

PRODUCT CATALOGUE



**KEI**

Wires and Cables  
The power behind the power™

KEI Industries Limited is a leading player in the power cable segment and is one of the most respected cable manufacturing companies in India. KEI manufactures high and low tension cables (EHV, HT & LT), control and instrumentation cables, house wires and stainless steel wires. It is one of the select companies in the country to manufacture speciality cables including braided cables, fire survival, Zero halogen cables, Shipwiring cables and Flexible mining cables.

Established in 1968, KEI has built up its leadership position over a period of five decades with a customer-focused approach and a continuous quest for world-class quality. Supported by an efficient marketing and distribution network KEI has a reputation for strong customer support. KEI also has a substantial international presence with a global spread of clients spreading across 35 countries.



An ISO 9001:2000 certified company; KEI carries out stringent quality control measures under surveillance of a competent team of technocrats and quality enablers. Continuous Product Innovations and cutting-edge R&D at KEI's in-house labs is what contributes towards constant evolution in our offerings and services. All KEI's cables and wires are of a superior quality, a reason why they have been accredited and certified by Testing Agencies across the globe.



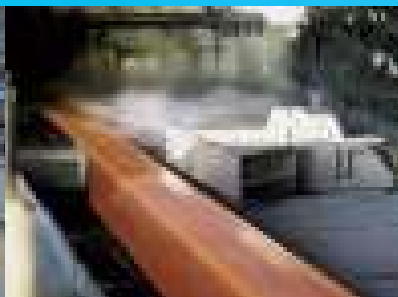
## MANUFACTURING FACILITIES

A large infrastructure, spread over an area of 86,000 sq metres across three strategically located units, supported by state-of-the-art production line-ups, gives KEI the strength to meet the varied needs of it's wide client base. No wonder KEI caters to over 100 large Indian companies covering almost all the industrial sectors.









## CLIENTS AND SECTORS

### MINING

- SECL
- WCL
- ECL
- Hindustan Zinc
- Marble Industries
- Birla Copper

### FERTILIZERS

- National Fertilizers Ltd
- Indo Gulf Fertilizers
- Indian Farmers & Fertilizers Corporation
- Gujrat State Fertilizers Co-operative Corporation
- Chambal Fertilizers
- Deepak Fertilizers
- Zuari Agro
- Rashtriya Chemicals and Fertilizers
- Tata Chemicals
- Hindustan Fertilizers Co. Ltd.

### TELECOMMUNICATION

- Bharat Sanchar Nigam
- Basic Operators and Telecom Networking Engineers
- Cyprus Telecommunication
- Spice Telecom
- Marconi
- Secure Meters
- Reliance Infocomm
- Defence

### INTERNATIONAL EPCS

- ABB
- Mcdermott
- VA Tech Hydro and VA Tech Flowel
- SIEMENS
- Mitsui
- Doosan
- SAMSUNG
- Itochu
- Hyundai
- LG
- Punj Llyods
- EIL
- TOYO
- BHEL
- Bechtel
- TECHNIP
- Larsen and Toubro
- TICB
- PETROFAC
- Skanska
- Alstom / Areva
- Briggs and Burton

### GLOBAL SUPPLIES

- Ireland Blyth Ltd., Mauritius
- 400 KV Switchyard Project Stage-1
- Industrial Pumps, Philippines
- Rey and Lenferna Ltd., Mauritius
- Baji Iraq
- BK Overseas, Uganda
- Bahri and Mazroei Trading Co., U.A.E
- Gulf Incon Doha, Qatar
- Joba Trading
- Abu Dhabi Commercial Corporation, U.A.E
- Oman Cable Industry, Muscat, Oman

- Min. of Electricity and Water, Bahrain
- Ministry of Finance, Dubai
- J Ray McDermott East Inc., Dubai
- Kuwait National Petroleum Corporation
- Cyprus Telecom. Authority, Nicosia, Cyprus
- Modern Electrical, Trinidad
- Kahrama, Qatar
- Al Hamas
- Innovative Technologies, Dubai
- Qatar Petroleum
- SEWA, Sharjah
- Systems Building, Mauritius
- Sohar Aluminium, Dubai
- FEWA
- PPC Ltd., Canada

### PRIVATE PROJECTS

- IBM
- DELL
- Inox Multiplex
- Hotel Taj
- Biocon
- MICROSOFT
- ITC
- ICICI
- Asian Paints
- TCS
- CENTURY-DOMAIN
- Infosys software
- HSBC
- Jet Airways
- Balakrishna Tyres
- MOSER BAER
- Ranbaxy
- HDFC
- Sahara
- Godfrey Philips
- SAMTEL
- PVR Multiplex
- Citi Bank
- Mind Space
- Kala Academy

### OIL AND GAS

- Oil and Natural Gas Commission
- Gas Authority of India
- Oil india Limited
- SHELL
- PETRONET

### CEMENT

- ACC
- RAS Cement
- Gujrat Ambuja
- ARM
- Jai Prakash Industries
- TCIL - TORO
- Binani Cement
- TATA Cement
- Birla Corporation
- Lafarge
- Larsen and Toubro
- Jabel Ali Cement
- Nigeria Cement
- Benue Cement

### FERROUS AND NON FERROUS METALS

- HINDALCO
- Hindustan Zinc
- Steel Authority of India Ltd.
- NALCO
- Essar
- BALCO
- Jindal
- Monnet Ispat
- TATA
- EBG India
- Sponge Iron Plants

### REFINERIES AND PETROCHEMICALS

- Indian Oil Corporation Ltd
- Bongaigaon Refineries Ltd
- Bharat Petroleum Corporation Ltd.
- Haldia Petrochemicals Ltd
- Indian Petrochemicals Ltd.
- CPCL, Chennai
- Kochi Refineries Ltd.
- MRPL, Mangalore
- National Aluminium Co. Ltd.
- Carin Energy
- Hindustan Petroleum Co. Ltd.
- Reliance
- Numaligarh Refineries Ltd.

### POWER AND TRANSMISSION /DOMESTIC

- TATA Power
- BSES Limited
- Gujarat State Energy Corporation
- Essar Power
- Nuclear Power Corporation
- National Thermal Power Co.
- Indian Railway State Electricity Boards
- Jindal Power
- DMRC
- CPWD/PWD
- CEB Mauritius
- Ahmedabad Electricity Co. Ltd.
- Crompton and Greaves
- Power Grid Corporation
- Surat Electricity Co.Ltd.
- JSPL
- ENRON
- Karnataka Power Co. Ltd.
- JVSL
- NDPL
- GEB
- BESCOM
- MSEB
- GOA Board





## PRODUCT RANGE

KEI provides a very wide range of products to its customers. The company is perhaps one of the few to offer customers specialty cables such as fire survival cables, zero halogen cables and braided cables. All wires are manufactured as per global quality and customer specifications.

- **EHV Cable Range - upto & including 132 kv**
- **Low Voltage copper/aluminium Cables**
- **Low Voltage PVC and XPLE Control Cables**
- **Thermocouple Compensating & Extension Cables**
- **FRLS / FR / HR / HFFR / HOFR / Rubber / LDPE / LSOH Power Control & Instrumentation Cables**
- **Flexible (Single & Multicore) and Cords**
- **Housewires (FR / FRLS / HRPVC / LSOH')**
- **Fire Survival**
- **Welding Cables/Rubber Cables**
- **Flat Cable**
- **Mining Cable (UNDERGROUND & OPEN CAST)**
- **Ship Wiring Cables**
- **Aerial Bunched Cables (AB Cables)**
- **Bare Conductors**

& MORE AS PER CUSTOMER SPECIFICATIONS  
IN BS, VDE, IEC, IS AND SABS STANDARDS  
(UPTO AND INCLUDING 132KV)

## MV XLPE INSULATED ARMoured CABLES

### Application

Power cables for medium voltage (upto 33KV) are used in – outdoor cable ducts, cable trays, conduits or underground locations under mechanical stresses in power and switching stations, local distribution systems and industrial plants

### Standards. BS 6622 & IEC 60502-2

Operating temperature	90°C
Short circuit temperature	250°C
Cable range manufactured	19/33 KV Screened Cables (33 KV Earth) 12.7/22 KV Screened Cables (22 KV Earth) 11/11 KV i.e. 11 KV (UE) Screened Cables 6.6/6.6 KV Screened Cables [6.6 KV (UE) & 11 KV (E)] 3.8/6.6 KV Screened Cables 3.3 KV (E) and (UE) Unscreened / Screened Cables
Sizes	50 Sq.mm to 1000 Sq.mm in Single Core Cables 25 Sq.mm to 400 Sq.mm in Multi Cores Cables

### Test Voltage

Rated Voltage	Test Voltage (for 5 min.)
U <sub>0</sub> KV	RMS
3.8	11
6.35	15
8.7	22
12.7	30
19	45

### CONSTRUCTION

**Conductor** Aluminium / Annealed Plain Copper Stranded compacted circular conductor conform to BS 6360 and IEC 60228, class 2

**Conductor Screening** Semi-Conducting layer over conductor

**Insulation** Cross linked Polyethylene to (XLPE)

**Insulation Screening** Semi-Conducting layer over insulation, in combination with Copper tape.

**Core colour** Single Core – Natural  
Multi Core – Numbered or colour polyester tapes applied over Copper tapes

**Bedding** Extruded PVC

**Armour** Single Core - Non-magnetic (Aluminium) wire / Flat wire Multi core - Galvanised steel wire / Flat wire / Tape

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



## Cables Constructions

### IEC 60502-2 3/6.6 KV Single Core Alu. Wire Armoured

Nominal cross sectional area <b>mm<sup>2</sup></b>	Nominal thickness of insulation <b>mm</b>	Approx. thickness of bedding <b>mm</b>	Nominal Alu. armour wire diameter <b>mm</b>	Nominal Thickness of PVC outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. Cu. cable weight <b>Kg/Km</b>	Approx. Alu. cable weight <b>Kg/Km</b>
50	2.5	0.9	1.6	1.8	25	1020	717
70	2.5	0.9	1.6	1.8	27	1247	827
95	2.5	1.0	1.6	1.8	29	1530	974
120	2.5	1.0	1.6	1.9	31	1832	1119
150	2.5	1.0	1.6	1.9	32	2112	1214
185	2.5	1.1	1.6	2.0	34	2504	1408
240	2.6	1.1	2.0	2.1	38	3171	1751
300	2.8	1.2	2.0	2.2	41	3828	2054
400	3.0	1.2	2.0	2.3	44	4846	2443
500	3.2	1.3	2.5	2.5	49	6031	3064
630	3.2	1.4	2.5	2.6	53	7351	3653
800	3.2	1.5	2.5	2.8	58	9082	4397
1000	3.2	1.6	2.5	2.9	64	11095	5261

### IEC 60502-2 6/10 KV Single Core Alu. Wire Armoured

50	3.4	1.0	1.6	1.8	27	1121	819
70	3.4	1.0	1.6	1.8	29	1348	928
95	3.4	1.0	1.6	1.9	31	1639	1084
120	3.4	1.0	1.6	1.9	33	1934	1221
150	3.4	1.1	1.6	2.0	35	2312	1413
185	3.4	1.1	2.0	2.0	37	2692	1596
240	3.4	1.1	2.0	2.1	39	3277	1858
300	3.4	1.2	2.0	2.2	42	3909	2135
400	3.4	1.2	2.0	2.3	45	4907	2504
500	3.4	1.3	2.5	2.5	49	6079	3112
630	3.4	1.4	2.5	2.6	53	7403	3705
800	3.4	1.5	2.5	2.8	58	9139	4454
1000	3.4	1.6	2.5	3.0	64	11188	5354

### IEC 60502-2 8.7/15 KV Single Core Alu. Wire Armoured

50	4.5	1.0	1.6	1.8	30	1257	955
70	4.5	1.0	1.6	1.9	31	1495	1075
95	4.5	1.1	1.6	1.9	33	1796	1241
120	4.5	1.1	2.0	2.0	36	2107	1394
150	4.5	1.1	2.0	2.1	36	2412	1513
185	4.5	1.1	2.0	2.1	39	2809	1713
240	4.5	1.2	2.0	2.2	42	3473	2054
300	4.5	1.2	2.0	2.3	44	4115	2341
400	4.5	1.3	2.5	2.4	49	5299	2896
500	4.5	1.4	2.5	2.6	52	6366	3399
630	4.5	1.4	2.5	2.7	56	7688	3990
800	4.5	1.5	2.5	2.8	61	9421	4737
1000	4.5	1.6	2.5	3.0	67	11495	5661



# Cables Constructions

## IEC 60502-2 12/20 KV Single Core Alu. Wire Armoured

Nominal cross sectional area <b>mm<sup>2</sup></b>	Nominal thickness of insulation <b>mm</b>	Approx. thickness of bedding <b>mm</b>	Nominal Alu. armour wire diameter <b>mm</b>	Nominal Thickness of PVC outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. Cu cable weight <b>Kg/Km</b>	Approx. Alu. cable weight <b>Kg/Km</b>
50	5.5	1.0	1.6	1.9	32	1382	1080
70	5.5	1.1	1.6	2.0	35	1731	1312
95	5.5	1.1	2.0	2.0	36	2023	1468
120	5.5	1.1	2.0	2.1	39	2357	1643
150	5.5	1.2	2.0	2.1	40	2662	1764
185	5.5	1.2	2.0	2.2	42	3076	1980
240	5.5	1.2	2.0	2.3	44	3685	2266
300	5.5	1.3	2.0	2.3	48	4442	2668
400	5.5	1.3	2.5	2.5	51	5497	3095
500	5.5	1.4	2.5	2.6	54	6566	3598
630	5.5	1.5	2.5	2.8	59	7948	4250
800	5.5	1.6	2.5	2.9	63	9703	5018
1000	5.5	1.7	2.5	3.1	69	11785	5951

## IEC 60502-2 18/30 KV Single Core Alu. Wire Armoured

50	8.0	1.1	2.0	2.1	39	1839	1536
70	8.0	1.2	2.0	2.2	41	2131	1711
95	8.0	1.2	2.0	2.2	43	2440	1885
120	8.0	1.2	2.0	2.3	45	2794	2080
150	8.0	1.3	2.0	2.3	47	3239	2340
185	8.0	1.3	2.5	2.4	49	3672	2576
240	8.0	1.3	2.5	2.5	51	4322	2902
300	8.0	1.4	2.5	2.6	54	5000	3226
400	8.0	1.4	2.5	2.7	57	6062	3659
500	8.0	1.5	2.5	2.8	60	7164	4197
630	8.0	1.6	2.5	2.9	65	8558	4859
800	8.0	1.7	2.5	3.1	69	10384	5699
1000	8.0	1.8	2.5	3.3	75	12522	6688



## Cables Constructions

### IEC 60502-2 3.6/6 KV Three Core Flat Strip Armoured

Nominal cross sectional area <b>mm<sup>2</sup></b>	Nominal thickness of insulation <b>mm</b>	Approx. thickness of bedding <b>mm</b>	Nominal Dimension G.I.Flat Strip. <b>mm</b>	Nominal Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. Copper cable weight <b>Kg/Km</b>	Approx. Alu. cable weight <b>Kg/Km</b>
35	2.5	1.2	4 X 0.8	2.2	42	2790	2168
50	2.5	1.2	4 X 0.8	2.3	44	3365	2455
70	2.5	1.4	4 X 0.8	2.4	48	4108	2850
95	2.5	1.4	4 X 0.8	2.5	52	5049	3359
120	2.5	1.4	4 X 0.8	2.6	57	6037	3903
150	2.5	1.6	4 X 0.8	2.7	59	6984	4294
185	2.5	1.6	4 X 0.8	2.9	63	8230	4941
240	2.6	1.6	4 X 0.8	3.0	69	10237	5987
300	2.8	1.8	4 X 0.8	3.2	75	12361	7050
400	3.0	1.8	4 X 0.8	3.5	83	15632	8438

### IEC 60502-2 6/10 KV Three Core Flat Strip Armoured

35	3.4	1.4	4 X 0.8	2.3	46	3186	2564
50	3.4	1.4	4 X 0.8	2.4	48	3709	2799
70	3.4	1.4	4 X 0.8	2.6	52	4526	3269
95	3.4	1.4	4 X 0.8	2.7	56	5495	3804
120	3.4	1.6	4 X 0.8	2.8	61	6566	4431
150	3.4	1.6	4 X 0.8	2.9	63	7451	4762
185	3.4	1.6	4 X 0.8	3.0	67	8720	5431
240	3.4	1.6	4 X 0.8	3.2	73	10632	6383
300	3.4	1.8	4 X 0.8	3.3	78	12646	7336
400	3.4	1.8	4 X 0.8	3.5	85	15951	8757

### IEC 60502-2 8.7/15 KV Three Core Flat Strip Armoured

50	4.5	1.4	4 X 0.8	2.6	54	4184	3275
70	4.5	1.6	4 X 0.8	2.7	58	5080	3822
95	4.5	1.6	4 X 0.8	2.8	62	6058	4367
120	4.5	1.6	4 X 0.8	2.9	66	7134	5001
150	4.5	1.6	4 X 0.8	3.0	68	8027	5338
185	4.5	1.6	4 X 0.8	3.2	73	9362	6073
240	4.5	1.8	4 X 0.8	3.3	78	11348	7099
300	4.5	1.8	4 X 0.8	3.5	83	13369	8059
400	4.5	1.8	4 X 0.8	3.7	90	16707	9513

### IEC 60502-2 12/20 KV Three Core Flat Strip Armoured

50	5.5	1.6	4 X 0.8	2.8	59	4717	3807
70	5.5	1.6	4 X 0.8	2.9	62	5593	4336
95	5.5	1.6	4 X 0.8	3.0	66	6601	4910
120	5.5	1.6	4 X 0.8	3.1	71	7711	5577
150	5.5	1.6	4 X 0.8	3.2	73	8614	5925
185	5.5	1.8	4 X 0.8	3.3	77	10016	6727
240	5.5	1.8	4 X 0.8	3.5	83	12011	7762
300	5.5	1.8	4 X 0.8	3.6	88	14028	8718
400	5.5	1.8	4 X 0.8	3.9	95	17457	10263

### IEC 60502-2 18/30 KV Three Core Flat Strip Armoured

50	8.0	1.6	4 X 0.8	3.1	71	6181	5272
70	8.0	1.8	4 X 0.8	3.2	75	7176	5919
95	8.0	1.8	4 X 0.8	3.4	79	8322	6632
120	8.0	1.8	4 X 0.8	3.5	84	9501	7367
150	8.0	1.8	4 X 0.8	3.6	86	10433	7743
185	8.0	1.8	4 X 0.8	3.7	90	11852	8563
240	8.0	1.8	4 X 0.8	3.9	96	13952	9704
300	8.0	2.0	4 X 0.8	4.0	101	16145	10835
400	8.0	2.0	4 X 0.8	4.2	107	19534	12340

## Cables Constructions

### IEC 60502-2 3.6/6 KV Three Core RWA Cable

Nominal cross sectional area <b>mm<sup>2</sup></b>	Nominal thickness of insulation <b>mm</b>	Approx. thickness of bedding <b>mm</b>	Nominal G.I. Armour wire diameter <b>mm</b>	Nominal Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. Copper cable weight <b>Kg/Km</b>	Approx. Alu. cable weight <b>Kg/Km</b>
35	2.5	1.2	2.0	2.3	45	3457	2835
50	2.5	1.2	2.5	2.4	48	4425	3515
70	2.5	1.4	2.5	2.5	52	5270	4013
95	2.5	1.4	2.5	2.7	56	6314	4624
120	2.5	1.4	2.5	2.8	60	7419	5285
150	2.5	1.6	2.5	2.9	63	8395	5706
185	2.5	1.6	2.5	3.0	67	9753	6464
240	2.6	1.6	2.5	3.2	73	11933	7685
300	2.8	1.8	3.15	3.4	80	14957	9647
400	3.0	1.8	3.15	3.7	88	18529	11336

### IEC 60502-2 6/10 KV Three Core RWA Cable

35	3.4	1.4	2.5	2.4	49	4271	3649
50	3.4	1.4	2.5	2.5	51	4758	3849
70	3.4	1.4	2.5	2.7	55	5677	4419
95	3.4	1.4	2.5	2.8	59	6757	5067
120	3.4	1.6	2.5	2.9	64	7936	5801
150	3.4	1.6	2.5	3.0	66	8871	6181
185	3.4	1.6	2.5	3.1	70	10214	6925
240	3.4	1.6	3.15	3.3	77	13045	8797
300	3.4	1.8	3.15	3.5	82	15257	9946
400	3.4	1.8	3.15	3.7	89	18796	11603

### IEC 60502-8.7/15 KV Three Core RWA Cable

50	4.5	1.4	2.5	2.7	57	5475	4565
70	4.5	1.6	2.5	2.8	61	6448	5190
95	4.5	1.6	2.5	3.0	65	7557	5866
120	4.5	1.6	2.5	3.1	70	8728	6594
150	4.5	1.6	2.5	3.2	72	9673	6983
185	4.5	1.6	3.15	3.3	77	11852	8563
240	4.5	1.8	3.15	3.5	84	14074	9825
300	4.5	1.8	3.15	3.6	88	16225	10914
400	4.5	1.8	3.15	3.9	95	19864	12670

### IEC 60502- 12/20 KV Three Core RWA Cable

50	5.5	1.6	2.5	2.9	62	6125	5215
70	5.5	1.6	2.5	3.0	66	7079	5821
95	5.5	1.6	2.5	3.1	70	8188	6497
120	5.5	1.6	2.5	3.2	75	9389	7254
150	5.5	1.6	3.15	3.4	78	11139	8449
185	5.5	1.8	3.15	3.5	83	12706	9417
240	5.5	1.8	3.15	3.6	88	14866	10618
300	5.5	1.8	3.15	3.8	93	17090	11780
400	5.5	1.8	3.15	4.0	100	20740	13545

### IEC 60502- 18/30 KV Three Core RWA Cable

50	8.0	1.6	2.5	3.3	75	7892	6982
70	8.0	1.8	3.15	3.4	80	9795	8536
95	8.0	1.8	3.15	3.5	84	11071	9381
120	8.0	1.8	3.15	3.6	89	12416	10282
150	8.0	1.8	3.15	3.7	90	13384	10695
185	8.0	1.8	3.15	3.9	95	15011	11722
240	8.0	1.8	3.15	4.0	101	17212	12963
300	8.0	2.0	3.15	4.2	106	19675	14364
400	8.0	2.0	3.15	4.4	113	23302	16109

## Cables Constructions

### BS6622 3.8/6.6 KV Single Core CU/ XLPE/Alu. Wire / PVC

Nominal cross sectional area <b>mm<sup>2</sup></b>	Nominal thickness of insulation <b>mm</b>	Minimum thickness of bedding <b>mm</b>	Nominal armour wire diameter <b>mm</b>	Min. Thickness of PVC outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. cable weight <b>Kg/Km</b>	Max.DC Resistance at 20°C <b>Ohm/Km</b>
50	2.5	0.76	1.6	1.24	24.2	1090	0.387
70	2.5	0.76	1.6	1.24	25.8	1340	0.268
95	2.5	0.76	1.6	1.32	27.7	1660	0.193
120	2.5	0.76	1.6	1.32	29.8	1970	0.153
150	2.5	0.76	1.6	1.40	30.7	2260	0.124
185	2.5	0.76	2.0	1.40	33.4	2760	0.0991
240	2.6	0.76	2.0	1.48	36.4	3430	0.0754
300	2.8	0.76	2.0	1.56	39.0	4130	0.0601
400	3.0	0.76	2.0	1.64	42.6	5080	0.0470
500	3.2	0.84	2.5	1.80	47.7	6490	0.0366
630	3.2	0.92	2.5	1.88	51.5	8030	0.0283
800	3.2	0.92	2.5	1.96	56.1	9930	0.0221
1000	3.2	1.00	2.5	2.12	61.9	12200	0.0176

### 6.35/11KV Single Core CU/ XLPE/Alu. Wire / PVC

50	3.4	0.76	1.6	1.24	26.2	1200	0.387
70	3.4	0.76	1.6	1.32	28.0	1470	0.268
95	3.4	0.76	1.6	1.32	29.7	1780	0.193
120	3.4	0.76	1.6	1.40	32.0	2110	0.153
150	3.4	0.76	2.0	1.48	33.7	2500	0.124
185	3.4	0.76	2.0	1.48	35.6	2920	0.0991
240	3.4	0.76	2.0	1.56	38.3	3580	0.0754
300	3.4	0.76	2.0	1.56	40.3	4230	0.0601
400	3.4	0.76	2.0	1.72	43.7	5180	0.0470
500	3.4	0.84	2.5	1.80	48.1	6530	0.0366
630	3.4	0.92	2.5	1.88	51.9	8080	0.0283
800	3.4	0.92	2.5	1.96	56.5	9970	0.0221
1000	3.4	1.0	2.5	2.12	62.3	12250	0.0176

### 8.7/15 KV Single Core CU/ XLPE/Alu. Wire / PVC

50	4.5	0.76	1.6	1.32	28.9	1360	0.387
70	4.5	0.76	1.6	1.32	30.5	1620	0.268
95	4.5	0.76	2.0	1.40	33.2	2050	0.193
120	4.5	0.76	2.0	1.48	35.5	2390	0.153
150	4.5	0.76	2.0	1.48	36.2	2680	0.124
185	4.5	0.76	2.0	1.56	38.3	3130	0.0991
240	4.5	0.76	2.0	1.64	41.0	3800	0.0754
300	4.5	0.76	2.0	1.64	43.0	4470	0.0601
400	4.5	0.84	2.5	1.80	47.6	5610	0.0470
500	4.5	0.84	2.5	1.88	50.6	6780	0.0366
630	4.5	0.92	2.5	1.96	54.6	8370	0.0283
800	4.5	1.00	2.5	2.04	59.4	10310	0.0221
1000	4.5	1.08	2.5	2.20	65.2	12630	0.0176

### 12.7/22 KV Single Core CU/ XLPE/Alu. Wire / PVC

50	5.5	0.76	1.60	1.40	32.1	1570	0.387
70	5.5	0.76	2.00	1.40	34.5	1940	0.268
95	5.5	0.76	2.00	1.48	36.4	2290	0.193
120	5.5	0.76	2.00	1.48	38.5	2630	0.153
150	5.5	0.76	2.00	1.56	39.4	2950	0.124
185	5.5	0.76	2.00	1.56	41.3	3390	0.0991
240	5.5	0.76	2.00	1.64	44.0	4070	0.0754
300	5.5	0.84	2.50	1.72	47.4	4940	0.0601
400	5.5	0.84	2.50	1.80	50.6	5920	0.0470
500	5.5	0.92	2.50	1.88	53.8	7130	0.0366
630	5.5	0.92	2.50	2.04	57.8	8740	0.0283
800	5.5	1.00	2.50	2.12	62.6	10720	0.0221
1000	5.5	1.08	2.50	2.20	68.2	13040	0.0176

## MV XLPE Insulated Armoured Cables

### 19/33 KV Single Core CU/ XLPE/Alu. Wire / PVC

Nominal cross sectional area <b>mm<sup>2</sup></b>	Nominal thickness of insulation <b>mm</b>	Minimum Thickness of bedding <b>mm</b>	Nominal armour wire diameter <b>mm</b>	Min. Thickness of PVC outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. cable weight <b>Kg/Km</b>	Max.DC Resistance at 20°C <b>Ohm/Km</b>
50	8.0	0.76	2.0	1.56	38.7	2100	0.387
70	8.0	0.76	2.0	1.56	40.3	2390	0.268
95	8.0	0.76	2.0	1.64	42.2	2770	0.193
120	8.0	0.76	2.0	1.64	44.3	3130	0.153
150	8.0	0.84	2.5	1.72	46.4	3630	0.124
185	8.0	0.84	2.5	1.80	48.5	4110	0.0991
240	8.0	0.84	2.5	1.80	51.0	4810	0.0754
300	8.0	0.92	2.5	1.88	53.2	5540	0.0601
400	8.0	0.92	2.5	1.96	56.4	6560	0.0470
500	8.0	1.00	2.5	2.04	59.8	7830	0.0366
630	8.0	1.00	2.5	2.12	63.6	9460	0.0283
800	8.0	1.08	2.5	2.28	68.6	11520	0.0221
1000	8.0	1.16	2.5	2.36	74.2	13900	0.0176

### 3.8/6.6 KV THREE CORE CU/ XLPE/ SWA / PVC

25	2.5	0.76	2.0	1.56	40.2	3330	0.727
35	2.5	0.76	2.0	1.64	42.5	3850	0.524
50	2.5	0.84	2.5	1.80	46.5	4900	0.387
70	2.5	0.84	2.5	1.88	50.2	5880	0.268
95	2.5	0.92	2.5	1.96	54.2	7090	0.193
120	2.5	1.00	2.5	2.04	59.2	8360	0.153
150	2.5	1.00	2.5	2.12	60.9	9300	0.124
185	2.5	1.08	2.5	2.20	65.4	10900	0.0991
240	2.6	1.16	2.5	2.36	72.0	13430	0.0754
300	2.8	1.24	3.15	2.60	79.3	16950	0.0601
400	3.0	1.40	3.15	2.76	87.5	20480	0.0470

### 6.35/11 KV THREE CORE CU/ XLPE/ SWA / PVC

25	3.4	0.84	2.5	1.72	46.1	4330	0.727
35	3.4	0.84	2.5	1.80	48.4	4880	0.524
50	3.4	0.92	2.5	1.88	51.2	5540	0.387
70	3.4	0.92	2.5	1.96	54.9	6550	0.268
95	3.4	1.00	2.5	2.04	58.9	7800	0.193
120	3.4	1.08	2.5	2.20	64.1	9150	0.153
150	3.4	1.08	2.5	2.28	65.8	10100	0.124
185	3.4	1.16	2.5	2.36	70.3	11700	0.0991
240	3.4	1.24	3.15	2.52	77.6	15020	0.0754
300	3.4	1.32	3.15	2.68	82.5	17010	0.0601
400	3.4	1.40	3.15	2.84	89.6	21040	0.0470

### 8.7/15 KV THREE CORE CU/ XLPE/ SWA / PVC

25	4.5	0.92	2.5	1.88	52.1	5200	0.727
35	4.5	0.92	2.5	1.96	54.4	5690	0.524
50	4.5	1.00	2.5	2.04	57.2	6470	0.387
70	4.5	1.00	2.5	2.12	60.9	7420	0.268
95	4.5	1.08	2.5	2.20	64.9	8720	0.193
120	4.5	1.16	2.5	2.28	69.9	10080	0.153
150	4.5	1.16	2.5	2.36	71.6	11170	0.124
185	4.5	1.24	3.15	2.52	77.6	13660	0.0991
240	4.5	1.32	3.15	2.68	83.6	16360	0.0754
300	4.5	1.40	3.15	2.76	88.3	18870	0.0601
400	4.5	1.48	3.15	3.00	95.6	22290	0.0470

## Cables Constructions

### 12.7/22 KV Three Core CU/ XLPE/SWA/ PVC

Nominal cross sectional area <b>mm<sup>2</sup></b>	Nominal thickness of insulation <b>mm</b>	Minimum Thickness of bedding <b>mm</b>	Nominal armour wire diameter <b>mm</b>	Min. Thickness of PVC outer sheath <b>mm</b>	Approx. over all diameter <b>mm</b>	Approx. cable weight <b>Kg/Km</b>	Max.DC Resistance at 20°C <b>Ohm/Km</b>
35	5.5	1.00	2.50	2.04	60.9	6440	0.524
50	5.5	1.00	2.50	2.12	63.5	7150	0.387
70	5.5	1.08	2.50	2.20	67.3	8280	0.268
95	5.5	1.16	2.50	2.36	71.6	9630	0.193
120	5.5	1.16	3.15	2.44	77.6	11930	0.153
150	5.5	1.24	3.15	2.52	79.5	12930	0.124
185	5.5	1.32	3.15	2.68	84.2	14750	0.0991
240	5.5	1.40	3.15	2.76	90.0	17210	0.0754
300	5.5	1.40	3.15	2.92	94.8	19720	0.0601
400	5.5	1.56	3.15	3.08	102.0	23140	0.0470

### 19/33 KV Three Core CU/ XLPE/ SWA / PVC

50	8.0	1.24	3.15	2.52	78.5	10730	0.387
70	8.0	1.24	3.15	2.60	82.1	11870	0.268
95	8.0	1.32	3.15	2.68	86.2	13380	0.193
120	8.0	1.40	3.15	2.76	91.1	14940	0.153
150	8.0	1.40	3.15	2.84	92.8	16170	0.124
185	8.0	1.48	3.15	2.92	97.3	18050	0.0991
240	8.0	1.56	3.15	3.08	103.3	20810	0.0754
300	8.0	1.64	3.15	3.24	108.3	23480	0.0601
400	8.0	1.72	3.15	3.40	115.3	27150	0.0470



Impulse Testing Lab

Conductor Technical Data for single Core and Multicore cables conforming to IEC 60228 (Stranded-Class-2) Aluminium Conductors and annealed copper conductors, stranded circular, compacted circular or shaped

Nominal size of Conductor <b>mm<sup>2</sup></b>	Short Circuit Rating (ISC) for XLPE cables		Max. D.C. Resistance at 20°C		Max. A.C. Resistance at 90°C	
	Copper	Aluminium	Plain Copper	Aluminium	Plain Copper	Aluminium
	<b>KA/sec</b>	<b>KA/sec</b>	<b>Ω/Km</b>	<b>Ω/Km</b>	<b>Ω/Km</b>	<b>Ω/Km</b>
1.5	0.21	-	12.200	-	15.430	-
2.5	0.36	-	7.410	-	9.450	-
4.0	0.57	0.38	4.610	7.410	5.880	9.480
6.0	0.85	0.56	3.080	4.610	3.930	5.900
10	1.42	0.94	1.830	3.080	2.330	3.490
16	2.27	1.50	1.150	1.910	1.470	2.420
25	3.60	2.40	0.727	1.200	0.930	1.540
35	5.00	3.30	0.524	0.868	0.671	1.110
50	7.10	4.70	0.387	0.641	0.495	0.820
70	10.0	6.60	0.268	0.443	0.343	0.567
95	13.6	9.00	0.193	0.320	0.247	0.410
120	17.1	11.3	0.153	0.253	0.196	0.324
150	21.4	14.2	0.124	0.206	0.159	0.264
185	26.4	17.5	0.0991	0.164	0.127	0.210
240	34.3	22.6	0.0754	0.125	0.0965	0.160
300	42.9	28.3	0.0601	0.100	0.0769	0.130
400	57.1	37.7	0.0470	0.0778	0.0602	0.100
500	71.4	47.2	0.0366	0.0605	0.0468	0.0774
630	90.0	59.4	0.0283	0.0469	0.0362	0.0600
800	114.3	75.5	0.0221	0.0367	0.0283	0.0470
1000	142.9	94.3	0.0176	0.0291	0.0225	0.0372

**Short Circuit Current Ratings for XLPE Cables**

Short Circuit Rating for I second duration for Copper and Aluminium XLPE Cables (Isc Current in KAmps)

**Ratings for any other duration :**

- 1) Max. Initial Conductor Temperature during operation : 90°C
  - 2) Max. Final Conductor Temperature during short circuit : 250°C
- Formula relating short Circuit Rating with t second duration

$$1t = 1sc / \sqrt{t}$$

Where 1t = Short Circuit Rating for t seconds.

t = Duration in seconds.

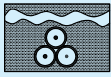
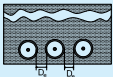
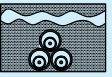
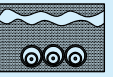


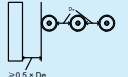
1sc = Short Circuit rating for 1 second.

Emergency overload : Cable may operate under overload conditions. Under such condition conductor temperature not to exceed 130°C for maximum 100 hours per year and not more that 500 hours during lifetime of cable. This is approximately 20% higher than specified rated current during the emergency period.



# Current ratings for single core cable with XLPE insulation


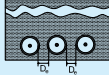

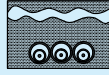


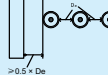
## Rated Voltage 3.6/6 KV to 18/30 KV Copper Conductor

Nominal area of conductor	Buried direct in the ground 20° C		In single-way ducts 20° C		In Air 30° C		
	Trefoil	Flat spaced	Trefoil Ducts	Flat touching ducts	Trefoil	Flat touching	Flat spaced
							
mm <sup>2</sup>	A	A	A	A	A	A	A
16	109	113	103	104	125	128	150
25	140	144	132	133	163	167	196
35	166	172	157	159	198	203	238
50	196	203	186	188	238	243	286
70	239	246	227	229	296	303	356
95	285	293	271	274	361	369	434
120	323	332	308	311	417	426	500
150	361	366	343	347	473	481	559
185	406	410	387	391	543	550	637
240	469	470	447	453	641	647	745
300	526	524	504	510	735	739	846
400	590	572	564	571	845	837	938
500	650	710	-	-	950	-	1090
630	730	790	-	-	1070	-	1260
800	820	910	-	-	1200	-	1410
1000	930	1030	-	-	1360	-	1610

Maximum conductor temperature 90°C  
 Ambient air temperature 30°C  
 Ground temperature 20°C  
 Depth of playing 0.8 m  
 Thermal resistivity of soil 1.5 K.m/W  
 Thermal resistivity of earthenware ducts 1.2 k.m/W  
 Screens bonded at both ends.









## Current ratings for single-core cables with XLPE insulation-rated voltage 3.6/6 KV to 18/30 KV Aluminium conductor

Nominal area of conductor	Buried direct in the ground 20° C		In single-way ducts 20° C		In Air 30° C		
	Trefoil	Flat spaced	Trefoil Ducts	Flat touching ducts	Trefoil	Flat touching	Flat spaced
							
mm <sup>2</sup>	A	A	A	A	A	A	A
16	84	88	80	81	97	99	116
25	108	112	102	103	127	130	153
35	129	134	122	123	154	157	185
50	152	157	144	146	184	189	222
70	186	192	176	178	230	236	278
95	221	229	210	213	280	287	338
120	252	260	240	242	324	332	391
150	281	288	267	271	368	376	440
185	317	324	303	307	424	432	504
240	367	373	351	356	502	511	593
300	414	419	397	402	577	586	677
400	470	466	451	457	673	676	769
500	520	560	-	-	660	-	760
630	590	640	-	-	740	-	850
800	670	720	-	-	840	-	960
1000	750	800	-	-	950	-	1100







Maximum conductor temperature 90°C  
 Ambient air temperature 30°C  
 Ground temperature 20°C  
 Depth of playing 0.8 m  
 Thermal resistivity of soil 1.5 K.m/W  
 Thermal resistivity of earthenware ducts 1.2 k.m/W  
 Screens bonded at both ends.

## Current ratings for three-core cables with XLPE insulation-rated voltage 3.6/6 KV to 18/30 KV Copper conductor Armoured and Unarmoured

Nominal area of conductor	Unarmoured			Armoured		
	Buried Direct in ground 20° C	In a Buried duct 20° C	In Air 30° C	Buried Direct in ground 20° C	In a Buried duct 20° C	In Air 30° C
						
mm <sup>2</sup>	A	A	A	A	A	A
16	101	87	109	101	88	110
25	129	112	142	129	112	143
35	153	133	170	154	134	172
50	181	158	204	181	158	205
70	221	193	253	220	194	253
95	262	231	304	263	232	307
120	298	264	351	298	264	352
150	334	297	398	332	296	397
185	377	336	455	374	335	453
240	434	390	531	431	387	529
300	489	441	606	482	435	599
400	553	501	696	541	492	683

Maximum conductor temperature 90°C  
 Ambient air temperature 30°C  
 Ground temperature 20°C  
 Depth of playing 0.8 m  
 Thermal resistivity of soil 1.5 K.m/W  
 Thermal resistivity of earthenware ducts 1.2 k.m/W  
 Screens bonded at both ends.

## Current ratings for three core XLPE insulated cables rated voltage 3.6/6 KV. to 18/30 KV Aluminium conductor, Armoured and Unarmoured

Nominal area of conductor	Unarmoured			Armoured		
	Buried Direct in ground 20° C	In a Buried duct 20° C	In Air 30° C	Buried Direct in ground 20° C	In a Buried duct 20° C	In Air 30° C
						
mm <sup>2</sup>	A	A	A	A	A	A
16	78	67	84	78	68	85
25	100	87	110	100	87	111
35	119	103	132	119	104	133
50	140	122	158	140	123	159
70	171	150	196	171	150	196
95	203	179	236	204	180	238
120	232	205	273	232	206	274
150	260	231	309	259	231	309
185	294	262	355	293	262	354
240	340	305	415	338	304	415
300	384	346	475	380	343	472
400	438	398	552	432	393	545

Maximum conductor temperature 90°C  
 Ambient air temperature 30°C  
 Ground temperature 20°C  
 Depth of playing 0.8 m  
 Thermal resistivity of soil 1.5 K.m/W  
 Thermal resistivity of earthenware ducts 1.2 k.m/W  
 Screens bonded at both ends.



## XLPE INSULATED ARMoured CABLES

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

Standards	BS 5467, IEC 60502-1 & VDE 0276
Operating Temperature	90° C
Short Circuit Temp.	250° C
Working Voltage	600 / 1000 Volts
Test Voltage	3.5 KV r m s for 5 minutes

### CONSTRUCTION

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

**Insulation** Cross linked polyethylene (XLPE)

Core Colour	
Single core	Red or Black
2 Core	Red , Black
3 Core	Red , Yellow , Blue
4 Core	Red , Yellow, Blue, Black
5 Core	Red , Yellow, Blue, Black & Yellow - Green
6 Core & above	Black colour with number printing

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

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

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

**Bedding** Extruded PVC compatible with operating temperature

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

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

**Minimum Bending radius** 12 times the cable diameter

**Admissible Pulling Force** Aluminium - 30N/mm<sup>2</sup> Copper - 50N/mm<sup>2</sup>



Note : Unarmoured cables construction details available upon request.

\*Aluminium - upto 10 mm<sup>2</sup> Copper - upto 6 mm<sup>2</sup>

\*\*Modification which serve to improve our products will be implemented without notice.

# Cables Constructions

## IEC 60502-1 0.6/1.0 KV Single Core XLPE/PVC/RWA/PVC

Nominal cross sectional area <b>mm<sup>2</sup></b>	Nominal thickness of insulation <b>mm</b>	Approx. Thickness of bedding <b>mm</b>	Nominal Alu. armour wire diameter <b>mm</b>	Nominal Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. Copper Cable weight <b>Kg/Km</b>	Approx. Alu. Cable weight <b>Ohm/Km</b>
25	0.90	1.0	0.8	1.8	15.5	447	300
35	0.90	1.0	0.8	1.8	16.5	553	346
50	1.00	1.0	1.25	1.8	19.0	757	454
70	1.10	1.0	1.25	1.8	21.0	978	558
95	1.10	1.0	1.25	1.8	22.5	1,233	677
120	1.20	1.0	1.6	1.8	25.5	1,559	846
150	1.40	1.0	1.6	1.8	26.5	1,854	955
185	1.60	1.0	1.6	1.8	29.0	2,226	1,130
240	1.70	1.0	1.6	1.9	32.0	2,791	1,372
300	1.80	1.0	1.6	1.9	34.0	3,378	1,604
400	2.00	1.2	2.0	2.1	39.0	4,502	2,099
500	2.20	1.2	2.0	2.2	43.0	5,506	2,539
630	2.40	1.2	2.0	2.3	47.0	6,796	3,098
800	2.60	1.4	2.5	2.5	53.5	8,757	4,072
1000	2.80	1.4	2.5	2.7	59.5	10,782	4,948

## IEC 60502-1 0.6/1.0 KV Two Cores XLPE/PVC/RWA/PVC

## XLPE/PVC/FSA/PVC

Nominal cross sectional area <b>mm<sup>2</sup></b>	Nominal thickness of insulation <b>mm</b>	Approx. Thickness of bedding <b>mm</b>	Nominal G.I. armour wire diameter <b>mm</b>	Nominal Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. Copper Cable weight <b>Kg/Km</b>	Approx. Alu. Cable weight <b>Kg/Km</b>	Nominal dimension G.I. Flat Strip <b>mm</b>	Nominal Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. copper cable weight <b>Kg/Km</b>	Approx. Alu. Cable weight <b>Kg/Km</b>
1.5	0.7	1.0	0.8	1.8	14.0	325	298					
2.5	0.7	1.0	0.8	1.8	15.0	372	328					
4.0	0.7	1.0	0.8	1.8	16.0	444	397					
6.0	0.7	1.0	0.8	1.8	17.0	520	446					
10	0.7	1.0	1.25	1.8	20.0	802	680					
16	0.7	1.0	1.25	1.8	22.0	995	807					
25	0.90	1.0	1.60	1.8	21.0	1124	830	4 X 0.8	1.8	19.5	936	642
35	0.90	1.0	1.60	1.8	22.5	1367	952	4 X 0.8	1.8	21.0	1158	742
50	1.00	1.0	1.60	1.8	24.5	1714	1107	4 X 0.8	1.8	23.0	1507	901
70	1.10	1.0	1.60	2.0	27.5	2212	1374	4 X 0.8	1.9	26.0	1964	1126
95	1.10	1.2	2.00	2.1	31.5	2993	1865	4 X 0.8	2.0	29.0	2500	1372
120	1.20	1.2	2.00	2.2	34.5	3579	2155	4 X 0.8	2.1	31.5	3059	1636
150	1.40	1.2	2.00	2.3	37.0	4282	2490	4 X 0.8	2.2	34.5	3713	1920
185	1.60	1.4	2.50	2.5	42.0	5480	3287	4 X 0.8	2.4	38.5	4546	2353
240	1.70	1.4	2.50	2.7	46.0	6712	3880	4 X 0.8	2.6	42.0	5670	2838
300	1.80	1.6	2.50	2.8	50.0	8108	4568	4 X 0.8	2.7	46.5	6947	3407
400	2.00	1.6	2.50	3.1	55.0	10204	5408	4 X 0.8	3.0	51.5	8958	4163



# Cables Constructions

## IEC 60502-1 0.6/1.0 KV Three Cores XLPE/PVC/RWA/PVC

Nominal cross sectional area <b>mm<sup>2</sup></b>	Nominal thickness of insulation <b>mm</b>	Approx. Thickness of bedding <b>mm</b>	Nominal G.I. armour wire diameter <b>mm</b>	Nominal Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. Copper Cable weight <b>Kg/Km</b>	Approx. Alu. Cable weight <b>Kg/Km</b>
1.5	0.7	1.0	0.8	1.8	14.5	353	314
2.5	0.7	1.0	0.8	1.8	15.5	411	345
4.0	0.7	1.0	0.8	1.8	16.5	497	427
6.0	0.7	1.0	0.8	1.8	18.0	597	486
10	0.7	1.0	1.25	1.8	21.0	922	738
16	0.7	1.0	1.25	1.8	23.0	1172	890
25	0.90	1.0	1.60	1.8	23.5	1474	1032
35	0.90	1.0	1.60	1.8	25.0	1787	1165
50	1.00	1.0	1.60	1.9	28.5	2348	1439
70	1.10	1.2	2.00	2.0	33.0	3252	1995
95	1.10	1.2	2.00	2.2	36.5	4092	2401
120	1.20	1.2	2.00	2.3	39.5	4934	2800
150	1.40	1.4	2.50	2.5	44.5	6367	3678
185	1.60	1.4	2.50	2.6	48.5	7608	4319
240	1.70	1.6	2.50	2.8	53.0	9378	5130
300	1.80	1.6	2.50	3.0	59.5	11434	6123
400	2.00	1.6	2.50	3.2	64.5	14456	7262

## XLPE/PVC/FSA/PVC

Nominal dimension G.I. Flat Strip. <b>mm</b>	Nominal Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. Copper Cable weight <b>Kg/Km</b>	Approx. Alu. Cable weight <b>Kg/Km</b>
4 X 0.8	1.8	22.0	1258	817
4 X 0.8	1.8	23.5	1565	943
4 X 0.8	1.8	27.0	2069	1160
4 X 0.8	2.0	30.5	2774	1516
4 X 0.8	2.1	33.5	3548	1857
4 X 0.8	2.2	37.0	4340	2206
4 X 0.8	2.3	41.0	5348	2659
4 X 0.8	2.5	45.0	6465	3176
4 X 0.8	2.7	49.5	8152	3903
4 X 0.8	2.8	55.5	10009	4698
4 X 0.8	3.1	61.0	12960	5766

## IEC 60502-1 0.6/1.0 KV Four Cores with reduced Neutral XLPE/PVC/RWA/PVC

Nominal cross sectional area <b>mm<sup>2</sup></b>	Nominal thickness of insulation <b>mm</b>	Approx. Thickness of bedding <b>mm</b>	Nominal G.I. armour wire diameter <b>mm</b>	Nominal Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. Copper Cable weight <b>Kg/Km</b>	Approx. Alu. Cable weight <b>Kg/Km</b>
25	0.90	1.0	1.60	1.8	24.5	1652	1117
35	0.90	1.0	1.60	1.8	26.0	1987	1270
50	1.00	1.0	1.60	1.9	29.5	2608	1552
70	1.10	1.2	2.00	2.1	34.5	3663	2197
95	1.10	1.2	2.00	2.2	38.0	4653	2660
120	1.20	1.2	2.00	2.4	41.5	5698	3145
150	1.40	1.4	2.50	2.5	46.5	7156	4049
185	1.60	1.4	2.50	2.7	51.5	8656	4804
240	1.70	1.6	2.50	2.9	57.5	10769	5808
300	1.80	1.6	2.50	3.0	61.5	12920	6713
400	2.00	1.6	3.15	3.3	69.0	17096	8806

## XLPE/PVC/FSA/PVC

Nominal dimension G.I. Flat Strip. <b>mm</b>	Nominal Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. Copper Cable weight <b>Kg/Km</b>	Approx. Alu. Cable weight <b>Kg/Km</b>
4 X 0.8	1.8	23.0	1446	910
4 X 0.8	1.8	24.5	1758	1042
4 X 0.8	1.9	27.5	2351	1295
4 X 0.8	2.1	32.0	3159	1694
4 X 0.8	2.2	35.5	4077	2083
4 X 0.8	2.3	39.0	5088	2535
4 X 0.8	2.5	43.0	6086	2978
4 X 0.8	2.7	48.0	7467	3614
4 X 0.8	2.9	54.0	9448	4487
4 X 0.8	3.1	58.5	11547	5339
4 X 0.8	3.4	65.0	14901	6611

## IEC 60502-1 0.6/1.0 KV Four Cores XLPE/PVC/RWA/PVC

Nominal cross sectional area <b>mm<sup>2</sup></b>	Nominal thickness of insulation <b>mm</b>	Approx. Thickness of bedding <b>mm</b>	Nominal G.I. armour wire diameter <b>mm</b>	Nominal Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. Copper Cable weight <b>Kg/Km</b>	Approx. Alu. Cable weight <b>Kg/Km</b>
1.5	0.7	1.0	0.8	1.8	15.5	393.2	340.5
2.5	0.7	1.0	0.8	1.8	16.5	465.8	378.6
4.0	0.7	1.0	0.8	1.8	18.0	574.0	480.1
6.0	0.7	1.0	1.25	1.8	20.0	828.7	680.6
10	0.7	1.0	1.25	1.8	22.5	1076.1	832.1
16	0.7	1.0	1.60	1.8	25.5	1525.3	1149.3
25	0.90	1.0	1.60	1.8	25.0	1761.2	1172.2
35	0.90	1.0	1.60	1.9	27.0	2201.1	1370.4
50	1.00	1.0	1.60	2.0	30.5	2893.0	1680.7
70	1.10	1.2	2.00	2.2	35.5	4033.8	2356.7
95	1.10	1.2	2.00	2.3	39.5	5141.9	2887.4
120	1.20	1.4	2.50	2.5	44.5	6630.8	3784.3
150	1.40	1.4	2.50	2.6	47.5	7952.6	4367.4
185	1.60	1.4	2.50	2.8	53.0	9565.0	5180.3
240	1.70	1.6	2.50	3.0	59.0	11941.3	6276.7
300	1.80	1.6	2.50	3.2	65.0	14495.5	7415.0
400	2.00	1.8	3.15	3.5	74.0	19476.0	9883.9

## XLPE/PVC/FSA/PVC

Nominal dimension G.I. Flat Strip. <b>mm</b>	Nominal Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. Copper Cable weight <b>Kg/Km</b>	Approx. Alu. Cable weight <b>Kg/Km</b>
4 X 0.8	1.8	23.5	1539.3	950.2
4 X 0.8	1.8	25.0	1944.8	1114.1
4 X 0.8	1.9	29.0	2615.4	1403.0
4 X 0.8	2.1	33.0	3490.0	1812.8
4 X 0.8	2.2	37.0	4523.5	2269.0
4 X 0.8	2.3	40.5	5587.7	2741.2
4 X 0.8	2.5	44.0	6847.2	3262.0
4 X 0.8	2.7	49.5	8338.3	3953.6
4 X 0.8	2.9	55.5	10580.0	4915.3
4 X 0.8	3.1	61.0	12999.4	5918.8
4 X 0.8	3.4	69.0	16990.5	7398.4

**IEC 60502-1 0.6/1.0 KV Control Cables CU/XLPE/PVC/RWA/PVC**

**CU/XLPE/PVC/FSA/PVC**

No. of cores	Nominal cross sectional area mm <sup>2</sup>	Nominal thickness of insulation mm	Approx. Thickness of bedding mm	Nominal G.I. armour wire diameter mm	Nominal Thickness of outer sheath mm	Approx. overall diameter Kg/Km	Approx. Copper Cable weight Kg/Km	Nominal dimension G.I. Flat Strip. mm	Nominal Thickness of outer sheath mm	Approx. overall diameter mm	Approx. Copper Cable weight Kg/Km
2	1.5	0.7	1.0	0.8	1.8	14.0	334				
3	1.5	0.7	1.0	0.8	1.8	14.5	360				
4	1.5	0.7	1.0	0.8	1.8	15.5	404				
5	1.5	0.7	1.0	0.8	1.8	16.5	452				
6	1.5	0.7	1.0	0.8	1.8	17.5	503				
7	1.5	0.7	1.0	0.8	1.8	17.5	511				
10	1.5	0.7	1.0	1.3	1.8	21.5	838				
12	1.5	0.7	1.0	1.25	1.8	22.0	885				
14	1.5	0.7	1.0	1.25	1.8	22.5	954	4 X 0.8	1.8	21.5	872
16	1.5	0.7	1.0	1.25	1.8	23.5	1031	4 X 0.8	1.8	22.5	930
19	1.5	0.7	1.0	1.25	1.8	24.5	1118	4 X 0.8	1.8	23.5	1023
24	1.5	0.7	1.0	1.6	1.8	28.0	1543	4 X 0.8	1.8	26.5	1277
27	1.5	0.7	1.0	1.6	1.8	28.5	1593	4 X 0.8	1.8	27.0	1352
30	1.5	0.7	1.0	1.6	1.8	29.5	1695	4 X 0.8	1.8	28.0	1423
37	1.5	0.7	1.0	1.6	1.8	31.5	1910	4 X 0.8	1.8	29.5	1616
40	1.5	0.7	1.0	1.6	1.9	32.5	2046	4 X 0.8	1.8	31.0	1731
43	1.5	0.7	1.0	1.6	1.9	33.5	2172	4 X 0.8	1.8	32.0	1850
47	1.5	0.7	1.0	1.6	1.9	34.5	2307	4 X 0.8	1.9	33.0	1993

No. of cores	Nominal cross sectional area mm <sup>2</sup>	Nominal thickness of insulation mm	Approx. Thickness of bedding mm	Nominal G.I. armour wire diameter mm	Nominal Thickness of outer sheath mm	Approx. overall diameter Kg/Km	Approx. Copper Cable weight Kg/Km	Nominal dimension G.I. Flat Strip. mm	Nominal Thickness of outer sheath mm	Approx. overall diameter mm	Approx. Copper Cable weight Kg/Km
2	2.5	0.7	1.0	0.8	1.8	15.0	378				
3	2.5	0.7	1.0	0.8	1.8	15.5	418				
4	2.5	0.7	1.0	0.8	1.8	16.5	477				
5	2.5	0.7	1.0	0.8	1.8	17.5	537				
6	2.5	0.7	1.0	1.25	1.8	19.5	731				
7	2.5	0.7	1.0	1.25	1.8	19.5	746				
10	2.5	0.7	1.0	1.25	1.8	23.0	1003	4 X 0.8	1.8	22.0	922
12	2.5	0.7	1.0	1.25	1.8	23.5	1077	4 X 0.8	1.8	22.5	977
14	2.5	0.7	1.0	1.25	1.8	24.5	1167	4 X 0.8	1.8	23.5	1072
16	2.5	0.7	1.0	1.6	1.8	26.0	1406	4 X 0.8	1.8	24.5	1178
19	2.5	0.7	1.0	1.6	1.8	27.0	1536	4 X 0.8	1.8	25.5	1301
24	2.5	0.7	1.0	1.6	1.8	30.5	1905	4 X 0.8	1.8	29.0	1627
27	2.5	0.7	1.0	1.6	1.8	31.0	1997	4 X 0.8	1.8	29.5	1703
30	2.5	0.7	1.0	1.6	1.9	32.5	2129	4 X 0.8	1.8	30.5	1830
37	2.5	0.7	1.0	1.6	1.9	34.5	2434	4 X 0.8	1.9	32.5	2111
40	2.5	0.7	1.0	1.6	2.0	35.5	2608	4 X 0.8	1.9	34.0	2262
43	2.5	0.7	1.0	2.0	2.0	37.5	3009	4 X 0.8	1.9	35.0	2419
47	2.5	0.7	1.2	2.0	2.1	39.5	3254	4 X 0.8	2.0	37.0	2638



## Current ratings for 0.6/1.0 KV XLPE cables

### Copper Conductor Cable

Conductor size	In ground 20°C				In air 30°C			
	Single-core		2-core	3-or-4 core	Single-core		2-core	3-or-4 core
	Trifoil	Flat 3 cables			Trifoil	Flat 3 cables		
Sq mm	Amp	Amp	Amp	Amp	Amp	Amp	Amp	Amp
1.5	28		34	29	27		29	24
2.5	38		44	37	37		39	33
4.0	49		58	49	44		52	45
6.0	62		72	61	56		67	56
10	82		96	81	78		90	78
16	108		125	106	105		115	99
25	140		159	132	139	141	152	131
35	166		191	158	174	176	188	162
50	197	206	225	189	222	288	228	197
70	239	249	273	229	285	358	291	251
95	287	295	328	275	346	425	354	304
120	325	333	373	313	402	485	410	353
150	363	366	418	350	463	549	472	406
185	404	402	466	390	529	618	539	463
240	465	454	539	451	625	715	636	546
300	519	498	603	505	720	810	732	628
400	573	528	677	565	815	848	847	728
500	634	571			918	923		
630	697	611			1027	992		
800	736	630			1119	1042		
1000	781	661			1214	1110		

### Aluminium Conductor Cable

4.0	39		40	27	34		37	32
6.0	49		50	35	43		48	41
10	65		69	44	58		65	55
16	84		96	81	80		85	74
25	109		120	101	109	109	112	98
35	127		144	121	123	135	138	120
50	151	158	171	144	162	215	166	145
70	184	191	208	175	207	270	211	185
95	219	228	248	210	252	324	254	224
120	250	258	266	239	292	372	235	264
150	279	286	304	268	337	424	269	305
185	312	317	349	301	391	477	308	350
240	361	363	406	349	465	554	364	418
300	405	403	450	393	540	626	409	488
400	475		487	437	661		573	562
500	540				748			
630	610				846			
800	680				976			
1000	760				1063			

Ground temperature 20°C  
Ground thermal resistivity 1.5 K.m/W

Depth of laying 750 mm  
An ambient air temperature 30°C



## Cables Constructions

### BS 5467 0.6/1KV Single Core CU/XLPE/PVC/SWA/PVC

Nominal cross sectional area <b>mm<sup>2</sup></b>	Nominal thickness of insulation <b>mm</b>	Thickness of bedding <b>mm</b>	Nominal AL wire armour dia. <b>mm</b>	Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. cable weight <b>Kg/Km</b>	Max. DC Resistance at 20°C <b>Ohm/Km</b>
50	1.0	0.8	0.9	1.5	16.5	1135	0.387
70	1.1	0.8	1.25	1.5	19.0	1525	0.268
95	1.1	0.8	1.25	1.6	21.0	1916	0.193
120	1.2	0.8	1.25	1.6	23.0	2418	0.153
150	1.4	1.0	1.6	1.7	25.5	2985	0.124
185	1.6	1.0	1.6	1.8	27.5	3422	0.0991
240	1.7	1.0	1.6	1.8	30.0	4641	0.0754
300	1.8	1.0	1.6	1.9	32.5	5282	0.0601
400	2.0	1.2	2.0	2.0	37.0	7049	0.0470
500	2.2	1.2	2.0	2.1	40.5	7645	0.0366
630	2.4	1.2	2.0	2.2	44.5	9681	0.0283
800	2.6	1.4	2.5	2.4	51.5	12090	0.0221
1000	2.8	1.4	2.5	2.5	56.5	14257	0.0176

### BS 5467 0.6/ 1 KV Two Core CU/XLPE/PVC/SWA/PVC

1.5	0.7	0.8	0.9	1.3	12.0	409	12.1
2.5	0.7	0.8	0.9	1.4	13.0	465	7.41
4.0	0.7	0.8	0.9	1.4	14.0	567	4.61
6.0	0.7	0.8	0.9	1.4	15.0	679	3.08
10	0.7	0.8	0.9	1.5	17.0	846	1.83
16	0.7	0.8	1.25	1.5	19.5	1190	1.15
25	0.9	0.8	1.25	1.6	20.0	1265	0.727
35	0.9	1.0	1.6	1.7	22.0	1646	0.524
50	1.0	1.0	1.6	1.8	24.5	2065	0.387
70	1.1	1.0	1.6	1.9	27.0	2604	0.268
95	1.1	1.2	2.0	2.0	30.5	3506	0.193
120	1.2	1.2	2.0	2.1	33.0	4287	0.153
150	1.4	1.2	2.0	2.2	36.0	5041	0.124
185	1.6	1.4	2.5	2.4	40.5	6296	0.0991
240	1.7	1.4	2.5	2.5	44.0	8156	0.0754
300	1.8	1.6	2.5	2.6	47.5	9514	0.0601
400	2.0	1.6	2.5	2.8	53.0	11960	0.0470

### BS 5467 0.6/ 1 KV Three Core CU/XLPE/PVC/SWA/PVC

1.5	0.7	0.8	0.9	1.3	12.5	437	12.1
2.5	0.7	0.8	0.9	1.4	13.5	502	7.41
4.0	0.7	0.8	0.9	1.4	14.5	623	4.61
6.0	0.7	0.8	0.9	1.4	15.5	744	3.08
10	0.7	0.8	1.25	1.5	18.5	1070	1.83
16	0.7	0.8	1.25	1.6	20.0	1330	1.15
25	0.9	1.0	1.6	1.7	23.0	1721	0.727
35	0.9	1.0	1.6	1.8	25.0	2111	0.524
50	1.0	1.0	1.6	1.8	27.5	2632	0.387
70	1.1	1.0	1.6	1.9	31.0	3385	0.268
95	1.1	1.2	2.0	2.1	35.0	4585	0.193
120	1.2	1.2	2.0	2.2	37.5	5617	0.153
150	1.4	1.4	2.5	2.3	42.0	7040	0.124
185	1.6	1.4	2.5	2.4	46.0	8286	0.0991
240	1.7	1.4	2.5	2.6	50.5	10769	0.0754
300	1.8	1.6	2.5	2.7	56.0	12797	0.0601
400	2.0	1.6	2.5	2.9	62.0	16043	0.0470

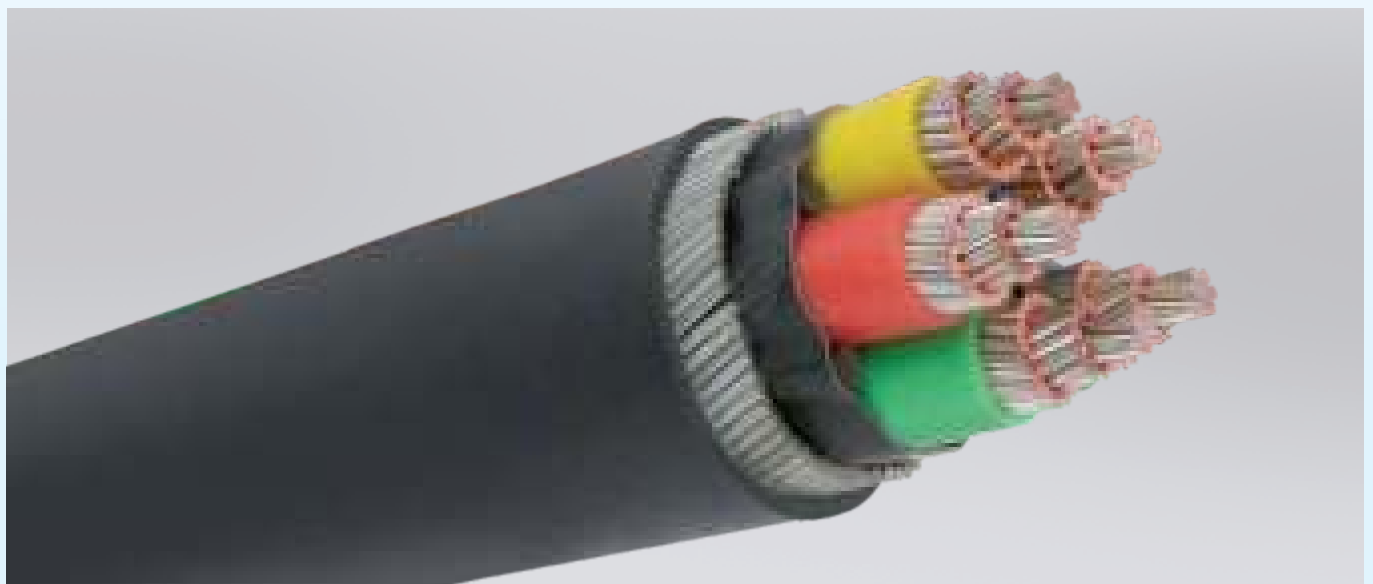
## Cables Constructions

### BS 5467 0.6/ 1 KV Four Core Cu/XLPE/PVC/SWA/PVC

Nominal cross sectional area <b>mm<sup>2</sup></b>	Nominal thickness of insulation <b>mm</b>	Thickness of bedding <b>mm</b>	Nominal armour wire <b>mm</b>	Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. cable weight <b>Kg/Km</b>	Max. DC Resistance at 20°C <b>Ohm/Km</b>
1.5	0.7	0.8	0.9	1.3	13.0	474	12.1
2.5	0.7	0.8	0.9	1.4	14.0	586	7.41
4.0	0.7	0.8	0.9	1.4	15.5	725	4.61
6.0	0.7	0.8	1.25	1.5	17.5	967	3.08
10	0.7	0.8	1.25	1.5	20.0	1265	1.83
16	0.7	0.8	1.25	1.6	22.0	1572	1.15
25	0.9	1.0	1.6	1.7	25.0	2074	0.727
35	0.9	1.0	1.6	1.8	27.0	2567	0.524
50	1.0	1.0	1.6	1.9	30.5	3236	0.387
70	1.1	1.2	2.0	2.1	35.0	4538	0.268
95	1.1	1.2	2.0	2.2	38.5	5859	0.193
120	1.2	1.4	2.5	2.3	43.5	7459	0.153
150	1.4	1.4	2.5	2.4	46.5	8835	0.124
185	1.6	1.4	2.5	2.6	51.5	10965	0.0991
240	1.7	1.6	2.5	2.7	57.5	13522	0.0754
300	1.8	1.6	2.5	2.9	62.5	16489	0.0601
400	2.0	1.8	3.15	3.2	71.5	21046	0.0470

### BS 5467 0.6/ 1KV Four Core with Reduced Neutral Cu/XLPE/PVC/SWA/PVC

Nominal cross sec. area Phase <b>mm<sup>2</sup></b>	Nominal cross sec. area Neutral <b>mm<sup>2</sup></b>	Nominal thickness of insulation Phase <b>mm</b>	Nominal thickness of insulation Neutral <b>mm</b>	Thickness of bedding <b>mm</b>	Nominal armour wire dia. <b>mm</b>	Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. cable weight <b>Kg/Km</b>	Max. DC Resistance at 20°C <b>Ohm/Km</b>
25	16	0.9	0.7	1.0	1.6	1.7	24.5	1990	0.727
35	16	0.9	0.7	1.0	1.6	1.8	27.0	2399	0.524
50	25	1.0	0.9	1.0	1.6	1.9	29.0	2930	0.387
70	35	1.1	0.9	1.2	2.0	2.0	33.5	4157	0.268
95	50	1.1	1.0	1.2	2.0	2.1	37.0	5357	0.193
120	70	1.2	1.1	1.2	2.0	2.2	40.5	6473	0.153
150	70	1.4	1.1	1.4	2.5	2.4	45.5	7896	0.124
185	95	1.6	1.1	1.4	2.5	2.5	49.5	9932	0.0991
240	120	1.7	1.2	1.6	2.5	2.6	55.0	12155	0.0754
300	150	1.8	1.4	1.6	2.5	2.8	60.5	14982	0.0601
400	185	2.0	1.6	1.6	2.5	3.0	66.5	18116	0.0470



## Cables Constructions

### BS 5467 0.6/1 KV Control Cables Cu/XLPE/PVC/SWA/PVC

Nominal cross sectional area <b>mm<sup>2</sup></b>	No. of cores	Nominal thickness of insulation <b>mm</b>	Thickness of bedding <b>mm</b>	Nominal armour wire diameter <b>mm</b>	Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. cable weight <b>Kg/Km</b>	Max. DC Resistance at 200C <b>Ohm/Km</b>
1.5	7	0.7	0.8	0.9	1.4	15.2	430	12.1
1.5	12	0.7	0.8	1.25	1.5	19.4	720	12.1
1.5	19	0.7	0.8	1.25	1.6	22.2	945	12.1
1.5	27	0.7	1.0	1.6	1.7	26.7	1405	12.1
1.5	37	0.7	1.0	1.6	1.7	29.0	1685	12.1
1.5	48	0.7	1.0	1.6	1.8	32.7	2040	12.1
2.5	7	0.7	0.8	0.9	1.4	17.1	555	7.41
2.5	12	0.7	0.8	1.25	1.6	22.4	950	7.41
2.5	19	0.7	1.0	1.6	1.7	26.6	1440	7.41
2.5	27	0.7	1.0	1.6	1.8	30.7	1860	7.41
2.5	37	0.7	1.0	1.6	1.8	33.8	2270	7.41
2.5	48	0.7	1.2	2.0	2.0	39.3	3105	7.41
4.0	7	0.7	0.8	1.25	1.5	19.7	820	4.61
4.0	12	0.7	1.0	1.6	1.6	25.7	1365	4.61
4.0	19	0.7	1.0	1.6	1.7	29.3	1820	4.61
4.0	27	0.7	1.0	1.6	1.9	34.4	2405	4.61
4.0	37	0.7	1.2	2.0	2.0	39.2	3315	4.61
4.0	48	0.7	1.2	2.0	2.1	44.1	4040	4.61



## PVC INSULATED ARMoured CABLES

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

**Standards** **BS 6346, IEC 60502-1 & VDE 0271**

Operating Temperature	70° C
Short Circuit Temp.	160° C
Working Voltage	600 / 1000 Volts
Test Voltage	3.5 KV r m s for 5 minutes

### CONSTRUCTION

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

**Insulation** PVC type T11 as per BS 7655: Section 3.1 and PVC type A as per IEC 60502-1

Single core	Red or Black
2 Core	Red , Black
3 Core	Red , Yellow , Blue
4 Core	Red , Yellow, Blue, Black
5 Core	Red , Yellow, Blue, Black & Yellow - Green
6 Core & above	Black colour with number printing

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

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

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

**Bedding** Extruded PVC compatible with operating temperature.

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

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

**Minimum Bending radius** :12 times the cable diameter

**Admissible Pulling Force** : Aluminium - 30N/mm<sup>2</sup>



Note : Unarmoured cables construction details available upon request.

\*Aluminium - upto 10 mm<sup>2</sup> Copper - upto 6 mm<sup>2</sup>

\*\*Modification which serve to improve our products will be implemented without notice.

## Cables Constructions

### BS 6346 0.6/ 1 KV Single Core Cu/PVC/PVC/SWA/PVC

Nominal cross sectional area <b>mm<sup>2</sup></b>	Nominal thickness of insulation <b>mm</b>	Thickness of bedding <b>mm</b>	Nominal AL armour wire diameter <b>mm</b>	Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. cable weight <b>Kg/Km</b>	Max. DC Resistance at 20°C <b>Ohm/Km</b>
50	1.4	0.8	1.25	1.5	18.5	780	0.387
70	1.4	0.8	1.25	1.6	20.5	1005	0.268
95	1.6	0.8	1.25	1.6	22.5	1288	0.193
120	1.6	1.0	1.6	1.7	26.0	1654	0.153
150	1.8	1.0	1.6	1.7	27.0	1969	0.124
185	2.0	1.0	1.6	1.8	29.5	2375	0.0991
240	2.2	1.0	1.6	1.9	32.5	2983	0.754
300	2.4	1.0	1.6	1.9	35.0	3607	0.0601
400	2.6	1.2	2.0	2.1	40.0	4794	0.0470
500	2.8	1.2	2.0	2.1	43.5	5848	0.0366
630	2.8	1.2	2.0	2.2	47.5	7154	0.0283
800	2.8	1.4	2.5	2.4	53.5	9087	0.0221
1000	3.0	1.4	2.5	2.5	59.5	11162	0.0176

### BS 6346 0.6/ 1 KV Two Core Cu/PVC/PVC/SWA/PVC

1.5	0.8	0.8	0.9	1.4	12.0	258	12.1
2.5	0.8	0.8	0.9	1.4	13.5	311	7.41
4.0	1.0	0.8	0.9	1.4	15.0	431	4.61
6.0	1.0	0.8	0.9	1.5	16.0	516	3.08
10	1.0	0.8	1.25	1.6	20.0	826	1.83
16	1.0	0.8	1.25	1.6	22.0	1021	1.15
25	1.2	1.0	1.6	1.7	22.0	1208	0.727
35	1.2	1.0	1.6	1.8	24.0	1467	0.524
50	1.4	1.0	1.6	1.9	26.5	1864	0.387
70	1.4	1.0	1.6	1.9	28.5	2319	0.268
95	1.6	1.2	2.0	2.1	33.0	3187	0.193
120	1.6	1.2	2.0	2.2	35.5	3758	0.153
150	1.8	1.2	2.0	2.3	38.5	4485	0.124
185	2.0	1.4	2.5	2.4	43.5	5709	0.0991
240	2.2	1.4	2.5	2.5	47.0	6998	0.0754
300	2.4	1.6	2.5	2.7	51.5	8437	0.0601
400	2.6	1.6	2.5	2.9	56.5	10592	0.0470

### BS 6346 0.6/ 1 KV Three Core Cu/PVC/PVC/SWA/PVC

1.5	0.8	0.8	0.9	1.4	12.5	287	12.1
2.5	0.8	0.8	0.9	1.4	14.0	357	7.41
4.0	1.0	0.8	0.9	1.4	15.5	490	4.61
6.0	1.0	0.8	1.25	1.5	17.5	689	3.08
10	1.0	0.8	1.25	1.6	21.0	957	1.83
16	1.0	0.8	1.25	1.6	23.0	1212	1.15
25	1.2	1.0	1.6	1.7	25.0	1577	0.727
35	1.2	1.0	1.6	1.8	26.5	1911	0.524
50	1.4	1.0	1.6	1.9	30.5	2522	0.387
70	1.4	1.2	2.0	2.0	34.0	3410	0.288
95	1.6	1.2	2.0	2.1	38.0	4349	0.193
120	1.6	1.2	2.0	2.2	40.5	5149	0.153
150	1.8	1.4	2.5	2.4	46.0	6648	0.124
185	2.0	1.4	2.5	2.5	50.0	7893	0.0991
240	2.2	1.6	2.5	2.6	54.5	9768	0.0754
300	2.4	1.6	2.5	2.8	61.0	11906	0.0601
400	2.6	1.6	2.5	3.0	66.5	14996	0.0470

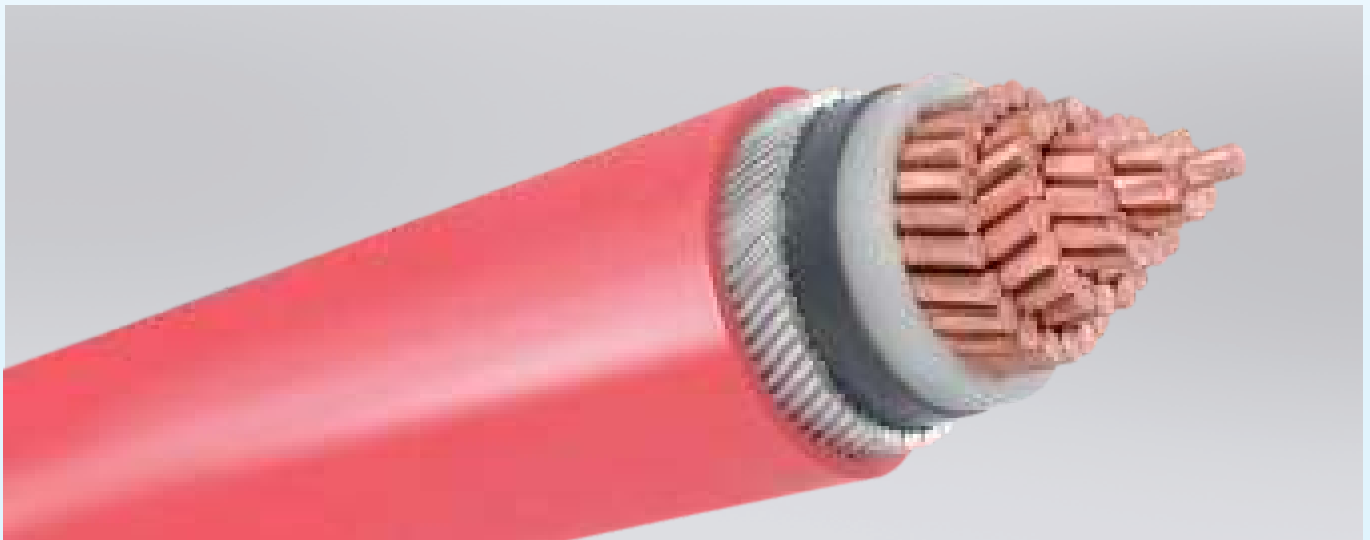
# PVC Insulated Armoured Cables

## BS 6346 0.6/ 1 KV Four Core Cu/PVC/PVC/SWA/PVC

Nominal cross sectional area <b>mm<sup>2</sup></b>	Nominal thickness of insulation <b>mm</b>	Thickness of bedding <b>mm</b>	Nominal armour wire <b>mm</b>	Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. cable weight <b>Kg/Km</b>	Max. DC Resistance at 20°C <b>Ohm/Km</b>
1.5	0.8	0.8	0.9	1.4	13.5	329	12.1
2.5	0.8	0.8	0.9	1.4	15.0	411	7.41
4.0	1.0	0.8	1.25	1.5	18.0	670	4.61
6.0	1.0	0.8	1.25	1.5	19.0	806	3.08
10	1.0	0.8	1.25	1.6	22.5	1125	1.83
16	1.0	1.0	1.6	1.7	26.5	1623	1.15
25	1.2	1.0	1.6	1.8	27.0	1917	0.727
35	1.2	1.0	1.6	1.9	28.5	2364	0.524
50	1.4	1.2	2.0	2.0	34.0	3358	0.387
70	1.4	1.2	2.0	2.1	36.5	4238	0.268
95	1.6	1.2	2.0	2.2	41.5	5459	0.193
120	1.6	1.4	2.5	2.4	44.5	6545	0.153
150	1.8	1.4	2.5	2.5	49.5	8274	0.124
185	2.0	1.6	2.5	2.6	55.0	9989	0.0991
240	2.2	1.6	2.5	2.8	61.0	12436	0.0754
300	2.4	1.6	2.5	3.0	67.0	15141	0.0601
400	2.6	1.8	3.15	3.3	76.0	20181	0.0470

## BS 6346 0.6/ 1 KV Four Core with Reduced Neutral Cu/PVC/PVC/SWA/PVC

Nominal cross sec. area Phase <b>mm<sup>2</sup></b>	Nominal cross sec. area Neutral <b>mm<sup>2</sup></b>	Nominal thickness of insulation Phase <b>mm</b>	Nominal thickness of insulation Neutral <b>mm</b>	Thickness of bedding <b>mm</b>	Nominal armour wire dia. <b>mm</b>	Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. cable weight <b>Kg/Km</b>	Max. DC Resistance at 20°C <b>Ohm/Km</b>
25	16	1.2	1.0	1.0	1.6	1.8	26.0	1799	0.727
35	16	1.2	1.0	1.0	1.6	1.8	27.5	2127	0.524
50	25	1.4	1.2	1.0	1.6	1.9	31.5	2807	0.387
70	35	1.4	1.2	1.2	2.0	2.0	35.5	3830	0.268
95	50	1.6	1.4	1.2	2.0	2.2	40.0	4966	0.193
120	70	1.6	1.4	1.4	2.5	2.3	44.0	6353	0.153
150	70	1.8	1.4	1.4	2.5	2.4	48.0	7445	0.124
185	95	2.0	1.6	1.4	2.5	2.5	52.5	8973	0.0991
240	120	2.2	1.6	1.6	2.5	2.7	59.0	11210	0.0754
300	150	2.4	1.8	1.6	2.5	2.9	64.0	13525	0.0601
400	185	2.6	2.0	1.8	3.15	3.1	71.5	17839	0.0470



## Cables Constructions

### 0.6/1KV Auxilliary Cables Cu/PVC/PVC/SWA/PVC

Nominal cross sectional area <b>mm<sup>2</sup></b>	No. of cores	Nominal thickness of insulation <b>mm</b>	Thickness of bedding <b>mm</b>	Nominal armour wire diameter <b>mm</b>	Thickness of outer sheath <b>mm</b>	Approx. overall diameter <b>mm</b>	Approx. cable weight <b>Kg/Km</b>	Max. DC Resistance at 20°C <b>Ohm/Km</b>
1.5	7	0.8	0.8	0.9	1.4	15.2	450	12.1
1.5	12	0.8	0.8	1.25	1.5	19.4	750	12.1
1.5	19	0.8	0.8	1.25	1.6	22.2	990	12.1
1.5	27	0.8	1.0	1.6	1.7	26.7	1470	12.1
1.5	37	0.8	1.0	1.6	1.8	29.2	1790	12.1
1.5	48	0.8	1.0	1.6	1.9	32.9	2170	12.1
2.5	7	0.8	0.8	1.25	1.5	18.0	680	7.41
2.5	12	0.8	0.8	1.25	1.6	22.4	995	7.41
2.5	19	0.8	1.0	1.6	1.7	26.6	1505	7.41
2.5	27	0.8	1.0	1.6	1.8	30.7	1985	7.41
2.5	37	0.8	1.0	1.6	1.9	34.0	2410	7.41
2.5	48	0.8	1.2	2.0	2.1	39.5	3290	7.41
4.0	7	1.0	0.8	1.25	1.6	20.5	890	4.61
4.0	12	1.0	1.0	1.6	1.7	26.8	1510	4.61
4.0	19	1.0	1.0	1.6	1.8	30.5	2015	4.61
4.0	27	1.0	1.2	2.0	2.0	37.1	2940	4.61
4.0	37	1.0	1.2	2.0	2.1	40.8	3660	4.61
4.0	48	1.0	1.2	2.0	2.2	46.0	4485	4.61

### Current Ratings Copper Conductor PVC Insulated Armoured cable 600/1000 V

Conductor size <b>mm<sup>2</sup></b>	IN AIR				IN GROUND			
	Single Core		2-Core	3 or 4 Core	Single Core		2-Core	3 or 4 Core
	Trefoil <b>(A)</b>	Flat <b>(A)</b>	<b>(A)</b>	<b>(A)</b>	Trefoil <b>(A)</b>	Flat <b>(A)</b>	<b>(A)</b>	<b>(A)</b>
16	-	-	97	83	-	-	119	101
25	-	-	128	110	-	-	158	132
35	-	-	157	135	-	-	190	159
50	181	230	190	163	203	211	225	188
70	231	286	241	207	248	257	277	233
95	280	338	291	251	297	305	332	279
120	324	385	336	290	337	341	377	317
150	373	436	386	332	376	377	422	355
185	425	490	439	378	423	417	478	401
240	501	566	516	445	485	469	551	462
300	567	616	592	510	542	515	616	517
400	657	674	683	590	600	549	693	580



## INSULATED FIXED / FLEXIBLE CORDS & WIRES



**Application** Installation in surface mounted or embedded conduits or similar closed systems. indoors, building wires, power cords and domestic electrical wiring purpose.

<b>Standards</b>	BS 6004, IEC 60227-3, BS 6007, BS 7919, BS 7211, BS 6231, BS 6141, BS 4737, BS 6500, <HAR>
Operating Temperature	70°C, 90°C
Working Voltage	300/500, 450/750 Volts
Maximum Short Circuit Temperature	160°C

**Test Voltage** After immerse in water for 12 hours test voltage applied for 5 minutes Thickness of insulation upto and including

0.7 mm	1.5 KV a.c.
0.7 mm to 1.0 mm	2.0 KV a.c.
1.0 mm and above	2.5 KV a.c.

**TYPE OF WIRES/CORDS** 2491LSF, 6491X, 6491LSF, 6241Y, 6242Y, 6243Y, 6181Y, 6181XY, 6181LSF, 318Y, 309Y, 218Y, 318LSF, 638TQ, 318TRS, 318TQ, 318XY, 380TQ, 680TQ,

**Conductor** Solid (class 1), Stranded (class 2), flexible (class 5), annealed copper conductor conforming to BS 6360 or IEC 60228

**Insulation** Poly Vinyl Chloride (PVC), Heat resistant (HR) PVC, Fire Retardant (FR) PVC, Fire Retardant Low Smoke (FRLS) PVC, Zero Halogen (LSOH), Thermosetting (XLPE, Rubber etc.)

**Colours** Green/Yellow, Blue, Red, Black, Grey, White, any other colours on request

**Sheath (Multicore)** Poly Vinyl Chloride (PVC), Heat resistant (HR) PVC, Fire Retardant (FR) PVC, Fire Retardant Low Smoke (FRLS) PVC, Zero Halogen (LSOH)

### Comparitive Properties

Feature	HR PVC	FR-PVC	FRLS-PVC	LSOH
Temperature Rating	85°C	70°C	70°C	105°C
Requirement of Oxygen to catch Fire (% in air)	>21	>30	>30	>35
Temperature required to catch Fire Temp (with 21% in Oxygen)	Room Temp.	>250°C	>250°C	>300°C
Visibility during cable burning (%)	<20	<35	>40	>80
Release of Halogen Gas during burning (% by weight)	<20	<20	<20	ZERO
Flame Retardancy	Good	Very Good	Very Good	Excellent

FLEXIBLE & FLAT (RHINOS) 2, 3, 4, 6, 10, 12, 14, 16, 19, 24 & 27  
(Details available on request).



Note : The number and diameter of conductor strands are for reference only and governed by conductor resistance. For other type of cords, wires, ECC, Flat, etc. the dimensions, parameters are available on request.

**\*\*Modification which serve to improve our products will be implemented without notice.**

## Cables Constructions

### 6491x : Copper Conductor, PVC Insulated Unsheathed Wires

Nominal cross section area of conductor <b>mm<sup>2</sup></b>	Number/Nominal diameter of wires <b>No/mm</b>	Thickness of Insulation <b>mm</b>	Overall Diameter Max. <b>mm</b>	Current carrying capacity <b>Amps</b>	Resistance per Km at 20°C <b>Ohms</b>	Insulation resistance at 70°C <b>M ohm-km</b>
1.5	1/1.4	0.7	3.2	17.5	12.1	0.011
	7/0.53	0.7	3.3	17.5	12.1	0.010
	30/0.25	0.7	3.4	17.5	13.3	0.010
2.5	1/1.8	0.8	3.9	24	7.41	0.010
	7/0.67	0.8	4.0	24	7.41	0.009
	50/0.25	0.8	4.1	24	7.98	0.009
4.0	1/2.25	0.8	4.4	32	4.61	0.0085
	7/0.85	0.8	4.6	32	4.61	0.0077
	56/0.30	0.8	4.8	32	4.95	0.007
6.0	1/2.76	0.8	5.0	41	3.08	0.0070
	7/1.04	0.8	5.2	41	3.08	0.0065
	84/0.30	0.8	5.3	41	3.3	0.006
10	1/3.57	1.0	6.4	57	1.83	0.0070
	7/1.35	1.0	6.7	57	1.83	0.0065
	80/0.40	1.0	6.8	57	1.91	0.0056
16	7/1.70	1.0	7.8	76	1.15	0.0050
	126/0.40	1.0	8.1	76	1.21	0.0046
25	7/2.14	1.2	9.7	101	0.727	0.0050
	196/0.40	1.2	10.2	101	0.78	0.0044
35	7/2.58	1.2	10.9	125	0.524	0.0043
	276/0.40	1.2	11.7	125	0.554	0.0038
50	19/1.78	1.4	12.8	151	0.387	0.0043
	396/0.40	1.4	13.9	151	0.386	0.0037
70	19/2.14	1.4	14.6	192	0.268	0.0035
	360/0.50	1.4	16.0	192	0.272	0.0032
95	19/2.52	1.6	17.1	232	0.193	0.0035
	475/0.50	1.6	18.2	232	0.206	0.0032
120	37/2.03	1.6	18.8	269	0.153	0.0032
	608/0.50	1.6	20.2	269	0.161	0.0029
150	37/2.25	1.8	20.9	300	0.124	0.0032
	756/0.50	1.8	22.5	300	0.129	0.0029
185	37/2.52	2.0	23.3	341	0.099	0.0032
	925/0.50	2.0	24.9	341	0.106	0.0029
240	61/2.25	2.2	26.6	400	0.0754	0.0032
	1221/0.50	2.2	28.4	400	0.0801	0.0028
300	61/2.52	2.4	29.6	458	0.0601	0.0030
400	61/2.85	2.6	33.2	546	0.0470	0.0028



## AERIAL BUNCHED CABLES



**Application:** Outdoor distribution in Rural or residential areas Offers cost effective safer and reliable cable for reticulation.

**Range:** LV Cables with XLPE, PVC or PE insulation MV cables with XLPE insulation

**Standard:** IS 14255, BS 7870-5, BS 625 HD 626, VDE 00276 P 626, IEC 60502 NF C 33-209

Voltage:	600/1000V, 11KV, 22KV
Conductor:	Hard Drawn Aluminium, alluminium alloy or copper

**Insulation:** Specially formulated for exposure to sunlight and outdoor application. LV XLPE or PE is loaded with carbon black MV cable insulated and screened cores are PVC sheathed

**Max Operating Temp:** XLPE: Max 90°C  
PVC or PE: Max 70°C

**Construction:** Insulated cores may be bundled together or laid up around high tensile insulated or bare messenger. If a messenger is provided; as the tension is taken by it, phase conductors can operate at maximum allowable conductor temperature.

**Minimum Bending Radius:** For LV 10 times & MV 15 times cable diameter

**Solar Radiation:** 1000 W/ sq m



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## Cables Constructions

### LV Cables

Conductor		Electrical Parameters			
Area (Sq. mm)	Strands	Current Rating In Air @ 30° C	Maximum DC Resistance @ 20° C	Reactance	Approx Breaking Load
		Amp	Ω/km	Ω/km	KN
16	7	87	1.91	0.091	2.84
25	7	107	1.20	0.087	4.17
35	7	132	0.868	0.085	5.78
50	7	165	0.641	0.083	8.45
70	19	205	0.443	0.0789	11.32
95	19	250	0.32	0.075	15.30
120	19	290	0.253	0.073	20.00
150	19	330	0.206	0.072	25.00

Current rating for max cond temp 80°C and wind velocity 1 km/hr



91 Bobbin Stranding Machine

## KEI RUBBER CABLES

In Keeping with the company's commitment to technological advancement, elastomer materials such as Ethylene Propylene Rubber "EPR", Polychloroprene "PCP", Chloro Sulphonated Polyethylene "CSP" Nitrile Rubber / PVC Blends, Ethylene Vivyl Acetate "EVA" and Silicone Rubber have been specially compounded to meet numerous heat oil and fire resisting requirements. In the recent years KEI has also developed special Elastomeric Fire Survival Cables for power, control and instrumentation wiring.

Elastomeric compounds for insulating and sheathing of cables are formulated to meet the requirement of BS 6899, IEC 60502 and IEC 60092 other international specification.

### GENERAL CONSTRUCTION "Conforming to IS 9968 Part I"

- Conductor** Annealed tinned Copper wires Solid "Class 1", Stranded "Class 2" flexible "Class 5" complying with the requirement of BS 6360/IE 60228
- Seperator Tape Insulation** Suitable Material Seperator Tape may be applied over the conductor. General Service elastomer compound / Heat Resisting elastomer compound / Silicone rubber as per IEC 60092 "351", BS-7655, VDE-0207Pt.-20
- Core Identification** Coloured insulation, Nos. Polyester tape, Coloured proofed tape, Nos. printing.
- Fillers** Natural or synthetic fibers or elastomer suitable for the operating temperature and compatible with the insulating material.
- Sheath** General Service elastomeric compound / Heavy Duty elastomeric compound as per IEC 60092 "359", BS-7655, VDE 0207Pt.-21

### Working Temperature of Commonly Used Elastomeric Insulating and Sheathing Material

MATERIAL	Max. Cond. Temp. for continuous operation <b>Deg C.</b>	Max. Cond. Temp. for short circuit <b>Deg C.</b>	Min. Working Temp. <b>Deg C.</b>
Natural Rubber (VIR and TRS)	60	200	-55
Ethylene Propylene Rubber (EPR)	90	250	-50
Polychloroprene (PCP)	70	200	-40
Chlorosupphonated Polyethylene (CSP)	90	200	-35
Silicone Rubber	150 / 180	350	-55
HR Nautral Ruber (HR VIR)	75	200	-55
Styrene Butadience Rubber	60	200	-55
Butyl Rubber	85	220	-50



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## Cables Constructions

Elastomeric Cables Range	Application
Cables up to 11 KV	Machine Trailing, Mining, Power
Flexible Trailing Cables	Reeling unreeling, Trailing, Festooning, Mobile Machines, Cranes, Coal Handling and Conveyors
Mining Cables	FT or Pliable Armoured or Landline type as per IS 14494, NCB, SABS specs for UG, Open cast, Coal or other mines and mining machines
Thermal Power Plants	For coal handling plants, flexible power and control application
Cables for steel plants	Flexible and high temp withstanding cables for furnace, melting shops, material handling
Wind energy	Flexible cables for power and control for Wind Mill generator connection
Fire Survival Cables	Fire Survival for 3 Hrs or 20 Min
Ship wiring	As per IEC specs and Naval specs DGS of DEFSTAN, NES
OFFSHORE and ONSHORE	For platforms and Ring as per IEC, BS and NEK Specs
Shore Supply & Generator Cables	For charging of ship batteries and supply from mobile generators
Motor Coil Leads	Elastomeric and Silicon as per IS, BS, or OEM Specs
High Temp Cables	Silicon insulated, glass fiber braided or unbraided
Pump Cables	For Water, submersible and sewerage pumps
Cables for Railway	Coach wiring, Metro railway
Wire	HFFR Low toxic emission under fire
Panel Wiring	For flexible, high power high temp zone, polluted or moist atmospheres
Battery Cables	For High current and long life
Low Temperature installations	Suitable for subzero temp installations and operations
Misc. Applications	outdoor high mast lighting, site power supply, white goods, oil or chemical resistant
Type	Power and Control cables up to 61 Crores Instrumentation Pairs 30 pairs, triads, quad Wires, flat cables
Voltage Grades	11KV, 6.6KV, 3.3KV, 1.1KV, 750V, 250V, 110V, 60V
Conductor Range	0.5 to 630 Sq. mm
Polymers Processed COMPOUNDS	EPR, EPDM, PCP, CSP, CPE, SILICONE, EVA HALOGEN FREE AND FIRE RESISTANT NON TOXIC COMPOUNDS
Braiding Offered	ATC, GI wire braid, Synthetics or Textile Yarn, Glass Fiber
Armouring	Pliable armour or steel/copper wires/Stainless steel



## CABLES FOR INSTRUMENTATION

KEI manufactures a wide variety of cables suitable for process instrumentation, which plays a vital role in measurement, supervision and control of the process. Introduction of microprocessor based / computerized instrumentation has demanded stringent quality requirements along with special electrical parameters for instrumentation cables.

The cables used for instrumentation are designed and manufactured very meticulously. KEI maintains high quality standards and follow & stringent in-process quality control during manufacturing of instrumentation cables, meeting the design parameters of the customer

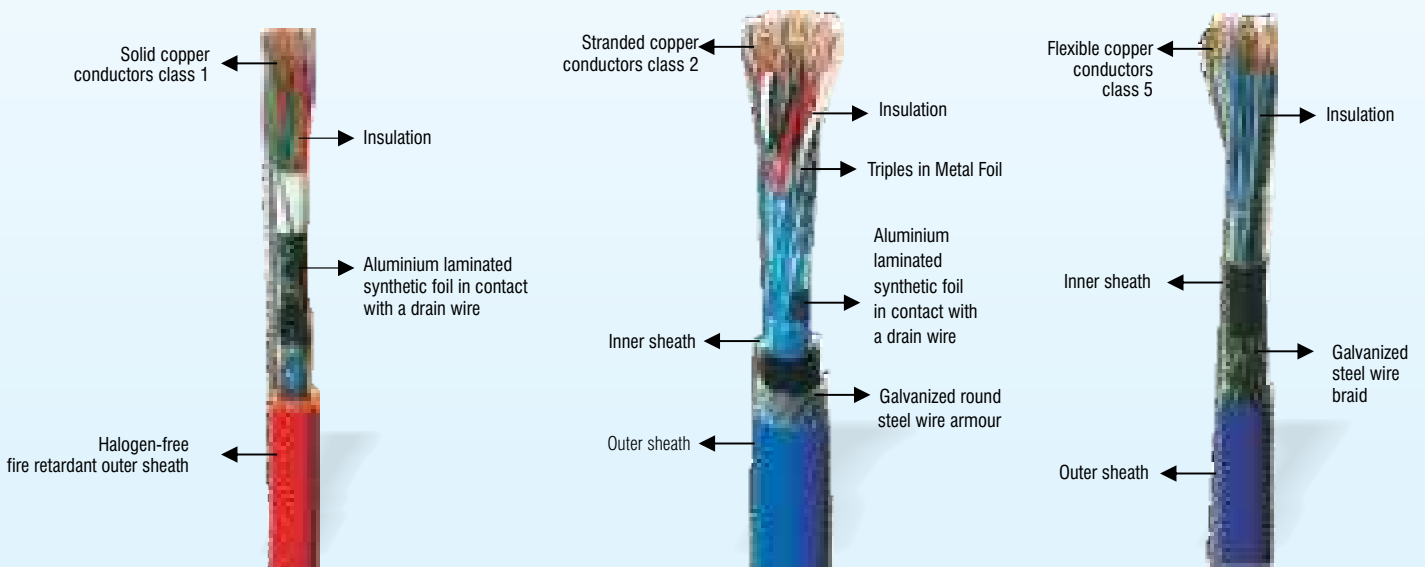
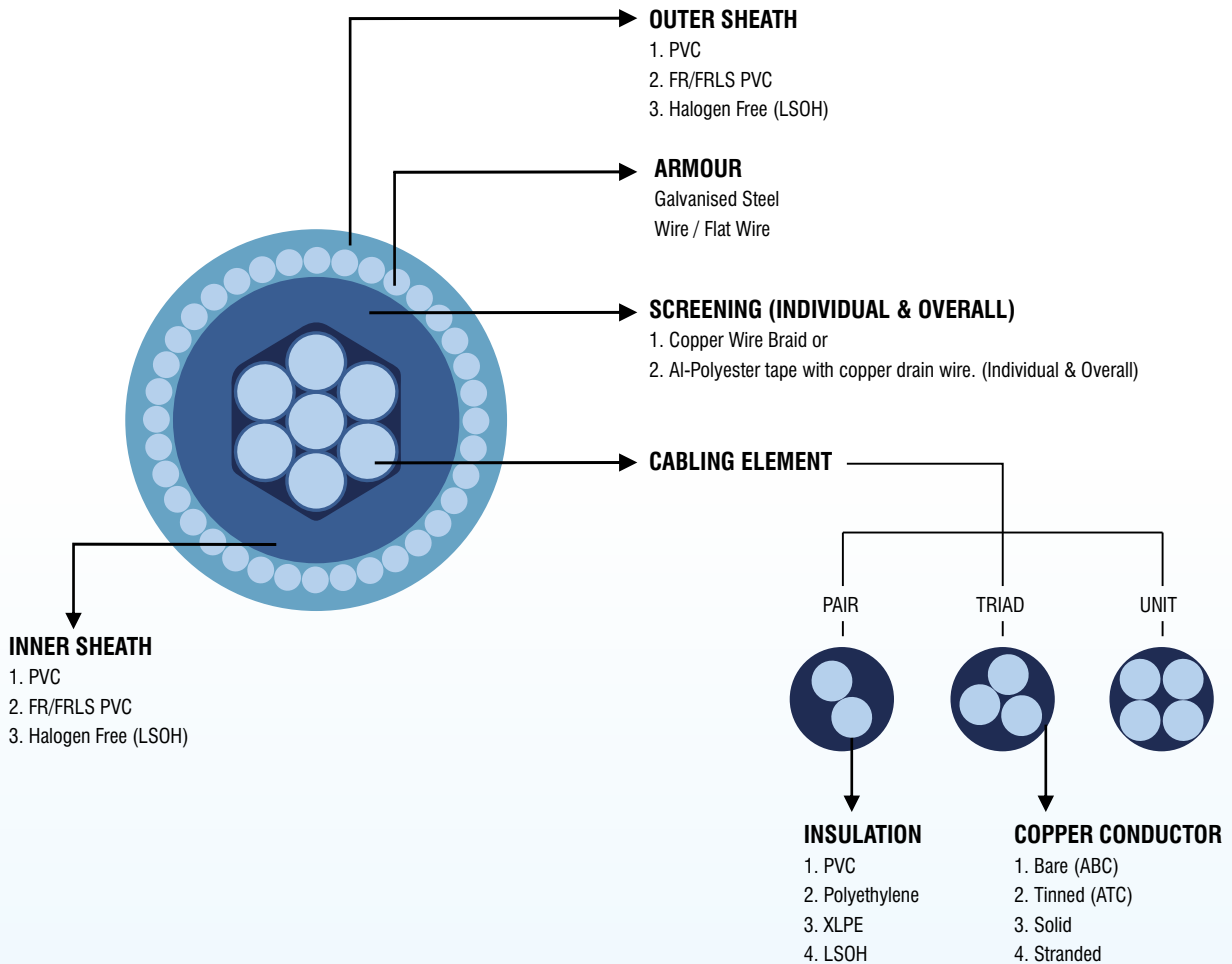
<b>Conductor</b>	0.5 Sq. mm to 2.5 Sq mm of solid/stranded Tinned/untinned copper conductors.
<b>Insulation</b>	PVC/Polyethylene/XLPE/LSOH as per requirement.
<b>Elements / Core:</b>	Pair/Triad/Quad, colour coded / number printed.
<b>Screening</b>	Aluminium Polyester screen over all (collective) screen (OAS), individual screen (IS), or both IS & OAS with ATC drain wire. Wire braiding can also be given as per customer requirement.
<b>Element Laying</b>	Concentric formation or unit & group formation as per requirement.
<b>Armouring</b>	Unarmoured / Galvanised steel wire / Flat wire armoured.
<b>Sheathing</b>	PVC, FR PVC, FRLS, LSOH as per requirement.
<b>Specification</b>	EIL-6-52-46. Rev.05, BS: 5308 Part 1 & Part 2, BSC 143-0.75 (24/0.2 mm) OAS, IEC 60092-375, 376, BS EN 50288, VDE 0815, VG 95218, NEK 606 and customers Specifications.)



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# Cables Constructions

## Typical Instrumentation Cable Constructions



## THERMOCOUPLE EXTENSION / COMPENSATING CABLES

Thermocouple extension and compensating cables are designed for interconnection between thermocouple probes and control instrumentation. They are generally available in the following types:

### Type (1)

Unarmoured cables with conductors insulated with PVC and twisted together in pairs, sheathed overall with PVC.

### Type (2)

Armoured cables with conductors insulated with PVC and twisted together in pairs, PVC bedding, Galvanised steel wire armour and sheathed overall with PVC.

All of the above types of cables can be supplied unscreened or screened (individually, collectively or both) with an Aluminium Polyester tape screen incorporating tinned copper drain wire.

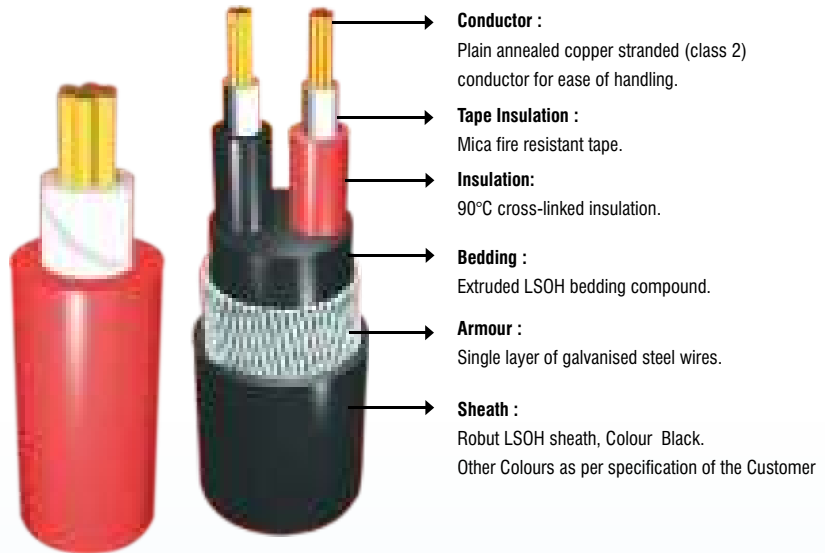
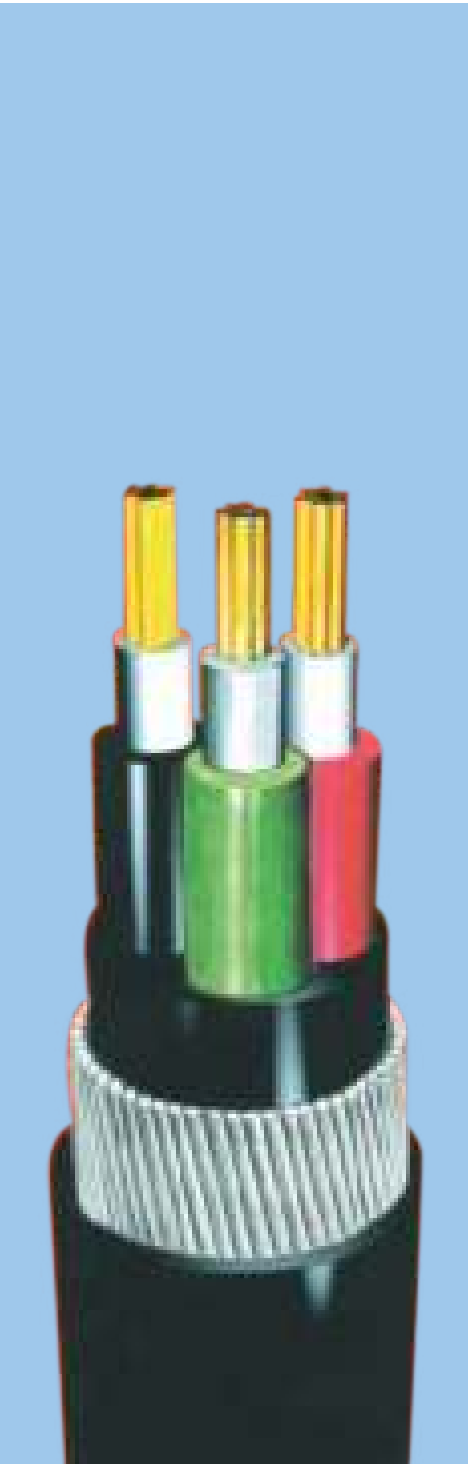
The construction is similar to paired instrumentation cable but the conductor material is different. Thermocouple are used in processes to sense temperature and is connected to the pyrometers for indication and control. The thermocouple and pyrometers are electrically connected by thermocouple extension/compensating cables. The conductors used for these cables are required to have similar thermo-electric (emf) properties as that of the thermocouple used for sensing the temperature.

### Range of Instrumentation Cables:

<b>Standard</b>	ANSI MC 96.1, BS-1843, IEC 60584-3, ENI
<b>Conductor</b>	Solid type as per type & mentioned in the table
<b>Insulation</b>	PVC/Polyethylene/XLPE/LSOH as per requirement.
<b>Elements</b>	Pairs colour coded/number printed.
<b>Screen</b>	Aluminium Polyester tape screen with Copper drain wire or alternately with Tinned Copper wire braiding. Individual element or overall screening as specified.
<b>Armouring</b>	Galvanised steel round wire / Flat wire.
<b>Sheathing</b>	PVC, FR PVC, FRLS, LSOH as per requirement.



## SINGLE / MULTI CORE FIRE RESISTANT CABLES



- Conductor :**  
Plain annealed copper stranded (class 2) conductor for ease of handling.
- Tape Insulation :**  
Mica fire resistant tape.
- Insulation:**  
90°C cross-linked insulation.
- Bedding :**  
Extruded LSOH bedding compound.
- Armour :**  
Single layer of galvanised steel wires.
- Sheath :**  
Robut LSOH sheath, Colour Black.  
Other Colours as per specification of the Customer

### Core Identification :

- Red Black
- Red Yellow Blue
- Black Red Yellow Blue
- 7- 37 Cores white with Printed numbers
- Other Core colors available as per customer specification

### Cable Characteristics

<b>TEMPERATURE</b>	Range 25 to + 90°C
<b>BENDING RADIUS</b>	Circular conductor $r=6D$ Shaped conductor $r=8D$
<b>MECHANICAL IMPACT</b>	Very Good
<b>FIRE PERFORMANCE</b>	BS 4066-1, BS4066-3
<b>FLEXIBILITY</b>	Rigid
<b>HALOGEN FREE</b>	BS6425-1
<b>LOW SMOKE</b>	Emissions BS 7622
<b>FIRE RESISTANT</b>	BS 6387

## Cables Constructions

### Single Core Fire Resistant Cables Low Voltage - 450/750 Volts

Nominal cross sectional area <b>mm<sup>2</sup></b>	Mean overall diameter <b>mm</b>	Approximate cable weight <b>kg/km</b>	Maximum conductor resistance at 20°C <b>ohms/km (1 sec) KA</b>	Short circuit rating <b>KA</b>	Current rating DC or single phase AC <b>Amps</b>	Current rating Three phase AC <b>Amps</b>	Volt drop DC <b>mV/A/m</b>	Volt drop Single phase AC <b>mV/A/m</b>	Volt drop Three phase AC <b>mV/A/m</b>
+1	3.7	20	18.1	0.1	17	15	46	46	40
1.5	3.9	26	12.1	0.15	22	19	31	31	27
2.5	4.7	38	7.41	0.25	30	26	19	19	16
4.0	5.3	54	4.61	0.4	40	35	12	12	10
6.0	5.9	75	3.08	0.6	51	45	7.9	7.9	6.8
10	7.3	122	1.83	1.0	71	63	4.7	4.7	4.0
16	8.5	185	1.15	1.6	95	85	2.9	2.9	2.5
25	11.3	300	0.727	2.5	126	111	1.85	1.9	1.65
35	12.5	390	0.524	3.5	156	138	1.35	1.35	1.15
50	14.5	525	0.387	5.0	189	168	0.99	1.05	0.9
70	16.5	730	0.268	7.0	240	214	0.68	0.75	0.65
95	18.5	1000	0.193	9.5	290	259	0.49	0.58	0.5
120	20.5	1230	0.153	12	336	299	0.39	0.48	0.42
150	22.5	1520	0.124	15	375	328	0.32	0.43	0.37
185	25	1890	0.0991	18	426	370	0.25	0.37	0.32
240	28	2440	0.0754	24	500	433	0.19	0.33	0.29
300	31	3045	0.0601	30	573	493	0.155	0.31	0.27
400	35	3870	0.047	40	683	584	0.12	0.29	0.25
500	38.5	4930	0.0366	50	783	666	0.093	0.28	0.24
630	42.5	6280	0.0283	63	900	764	0.072	0.27	0.23

### Multi Core Fire Resistant Cables Low Voltage - 600/1000 Volts

Nominal cross sectional area <b>mm<sup>2</sup></b>	Approximate overall diameter <b>mm</b>	Approximate diameter under armour <b>mm</b>	Nominal diameter of armour wires <b>mm</b>	Approximate cable weight <b>kg/km</b>	Maximum conductor resistance at 20°C <b>ohms/km</b>	Current rating DC or Single phase AC Clipped direct <b>Amps</b>	Current rating DC or Single phase AC Free Air <b>Amps</b>	Volt drop DC <b>mV/A/m</b>	Volt drop Single phase AC <b>mV/A/m</b>
<b>Two core</b>									
+1	12.2	7.8	0.9	280	18.1	18	21	47	47
1.5	12.9	8.3	0.9	310	12.1	27	29	31	31
2.5	14.1	9.6	0.9	380	7.41	36	39	19	19
4.0	15.2	10.6	0.9	450	4.61	49	52	12	12
6.0	16.4	12.0	0.9	530	3.08	62	66	7.9	7.9
10	18.6	14.0	0.9	630	1.83	85	90	4.7	4.7
16	21.4	15.9	0.9	920	1.15	110	115	2.9	2.9
25	22.0	16.3	1.25	1200	0.727	146	152	1.85	1.9
35	24.8	18.2	1.6	1600	0.524	180	188	1.35	1.35
50	28.0	21.2	1.6	2000	0.387	219	228	0.98	1.0
70	30.7	23.7	1.6	2400	0.268	279	291	0.67	0.69
95	35.3	27.3	2.0	3300	0.193	338	354	0.49	0.52
120	36.6	28.4	2.0	3800	0.153	392	410	0.39	0.42
150	39.3	30.9	2.0	4400	0.124	451	472	0.31	0.35
185	44.2	34.4	2.5	5700	0.0991	515	539	0.25	0.29
240	48.0	38.0	2.5	7200	0.0754	637	636	0.195	0.24
300	51.8	41.6	2.5	8300	0.0601	698	732	0.155	0.21
400	55.9	45.3	2.5	10500	0.047	787	847	0.12	0.19

## Single / Multi Core Fire Resistant Cables

### Three Core

Nominal cross sectional area <b>mm<sup>2</sup></b>	Approximate overall diameter <b>mm</b>	Approximate diameter under armour <b>mm</b>	Nominal diameter of armour wires <b>mm</b>	Approximate cable weight <b>kg/km</b>	Maximum conductor resistance at 20°C <b>ohms/km</b>	Short circuit rating (1 sec) of Conductor <b>KA</b>	Current rating Three phase AC Clipped direct <b>Amps</b>	Current rating Three Phase AC Free Air <b>Amps</b>	Volt drop Three phase AC <b>mV/A/m</b>
+1	12.7	8.3	0.9	310	18.1	0.14	17	18	40
1.5	13.4	8.8	0.9	340	12.1	0.20	23	25	27
2.5	14.8	10.2	0.9	430	7.41	0.35	31	33	16
4.0	16.1	11.5	0.9	510	4.61	0.57	42	44	10
6.0	17.4	12.8	0.9	620	3.08	0.86	53	56	6.8
10	20.3	14.8	1.25	930	1.83	1.4	73	78	4.0
16	22.8	17.1	1.25	1210	1.15	2.2	94	99	2.5
25	27.4	20.8	1.6	1800	0.727	3.6	124	131	1.65
35	29.2	22.4	1.6	2100	0.524	5.0	154	162	1.15
50	33.0	26.2	1.6	2600	0.387	7.1	187	197	0.87
70	37.0	30.0	1.6	3400	0.268	10.0	238	251	0.60
95	40.6	32.4	2.0	4500	0.193	13.6	389	304	0.45
120	43.8	35.4	2.0	5500	0.153	17.2	335	353	0.37
150	48.0	38.4	2.5	6900	0.124	21.4	386	406	0.30
185	52.0	42.2	2.5	8200	0.0991	26.5	441	463	0.26
240	57.1	46.9	2.5	10200	0.0754	34.3	520	546	0.21
300	63.0	52.6	2.5	12200	0.0601	42.9	599	628	0.185
400	69.5	58.7	2.5	15000	0.0470	57.2	673	728	0.165

### Four core

Nominal cross sectional area <b>mm<sup>2</sup></b>	Approximate overall diameter <b>mm</b>	Approximate diameter under armour <b>mm</b>	Nominal diameter of armour wires <b>mm</b>	Approximate cable weight <b>kg/km</b>	Maximum conductor resistance at 20°C <b>ohms/km</b>	Short circuit rating (1 sec) of Conductor <b>KA</b>	Current rating Three phase AC Clipped direct <b>Amps</b>	Current rating Three Phase AC Free Air <b>Amps</b>	Volt drop Three phase AC <b>mV/A/m</b>
+1	13.5	9.1	0.9	350	18.1	0.14	17	18	40
1.5	14.3	9.7	0.9	390	12.1	0.20	23	25	27
2.5	16.0	11.4	0.9	490	7.41	0.35	31	33	16
4.0	17.3	12.7	0.9	590	4.61	0.57	42	44	10
6.0	19.6	14.1	1.25	830	3.08	0.86	53	56	6.8
10	21.8	16.3	1.25	1040	1.83	1.4	73	78	4.0
16	24.6	18.9	1.25	1370	1.15	2.2	94	99	2.5
25	29.1	22.5	1.6	2100	0.727	3.6	124	131	1.65
35	32.2	25.4	1.6	2500	0.524	5.0	154	162	1.15
50	35.0	28.0	1.6	3200	0.387	7.1	187	197	0.87
70	40.2	32.0	2.0	4500	0.268	10.0	238	251	0.60
95	44.0	35.6	2.0	5600	0.193	13.6	289	304	0.45
120	48.4	38.8	2.5	7200	0.153	17.2	335	353	0.37
150	52.5	42.7	2.5	8500	0.124	21.4	386	406	0.30
185	57.1	46.9	2.5	10300	0.0991	26.5	441	463	0.26
240	62.7	52.3	2.5	12800	0.0754	34.3	520	546	0.21
300	69.6	58.8	2.5	15600	0.0601	42.9	599	628	0.185
400	78.0	65.3	3.15	20400	0.0470	57.2	673	728	0.165

Circular conductor 1.0-16mm<sup>2</sup>, Shaped conductor >= 25mm<sup>2</sup>.

## Cables Constructions

Nominal cross sectional area <b>mm<sup>2</sup></b>	Approximate overall diameter <b>mm</b>	Approximate diameter under armour <b>mm</b>	Nominal diameter of armour wires <b>mm</b>	Approximate cable weight <b>kg/km</b>	Maximum conductor resistance at 20°C <b>ohms/km</b>	Current rating DC or Single phase AC Clipped direct <b>Amps</b>	Current rating DC or Single phase AC Free Air <b>Amps</b>	Volt drop DC <b>mV/A/m</b>	Volt drop Single phase AC <b>mV/A/m</b>
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### Seven core

+1	15.6	11.0	0.9	450	18.1	18 *	21 *	47	47
1.5	16.4	11.8	0.9	500	12.1	27 *	29 *	31	31
2.5	18.3	13.7	0.9	640	7.41	36 *	39 *	19	19
4.0	20.8	15.3	1.25	910	4.61	49 *	52 *	12	12

### Twelve core

+1	20.1	14.6	1.25	750	18.1	18 *	21 *	47	47
1.5	21.2	15.7	1.25	850	12.1	27 *	29 *	31	31
2.5	24.0	18.3	1.25	1090	7.41	36 *	39 *	19	19
4.0	27.3	20.9	1.6	1550	4.61	49 *	52 *	12	12

### Nineteen core

+1	22.8	17.1	1.25	970	18.1	18 *	21 *	47	47
1.5	24.2	18.5	1.25	1120	12.1	27 *	29 *	31	31
2.5	28.6	22.0	1.6	1650	7.41	36 *	39 *	19	19

### Twenty-seven core

+1	27.7	21.1	1.6	1430	18.1	18 *	21 *	47	47
1.5	29.4	22.8	1.6	1650	12.1	27 *	29 *	31	31
2.5	33.4	26.6	1.6	2150	7.41	36 *	39 *	19	19

### Thirty-seven core

+1	30.6	23.7	1.6	1700	18.1	18 *	21 *	47	47
1.5	32.2	25.6	1.6	2000	12.1	27 *	29 *	31	31
2.5	36.7	29.9	1.6	2650	7.41	36 *	39 *	19	19

Circular conductor 1.0-16mm<sup>2</sup>, Shaped conductor  $\geq 25\text{mm}^2$ . Installation methods for current rating in accordance with BS7671/IEE Wiring Regulations \*.

The tabulated rating is as a two core cable and may be used where the number of cores carrying current does not exceed the square root of the total number of cores. +Size not included in BS7846

Installation methods for current rating "Enclosed in conduit on a wall or in trunking" in accordance with BS7671/IEE Wiring Regulations. The tabulated ratings are based upon a 30°C ambient temperature and 90° C operating temperature. For other ambient temperatures or where several circuits are grouped together, the following rating factor should be applied.

#### Temperature rating factors

Ambient Temperature °C	25	30	35	40	45	50	55	60
Rating factor	1.02	1.00	0.96	0.91	0.87	0.82	0.76	0.71

#### Correction factors for groupings

Number of circuits	2	3	4	5	6	7	8	9
Rating factor	0.80	0.70	0.65	0.60	0.57	0.54	0.52	0.50



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