0.71	0.80	0.67	-
65	0.35	0.65	0.76	0.60	-
70	-	0.58	0.71	0.52	-
75	-	0.50	0.61	0.43	-
80	-	0.41	0.50	0.30	-
85	-	0.29	0.35	-	-

Table 26 : Correction Factor for Ambient Ground Temperature Other Than 15°C to be Applied to the Current-Carrying Capacities for Cables in Ducts or in Ground

Ground Temperature	Insulation	
	PVC	XLPE
(°C)	(70°C)	(90°C)
10	1.04	1.03
15	1.00	1.00
20	0.95	0.97
25	0.90	0.93
30	0.85	0.89
35	0.80	0.86
40	0.74	0.82
45	0.67	0.77
50	0.60	0.73
55	-	0.68
60	-	0.63
65	-	0.58