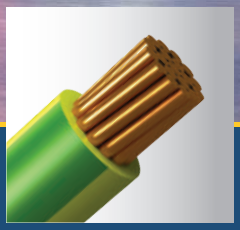
KEYSTONE CABLE



Building & Infrastructure Cables

DELIVERING ENERGY

Keystone Cable is a Leading Singapore-based Cable Manufacturer and Supplier.

Keystone Cable Market Reach

Established since 1990, Keystone Cable has an unwavering commitment to producing cables of the highest quality. Keystone Cable has obtained all necessary certificates from TÜV SÜD PSB. In addition, we are ISO 9001, 14001 and OHSAS 18001 accredited for our Quality, Environment and Safety Management Systems.

With our emphasis on stringent quality control processes, we provide our customers with a guarantee of product excellence and reliability.

CERTIFICATIONS

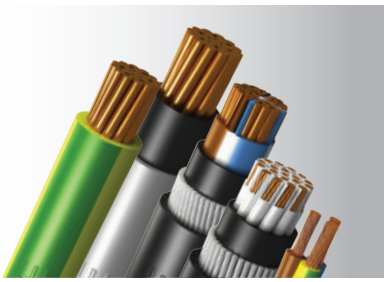
ISO 9001:2008 | ISO 14001:2004 | OHSAS 18001:2007 | TÜV SÜD PSB

Keystone Cable Business Solutions

BUILDING

This catalogue showcases our range of cables used in the Building & Infrastructure Industry. These cables are designed, manufactured and tested in accordance to international standards.

For more information on our offerings in other industries, please visit our website: www.keystone-cable.com



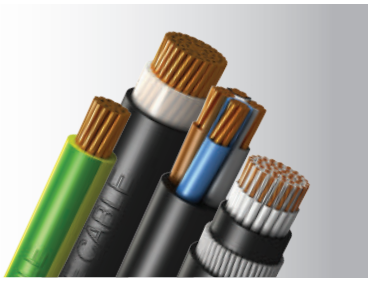
PVC-Insulated Cables

PVC-Insulated Cables are widely used and have a long term permissible operational temperature of up to 70°C. These cables have perfect bending properties for easy installation and maintenance, which makes them a popular choice for indoor and outdoor uses for voltage requirements of 1kV and below. Should there be a requirement for ground emplacement, the armoured cable is preferred for higher electrical and mechanical protection.

XLPE-Insulated Cables

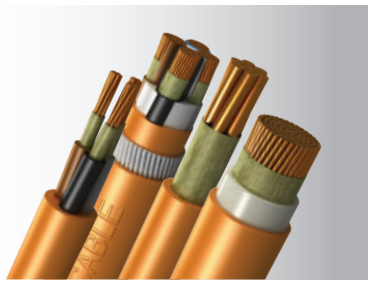
XLPE (Cross-linked Polyethylene) is an excellent insulation material that has several advantages over conventional thermoplastic insulating material. Some advantages include zero halogen & permissible operational temperature up to 90˚c, allowing the cables to withstand a greater current rating compared with PVC cables. The variance gets wider as the conductor size increases, which is also the reason XLPE insulated cables are widely chosen where bigger cables are required for main power supply.

On the other hand, XLPE insulated cables are less flexible compared with PVC cables, hence making it a less favourable choice for smaller conductor size cables where the current rating advantage is less significant.



LSZH Flame Retardant Cables

When LSZH (low smoke zero halogen) material is used, the cable is deemed a high security cable. In the event of fire, these cables emit little smoke and no toxic gases, thus protecting public health and avoiding possible damages to electronic equipment. It is therefore highly recommended for use in public places such as underground passenger systems, hospitals, schools, museums, airports, bus terminals, and petrochemical plants.



LSZH Fire Resistant Cables

In addition to the advantages of a LSZH Flame Retardant Cable where there is low smoke emission and no toxic gas is released, LSZH Fire Resistant Cable also ensures that critical electrical installations such as fire alarms, smoke detectors, emergency lights, sprinklers, public address systems continue to perform their functions in a fire event.

The key difference lies in an added fire barrier insulation for such cables. Keystone LSZH Fire Resistant Cables have been engineered and tested under the most stringent conditions and are certified to conduct electricity for at least 3 hours at a temperature of 950˚C.

Prefabricated Branch Cables

Prefabricated Branch Cables are commonly used in Japan, China, Hong Kong and UAE. These cables are customized to order for each project. The sub-cables that branch out from the main riser are pre-fabricated under factory conditions providing the advantages of low installation costs, low accuracy needed during installation, high moisture and shock resistance, and short manufacturing lead time compared with the bus duct system. Suitable installations include residential and light commercial projects where the power requirement for each floor is generally known.

Annealed Stranded Copper Conductor

Annealed Stranded Copper Conductor is widely used as an effective and economic choice for grounding as an earth cable.

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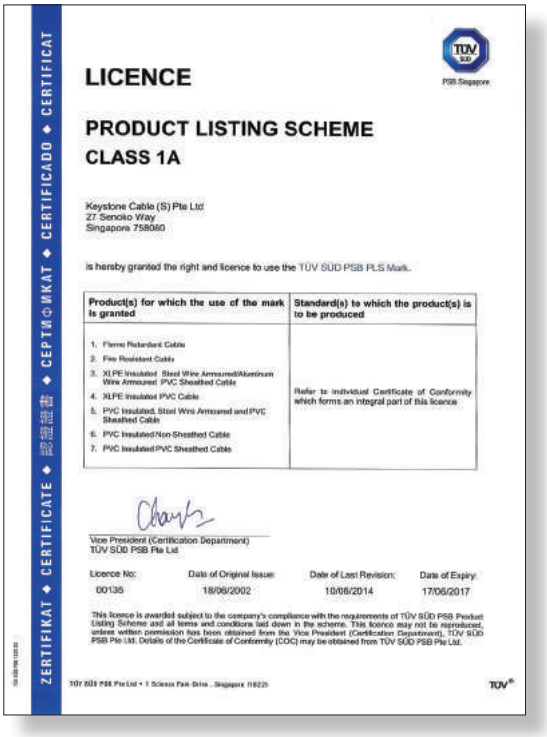
Certification, Testing & Standards

KEYSTONE CABLE
tel (65) 6367 0107 **fax** (65) 6365 2963
www.keystone-cable.com

Keystone Cable's products are certified by TÜV SÜD, the Germany based international third party testing laboratory. Keystone Cable is certified under TÜV SÜD PSB Product Listing Scheme (Class 1A).

TÜV SÜD PSB
Certification



ZERTIFIKAT ◆ CERTIFICATE ◆ 認證證書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

LICENCE

PRODUCT LISTING SCHEME
CLASS 1A

Keystone Cable (S) Pte Ltd
27 Senoko Way
Singapore 758060

is hereby granted the right and licence to use the TÜV SÜD PSB PLS Mark.

Product(s) for which the use of the mark is granted	Standard(s) to which the product(s) is to be produced
1. Flame Retardant Cable 2. Fire Resistant Cable 3. XLPE Insulated Steel Wire Armoured/Aluminum Wire Armoured PVC Sheathed Cable 4. XLPE Insulated PVC Cable 5. PVC Insulated, Steel Wire Armoured and PVC Sheathed Cable 6. PVC Insulated Non-Sheathed Cable 7. PVC Insulated PVC Sheathed Cable	Refer to individual Certificate of Conformity which forms an integral part of this licence

Vice President (Certification Department)
TÜV SÜD PSB Pte Ltd

Licence No:	Date of Original Issue:	Date of Last Revision:	Date of Expiry:
00135	18/06/2002	10/06/2014	17/06/2017

This licence is awarded subject to the company's compliance with the requirements of TÜV SÜD PSB Product Listing Scheme and all terms and conditions laid down in the scheme. This licence may not be reproduced, unless written permission has been obtained from the Vice President (Certification Department), TÜV SÜD PSB Pte Ltd. Details of the Certificate of Conformity (COC) may be obtained from TÜV SÜD PSB Pte Ltd.

TÜV SÜD PSB Pte Ltd • 1 Science Park Drive , Singapore 118225

PSB Product Listing Scheme
Class 1A

Products for which the use of PSB mark is granted:

- Flame Retardant Cable (LSZH)
- Fire Resistant Cable
- XLPE Insulated, Steel Wire Armoured/Aluminium Wire Armoured, PVC Sheathed Cable
- XLPE Insulated, PVC Sheathed Cable
- PVC Insulated, Non-Sheathed Cable
- PVC Insulated, PVC Sheathed Cable

Please contact us for copies of the certificates.

Testing & Standards

Main Cable Specifications		Material Tests
IEC 60228	BS EN 50525-3-41 (BS 7211)	BS 2627
BS EN 60228	BS 5467	BS 6469
SS 358-3	BS 6724	BS EN 50363 (BS 7655)
IEC 60227-3	BS 7629	BS EN 60811
BS EN 50525-2-31 (BS 6004)	BS 7846	IEC 60811
BS 2004	AS/NZS 5000.1	
BS EN 50525-2-11 (BS 6500)	BS 5099	
IEC 60502-1	BPO CW1308	

Flame Retardant & Fire Resistant Tests		Tests on Acid Gas Evolved	Smoke Density Tests
BS EN 60332-1	AS/NZS 3013	BS EN 60754	BS EN 61034
BS EN 60332-3	BS 6387 CAT CWZ	IEC 60754	IEC 61034
IEC 60332-1	IEC 60331		
IEC 60332-3	SS 299 CAT CWZ		

Cable Marking Guide

KEYSTONE CABLE
tel (65) 6367 0107 fax (65) 6365 2963
www.keystone-cable.com

Keystone Cable is committed to high quality cable manufacture with cable markings. The following simple marking guide shows you what to look for.

1. Manufacture Name
2. Cable Type
3. Voltage
4. Model Code*
5. Number and Nominal Size of Cable Cores
6. PLS-Listed Standard No.& Licence No. or Standard No. for non-PLS**
7. Year of Manufacture
8. Batch No.

Note: * Refer to table below for full Keystone model code listing
** PLS denotes PSB Product Listing Scheme

Model Code

Keystone Cable uses a standardized short form model code for cable identification and marking.

Cable Description	Model Code
CU/PVC	PVC
CU/LSZH	LSZH
CU/PVC/PVC	PP
CU/PVC/PVC/AWA/PVC	PPAP
CU/PVC/PVC/SWA/PVC	PPSP
CU/PVC/PVC Flexible Cable	PP-FLEX
CU/PVC or CU/LSZH Flexible Cable	PVC-FLEX or LSZH-FLEX
CU/XLPE/PVC	XP
CU/XLPE/PVC/AWA/PVC	XPAP
CU/XLPE/PVC/SWA/PVC	XPSP
CU/MICA/LSZH	ML
CU/MICA/XLPE/LSZH	MXL
CU/MICA/XLPE/LSZH/AWA/LSZH	MXLAL
CU/MICA/XLPE/LSZH/SWA/LSZH	MXLSL
CU/RUBBER/CHLOROPRENE	NEOPRENE CABLE
Bare Copper Conductor	BARE CONDUCTOR

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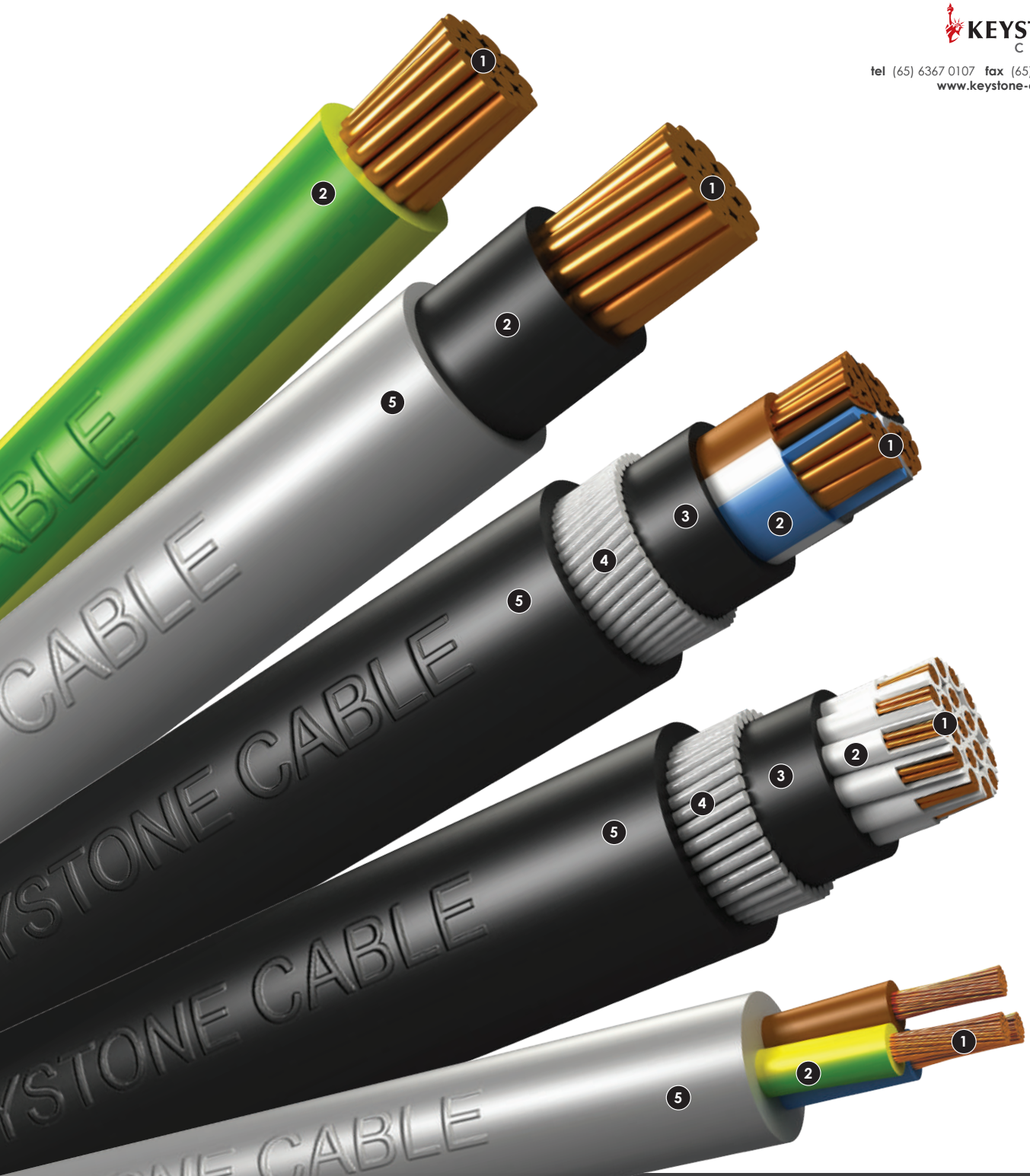


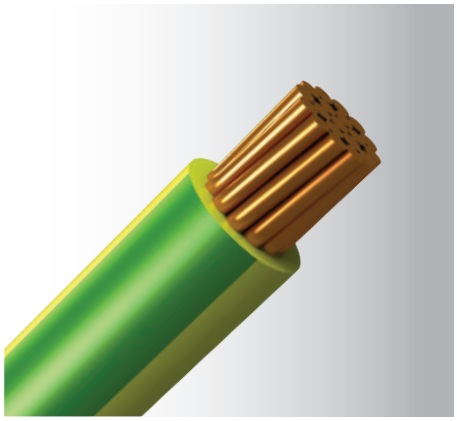
PVC-Insulated Cables

1	Conductor	Plain Annealed Copper
2	Insulation	PVC
3	Bedding	PVC
4	Armouring	Galvanized Steel Wire
5	Oversheath	PVC

PVC-Insulated Cables

KEYSTONE CABLE
tel (65) 6367 0107 fax (65) 6365 2963
www.keystone-cable.com

450/750V Single-Core
PVC Insulated, Non-Sheathed Cable
Description: CU/PVC
Model Code: PVC



Application :	This cable is used in light fitting, and in switching and control equipment. It can be installed in conduit, in cable trunking and on cable trays
Voltage rating :	450/750V
Construction :	Plain annealed copper, PVC insulated cable
Insulation colour :	Brown, Black, Grey, Blue, Green/Yellow or as per order
Specification :	SS358-3, IEC60227-3, BS EN 50525-2-31(BS6004)
Operating temperature:	70˚C

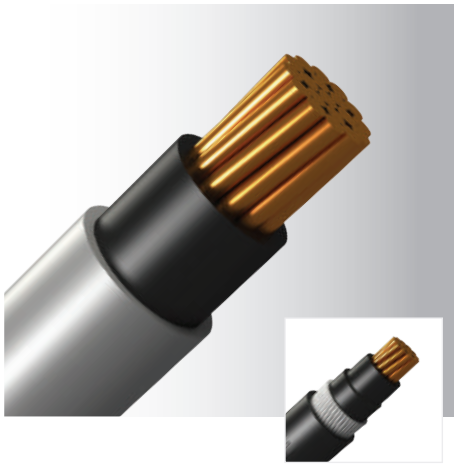
Conductor			Insulation	Approx. Overall Diam.	Approx. Weight
Nominal Area	No./Diam. of Strand	Approx. Diam.	Thickness		
(mm^2)	(no./mm)	(mm)	(mm)	(mm)	(kg/km)
1.5	1/1.38	1.38	0.7	2.9	20
1.5	7/0.53	1.59	0.7	3.1	22
2.5	1/1.78	1.78	0.8	3.4	32
2.5	7/0.67	2.01	0.8	3.7	34
4	7/0.85	2.55	0.8	4.3	50
6	7/1.04	3.12	0.8	4.8	70
10	7/1.35	4.05	1.0	6.0	120
16	7/1.70	5.10	1.0	7.0	180
25	7/2.14	6.42	1.2	9.0	280
35	19/1.53	7.65	1.2	10.0	380
50	19/1.78	8.90	1.4	12.0	500
70	19/2.14	10.70	1.4	13.7	715
95	19/2.52	12.60	1.6	16.0	990
120	37/2.03	14.21	1.6	17.5	1,220
150	37/2.25	15.75	1.8	19.5	1,500
185	37/2.52	17.64	2.0	22.0	1,890
240	61/2.25	20.25	2.2	25.0	2,460
300	61/2.52	22.68	2.4	28.0	3,080
400	61/2.85	25.65	2.6	31.5	3,920
500	61/3.20	28.80	2.8	35.0	4,920
630	127/2.52	32.76	2.8	39.0	6,260

For current rating and voltage drop please refer to Tables 2 & 3 (Page 45)

PVC-Insulated Cables

KEYSTONE CABLE
tel (65) 6367 0107 fax (65) 6365 2963
www.keystone-cable.com

600/1000V Single-Core
PVC Insulated, Unarmoured & Armoured, PVC Sheathed Cable
Description: CU/PVC/PVC or CU/PVC/PVC/AWA/PVC
Model Code: PP or PPAP



Application :	This cable is primarily used for main power supply such as in switchgears and power stations. It can be installed in cable trenches, cable ducts and cable trunking. The armoured cable is ideal for ground emplacement if a higher electrical or mechanical protection is required
Voltage rating :	600/1000V
Construction :	Plain annealed copper, PVC insulated, unarmoured or aluminum wires armoured, PVC sheathed cable
Insulation colour :	Red or Black
Sheath colour :	Grey, Black or as per order
Specification :	IEC60502-1
Operating Temperature:	70˚C

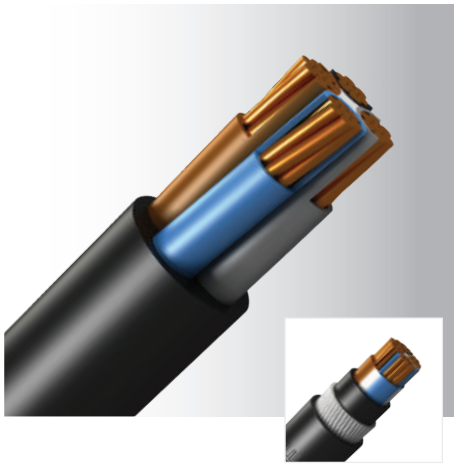
Conductor			Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	No./Diam. of Strand	Max. Diam. of Conductor	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(no./mm)	(mm)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	1/1.38	1.38	0.8	6.0	52	-	-
1.5	7/0.53	1.59	0.8	6.3	55	-	-
2.5	1/1.78	1.78	0.8	6.4	65	-	-
2.5	7/0.67	2.01	0.8	6.6	65	-	-
4	7/0.85	2.55	1.0	7.8	95	-	-
6	7/1.04	3.12	1.0	8.3	125	-	-
10	7/1.35	4.05	1.0	9.2	170	-	-
16	7/1.70	5.10	1.0	10.4	240	-	-
25	7/2.14	6.42	1.2	11.9	350	-	-
35	19/1.53	7.65	1.2	13.0	460	-	-
50	19/1.78	8.90	1.4	14.9	580	20.4	849
70	19/2.14	10.70	1.4	16.7	820	21.9	1087
95	19/2.52	12.60	1.6	19.1	1100	24.1	1402
120	37/2.03	14.21	1.6	20.9	1360	26.0	1721
150	37/2.25	15.75	1.8	22.8	1660	27.8	2047
185	37/2.52	17.64	2.0	25.3	2060	30.0	2476
240	61/2.25	20.25	2.2	28.8	2680	33.3	3143
300	61/2.52	22.68	2.4	32.3	3340	37.1	3936
400	61/2.85	25.65	2.6	35.0	4250	41.3	4935
500	61/3.20	28.80	2.8	40.1	5300	46.8	6138
630	127/2.52	32.76	2.8	44.2	6700	51.2	7660
800	127/2.85	37.05	2.8	48.5	8400	57.2	9726
1000	127/3.20	41.60	3.0	54.3	10600	62.5	11995

Current rating and voltage drop
For Unarmoured Cable, please refer to Tables 2 & 3 (Page 45)
For Armoured Cable, please refer to Tables 4 & 5 (Page 46)

PVC-Insulated Cables

KEYSTONE CABLE
tel (65) 6367 0107 **fax** (65) 6365 2963
www.keystone-cable.com

600/1000V 2-Core ~ 4-Core
PVC Insulated, Unarmoured & Armoured, PVC Sheathed Cable
Description: CU/PVC/PVC or CU/PVC/PVC/SWA/PVC
Model Code: PP or PPSP



Application :	This cable is primarily used for main power supply. It can be installed in cable ducts, on cable trays, on cable ladders and in cable trunking. The armoured cable is ideal for ground emplacement if a higher electrical or mechanical protection is required
Voltage rating :	600/1000V
Construction :	Plain annealed copper, PVC insulated, unarmoured or galvanized steel wires armoured, PVC sheathed cable
Insulation Colour :	2-Core: (Brown & Blue) 3-Core: (Brown, Black & Grey) 4-Core: (Brown, Black, Grey & Blue) or as per order
Sheath colour :	Black
Specification :	IEC60502-1
Operating Temperature:	70˚C

2-CORE					
Conductor	Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	0.8	11.2	150	14.9	397
2.5	0.8	11.6	180	15.7	440
4	1.0	13.7	260	17.6	547
6	1.0	15.2	290	19.5	734
10	1.0	16.8	385	21.3	898
16	1.0	18.8	528	23.4	1100
25 (cs)	1.2	22.0	761	27.5	1573
35 (cs)	1.2	24.4	983	29.8	1887
50 (cs)	1.4	27.7	1288	33.3	2321
70 (cs)	1.4	31.6	1772	38.0	3210
95 (cs)	1.6	36.2	2397	43.3	4096
120 (cs)	1.6	38.8	2934	45.9	4755
150 (cs)	1.8	42.7	3562	50.8	5985
185 (cs)	2.0	47.6	4445	56.2	7196
240 (cs)	2.2	54.0	5751	62.7	8860
300 (cs)	2.4	60.2	7166	69.1	10677
400 (cs)	2.6	67.6	9082	76.8	13018

Current rating and voltage drop
For Unarmoured Cable, please refer to Tables 6 & 7 (Page 47)
For Armoured Cable, please refer to Tables 8 & 9 (Page 48)

(cs) : Circular Compact Stranded Conductor

PVC-Insulated Cables

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tel (65) 6367 0107 fax (65) 6365 2963
www.keystone-cable.com

600/1000V 2-Core ~ 4-Core
PVC Insulated, Unarmoured & Armoured, PVC Sheathed Cable
Description: CU/PVC/PVC or CU/PVC/PVC/SWA/PVC
Model Code: PP or PPSP

3-CORE					
Conductor	Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	0.8	11.3	165	15.4	433
2.5	0.8	12.3	200	16.3	493
4	1.0	14.2	300	19.1	728
6	1.0	15.8	380	20.3	840
10	1.0	17.7	545	22.3	1048
16	1.0	20.0	760	24.6	1321
25 (cs)	1.2	23.1	1046	28.5	1914
35 (cs)	1.2	26.0	1365	31.0	2326
50 (cs)	1.4	30.1	1822	36.0	2967
70 (cs)	1.4	33.7	2494	40.8	4100
95 (cs)	1.6	38.9	3412	45.7	5209
120 (cs)	1.6	41.7	4190	48.5	6110
150 (cs)	1.8	45.9	5096	54.4	7750
185 (cs)	2.0	51.2	6364	59.7	9300
240 (cs)	2.2	58.2	8282	67.1	11657
300 (cs)	2.4	64.6	10295	73.8	14082
400 (cs)	2.6	72.8	13098	83.3	18298

4-CORE					
Conductor	Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	0.8	12.3	210	16.3	485
2.5	0.8	13.2	265	17.3	562
4	1.0	15.2	385	20.3	830
6	1.0	16.9	440	21.7	976
10	1.0	19.3	675	24.0	1229
16	1.0	21.9	925	27.2	1738
25 (cs)	1.2	25.5	1320	30.7	2290
35 (s)	1.2	26.5	1740	31.4	2850
50 (s)	1.4	30.0	2300	35.9	3709
70 (s)	1.4	34.0	3180	39.4	4672
95 (s)	1.6	38.3	4370	46.8	6471
120 (s)	1.6	41.8	5400	51.0	7741
150 (s)	1.8	47.5	6550	55.2	9183
185 (s)	2.0	52.0	8180	58.8	10776
240 (s)	2.2	58.0	10700	68.2	13893
300 (s)	2.4	66.0	13200	74.0	17444
400 (s)	2.6	73.5	17100	85.5	22340

Current rating and voltage drop
For Unarmoured Cable, please refer to Tables 6 & 7 (Page 47)
For Armoured Cable, please refer to Tables 8 & 9 (Page 48)

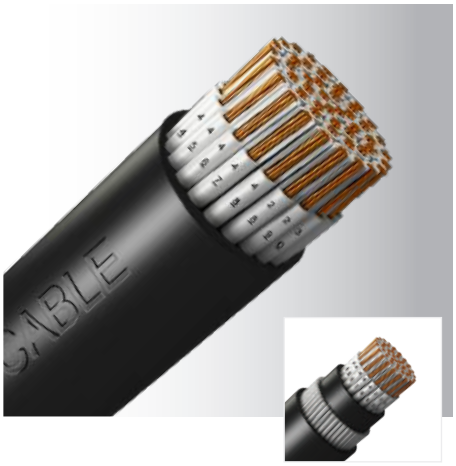
(cs) : Circular Compact Stranded Conductor
(s) : Sector Shaped Stranded Conductors

KEYSTONE CABLE
tel (65) 6367 0107 fax (65) 6365 2963
www.keystone-cable.com

600/1000V Multi-Core
PVC Insulated, Unarmoured & Armoured, PVC Sheathed Auxiliary Cable

Description: CU/PVC/PVC or CU/PVC/PVC/SWA/PVC

Model Code: PP or PPSP



Application :	The auxiliary cable is used in supervisory electrical equipment and station control circuits, in light, ordinary or heavy duty industry where power distribution device is needed to transmit control signals or measure signal operations
Voltage rating :	600/1000V
Construction :	Plain annealed copper, PVC insulated, unarmoured or galvanized steel wires armoured, PVC sheathed cable
Insulation colour :	White (with black numbering)
Sheath colour :	Black
Specification :	IEC60502-1
Operating Temperature:	70˚C

No. of Core	Conductor		Insulation	Unarmoured Cable		Armoured Cable	
	Nominal Area	No./Diam. Of Strand	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
	(mm^2)	(no./mm)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
5	1.5	7/0.53	0.8	13.3	229	17.2	538
7				14.3	282	18.2	620
10				17.5	395	22.2	932
12				18.1	438	22.7	996
19				20.8	632	26.2	1434
27				24.6	878	29.9	1801
37				28.0	1164	32.9	2180
48				32.0	1491	37.7	2910
5	2.5	7/0.67	0.8	14.4	292	18.3	627
7				15.5	366	20.1	847
10				19.2	516	23.8	1100
12				19.8	577	24.4	1185
19				22.9	845	28.3	1725
27				27.2	1159	32.7	2215
37				31.0	1575	36.1	2721
48				35.6	2042	42.4	3720
5	4.0	7/0.85	1.0	17.0	421	21.6	935
7				18.4	536	23.0	1103
10				23.1	764	28.4	1631
12				23.8	860	29.1	1765
19				28.3	1296	33.2	2351
27				33.9	1802	39.6	3330
37				38.3	2428	44.5	4213
48				43.9	3111	52.3	5773

Current rating and voltage drop

For Unarmoured Cable, please refer to Tables 6 & 7 (Page 47)
For Armoured Cable, please refer to Tables 8 & 9 (Page 48)

KEYSTONE CABLE
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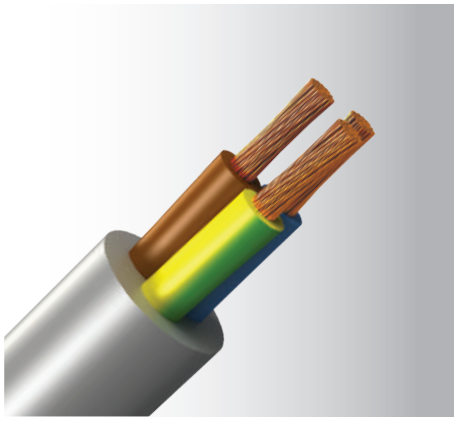
250/440V Circular Type
PVC Insulated, PVC Sheathed Flexible Cable

Description: CU/PVC/PVC

Model Code: PP-FLEX



Application :	This cable is used for general indoor and outdoor purposes. (eg. Portable tools, washing machines and vacuum cleaners)
Voltage rating :	250/440V
Construction :	Flexible plain annealed copper conductor, PVC insulated, PVC sheathed cable
Insulation Colour :	2-Core: (Blue & Brown) 3-Core: (Green/Yellow, Blue & Brown) 4-Core: (Green/Yellow, Blue, Brown & Black) or (Green/Yellow, Brown, Black & Grey)
Sheath colour :	Grey or as per order
Specification :	BS2004
Operating Temperature:	70˚C

No. of Core	Conductor		Insulation	Sheath	Approx. Overall Diam.	Approx. Weight
	Nominal Area	No./Diam. of Strand	Thickness	Thickness		
	(mm^2)	(no./mm)	(mm)	(mm)	(mm)	(kg/km)
Single-Core	0.4	14/0.193	0.64	-	2.5	11
2-Core				1.02	6.6	56
3-Core				1.02	6.9	67
4-Core				1.02	7.4	79
Single-Core	0.7	23/0.193	0.64	-	2.6	13
2-Core				1.02	7.2	70
3-Core				1.02	7.5	87
4-Core				1.02	8.2	100
Single-Core	1.2	40/0.193	0.64	-	2.8	17
2-Core				1.02	7.7	88
3-Core				1.02	8.2	107
4-Core				1.02	9.4	141
Single-Core	2.0	70/0.193	0.64	-	3.3	27
2-Core				1.27	9.2	129
3-Core				1.27	9.7	158
4-Core				1.27	10.5	192
Single-Core	3.2	110/0.193	0.64	-	3.8	40
2-Core				1.27	10.0	167
3-Core				1.27	10.6	208
4-Core				1.27	11.5	258
Single-Core	4.7	162/0.193	0.76	-	5.0	58
2-Core				1.27	11.5+	227
					11.9*	228
3-Core				1.27	12.2+	286
					12.7*	288
4-Core				1.27	13.5+	350
					14.0*	353

For current rating and voltage drop please refer to Tables 10 & 11 (Page 49)

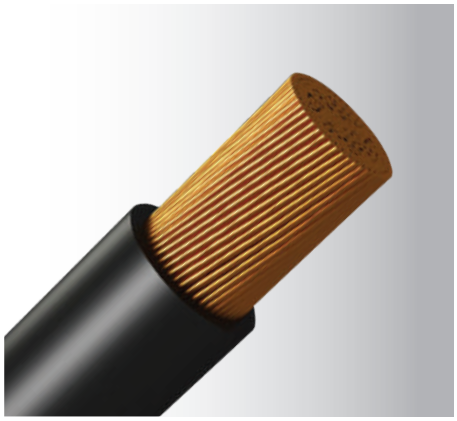
+ Bunched Conductor
* Rope-Stranded Conduct
(1mm=0.039 inch)

Flexible Cables

KEYSTONE CABLE
tel (65) 6367 0107 fax (65) 6365 2963
www.keystone-cable.com

300/500V & 450/750V
PVC or LSZH Insulated

Description: CU/PVC or CU/LSZH
Model Code: PVC-FLEX or LSZH-FLEX



Application :	It must be laide pipes at sight, embedded or closed system, allowed for fixed and protected installation, upon or into illumination sets for voltage under 1000V AC or 750 DC to ground
Voltage rating :	300/500V or 450/750V
Construction :	Bare or Tinned copper conductor according to DIN VDE 0295 and IEC 06228 class 5, EI5 or TI1 insulated
Insulation Colour :	Black, Light Blue, Brown, Grey, Orange, Pink, Red, Turquoise, Violet, White, Green/Yellow
Specification :	EN50265 HD21.3 S3, BS EN 50525-2-31
Operating Temperature:	70˚C

H05Z-K & H05V-K

No. of Core	Conductor			Insulation		Approx. Overall Diam.	Approx. Weight	Current Rating at 30°C
	Nominal Area	Approx. Diam.	Maximum Conductor Resistance at 20°C	Thickness	Maximum Insulation Resistance at 70°C			
	(mm^2)	(mm)	(Ω/km)	(mm)	(Ω/km)	(mm)	(kg/km)	(A)
Single-Core	0.40	0.77	39.0	0.60	0.013	2.3	7	12.0
	0.75	0.95	26.0	0.60	0.011	2.4	10	15.5
	1.00	1.30	19.5	0.60	0.010	2.6	12	15.5

H07Z-K & H07V-K

Single-Core	1.5	1.6	13.3	0.7	0.010	3.1	21	15.5
	2.5	2	7.98	0.8	0.009	3.8	33	21
	4	2.6	4.95	0.8	0.007	4.4	48	28
	6	3.4	3.30	0.8	0.006	4.9	66	36
	10	4.4	1.91	1.0	0.0056	6.4	112	50
	16	5.7	1.21	1.0	0.0046	7.4	167	68
	25	6.9	0.78	1.2	0.0044	9.1	254	89
	35	8.1	0.554	1.2	0.0038	10.4	340	110
	50	9.8	0.386	1.4	0.0037	12.4	485	154
	70	11.6	0.272	1.4	0.0032	13.6	674	171
	95	13.3	0.206	1.6	0.0032	15.8	894	207
	120	15.1	0.161	1.6	0.0029	17.4	1110	239
	150	16.8	0.129	1.8	0.0029	19.8	1400	275
	185	18.8	0.106	2.0	0.0029	21.6	1700	314
	240	21.4	0.0801	2.2	0.0028	24.6	2230	369

For current rating and voltage drop please refer to Tables 10 & 11 (Page 49)

XLPE-Insulated Cables

1	Conductor	Plain Annealed Copper
2	Insulation	XLPE
3	Bedding	PVC
4	Armouring	Al Wire / Galvanized Steel Wire
5	Oversheath	PVC

XLPE-Insulated Cables

KEYSTONE CABLE
tel (65) 6367 0107 fax (65) 6365 2963
www.keystone-cable.com

600/1000V Single-Core
XLPE Insulated, Unarmoured & Armoured, PVC Sheathed Cable
Description: CU/XLPE/PVC or CU/XLPE/PVC/AWA/PVC
Model Code: XP or XPAP

Application :	This cable is primarily used for main power supply. It can be installed in cable ducts, in cable trunking, on cable trays and on cable ladders and in switchgears
Voltage rating :	600/1000V
Construction :	Plain annealed copper, XLPE insulated, unarmoured or aluminum wires armoured, PVC sheathed cable
Insulation colour :	Natural
Sheath colour :	Black
Specification :	IEC60502-1
Operating Temperature:	90˚C

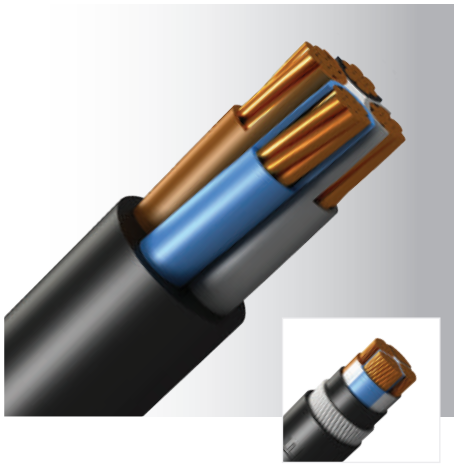
Conductor			Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	No./Dia. Of Strand	Max. Diam. Of Conductor	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(no./mm)	(mm)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	7/0.53	1.59	0.7	6.1	50	-	-
2.5	7/0.67	2.01	0.7	6.5	62	-	-
4	7/0.85	2.55	0.7	7.0	81	-	-
6	7/1.04	3.12	0.7	7.5	100	-	-
10	7/1.35	4.05	0.7	8.5	150	-	-
16	7/1.70	5.10	0.7	9.5	200	-	-
25	7/2.14	6.42	0.9	11.5	310	16.5	470
35	19/1.53	7.65	0.9	12.5	420	17.8	581
50	19/1.78	8.90	1.0	14.0	550	20.5	800
70	19/2.14	10.70	1.1	16.3	770	22.2	1036
95	19/2.52	12.60	1.1	18.2	1040	23.9	1321
120	37/2.03	14.21	1.2	20.0	1300	26.0	1640
150	37/2.25	15.75	1.4	22.0	1580	27.8	1956
185	37/2.52	17.64	1.6	24.5	1970	30.0	2376
240	61/2.25	20.25	1.7	27.5	2520	33.3	3005
300	61/2.52	22.68	1.8	30.5	3150	36.2	3654
400	61/2.85	25.65	2.0	34.0	4000	41.2	4718
500	61/3.20	28.80	2.2	38.6	5000	46.4	5850
630	127/2.52	32.76	2.4	43.5	6500	52.0	7350
800	127/2.85	37.05	2.6	48.5	8200	58.0	9460
1000	127/3.20	41.60	2.8	53.6	10000	63.0	11700

Current rating and voltage drop
For Unarmoured Cable, please refer to Tables 12 & 13 (Page 50)
For Armoured Cable, please refer to Tables 14 & 15 (Page 51)

XLPE-Insulated Cables

KEYSTONE CABLE
tel (65) 6367 0107 fax (65) 6365 2963
www.keystone-cable.com

600/1000V 2-Core ~ 5-Core
XLPE Insulated, Unarmoured & Armoured, PVC Sheathed Cable
Description: CU/XLPE/PVC or CU/XLPE/PVC/SWA/PVC
Model Code: XP or XPSP



Application :	This cable is primarily used for main power supply. It can be installed in cable ducts, in cable trunking, on cable trays, and on cable ladders
Voltage rating :	600/1000V
Construction :	Plain annealed copper, XLPE insulated, unarmoured or galvanized steel wires armoured, PVC sheathed cable
Insulation colour :	2-Core: (Brown & Blue) 3-Core: (Brown, Black & Grey) 4-Core: (Brown, Black, Grey & Blue) 5-Core & above: (Brown, Black, Grey, Blue, Green/Yellow) or as per order
Sheath colour :	Black
Specification :	IEC60502-1
Operating Temperature:	90˚C

2-CORE					
Conductor	Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	0.7	10.1	130	14.5	325
2.5	0.7	11.0	160	15.5	400
4	0.7	12.0	200	16.5	475
6	0.7	13.1	260	17.5	570
10	0.7	16.0	380	20.8	800
16	0.7	18.0	480	22.9	1050
25 (cs)	0.9	21.2	709	26.7	1471
35 (cs)	0.9	23.4	925	29.0	1762
50 (cs)	1.0	26.8	1214	32.4	2150
70 (cs)	1.1	30.4	1675	36.3	2749
95 (cs)	1.1	34.0	2244	41.2	3776
120 (cs)	1.2	37.0	2799	44.2	4435
150 (cs)	1.4	41.0	3426	48.2	5222
185 (cs)	1.6	45.8	4264	54.4	6919
240 (cs)	1.7	51.8	5540	60.4	8387
300 (cs)	1.8	57.4	6873	66.3	10073
400 (cs)	2.0	65.0	8769	74.0	12327

Current rating and voltage drop
For Unarmoured Cable, please refer to Tables 16 & 17 (Page 52)
For Armoured Cable, please refer to Tables 18 & 19 (Page 53)

(cs) : Circular Compact Stranded Conductor

XLPE-Insulated Cables

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600/1000V 2-Core ~ 5-Core
XLPE Insulated, Unarmoured & Armoured, PVC Sheathed Cable
Description: CU/XLPE/PVC or CU/XLPE/PVC/SWA/PVC
Model Code: XP or XPSP

3-CORE					
Conductor	Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	0.7	10.5	145	15.0	390
2.5	0.7	11.4	190	16.0	435
4	0.7	12.8	250	17.0	550
6	0.7	14.0	320	18.5	660
10	0.7	16.9	480	21.7	900
16	0.7	19.0	645	24.0	1260
25 (cs)	0.9	22.5	968	28.0	1772
35 (cs)	0.9	25.0	1278	30.5	2175
50 (cs)	1.0	28.5	1688	34.5	2700
70 (cs)	1.1	32.6	2365	40.0	3805
95 (cs)	1.1	36.5	3197	44.0	4831
120 (cs)	1.2	39.7	3982	47.5	5772
150 (cs)	1.4	44.0	4872	53.2	7344
185 (cs)	1.6	49.2	6074	58.2	8813
240 (cs)	1.7	55.6	7903	65.0	11050
300 (cs)	1.8	61.6	9822	71.0	13312
400 (cs)	2.0	70.0	12533	80.5	17317

4-CORE					
Conductor	Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	0.7	11.5	180	15.5	430
2.5	0.7	12.5	230	16.5	495
4	0.7	14.0	315	18.0	610
6	0.7	15.0	395	20.0	810
10	0.7	18.4	590	23.2	1120
16	0.7	21.4	860	27.0	1480
25 (s)	0.9	22.0	1200	27.5	2000
35 (s)	0.9	25.0	1600	30.5	2400
50 (s)	1.0	28.0	2100	34.0	3100
70(s)	1.1	32.0	3000	39.5	4440
95 (s)	1.1	37.0	4100	44.0	5700
120 (s)	1.2	42.0	5160	50.0	7386
150 (s)	1.4	46.0	6300	54.5	8770
185 (s)	1.6	50.5	7881	59.0	10750
240 (s)	1.7	58.0	10500	68.0	13600
300 (s)	1.8	64.0	13100	73.0	16400
400 (s)	2.0	73.0	16700	85.0	21740

Current rating and voltage drop
For Unarmoured Cable, please refer to Tables 16 & 17 (Page 52)
For Armoured Cable, please refer to Tables 18 & 19 (Page 53)

(cs) : Circular Compact Stranded Conductor
(s) : Sector Shaped Stranded Conductors

XLPE-Insulated Cables

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600/1000V 2-Core ~ 5-Core
XLPE Insulated, Unarmoured & Armoured, PVC Sheathed Cable
Description: CU/XLPE/PVC or CU/XLPE/PVC/SWA/PVC
Model Code: XP or XPSP

5-CORE					
Conductor	Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	0.7	12.8	208	16.8	455
2.5	0.7	13.9	263	17.8	540
4	0.7	15.4	355	20.0	795
6	0.7	16.9	465	21.8	956
10	0.7	19.8	700	24.8	1272
16	0.7	22.5	1020	28.6	1845
25 (cs)	0.9	27.0	1530	32.6	2500
35 (cs)	0.9	30.0	2035	36.2	3140
50 (cs)	1.0	34.5	2720	41.5	4300
70 (cs)	1.1	39.6	3825	46.8	5585
95 (cs)	1.1	45.0	5185	53.0	7675
120 (cs)	1.2	49.2	6320	57.6	9125
150 (cs)	1.4	54.5	7800	63.0	10824
185 (cs)	1.6	60.5	9800	70.0	13211
240 (cs)	1.7	68.8	12520	79.2	17466

Current rating and voltage drop
For Unarmoured Cable, please refer to Tables 16 & 17 (Page 52)
For Armoured Cable, please refer to Tables 18 & 19 (Page 53)

(cs) : Circular Compact Stranded Conductor

XLPE-Insulated Cables

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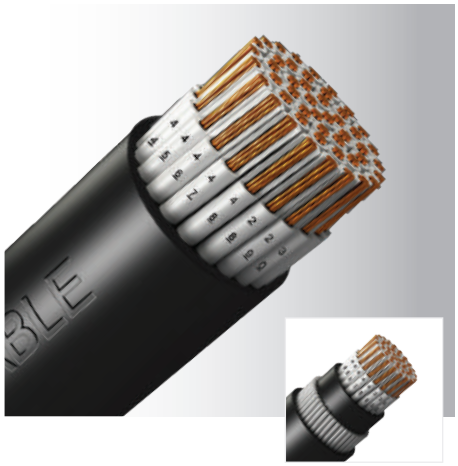
600/1000V Multi-Core
XLPE Insulated, Unarmoured & Armoured, PVC Sheathed Cable
Description: CU/XLPE/PVC or CU/XLPE/PVC/SWA/PVC
Model Code: XP or XPSP



Application :	This cable is primarily used for main power supply. It can be installed in cable ducts, in cable trunking, on cable trays, and on cable ladders
Voltage rating :	600/1000V
Construction :	Plain annealed copper, XLPE compound insulated, unarmoured or galvanized steel wires armoured, PVC sheathed cable
Insulation colour :	White (with black numbering)
Sheath colour :	Black
Specification :	IEC60502-1
Operating Temperature:	90˚C

No. of Core	Conductor		Insulation	Unarmoured Cable		Armoured Cable	
	Nominal Area	No./Diam. Of Strand	Thickness	Approx. Overall Diam.	Approx. Weight	Approx Overall Diam.	Approx. Weight
	(mm^2)	(no./mm)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
5	1.5	7/0.53	0.7	12.8	215	16.5	497
7				13.7	260	17.5	565
10				16.8	365	21.5	850
12				17.3	405	22.0	905
19				19.9	570	24.7	1150
27				23.5	770	29.5	1624
37				26.1	1000	32.0	1940
48				30.3	1255	36.5	2384
5	2.5	7/0.67	0.7	13.8	280	18.0	583
7				14.9	350	19.0	787
10				18.4	485	23.0	1011
12				19.0	545	24.0	1096
19				21.9	780	28.0	1570
27				25.9	1060	32.0	2000
37				29.5	1380	36.0	2470
48				33.7	1770	41.0	3340
5	4.0	7/0.85	0.7	15.4	375	20.0	812
7				16.7	476	21.0	957
10				20.8	670	26.0	1400
12				21.5	760	27.0	1510
19				24.9	1105	31.0	2000
27				30.2	1520	36.0	2630
37				33.9	2000	42.0	3580
48				39.0	2600	47.0	4370

Current rating and voltage drop
For Unarmoured Cable, please refer to Tables 16 & 17 (Page 52)
For Armoured Cable, please refer to Tables 18 & 19 (Page 53)

LSZH* Flame Retardant Cables

1	Conductor	Plain Annealed Copper
2	Insulation	XLPE / LSZH*
3	Bedding	LSZH*
4	Armouring	Galvanized Steel Wire
5	Oversheath	LSZH*

* LSZH: Low Smoke Zero Halogen

LSZH* Fire Resistant Cables

1	Conductor	Plain Annealed Copper
2	Fire Barrier	Mica Tape
3	Filler	LSZH* Yarn
4	Insulation	XLPE / LSZH*
5	Bedding	LSZH*
6	Armouring	Galvanized Steel Wire
7	Oversheath	LSZH*

* LSZH: Low Smoke Zero Halogen

KEYSTONE CABLE
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www.keystone-cable.com

Flame Propagation Tests (IEC 60332, BS EN 60332)

Tests on electric cables under fire conditions

Part 1 : Tests on a single vertical insulated wire or cable
Part 3 : Tests on bunched wires and cables under fire condition

Flame retardant cables prevent flame propagation during a fire emergency. Additives such as aluminium hydroxide or magnesium hydroxide are included in our cable's protective material. When the material comes into contact with fire, the by product from the endothermic reaction is gaseous water which will help envelop the flame and thereby exclude oxygen from the fire.

$$Mg(OH)_2 \rightarrow MgO + H_2O \quad \text{or} \quad 2Al(OH)_3 \rightarrow Al_2O_3 + 3H_2O$$

In this reaction, the decomposition products are non-toxic and the mineral phases MgO and Al_2O_3 are alkaline, reducing the likelihood of acidic, corrosive gases exiting the plastic.

This test is also conducted on both a single cable as well as bunched vertical cables as it cannot be assumed bunched cables will behave the same way as do single cables. This is because flame propagation along a vertical bunch of cables depends on other factors such as volume of combustible material exposed, geometrical configuration of the cables etc.

The IEC 60332-3 specifies methods for assessing flame retardance of bunched cables comprising of varying densities of combustible material.

IEC 60332-3	Total volume of non-metallic material in the bunched cables on a vertical ladder (litres)	Duration exposed to flame (mins)
Category A	7	40
Category B	3.5	40
Category C	1.5	20

Passing criteria: After the burning has ceased, the charred portion should not exceed a height of 2.5 meters.

Acid Gas Emission Tests (IEC 60754, BS EN 60754)

Test on gases evolved during combustion of materials from cables

When fire comes into contact with polyvinyl chloride (PVC) or chlorine containing material, hydrogen chloride gas (HCl) is released. The HCl gas could cause irritation to the eyes, mouth, throat, nose and lungs. At Keystone Cable, all our fire resistant and flame retardant cables use Low Smoke Zero Halogen (LSZH) compounds to prevent the formation of HCl gases from the burning of cables.

The standards determine the degree of acidity of gases evolved during the combustion of cable materials by measuring pH and conductivity.

Passing Criteria: The weighted pH value not less than 4.3 when related to 1 litre of water, and the weighted value of conductivity not more that 10µS/mm when related to 1 litre of water.

Smoke Emission Tests (IEC 61034, BS EN 61034)

Measurement of smoke density of electric cables burning under defined conditions

The "3 meter cube test" measures the amount of smoke generated by cables in the event of fire. The cables are placed in a $3m^3$ enclosure. A beam of light is transmitted from one window of the chamber to the opposite window. The cables are subjected to fire in the chamber, and the light transmission is recorded.

Passing Criteria: A minimum light transmission value of 60%.

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Fire Resistant Tests (BS 6387, SS 299, IEC 60331)

Specification for performance requirements for cables required to maintain circuit integrity under fire conditions

During fire evacuations, it is important for critical electrical installations to perform their functions; these include fire alarms, smoke detectors, sprinklers, emergency lighting, and exit lights. At Keystone Cable, we conduct these stringent tests by simulating the environment for our fire resistant cables to ensure that they pass the safety requirements and will perform during such emergencies. The category letter assigned to the cable reflects the level of testing the cable has gone through and passed.

Resistance to fire (BS 6387, SS 299, IEC 60331)

Category A	Cables are subjected to fire at 650°C for 3 hours
Category B*	Cables are subjected to fire at 750°C for 3 hours
Category C	Cables are subjected to fire at 950°C for 3 hours

*IEC 60331 only applies to Category B

Resistance to fire with water (BS 6387, SS 299)

Category W	Cables are subjected to fire at 650°C for 15 minutes, then at 650°C with water spray for another 15 minutes.

Resistance to fire with mechanical shock (BS 6387, SS 299)

Category X	Cables are subjected to fire at 650°C for 15 minutes with mechanical shock applied every 30s.
Category Y	Cables are subjected to fire at 750°C for 15 minutes with mechanical shock applied every 30s.
Category Z	Cables are subjected to fire at 950°C for 15 minutes with mechanical shock applied every 30s.

Passing criteria: No short circuit during the respective testing period.

LSZH Flame Retardant Cables

KEYSTONE CABLE
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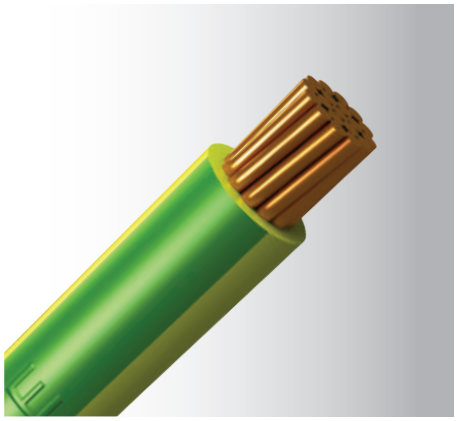
600/1000V Single-Core
LSZH Insulated, Non-Sheathed
Description: CU/LSZH
Model Code: LSZH



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 :	600/1000V
Construction :	Plain annealed copper, XLEVA compound insulated, non-sheathed cable
Insulation colour :	Brown, Black, Grey, Blue, Orange, Green/Yellow or as per order
Specification :	BS EN 50525-3-41(BS7211), IEC60332-1, IEC60332-3, IEC60754, IEC61034
Operating Temperature:	90˚C

Conductor		Insulation	Approx. Overall Diam.	Approx. Weight
Nominal Area	No./Diam. Of Strand	Thickness		
(mm^2)	(no./mm)	(mm)	(mm)	(kg/km)
1.5	7/0.53	0.7	3.1	23
2.5	7/0.67	0.8	3.7	35
4	7/0.85	0.8	4.3	52
6	7/1.04	0.8	4.8	73
10	7/1.35	1.0	6.2	120
16	7/1.70	1.0	7.2	180
25	7/2.14	1.2	9.0	285
35	19/1.53	1.2	10.2	375
50	19/1.78	1.4	12.0	510
70	19/2.14	1.4	14.0	720
95	19/2.52	1.6	16.0	995
120	37/2.03	1.6	18.0	1230
150	37/2.25	1.8	20.0	1520
185	37/2.52	2.0	22.0	1900
240	61/2.25	2.2	25.0	2480
300	61/2.52	2.4	28.0	3100
400	61/2.85	2.6	31.5	3950
500	61/3.20	2.8	35.0	4950
630	127/2.52	2.8	39.0	6360

For current rating and voltage drop please refer to Tables 12 & 13 (Page 50)

LSZH Flame Retardant Cables

KEYSTONE CABLE
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600/1000V Single-Core
XLPE Insulated, Unarmoured & Armoured, LSZH Sheathed
Description: CU/XLPE/LSZH or CU/XLPE/LSZH/AWA/LSZH
Model Code: XL or XLAL

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 :	600/1000V
Construction :	Plain annealed copper, XLPE or XLEVA compound insulated, unarmoured or aluminum wires armoured, LSZH compound sheathed cable
Insulation colour :	Natural
Sheath colour :	Black or as per order
Specification :	BS6724, IEC60502-1, IEC60332-1, IEC60332-3, IEC60754, IEC61034
Operating Temperature:	90˚C (or 110˚C upon request)

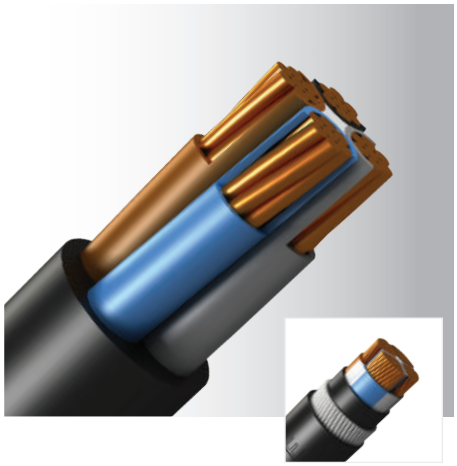
Conductor		Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	No./Diam. Of Strand	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(no./mm)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	7/0.53	0.7	6.1	52	-	-
2.5	7/0.67	0.7	6.6	67	-	-
4	7/0.85	0.7	7.0	85	-	-
6	7/1.04	0.7	7.5	110	-	-
10	7/1.35	0.7	8.5	155	-	-
16	7/1.70	0.7	9.5	225	-	-
25	7/2.14	0.9	11.5	335	-	-
35	19/1.53	0.9	12.5	435	-	-
50	19/1.78	1.0	14.0	570	20.5	800
70	19/2.14	1.1	16.3	800	22.2	1050
95	19/2.52	1.1	18.2	1080	23.9	1340
120	37/2.03	1.2	20.0	1330	26.0	1640
150	37/2.25	1.4	22.0	1630	27.8	1970
185	37/2.52	1.6	24.5	2030	30.0	2410
240	61/2.25	1.7	27.5	2650	33.3	3005
300	61/2.52	1.8	30.5	3260	36.2	3700
400	61/2.85	2.0	34.0	4140	41.2	4750
500	61/3.20	2.2	38.6	5200	46.4	5900
630	127/2.52	2.4	43.5	6650	52.0	7412
800	127/2.85	2.6	48.5	8450	58.0	9500
1000	127/3.20	2.8	53.6	10600	63.0	11730

Current rating and voltage drop
For Unarmoured Cable, please refer to Tables 12 & 13 (Page 50)
For Armoured Cable, please refer to Tables 14 & 15 (Page 51)

LSZH Flame Retardant Cables

KEYSTONE CABLE
tel (65) 6367 0107 fax (65) 6365 2963
www.keystone-cable.com

600/1000V 2-Core ~ 5-Core
XLPE Insulated, Unarmoured & Armoured, LSZH Sheathed
Description: CU/XLPE/LSZH or CU/XLPE/LSZH/SWA/LSZH
Model Code: XL or XLSL



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 :	600/1000V
Construction :	Plain annealed copper, XLPE or XLEVA compound insulated, unarmoured or galvanized steel wires armoured, LSZH compound sheathed cable
Insulation colour :	2-Core: (Brown & Blue) 3-Core: (Brown, Black & Grey) 4-Core: (Brown, Black, Grey & Blue) 5-Core & above: (Brown, Black, Grey, Blue, Green/Yellow) or as per order
Sheath colour :	Black or as per order
Specification :	BS6724, IEC60502-1, IEC60332-1, IEC60332-3, IEC60754, IEC61034
Operating temperature:	90˚C (or 110˚C upon request)

2-CORE					
Conductor	Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	0.7	10.1	130	14.5	362
2.5	0.7	11.0	165	15.5	410
4	0.7	12.0	215	16.5	490
6	0.7	13.1	270	18.0	580
10	0.7	16.0	390	20.8	800
16	0.7	18.0	495	22.9	1050
25(cs)	0.9	21.2	726	26.7	1473
35(cs)	0.9	23.4	944	29.0	1780
50(cs)	1.0	26.8	1257	32.4	2188
70(cs)	1.1	30.4	1724	36.3	2805
95(cs)	1.1	34.0	2299	41.2	3827
120(cs)	1.2	37.0	2848	44.2	4488
150(cs)	1.4	41.0	3479	48.2	5277
185(cs)	1.6	45.8	4323	54.4	6860
240(cs)	1.7	51.8	5608	60.4	8445
300(cs)	1.8	57.4	6948	66.3	10132
400(cs)	2.0	65.0	8854	74.0	12388

Current rating and voltage drop
For Unarmoured Cable, please refer to Tables 16 & 17 (Page 52)
For Armoured Cable, please refer to Tables 18 & 19 (Page 53)

(cs): Circular Compact Stranded Conductor

LSZH Flame Retardant Cables

KEYSTONE CABLE
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www.keystone-cable.com

600/1000V 2-Core ~ 5-Core
XLPE Insulated, Unarmoured & Armoured, LSZH Sheathed
Description: CU/XLPE/LSZH or CU/XLPE/LSZH/SWA/LSZH
Model Code: XL or XLSL

3-CORE					
Conductor	Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	0.7	10.5	145	15.0	390
2.5	0.7	11.4	190	16.0	435
4	0.7	12.8	250	17.0	550
6	0.7	14.0	320	18.5	660
10	0.7	16.9	480	21.7	900
16	0.7	19.0	661	24.0	1260
25(cs)	0.9	22.5	987	28.0	1791
35(cs)	0.9	25.0	1299	30.5	2193
50(cs)	1.0	28.5	1734	34.5	2755
70(cs)	1.1	32.6	2418	40.0	3881
95(cs)	1.1	36.5	3245	44.0	4897
120(cs)	1.2	39.7	4034	47.5	5812
150(cs)	1.4	44.0	4930	53.2	7401
185(cs)	1.6	49.2	6138	58.2	8870
240(cs)	1.7	55.6	7976	65.0	11111
300(cs)	1.8	61.6	9903	71.0	13373
400(cs)	2.0	70.0	12624	80.5	17404

4-CORE					
Conductor	Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	0.7	11.5	180	15.5	430
2.5	0.7	12.5	230	16.5	495
4	0.7	14.0	315	18.0	610
6	0.7	15.5	395	20.0	810
10	0.7	18.4	590	23.2	1120
16	0.7	21.4	860	27.0	1480
25(s)	0.9	22.0	1225	27.5	2000
35(s)	0.9	25.0	1625	30.5	2480
50(s)	1.0	28.0	2200	34.0	3180
70(s)	1.1	32.0	3050	39.5	4500
95(s)	1.1	37.0	4110	44.0	5775
120(s)	1.2	42.0	5915	50.2	7450
150(s)	1.4	46.0	6350	54.5	8830
185(s)	1.6	50.5	7985	59.0	10805
240(s)	1.7	58.0	10595	68.0	13630
300(s)	1.8	64.0	13220	73.0	16530
400(s)	2.0	73.0	16805	85.0	21840

Current rating and voltage drop
For Unarmoured Cable, please refer to Tables 16 & 17 (Page 52)
For Armoured Cable, please refer to Tables 18 & 19 (Page 53)

(cs): Circular Compact Stranded Conductor
(s) : Sector Shaped Stranded Conductors

LSZH Flame Retardant Cables

KEYSTONE CABLE
tel (65) 6367 0107 **fax** (65) 6365 2963
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600/1000V 2-Core ~ 5-Core
XLPE Insulated, Unarmoured & Armoured, LSZH Sheathed
Description: CU/XLPE/LSZH or CU/XLPE/LSZH/SWA/LSZH
Model Code: XL or XLSL

5-CORE					
Conductor	Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	0.7	12.8	208	16.8	455
2.5	0.7	13.9	263	17.8	540
4	0.7	15.4	355	20.0	795
6	0.7	16.9	465	21.8	956
10	0.7	19.8	700	24.8	1272
16	0.7	22.5	1020	28.6	1845
25 (cs)	0.9	27.0	1530	32.6	2500
35 (cs)	0.9	30.0	2035	36.2	3140
50 (cs)	1.0	34.5	2720	41.5	4300
70 (cs)	1.1	39.6	3825	46.8	5585
95 (cs)	1.1	45.0	5185	53.0	7675
120 (cs)	1.2	49.2	6320	57.6	9125
150 (cs)	1.4	54.5	7800	63.0	10824
185 (cs)	1.6	60.5	9800	70.0	13211
240 (cs)	1.7	68.8	12520	79.2	17466

Current rating and voltage drop
For Unarmoured Cable, please refer to Tables 16 & 17 (Page 52)
For Armoured Cable, please refer to Tables 18 & 19 (Page 53)

(cs): Circular Compact Stranded Conductor

LSZH Flame Retardant Cables

KEYSTONE CABLE
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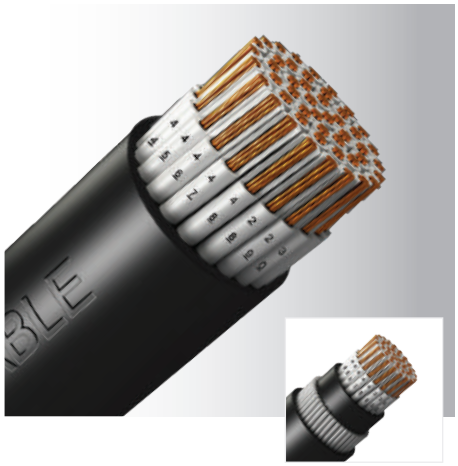
www.keystone-cable.com

600/1000V Multi-Core
XLPE Insulated, Unarmoured & Armoured, LSZH Sheathed
Description: CU/XLPE/LSZH or CU/XLPE/LSZH/SWA/LSZH
Model Code: XL or XLSL



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 :	600/1000V
Construction :	Plain annealed copper, XLPE or XLEVA compound insulated, unarmoured or galvanized steel wires armoured, LSZH compound sheathed cable
Insulation colour :	White (with black numbering)
Sheath colour :	Black
Specification :	BS6724, IEC60502-1, IEC60332-1, IEC60332-3, IEC60754, IEC61034
Operating Temperature:	90˚C (or 110˚C upon request)

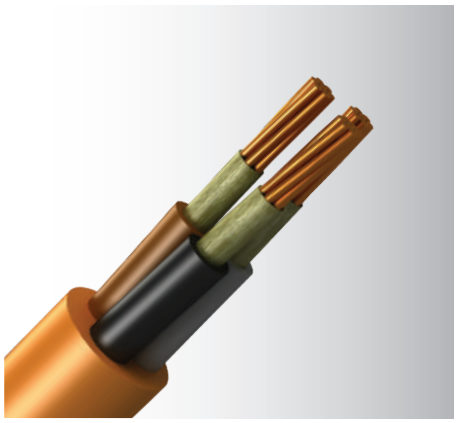
No. of Core	Conductor		Insulation	Unarmoured Cable		Armoured Cable	
	Nominal Area	No./Diam. Of Strand	Thickness	Approx. Overall Diam.	Approx. Weight	Approx Overall Diam.	Approx. Weight
	(mm^2)	(no./mm)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
5	1.5	7/0.53	0.7	12.8	215	16.5	497
7				13.7	260	17.5	565
10				16.8	365	21.5	850
12				17.3	405	22.0	905
19				19.9	570	24.7	1150
27				23.5	770	29.5	1624
37				26.1	1000	32.0	1940
48				30.3	1255	36.5	2384
5	2.5	7/0.67	0.7	13.8	280	18.0	583
7				14.9	350	19.0	787
10				18.4	485	23.0	1011
12				19.0	545	24.0	1096
19				21.9	780	28.0	1570
27				25.9	1060	32.0	2000
37				29.5	1380	36.0	2470
48				33.7	1770	41.0	3340
5	4.0	7/0.85	0.7	15.4	375	20.0	812
7				16.7	476	21.0	957
10				20.8	670	26.0	1400
12				21.5	760	27.0	1510
19				24.9	1105	31.0	2000
27				30.2	1520	36.0	2630
37				33.9	2000	42.0	3580
48				39.0	2600	47.0	4370

Current rating and voltage drop
For Unarmoured Cable, please refer to Tables 16 & 17 (Page 52)
For Armoured Cable, please refer to Tables 18 & 19 (Page 53)

LSZH Fire Resistant Cables

KEYSTONE CABLE
tel (65) 6367 0107 fax (65) 6365 2963
www.keystone-cable.com

300/500V Single-Core ~ 4-Core
Mica Tape, XLPE Insulated, LSZH Sheathed
Description: CU/MICA/XLPE/LSZH
Model Code: MXL



Application :	This cable is designed for areas where the integrity of the electrical circuit is critical in maintaining power supply. Applications can be found in emergency lightings, control and power circuits, power stations, fire alarm systems, underground tunnels, communications systems, sewage treatment plants, lifts, escalators, and high-rise buildings
Voltage rating :	300/500V
Construction :	Plain annealed copper, mica tape fire barrier, XLPE insulated, LSZH compound sheathed cable
Insulation colour :	Single-Core: (Natural) 2-Core: (Brown & Blue) 3-Core: (Brown, Black & Grey) 4-Core: (Brown, Black, Grey & Blue) or as per order
Sheath colour :	Orange or as per order
Specification :	IEC60502-1, BS6387, SS299-1, IEC60331, IEC60332-1, IEC60332-3, IEC60754, IEC61034
Operating Temperature:	90˚C

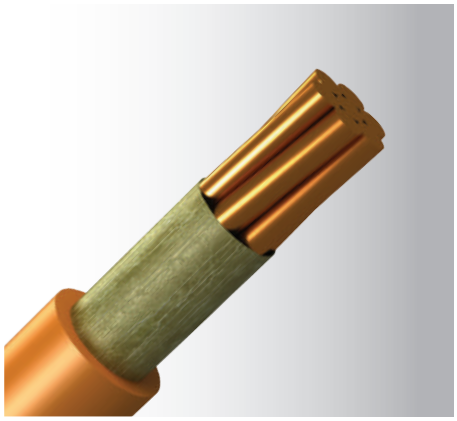
No. of Core	Conductor		Insulation	Sheath	Without Earth Conductor		With Earth Conductor	
	Nominal Area	No./Diam. of Strand	Thickness	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
	(mm^2)	(no./mm)	(mm)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
Single-core	1.5	7/0.53	0.5	0.5	4.8	35	-	-
2-core					8.5	70	8.7	91
3-core					9.0	95	10.1	120
4-core					10.4	134	11.7	146
Single-core	2.5	7/0.67	0.5	0.5	5.3	46	-	-
2-core					9.3	93	9.6	120
3-core					10.0	128	10.7	162
4-core					11.4	180	13.0	200
Single-core	4.0	7/0.85	0.5	0.5	5.8	63	-	-
2-core					10.4	128	10.5	170
3-core					11.5	190	12.5	229
4-core					12.7	255	13.5	284

For current rating and voltage drop please refer to Tables 16 & 17 (Page 52)

LSZH Fire Resistant Cables

KEYSTONE CABLE
tel (65) 6367 0107 fax (65) 6365 2963
www.keystone-cable.com

600/1000V Single-Core
Mica Tape, LSZH Insulated, Non-Sheathed
Description: CU/MICA/LSZH
Model Code: ML



Application :	This cable is used in fire extinguishing systems, sprinklers, control panels, and exit lights in high-rise buildings, hotels, hospitals, sub-ways, and public facilities
Voltage rating :	600/1000V
Construction :	Plain annealed copper, mica tape fire barrier, XLEVA compound insulated cable
Insulation colour:	Orange or as per order
Specification :	IEC60502-1, BS EN 50525-3-41(BS7211), BS6387, SS299-1, IEC60331, IEC60332-1, IEC60332-3, IEC60754, IEC61034
Operating Temperature:	90˚C (or 125˚C upon request)

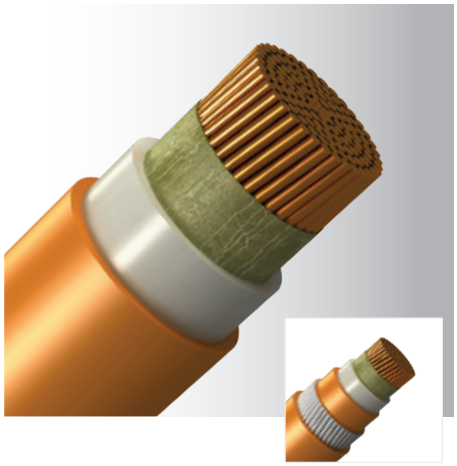
Conductor		Insulation	Approx. Overall Diam.	Approx. Weight
Nominal Area	No./Diam. Of Strand	Thickness		
(mm^2)	(no./mm)	(mm)	(mm)	(kg/km)
1.5	7/0.53	0.8	4.1	38
2.5	7/0.67	0.8	4.5	49
4	7/0.85	1.0	5.5	70
6	7/1.04	1.0	6.0	96
10	7/1.35	1.0	7.0	141
16	7/1.70	1.0	8.0	200
25	7/2.14	1.2	9.5	304
35	19/1.53	1.2	10.6	402
50	19/1.78	1.4	12.3	537
70	19/2.14	1.4	13.9	742
95	19/2.52	1.6	15.9	990
120	37/2.03	1.6	17.2	1250
150	37/2.25	1.8	18.9	1520
185	37/2.52	2.0	21.2	1900
240	61/2.25	2.2	25.8	2550
300	61/2.52	2.4	28.8	3150
400	61/2.85	2.6	32.2	4000
500	61/3.20	2.8	35.7	5000
630	127/2.52	2.8	39.7	6360

For current rating and voltage drop please refer to Tables 12 & 13 (Page 50)

LSZH Fire Resistant Cables

KEYSTONE CABLE
tel (65) 6367 0107 fax (65) 6365 2963
www.keystone-cable.com

600/1000V Single-Core
Mica Tape, XLPE Insulated, Unarmoured & Armoured, LSZH Sheathed
Description: CU/MICA/XLPE/LSZH or CU/MICA/XLPE/LSZH/AWA/LSZH
Model Code: MXL or MXLAL



Application :	This cable is designed for areas where the integrity of the electrical circuit is critical in maintaining power supply. Applications can be found in emergency lightings, control and power circuits, power stations, fire alarm systems, underground tunnels, communications systems, sewage treatment plants, lifts, escalators, and high-rise buildings
Voltage rating :	600/1000V
Construction :	Plain annealed copper, mica tape fire barrier, XLPE or XLEVA compound insulated, unarmoured or aluminum wires armoured, LSZH compound sheathed cable
Insulation colour :	Natural
Sheath colour :	Orange or as per order
Specification :	BS6724, BS6387, SS299-1, IEC60502-1, IEC60331, IEC60332-1, IEC60332-3, IEC60754, IEC61034
Operating Temperature:	90˚C or 110˚C (or 125˚C upon request)

Conductor			Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	No./Diam. Of Strand	Diam. Of Conductor	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(no./mm)	(mm)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	7/0.53	1.59	0.7	6.7	61	-	-
2.5	7/0.67	2.01	0.7	7.1	75	-	-
4	7/0.85	2.55	0.7	7.8	94	-	-
6	7/1.04	3.12	0.7	8.5	122	-	-
10	7/1.35	4.05	0.7	9.6	170	-	-
16	7/1.70	5.10	0.7	10.6	235	-	-
25	7/2.14	6.42	0.9	12.3	343	-	-
35	19/1.53	7.65	0.9	13.7	455	-	-
50	19/1.78	8.90	1.0	15.1	590	19.5	816
70	19/2.14	10.70	1.1	16.6	820	21.0	1047
95	19/2.52	12.60	1.1	19.0	1075	23.5	1353
120	37/2.03	14.21	1.2	20.5	1350	25.5	1689
150	37/2.25	15.75	1.4	22.7	1640	27.5	2010
185	37/2.52	17.64	1.6	25.5	2040	30.0	2440
240	61/2.25	20.25	1.7	28.5	2650	34.5	3060
300	61/2.52	22.68	1.8	31.5	3260	36.9	3690
400	61/2.85	25.65	2.0	35.4	4130	41.5	4780
500	61/3.20	28.80	2.2	39.0	5200	45.5	5970
630	127/2.52	32.76	2.4	43.5	6600	50.5	7530
800	127/2.85	37.05	2.6	48.5	8300	56.8	9680
1000	127/3.20	41.60	2.8	54.0	10458	61.5	11980

Current rating and voltage drop
For Unarmoured Cable, please refer to Tables 12 & 13 (Page 50)
For Armoured Cable, please refer to Tables 14 & 15 (Page 51)

LSZH Fire Resistant Cables

KEYSTONE CABLE
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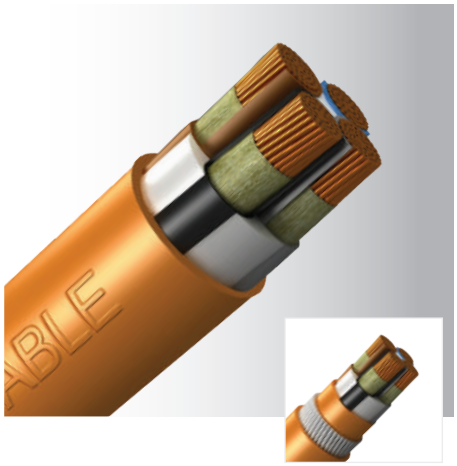
www.keystone-cable.com

600/1000V 2-Core ~ 5-Core
Mica Tape, XLPE Insulated, Unarmoured & Armoured, LSZH Sheathed
Description: CU/MICA/XLPE/LSZH or CU/MICA/XLPE/LSZH/SWA/LSZH
Model Code: MXL or MXLSL



Application :	This cable is designed for areas where the integrity of the electrical circuit is critical in maintaining power supply. Applications can be found in emergency lightings, control and power circuits, power stations, fire alarm systems, underground tunnels, communications systems, sewage treatment plants, lifts, escalators, and high-rise buildings
Voltage rating :	600/1000V
Construction :	Plain annealed copper, mica tape fire barrier, XLPE or XLEVA compound insulated, galvanized steel wires armoured, LSZH compound sheathed cable.
Insulation colour :	2-Core: (Brown & Blue) 3-Core: (Brown, Black & Grey) 4-Core: (Brown, Black, Grey & Blue) 5-Core & above: (Brown, Black, Grey, Blue, Green/Yellow) or as per order
Sheath colour :	Orange or as per order
Specification :	BS7846, BS6387, SS299, IEC60331, IEC60332-1, IEC60332-3, IEC60754, IEC61034
Operating Temperature:	90˚C or 110˚C (or 125˚C upon request)

2-CORE							
Conductor			Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	No./Diam. Of Strand	Diam. Of Conductor	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(no./mm)	(mm)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	7/0.53	1.59	0.7	12.2	150	15.3	450
2.5	7/0.67	2.01	0.7	12.6	193	16.5	511
4	7/0.85	2.55	0.7	13.8	250	17.6	595
6	7/1.04	3.12	0.7	15.0	326	18.8	809
10	7/1.35	4.05	0.7	17.5	411	22.0	940
16	7/1.70	5.10	0.7	19.5	550	24.0	1100
25(cs)	7/2.14	6.42	0.9	22.5	792	27.5	1634
35(cs)	19/1.53	7.65	0.9	26.0	1043	31.0	2000
50(cs)	19/1.78	8.90	1.0	29.0	1337	34.0	2450
70(cs)	19/2.14	10.70	1.1	32.3	1828	37.8	3200
95(cs)	19/2.52	12.6	1.1	36.0	2419	43.5	4149

Current rating and voltage drop
For Unarmoured Cable, please refer to Tables 16 & 17 (Page 52)
For Armoured Cable, please refer to Tables 18 & 19 (Page 53)

(cs) : Circular Compact Stranded Conductor

LSZH Fire Resistant Cables

KEYSTONE CABLE
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www.keystone-cable.com

600/1000V 2-Core ~ 5-Core
Mica Tape, XLPE Insulated, Unarmoured & Armoured, LSZH Sheathed
Description: CU/MICA/XLPE/LSZH or CU/MICA/XLPE/LSZH/SWA/LSZH
Model Code: MXL or MXLSL

3-CORE							
Conductor			Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	No./Diam. Of Strand	Diam. Of Conductor	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(no./mm)	(mm)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	7/0.53	1.59	0.7	12.3	170	16.5	420
2.5	7/0.67	2.01	0.7	13.8	200	17.0	500
4	7/0.85	2.55	0.7	15.2	300	18.5	600
6	7/1.04	3.12	0.7	16.8	380	19.8	883
10	7/1.35	4.05	0.7	18.6	550	22.6	1086
16	7/1.70	5.10	0.7	21.0	760	25.0	1370
25(cs)	7/2.14	6.15	0.9	24.0	1068	29.0	1900
35(cs)	19/1.53	7.3	0.9	27.4	1420	33.2	2458
50(cs)	19/1.78	8.5	1.0	30.5	1838	36.8	3006
70(cs)	19/2.14	10.05	1.1	34.5	2536	42.0	4206
95(cs)	19/2.52	11.8	1.1	39.0	3401	46.0	5400
120(cs)	37/2.03	13.0	1.2	42.5	4203	49.0	6450
150(cs)	37/2.25	14.4	1.4	46.5	5100	55.0	8200
185(cs)	37/2.52	16.2	1.6	52.0	6357	60.0	9800
240(cs)	61/2.25	18.8	1.7	58.6	8226	68.0	12300
300(cs)	61/2.52	21.25	1.8	64.5	10212	74.0	14800
400(cs)	61/2.85	24.3	2.0	73.0	13000	83.0	17600

4-CORE							
Conductor			Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	No./Diam. Of Strand	Diam. Of Conductor	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(no./mm)	(mm)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	7/0.53	1.59	0.7	14.3	190	16.0	475
2.5	7/0.67	2.01	0.7	15.2	248	17.8	570
4	7/0.85	2.55	0.7	16.5	335	19.8	690
6	7/1.04	3.12	0.7	18.0	440	21.6	940
10	7/1.35	4.05	0.7	20.6	670	24.5	1267
16	7/1.70	5.10	0.7	23.6	933	28.1	1776
25(cs)	7/2.14	6.15	0.9	26.7	1364	31.6	2400
35(cs)	19/1.53	7.30	0.9	30.4	1822	36.1	2973
50(cs)	19/1.78	8.50	1.0	34.1	2386	41.2	4027
70(cs)	19/2.14	10.05	1.1	38.5	3324	45.5	5300
95(cs)	19/2.52	11.80	1.1	43.0	4435	51.3	6910
120(cs)	37/2.03	13.00	1.2	46.5	5492	55.3	8500
150(cs)	37/2.25	14.40	1.4	51.5	6691	60.2	9683
185(cs)	37/2.52	16.20	1.6	57.5	8341	66.4	11764
240(cs)	61/2.25	18.80	1.7	65.0	10798	74.0	14610
300(cs)	61/2.52	21.25	1.8	71.9	13411	82.0	17598
400(cs)	61/2.85	24.30	2.0	81.0	17000	92.0	25500

Current rating and voltage drop
For Unarmoured Cable, please refer to Tables 16 & 17 (Page 52)
For Armoured Cable, please refer to Tables 18 & 19 (Page 53)

(cs) : Circular Compact Stranded Conductor

LSZH Fire Resistant Cables

KEYSTONE CABLE
tel (65) 6367 0107 fax (65) 6365 2963
www.keystone-cable.com

600/1000V 2-Core ~ 5-Core
Mica Tape, XLPE Insulated, Unarmoured & Armoured, LSZH Sheathed
Description: CU/MICA/XLPE/LSZH or CU/MICA/XLPE/LSZH/SWA/LSZH
Model Code: MXL or MXLSL

5-CORE							
Conductor			Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	No./Diam. Of Strand	Diam. Of Conductor	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(no./mm)	(mm)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
1.5	7/0.53	1.59	0.7	15.2	273	19.2	588
2.5	7/0.67	2.01	0.7	16.4	330	20.6	674
4	7/0.85	2.55	0.7	17.8	434	22.9	928
6	7/1.04	3.12	0.7	19.5	547	24.6	1083
10	7/1.35	4.05	0.7	22.0	780	27.8	1679
16	7/1.70	5.10	0.7	24.8	1105	30.6	2096
25(cs)	7/2.14	6.15	0.9	29.0	1625	34.8	2765
35(cs)	19/1.53	7.3	0.9	33.8	2270	40.0	3415
50(cs)	19/1.78	8.5	1.0	38.0	2876	45.0	4239
70(cs)	19/2.14	10.0	1.1	43.0	3967	50.4	5920
95(cs)	19/2.52	11.8	1.1	48.5	5355	57.2	8053
120(cs)	37/2.03	13.0	1.2	52.6	6750	61.4	9582
150(cs)	37/2.25	14.4	1.4	57.8	8220	67.2	11363
185(cs)	37/2.52	16.2	1.6	64.5	10250	73.5	13725

Current rating and voltage drop
For Unarmoured Cable, please refer to Tables 16 & 17 (Page 52)
For Armoured Cable, please refer to Tables 18 & 19 (Page 53)

(cs) : Circular Compact Stranded Conductor

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Other Cables

1	Conductor	Plain Annealed Copper Class 2
2	Insulation	XLPE
3	Oversheath	PVC or LSZH*

* LSZH: Low Smoke Zero Halogen

Other Cables

KEYSTONE CABLE
tel (65) 6367 0107 fax (65) 6365 2963
www.keystone-cable.com

600/1000V Prefabricated Branch Cables

Description: CU/XLPE/PVC or CU/XLPE/PVC/AWA/PVC
Model Code: XP or XPAP

Application :	This cable is used for urban networks. It can be installed aerially, in conduit, on open trays and in underground ducts
Features :	• Connecting branches are pre-fabricated and tested in the factory. This eliminates the risk of workmanship error or loss of components during installation • Ease of installation and shorter installation time translates to cost savings. Duration of installation is ~5-10% that of Bus-Duct System • Minimum installation skills and labor force is required • Shock resistant due to less chance of loose connection problems • Water resistant due to the rigid construction design
Voltage rating :	600/1000V
Construction :	Plain annealed copper, XLPE insulated, unarmoured or aluminium wires armoured, PVC sheathed cable
Insulation colour :	Natural
Sheath colour :	Black
Specification :	IEC60502-1
Operating Temperature:	90˚C

Conductor			Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	No./Diam. Of Strand	Max. Diam. Of Conductor	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(no./mm)	(mm)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
16	7/1.70	5.10	0.7	9.5	200	-	-
25	7/2.14	6.42	0.9	11.5	310	-	-
35	19/1.53	7.65	0.9	12.5	420	-	-
50	19/1.78	8.90	1.0	14.0	550	20.5	800
70	19/2.14	10.70	1.1	16.3	770	22.2	1036
95	19/2.52	12.60	1.1	18.2	1040	23.9	1321
120	37/2.03	14.21	1.2	20.0	1300	26.0	1640
150	37/2.25	15.75	1.4	22.0	1580	27.8	1956
185	37/2.52	17.64	1.6	24.5	1970	30.0	2376
240	61/2.25	20.25	1.7	27.5	2520	33.3	3005
300	61/2.52	22.68	1.8	30.5	3150	36.2	3654
400	61/2.85	25.65	2.0	34.0	4000	41.2	4718
500	61/3.20	28.80	2.2	38.6	5000	46.4	5850
630	127/2.52	32.76	2.4	43.5	6500	52.0	7350
800	127/2.85	37.05	2.6	48.5	8200	58.0	9460
1000	127/3.20	41.60	2.8	53.6	10000	63.0	11700

For technical specification please refer to Table 24 (Page 56)

KEYSTONE CABLE
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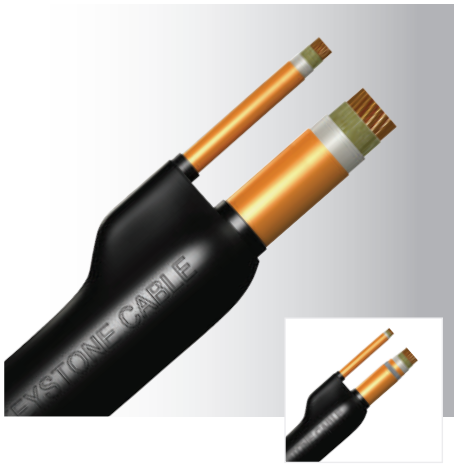
600/1000V Prefabricated Branch Cables

Description: CU/MICA/XLPE/LSZH or CU/MICA/XLPE/LSZH/AWA/LSZH

Model Code: MXL or MXLAL



Application :	This cable is used for urban networks where the integrity of the electrical circuit is critical in maintaining power supply
Features :	• Connecting branches are pre-fabricated and tested in the factory. This eliminates the risk of workmanship error or loss of components during installation • Ease of installation and shorter installation time translates to cost savings. Duration of installation is ~5-10% that of Bus-Duct System • Minimum installation skills and labor force is required • Fire resistant, shock resistant and water resistant
Voltage rating :	600/1000V
Construction :	Plain annealed copper, mica tape fire barrier, XLPE insulated, unarmoured or aluminium wires armoured, LSZH compound sheathed cable
Insulation colour :	Natural
Sheath colour :	Orange
Specification :	IEC60502-1
Operating Temperature:	90˚C

Conductor			Insulation	Unarmoured Cable		Armoured Cable	
Nominal Area	No./Diam. Of Strand	Diam. Of Conductor	Thickness	Approx. Overall Diam.	Approx. Weight	Approx. Overall Diam.	Approx. Weight
(mm^2)	(no./mm)	(mm)	(mm)	(mm)	(kg/km)	(mm)	(kg/km)
6	7/1.04	3.12	0.7	8.5	122	-	-
10	7/1.35	4.05	0.7	9.6	170	-	-
16	7/1.70	5.10	0.7	10.6	235	-	-
25	7/2.14	6.42	0.9	12.3	343	-	-
35	19/1.53	7.65	0.9	13.7	455	-	-
50	19/1.78	8.90	1.0	15.1	590	19.5	816
70	19/2.14	10.70	1.1	16.6	820	21.0	1047
95	19/2.52	12.60	1.1	19.0	1075	23.5	1353
120	37/2.03	14.21	1.2	20.5	1350	25.5	1689
150	37/2.25	15.75	1.4	22.7	1640	27.5	2010
185	37/2.52	17.64	1.6	25.5	2040	30.0	2440
240	61/2.25	20.25	1.7	28.5	2650	34.5	3060
300	61/2.52	22.68	1.8	31.5	3260	36.9	3690
400	61/2.85	25.65	2.0	35.4	4130	41.5	4780
500	61/3.20	28.80	2.2	39.0	5200	45.5	5970
630	127/2.52	32.76	2.4	43.5	6600	50.5	7530
800	127/2.85	37.05	2.6	48.5	8300	56.8	9680
1000	127/3.20	41.60	2.8	54.0	10458	61.5	11980

For technical specification, please refer to Table 24 (Page 56)

KEYSTONE CABLE
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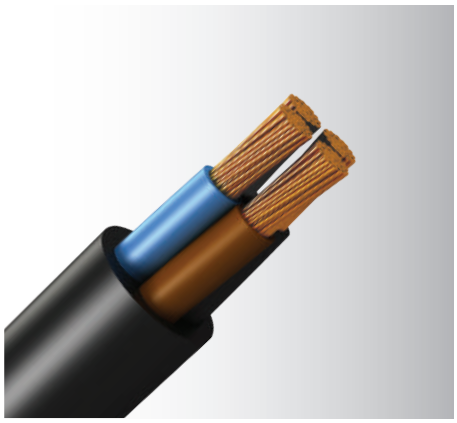
EPR Rubber Insulated Polychloroprene Sheathed Flexible Cables (H07RN-F)

Description: CU/RUBBER/CHLOROPRENE

Model Code: NEOPRENE CABLE



Application :	This flexible cable can be installed either as a fixed or mobile cable under adverse conditions such as in oily, acidic or alkaline environment
Voltage rating :	450/750V
Construction :	Class 5 plain annealed flexible copper, rubber insulated, polychloroprene sheathed cable
Insulation colour :	Single-Core: Black 2-Core: Brown & Blue 3-Core: Brown, Blue & Green/Yellow 4-Core: Brown, Blue, Black & Green/Yellow 5-Core: Brown, Blue, Black, Grey & Green/Yellow
Sheath colour :	Black
Specification:	BS EN 50525-2-21()BS6007,BS7917), BS6883
Operating Temperature:	-25˚C to 60˚C (or 90˚C upon request)
Certification:	VDE

1-CORE				
Conductor Nominal Area	Insulation Thickness	Sheath Thickness	Outer Diam.	Approx. Weight
(mm^2)	(mm)	(mm)	(mm)	(kg/km)
1.5	0.8	1.4	6.0	50
2.5	0.9	1.4	6.5	65
4	1.0	1.5	7.5	90
6	1.0	1.6	8.5	115
10	1.2	1.8	10.0	180
16	1.2	1.9	11.5	255
25	1.4	2.0	13.0	365
35	1.4	2.2	15.0	485
50	1.6	2.4	17.0	680
70	1.6	2.6	19.0	900
95	1.8	2.8	21.5	1160
120	1.8	3.0	23.5	1460
150	2.0	3.2	25.5	1800
185	2.2	3.4	28.5	2200
240	2.4	3.5	31.5	2830
300	2.6	3.6	34.0	3480
400	2.8	3.8	38.5	4500
500	3.0	4.0	44.0	5800

For technical specification please refer to Table 20 (Page 54)

KEYSTONE CABLE
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EPR Rubber Insulated Polychloroprene Sheathed Flexible Cables (H07RN-F)

Description: CU/RUBBER/CHLOROPRENE

Model Code: NEOPRENE CABLE

2-CORE				
Conductor Nominal Area	Insulation Thickness	Sheath Thickness	Outer Diam.	Approx. Weight
(mm^2)	(mm)	(mm)	(mm)	(kg/km)
1	0.8	1.3	8.3	90
1.5	0.8	1.5	9.2	115
2.5	0.9	1.7	11.0	165
4	1.0	1.8	12.6	230
6	1.0	2.0	14.2	300
10	1.2	3.1	19.2	545
16	1.2	3.3	22.0	765
25	1.4	3.6	25.4	1090

3-CORE				
Conductor Nominal Area	Insulation Thickness	Sheath Thickness	Outer Diam.	Approx. Weight
(mm^2)	(mm)	(mm)	(mm)	(kg/km)
1	0.8	1.4	9.0	110
1.5	0.8	1.6	10.0	140
2.5	0.9	1.8	12.0	200
4	1.0	1.9	13.5	280
6	1.0	2.1	15.5	375
10	1.2	3.3	20.5	675
16	1.2	3.5	23.5	950
25	1.4	3.8	27.5	1360
35	1.4	4.1	30.5	1795
50	1.6	4.5	35.0	2480
70	1.6	4.8	39.0	3285
95	1.8	5.3	45.3	4210
120	1.8	5.6	49.0	5280
150	2.0	6.0	60.0	6420

For technical specification please refer to Table 20 (Page 54)

KEYSTONE CABLE
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EPR Rubber Insulated Polychloroprene Sheathed Flexible Cables (H07RN-F)

Description: CU/RUBBER/CHLOROPRENE

Model Code: NEOPRENE CABLE

4-CORE				
Conductor Nominal Area	Insulation Thickness	Sheath Thickness	Outer Diam.	Approx. Weight
(mm^2)	(mm)	(mm)	(mm)	(kg/km)
1	0.8	1.5	10.0	135
1.5	0.8	1.7	11.0	170
2.5	0.9	1.9	13.0	250
4	1.0	2.0	15.0	350
6	1.0	2.3	17.0	470
10	1.2	3.4	22.5	830
16	1.2	3.6	25.5	1170
25	1.4	4.1	30.0	1700
35	1.4	4.4	34.0	2300
50	1.6	4.8	39.0	3160
70	1.6	5.2	43.5	4200
95	1.8	5.9	50.0	5450
120	1.8	6.0	54.0	6770

5-CORE				
Conductor Nominal Area	Insulation Thickness	Sheath Thickness	Outer Diam.	Approx. Weight
(mm^2)	(mm)	(mm)	(mm)	(kg/km)
1	0.8	1.6	11.0	160
1.5	0.8	1.8	12.0	205
2.5	0.9	2.0	14.5	300
4	1.0	2.2	16.5	420
6	1.0	2.5	19.0	580
10	1.2	3.6	25.0	1120
16	1.2	3.9	28.0	1440
25	1.4	4.4	33.5	2120

For technical specification please refer to Table 20 (Page 54)

KEYSTONE CABLE
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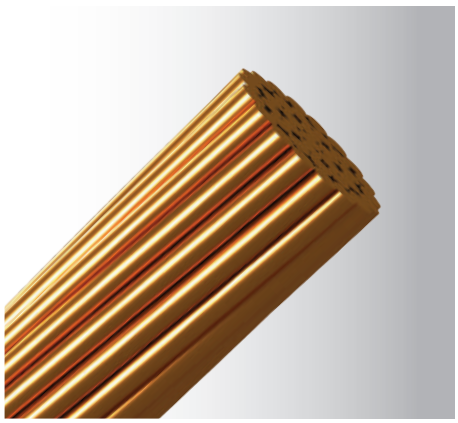
Annealed Stranded Bare Copper Conductor (Circular Non-Compacted or Compacted)

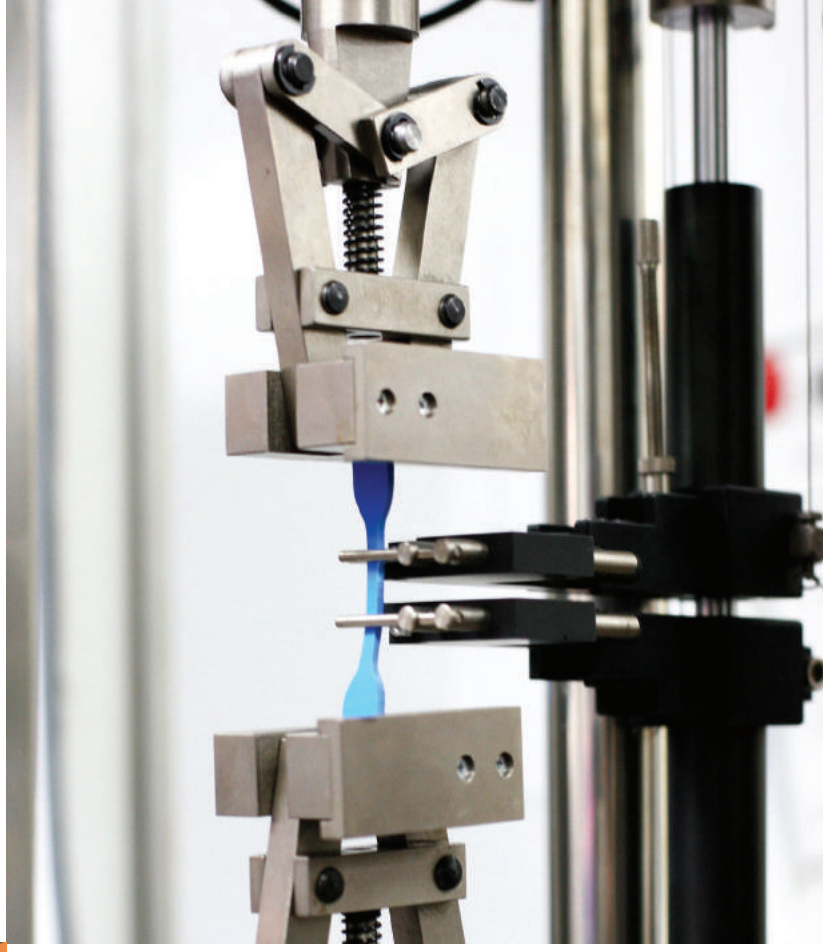
Model Code: BARE CONDUCTOR

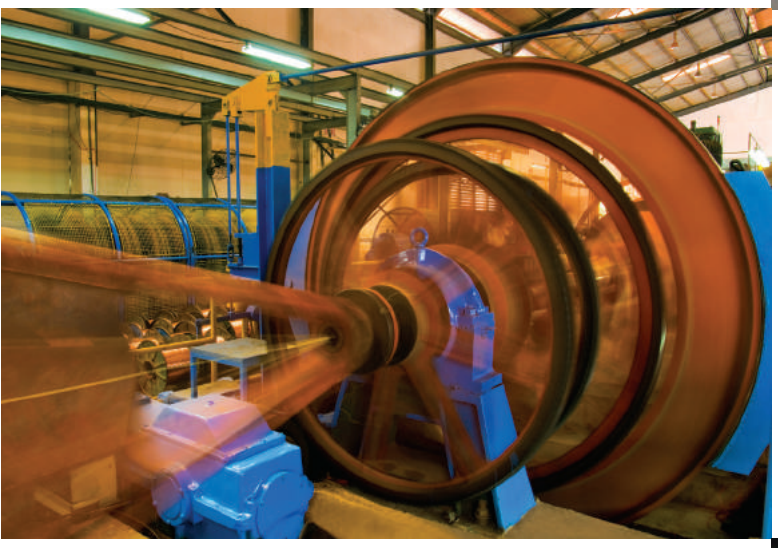


Application :	For power transmission and distribution lines
Construction :	Plain annealed copper conductor
Specification :	IEC60228, BS EN 60228

Conductor				Maximum Conductor Resistance at 20°C	Approx. Weight
Nominal Area	No./Diam. of Strand	Approx. Diam.	Circular Compacted Diam.		
(mm^2)	(no./mm)	(mm)	(mm)	(Ω/km)	(kg/km)
1	1/1.13	1.13	-	18.1	9
1	7/0.43	1.29	-	18.1	9
1.5	1/1.38	1.38	-	12.1	13
1.5	7/0.53	1.59	-	12.1	14
2.5	1/1.78	1.78	-	7.41	22
2.5	7/0.67	2.01	-	7.41	22
4	7/0.85	2.55	-	4.61	36
6	7/1.04	3.12	-	3.08	54
10	7/1.35	4.05	-	1.83	91
16	7/1.70	5.10	5.00	1.15	144
25	7/2.14	6.42	6.15	0.727	228
35	19/1.53	7.65	7.30	0.524	317
50	19/1.78	8.90	8.50	0.387	429
70	19/2.14	10.70	10.1	0.268	620
95	19/2.52	12.60	11.8	0.193	859
120	37/2.03	14.21	13.0	0.153	1086
150	37/2.25	15.75	14.1	0.124	1334
185	37/2.52	17.64	16.2	0.0991	1673
240	61/2.25	20.25	18.8	0.0754	2199
300	61/2.52	22.68	21.3	0.0601	2759
400	61/2.85	25.65	24.3	0.0470	3528
500	61/3.20	28.80	27.4	0.0366	4448
630	127/2.52	32.76	30.5	0.0283	5744
800	127/2.85	37.05	-	0.0221	7346
1000	127/3.20	41.60	-	0.0176	9261

For conductor resistance temperature correction factors, please refer to Table 32 (Page 58)





Technical Data

Schedule of Installation Methods of Cables

(Reference Method Included)

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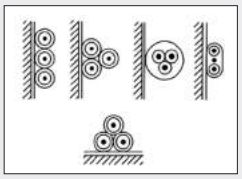
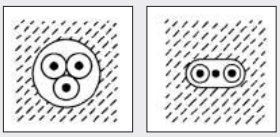
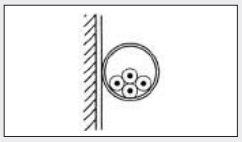
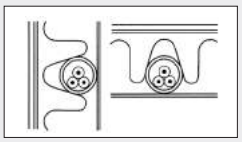
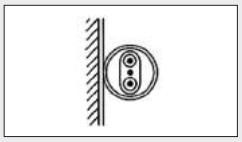
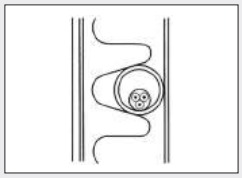
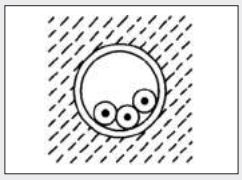
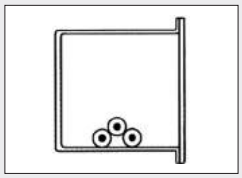
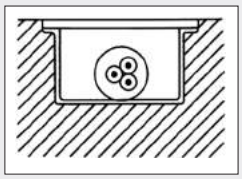
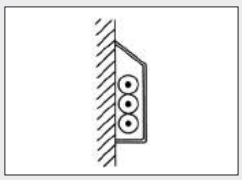
Table 1

	Installation Method	Examples	Appropriate Reference Method for Determining Current-Carrying Capacity
1	2	3	4
Open and Clipped Direct :			
1	Sheathed cables clipped direct to or lying on a non-metallic surface		Method 1
Cables Embedded Direct in Building Materials :			
2	Sheathed cables embedded directly in masonry, brickwork, concrete, plaster or the like (other than thermally insulating materials)		Method 1
In Conduit :			
3	Single-core non-sheathed cables in metallic or non-metallic conduit on a wall or ceiling		Method 3
4	* Single-core non-sheathed cables in metallic or non-metallic conduit in a thermally insulating wall or above a thermally insulating ceiling, the conduit being in contact with a thermally conducitve surface on one side		Method 4
5	Multi-core cables having non-metallic sheath, in metallic sheath, in metallic or non-metallic conduit on a wall or ceiling		Method 3

* The wall is assumed to consist of an outer weatherproof skin, thermal insulation and an inner skin of plasterboard or wood-like material, with a coefficient of heat transfer not less than 10 W/m^{2}K. The conduit is fixed so that it is close to, but not necessarily touching, the inner skin. Heat from the cables is assumed to escape through the inner skin only.

	Installation Method	Examples	Appropriate Reference Method for Determining Current-Carrying Capacity
1	2	3	4
6	Sheathed cables in conduit in a thermally insulating wall etc		Method 4
7	Cables in conduit embedded in masonry, brickwork, concrete, plaster or the like (other than thermally insulating materials)		Method 3
In Trunking :			
8	Cables in trunking on a wall or suspended in the air		Method 3
9	Cables in flush floor trunking		Method 3
10	Single-core Cables in skirting trunkingg		Method 3

* The wall is assumed to consist of an outer weatherproof skin, thermal insulation and an inner skin of plasterboard or wood-like material, with a coefficient of heat transfer not less than 10 W/m^{2}K. The conduit is fixed so that it is close to, but not necessarily touching, the inner skin. Heat from the cables is assumed to escape through the inner skin only.

Schedule of Installation Methods of Cables

(Reference Method Included)

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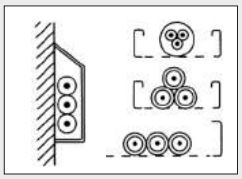
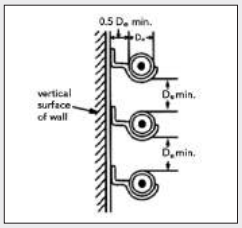
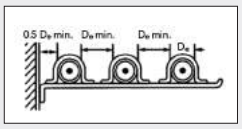
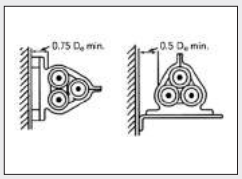
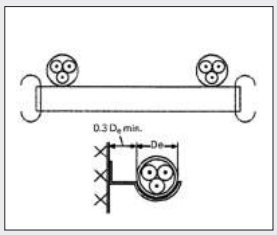
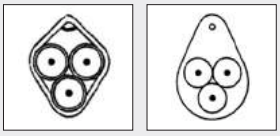
	Installation Method	Examples	Appropriate Reference Method for Determining Current-Carrying Capacity
1	2	3	4
In Tray :			
11	Sheathed cables, bunched and unenclosed, on a perforated cable tray. A perforated cable tray is considered a tray with holes that occupy at least 30% of the surface area		Method 11
In free air, on cleats, brackets or a ladder :			
12	Sheathed single-core cables in free air (any supporting metalwork under the cables occupying less than 10% of the plan area) Two or three cables vertically one above the other, minimum distance between cable surfaces equal to the overall cable diameter (D_e); distance from the wall not less than $0.5D_e$ Two or three cables horizontally, with spacings as above Three cables in trefoil, distance between wall and surface of nearest cable $0.5D_e$ or nearest cables $0.75D_e$	  	Method 12
13	Sheathed multi-core cables on ladder or brackets, with separation greater than $2D_e$. Sheathed multi-core cables in free air distance between wall and cable surface not less than $0.3D_e$. Any supporting metalwork under the cables occupying less than 10% of the plan area		Method 13
14	Cables suspended from or incorporating a catenary wire		Method 12 or 13 as appropriate

* The wall is assumed to consist of an outer weatherproof skin, thermal insulation and an inner skin of plasterboard or wood-like material, with a coefficient of heat transfer not less than 10 W/m²K. The conduit is fixed so that it is close to, but not necessarily touching, the inner skin. Heat from the cables is assumed to escape through the inner skin only.

Current Rating and Voltage Drop

PVC Insulated Cables
Single-Core, Unarmoured

KEYSTONE CABLE
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www.keystone-cable.com

Single-Core Cables with PVC Insulation, Unarmoured, with or without Sheath 450/750V or 600/1000V

Table 2 : Current-Carrying Capacities (Amp) [CU/PVC or CU/PVC/PVC Cables]

BS EN 50525-2-31 (BS 6004)
IEC 60502 (BS 6346)
SS 358

Conductor Operating Temperature : 70°C
Ambient Temperature : 30°C

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 (free air)		
									Horizontal flat spaced	Vertical flat spaced	Trefoil
	2 cables, single-phase a.c. or d.c.	3 or 4 cables, three phase a.c.	2 cables, single-phase a.c. or d.c.	3 or 4 cables, three-phase a.c.	2 cables, single-phase a.c. or d.c.flat and touching	3 or 4 cables, three-phase a.c. flat and touching or trefoil	2 cables, single-phase a.c.or d.c. or flat and touching	3 or 4 cable three -phase a.c. flat and touching or trefoil	2 cables, single-phase a.c. or d.c. or 3 cables three-phase a.c.	2 cables, single-phase a.c. or d.c. or 3 cables three phase a.c.	3 cables, trefoil three 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
BS 6004											
1	11	10.5	13.5	12	15.5	14	-	-	-	-	-
1.5	14.5	13.5	17.5	15.5	20	18	-	-	-	-	-
2.5	19.5	18	24	21	27	25	-	-	-	-	-
4	26	24	32	28	37	33	-	-	-	-	-
6	34	31	41	36	47	43	-	-	-	-	-
10	46	42	57	50	65	59	-	-	-	-	-
16	61	56	76	68	87	79	-	-	-	-	-
25	80	73	101	89	114	104	126	112	146	130	110
35	99	89	125	110	141	129	156	141	181	162	137
BS 6346											
50	119	108	151	134	182	167	191	172	219	197	167
70	151	136	192	171	234	214	246	223	281	254	216
95	182	164	232	207	284	261	300	273	341	311	264
120	210	188	269	239	330	303	349	318	396	362	308
150	240	216	300	262	381	349	404	369	456	419	356
185	273	245	341	296	436	400	463	424	521	480	409
240	320	286	400	346	515	472	549	504	615	569	485
300	367	328	458	394	594	545	635	584	709	659	561
400	-	-	546	467	694	634	732	679	852	795	656
500	-	-	626	533	792	723	835	778	982	920	749
630	-	-	720	611	904	826	953	892	1138	1070	855
800	-	-	-	-	1030	943	1086	1020	1265	1188	971
1000	-	-	-	-	1154	1058	1216	1149	1420	1337	1079

Note : For rating factors of ambient temperature other than 30°C please refer to Table 25

Table 3 : Voltage Drop (Per Amp, Per Meter) [CU/PVC or CU/PVC/PVC Cables]

BS EN 50525-2-31 (BS 6004)
IEC 60502-1 (BS 6346)
SS 358

Conductor Operating Temperature : 70°C
Ambient Temperature : 30°C

Conductor cross-sectional area	2 cables d.c.	2 cables single-phase a.c.									3 or 4 cables three-phase a.c.											
		Reference Methods 3 & 4 (enclosed in conduit etc, in or on a wall)			Reference Methods 1 & 11 (clipped direct or on trays, touching)			Reference Method 12 (space)			Reference Methods 3 & 4 (enclosed in conduit etc, in or on a wall)			Reference Methods 1, 11 & 12 (in trefoil)			Reference Methods 1 & 11 (flat touching)			Reference Method 12 (flat spaced)		
1	2	3			4			5			6			7			8			9		
mm²	mV/ A/m	mV/ A/m			mV/ A/m			mV/ A/m			mV/ A/m			mV/ A/m			mV/ A/m			mV/ A/m		
1	44		44			44			44			38			38			38			38	
1.5	29		29			29			29			25			25			25			25	
2.5	18		18			18			18			15			15			15			15	
4	11		11			11			11			9.5			9.5			9.5			9.5	
6	7.3		7.3			7.3			7.3			6.4			6.4			6.4			6.4	
10	4.4		4.4			4.4			4.4			3.8			3.8			3.8			3.8	
16	2.8		2.8			2.8			2.8			2.4			2.4			2.4			2.4	
		r	x	z	r	x	z	r	x	z	r	x	z	r	x	z	r	x	z	r	x	z
25	1.75	1.80	0.33	1.80	1.75	0.20	1.75	1.75	0.29	1.80	1.50	0.29	1.55	1.50	0.175	1.50	1.50	0.25	1.55	1.50	0.32	1.55
35	1.25	1.30	0.31	1.30	1.25	0.195	1.25	1.25	0.28	1.30	1.10	0.27	1.10	1.10	0.170	1.10	1.10	0.24	1.10	1.10	0.32	1.15
50	0.93	0.95	0.30	1.00	0.93	0.190	0.95	0.93	0.28	0.97	0.81	0.26	0.85	0.80	0.165	0.82	0.80	0.24	0.84	0.80	0.32	0.86
70	0.63	0.65	0.29	0.72	0.63	0.185	0.66	0.63	0.27	0.69	0.56	0.25	0.61	0.55	0.160	0.57	0.55	0.24	0.60	0.55	0.31	0.63
95	0.46	0.49	0.28	0.56	0.47	0.180	0.50	0.47	0.27	0.54	0.42	0.24	0.48	0.41	0.155	0.43	0.41	0.23	0.47	0.40	0.31	0.51
120	0.36	0.39	0.27	0.47	0.37	0.175	0.41	0.37	0.26	0.45	0.33	0.23	0.41	0.32	0.150	0.36	0.32	0.23	0.40	0.32	0.30	0.44
150	0.29	0.31	0.27	0.41	0.30	0.175	0.34	0.29	0.26	0.39	0.27	0.23	0.36	0.26	0.150	0.30	0.26	0.23	0.34	0.26	0.30	0.40
185	0.23	0.25	0.27	0.37	0.24	0.170	0.29	0.24	0.26	0.35	0.22	0.23	0.32	0.21	0.145	0.26	0.21	0.22	0.31	0.21	0.30	0.36
240	0.180	0.195	0.26	0.33	0.185	0.165	0.25	0.185	0.25	0.31	0.17	0.23	0.29	0.160	0.145	0.22	0.160	0.22	0.27	0.160	0.29	0.34
300	0.145	0.160	0.26	0.31	0.150	0.165	0.22	0.150	0.25	0.29	0.14	0.23	0.27	0.130	0.140	0.190	0.130	0.22	0.25	0.130	0.29	0.32
400	0.105	0.130	0.26	0.29	0.120	0.160	0.20	0.115	0.25	0.27	0.12	0.22	0.25	0.105	0.140	0.175	0.105	0.21	0.24	0.100	0.29	0.31
500	0.086	0.110	0.26	0.28	0.098	0.155	0.185	0.093	0.24	0.26	0.10	0.22	0.25	0.086	0.135	0.160	0.086	0.21	0.23	0.081	0.29	0.30
630	0.068	0.094	0.25	0.27	0.081	0.155	0.175	0.076	0.24	0.25	0.08	0.22	0.24	0.072	0.135	0.150	0.072	0.21	0.22	0.066	0.28	0.29
800	0.053	-	-	-	0.068	0.150	0.165	0.061	0.24	0.25	-	-	-	0.060	0.130	0.145	0.060	0.21	0.22	0.053	0.28	0.29
1000	0.042	-	-	-	0.059	0.150	0.160	0.050	0.24	0.24	-	-	-	0.052	0.130	0.140	0.052	0.20	0.21	0.044	0.28	0.28

Note : r = conductor resistance at operating temperature, x = reactance, z = impedance

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Table 4 : Current-Carrying Capacities (Amp) [CU/PVC/PVC/AWA/PVC Cables]

Conductor Operating Temperature : 70°C
Ambient Temperature : 30°C

IEC 60502-1 (BS 6346)

Conductor cross-sectional area	Reference Method 1 (clipped direct)		Reference Method 11 (on perforated cable tray)		Reference Method 12 (free air)					Direct in ground		In single way ducts	
	2 cables single-phase a.c. or d.c.	3 or 4 cables 3-phase a.c.	2 cables single-phase a.c. flat & touching	3 or 4 cables 3-phase a.c. flat & touching	3 or 4 cables 3-phase a.c.			2 cables d.c. spaced		2 cables flat touching	3 cables trefoil touching	2 cables duct touching	3 cables trefoil touching
					Horizontal flat spaced	Vertical flat spaced	3 cables trefoils	Horizontal	Vertical				
1	2	3	4	5	6	7	8	9	10	11	12	13	14
mm²	A	A	A	A	A	A	A	A	A	A	A	A	A
50	193	179	205	189	230	212	181	229	216	238	203	216	199
70	245	225	259	238	286	263	231	294	279	292	248	262	241
95	296	269	313	285	338	313	280	357	340	349	297	308	282
120	342	309	360	327	385	357	324	415	396	396	337	341	311
*150	393	352	413	373	436	405	373	479	458	443	376	375	342
185	447	399	469	422	490	456	425	548	525	497	423	414	375
240	525	465	550	492	566	528	501	648	622	571	485	463	419
300	594	515	624	547	616	578	567	748	719	640	542	509	459
400	687	575	723	618	674	632	657	885	851	708	600	545	489
500	763	622	805	673	721	676	731	1035	997	780	660	585	523
630	843	669	891	728	771	723	809	1218	1174	856	721	632	563
800	919	710	976	777	824	772	886	1441	1390	895	756	662	587
1000	975	737	1041	808	872	816	946	1685	1627	939	797	703	621

Note : For rating factors of ambient temperature other than 30°C please refer Table 25
For rating factors for group temperature other than 15°C please refer to Table 30
For group rating factors please refer to Table 27

Table 5 : Voltage Drop (Per Amp Per Meter) [CU/PVC/PVC/AWA/PVC Cables]

Conductor Operating Temperature : 70°C
Ambient Temperature : 30°C

IEC 60502-1 (BS6346)

Conductor cross-sectional area	2 cables d.c.	2 cables single-phase a.c.						3 or 4 cables three-phase a.c.									Direct in ground		In single way ducts	
		Reference Methods 1 & 11 (Touching)			Reference Method 12 (space*)			Reference Methods 1, 11 & 12 (in trefoil touching)			Reference Methods 1 & 11 (flat touching)			Reference Method 12 (flat spaced*)			2 cables flat touching	3 cables trefoil touching	2 cables flat touching	3 cables trefoil touching
1	2	3			4			5			6			7			8	9	10	11
mm²	mV/A/m	mV/A/m			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	r	x	z	r	x	z				
50	0.93	0.93	0.22	0.95	0.92	0.30	0.97	0.80	0.190	0.82	0.79	0.26	0.84	0.79	0.34	0.86	0.97	0.82	1.00	0.88
70	0.63	0.64	0.21	0.68	0.66	0.29	0.72	0.56	0.180	0.58	0.57	0.25	0.62	0.59	0.32	0.68	0.67	0.58	0.76	0.66
95	0.46	0.48	0.20	0.52	0.51	0.28	0.58	0.42	0.175	0.45	0.44	0.25	0.50	0.47	0.31	0.57	0.50	0.44	0.61	0.53
120	0.36	0.39	0.195	0.43	0.42	0.28	0.50	0.33	0.17	0.37	0.36	0.24	0.43	0.40	0.30	0.50	0.42	0.36	0.54	0.47
150	0.29	0.31	0.19	0.37	0.34	0.27	0.44	0.27	0.165	0.32	0.30	0.24	0.38	0.34	0.30	0.45	0.36	0.31	0.48	0.42
185	0.23	0.26	0.19	0.32	0.29	0.27	0.39	0.22	0.160	0.27	0.25	0.23	0.34	0.29	0.29	0.41	0.31	0.27	0.44	0.38
240	0.180	0.20	0.180	0.27	0.23	0.26	0.35	0.175	0.160	0.23	0.20	0.23	0.30	0.24	0.28	0.37	0.26	0.23	0.40	0.34
300	0.145	0.160	0.180	0.24	0.190	0.26	0.32	0.140	0.155	0.21	0.165	0.22	0.28	0.20	0.28	0.34	0.23	0.20	0.37	0.32
400	0.105	0.140	0.175	0.22	0.180	0.24	0.30	0.120	0.150	0.195	0.160	0.21	0.26	0.21	0.25	0.32	0.22	0.19	0.34	0.30
500	0.086	0.120	0.170	0.21	0.165	0.23	0.29	0.105	0.145	0.180	0.145	0.20	0.25	0.190	0.24	0.30	0.20	0.18	0.32	0.28
630	0.068	0.105	0.165	0.195	0.150	0.22	0.27	0.091	0.145	0.170	0.135	0.195	0.23	0.175	0.22	0.28	0.19	0.16	0.30	0.26
800	0.053	0.095	0.160	0.185	0.145	0.21	0.25	0.082	0.140	0.160	0.125	0.180	0.22	0.170	0.195	0.26	-	-	-	-
1000	0.042	0.091	0.155	0.180	0.140	0.190	0.24	0.079	0.135	0.155	0.125	0.165	0.21	0.165	0.170	0.24	-	-	-	-

Note : r = conductor resistance at operating temperature
x = reactance
z = impedance

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Table 6 : Current-Carrying Capacities (Amp) [CU/PVC/PVC Cables]

Conductor Operating Temperature : 70°C
Ambient Temperature : 30°C

BS EN 50525-2-31 (BS 6004)
IEC 60502-1 (BS 6346)

Conductor cross-sectional area	Reference Method 4 (enclosed in an 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 perforated cable tray), or Reference Method 13 (free air)	
	one 2-core cable* single-phase a.c. or d.c.	one 3-core cable* or one 4-core cable 3-phase a.c.	one 2-core cable* single-phase a.c. or d.c.	one 3-core cable* or one 4-core cable 3-phase a.c.	one 2-core cable* single-phase a.c. or d.c.	one 3-core cable* or one 4-core cable 3-phase a.c.	one 2-core cable* single-phase a.c. or d.c.	one 3-core cable* or one 4-core cable 3-phase a.c.
1	2	3	4	5	6	7	8	9
mm²	A	A	A	A	A	A	A	A
1	11	10	13	11.5	15	13.5	17	14.5
1.5	14	13	16.5	15	19.5	17.5	22	18.5
2.5	18.5	17.5	23	20	27	24	30	25
4	25	23	30	27	36	32	40	34
6	32	29	38	34	46	41	51	43
10	43	39	52	46	63	57	70	60
16	57	52	69	62	85	76	94	80
25	75	68	90	80	112	96	119	101
35	92	83	111	99	138	119	148	126
50	110	99	133	118	168	144	180	153
70	139	125	168	149	213	184	232	196
95	167	150	201	179	258	223	282	238
120	192	172	232	206	299	259	328	276
150	219	196	258	225	344	299	379	319
185	248	223	294	255	392	341	434	364
240	291	261	344	297	461	403	514	430
300	334	298	394	339	530	464	593	497
400	-	-	470	402	634	557	715	597

* With or without protective conductor
Note : For rating factors of ambient temperature other than 30°C please refer to Table 25

Table 7 : Voltage Drop (Per Amp Per Meter) [CU/PVC/PVC Cables]

Conductor Operating Temperature : 70°C
Ambient Temperature : 30°C

Conductor cross-sectional	2-core cable a.c.	2-core cable single-phase a.c.			3-core or 4-core cable 3-phase a.c.		
1	2	3			4		
mm²	mV/A/m	mV/A/m			mV/A/m		
1	44		44			38	
1.5	29		29			25	
2.5	18		18			15	
4	11		11			9.5	
6	7.3		7.3			6.4	
10	4.4		4.4			3.8	
16	2.8		2.8			2.4	
		r	x	z	r	x	z
25	1.75	1.75	0.170	1.75	1.50	0.145	1.50
35	1.25	1.25	0.165	1.25	1.10	0.145	1.10
50	0.93	0.93	0.165	0.94	0.80	0.140	0.81
70	0.63	0.63	0.160	0.65	0.55	0.140	0.57
95	0.46	0.47	0.155	0.50	0.41	0.135	0.43
120	0.36	0.38	0.155	0.41	0.33	0.135	0.35
150	0.29	0.30	0.155	0.34	0.26	0.130	0.29
185	0.23	0.25	0.150	0.29	0.21	0.130	0.25
240	0.180	0.190	0.150	0.24	0.165	0.130	0.21
300	0.145	0.155	0.145	0.21	0.135	0.130	0.185
400	0.105	0.115	0.145	0.185	0.100	0.125	0.160

Note : r = conductor resistance at operating temperature, x = reactance, z = impedance

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Table 8 : Current-Carrying Capacities (Amp) [CU/PVC/PVC/SWA/PVC Cables]

Conductor Operating Temperature : 70°C
Ambient Temperature : 30°C

IEC 60502-1 (BS6346)

Conductor cross-sectional area	Reference Method 1 (clipped direct)		Reference Method 11 (on a perforated horizontal cable tray or Reference Method 13 [free air])		Direct in ground		In single way ducts	
	one 2-core cable single-phase a.c. or d.c.	one 3-core or 4-core cable 3-phase a.c.	one 2-core cable single-phase a.c. or d.c.	one 3-core or 4-core cable 3-phase a.c.	2-core	3-core or 4-core	2-core	3-core or 4-core
1	2	3	4	5	6	7	8	9
mm²	A	A	A	A	A	A	A	A
1.5	21	18	22	19	32	27	26	22
2.5	28	25	31	26	41	35	34	29
4	38	33	41	35	55	47	45	38
6	49	42	53	45	69	59	57	48
10	67	58	72	62	92	78	76	64
16	89	77	97	83	119	101	98	83
25	118	102	128	110	158	132	129	107
35	145	125	157	135	190	159	154	126
50	175	151	190	163	225	188	183	153
70	222	192	241	207	277	233	225	190
95	269	231	291	251	332	279	271	228
120	310	267	336	290	377	317	309	260
150	356	306	386	332	422	355	346	292
185	405	348	439	378	478	401	393	331
240	476	409	516	445	551	462	455	382
300	547	469	592	510	616	517	510	428
400	621	540	683	590	693	580	574	490

Note : For rating factors of ambient temperature other than 30°C please refer to Table 25
For rating factors of group temperature other than 15°C please refer to Table 30
For group rating factors please refer to Table 27

Table 9 : Voltage Drop (Per Amp Per Meter) [CU/PVC/PVC/SWA/PVC Cables]

Conductor Operating Temperature : 70°C
Ambient Temperature : 30°C

IEC 60502-1 (BS6346)

Conductor cross-sectional area	2-core cable a.c.	2-core cable single-phase a.c.			3-core or 4-core cable 3-phase a.c.			Direct in ground		In single way ducts	
								2-core	3-core or 4-core	2-core	3-core or 4-core
1	2	3			4			5	6	7	8
mm²	mV/A/m	mV/A/m			mV/A/m			mV/A/m	mV/A/m	mV/A/m	mV/A/m
1.5	29		29			25		29	25	29	25
2.5	18		18			15		18	15	18	15
4	11		11			9.5		11	9.5	11	9.5
6	7.3		7.3			6.4		7.4	6.4	7.4	6.4
10	4.4		4.4			3.8		4.4	3.8	4.4	3.8
16	2.8		2.8			2.4		2.8	2.4	2.8	2.4
		r	x	z	r	x	z				
25	1.75	1.75	0.17	1.75	1.5	0.145	1.5	1.7	1.5	1.7	1.5
35	1.25	1.25	0.165	1.25	1.1	0.145	1.1	1.3	1.1	1.3	1.1
50	0.93	0.93	0.165	0.94	0.8	0.14	0.81	0.94	0.82	0.94	0.82
70	0.63	0.63	0.16	0.65	0.55	0.14	0.57	0.66	0.57	0.66	0.57
95	0.46	0.47	0.155	0.5	0.41	0.135	0.43	0.49	0.42	0.49	0.42
120	0.36	0.38	0.155	0.41	0.33	0.135	0.35	0.4	0.35	0.40	0.35
150	0.29	0.30	0.155	0.34	0.26	0.13	0.29	0.34	0.29	0.34	0.29
185	0.23	0.25	0.15	0.29	0.21	0.13	0.25	0.29	0.25	0.29	0.25
240	0.18	0.19	0.15	0.24	0.165	0.13	0.21	0.24	0.21	0.24	0.21
300	0.145	0.155	0.145	0.21	0.135	0.13	0.185	0.21	0.18	0.21	0.18
400	0.105	0.115	0.145	0.185	0.1	0.125	0.16	0.19	0.17	0.19	0.17

Note : r = conductor resistance at operating temperature, x = reactance, z = impedance

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Flexible Cables with PVC Insulation, or PVC Insulation & PVC Outersheath.

Table 10 : Technical Data Flexible Cord, Imperial Sizes (CU/PVC or CU/PVC/PVC Cables)

Conductor Operating Temperature : 70°C
Ambient Temperature : 30°C

BS 2004

Conductor		Current Rating	Voltage Drop per 100 feet		Maximum Weight supportable by twin flexible cord
Nominal Area	Construction	1 or 3 phase a.c. or d.c.	d.c. or 1 phase a.c.	3 phase a.c.	
1	2	3	4	5	6
in^2	No. / in	Amp	V	V	lb
0.0006	14 / 0.0076	3	8.9	7.7	3
0.0010	23 / 0.0076	6	11	9.4	5
0.0017	40 / 0.0076	13	14	12	10
0.0030	70 / 0.0076	18	12	10	10
0.0048	110 / 0.0076	24	9.6	8.3	10
0.0070	162 / 0.0076	31	8.4	7.3	10

Note : For rating factor of ambient temperature other than 30°C please refer to Table 25

Table 11 : Technical Data Flexible Cord, Metrics Sizes (CU/PVC or CU/PVC/PVC Cables)

Conductor Operating Temperature : 70°C
Ambient Temperature : 30°C

BS 6500

Conductor		Current Rating	Voltage Drop per 100 feet		Maximum Weight supportable by twin flexible cord
Nominal Area	Construction	1 or 3 phase a.c. or d.c.	d.c. or 1 phase a.c.	3 phase a.c.	
1	2	3	4	5	6
mm^2	No. / mm	Amp	mV/m	mV/m	Kg
0.50	16 / 0.2	3	83	72	2
0.75	24 / 0.2	6	56	48	3
1.00	32 / 0.2	10	43	37	5
1.25	40 / 0.2	13	35	29	5
1.50	30 / 0.25	16	31	26	5
2.50	50 / 0.25	25	18	16	5
4.00	56 / 0.30	32	11	10	5

Note : For rating factor of ambient temperature other than 30°C please refer to Table 25

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Single-Core Cables with XLPE (or LSZH) Insulation, with or without PVC (or LSZH) Outersheath 450/750V or 600/1000V

Table 12 : Current-Carrying Capacities (Amp)
[CU/LSZH, CU/XLPE/PVC, CU/XLPE/LSZH, CU/MICA/LSZH or CU/MICA/XLPE/LSZH Cables]

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

BS EN 50525-3-41 (BS 7211)
IEC60502-1

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 (free air)		
									Horizontal flat spaced	Vertical flat spaced	Trefoil
	2 cables, single-phase a.c. or d.c.	3 or 4 cables, 3-phase a.c.	2 cables, single-phase a.c. or d.c	3 or 4 cables, 3-phase a.c.	2 cables, single-phase a.c. or d.c. flat and touching	3 or 4 cables, 3-phase a.c. flat and touching or trefoil	2 cables, single-phase a.c. or d.c. or flat and touching	3 or 4 cables, 3-phase a.c. flat and touching or trefoil	2 cables, single-phase a.c. or d.c. or 3 cables three phase	2 cables, single-phase a.c. or d.c. or 3 cables three phase	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	125	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	-	-	684	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	1580	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 27
For rating factors of ground temperature other than 15°C please refer to Table 30

Table 13 : Voltage Drop (Per Amp Per Meter)
[CU/LSZH, CU/XLPE/PVC, CU/XLPE/LSZH, CU/MICA/LSZH or CU/MICA/XLPE/LSZH Cables]

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

BS EN 50525-3-41 (BS 7211)
IEC60502-1

Size of Conductor	2 cables d.c.	2 cables, single-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 (in 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	7.8		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	1.600	0.165	1.600	1.600	0.190	1.600
35	1.35	1.35	0.29	1.35	1.35	0.180	1.35	1.15	0.25	1.15	1.150	0.155	1.150	1.150	0.180	1.150
50	0.99	1.00	0.29	1.05	0.99	0.180	1.00	0.87	0.25	0.90	0.860	0.155	0.870	0.860	0.180	0.870
70	0.68	0.70	0.28	0.75	0.68	0.175	0.71	0.60	0.24	0.65	0.590	0.150	0.610	0.590	0.175	0.620
95	0.49	0.51	0.27	0.58	0.49	0.170	0.52	0.44	0.23	0.50	0.430	0.145	0.450	0.430	0.170	0.460
120	0.39	0.41	0.26	0.48	0.39	0.165	0.43	0.35	0.23	0.42	0.340	0.140	0.370	0.340	0.165	0.380
150	0.32	0.33	0.26	0.43	0.32	0.165	0.36	0.29	0.23	0.37	0.280	0.140	0.310	0.280	0.165	0.320
185	0.25	0.27	0.26	0.37	0.26	0.165	0.30	0.23	0.23	0.32	0.220	0.140	0.260	0.220	0.165	0.280
240	0.19	0.21	0.26	0.33	0.20	0.160	0.25	0.185	0.22	0.29	0.170	0.140	0.220	0.170	0.165	0.240
300	0.155	0.175	0.25	0.31	0.16	0.160	0.22	0.150	0.22	0.27	0.140	0.140	0.195	0.135	0.160	0.210
400	0.12	0.140	0.25	0.29	0.13	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	0.10	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 = conductor resistance at operating temperature, x = reactance, z = impedance

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Table 14 : Current-Carrying Capacities (Amp)
[CU/XLPE/PVC/AWA/PVC, CU/XLPE/LSZH/AWA/LSZH, CU/MICA/XLPE/LSZH/AWA/LSZH Cables]

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

BS 6724
IEC60502-1

Conductor cross-sectional area	Reference Method 1 (clipped direct)		Reference Method 11 (on perforated cable tray)		Reference Method 12 (free air)	In single-way ducts		Laid direct in ground	
	2 cables single-phase a.c. or d.c. flat and touching	3 or 4 cables 3-phase a.c. flat and touching	2 cables single-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 single-phase a.c. or d.c. ducts touching	3 cables 3-phase a.c. trefoil touching	2 cables single-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
mm²	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 27
For rating factors of ground temperature other than 15°C please refer to Table 30

Table 15 : Voltage Drop (Per Amp Per Meter)
[CU/XLPE/PVC/AWA/PVC, CU/XLPE/LSZH/AWA/LSZH, CU/MICA/XLPE/LSZH/AWA/LSZH Cables]

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

BS 6724
IEC60502-1

Conductor cross-sectional area	2 cables d.c.	2 cables single-phase a.c.			3 or 4 cables three-phase a.c.						2 cables single-phase a.c.		3 or 4 cables, 3-phase a.c. touching	
		Reference Method 1 & 11 (touching)			Reference Method 1, 11 & 12 (in 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
mm²	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	0.86	0.18	0.87	0.84	0.25	0.88	1.10	0.99	0.93	0.86
70	0.67	0.68	0.20	0.71	0.59	0.17	0.62	0.6	0.25	0.65	0.80	0.70	0.70	0.61
95	0.49	0.51	0.195	0.55	0.44	0.17	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	0.18	0.155	0.24	0.21	0.22	0.30	0.40	0.26	0.35	0.23
300	0.155	0.17	0.175	0.25	0.145	0.150	0.21	0.17	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 = conductor resistance at operating temperature
x = reactance
z = impedance

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Table 16 : Current-Carrying Capacities (Amp) [CU/XLPE/PVC, CU/XLPE/LSZH or CU/MICA/XLPE/LSZH Cables]

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

IEC60502-1

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 (free air)	
	one 3-core cable or one 4-core cable 3-phase a.c.	one 2-core cable single-phase a.c. or d.c.	one 3-core cable or one 4-core cable 3-phase a.c.	one 2-core cable single-phase a.c. or d.c.	one 3-core cable or one 4-core cable 3-phase a.c.	one 2-core cable single-phase a.c. or d.c.	one 3-core cable or one 4-core cable 3-phase a.c.
1	2	3	4	5	6	7	8
mm²	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	-	625	536	803	667	865	741

Note : For rating factors of ambient temperature other than 30°C please refer to Table 27
For rating factors of ground temperature other than 15°C please refer to Table 30

Table 17 : Voltage Drop (Per Amp Per Meter) [CU/XLPE/PVC, CU/XLPE/LSZH or CU/MICA/XLPE/LSZH Cables]

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

IEC60502-1

Conductor cross-sectional area	2-core cable d.c.	2-core cable single-phase a.c.			3-core or 4-core cable 3-phase a.c.		
1	2	3			4		
mm²	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	0.20	0.140	0.24	0.175	0.125	0.21
300	0.155	0.16	0.140	0.21	0.140	0.120	0.185
400	0.120	0.13	0.140	0.19	0.115	0.120	0.165

Note : r = conductor resistance at operating temperature
x = reactance
z = impedance

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Table 18 : Current-Carrying Capacities (Amp)
[CU/XLPE/PVC/SWA/PVC, CU/XLPE/LSZH/SWA/LSZH, CU/MICA/XLPE/LSZH/SWA/LSZH Cables]

Conductor Operating Temperature : 90°C — BS 6724
Ambient Temperature : 30°C — IEC60502-1

Conductor cross-sectional area	Reference Method 1 (clipped direct)		Reference Method 11 (on a perforated horizontal cable tray or Reference Method 13 [free air])		In single-way ducts		Laid direct in ground	
	one 2-core cable single-phase a.c. or d.c.	one 3-core or 4-core cable 3-phase a.c.	one 2-core cable single-phase a.c. or d.c.	one 3-core or 4-core cable 3-phase a.c.	one 2-core cable single-phase a.c. or d.c.	one 3-core or 4-core cable 3-phase a.c.	one 2-core cable single-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
mm²	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 27
For rating factors of ground temperature other than 15°C please refer to Table 30

Table 19 : Voltage Drop (Per Amp Per Meter)
[CU/XLPE/PVC/SWA/PVC, CU/XLPE/LSZH/SWA/LSZH, CU/MICA/XLPE/LSZH/SWA/LSZH Cables]

Conductor Operating Temperature : 90°C — BS 6724
Ambient Temperature : 30°C — IEC60502-1

Conductor cross-sectional area	2-core cable d.c.	2 cables, single-phase a.c.			3 or 4 cables, 3-phase a.c.			2 cables, single-phase a.c.	3 or 4 cables, 3-phase a.c.
								In ducts or in ground	In ducts or in ground
1	2	3			4			5	6
mm²	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 = conductor resistance at operating temperature
x = reactance
z = impedance

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Table 20 : Current-Carrying Capacities (Amp)
[CU/RUBBER/POLYCHLOROPRENE Cables]

Conductor Operating Temperature : 60°C — BS 6007
Ambient Temperature : 30°C — BS 7919

Conductor cross-sectional area	Single-Phase a.c. or d.c.	Three-Phase a.c.	Single-Phase a.c. or d.c.
	one 2-core cable	one 3-core, 4-core, or 5-core cable	two single-core cables
1	2	3	4
mm²	A	A	A
0.5	3	3	-
0.75	6	6	-
1	10	10	-
1.25	13	-	-
1.5	16	16	-
2.5	25	20	-
4	30	26	-
6	39	34	-
10	51	47	-
16	73	63	-
25	97	83	-
35	-	102	140
50	-	124	175
70	-	158	216
95	-	192	258
120	-	222	302
150	-	255	347
185	-	291	394
240	-	343	471
300	-	394	541
400	-	-	644
500	-	-	738
630	-	-	861

Note : For rating factors of ambient temperature other than 30°C please refer to Table 28

Table 21 : Voltage Drop (Per Amp Per Meter)
[CU/RUBBER/POLYCHLOROPRENE Cables]

Conductor Operating Temperature : 60°C — BS 6007
Ambient Temperature : 30°C — BS 7919

Conductor cross-sectional area	2-core cable d.c.	2-core cable, single-phase a.c.			one 3-core, 4-core or 5-core cables, 3-phase a.c.			2 single-core cables, touching			
								d.c.	Single-phase a.c.		
1	2	3			4			5	6		
mm²	mV/A/m	mV/A/m			mV/A/m			mV/A/m	mV/A/m		
0.5	93	93			80			-	-		
0.75	62	62			54			-	-		
1	46	46			40			-	-		
1.25	37	37			-			-	-		
1.5	32	32			27			-	-		
2.5	19	19			16			-	-		
4	12	12			10			-	-		
6	7.8	7.8			6.7			-	-		
10	4.6	4.6			4.0			-	-		
16	2.9	2.9			2.5			-	-		
		r	x	z	r	x	z		r	x	z
25	1.8	1.8	0.175	1.85	1.55	0.150	1.55	-		-	
35	-		-		1.10	0.150	1.15	1.31	1.31	0.21	1.32
50	-		-		0.83	0.145	0.84	0.91	0.91	0.21	0.93
70	-		-		0.57	0.140	0.58	0.64	0.64	0.20	0.67
95	-		-		0.42	0.135	0.44	0.49	0.49	0.195	0.53
120	-		-		0.33	0.135	0.36	0.38	0.38	0.190	0.43
150	-		-		0.27	0.130	0.30	0.31	0.31	0.190	0.36
185	-		-		0.22	0.130	0.30	0.25	0.25	0.190	0.32
240	-		-		0.170	0.130	0.21	0.190	0.195	0.185	0.27
300	-		-		0.135	0.125	0.185	0.150	0.155	0.180	0.24
400	-		-			-		0.115	0.120	0.175	0.21
500	-		-			-		0.090	0.099	0.170	0.20
630	-		-			-		0.068	0.079	0.170	0.185

Note : r = conductor resistance at operating temperature
x = reactance
z = impedance

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Table 22 : Current-Carrying Capacities (Amp)
[CU/RUBBER/POLYCHLOROPRENE Cables]

Conductor Operating Temperature : 90°C — BS 6883
Ambient Temperature : 30°C — BS 7919

Conductor cross-sectional area	Single-Phase a.c. or d.c.	Three-Phase a.c.	Single-Phase a.c. or d.c.
	one 2-core cable	one 3-core, 4-core, or 5-core cable	two single-core cables
1	2	3	4
mm²	A	A	A
4	42	37	-
6	55	49	-
10	76	66	-
16	103	89	-
25	136	119	-
35	-	146	200
50	-	177	250
70	-	225	310
95	-	273	369
120	-	316	432
150	-	363	497
185	-	414	564
240	-	487	773
300	-	560	-
400	-	-	924
500	-	-	1062
630	-	-	1242

Note : For rating factors of ambient temperature other than 30°C please refer to Table 29

Table 23 : Voltage Drop (Per Amp Per Meter)
[CU/RUBBER/POLYCHLOROPRENE Cables]

Conductor Operating Temperature : 90°C — BS 6883
Ambient Temperature : 30°C — BS 7919

Conductor cross-sectional area	2-core cable d.c.	2-core cable, single-phase a.c.			one 3-core, 4-core or 5-core cables, 3-phase a.c.			2 single-core cables, touching Single-phase a.c.		
1	2	3			4			6		
mm²	mV/A/m	mV/A/m			mV/A/m			mV/A/m		
4	13.2		13.2			11.1			-	
6	8.5		8.5			7.4			-	
10	5.1		5.1			4.4			-	
16	3.2		3.2			2.7			-	
		r	x	z	r	x	z	r	x	z
25	2.03	2.03	0.175	2.04	1.73	0.15	1.73	-	-	-
35	-		-		1.22	0.15	1.23	1.44	0.21	1.46
50	-		-		0.91	0.145	0.93	1.00	0.21	1.02
70	-		-		0.62	0.14	0.64	0.71	0.20	0.73
95	-		-		0.47	0.135	0.49	0.54	0.195	0.57
120	-		-		0.37	0.135	0.39	0.42	0.190	0.46
150	-		-		0.29	0.130	0.32	0.34	0.190	0.39
185	-		-		0.24	0.130	0.27	0.27	0.190	0.33
240	-		-		0.188	0.130	0.23	0.21	0.185	0.28
300	-		-		0.147	0.125	0.195	0.173	0.180	0.25
400	-		-			-		0.132	0.175	0.22
500	-		-			-		0.107	0.170	0.20
630	-		-			-		0.085	0.170	0.190

Note : r = conductor resistance at operating temperature
x = reactance
z = impedance

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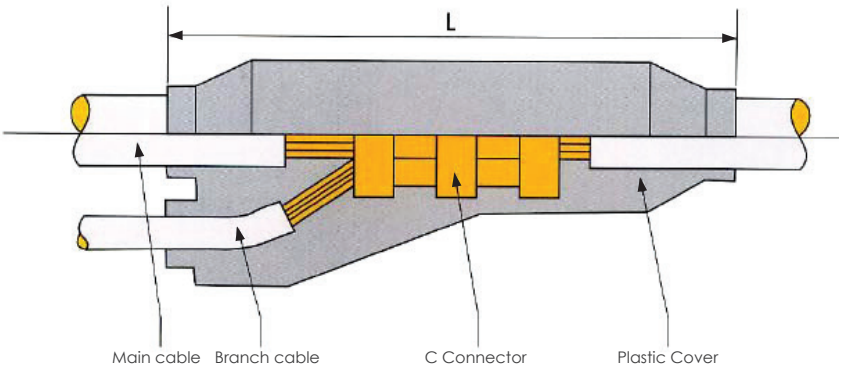
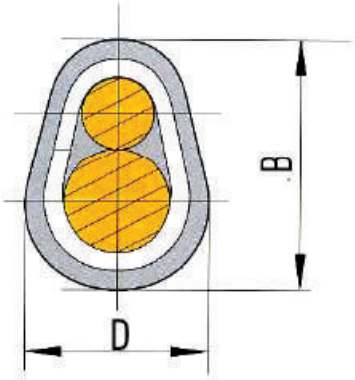
Table 24 : Prefabricated Branch Cables Size Reference

Main Cable	sqmm²	25	35	50	70	70	95	120	95	120	150	185	240	185	240	300	400	400	500	630	800	1000
Branch Cable	sqmm²	6 to 25	6 to 35	6 to 50	6 to 25	35 to 70	6 to 50	6 to 25	70 to 95	35 to 120	6 to 120	6 to 95	6 to 35	120	50 to 120	60 to 150	6 to 50	70 to 150	6 to 185	6 to 185	6 to 185	6 to 185
Reference Size	L	104		130		154			190					213				250			290	
	D	28		35		42			52					66				78			88	
	B	46		58		70			86					100				113			134	





Inspection and Testing:	• Each connection made between the main and branch cable employs a copper "C" type connector and is encapsulated in thermoplastic • Insulation Resistance value of the system is measured over 200MΩ at the factory • Cable with connectors can withstand dielectric voltage of 3.5kV for 5 minutes under one meter water pressure • The DC conductor resistance ratio between the connected cable system and the cables with same length is less than 1.2 • Able to withstand 250 Heat Cycle Test • Cable system meets flame retardant requirement to IEC 60332

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Table 25 : Rating Factors for Other Air Temperatures (PVC Insulated)

Ambient Temperature	25°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
Rating Factors	1.03	1.00	0.94	0.87	0.79	0.71	0.61	0.50	0.35	-

Table 26 : Rating Factors for Other Ground Temperatures (PVC Insulated)

Ground Temperature	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C
Rating Factors	1.04	1.00	0.95	0.90	0.85	0.80	0.74	0.67	0.60

Table 27 : Rating Factors for Other Ambient Air Temperatures (XLPE or LSZH Insulated)

Ambient Temperature	25°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C
Rating Factors	1.04	1.00	0.95	0.90	0.85	0.79	0.73	0.67

Table 28 : Rating Factors for Other Ambient Air Temperatures (60°C thermoplastic or thermosetting insulated cords)

Ambient Temperature	35°C	40°C	45°C	50°C	55°C
Rating Factors	0.91	0.82	0.71	0.58	0.41

Table 29 : Rating Factors for Other Ambient Air Temperatures (90°C thermoplastic or thermosetting insulated cords)

Ambient Temperature	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C	75°C	80°C	85°C
Rating Factors	0.95	0.91	0.86	0.82	0.76	0.70	0.64	0.57	0.50	0.40	0.28

Table 30 : Rating Factors for Other Ground Temperatures (XLPE or LSZH Insulated)

Ground Temperature	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C
Rating Factors	1.00	0.97	0.93	0.89	0.86	0.82	0.77	0.73

Table 31 : Rating Factors for Other Air Temperatures

Ambient Temperature	30°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
PVC Cords, non-heat resisting	1.00	0.96	0.92	0.87	0.71	0.61	0.50		
PVC Cords, heat resisting					1	0.96	0.83	0.67	0.47

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Table 32 : Conductor Resistance Temperature Correction Factors

Temperature (°C)	Factor	Temperature (°C)	Factor
10	0.961	25	1.020
11	0.965	30	1.039
12	0.969	35	1.059
13	0.972	40	1.079
14	0.976	45	1.098
15	0.980	50	1.118
16	0.984	55	1.138
17	0.988	60	1.157
18	0.992	65	1.177
19	0.996	70	1.196
20	1.000	75	1.216
21	1.004	80	1.236
22	1.008	85	1.255
23	1.012	90	1.275
24	1.016		

Table 33 : 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, vertical or horizontal (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 diameter (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.

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Table 34 : Correction Factors for Cables Installed in Enclosed Trenches

Conductor cross-sectional area	Correction factor									
	Installation Method 18				Installation Method 19			Installation Method 20		
	2 single-core cables or 1 three-core or 4-core cables	3 single-core cables, or two 2-core cables	4 single-core cables, or 2 three-core or 4-core cables	6 single-core cables, 4 two-core cables, or 3 three-core or 4-core cables	6 single-core cables, 4 two-core cables, or 3 three-core or 4-core cables	8 single-core cables, or 4 three-core or 4-core cables	12 single-core cables, 8 two-core cables, or 6 three-core or 4-core cables	12 single-core cables, 8 2-core cables, or 6 three-core or 4-core cables	18 single-core cables, 12 2-core cables, or 9 three-core or 4-core cables	24 single-core cables, 16 2-core cables, or 12 three-core or 4-core cables
1	2	3	4	5	6	7	8	9	10	11
mm^2										
4	0.93	0.90	0.87	0.82	0.86	0.83	0.76	0.81	0.74	0.69
6	0.92	0.89	0.86	0.81	0.86	0.82	0.75	0.80	0.73	0.68
10	0.91	0.88	0.85	0.80	0.85	0.80	0.74	0.78	0.72	0.66
16	0.91	0.87	0.84	0.78	0.83	0.78	0.71	0.76	0.70	0.64
25	0.90	0.86	0.82	0.76	0.81	0.76	0.69	0.74	0.67	0.62
35	0.89	0.85	0.81	0.75	0.80	0.74	0.68	0.72	0.66	0.60
50	0.88	0.84	0.79	0.74	0.78	0.73	0.66	0.71	0.64	0.59
70	0.87	0.82	0.78	0.72	0.77	0.72	0.64	0.70	0.62	0.57
95	0.86	0.81	0.76	0.70	0.75	0.70	0.63	0.68	0.60	0.55
120	0.85	0.80	0.75	0.69	0.73	0.68	0.61	0.66	0.58	0.53
150	0.84	0.78	0.74	0.67	0.72	0.67	0.59	0.64	0.57	0.51
185	0.83	0.77	0.73	0.65	0.70	0.65	0.58	0.63	0.55	0.49
240	0.82	0.76	0.71	0.63	0.69	0.63	0.56	0.61	0.53	0.48
300	0.81	0.74	0.69	0.62	0.68	0.62	0.54	0.59	0.52	0.46
400	0.80	0.73	0.67	0.59	0.66	0.60	0.52	0.57	0.50	0.44
500	0.78	0.72	0.66	0.58	0.64	0.58	0.51	0.56	0.48	0.43
630	0.77	0.71	0.65	0.56	0.63	0.57	0.49	0.54	0.47	0.41

Note: For rating factor of ambient temperature other than 30°C please refer to Table 25

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Table 35 : Short - Circuit Ratings for One Second for PVC/XLPE or LSZH Insulated Cables with Copper Conductor

Serial Number	Nominal Area of Conductor	Short Circuit Rating (KA)	
no.	mm^2	XLPE/LSZH Insulated Cables	PVC Insulated Cables
1.	1.5	0.2145	0.1725
2.	2.5	0.3575	0.2875
3.	4	0.5720	0.4600
4.	6	0.8580	0.6900
5.	10	1.4300	1.1500
6.	16	2.2880	1.8400
7.	25	3.5750	2.8750
8.	35	5.0050	4.0250
9.	50	7.1500	5.7500
10.	70	10.0100	8.0500
11.	95	13.5850	10.9250
12.	120	17.1600	13.8000
13.	150	21.4500	17.2500
14.	185	26.4550	21.2750
15.	240	34.3200	27.2750
16.	300	42.9000	34.5000
17.	400	57.2000	46.0000
18.	500	71.5000	57.5000
19.	630	90.0900	72.4500
20.	800	114.4000	92.0000
21.	1000	143.0000	115.0000

The above rating is calculated using the following formula:-

XLPE / LSZH Insulated Cables	PVC Insulated Cables
$I = \frac{0.143\,S}{\sqrt{T}}\,KA$	$I = \frac{0.115\,S}{\sqrt{T}}\,KA$

Where I = short circuit rating (KA)
S = conductor area (sq mm)
T = duration of short circuit (sec)

Basic conditions for circuit calculation :
The conductor temperature prior to short circuit is assumed to be 90°C (XLPE/LSZH) or 70°C (PVC) and short circuit temperature is 250°C (XLPE/LSZH) or 160°C / 140°C* (PVC). Above ratings are based on fault duration (symmetrical short circuit) of one second.

* Above $300mm^2$
For other periods, divide the above tabulated values by the square root of the time in seconds.

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Selection of Cables Based on Voltage Drops and Current-Carrying Capacity

Voltage drop is normally only of importance for cables of voltage rating not exceeding 600/1000V. If the voltage drop is to be in compliance with CP5/IEE wiring regulations, then the voltage drop for any particular cable run must be such that the total voltage drop in the circuit of which the cable forms a part does not exceed 4% of the nominal voltage (i.e. 9.2V for a single phase 230V supply and 16.6V for a three phase 415V supply).

Since the actual power factor of the load is usually not known, the most practical approach to calculate the voltage drop is to assume the worst conditions (i.e. power factor equal to one and the conductor is at maximum operating temperature). The voltage drop values given in the tables are based on these assumptions and tabulated for a current of 1 amp for a 1 metre run (i.e. for a distance of 1 metre along the route taken by the cables), and represent the result of the voltage drops in all the circuit conductors. For balance three phase a.c. circuits, the values relate to the line voltage. For any given run, the values need to be multiplied by the length of the run (metres) and by the current (amps) that the cables carry.

Voltage drop can be calculated using the following formulas :

1. V_{max} = 4% x supply voltage

2. $V_d = \dfrac{V_{max} \times 1000}{I \times L}$

3. $V_{ds} \leq V_d$

4. $V_t = \dfrac{V_{ds} \times I \times L}{1000}$

Where
I = Current (A)
L = Length of cable installed (m)
V_{max} = Max. permissible volt drop in the circuit (V)

V_d = Max. volt drop in the circuit (mV/A/m)
V_{ds} = Volt drop of the selected cable (mV/A/m)
V_t = Total volt drop in the circuit (V)

Example :

Consider a route of 200 metres of cable to be laid direct in ground and carries a 100 amp load, the supply voltage is 415V, three phase a.c. and the cable structure is copper conductor, XLPE insulated armoured.

1. V_{max} = Max. permissible voltage drop in the circuit = 4% x 415V = 16.6V
2. V_d = Max. voltage drop in the circuit = 16.6 x 1000 / (100 x 200) = 0.83 mV/A/m
3. Select a cable from Table 19, such that the V^{ds} is equal to, or less than Vd the 0.83mV/A/m calculated. It will be seen that this value (V^{ds}) is 0.61mV/A/m giving a cable size of 70mm^2.
4. V_t = Total voltage drop in the circuit = 0.61 x 100 x 200 / 1000 = 12.2V

Selection of Cable Exposed to Fire Condition Based on Conductor Resistance

Conductor resistance of cable increases suddenly when the cable is subjected to fire conditions and conductor resistance at 750°C becomes 3.87 times that of the one at 20°C.
(For other temperatures, refer to Table 26)

Correspondingly, the voltage drop is also increased by 3.87 times.

To select the size of cable exposed to fire conditions, calculate R_0 using the formula shown below and select the size of cable based on the value shown in pg 40 which should not exceed R_0 calculated by the formula.

$$R_0 \leq \frac{V_{max}}{KI} \times \frac{1}{L\,[1 + (F-1)\frac{L_1}{L}]} \times 10^3 \quad (\Omega / km)$$

Where
R_0 = Conductor resistance at 20°C (Ω / km)
V_{max} = Max. permissible voltage drop in the circuit (V)
K = Factor according to the wiring

Single phase 2-core, $K = 2$

Three phase 3-core, $K = \sqrt{3}$

I = Current (A)
L = Lengh of cable installed (m)
L_1 = Lengh of cable subjected to flame (m)
F = Correction factor (Table 27)

Table 36 : Minimum Bending Radius

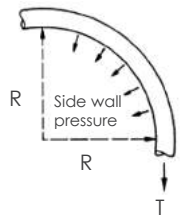
To install the cables safely without damaging the electrical and physical properties of the cables, the tabulated minimum bending radius must be observed.

Type of Product	Construction	Overall Diam. (mm)		Minimum Bending Radius	
		Single-Core	Multi-Core	Single-Core	Multi-Core
PVC Insulated Power / Control Cables	Unarmoured for fixed wiring	D ≥ 25	D ≥ 25	3D	4D
		D > 25	D > 25	6D	6D
	Unamoured / Armoured	Any		6D	
XLPE (or LSZH) Insulated Power/ Control Cables	Unamoured	Any		8D	
	Armoured	Any		8D	
Fire Resistant Cables	Stranded Circular	Any		8D	
	Stranded Shape	Any		10D	
Fire Resistant Cables	Any	Any		10D	
Armoured Cables					

Note : D means the overall diameter of cable (mm)

Side Wall Pressure to Cable

Permissible maximum side wall pressure to the cable at bending point during installation is 500 Kg f/m



$$\text{Side Wall Pressure to Cable} = \frac{\text{Pulling Tension (Kgf)}}{\text{Bending Radius (m)}}$$

$$= \frac{T}{R}$$

Table 37 : Permissible Maximum Pulling Tension (T)

Conductor	Max. Pulling Tension (Kgf)
Copper	7 x No. of cores x Norminal Area of Conductor

Drum Handing

Handle the drums with care.

It is always recommended and a must with heavy drums -

- To lift drums with a fork-lift truck or a crane when removing them from the vehicle.
- Always lower the drums into an upright position on their flanges.

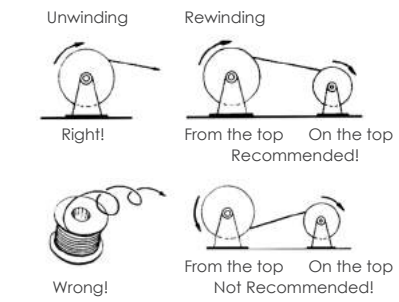


Table 38 : Wire Gauge Conversion

Conductor Size	Cross-section Area	
AWG	(mm^2)	Nearest Available mm^2
20	0.519	0.50
18	0.823	1.00
16	1.31	1.50
14	2.08	2.50
12	3.31	4.00
10	5.26	6.00
8	8.37	10.00
6	13.3	16.00
4	21.15	25.00
2	33.62	35.00
1	42.41	50.00
1/0	53.49	70.00
2/0	67.23	70.00
3/0	85.01	95.00
4/0	107.2	120.00

Conductor Size	Cross-section Area	
MCM	(mm^2)	Nearest Available mm^2
250	126.70	120-150
300	152.00	150
350	177.30	185
400	202.70	185
450	228.00	185-240
500	253.40	240
550	278.80	240-300
600	304.00	300
650	329.40	300
700	354.70	300-400
750	380.00	400
800	405.40	400
850	430.70	400
900	456.00	400
950	481.40	400
1000	506.70	500-630
1250	633.40	630
1500	760.00	800
1750	886.70	800-1000
2000	1013.40	1000

Note : AWG - America Wire Gauge

MCM is an abbreviation for thousands of circular mills, an old measurement of wire gauge

1MCM = 1 kcmil = 0.5067 square millimeters

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