LSZH Flame Retardant Prefabricated Branch Cables

KEYSTONE CABLE
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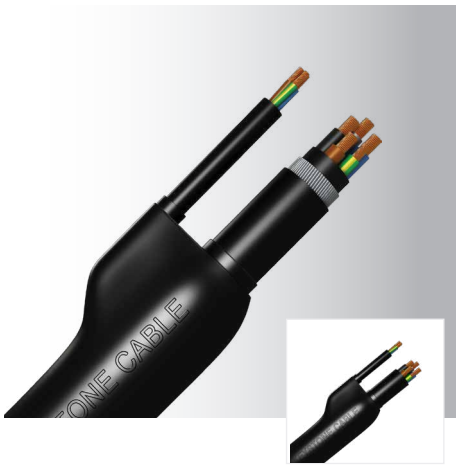
0.6/1kV 2-Core ~ 5-Core
XLPE Insulated, Unarmoured or Armoured, LSZH Sheathed Cable
Description: CU/XLPE/LSZH-AT-UV or CU/XLPE/LSZH/SWA/LSZH-AT-UV
Model Code: XL-AT-UV or XLSL-AT-UV



Application :	This cable is used in power supply for lighting system of highways, tunnels, and bridges.
Voltage rating :	0.6/1kV
Construction :	Plain annealed copper (IEC 60228 Class 2), XLPE insulated, unarmoured or galvanized steel wires armoured, anti-termite and UV resistant LSZH compound sheathed cable
Insulation colour :	2-Core: Brown, Blue; 3-Core: Brown, Black, Grey; Brown, Blue, Green/Yellow; 4-Core: Brown, Black, Grey, Blue; Brown, Black, Grey, Green/Yellow; 5-Core: Brown, Black, Grey, Blue, Green/Yellow; (Other colour upon request)
Sheath colour :	Black
Specification :	IEC 60502-1, BS 6724, IEC 60332-1, IEC 60332-3, IEC 60754, IEC 61034
Operating temperature :	90˚C

2-CORE [2C]
(Brown, Blue) (1-phase and neutral)

Conductor	Insulation	Unarmoured Cable			Armoured Cable		
Nominal Area	Thickness	**Part No.**	Approx. Overall Diam.	Approx. Weight	**Part No.**	Approx. Overall Diam.	Approx. Weight
(mm^2)	(mm)		(mm)	(kg/km)		(mm)	(kg/km)
2.5	0.7	**0802B******	11.0	165	**0802B******	15.5	410
4	0.7	**0902B******	12.0	215	**0902B******	16.5	490
6	0.7	**1002B******	13.1	270	**1002B******	18.0	580
10	0.7	**1102B******	16.0	390	**1102B******	20.8	800
16	0.7	**1202B******	18.0	495	**1202B******	22.9	1050
25 (cs)	0.9	**1302B******	21.2	726	**1302B******	26.7	1473
35 (cs)	0.9	**1402B******	23.4	944	**1402B******	29.0	1780

3-CORE [3C]
(Brown, Black, Grey) (3-phase, three wire)

Conductor	Insulation	Unarmoured Cable			Armoured Cable		
Nominal Area	Thickness	**Part No.**	Approx. Overall Diam.	Approx. Weight	**Part No.**	Approx. Overall Diam.	Approx. Weight
(mm^2)	(mm)		(mm)	(kg/km)		(mm)	(kg/km)
2.5	0.7	**0803B******	11.4	190	**0803B******	16.0	435
4	0.7	**0903B******	12.8	250	**0903B******	17.0	550
6	0.7	**1003B******	14.0	320	**1003B******	18.5	660
10	0.7	**1103B******	16.9	480	**1103B******	21.7	900
16	0.7	**1203B******	19.0	645	**1203B******	24.0	1260
25 (cs)	0.9	**1303B******	22.5	968	**1303B******	28.0	1772
35 (cs)	0.9	**1403B******	25.0	1278	**1403B******	30.5	2175

**** Stands for branch size, please contact us for more information.

Current rating and voltage drop
For Unarmoured Cable, please refer to Table 5 & 6 (Page 27)
For Armoured Cable, please refer to Table 7 & 8 (Page 28)

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3-CORE [3G]
(Brown, Blue, Green/Yellow) (1-phase and earth)

Conductor	Insulation	Unarmoured Cable			Armoured Cable		
Nominal Area	Thickness	**Part No.**	Approx. Overall Diam.	Approx. Weight	**Part No.**	Approx. Overall Diam.	Approx. Weight
(mm^2)	(mm)		(mm)	(kg/km)		(mm)	(kg/km)
2.5	0.7	**0803B******	11.4	190	**0803B******	16.0	435
4	0.7	**0903B******	12.8	250	**0903B******	17.0	550
6	0.7	**1003B******	14.0	320	**1003B******	18.5	660
10	0.7	**1103B******	16.9	480	**1103B******	21.7	900
16	0.7	**1203B******	19.0	645	**1203B******	24.0	1260
25 (cs)	0.9	**1303B******	22.5	968	**1303B******	28.0	1772
35 (cs)	0.9	**1403B******	25.0	1278	**1403B******	30.5	2175

4-CORE [4C]
(Brown, Black, Grey, Blue) (3-phase and neutral)

Conductor	Insulation	Unarmoured Cable			Armoured Cable		
Nominal Area	Thickness	**Part No.**	Approx. Overall Diam.	Approx. Weight	**Part No.**	Approx. Overall Diam.	Approx. Weight
(mm^2)	(mm)		(mm)	(kg/km)		(mm)	(kg/km)
2.5	0.7	**0804B******	12.5	230	**0804B******	16.5	495
4	0.7	**0904B******	14.0	315	**0904B******	18.0	610
6	0.7	**1004B******	15.0	395	**1004B******	20.0	810
10	0.7	**1104B******	18.4	590	**1104B******	23.2	1120
16	0.7	**1204B******	21.4	860	**1204B******	27.0	1480
25 (cs)	0.9	**1304B******	25.0	1365	**1304B******	30.8	2160
35 (cs)	0.9	**1404B******	27.4	1665	**1404B******	33.8	2690

4-CORE [4G]
(Brown, Black, Grey, Green/Yellow) (3-phase and earth)

Conductor	Insulation	Unarmoured Cable			Armoured Cable		
Nominal Area	Thickness	**Part No.**	Approx. Overall Diam.	Approx. Weight	**Part No.**	Approx. Overall Diam.	Approx. Weight
(mm^2)	(mm)		(mm)	(kg/km)		(mm)	(kg/km)
2.5	0.7	**0804B******	12.5	230	**0804B******	16.5	495
4	0.7	**0904B******	14.0	315	**0904B******	18.0	610
6	0.7	**1004B******	15.0	395	**1004B******	20.0	810
10	0.7	**1104B******	18.4	590	**1104B******	23.2	1120
16	0.7	**1204B******	21.4	860	**1204B******	27.0	1480
25 (cs)	0.9	**1304B******	25.0	1365	**1304B******	30.8	2160
35 (cs)	0.9	**1404B******	27.4	1665	**1404B******	33.8	2690

**** Stands for branch size, please contact us for more information.

Current rating and voltage drop
For Unarmoured Cable, please refer to Table 5 & 6 (Page 27)
For Armoured Cable, please refer to Table 7 & 8 (Page 28)

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Model Code: XL-AT-UV or XLSL-AT-UV

5-CORE [5G]
(Brown, Black, Grey, Blue, Green/Yellow) (3-phase, neutral and earth)

Conductor	Insulation	Unarmoured Cable			Armoured Cable		
Nominal Area	Thickness	**Part No.**	Approx. Overall Diam.	Approx. Weight	**Part No.**	Approx. Overall Diam.	Approx. Weight
(mm^2)	(mm)		(mm)	(kg/km)		(mm)	(kg/km)
2.5	0.7	**0805B******	13.9	263	**0805B******	17.8	540
4	0.7	**0905B******	15.4	355	**0905B******	20.0	795
6	0.7	**1005B******	16.9	465	**1005B******	21.8	956
10	0.7	**1105B******	19.8	700	**1105B******	24.8	1272
16	0.7	**1205B******	22.5	1020	**1205B******	28.6	1845
25 (cs)	0.9	**1305B******	27.0	1530	**1305B******	32.6	2500
35 (cs)	0.9	**1405B******	30.0	2035	**1405B******	36.2	3140

**** Stands for branch size, please contact us for more information.

Current rating and voltage drop
For Unarmoured Cable, please refer to Table 5 & 6 (Page 27)
For Armoured Cable, please refer to Table 7 & 8 (Page 28)

(cs) : Circular Compact Stranded Conductor

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Multi-Core Cables with XLPE Insulation, PVC (or LSZH) Outersheath 0.6/1kV

Table 5 : Current-Carrying Capacities (Amp)
[CU/XLPE/PVC, CU/XLPE/LSZH or CU/MT/XLPE/LSZH Cables]

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

IEC 60502-1

Conductor Cross-sectional Area	Reference Method 4 (enclosed in an conduit insulated wall etc)	Reference Method 3 (enclosed in conduit on a wall or ceiling, or in trunking)		Reference Method 1 (clipped direct)		Reference Method 11 (on a perforated cable tray), or Reference Method 13 (in free air)	
	one 3-core or 4-core cable, 3-phase a.c.	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.
1	2	3	4	5	6	7	8
mm^2	A	A	A	A	A	A	A
1.5	16.5	22	19.5	24	22	26	23
2.5	22	30	26	33	30	36	32
4	30	40	35	45	40	49	42
6	38	51	44	58	52	63	54
10	51	69	60	80	71	86	75
16	68	91	80	107	96	115	100
25	89	119	105	138	119	149	127
35	109	146	128	171	147	185	158
50	130	175	154	209	179	225	192
70	164	221	194	269	229	289	246
95	197	265	233	328	278	352	298
120	227	305	268	382	322	410	346
150	259	334	300	441	371	473	399
185	295	384	340	506	424	542	456
240	346	459	398	599	500	641	538
300	396	532	455	693	576	741	621
400	472	625	536	803	667	865	741

Note : For rating factors of ambient temperature other than 30°C, please refer to Table 9 (Page 29)

Table 6 : Voltage Drop (Per Amp Per Meter)
[CU/XLPE/PVC, CU/XLPE/LSZH or CU/MT/XLPE/LSZH Cables]

Conductor Operating Temperature : 90°C

IEC 60502-1

Conductor Cross-sectional Area	2-core cable, d.c.	2-core cable, 1-phase a.c.			3-core or 4-core cables, 3-phase a.c.		
1	2	3			4		
mm^2	mV/A/m	mV/A/m			mV/A/m		
1.5	31	31			27		
2.5	19	19			16		
4	12	12			10		
6	7.9	7.9			6.8		
10	4.7	4.7			4.0		
16	2.9	2.9			2.5		
		r	x	z	r	x	z
25	1.85	1.85	0.160	1.90	1.60	0.140	1.65
35	1.35	1.35	0.155	1.35	1.15	0.135	1.15
50	0.98	0.99	0.155	1.00	0.86	0.135	0.87
70	0.67	0.67	0.150	0.69	0.59	0.130	0.60
95	0.49	0.50	0.150	0.52	0.43	0.130	0.45
120	0.39	0.40	0.145	0.42	0.34	0.130	0.37
150	0.31	0.32	0.145	0.35	0.28	0.125	0.30
185	0.25	0.26	0.145	0.29	0.22	0.125	0.26
240	0.195	0.200	0.140	0.24	0.175	0.125	0.21
300	0.155	0.160	0.140	0.21	0.140	0.120	0.185
400	0.120	0.130	0.140	0.190	0.115	0.120	0.165

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

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

Table 7 : Current-Carrying Capacities (Amp)

[CU/XLPE/PVC/SWA/PVC, CU/XLPE/LSZH/SWA/LSZH, CU/MT/XLPE/LSZH/SWA/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 horizontal cable tray) or Reference Method 13 (in free air)		In single-way ducts		Laid direct in ground	
	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.	one 2-core cable, 1-phase a.c. or d.c.	one 3-core or 4-core cable, 3-phase a.c.
1	2	3	4	5	6	7	8	9
mm^2	A	A	A	A	A	A	A	A
1.5	27	23	29	25	-	23	-	28
2.5	36	31	39	33	-	30	-	36
4	49	42	52	44	-	40	-	48
6	62	53	66	56	-	50	-	60
10	85	73	90	78	-	65	-	80
16	110	94	115	99	115	94	140	115
25	146	124	152	131	145	125	180	150
35	180	154	188	162	175	150	215	180
50	219	187	228	197	210	175	255	215
70	279	238	291	251	260	215	315	265
95	338	289	354	304	310	260	380	315
120	392	335	410	353	355	300	430	360
150	451	386	472	406	400	335	480	405
185	515	441	539	463	455	380	540	460
240	607	520	636	546	520	440	630	530
300	698	599	732	628	590	495	700	590
400	787	673	847	728	660	560	790	670

Note : For rating factors of ambient temperature other than 30°C, please refer to Table 9 (Page 29)
For rating factors of ground temperature other than 15°C, please refer to Table 10 (Page 29)

Table 8 : Voltage Drop (Per Amp Per Meter)

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

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

Conductor Cross-sectional Area	2-core cable, d.c.	2-core cables, 1-phase a.c.			3-core or 4-core cables, 3-phase a.c.			2-core cables, 1-phase a.c.	3-core or 4-core cables, 3-phase a.c.
								In ducts or in ground	In ducts or in ground
1	2	3			4			5	6
mm^2	mV/A/m	mV/A/m			mV/A/m			mV/A/m	mV/A/m
1.5	31.0	31.0			27.0			31.0	25.0
2.5	19.0	19.0			16.0			19.0	15.0
4	12.0	12.0			10.0			12.0	9.7
6	7.9	7.9			6.8			7.9	6.5
10	4.7	4.7			4.0			4.7	3.9
16	2.9	2.9			2.5			2.9	2.6
		r	x	z	r	x	z		
25	1.850	1.850	0.160	1.900	1.600	0.140	1.650	1.900	1.600
35	1.350	1.350	0.155	1.350	1.150	0.135	1.150	1.350	1.200
50	0.980	0.990	0.155	1.000	0.860	0.135	0.870	1.000	0.870
70	0.670	0.670	0.150	0.690	0.590	0.130	0.600	0.690	0.610
95	0.490	0.500	0.150	0.520	0.430	0.130	0.450	0.520	0.450
120	0.390	0.400	0.145	0.420	0.340	0.130	0.370	0.420	0.360
150	0.310	0.320	0.145	0.350	0.280	0.125	0.300	0.350	0.300
185	0.250	0.260	0.145	0.290	0.220	0.125	0.260	0.290	0.250
240	0.195	0.200	0.140	0.240	0.175	0.125	0.210	0.240	0.210
300	0.155	0.160	0.140	0.210	0.140	0.120	0.185	0.210	0.190
400	0.120	0.130	0.140	0.190	0.115	0.120	0.165	0.190	0.180

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

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Table 9 : Correction Factor for Ambient Air Temperature Other than 30°C to be Applied to the Current-Carrying Capacities for Cables in Free Air

Insulation	Ambient Temperature (°C)															
	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
XLPE (90°C)	1.15	1.12	1.08	1.04	1.00	0.96	0.91	0.87	0.82	0.76	0.71	0.65	0.58	0.50	0.41	0.29

Table 10 : 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

Insulation	Ground Temperature (°C)											
	10	15	20	25	30	35	40	45	50	55	60	65
XLPE (90°C)	1.03	1.00	0.97	0.93	0.89	0.86	0.82	0.77	0.73	0.67	0.63	0.58

Table 11 : Correction Factors for Ambient Temperature & Group Installation

Correction for groups of more than one circuit of single-core cables, or more than one multi-core cable

Reference Methods of Installation		Correction Factor (Cg)													
		Number of Circuits or Multi-Core Cables													
		2	3	4	5	6	7	8	9	10	12	14	16	18	20
Enclosed (Method 3 or 4) or bunched and clipped to a non-metallic surface (Method 1)		0.80	0.70	0.65	0.60	0.57	0.54	0.52	0.50	0.48	0.45	0.43	0.41	0.39	0.38
Single layer clipped to a non-metallic surface (Method 1)	Touching	0.85	0.79	0.75	0.73	0.72	0.72	0.71	0.70	-	-	-	-	-	-
	Spaced*	0.94	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Single layer multi-core on a perforated metal cable tray (Method 11)	Touching	0.86	0.81	0.77	0.75	0.74	0.73	0.73	0.72	0.71	0.70	-	-	-	-
	Spaced*	0.91	0.89	0.88	0.87	0.87	-	-	-	-	-	-	-	-	-
Single layer single-core on a perforated metal cable tray, touching (Method 11)	Horizontal	0.90	0.85	-	-	-	-	-	-	-	-	-	-	-	-
	Vertical	0.85	-	-	-	-	-	-	-	-	-	-	-	-	-
Single layer multi-core touching on ladder supports		0.86	0.82	0.80	0.79	0.78	0.78	0.78	0.77	-	-	-	-	-	-

* Space means a clearance between adjacent surfaces of at least one cable Diam. (D_e). Where the horizontal clearance between adjacent cables exceeds 2 D_e, no correction factor need be applied

Note : 1 The factors in the table are applicable to a group of cables all of the same sizes. The value of the current derived from application of the appropriate factors is the maximum continous current to be carried by any of the cables in the group.

2 If, due to known operating conditions, a cable is expected to carry not more than 30% of its grouped rating, it may be ignored for the purpose of obtaining the rating factor for the rest of the group.

For example, a group of N loaded cables would normally require a group reduction factor of Cg applied to the tabulated Lt. However, if M cables in the group carry loads which are not greater than 0.3Cg Lt amperes, the other cables can be sized by using the group rating factor corresponding to (N-M) cables.