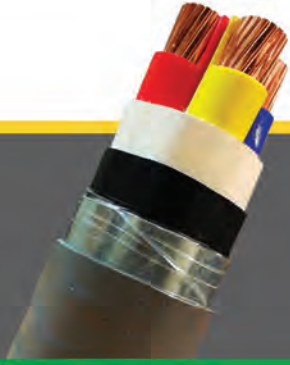




**OmanCables**  
الكابلات العمانية



## Medium Voltage Cables

TRULY  
OMANI  
TRUSTED GLOBALLY



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## Company Profile

Oman Cables Industry (SAOG) develops, manufactures and markets a totally integrated variety of electrical products, which include **medium voltage power cables**, low voltage power and control cables, pilot cables, overhead power transmission line conductors and building wires.

OCI offers cables with special features suitable for different types of applications, environmental conditions or as per customer requirement.

- Flame Retardant Properties
- Low Smoke and Fume (LSF) Properties
- Cables with Anti-Termite Sheaths
- UV Resistant Outer Sheath
- Lead Sheath

The manufacturing facilities are situated within the largest industrial complex in Muscat, The Sultanate of Oman, with its offices and factory presently occupying an area of 135000 sqm with future expansion plans in mind. OCI have equivalent facilities in Sohar, Oman at its Aluminum manufacturing facility and together has a capacity of copper and aluminum of more than 120,000 MT annually.

Oman Cables Industry (SAOG) has its offices in Oman, UAE, Qatar, and KSA and has an extensive network of distributors and agents throughout MENA, Asia and Europe.



## Product Range

Voltage Grade	:	3.6/6/7.2 kV To 18/30/36 kV (U <sub>o</sub> /U/U <sub>m</sub> ) As Per IEC-60502-2 (Equivalent 3.8/6.6/7.2 kV To 19/33/36 kV - (U <sub>o</sub> /U/U <sub>m</sub> ) As Per BS 6622)
Conductor	:	Copper or Aluminium
Conductor Size	:	25 To 1000 Sq. mm
Specification	:	IEC 60502 Part 2, BS 6622, or Any Other International specification covering above voltage range
U <sub>o</sub>	:	Nominal Phase To Earth Voltage
U	:	Nominal Phase To Phase Voltage
U <sub>m</sub>	:	Maximum Phase To Phase Voltage

### Special Features

OCI can also offer cables with different sheathing, screening, taping & armouring options as per customer's specific requirements. We can also offer cables suitable for superior fire performance characteristics as well as with low smoke & fume (LSF or LSOH/LSZH) properties. Special features like longitudinal water sealing of conductors & CU screens, radial water sealing of CU screens as well as different colour of outer sheath can be provided on request.

The cable design in this catalogue conforms to IEC 60502 Part 2 & in most cases to BS 6622. However if requested, **we can separately offer guaranteed technical particulars for cables as per different international specifications or specific customer needs.**

# Constructional Features

## Conductor

We can offer cables with both copper or aluminium conductors. Conductors upto 1000 sq mm will be circular compacted & stranded and shall comply with IEC-60228 Class 2.

## Conductor screen

This will be an extruded layer of semiconducting XLPE applied under simultaneous triple extrusion process over the conductor along with the insulation and the insulation screen.

## Insulation

This will be an extruded layer of insulating grade XLPE applied over conductor screen under triple extrusion process along with conductor screen and insulation screen.

## Insulation screen

This will be a layer of semiconducting XLPE which will be applied by tripe extrusion process over the insulation.

## Metallic screen

It will consist of a layer of copper tape applied helically with overlap over insulation screen. Other combinations of metallic screens as per customer's requirement can also be provided on request.



## Laying-up

In case of three core cables, the three cores are laid up with non hygroscopic fillers like polypropylene (PP) fillers at interstices and a binder tape is applied with an overlap. These binder tapes can be a PVC or Polyethylene, or Polypropylene or Polyester.

## Inner Sheath (Bedding)

Extruded layer of PVC or PE is applied over the laid-up cores. PVC is normally of grade ST2 or PE of grade ST7 as per IEC 60502 Part 2.

## Armour

In case of Armoured cables, the armour is applied over inner sheath. For Single core cables this is of aluminium wires and for multicore cables the armour can be of one among the following options:-

- a) Galvanized steel wire.
- b) Galvanized steel tape.

The armour is applied helically over the inner sheath.

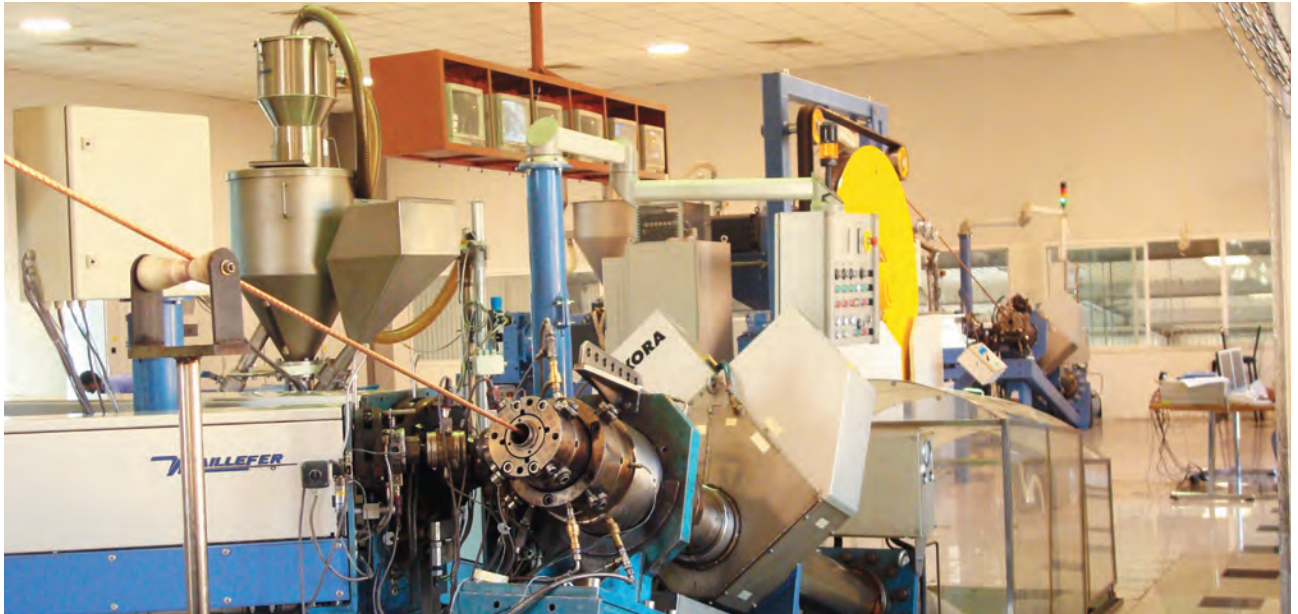
## Outer sheath

An extruded layer is applied over the armour in case of armoured cables and over the laid-up cores (for multi core)/copper screen (for single core) in case of unarmoured cables. Outer sheath material can be either PVC of grade ST2 or PE of grade ST7 as per IEC-60502 Part 2.

## Special features which we can offer

- Water tight construction (both radial & longitudinal for Cu screen and Longitudinal for conductor)
- Strippable insulation screen
- TR-XLPE insulation
- Metallic screen of multiple layers of copper tapes or a combination of copper wires and tapes to increase the earth fault current carrying capacity.
- Increased armour conductivity by way of insertion of tinned copper wires in armour.
- UV resistant coloured outer sheath.
- LSF (Low Smoke & Fume) (LSOH/LSZH) MV cables as per BS 7835 with LSF (LSOH/LSZH) inner/outer sheath.
- Flame Retardant MV cables conforming to IEC 60332
- FR-PVC or FRRT - PVC or FRLS-PVC inner sheath and/or outer sheath
- Graphite coating on outer sheath.

## Plant and Machinery



Triple Head Extrusion - CCV Plant

The medium voltage cable manufacturing facility at OCI is the most modern facility available in the region today with the state of the art machinery & equipment supplied by the biggest & the best names in the cable manufacturing machinery industry. The entire MV cables manufacturing plant at OCI is fully air-conditioned with humidity control to ensure contamination free atmosphere, the only kind in the whole of Middle East.

The heart of the MV cables manufacturing facility is the CCV line. These lines are supplied by Maillefer, Finland and incorporates some of the most modern features like,

- Triple extrusion head to ensure superior quality of extrusion and uniform bonding of conductor screen, XLPE insulation & the insulation screen.
- In line X-ray machine for checking proper concentricity of all 3 layers of Insulation as well as measuring thickness of extruded materials, ovality and overall diameter.
- CDCC - Completely Dry Curing & Cooling in an inert atmosphere of nitrogen.
- Fully Computerized auto-cure control system which controls all driving parameters to achieve best curing of extruded materials.
- Fully automatic compound handling system ensuring a contamination free line, which is

absolutely essential to achieve a superior quality product.

### Some Of The Other Machines Include:

- Central stranding machine from SKET Germany
- Combined CU taping & Multi wire screening machine from Pourtier France
- 3000 mm Drum twister Laying-up machine from SKET Germany
- 3000 mm Drum twister Armouring machine from Pourtier France
- Combined 3000 mm Drum twister Laying-up & Armouring machine from Pourtier France
- Steel tape Armouring machine from Pourtier France
- Extrusion sheathing lines from Maillefer Finland and from Troester Germany
- Lead extruder from HFSAB Sweden.

With the manufacturing facilities incorporating the use of latest available technology, the MV cables offered by OCI provides customers with a definite advantage in terms of:

- Complete adherence to specifications,
- Superior overall performance,
- Minimum risk of insulation failures,
- Much longer service life.

# MV Cables Testing Facility

OCI has made a major investment in the Testing facilities for its MV Cables factory. We have equipped ourselves with the latest and most advanced cable testing facility available in the world.

All testing equipment such as Partial discharge detector, High Voltage Tester, Tan delta bridge and Impulse tester are supplied and erected by Hipotronics USA/Haefely & Tattex Switzerland.

The screened room for 'Partial Discharge' Test has been supplied & erected by M/s ETS Lindgren, UK, who are the world leaders in interference technology products. This facility is the first of its kind in the region & ensures detecting discharge levels less than 1pC.

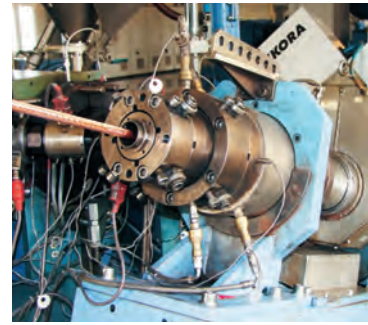
Apart from the above, the other major testing facilities include:

- a) Partial Discharge detector from M/s Hipotronics (Robinson) USA
- b) 1000 kVA/100 kV - Series Resonance Test set with fully automatic control system - from M/s Hipotronics, USA.
- c) 1500 kVA/120 kV - Series Resonance test set with fully automatic control system from M/s Haefely Switzerland.
- d) 300 kV/15 kJ - Latest Impulse Test facility from M/s Haefely, Switzerland.
- e) Fully automatic 'Tan delta' measuring facility from M/s Tettex, Switzerland.

We have also installed many in line devices/ facilities for checking the product quality during the manufacturing process, examples of this are the X-Ray machine installed on the CCV line, Curing Optimization Software, online conductor resistance measurement device etc. These features reduce any risk of failure and ensure a long service life for our products.



Control Panel



In Line X ray Unit

With this modern equipment & facilities, we ensure close manufacturing tolerances and compliance to customer specifications as well as effective monitoring of the entire manufacturing process to ensure a world class product.

OCI's quality management system is accredited to ISO 9001 by BASEC, UK. The design validation for our MV Cables range has been done at recognized international laboratories.

With the above state of the art Testing Facility, we can conduct all Routine Tests, Type Tests and Sample Tests mentioned in IEC 60502 Part 2, BS 6622 & other international specifications, in-house. 100% of the cables manufactured by OCI are routine tested prior to dispatch, however if the customers desire to witness these tests or other Type / Sample tests, they can nominate their representatives or appoint a third party to witness the same at OCI factory.



## Oman Cables Quality Assurance

In order to ensure the best quality products, it is essential to test and inspect the product at each stage of manufacturing including raw materials and finished product.

Oman Cables Quality Assurance System includes:

- A. Raw Materials Inspection
- B. In-process inspection
- C. Finished product inspection

### Raw Materials Inspection:

All the raw materials are sourced from internationally approved companies, known for their quality products. Once the material is received with their product certificate, Oman Cables quality team tests and inspects the same again. Only those materials which meet Oman Cables internal standards are released for production.

### In-Process Inspection:

A team of well experienced and qualified personnel, dedicated to quality, inspects and test all the in-process materials at every stage, and only materials complying to the specified requirements are released for processing.

### Finished Product Inspection:

Oman Cables products are fully tested to the applicable standard to which it is manufactured before leaving the factory.

Routine tests are carried out for conformity to the specifications on 100% cable drums. Sample tests and type tests are carried out at regular intervals as per the applicable standards to confirm the product quality.



Testing Laboratory



## Notes on FRLS and FR Sheathed Cables

### Oxygen Index (ASTM D 2863)

The criterion for burning is presence of percentage of oxygen in air. By mixing oxygen and nitrogen at various percentages this test finds at what percentage of oxygen the standard specimen starts burning. Higher the oxygen index higher the resistance to get ignited. Min. oxygen index shall be 30%.

### Temperature Index (ASTM D 2863)

Temperature index is the temperature at which the oxygen index of the material becomes 21. This test is carried out usually by extrapolation after the oxygen index is measured at various temperatures. Minimum temperature index shall be 250 °C.

### Smoke Density (ASTM D 2843)

This parameter relates to measuring and observing relative amounts of smoke produced by the burning or decomposition of materials. This test is carried out in accordance with ASTM D 2843. The measurements are made in terms of loss of light transmission through a collected volume of smoke produced under control standardized conditions. Generally requirement by customer is smoke density rating less than 60%.

### Acid Gas Emission (IEC 60754-1)

During burning of cable materials acid gases are evolved especially hydrogen chloride. The gas

emission is evaluated in accordance with test method IEC 60754-1, where approximately 1 gm. of the material is pyrolysed at 800 °C in a combustion tube and resultant gases are analyzed.

### Flame Retardance (IEC 60332-1)

A single cable sample is clamped vertically. The Bunsen or other similar burner is arranged at 45 Degree to the axis of the cable sample, applying flame at 475 mm below to top clamp. The flame is applied for a period of time depending upon the diameter of the cable.

The test requirement is that after all burning has ceased the charred or affected portion shall not have reached within 50 mm from the top clamp.

### Flame Retardance Test (IEC 60332 -3)

This test is carried out to check flame retardant properties of bunched cables. Three categories of tests namely category “A”, “B” and “C” have been defined according to quantity of combustible material available over unit length. Cable pieces are tied on vertical ladder and flame is applied from a horizontal ladder. After the specified time the burner is removed. All parameters are pre defined according to specification. The charred portion is measured and compared with the standards to decide on acceptability.

### Special PVC Compounds with Additional Requirements which OCI can provide:

Property	Material		
	FR	FRLS	FRRT
Oxygen Index (Min.)	30	30	30
Temperature Index (Min.)	250	250	250
Smoke Density Rating (Max.)	-	60	-
Acid Gas Generation (Max.)	-	20 %	17%
Flammability Test*	IEC 60332-1 and IEC 60332-3-24	IEC 60332-1 and IEC 60332-3-24	IEC 60332-1 and IEC 60332-3-24

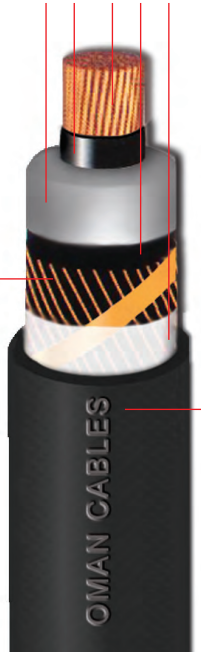
\* Based on specific request, we can provide compounds which can meet flammability requirements of IEC 60332-3-23 and IEC 60332-3-22

# Technical Section



Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)

XLPE Insulation  
Conductor Screen (Semi-conductive)  
Copper Conductor  
Insulation Screen (Semi-conductive)  
Binder Tape  
Outer Sheath



**3.6/6 (7.2) kV  
Single Core Copper Conductor  
XLPE Insulated Unarmoured  
To IEC 60502-2  
(Suitable for 3.8/6.6 kV  
Earthed System)**

		SINGLE CORE, 2XCY, Unarmoured Cables, 3.6/6 kV to IEC 60502-2																
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400	500	630	800	1000	
<b>(A) Manufacturing Dimensions</b>																		
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2	
2.0	Conductor weight (Approximate)	kg/km	218	303	408	591	821	1035	1277	1601	2110	2640	3383	4272	5640	7286	9046	
3.0	Insulation thickness (Nominal)	mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.0	3.2	3.2	3.2	3.2	
4.0	Outer sheath thickness (Nominal)	mm	1.5	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.6	
5.0	Outer sheath thickness (Minimum)	mm	1.00	1.00	1.08	1.08	1.16	1.16	1.24	1.24	1.32	1.40	1.48	1.56	1.64	1.72	1.88	
6.0	Cable overall diameter (Approximate)	mm	17.0	18.0	19.5	21.0	23.0	24.5	26.0	28.0	30.5	33.5	37.0	41.0	44.5	50.0	54.5	
7.0	Cable weight (Approximate)	kg/km	495	600	740	960	1240	1490	1775	2140	2730	3350	4235	5250	6745	8580	10510	
8.0	Standard drum length (±5% Tolerance)	m	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500	
9.0	Minimum bending radius of cable (During installation)	mm	340	360	390	420	460	490	520	560	610	670	740	820	890	1000	1090	
<b>(B) Electrical Parameters</b>																		
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	0.0366	0.0283	0.0221	0.0176	
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.928	0.669	0.494	0.343	0.247	0.197	0.160	0.128	0.099	0.080	0.064	0.052	0.042	0.036	0.031	
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.130	0.124	0.119	0.109	0.105	0.101	0.099	0.095	0.092	0.091	0.089	0.088	0.084	0.084	0.082	
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.937	0.680	0.508	0.360	0.268	0.221	0.188	0.159	0.135	0.121	0.110	0.102	0.094	0.091	0.088	
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.623	1.178	0.880	0.624	0.464	0.383	0.326	0.275	0.234	0.210	0.191	0.177	0.163	0.158	0.152	
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.26	0.29	0.32	0.37	0.42	0.46	0.50	0.54	0.59	0.61	0.64	0.67	0.75	0.86	0.94	
7.0	Approximate charging current per phase at U <sub>0</sub> = 3.6 kV and f = 50 Hz	mA/m	0.29	0.33	0.36	0.42	0.48	0.52	0.57	0.61	0.67	0.69	0.72	0.76	0.85	0.97	1.06	
8.0	Sustained current ratings (With both end bonding):-																	
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	140	166	196	239	285	323	361	406	469	526	590	655	731	806	873	
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	132	157	186	227	271	308	343	387	447	504	564	635	712	789	859	
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	163	198	238	296	361	417	473	543	641	735	845	956	1095	1241	1373	
9.0	Short circuit current rating of conductor for 1 second	kA	3.58	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20	71.50	90.09	114.40	143.00	

Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)

XLPE Insulation

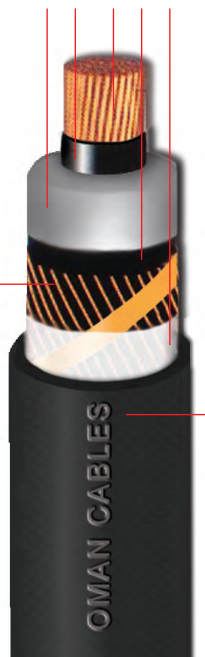
Conductor Screen (Semi-conductive)

Copper Conductor

Insulation Screen (Semi-conductive)

Binder Tape

Outer Sheath



## 6/10 (12) kV Single Core Copper Conductor XLPE Insulated Unarmoured To IEC 60502-2 (Suitable for 6.35/11kV Earthed System)

COPPER CONDUCTOR		SINGLE CORE, 2XCXY, Unarmoured Cables, 6/10 kV to IEC 60502-2															
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400	500	630	800	1000
<b>(A) Manufacturing Dimensions</b>																	
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	218	303	408	591	821	1035	1277	1601	2110	2640	3383	4272	5640	7286	9046
3.0	Insulation thickness (Nominal)	mm	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
4.0	Outer sheath thickness (Nominal)	mm	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.9	2.0	2.0	2.1	2.2	2.3	2.5	2.6
5.0	Outer sheath thickness (Minimum)	mm	1.00	1.08	1.08	1.16	1.16	1.24	1.24	1.32	1.40	1.40	1.48	1.56	1.64	1.80	1.88
6.0	Cable overall diameter (Approximate)	mm	19.0	20.0	21.5	23.0	25.0	26.5	28.0	30.0	32.5	34.5	38.0	41.0	45.0	50.5	54.5
7.0	Cable weight (Approximate)	kg/km	550	670	805	1040	1315	1580	1855	2240	2830	3420	4280	5275	6770	8635	10545
8.0	Standard drum length (±5% Tolerance)	m	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500
9.0	Minimum bending radius of cable (During installation)	mm	380	400	430	460	500	530	560	600	650	690	760	820	900	1010	1090
<b>(B) Electrical Parameters</b>																	
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	0.0366	0.0283	0.0221	0.0176
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.928	0.669	0.494	0.343	0.247	0.196	0.160	0.128	0.099	0.080	0.064	0.052	0.042	0.036	0.031
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.137	0.131	0.125	0.115	0.110	0.106	0.103	0.100	0.096	0.093	0.090	0.088	0.085	0.084	0.082
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.938	0.682	0.510	0.362	0.270	0.223	0.190	0.162	0.138	0.123	0.110	0.102	0.095	0.091	0.088
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.625	1.181	0.883	0.627	0.468	0.386	0.329	0.281	0.239	0.213	0.191	0.177	0.165	0.158	0.152
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.21	0.23	0.25	0.29	0.32	0.35	0.38	0.42	0.47	0.51	0.57	0.63	0.71	0.81	0.89
7.0	Approximate charging current per phase at U <sub>0</sub> = 6 kV and f = 50 Hz	mA/m	0.40	0.43	0.47	0.55	0.60	0.66	0.72	0.79	0.89	0.96	1.07	1.19	1.34	1.53	1.68
8.0	Sustained current ratings (With both end bonding):-																
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	140	166	196	239	285	323	361	406	469	526	590	655	731	806	873
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	132	157	186	227	271	308	343	387	447	504	564	635	712	789	859
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	163	198	238	296	361	417	473	543	641	735	845	956	1095	1241	1373
9.0	Short circuit current rating of conductor for 1 second	kA	3.58	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20	71.50	90.09	114.40	143.00

Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)

XLPE Insulation

Conductor Screen (Semi-conductive)

Copper Conductor

Insulation Screen (Semi-conductive)

Binder Tape

Outer Sheath

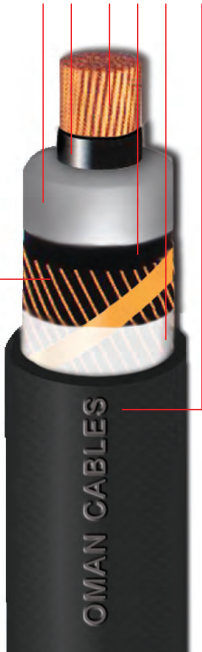


## 8.7/15 (17.5) kV Single Core Copper Conductor XLPE Insulated Unarmoured To IEC 60502-2 (Suitable for 8.7/15 kV Earthed System)

**SINGLE CORE, 2XCy, Unarmoured Cables, 8.7/15 kV to IEC 60502-2**

Sr. No.	Nominal Area of Conductor	SINGLE CORE, 2XCy, Unarmoured Cables, 8.7/15 kV to IEC 60502-2															
		mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400	500	630	800	1000
<b>(A) Manufacturing Dimensions</b>																	
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	218	303	408	591	821	1035	1277	1601	2110	2640	3383	4272	5640	7286	9046
3.0	Insulation thickness (Nominal)	mm	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
4.0	Outer sheath thickness (Nominal)	mm	1.6	1.7	1.7	1.7	1.8	1.9	1.9	2.0	2.0	2.1	2.2	2.3	2.4	2.5	2.7
5.0	Outer sheath thickness (Minimum)	mm	1.08	1.16	1.16	1.16	1.24	1.32	1.32	1.40	1.40	1.48	1.56	1.64	1.72	1.80	1.96
6.0	Cable overall diameter (Approximate)	mm	21.5	22.5	24.0	25.5	27.5	29.0	30.5	32.5	34.5	37.0	40.5	43.5	47.5	52.5	57.0
7.0	Cable weight (Approximate)	kg/km	635	760	900	1130	1420	1695	1975	2365	2950	3565	4440	5445	6955	8815	10765
8.0	Standard drum length (±5% Tolerance)	m	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
9.0	Minimum bending radius of cable (During installation)	mm	430	450	480	510	550	580	610	650	690	740	810	870	950	1050	1140
<b>(B) Electrical Parameters</b>																	
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	0.0366	0.0283	0.0221	0.0176
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.928	0.669	0.494	0.343	0.247	0.196	0.160	0.128	0.099	0.080	0.064	0.051	0.042	0.035	0.031
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.145	0.138	0.132	0.122	0.116	0.112	0.109	0.105	0.100	0.097	0.094	0.091	0.089	0.087	0.085
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.939	0.683	0.511	0.364	0.273	0.226	0.194	0.166	0.141	0.126	0.114	0.104	0.098	0.094	0.090
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.626	1.183	0.885	0.630	0.473	0.391	0.336	0.288	0.244	0.218	0.197	0.180	0.170	0.163	0.156
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.17	0.19	0.21	0.23	0.26	0.28	0.30	0.33	0.37	0.40	0.45	0.49	0.55	0.63	0.69
7.0	Approximate charging current per phase at U <sub>0</sub> = 8.7 kV and f = 50 Hz	mA/m	0.46	0.52	0.57	0.63	0.71	0.77	0.82	0.90	1.01	1.09	1.23	1.34	1.50	1.72	1.89
8.0	Sustained current ratings (With both end bonding):-																
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	140	166	196	239	285	323	361	406	469	526	590	655	731	806	873
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	132	157	186	227	271	308	343	387	447	504	564	635	712	789	859
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	163	198	238	296	361	417	473	543	641	735	845	956	1095	1241	1373
9.0	Short circuit current rating of conductor for 1 second	kA	3.58	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20	71.50	90.09	114.40	143.00

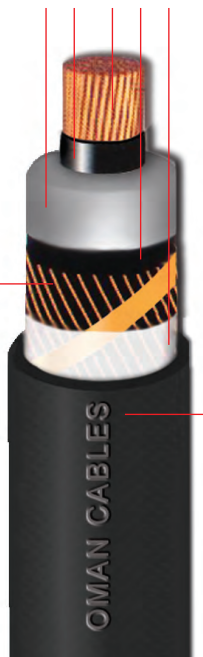
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)  
XLPE Insulation  
Conductor Screen (Semi-conductive)  
Copper Conductor  
Insulation Screen (Semi-conductive)  
Binder Tape  
Outer Sheath



**12/20 (24) kV**  
**Single Core Copper Conductor**  
**XLPE Insulated Unarmoured**  
**To IEC 60502-2**  
**(Suitable for 12.7/22 kV**  
**Earthed System)**

COPPER CONDUCTOR		SINGLE CORE, 2XC, Unarmoured Cables, 12/20 kV to IEC 60502-2														
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	35	50	70	95	120	150	185	240	300	400	500	630	800	1000
<b>(A) Manufacturing Dimensions</b>																
1.0	Conductor diameter (Approximate)	mm	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	303	408	591	821	1035	1277	1601	2110	2640	3383	4272	5640	7286	9046
3.0	Insulation thickness (Nominal)	mm	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
4.0	Outer sheath thickness (Nominal)	mm	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7
5.0	Outer sheath thickness (Minimum)	mm	1.16	1.24	1.24	1.32	1.32	1.40	1.40	1.48	1.56	1.64	1.72	1.80	1.88	1.96
6.0	Cable overall diameter (Approximate)	mm	25.0	26.0	28.0	29.5	31.0	32.5	34.5	37.0	39.5	43.0	46.0	50.0	55.0	59.5
7.0	Cable weight (Approximate)	kg/km	845	1005	1240	1540	1800	2105	2485	3095	3715	4605	5625	7150	9025	10965
8.0	Standard drum length (±5% Tolerance)	m	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
9.0	Minimum bending radius of cable (During installation)	mm	500	520	560	590	620	650	690	740	790	860	920	1000	1100	1190
<b>(B) Electrical Parameters</b>																
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	0.0366	0.0283	0.0221	0.0176
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.669	0.494	0.343	0.247	0.196	0.160	0.128	0.098	0.079	0.063	0.051	0.042	0.035	0.030
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.145	0.137	0.128	0.121	0.116	0.113	0.109	0.104	0.101	0.098	0.095	0.092	0.090	0.088
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.685	0.513	0.366	0.275	0.228	0.196	0.168	0.143	0.128	0.117	0.108	0.101	0.097	0.093
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.186	0.889	0.634	0.476	0.395	0.339	0.291	0.248	0.222	0.203	0.187	0.175	0.168	0.161
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.16	0.18	0.20	0.22	0.24	0.26	0.28	0.31	0.34	0.38	0.42	0.46	0.53	0.58
7.0	Approximate charging current per phase at U <sub>0</sub> = 12 kV and f = 50 Hz	mA/m	0.60	0.68	0.75	0.83	0.90	0.98	1.06	1.17	1.28	1.43	1.58	1.73	2.00	2.19
8.0	Sustained current ratings (With both end bonding):-															
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	166	196	239	285	323	361	406	469	526	590	655	731	806	873
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	157	186	227	271	308	343	387	447	504	564	635	712	789	859
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	198	238	296	361	417	473	543	641	735	845	956	1095	1241	1373
9.0	Short circuit current rating of conductor for 1 second	kA	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20	71.50	90.09	114.40	143.00

Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)



**18/30 (36) kV**  
**Single Core Copper Conductor**  
**XLPE Insulated Unarmoured**  
**To IEC 60502-2**  
**(Suitable for 19/33 kV**  
**Earthed System)**

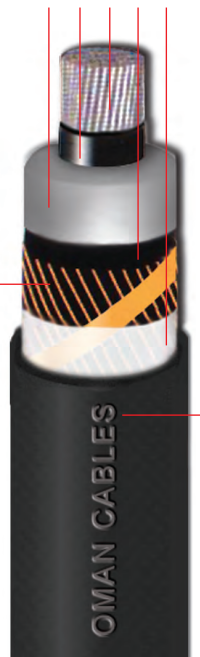
XLPE Insulation  
Conductor Screen (Semi-conductive)  
Copper Conductor  
Insulation Screen (Semi-conductive)  
Binder Tape  
Outer Sheath

**SINGLE CORE, 2XCY, Unarmoured Cables, 18/30 kV to IEC 60502-2**

Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	50	70	95	120	150	185	240	300	400	500	630	800	1000
<b>(A) Manufacturing Dimensions</b>															
1.0	Conductor diameter (Approximate)	mm	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	408	591	821	1035	1277	1601	2110	2640	3383	4272	5640	7286	9046
3.0	Insulation thickness (Nominal)	mm	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
4.0	Outer sheath thickness (Nominal)	mm	1.9	2.0	2.1	2.1	2.1	2.2	2.3	2.3	2.5	2.5	2.7	2.8	2.9
5.0	Outer sheath thickness (Minimum)	mm	1.32	1.40	1.48	1.48	1.48	1.56	1.64	1.64	1.80	1.80	1.96	2.04	2.12
6.0	Cable overall diameter (Approximate)	mm	31.5	33.0	35.0	36.5	38.0	40.0	42.5	44.5	48.0	51.0	55.5	60.5	64.5
7.0	Cable weight (Approximate)	kg/km	1255	1520	1835	2110	2410	2820	3450	4075	5010	6035	7615	9535	11510
8.0	Standard drum length (±5% Tolerance)	m	1000	1000	1000	1000	1000	500	500	500	500	500	500	500	500
9.0	Minimum bending radius of cable (During installation)	mm	630	660	700	730	760	800	850	890	960	1020	1110	1210	1290
<b>(B) Electrical Parameters</b>															
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	0.0366	0.0283	0.0221	0.0176
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.494	0.343	0.247	0.196	0.159	0.128	0.098	0.079	0.063	0.051	0.041	0.034	0.030
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.149	0.138	0.131	0.126	0.123	0.118	0.113	0.109	0.105	0.101	0.098	0.096	0.093
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.516	0.370	0.280	0.233	0.201	0.174	0.150	0.135	0.122	0.113	0.106	0.102	0.098
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	0.894	0.641	0.485	0.404	0.348	0.301	0.260	0.234	0.211	0.196	0.184	0.177	0.170
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.14	0.15	0.17	0.18	0.20	0.21	0.23	0.25	0.28	0.30	0.34	0.38	0.42
7.0	Approximate charging current per phase at U <sub>0</sub> = 18 kV and f = 50 Hz	mA/m	0.79	0.85	0.96	1.02	1.13	1.19	1.30	1.41	1.58	1.70	1.92	2.15	2.38
8.0	Sustained current ratings (With both end bonding):-														
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	196	239	285	323	361	406	469	526	590	655	731	806	873
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	186	227	271	308	343	387	447	504	564	635	712	789	859
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	238	296	361	417	473	543	641	735	845	956	1095	1241	1373
9.0	Short circuit current rating of conductor for 1 second	kA	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20	71.50	90.09	114.40	143.00



Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)



**3.6/6 (7.2) kV  
Single Core Aluminium Conductor  
XLPE Insulated Unarmoured  
To IEC 60502-2  
(Suitable for 3.8/6.6 kV  
Earthed System)**

ALUMINIUM CONDUCTOR		SINGLE CORE, A2XCXY, Unarmoured Cables, 3.6 kV to IEC 60502-2															
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400	500	630	800	1000
<b>(A) Manufacturing Dimensions</b>																	
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	67	92	125	182	251	317	390	493	646	803	1027	1307	1721	2188	2759
3.0	Insulation thickness (Nominal)	mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.0	3.2	3.2	3.2	3.2
4.0	Outer sheath thickness (Nominal)	mm	1.5	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.6
5.0	Outer sheath thickness (Minimum)	mm	1.00	1.00	1.08	1.08	1.16	1.16	1.24	1.24	1.32	1.40	1.48	1.56	1.64	1.72	1.88
6.0	Cable overall diameter (Approximate)	mm	17.0	18.0	19.5	21.0	23.0	24.5	26.0	28.0	30.5	33.5	37.0	41.0	44.5	50.0	54.5
7.0	Cable weight (Approximate)	kg/km	340	390	460	550	670	770	885	1030	1265	1515	1875	2285	2825	3480	4225
8.0	Standard drum length (±5% Tolerance)	m	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500
9.0	Minimum bending radius of cable (During installation)	mm	340	360	390	420	460	490	520	560	610	670	740	820	890	1000	1090
<b>(B) Electrical Parameters</b>																	
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	0.0605	0.0469	0.0367	0.0291
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.54	1.11	0.823	0.569	0.411	0.325	0.265	0.212	0.162	0.130	0.102	0.081	0.065	0.052	0.044
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.130	0.124	0.119	0.109	0.105	0.101	0.099	0.095	0.092	0.091	0.089	0.088	0.084	0.084	0.082
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.55	1.12	0.832	0.579	0.424	0.340	0.283	0.232	0.186	0.159	0.135	0.120	0.106	0.099	0.093
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	2.685	1.940	1.441	1.003	0.734	0.589	0.490	0.402	0.322	0.275	0.234	0.208	0.184	0.171	0.161
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.26	0.29	0.32	0.37	0.42	0.46	0.50	0.54	0.59	0.61	0.64	0.67	0.75	0.86	0.94
7.0	Approximate charging current per phase at U <sub>0</sub> = 3.6 kV and f= 50 Hz	mA/m	0.29	0.33	0.36	0.42	0.48	0.52	0.57	0.61	0.67	0.69	0.72	0.76	0.85	0.97	1.06
8.0	Sustained current ratings (With both end bonding):-																
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	108	129	152	186	221	252	281	317	367	414	470	528	599	672	743
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	102	122	144	176	210	240	267	303	351	397	451	512	583	658	731
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	127	154	184	230	280	324	368	424	502	577	673	770	896	1033	1167
9.0	Short circuit current rating of conductor for 1 second	kA	2.35	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60	47.00	59.22	75.20	94.00

**SECTION A - TABLE 6**

Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)



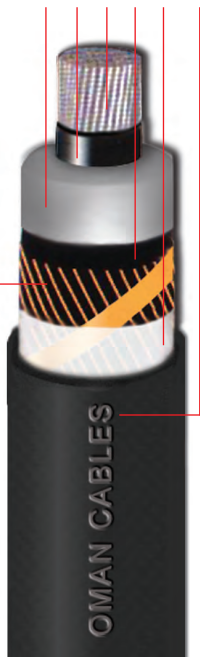
**6/10 (12) kV**  
**Single Core Aluminium Conductor**  
**XLPE Insulated Unarmoured**  
**To IEC 60502-2**  
**(Suitable for 6.35/11 kV**  
**Earthed System)**

**SINGLE CORE, A2XCy, Unarmoured Cables, 6/10 kV to IEC 60502-2**

ALUMINIUM CONDUCTOR		25	35	50	70	95	120	150	185	240	300	400	500	630	800	1000	
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>															
<b>(A) Manufacturing Dimensions</b>																	
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	67	92	125	182	251	317	390	493	646	803	1027	1307	1721	2188	2759
3.0	Insulation thickness (Nominal)	mm	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
4.0	Outer sheath thickness (Nominal)	mm	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.9	2.0	2.0	2.1	2.2	2.3	2.5	2.6
5.0	Outer sheath thickness (Minimum)	mm	1.00	1.08	1.08	1.16	1.16	1.24	1.24	1.32	1.40	1.40	1.48	1.56	1.64	1.80	1.88
6.0	Cable overall diameter (Approximate)	mm	19.0	20.0	21.5	23.0	25.0	26.5	28.0	30.0	32.5	34.5	38.0	41.0	45.0	50.5	54.5
7.0	Cable weight (Approximate)	kg/km	400	460	520	630	745	860	970	1130	1365	1580	1925	2310	2855	3535	4260
8.0	Standard drum length (±5% Tolerance)	m	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
9.0	Minimum bending radius of cable (During installation)	mm	380	400	430	460	500	530	560	600	650	690	760	820	900	1010	1090
<b>(B) Electrical Parameters</b>																	
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	0.0605	0.0469	0.0367	0.0291
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.54	1.11	0.823	0.569	0.411	0.325	0.265	0.212	0.162	0.130	0.102	0.081	0.064	0.052	0.044
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.137	0.131	0.125	0.115	0.110	0.106	0.103	0.100	0.096	0.093	0.090	0.088	0.085	0.084	0.082
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.55	1.12	0.832	0.581	0.425	0.342	0.284	0.234	0.188	0.160	0.136	0.120	0.106	0.099	0.093
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	2.685	1.940	1.441	1.006	0.736	0.592	0.492	0.405	0.326	0.277	0.236	0.208	0.184	0.171	0.161
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.21	0.23	0.25	0.29	0.32	0.35	0.38	0.42	0.47	0.51	0.57	0.63	0.71	0.81	0.89
7.0	Approximate charging current per phase at Uo = 6 kV and f= 50 Hz	mA/m	0.40	0.43	0.47	0.55	0.60	0.66	0.72	0.79	0.89	0.96	1.07	1.19	1.34	1.53	1.68
8.0	Sustained current ratings (With both end bonding):-																
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	108	129	152	186	221	252	281	317	367	414	470	528	599	672	743
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	102	122	144	176	210	240	267	303	351	397	451	512	583	658	731
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	127	154	184	230	280	324	368	424	502	577	673	770	896	1033	1167
9.0	Short circuit current rating of conductor for 1 second	kA	2.35	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60	47.00	59.22	75.20	94.00

**SECTION A - TABLE 7**

Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)



## 8.7/15 (17.5) kV Single Core Aluminium Conductor XLPE Insulated Unarmoured To IEC 60502-2 (Suitable for 8.7/15 kV Earthed System)

ALUMINIUM CONDUCTOR		SINGLE CORE, A2XCXY, Unarmoured Cables, 8.7/15 kV to IEC 60502-2															
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400	500	630	800	1000
<b>(A) Manufacturing Dimensions</b>																	
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	67	92	125	182	251	317	390	493	646	803	1027	1307	1721	2188	2759
3.0	Insulation thickness (Nominal)	mm	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
4.0	Outer sheath thickness (Nominal)	mm	1.6	1.7	1.7	1.7	1.8	1.9	1.9	2.0	2.0	2.1	2.2	2.3	2.4	2.5	2.7
5.0	Outer sheath thickness (Minimum)	mm	1.08	1.16	1.16	1.16	1.24	1.32	1.32	1.40	1.40	1.48	1.56	1.64	1.72	1.80	1.96
6.0	Cable overall diameter (Approximate)	mm	21.5	22.5	24.0	25.5	27.5	29.0	30.5	32.5	34.5	37.0	40.5	43.5	47.5	52.5	57.0
7.0	Cable weight (Approximate)	kg/km	485	550	615	720	850	975	1090	1255	1485	1725	2085	2480	3035	3715	4480
8.0	Standard drum length (±5% Tolerance)	m	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
9.0	Minimum bending radius of cable (During installation)	mm	430	450	480	510	550	580	610	650	690	740	810	870	950	1050	1140
<b>(B) Electrical Parameters</b>																	
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	0.0605	0.0469	0.0367	0.0291
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.54	1.11	0.823	0.569	0.411	0.325	0.265	0.212	0.162	0.130	0.102	0.081	0.064	0.052	0.043
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.145	0.138	0.132	0.122	0.116	0.112	0.109	0.105	0.100	0.097	0.094	0.091	0.089	0.087	0.085
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.55	1.12	0.834	0.582	0.427	0.344	0.287	0.237	0.190	0.162	0.139	0.122	0.110	0.101	0.095
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	2.685	1.940	1.445	1.008	0.740	0.596	0.497	0.410	0.329	0.281	0.241	0.211	0.191	0.175	0.165
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.17	0.19	0.21	0.23	0.26	0.28	0.30	0.33	0.37	0.40	0.45	0.49	0.55	0.63	0.69
7.0	Approximate charging current per phase at U <sub>0</sub> = 8.7 kV and f= 50 Hz	mA/m	0.46	0.52	0.57	0.63	0.71	0.77	0.82	0.90	1.01	1.09	1.23	1.34	1.50	1.72	1.89
8.0	Sustained current ratings (With both end bonding):-																
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	108	129	152	186	221	252	281	317	367	414	470	528	599	672	743
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	102	122	144	176	210	240	267	303	351	397	451	512	583	658	731
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	127	154	184	230	280	324	368	424	502	577	673	770	896	1033	1167
9.0	Short circuit current rating of conductor for 1 second	kA	2.35	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60	47.00	59.22	75.20	94.00

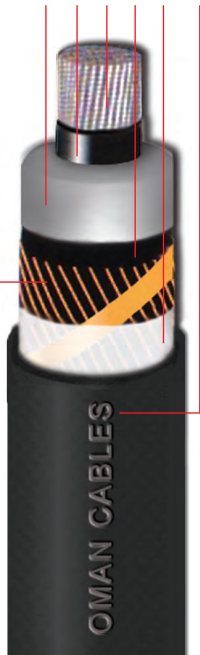
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)



**12/20 (24) kV**  
**Single Core Aluminium Conductor**  
**XLPE Insulated Unarmoured**  
**To IEC 60502-2**  
**(Suitable for 12.7/22 kV**  
**Earthed System)**

ALUMINIUM CONDUCTOR		SINGLE CORE, A2XC, Unarmoured Cables, 12/20 kV to IEC 60502-2														
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	35	50	70	95	120	150	185	240	300	400	500	630	800	1000
<b>(A) Manufacturing Dimensions</b>																
1.0	Conductor diameter (Approximate)	mm	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	92	125	182	251	317	390	493	646	803	1027	1307	1721	2188	2759
3.0	Insulation thickness (Nominal)	mm	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
4.0	Outer sheath thickness (Nominal)	mm	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7
5.0	Outer sheath thickness (Minimum)	mm	1.16	1.24	1.24	1.32	1.32	1.40	1.40	1.48	1.56	1.64	1.72	1.80	1.88	1.96
6.0	Cable overall diameter (Approximate)	mm	25.0	26.0	28.0	29.5	31.0	32.5	34.5	37.0	39.5	43.0	46.0	50.0	55.0	59.5
7.0	Cable weight (Approximate)	kg/km	635	720	830	970	1085	1215	1375	1630	1880	2250	2660	3230	3925	4680
8.0	Standard drum length (±5% Tolerance)	m	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500	500	500	500
9.0	Minimum bending radius of cable (During installation)	mm	500	520	560	590	620	650	690	740	790	860	920	1000	1100	1190
<b>(B) Electrical Parameters</b>																
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	0.0605	0.0469	0.0367	0.0291
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.11	0.823	0.569	0.411	0.325	0.265	0.212	0.162	0.130	0.102	0.081	0.064	0.052	0.043
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.145	0.137	0.128	0.121	0.116	0.113	0.109	0.104	0.101	0.098	0.095	0.092	0.090	0.088
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.12	0.834	0.583	0.428	0.345	0.288	0.238	0.193	0.165	0.141	0.125	0.112	0.104	0.098
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.940	1.445	1.010	0.741	0.598	0.499	0.412	0.334	0.286	0.244	0.217	0.194	0.180	0.170
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.16	0.18	0.20	0.22	0.24	0.26	0.28	0.31	0.34	0.38	0.42	0.46	0.53	0.58
7.0	Approximate charging current per phase at U <sub>0</sub> = 12 kV and f = 50 Hz	mA/m	0.60	0.68	0.75	0.83	0.90	0.98	1.06	1.17	1.28	1.43	1.58	1.73	2.00	2.19
8.0	Sustained current ratings (With both end bonding):-															
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	129	152	186	221	252	281	317	367	414	470	528	599	672	743
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	122	144	176	210	240	267	303	351	397	451	512	583	658	731
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	154	184	230	280	324	368	424	502	577	673	770	896	1033	1167
9.0	Short circuit current rating of conductor for 1 second	kA	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60	47.00	59.22	75.20	94.00

Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)



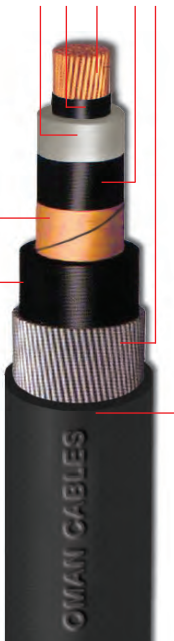
## 18/30 (36) kV Single Core Aluminium Conductor XLPE Insulated Unarmoured To IEC 60502-2 (Suitable for 19/33 kV Earthed System)

ALUMINIUM CONDUCTOR		SINGLE CORE, A2XCY, Unarmoured Cables, 18/30 kV to IEC 60502-2													
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	50	70	95	120	150	185	240	300	400	500	630	800	1000
<b>(A) Manufacturing Dimensions</b>															
1.0	Conductor diameter (Approximate)	mm	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	125	182	251	317	390	493	646	803	1027	1307	1721	2188	2759
3.0	Insulation thickness (Nominal)	mm	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
4.0	Outer sheath thickness (Nominal)	mm	1.9	2.0	2.1	2.1	2.1	2.2	2.3	2.3	2.5	2.5	2.7	2.8	2.9
5.0	Outer sheath thickness (Minimum)	mm	1.32	1.40	1.48	1.48	1.48	1.56	1.64	1.64	1.80	1.80	1.96	2.04	2.12
6.0	Cable overall diameter (Approximate)	mm	31.5	33.0	35.0	36.5	38.0	40.0	42.5	44.5	48.0	51.0	55.5	60.5	64.5
7.0	Cable weight (Approximate)	kg/km	970	1110	1265	1390	1520	1710	1990	2240	2655	3070	3695	4435	5225
8.0	Standard drum length ( $\pm 5\%$ Tolerance)	m	1000	1000	1000	1000	1000	500	500	500	500	500	500	500	500
9.0	Minimum bending radius of cable (During installation)	mm	630	660	700	730	760	800	850	890	960	1020	1110	1210	1290
<b>(B) Electrical Parameters</b>															
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	0.0605	0.0469	0.0367	0.0291
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.823	0.569	0.411	0.325	0.265	0.211	0.162	0.130	0.102	0.080	0.064	0.051	0.043
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.149	0.138	0.131	0.126	0.123	0.118	0.113	0.109	0.105	0.101	0.098	0.096	0.093
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.836	0.585	0.431	0.349	0.292	0.242	0.198	0.170	0.146	0.129	0.117	0.109	0.102
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.448	1.013	0.747	0.604	0.506	0.419	0.343	0.294	0.253	0.223	0.203	0.189	0.177
6.0	Capacitance at 50 Hz (Approximate)	$\mu$ F/km	0.14	0.15	0.17	0.18	0.20	0.21	0.23	0.25	0.28	0.30	0.34	0.38	0.42
7.0	Approximate charging current per phase at $U_0 = 18$ kV and $f = 50$ Hz	mA/m	0.79	0.85	0.96	1.02	1.13	1.19	1.30	1.41	1.58	1.70	1.92	2.15	2.38
8.0	Sustained current ratings (With both end bonding):-														
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	152	186	221	252	281	317	367	414	470	528	599	672	743
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	144	176	210	240	267	303	351	397	451	512	583	658	731
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	184	230	280	324	368	424	502	577	673	770	896	1033	1167
9.0	Short circuit current rating of conductor for 1 second	kA	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60	47.00	59.22	75.20	94.00

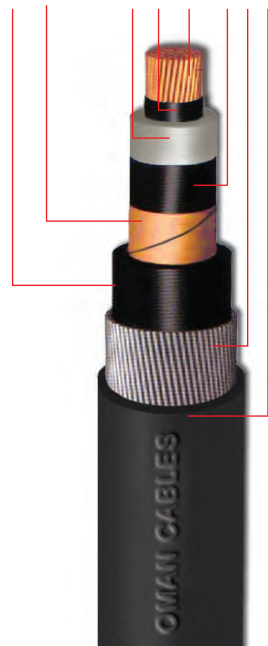
SECTION A - TABLE 10

**3.6/6 (7.2) kV  
Single Core Copper Conductor  
XLPE Insulated  
Aluminium Wire Armoured  
To IEC 60502-2  
(Suitable for 3.8/6.6 kV  
Earthed System)**

Bedding  
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)  
XLPE Insulation  
Conductor Screen (Semi-conductive)  
Copper Conductor  
Insulation Screen (Semi-conductive)  
Aluminium Wire Armour  
Outer Sheath



COPPER CONDUCTOR		SINGLE CORE, 2XCWAY, Aluminium Wire Armoured Cables, 3.6/6 kV to IEC 60502-2															
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400	500	630	800	1000
<b>(A) Manufacturing Dimensions</b>																	
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	218	303	408	591	821	1035	1277	1601	2110	2640	3383	4272	5640	7286	9046
3.0	Insulation thickness (Nominal)	mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.0	3.2	3.2	3.2	3.2
4.0	Separation sheath thickness (Nominal)	mm	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.4	1.4	1.5
5.0	Armour wire diameter (Nominal)	mm	1.6	1.6	1.6	1.6	1.6	1.6	1.6	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5
6.0	Outer sheath thickness (Nominal)	mm	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.2	2.3	2.5	2.6	2.7	2.9
7.0	Outer sheath thickness (Minimum)	mm	1.16	1.16	1.24	1.24	1.32	1.32	1.40	1.40	1.48	1.56	1.64	1.80	1.88	1.96	2.12
8.0	Cable overall diameter (Approximate)	mm	22.0	23.0	24.5	26.0	28.0	29.5	31.0	33.5	36.0	39.0	42.5	47.5	52.0	57.0	61.5
9.0	Cable weight (Approximate)	kg/km	755	875	1025	1265	1570	1840	2145	2620	3260	3920	4860	6140	7735	9680	11695
10.0	Standard drum length (±5% Tolerance)	m	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
11.0	Minimum bending radius of cable (During installation)	mm	330	345	368	390	420	443	465	503	540	585	638	713	780	855	923
<b>(B) Electrical Parameters</b>																	
<b>(i) Conductor</b>																	
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	0.0366	0.0283	0.0221	0.0176
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.928	0.669	0.494	0.343	0.247	0.196	0.160	0.128	0.098	0.079	0.063	0.051	0.041	0.035	0.030
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.146	0.139	0.133	0.123	0.117	0.113	0.110	0.107	0.102	0.100	0.097	0.097	0.094	0.092	0.090
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.939	0.683	0.512	0.364	0.273	0.226	0.194	0.167	0.141	0.127	0.116	0.110	0.103	0.098	0.095
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.626	1.183	0.887	0.630	0.473	0.391	0.336	0.289	0.244	0.220	0.201	0.191	0.178	0.170	0.165
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.26	0.29	0.32	0.37	0.42	0.46	0.50	0.54	0.59	0.61	0.64	0.67	0.75	0.86	0.94
7.0	Approximate charging current per phase at U <sub>0</sub> = 3.6 kV and f = 50 Hz	mA/m	0.29	0.33	0.36	0.42	0.48	0.52	0.57	0.61	0.67	0.69	0.72	0.76	0.85	0.97	1.06
8.0	Sustained current ratings (With both end bonding):-																
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	137	164	193	234	278	315	349	391	446	495	551	593	646	693	731
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	131	155	183	223	265	301	334	376	430	478	534	578	632	682	721
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	162	196	234	291	353	406	460	524	611	692	788	873	975	1074	1156
9.0	Short circuit current rating of conductor for 1 second	kA	3.58	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20	71.50	90.09	114.40	143.00
<b>(ii) Armour</b>																	
1.0	DC resistance at 20 °C (Approximate)	ohm/km	0.607	0.562	0.524	0.474	0.434	0.400	0.380	0.286	0.256	0.237	0.211	0.152	0.138	0.122	0.113
2.0	AC resistance at 80 °C (Approximate)	ohm/km	0.754	0.698	0.651	0.589	0.539	0.497	0.472	0.355	0.318	0.294	0.262	0.189	0.171	0.151	0.140
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	4.27	4.61	4.95	5.46	5.97	6.49	6.83	9.07	10.14	10.94	12.27	17.09	18.75	21.25	22.92



Bedding  
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)

XLPE Insulation  
Conductor Screen (Semi-conductive)  
Copper Conductor

Insulation Screen (Semi-conductive)  
Aluminium Wire Armour  
Outer Sheath

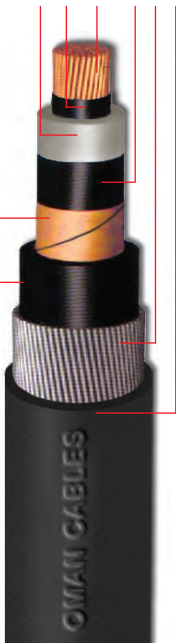
**6/10 (12) kV  
Single Core Copper Conductor  
XLPE Insulated  
Aluminium Wire Armoured  
To IEC 60502-2  
(Suitable for 6.35/11 kV  
Earthed System)**

COPPER CONDUCTOR		SINGLE CORE, 2XCWAY, Aluminium Wire Armoured Cables, 6/10 kV to IEC 60502-2															
Str. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400	500	630	800	1000
<b>(A) Manufacturing Dimensions</b>																	
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	218	303	408	591	821	1035	1277	1601	2110	2640	3383	4272	5640	7286	9046
3.0	Insulation thickness (Nominal)	mm	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
4.0	Separation sheath thickness (Nominal)	mm	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
5.0	Armour wire diameter (Nominal)	mm	1.6	1.6	1.6	1.6	1.6	1.6	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	2.5
6.0	Outer sheath thickness (Nominal)	mm	1.7	1.8	1.8	1.9	1.9	2.0	2.1	2.1	2.2	2.2	2.4	2.5	2.6	2.7	2.9
7.0	Outer sheath thickness (Minimum)	mm	1.16	1.24	1.24	1.32	1.32	1.40	1.48	1.48	1.56	1.56	1.72	1.80	1.88	1.96	2.12
8.0	Cable overall diameter (Approximate)	mm	24.0	25.0	26.0	28.0	29.5	31.5	33.5	35.5	38.0	40.0	43.5	48.0	52.0	57.5	62.0
9.0	Cable weight (Approximate)	kg/km	835	960	1110	1370	1665	1955	2355	2745	3380	4005	4940	6170	7765	9715	11745
10.0	Standard drum length (±5% Tolerance)	m	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500	500	500
11.0	Minimum bending radius of cable (During installation)	mm	360	375	390	420	443	473	503	533	570	600	653	720	780	863	930
<b>(B) Electrical Parameters</b>																	
<b>(i) Conductor</b>																	
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	0.0366	0.0283	0.0221	0.0176
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.928	0.669	0.494	0.343	0.247	0.196	0.160	0.128	0.098	0.079	0.063	0.051	0.041	0.035	0.030
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.152	0.145	0.137	0.128	0.121	0.117	0.115	0.110	0.106	0.102	0.099	0.098	0.094	0.092	0.090
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.940	0.685	0.513	0.366	0.275	0.228	0.197	0.169	0.144	0.129	0.117	0.110	0.103	0.098	0.095
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.628	1.186	0.889	0.634	0.476	0.395	0.341	0.293	0.249	0.223	0.203	0.191	0.178	0.170	0.165
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.21	0.23	0.25	0.29	0.32	0.35	0.38	0.42	0.47	0.51	0.57	0.63	0.71	0.81	0.89
7.0	Approximate charging current per phase at U <sub>0</sub> = 6 kV and f = 50 Hz	mA/m	0.40	0.43	0.47	0.55	0.60	0.66	0.72	0.79	0.89	0.96	1.07	1.19	1.34	1.53	1.68
8.0	Sustained current ratings (With both end bonding):-																
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	137	164	193	234	278	315	349	391	446	495	551	593	646	693	731
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	131	155	183	223	265	301	334	376	430	478	534	578	632	682	721
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	162	196	234	291	353	406	460	524	611	692	788	873	975	1074	1156
9.0	Short circuit current rating of conductor for 1 second	kA	3.58	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20	71.50	90.09	114.40	143.00
<b>(ii) Armour</b>																	
1.0	DC resistance at 20 °C (Approximate)	ohm/km	0.542	0.506	0.474	0.434	0.400	0.370	0.286	0.270	0.243	0.226	0.207	0.152	0.138	0.122	0.111
2.0	AC resistance at 80 °C (Approximate)	ohm/km	0.673	0.628	0.589	0.539	0.497	0.459	0.355	0.335	0.302	0.281	0.257	0.189	0.171	0.151	0.138
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	4.78	5.12	5.46	5.97	6.49	7.00	9.07	9.60	10.67	11.47	12.54	17.09	18.75	21.25	23.34

SECTION B - TABLE 2

# 8.7/15 (17.5) kV Single Core Copper Conductor XLPE Insulated Aluminium Wire Armoured To IEC 60502-2 (Suitable for 8.7/15 kV Earthed System)

Bedding  
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)  
XLPE Insulation  
Conductor Screen (Semi-conductive)  
Copper Conductor  
Insulation Screen (Semi-conductive)  
Aluminium Wire Armour  
Outer Sheath



COPPER CONDUCTOR		SINGLE CORE, 2XCWwY, Aluminium Wire Armoured Cables, 8.7/15 kV to IEC 60502-2															
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400	500	630	800	1000
<b>(A) Manufacturing Dimensions</b>																	
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	218	303	408	591	821	1035	1277	1601	2110	2640	3383	4272	5640	7286	9046
3.0	Insulation thickness (Nominal)	mm	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
4.0	Separation sheath thickness (Nominal)	mm	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
5.0	Armour wire diameter (Nominal)	mm	1.6	1.6	1.6	1.6	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5
6.0	Outer sheath thickness (Nominal)	mm	1.8	1.9	1.9	1.9	2.0	2.1	2.1	2.2	2.3	2.3	2.5	2.6	2.7	2.8	3.0
7.0	Outer sheath thickness (Minimum)	mm	1.24	1.32	1.32	1.32	1.40	1.48	1.48	1.56	1.64	1.64	1.80	1.88	1.96	2.04	2.20
8.0	Cable overall diameter (Approximate)	mm	26.0	27.5	28.5	30.0	33.0	34.5	36.0	37.5	40.5	42.5	47.5	50.5	54.5	59.5	64.5
9.0	Cable weight (Approximate)	kg/km	940	1080	1235	1490	1890	2190	2495	2920	3555	4190	5315	6395	8005	9970	12045
10.0	Standard drum length (±5% Tolerance)	m	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500	500	500	500	500
11.0	Minimum bending radius of cable (During installation)	mm	390	413	428	450	495	518	540	563	608	638	713	758	818	893	968
<b>(B) Electrical Parameters</b>																	
<b>(i) Conductor</b>																	
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	0.0366	0.0283	0.0221	0.0176
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.928	0.669	0.494	0.343	0.247	0.196	0.159	0.128	0.098	0.079	0.063	0.051	0.041	0.034	0.030
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.157	0.151	0.143	0.132	0.128	0.123	0.119	0.114	0.110	0.106	0.104	0.101	0.097	0.095	0.093
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.941	0.686	0.514	0.368	0.278	0.231	0.199	0.171	0.147	0.132	0.122	0.113	0.105	0.101	0.098
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.630	1.188	0.890	0.637	0.482	0.400	0.345	0.296	0.255	0.229	0.211	0.196	0.182	0.175	0.170
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.17	0.19	0.21	0.23	0.26	0.28	0.30	0.33	0.37	0.40	0.45	0.49	0.55	0.63	0.69
7.0	Approximate charging current per phase at U <sub>o</sub> = 8.7 kV and f = 50 Hz	mA/m	0.46	0.52	0.57	0.63	0.71	0.77	0.82	0.90	1.01	1.09	1.23	1.34	1.50	1.72	1.89
8.0	Sustained current ratings (With both end bonding):- Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	137	164	193	234	278	315	349	391	446	495	551	593	646	693	731
8.1	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	131	155	183	223	265	301	334	376	430	478	534	578	632	682	721
8.2	Laid in trefoil formation in air, ambient temp. = 30 °C	A	162	196	234	291	353	406	460	524	611	692	788	873	975	1074	1156
8.3	Short circuit current rating of conductor for 1 second	kA	3.58	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20	71.50	90.09	114.40	143.00
<b>(ii) Armour</b>																	
1.0	DC resistance at 20 °C (Approximate)	ohm/km	0.474	0.447	0.422	0.389	0.294	0.278	0.263	0.243	0.226	0.211	0.155	0.141	0.130	0.115	0.105
2.0	AC resistance at 80 °C (Approximate)	ohm/km	0.589	0.555	0.524	0.483	0.365	0.345	0.327	0.302	0.281	0.262	0.192	0.175	0.161	0.143	0.130
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	5.46	5.80	6.15	6.66	8.80	9.34	9.87	10.67	11.47	12.27	16.67	18.34	20.00	22.50	24.59





Bedding  
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)  
XLPE Insulation  
Conductor Screen (Semi-conductive)  
Copper Conductor  
Insulation Screen (Semi-conductive)  
Aluminium Wire Armour  
Outer Sheath

**12/20 (24) kV**  
**Single Core Copper Conductor**  
**XLPE Insulated**  
**Aluminium Wire Armoured**  
**To IEC 60502-2**  
**(Suitable for 12.7/22 kV**  
**Earthed System)**

SINGLE CORE, 2XCWwY, Aluminium Wire Armoured Cables, 12/20 kV to IEC 60502-2																
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	35	50	70	95	120	150	185	240	300	400	500	630	800	1000
<b>(A) Manufacturing Dimensions</b>																
1.0	Conductor diameter (Approximate)	mm	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	303	408	591	821	1035	1277	1601	2110	2640	3383	4272	5640	7286	9046
3.0	Insulation thickness (Nominal)	mm	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
4.0	Separation sheath thickness (Nominal)	mm	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.6
5.0	Armour wire diameter (Nominal)	mm	1.6	1.6	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5	2.5
6.0	Outer sheath thickness (Nominal)	mm	1.9	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.4	2.5	2.6	2.8	2.9	3.0
7.0	Outer sheath thickness (Minimum)	mm	1.32	1.40	1.40	1.48	1.48	1.56	1.56	1.64	1.72	1.80	1.88	2.04	2.12	2.20
8.0	Cable overall diameter (Approximate)	mm	29.5	31.0	33.5	35.0	36.5	38.0	40.0	42.5	46.0	49.5	53.0	57.0	62.0	66.5
9.0	Cable weight (Approximate)	kg/km	1200	1375	1720	2045	2330	2660	3075	3720	4555	5515	6615	8215	10225	12290
10.0	Standard drum length (±5% Tolerance)	m	1000	1000	1000	1000	1000	1000	500	500	500	500	500	500	500	500
11.0	Minimum bending radius of cable (During installation)	mm	443	465	503	525	548	570	600	638	690	743	795	855	930	998
<b>(B) Electrical Parameters</b>																
<b>(i) Conductor</b>																
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	0.0366	0.0283	0.0221	0.0176
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.669	0.494	0.343	0.247	0.196	0.159	0.128	0.098	0.079	0.063	0.051	0.041	0.034	0.029
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.155	0.148	0.139	0.131	0.126	0.123	0.118	0.113	0.111	0.107	0.104	0.100	0.097	0.095
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.687	0.516	0.370	0.280	0.233	0.201	0.174	0.150	0.136	0.124	0.116	0.108	0.103	0.099
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.190	0.894	0.641	0.485	0.404	0.348	0.301	0.260	0.236	0.215	0.201	0.187	0.178	0.171
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.16	0.18	0.20	0.22	0.24	0.26	0.28	0.31	0.34	0.38	0.42	0.46	0.53	0.58
7.0	Approximate charging current per phase at U <sub>0</sub> = 12 kV and f = 50 Hz	mA/m	0.60	0.68	0.75	0.83	0.90	0.98	1.06	1.17	1.28	1.43	1.58	1.73	2.00	2.19
8.0	Sustained current ratings (With both end bonding):-															
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	164	193	234	278	315	349	391	446	495	551	593	646	693	731
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	155	183	223	265	301	334	376	430	478	534	578	632	682	721
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	196	234	291	353	406	460	524	611	692	788	873	975	1074	1156
9.0	Short circuit current rating of conductor for 1 second	kA	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20	71.50	90.09	114.40	143.00
<b>(ii) Armour</b>																
1.0	DC resistance at 20 °C (Approximate)	ohm/km	0.400	0.380	0.286	0.270	0.256	0.243	0.226	0.211	0.159	0.145	0.135	0.124	0.111	0.102
2.0	AC resistance at 80 °C (Approximate)	ohm/km	0.497	0.472	0.355	0.335	0.318	0.302	0.281	0.262	0.197	0.180	0.168	0.154	0.138	0.127
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	6.49	6.83	9.07	9.60	10.14	10.67	11.47	12.27	16.25	17.92	19.17	20.84	23.34	25.42

SECTION B - TABLE 4

Bedding

Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)

XLPE Insulation

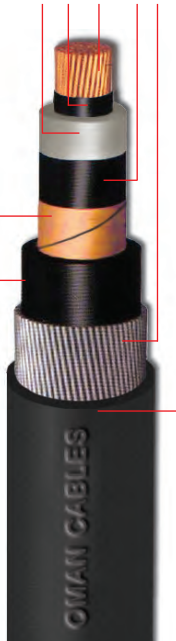
Conductor Screen (Semi-conductive)

Copper Conductor

Insulation Screen (Semi-conductive)

Aluminium Wire Armour

Outer Sheath



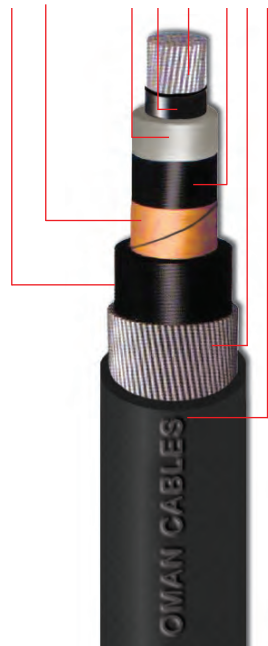
# 18/30 (36) kV Single Core Copper Conductor XLPE Insulated Aluminium Wire Armoured To IEC 60502-2 (Suitable for 19/33 kV Earthed System)

## SINGLE CORE, 2XCW<sub>A</sub>Y, Aluminium Wire Armoured Cables, 18/30 kV to IEC 60502-2

Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	50	70	95	120	150	185	240	300	400	500	630	800	1000
<b>(A) Manufacturing Dimensions</b>															
1.0	Conductor diameter (Approximate)	mm	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	408	591	821	1035	1277	1601	2110	2640	3383	4272	5640	7286	9046
3.0	Insulation thickness (Nominal)	mm	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
4.0	Separation sheath thickness (Nominal)	mm	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.7
5.0	Armour wire diameter (Nominal)	mm	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
6.0	Outer sheath thickness (Nominal)	mm	2.2	2.2	2.3	2.3	2.4	2.5	2.5	2.6	2.7	2.8	2.9	3.1	3.2
7.0	Outer sheath thickness (Minimum)	mm	1.56	1.56	1.64	1.64	1.72	1.80	1.80	1.88	1.96	2.04	2.12	2.28	2.36
8.0	Cable overall diameter (Approximate)	mm	37.0	38.5	40.5	42.0	45.0	46.5	49.0	52.0	55.0	58.5	62.0	67.5	72.0
9.0	Cable weight (Approximate)	kg/km	1810	2085	2425	2725	3245	3695	4345	5065	6040	7155	8790	10880	12980
10.0	Standard drum length (±5% Tolerance)	m	1000	500	500	500	500	500	500	500	500	500	500	500	500
11.0	Minimum bending radius of cable (During installation)	mm	555	578	608	630	675	698	735	780	825	878	930	1013	1080
<b>(B) Electrical Parameters</b>															
<b>(i) Conductor</b>															
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	0.0366	0.0283	0.0221	0.0176
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.494	0.343	0.247	0.196	0.159	0.128	0.098	0.079	0.063	0.050	0.041	0.034	0.029
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.159	0.148	0.141	0.135	0.133	0.127	0.122	0.118	0.114	0.110	0.105	0.103	0.100
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.519	0.374	0.284	0.238	0.207	0.180	0.156	0.142	0.130	0.121	0.113	0.108	0.104
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	0.899	0.648	0.492	0.412	0.359	0.312	0.270	0.246	0.225	0.210	0.196	0.187	0.180
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.14	0.15	0.17	0.18	0.20	0.21	0.23	0.25	0.28	0.30	0.34	0.38	0.42
7.0	Approximate charging current per phase at U <sub>0</sub> = 18 kV and f = 50 Hz	mA/m	0.79	0.85	0.96	1.02	1.13	1.19	1.30	1.41	1.58	1.70	1.92	2.15	2.38
8.0	Sustained current ratings (With both end bonding):- Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	193	234	278	315	349	391	446	495	551	593	646	693	731
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	183	223	265	301	334	376	430	478	534	578	632	682	721
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	234	291	353	406	460	524	611	692	788	873	975	1074	1156
9.0	Short circuit current rating of conductor for 1 second	kA	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20	71.50	90.09	114.40	143.00
<b>(ii) Armour</b>															
1.0	DC resistance at 20 °C (Approximate)	ohm/km	0.249	0.237	0.226	0.216	0.164	0.155	0.148	0.138	0.130	0.120	0.111	0.100	0.093
2.0	AC resistance at 80 °C (Approximate)	ohm/km	0.309	0.294	0.281	0.268	0.204	0.192	0.184	0.171	0.161	0.149	0.138	0.124	0.115
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	10.40	10.94	11.47	12.00	15.84	16.67	17.50	18.75	20.00	21.67	23.34	25.84	27.92

### SECTION B - TABLE 5

Bedding  
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)  
XLPE Insulation  
Conductor Screen (Semi-conductive)  
Aluminium Conductor  
Insulation Screen (Semi-conductive)  
Aluminium Wire Armour  
Outer Sheath



**3.6/6 (7.2) kV  
Single Core Aluminium Conductor  
XLPE Insulated  
Aluminium Wire Armoured  
To IEC 60502-2  
(Suitable for 3.8/6.6 kV  
Earthed System)**

ALUMINIUM CONDUCTOR		SINGLE CORE, A2XCWAlY, Aluminium Wire Armoured Cables, 3.6/6 kV to IEC 60502-2															
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400	500	630	800	1000
<b>(A) Manufacturing Dimensions</b>																	
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	67	92	125	182	251	317	390	493	646	803	1027	1307	1721	2188	2759
3.0	Insulation thickness (Nominal)	mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.0	3.2	3.2	3.2	3.2
4.0	Separation sheath thickness (Nominal)	mm	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.4	1.4	1.5
5.0	Armour wire diameter (Nominal)	mm	1.6	1.6	1.6	1.6	1.6	1.6	1.6	2.0	2.0	2.0	2.0	2.0	2.5	2.5	2.5
6.0	Outer sheath thickness (Nominal)	mm	1.7	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.2	2.3	2.5	2.6	2.7	2.9
7.0	Outer sheath thickness (Minimum)	mm	1.16	1.16	1.24	1.24	1.32	1.32	1.40	1.40	1.48	1.56	1.64	1.80	1.88	1.96	2.12
8.0	Cable overall diameter (Approximate)	mm	22.0	23.0	24.5	26.0	28.0	29.5	31.0	33.5	36.0	39.0	42.5	47.5	52.0	57.0	61.5
9.0	Cable weight (Approximate)	kg/km	605	665	740	855	1000	1125	1255	1510	1795	2080	2500	3175	3815	4580	5405
10.0	Standard drum length (±5% Tolerance)	m	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500	500	500
11.0	Minimum bending radius of cable (During installation)	mm	330	345	368	390	420	443	465	503	540	585	638	713	780	855	923
<b>(B) Electrical Parameters</b>																	
<b>(i) Conductor</b>																	
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	0.0605	0.0469	0.0367	0.0291
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.54	1.11	0.823	0.569	0.411	0.325	0.265	0.212	0.162	0.130	0.102	0.080	0.064	0.052	0.043
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.146	0.139	0.133	0.123	0.117	0.113	0.110	0.107	0.102	0.100	0.097	0.097	0.094	0.092	0.090
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.55	1.12	0.834	0.582	0.427	0.344	0.287	0.237	0.191	0.164	0.141	0.126	0.114	0.106	0.100
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	2.685	1.940	1.445	1.008	0.740	0.596	0.497	0.410	0.331	0.284	0.244	0.218	0.197	0.184	0.173
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.26	0.29	0.32	0.37	0.42	0.46	0.50	0.54	0.59	0.61	0.64	0.67	0.75	0.86	0.94
7.0	Approximate charging current per phase at U <sub>0</sub> = 3.6 kV and f = 50 Hz	mA/m	0.29	0.33	0.36	0.42	0.48	0.52	0.57	0.61	0.67	0.69	0.72	0.76	0.85	0.97	1.06
8.0	Sustained current ratings (With both end bonding):-																
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	107	127	150	182	217	246	274	309	355	397	448	494	549	601	648
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	101	121	142	174	207	235	262	297	342	383	434	482	537	592	639
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	126	152	182	226	275	317	360	413	485	552	638	724	824	927	1020
9.0	Short circuit current rating of conductor for 1 second	kA	2.35	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60	47.00	59.22	75.20	94.00
<b>(ii) Armour</b>																	
1.0	DC resistance at 20 °C (Approximate)	ohm/km	0.607	0.562	0.524	0.474	0.434	0.400	0.380	0.286	0.256	0.237	0.211	0.152	0.138	0.122	0.113
2.0	AC resistance at 80 °C (Approximate)	ohm/km	0.754	0.698	0.651	0.589	0.539	0.497	0.472	0.355	0.318	0.294	0.262	0.189	0.171	0.151	0.140
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	4.27	4.61	4.95	5.46	5.97	6.49	6.83	9.07	10.14	10.94	12.27	17.09	18.75	21.25	22.92

SECTION B - TABLE 6

**6/10 (12) kV  
Single Core Aluminium Conductor  
XLPE Insulated  
Aluminium Wire Armoured  
To IEC 60502-2  
(Suitable for 6.35/11 kV  
Earthed System)**

Bedding  
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape  
or copper tape (The details given in below Table are for  
copper tape screened cables). For copper wire screened  
cables the details can be given on specific request.)

XLPE Insulation

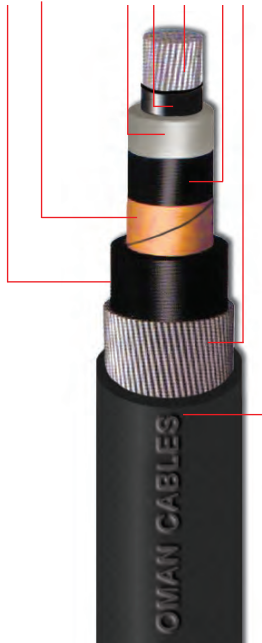
Conductor Screen (Semi-conductive)

Aluminium Conductor

Insulation Screen (Semi-conductive)

Aluminium Wire Armour

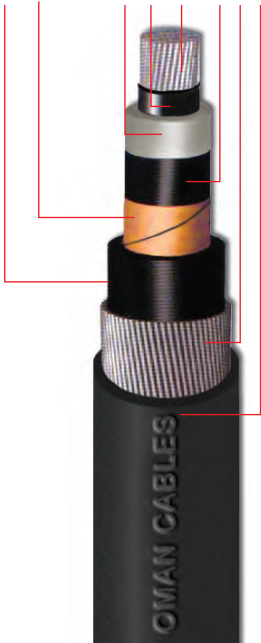
Outer Sheath



ALUMINIUM CONDUCTOR		SINGLE CORE, A2XCWwY, Aluminium Wire Armoured Cables, 6/10 kV to IEC 60502-2															
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400	500	630	800	1000
<b>(A) Manufacturing Dimensions</b>																	
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	67	92	125	182	251	317	390	493	646	803	1027	1307	1721	2188	2759
3.0	Insulation thickness (Nominal)	mm	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
4.0	Separation sheath thickness (Nominal)	mm	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
5.0	Armour wire diameter (Nominal)	mm	1.6	1.6	1.6	1.6	1.6	1.6	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	2.5
6.0	Outer sheath thickness (Nominal)	mm	1.7	1.8	1.8	1.9	1.9	2.0	2.1	2.1	2.2	2.2	2.4	2.5	2.6	2.7	2.9
7.0	Outer sheath thickness (Minimum)	mm	1.16	1.24	1.24	1.32	1.32	1.40	1.48	1.48	1.56	1.56	1.72	1.80	1.88	1.96	2.12
8.0	Cable overall diameter (Approximate)	mm	24.0	25.0	26.0	28.0	29.5	31.5	33.5	35.5	38.0	40.0	43.5	48.0	52.0	57.5	62.0
9.0	Cable weight (Approximate)	kg/km	685	750	830	960	1095	1235	1465	1640	1920	2170	2585	3205	3845	4615	5455
10.0	Standard drum length (±5% Tolerance)	m	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500	500	500
11.0	Minimum bending radius of cable (During installation)	mm	360	375	390	420	443	473	503	533	570	600	653	720	780	863	930
<b>(B) Electrical Parameters</b>																	
<b>(i) Conductor</b>																	
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	0.0605	0.0469	0.0367	0.0291
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.54	1.11	0.823	0.569	0.411	0.325	0.265	0.212	0.162	0.130	0.102	0.080	0.064	0.052	0.043
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.152	0.145	0.137	0.128	0.121	0.117	0.115	0.110	0.106	0.102	0.099	0.098	0.094	0.092	0.090
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.55	1.12	0.834	0.583	0.428	0.345	0.289	0.239	0.194	0.165	0.142	0.127	0.114	0.106	0.100
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	2.685	1.940	1.445	1.010	0.741	0.598	0.501	0.414	0.336	0.286	0.246	0.220	0.197	0.184	0.173
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.21	0.23	0.25	0.29	0.32	0.35	0.38	0.42	0.47	0.51	0.57	0.63	0.71	0.81	0.89
7.0	Approximate charging current per phase at U <sub>0</sub> = 6 kV and f = 50 Hz	mA/m	0.40	0.43	0.47	0.55	0.60	0.66	0.72	0.79	0.89	0.96	1.07	1.19	1.34	1.53	1.68
8.0	Sustained current ratings (With both end bonding):-																
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	107	127	150	182	217	246	274	309	355	397	448	494	549	601	648
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	101	121	142	174	207	235	262	297	342	383	434	482	537	592	639
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	126	152	182	226	275	317	360	413	485	552	638	724	824	927	1020
9.0	Short circuit current rating of conductor for 1 second	kA	2.35	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60	47.00	59.22	75.20	94.00
<b>(ii) Armour</b>																	
1.0	DC resistance at 20 °C (Approximate)	ohm/km	0.542	0.506	0.474	0.434	0.400	0.370	0.286	0.270	0.243	0.226	0.207	0.152	0.138	0.122	0.111
2.0	AC resistance at 80 °C (Approximate)	ohm/km	0.673	0.628	0.589	0.539	0.497	0.459	0.355	0.335	0.302	0.281	0.257	0.189	0.171	0.151	0.138
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	4.78	5.12	5.46	5.97	6.49	7.00	9.07	9.60	10.67	11.47	12.54	17.09	18.75	21.25	23.34

**8.7/15 (17.5) kV  
Single Core Aluminium Conductor  
XLPE Insulated  
Aluminium Wire Armoured  
To IEC 60502-2  
(Suitable for 8.7/15 kV  
Earthed System)**

Bedding  
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape  
or copper tape (The details given in below Table are for  
copper tape screened cables). For copper wire screened  
cables the details can be given on specific request.)  
XLPE Insulation  
Conductor Screen (Semi-conductive)  
Aluminium Conductor  
Insulation Screen (Semi-conductive)  
Aluminium Wire Armour  
Outer Sheath



ALUMINIUM CONDUCTOR		SINGLE CORE, A2XCWwY, Aluminium Wire Armoured Cables, 8.7/15 kV to IEC 60502-2															
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400	500	630	800	1000
<b>(A) Manufacturing Dimensions</b>																	
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	67	92	125	182	251	317	390	493	646	803	1027	1307	1721	2188	2759
3.0	Insulation thickness (Nominal)	mm	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
4.0	Separation sheath thickness (Nominal)	mm	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.4	1.5	1.6
5.0	Armour wire diameter (Nominal)	mm	1.6	1.6	1.6	1.6	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5
6.0	Outer sheath thickness (Nominal)	mm	1.8	1.9	1.9	1.9	2.0	2.1	2.1	2.2	2.3	2.3	2.5	2.6	2.7	2.8	3.0
7.0	Outer sheath thickness (Minimum)	mm	1.24	1.32	1.32	1.32	1.40	1.48	1.48	1.56	1.64	1.64	1.80	1.88	1.96	2.04	2.20
8.0	Cable overall diameter (Approximate)	mm	26.0	27.5	28.5	30.0	33.0	34.5	36.0	37.5	40.5	42.5	47.5	50.5	54.5	59.5	64.5
9.0	Cable weight (Approximate)	kg/km	790	870	955	1080	1320	1470	1605	1810	2090	2350	2960	3430	4085	4875	5760
10.0	Standard drum length (±5% Tolerance)	m	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500	500	500	500	500
11.0	Minimum bending radius of cable (During installation)	mm	390	413	428	450	495	518	540	563	608	638	713	758	818	893	968
<b>(B) Electrical Parameters</b>																	
<b>(i) Conductor</b>																	
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	0.0605	0.0469	0.0367	0.0291
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.54	1.11	0.823	0.569	0.411	0.325	0.265	0.211	0.162	0.130	0.102	0.080	0.064	0.051	0.043
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.157	0.151	0.143	0.132	0.128	0.123	0.119	0.114	0.110	0.106	0.104	0.101	0.097	0.095	0.093
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.55	1.12	0.835	0.584	0.430	0.347	0.290	0.240	0.196	0.168	0.146	0.129	0.116	0.108	0.102
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	2.685	1.940	1.446	1.012	0.745	0.601	0.502	0.416	0.339	0.291	0.253	0.223	0.201	0.187	0.177
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.17	0.19	0.21	0.23	0.26	0.28	0.30	0.33	0.37	0.40	0.45	0.49	0.55	0.63	0.69
7.0	Approximate charging current per phase at U <sub>0</sub> = 8.7 kV and f = 50 Hz	mA/m	0.46	0.52	0.57	0.63	0.71	0.77	0.82	0.90	1.01	1.09	1.23	1.34	1.50	1.72	1.89
8.0	Sustained current ratings (With both end bonding):-																
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	107	127	150	182	217	246	274	309	355	397	448	494	549	601	648
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	101	121	142	174	207	235	262	297	342	383	434	482	537	592	639
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	126	152	182	226	275	317	360	413	485	552	638	724	824	927	1020
9.0	Short circuit current rating of conductor for 1 second	kA	2.35	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60	47.00	59.22	75.20	94.00
<b>(ii) Armour</b>																	
1.0	DC resistance at 20 °C (Approximate)	ohm/km	0.474	0.447	0.422	0.389	0.294	0.278	0.263	0.243	0.226	0.211	0.155	0.141	0.130	0.115	0.105
2.0	AC resistance at 80 °C (Approximate)	ohm/km	0.589	0.555	0.524	0.483	0.365	0.345	0.327	0.302	0.281	0.262	0.192	0.175	0.161	0.143	0.130
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	5.46	5.80	6.15	6.66	8.80	9.34	9.87	10.67	11.47	12.27	16.67	18.34	20.00	22.50	24.59

**SECTION B - TABLE 8**

Bedding

Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)

XLPE Insulation

Conductor Screen (Semi-conductive)

Aluminium Conductor

Insulation Screen (Semi-conductive)

Aluminium Wire Armour

Outer Sheath



**12/20 (24) kV  
Single Core Aluminium Conductor  
XLPE Insulated  
Aluminium Wire Armoured  
To IEC 60502-2  
(Suitable for 12.7/22 kV  
Earthed System)**

ALUMINIUM CONDUCTOR		SINGLE CORE, A2XCWwY, Aluminium Wire Armoured Cables, 12/20 kV to IEC 60502-2														
Str. No.	Nominal Area of Conductor (A)	mm <sup>2</sup>	35	50	70	95	120	150	185	240	300	400	500	630	800	1000
1.0	Conductor diameter (Approximate)	mm	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	92	125	182	251	317	390	493	646	803	1027	1307	1721	2188	2759
3.0	Insulation thickness (Nominal)	mm	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
4.0	Separation sheath thickness (Nominal)	mm	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.4	1.4	1.5	1.6
5.0	Armour wire diameter (Nominal)	mm	1.6	1.6	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5
6.0	Outer sheath thickness (Nominal)	mm	1.9	2.0	2.0	2.1	2.1	2.2	2.2	2.3	2.4	2.5	2.6	2.8	2.9	3.0
7.0	Outer sheath thickness (Minimum)	mm	1.32	1.40	1.40	1.48	1.48	1.56	1.56	1.64	1.72	1.80	1.88	2.04	2.12	2.20
8.0	Cable overall diameter (Approximate)	mm	29.5	31.0	33.5	35.0	36.5	38.0	40.0	42.5	46.0	49.5	53.0	57.0	62.0	66.5
9.0	Cable weight (Approximate)	kg/km	990	1090	1310	1475	1615	1770	1965	2255	2720	3160	3650	4295	5130	6005
10.0	Standard drum length (±5% Tolerance)	m	1000	1000	1000	1000	1000	1000	500	500	500	500	500	500	500	500
11.0	Minimum bending radius of cable (During installation)	mm	443	465	503	525	548	570	600	638	690	743	795	855	930	998
<b>(B) Electrical Parameters</b>																
<b>(i) Conductor</b>																
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	0.0605	0.0469	0.0367	0.0291
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.11	0.823	0.569	0.411	0.325	0.265	0.211	0.162	0.130	0.102	0.080	0.064	0.051	0.043
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.155	0.148	0.139	0.131	0.126	0.123	0.118	0.113	0.111	0.107	0.104	0.100	0.097	0.095
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.12	0.836	0.586	0.431	0.349	0.292	0.242	0.198	0.171	0.148	0.131	0.119	0.110	0.104
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.940	1.448	1.015	0.747	0.604	0.506	0.419	0.343	0.296	0.256	0.227	0.206	0.191	0.180
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.16	0.18	0.20	0.22	0.24	0.26	0.28	0.31	0.34	0.38	0.42	0.46	0.53	0.58
7.0	Approximate charging current per phase at U <sub>0</sub> = 12 kV and f = 50 Hz	mA/m	0.60	0.68	0.75	0.83	0.90	0.98	1.06	1.17	1.28	1.43	1.58	1.73	2.00	2.19
8.0	Sustained current ratings (With both end bonding):-															
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	127	150	182	217	246	274	309	355	397	448	494	549	601	648
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	121	142	174	207	235	262	297	342	383	434	482	537	592	639
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	152	182	226	275	317	360	413	485	562	638	724	824	927	1020
9.0	Short circuit current rating of conductor for 1 second	kA	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60	47.00	59.22	75.20	94.00
<b>(ii) Armour</b>																
1.0	DC resistance at 20 °C (Approximate)	ohm/km	0.400	0.380	0.286	0.270	0.256	0.243	0.226	0.211	0.159	0.145	0.135	0.124	0.111	0.102
2.0	AC resistance at 80 °C (Approximate)	ohm/km	0.497	0.472	0.355	0.335	0.318	0.302	0.281	0.262	0.197	0.180	0.168	0.154	0.138	0.127
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	6.49	6.83	9.07	9.60	10.14	10.67	11.47	12.27	16.25	17.92	19.17	20.84	23.34	25.42

**SECTION B - TABLE 9**

**18/30 (36) kV**  
**Single Core Aluminium Conductor**  
**XLPE Insulated**  
**Aluminium Wire Armoured**  
**To IEC 60502-2**  
**(Suitable for 19/33 kV**  
**Earthed System)**

Bedding  
 Metallic Copper Screen  
 (Copper screen can be of Cu wires + open helix Cu tape  
 or copper tape (The details given in below Table are for  
 copper tape screened cables). For copper wire screened  
 cables the details can be given on specific request.)  
 XLPE Insulation  
 Conductor Screen (Semi-conductive)  
 Aluminium Conductor  
 Insulation Screen (Semi-conductive)  
 Aluminium Wire Armour  
 Outer Sheath



ALUMINIUM CONDUCTOR															
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	50	70	95	120	150	185	240	300	400	500	630	800	1000
<b>(A) Manufacturing Dimensions</b>															
1.0	Conductor diameter (Approximate)	mm	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	26.3	30.0	34.2	38.2
2.0	Conductor weight (Approximate)	kg/km	125	182	251	317	390	493	646	803	1027	1307	1721	2188	2759
3.0	Insulation thickness (Nominal)	mm	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
4.0	Separation sheath thickness (Nominal)	mm	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.7
5.0	Armour wire diameter (Nominal)	mm	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
6.0	Outer sheath thickness (Nominal)	mm	2.2	2.2	2.3	2.3	2.4	2.5	2.5	2.6	2.7	2.8	2.9	3.1	3.2
7.0	Outer sheath thickness (Minimum)	mm	1.56	1.56	1.64	1.64	1.72	1.80	1.80	1.88	1.96	2.04	2.12	2.28	2.36
8.0	Cable overall diameter (Approximate)	mm	37.0	38.5	40.5	42.0	45.0	46.5	49.0	52.0	55.0	58.5	62.0	67.5	72.0
9.0	Cable weight (Approximate)	kg/km	1530	1675	1855	2005	2355	2585	2880	3230	3685	4190	4870	5780	6695
10.0	Standard drum length (±5% Tolerance)	m	1000	500	500	500	500	500	500	500	500	500	500	500	500
11.0	Minimum bending radius of cable (During installation)	mm	555	578	608	630	675	698	735	780	825	878	930	1013	1080
<b>(B) Electrical Parameters</b>															
<b>(i) Conductor</b>															
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	0.0605	0.0469	0.0367	0.0291
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.823	0.569	0.411	0.325	0.265	0.211	0.162	0.130	0.102	0.080	0.063	0.051	0.042
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.159	0.148	0.141	0.135	0.133	0.127	0.122	0.118	0.114	0.110	0.105	0.103	0.100
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.838	0.588	0.435	0.352	0.297	0.246	0.203	0.176	0.153	0.136	0.122	0.115	0.108
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.451	1.018	0.753	0.610	0.514	0.426	0.352	0.305	0.265	0.236	0.211	0.199	0.187
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.14	0.15	0.17	0.18	0.20	0.21	0.23	0.25	0.28	0.30	0.34	0.38	0.42
7.0	Approximate charging current per phase at U <sub>0</sub> = 18 kV and f = 50 Hz	mA/m	0.79	0.85	0.96	1.02	1.13	1.19	1.30	1.41	1.58	1.70	1.92	2.15	2.38
8.0	Sustained current ratings (With both end bonding):-														
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation.	A	150	182	217	246	274	309	355	397	448	494	549	601	648
8.2	Drawn into earthenware duct, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid in trefoil formation in One Common Duct	A	142	174	207	235	262	297	342	383	434	482	537	592	639
8.3	Laid in trefoil formation in air, ambient temp. = 30 °C	A	182	226	275	317	360	413	485	552	638	724	824	927	1020
9.0	Short circuit current rating of conductor for 1 second	kA	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60	47.00	59.22	75.20	94.00
<b>(ii) Armour</b>															
1.0	DC resistance at 20 °C (Approximate)	ohm/km	0.249	0.237	0.226	0.216	0.164	0.155	0.148	0.138	0.130	0.120	0.111	0.100	0.093
2.0	AC resistance at 80 °C (Approximate)	ohm/km	0.309	0.294	0.281	0.268	0.204	0.192	0.184	0.171	0.161	0.149	0.138	0.124	0.115
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	10.40	10.94	11.47	12.00	15.84	16.67	17.50	18.75	20.00	21.67	23.34	25.84	27.92

SECTION B - TABLE 10



**Fillers**  
 Metallic Copper Screen  
 (Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)  
 XLPE Insulation  
 Conductor Screen (Semi-conductive)  
 Copper Conductor  
 Insulation Screen (Semi-conductive)  
 Binder tape  
 Outer Sheath

## 3.6/6 (7.2) kV Three Core Copper Conductor XLPE Insulated Unarmoured To IEC 60502-2 (Suitable for 3.8/6.6 kV Earthed System)

COPPER CONDUCTOR		THREE CORE, 2XCEY, Unarmoured Cables, 3.6/6 kV to IEC 60502-2											
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400
<b>(A) Manufacturing Dimensions</b>													
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	665	922	1242	1800	2500	3152	3888	4875	6425	8039	10301
3.0	Insulation thickness (Nominal)	mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.0
4.0	Outer sheath thickness (Nominal)	mm	2.1	2.1	2.2	2.3	2.5	2.6	2.7	2.8	3.0	3.2	3.4
5.0	Outer sheath thickness (Minimum)	mm	1.48	1.48	1.56	1.64	1.80	1.88	1.96	2.04	2.20	2.36	2.52
6.0	Cable overall diameter (Approximate)	mm	34.5	37.0	39.5	43.5	47.5	51.0	54.0	58.0	64.0	70.0	78.0
7.0	Cable weight (Approximate)	kg/km	1585	1925	2370	3090	3995	4815	5710	6900	8810	10820	13675
8.0	Standard drum length (±5% Tolerance)	m	1000	1000	500	500	500	500	500	500	500	500	250
9.0	Minimum bending radius of cable (During installation)	mm	518	555	593	653	713	765	810	870	960	1050	1170
<b>(B) Electrical Parameters</b>													
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.928	0.669	0.494	0.343	0.247	0.197	0.160	0.129	0.099	0.080	0.065
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.120	0.114	0.109	0.100	0.096	0.093	0.091	0.087	0.085	0.084	0.082
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.936	0.679	0.506	0.357	0.265	0.218	0.184	0.156	0.130	0.116	0.105
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.621	1.176	0.876	0.618	0.459	0.378	0.319	0.270	0.225	0.201	0.182
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.27	0.29	0.33	0.38	0.42	0.47	0.51	0.55	0.60	0.62	0.65
7.0	Approximate charging current per phase at U <sub>o</sub> = 3.6 kV & f = 50 Hz	mA/m	0.31	0.33	0.37	0.43	0.48	0.53	0.58	0.62	0.68	0.70	0.74
8.0	Sustained current ratings:-												
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	129	153	181	221	262	298	334	377	434	489	553
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	112	133	158	193	231	264	297	336	390	441	501
8.3	Laid singly in air, ambient temp. = 30 °C	A	142	170	204	253	304	351	398	455	531	606	696
9.0	Short circuit current rating of conductor for 1 second	kA	3.58	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20

SECTION C - TABLE 1





Fillers  
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)

XLPE Insulation  
Conductor Screen (Semi-conductive)  
Copper Conductor  
Insulation Screen (Semi-conductive)  
Binder tape  
Outer Sheath

**6/10 (12) kV  
Three Core Copper Conductor  
XLPE Insulated Unarmoured  
To IEC 60502-2  
(Suitable for 6.35/11 kV  
Earthed System)**

COPPER CONDUCTOR		THREE CORE, 2XCEY, Unarmoured Cables, 6/10 kV to IEC 60502-2											
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400
<b>(A) Manufacturing Dimensions</b>													
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	665	922	1242	1800	2500	3152	3888	4875	6425	8039	10301
3.0	Insulation thickness (Nominal)	mm	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
4.0	Outer sheath thickness (Nominal)	mm	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.1	3.3	3.5
5.0	Outer sheath thickness (Minimum)	mm	1.56	1.64	1.72	1.80	1.88	1.96	2.04	2.12	2.28	2.44	2.60
6.0	Cable overall diameter (Approximate)	mm	39.0	41.0	44.0	47.5	51.5	55.0	58.0	62.0	67.5	73.0	80.0
7.0	Cable weight (Approximate)	kg/km	1805	2180	2640	3380	4285	5125	6040	7250	9155	11105	13900
8.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	500	500	500	500	500	500	250
9.0	Minimum bending radius of cable (During installation)	mm	585	615	660	713	773	825	870	930	1013	1095	1200
<b>(B) Electrical Parameters</b>													
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.928	0.669	0.494	0.343	0.247	0.197	0.160	0.129	0.099	0.080	0.065
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.127	0.121	0.116	0.107	0.102	0.098	0.096	0.092	0.089	0.086	0.084
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.937	0.680	0.507	0.359	0.267	0.220	0.187	0.158	0.133	0.117	0.106
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.623	1.178	0.878	0.622	0.462	0.381	0.324	0.274	0.230	0.203	0.184
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.21	0.23	0.26	0.29	0.33	0.36	0.39	0.42	0.48	0.52	0.58
7.0	Approximate charging current per phase at U <sub>0</sub> = 6 kV & f = 50 Hz	mA/m	0.40	0.43	0.49	0.55	0.62	0.68	0.74	0.79	0.90	0.98	1.09
8.0	Sustained current ratings:-												
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	129	153	181	221	262	298	334	377	434	489	553
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	112	133	158	193	231	264	297	336	390	441	501
8.3	Laid singly in air, ambient temp. = 30 °C	A	142	170	204	253	304	351	398	455	531	606	696
9.0	Short circuit current rating of conductor for 1 second	kA	3.58	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20

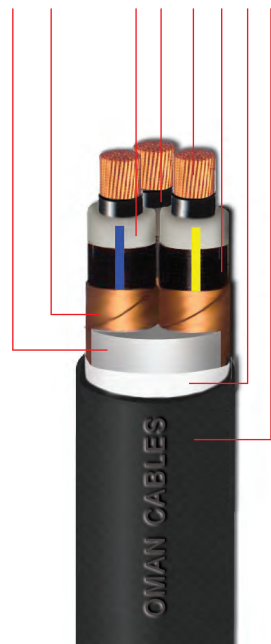
**SECTION C - TABLE 2**



Fillers  
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)  
XLPE Insulation  
Conductor Screen (Semi-conductive)  
Copper Conductor  
Insulation Screen (Semi-conductive)  
Binder tape  
Outer Sheath

## 8.7/15 (17.5) kV Three Core Copper Conductor XLPE Insulated Unarmoured To IEC 60502-2 (Suitable for 8.7/15 kV Earthed System)

COPPER CONDUCTOR		THREE CORE, 2XCEY, Unarmoured Cables, 8.7/15 kV to IEC 60502-2											
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400
<b>(A) Manufacturing Dimensions</b>													
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	665	922	1242	1800	2500	3152	3888	4875	6425	8039	10301
3.0	Insulation thickness (Nominal)	mm	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
4.0	Outer sheath thickness (Nominal)	mm	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.3	3.4	3.7
5.0	Outer sheath thickness (Minimum)	mm	1.72	1.80	1.88	1.96	2.04	2.12	2.20	2.28	2.44	2.52	2.76
6.0	Cable overall diameter (Approximate)	mm	44.0	46.5	49.0	53.0	56.5	60.0	63.0	67.0	73.0	77.5	85.0
7.0	Cable weight (Approximate)	kg/km	2125	2515	2995	3765	4695	5560	6495	7735	9680	11630	14510
8.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	500	500	500	500	500	250	250
9.0	Minimum bending radius of cable (During installation)	mm	660	698	735	795	848	900	945	1005	1095	1163	1275
<b>(B) Electrical Parameters</b>													
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.928	0.669	0.494	0.343	0.247	0.197	0.160	0.128	0.099	0.080	0.064
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.136	0.129	0.123	0.114	0.108	0.104	0.101	0.097	0.093	0.091	0.088
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.938	0.681	0.509	0.361	0.270	0.223	0.189	0.161	0.136	0.121	0.109
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.625	1.180	0.882	0.625	0.468	0.386	0.327	0.279	0.236	0.210	0.189
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.17	0.19	0.21	0.24	0.26	0.29	0.31	0.34	0.37	0.41	0.46
7.0	Approximate charging current per phase at U <sub>o</sub> = 8.7 kV & f = 50 Hz	mA/m	0.46	0.52	0.57	0.66	0.71	0.79	0.85	0.93	1.01	1.12	1.26
8.0	Sustained current ratings:-												
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	129	153	181	221	262	298	334	377	434	489	553
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	112	133	158	193	231	264	297	336	390	441	501
8.3	Laid singly in air, ambient temp. = 30 °C	A	142	170	204	253	304	351	398	455	531	606	696
9.0	Short circuit current rating of conductor for 1 second	kA	3.58	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20



Fillers  
 Metallic Copper Screen  
 (Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)  
 XLPE Insulation  
 Conductor Screen (Semi-conductive)  
 Copper Conductor  
 Insulation Screen (Semi-conductive)  
 Binder tape  
 Outer Sheath

**12/20 (24) kV  
 Three Core Copper Conductor  
 XLPE Insulated Unarmoured  
 To IEC 60502-2  
 (Suitable for 12.7/22 kV  
 Earthed System)**

COPPER CONDUCTOR		THREE CORE, 2XCEY, Unarmoured Cables, 12/20 kV to IEC 60502-2										
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	35	50	70	95	120	150	185	240	300	400
<b>(A)</b>	<b>Manufacturing Dimensions</b>											
1.0	Conductor diameter (Approximate)	mm	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	922	1242	1800	2500	3152	3888	4875	6425	8039	10301
3.0	Insulation thickness (Nominal)	mm	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
4.0	Outer sheath thickness (Nominal)	mm	2.6	2.7	2.8	2.9	3.0	3.1	3.3	3.4	3.6	3.8
5.0	Outer sheath thickness (Minimum)	mm	1.88	1.96	2.04	2.12	2.20	2.28	2.44	2.52	2.68	2.84
6.0	Cable overall diameter (Approximate)	mm	51.5	54.0	57.5	61.5	65.0	68.0	72.0	77.5	83.0	90.0
7.0	Cable weight (Approximate)	kg/km	2865	3365	4155	5110	6000	6955	8255	10200	12225	15115
8.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	500	500	500	250	250	250
9.0	Minimum bending radius of cable (During installation)	mm	773	810	863	923	975	1020	1080	1163	1245	1350
<b>(B)</b>	<b>Electrical Parameters</b>											
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.669	0.494	0.343	0.247	0.196	0.160	0.128	0.099	0.080	0.064
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.136	0.130	0.120	0.114	0.110	0.106	0.102	0.098	0.095	0.092
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.683	0.511	0.363	0.272	0.225	0.192	0.164	0.139	0.124	0.112
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.183	0.885	0.629	0.471	0.390	0.333	0.284	0.241	0.215	0.194
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.17	0.18	0.20	0.23	0.25	0.26	0.29	0.32	0.35	0.38
7.0	Approximate charging current per phase at U <sub>0</sub> = 12 kV & f = 50 Hz	mA/m	0.64	0.68	0.75	0.87	0.94	0.98	1.09	1.21	1.32	1.43
8.0	Sustained current ratings:-											
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	153	181	221	262	298	334	377	434	489	553
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	133	158	193	231	264	297	336	390	441	501
8.3	Laid singly in air, ambient temp. = 30 °C	A	170	204	253	304	351	398	455	531	606	696
9.0	Short circuit current rating of conductor for 1 second	kA	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20

SECTION C - TABLE 4



Fillers  
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)

XLPE Insulation

Conductor Screen (Semi-conductive)

Copper Conductor

Insulation Screen (Semi-conductive)

Binder tape

Outer Sheath

18/30 (36) kV

Three Core Copper Conductor  
XLPE Insulated Unarmoured  
To IEC 60502-2  
(Suitable for 19/33 kV  
Earthed System)

COPPER CONDUCTOR

THREE CORE, 2XCEY, Unarmoured Cables, 18/30 kV to IEC 60502-2

Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	50	70	95	120	150	185	240	300	400
(A)	Manufacturing Dimensions										
1.0	Conductor diameter (Approximate)	mm	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	1242	1800	2500	3152	3888	4875	6425	8039	10301
3.0	Insulation thickness (Nominal)	mm	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
4.0	Outer sheath thickness (Nominal)	mm	3.1	3.2	3.3	3.4	3.5	3.6	3.8	4.0	4.2
5.0	Outer sheath thickness (Minimum)	mm	2.28	2.36	2.44	2.52	2.60	2.68	2.84	3.00	3.16
6.0	Cable overall diameter (Approximate)	mm	65.5	69.5	73.0	76.5	79.5	83.5	89.5	94.5	101.5
7.0	Cable weight (Approximate)	kg/km	4375	5225	6240	7180	8190	9515	11585	13695	16700
8.0	Standard drum length (±5% Tolerance)	m	500	500	500	250	250	250	250	250	250
9.0	Minimum bending radius of cable (During installation)	mm	983	1043	1095	1148	1193	1253	1343	1418	1523
(B)	Electrical Parameters										
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.494	0.343	0.247	0.196	0.160	0.128	0.098	0.079	0.063
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.143	0.132	0.125	0.120	0.117	0.112	0.107	0.103	0.100
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.514	0.368	0.277	0.230	0.198	0.170	0.145	0.130	0.118
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	0.890	0.637	0.480	0.398	0.343	0.294	0.251	0.225	0.204
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.14	0.16	0.17	0.19	0.20	0.22	0.24	0.26	0.28
7.0	Approximate charging current per phase at U <sub>0</sub> = 18 kV & f = 50 Hz	mA/m	0.79	0.90	0.96	1.07	1.13	1.24	1.36	1.47	1.58
8.0	Sustained current ratings:-										
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	181	221	262	298	334	377	434	489	553
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	158	193	231	264	297	336	390	441	501
8.3	Laid singly in air, ambient temp. = 30 °C	A	204	253	304	351	398	455	531	606	696
9.0	Short circuit current rating of conductor for 1 second	kA	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20

SECTION C - TABLE 5



Fillers  
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request)

XLPE Insulation  
Conductor Screen (Semi-conductive)  
Aluminium Conductor  
Insulation Screen (Semi-conductive)  
Binder tape  
Outer Sheath

## 3.6/6 (7.2) kV Three Core Aluminium Conductor XLPE Insulated Unarmoured To IEC 60502-2 (Suitable for 3.8/6.6 kV Earthed System)

ALUMINIUM CONDUCTOR		THREE CORE, A2XCEY, Unarmoured Cables, 3.6/6 kV to IEC 60502-2											
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400
<b>(A) Manufacturing Dimensions</b>													
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	203	280	381	553	764	965	1186	1500	1967	2445	3126
3.0	Insulation thickness (Nominal)	mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.0
4.0	Outer sheath thickness (Nominal)	mm	2.1	2.1	2.2	2.3	2.5	2.6	2.7	2.8	3.0	3.2	3.4
5.0	Outer sheath thickness (Minimum)	mm	1.48	1.48	1.56	1.64	1.80	1.88	1.96	2.04	2.20	2.36	2.52
6.0	Cable overall diameter (Approximate)	mm	34.5	37.0	39.5	43.5	47.5	51.0	54.0	58.0	64.0	70.0	78.0
7.0	Cable weight (Approximate)	kg/km	1120	1285	1505	1840	2255	2625	3010	3525	4350	5225	6500
8.0	Standard drum length (±5% Tolerance)	m	1000	1000	500	500	500	500	500	500	500	500	250
9.0	Minimum bending radius of cable (During installation)	mm	518	555	593	653	713	765	810	870	960	1050	1170
<b>(B) Electrical Parameters</b>													
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.54	1.11	0.823	0.569	0.411	0.326	0.266	0.212	0.162	0.131	0.103
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.120	0.114	0.109	0.100	0.096	0.093	0.091	0.087	0.085	0.084	0.082
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.54	1.12	0.830	0.578	0.422	0.339	0.281	0.229	0.183	0.156	0.132
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	2.667	1.940	1.438	1.001	0.731	0.587	0.487	0.397	0.317	0.270	0.229
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.27	0.29	0.33	0.38	0.42	0.47	0.51	0.55	0.60	0.62	0.65
7.0	Approximate charging current per phase at U <sub>0</sub> = 3.6 kV & f = 50 Hz	mA/m	0.31	0.33	0.37	0.43	0.48	0.53	0.58	0.62	0.68	0.70	0.74
8.0	Sustained current ratings:-												
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	100	119	140	171	203	232	260	294	340	384	438
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	87	103	122	150	179	205	231	262	305	346	398
8.3	Laid singly in air, ambient temp. = 30 °C	A	110	132	158	196	236	273	309	355	415	475	552
9.0	Short circuit current rating of conductor for 1 second	kA	2.35	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60

SECTION C - TABLE 6



Fillers  
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)

XLPE insulation  
Conductor Screen (Semi-conductive)  
Aluminium Conductor  
Insulation Screen (Semi-conductive)  
Binder tape  
Outer Sheath

## 6/10 (12) kV Three Core Aluminium Conductor XLPE Insulated Unarmoured To IEC 60502-2 (Suitable for 6.35/11 kV Earthed System)

ALUMINIUM CONDUCTOR		THREE CORE, A2XCEY, Unarmoured Cables, 6/10 kV to IEC 60502-2											
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400
<b>(A) Manufacturing Dimensions</b>													
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	203	280	381	553	764	965	1186	1500	1967	2445	3126
3.0	Insulation thickness (Nominal)	mm	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
4.0	Outer sheath thickness (Nominal)	mm	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.1	3.3	3.5
5.0	Outer sheath thickness (Minimum)	mm	1.56	1.64	1.72	1.80	1.88	1.96	2.04	2.12	2.28	2.44	2.60
6.0	Cable overall diameter (Approximate)	mm	39.0	41.0	44.0	47.5	51.5	55.0	58.0	62.0	67.5	73.0	80.0
7.0	Cable weight (Approximate)	kg/km	1345	1540	1780	2135	2550	2940	3340	3875	4695	5515	6725
8.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	500	500	500	500	500	500	250
9.0	Minimum bending radius of cable (During installation)	mm	585	615	660	713	773	825	870	930	1013	1095	1200
<b>(B) Electrical Parameters</b>													
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.54	1.11	0.823	0.569	0.411	0.326	0.265	0.212	0.162	0.131	0.103
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.127	0.121	0.116	0.107	0.102	0.098	0.096	0.092	0.089	0.086	0.084
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.55	1.12	0.831	0.579	0.423	0.340	0.282	0.231	0.185	0.157	0.133
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	2.685	1.940	1.439	1.003	0.733	0.589	0.488	0.400	0.320	0.272	0.230
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.21	0.23	0.26	0.29	0.33	0.36	0.39	0.42	0.48	0.52	0.58
7.0	Approximate charging current per phase at U <sub>0</sub> = 6 kV & f = 50 Hz	mA/m	0.40	0.43	0.49	0.55	0.62	0.68	0.74	0.79	0.90	0.98	1.09
8.0	Sustained current ratings:-												
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	100	119	140	171	203	232	260	294	340	384	438
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	87	103	122	150	179	205	231	262	305	346	398
8.3	Laid singly in air, ambient temp. = 30 °C	A	110	132	158	196	236	273	309	355	415	475	552
9.0	Short circuit current rating of conductor for 1 second	kA	2.35	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60

**8.7/15 (17.5) kV**  
**Three Core Aluminium Conductor**  
**XLPE Insulated Unarmoured**  
**To IEC 60502-2**  
**(Suitable for 8.7/15 kV**  
**Earthed System)**

Fillers  
 Metallic Copper Screen  
 (Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request)  
 XLPE Insulation  
 Conductor Screen (Semi-conductive)  
 Aluminium Conductor  
 Insulation Screen (Semi-conductive)  
 Binder tape  
 Outer Sheath



ALUMINIUM CONDUCTOR		THREE CORE, A2XCEY, Unarmoured Cables, 8.7/15 kV to IEC 60502-2											
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400
<b>(A) Manufacturing Dimensions</b>													
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	203	280	381	553	764	965	1186	1500	1967	2445	3126
3.0	Insulation thickness (Nominal)	mm	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
4.0	Outer sheath thickness (Nominal)	mm	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.3	3.4	3.7
5.0	Outer sheath thickness (Minimum)	mm	1.72	1.80	1.88	1.96	2.04	2.12	2.20	2.28	2.44	2.52	2.76
6.0	Cable overall diameter (Approximate)	mm	44.0	46.5	49.0	53.0	56.5	60.0	63.0	67.0	73.0	77.5	85.0
7.0	Cable weight (Approximate)	kg/km	1665	1875	2135	2520	2960	3375	3795	4360	5220	6035	7335
8.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	500	500	500	500	500	250	250
9.0	Minimum bending radius of cable (During installation)	mm	660	698	735	795	848	900	945	1005	1095	1163	1275
<b>(B) Electrical Parameters</b>													
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.54	1.11	0.823	0.569	0.411	0.325	0.265	0.212	0.162	0.130	0.103
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.136	0.129	0.123	0.114	0.108	0.104	0.101	0.097	0.093	0.091	0.088
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.55	1.12	0.832	0.580	0.425	0.341	0.284	0.233	0.187	0.159	0.135
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	2.685	1.940	1.441	1.005	0.736	0.591	0.492	0.404	0.324	0.275	0.234
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.17	0.19	0.21	0.24	0.26	0.29	0.31	0.34	0.37	0.41	0.46
7.0	Approximate charging current per phase at U <sub>0</sub> = 8.7 kV & f = 50 Hz	mA/m	0.46	0.52	0.57	0.66	0.71	0.79	0.85	0.93	1.01	1.12	1.26
8.0	Sustained current ratings:-												
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	100	119	140	171	203	232	260	294	340	384	438
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	87	103	122	150	179	205	231	262	305	346	398
8.3	Laid singly in air, ambient temp. = 30 °C	A	110	132	158	196	236	273	309	355	415	475	552
9.0	Short circuit current rating of conductor for 1 second	kA	2.35	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60

**SECTION C - TABLE 8**



Fillers  
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)  
XLPE Insulation  
Conductor Screen (Semi-conductive)  
Aluminium Conductor  
Insulation Screen (Semi-conductive)  
Binder tape  
Outer Sheath

## 12/20 (24) kV Three Core Aluminium Conductor XLPE Insulated Unarmoured To IEC 60502-2 (Suitable for 12.7/22 kV Earthed System)

ALUMINIUM CONDUCTOR		THREE CORE, A2XCEY, Unarmoured Cables, 12/20 kV to IEC 60502-2										
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	35	50	70	95	120	150	185	240	300	400
<b>(A) Manufacturing Dimensions</b>												
1.0	Conductor diameter (Approximate)	mm	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	280	381	553	764	965	1186	1500	1967	2445	3126
3.0	Insulation thickness (Nominal)	mm	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
4.0	Outer sheath thickness (Nominal)	mm	2.6	2.7	2.8	2.9	3.0	3.1	3.3	3.4	3.6	3.8
5.0	Outer sheath thickness (Minimum)	mm	1.88	1.96	2.04	2.12	2.20	2.28	2.44	2.52	2.68	2.84
6.0	Cable overall diameter (Approximate)	mm	51.5	54.0	57.5	61.5	65.0	68.0	72.0	77.5	83.0	90.0
7.0	Cable weight (Approximate)	kg/km	2220	2500	2910	3375	3810	4255	4880	5745	6635	7940
8.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	500	500	500	250	250	250
9.0	Minimum bending radius of cable (During installation)	mm	773	810	863	923	975	1020	1080	1163	1245	1350
<b>(B) Electrical Parameters</b>												
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.11	0.823	0.569	0.411	0.325	0.265	0.212	0.162	0.130	0.102
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.136	0.130	0.120	0.114	0.110	0.106	0.102	0.098	0.095	0.092
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.12	0.833	0.582	0.427	0.343	0.285	0.235	0.189	0.161	0.137
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.940	1.443	1.008	0.740	0.594	0.494	0.407	0.327	0.279	0.237
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.17	0.18	0.20	0.23	0.25	0.26	0.29	0.32	0.35	0.38
7.0	Approximate charging current per phase at U <sub>0</sub> = 12 kV & f = 50 Hz	mA/m	0.64	0.68	0.75	0.87	0.94	0.98	1.09	1.21	1.32	1.43
8.0	Sustained current ratings:-											
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	119	140	171	203	232	260	294	340	384	438
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	103	122	150	179	205	231	262	305	346	398
8.3	Laid singly in air, ambient temp. = 30 °C	A	132	158	196	236	273	309	355	415	475	552
9.0	Short circuit current rating of conductor for 1 second	kA	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60



# 18/30 (36) kV Three Core Aluminium Conductor XLPE Insulated Unarmoured To IEC 60502-2 (Suitable for 19/33 kV Earthed System)

Fillers  
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape  
or copper tape (The details given in below Table are for  
copper tape screened cables). For copper wire screened  
cables the details can be given on specific request)

XLPE Insulation  
Conductor Screen (Semi-conductive)  
Aluminium Conductor  
Insulation Screen (Semi-conductive)  
Binder tape  
Outer Sheath



ALUMINIUM CONDUCTOR		THREE CORE, A2XCEY, Unarmoured Cables, 18/30 kV to IEC 60502-2										
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	50	70	95	120	150	185	240	300	400	
<b>(A) Manufacturing Dimensions</b>												
1.0	Conductor diameter (Approximate)	mm	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	
2.0	Conductor weight (Approximate)	kg/km	381	553	764	965	1186	1500	1967	2445	3126	
3.0	Insulation thickness (Nominal)	mm	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
4.0	Outer sheath thickness (Nominal)	mm	3.1	3.2	3.3	3.4	3.5	3.6	3.8	4.0	4.2	
5.0	Outer sheath thickness (Minimum)	mm	2.28	2.36	2.44	2.52	2.60	2.68	2.84	3.00	3.16	
6.0	Cable overall diameter (Approximate)	mm	65.5	69.5	73.0	76.5	79.5	83.5	89.5	94.5	101.5	
7.0	Cable weight (Approximate)	kg/km	3510	3975	4505	4995	5485	6140	7130	8105	9525	
8.0	Standard drum length (±5% Tolerance)	m	500	500	500	250	250	250	250	250	250	
9.0	Minimum bending radius of cable (During installation)	mm	983	1043	1095	1148	1193	1253	1343	1418	1523	
<b>(B) Electrical Parameters</b>												
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.823	0.569	0.411	0.325	0.265	0.212	0.162	0.130	0.102	
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.143	0.132	0.125	0.120	0.117	0.112	0.107	0.103	0.100	
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.835	0.584	0.430	0.346	0.290	0.240	0.194	0.166	0.143	
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.446	1.012	0.745	0.599	0.502	0.416	0.336	0.288	0.248	
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.14	0.16	0.17	0.19	0.20	0.22	0.24	0.26	0.28	
7.0	Approximate charging current per phase at U <sub>0</sub> = 18 kV & f = 50 Hz	mA/m	0.79	0.90	0.96	1.07	1.13	1.24	1.36	1.47	1.58	
8.0	Sustained current ratings:-											
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	140	171	203	232	260	294	340	384	438	
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	122	150	179	205	231	262	305	346	398	
8.3	Laid singly in air, ambient temp. = 30 °C	A	158	196	236	273	309	355	415	475	552	
9.0	Short circuit current rating of conductor for 1 second	kA	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60	

## SECTION C - TABLE 10

Galvanised Steel Wire Armour

Bedding

Metallic Copper Screen

(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)

XLPE Insulation

Conductor Screen (Semi-conductive)

Copper Conductor

Insulation Screen (Semi-conductive)

PP Fillers

Binder tape

Outer Sheath



3.6/6 (7.2) kV

Three Core Copper Conductor

XLPE Insulated Steel

Wire Armoured To IEC 60502-2

(Suitable for 3.8/6.6 kV

Earthed System)

		3 CORE, 2XCWEVY, G. S. Wire armoured Cables, 3.6/6 kV to IEC 60502-2											
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400
<b>(A) Manufacturing Dimensions</b>													
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	665	922	1242	1800	2500	3152	3888	4875	6425	8039	10301
3.0	Insulation thickness (Nominal)	mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.0
4.0	Separation sheath thickness (Nominal)	mm	1.2	1.2	1.3	1.4	1.4	1.5	1.5	1.6	1.7	1.8	2.0
5.0	Armour wire diameter (Nominal)	mm	2.0	2.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.15	3.15
6.0	Outer sheath thickness (Nominal)	mm	2.3	2.3	2.5	2.6	2.7	2.8	2.9	3.0	3.2	3.5	3.8
7.0	Outer sheath thickness (Minimum)	mm	1.64	1.64	1.80	1.88	1.96	2.04	2.12	2.20	2.36	2.60	2.84
8.0	Cable overall diameter (Approximate)	mm	40.0	42.5	46.5	50.5	54.0	57.5	61.0	65.0	71.0	79.0	87.5
9.0	Cable weight (Approximate)	kg/km	3010	3440	4425	5350	6415	7415	8490	9885	12140	15430	18910
10.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	500	500	500	500	500	250	250
11.0	Minimum bending radius of cable (During installation)	mm	480	510	558	606	648	690	732	780	852	948	1050
<b>(B) Electrical Parameters</b>													
<b>(i) Conductor</b>													
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.928	0.669	0.494	0.343	0.247	0.197	0.160	0.129	0.099	0.080	0.065
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.120	0.114	0.109	0.100	0.096	0.093	0.091	0.087	0.085	0.084	0.082
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.936	0.679	0.506	0.357	0.265	0.218	0.184	0.156	0.130	0.116	0.105
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.621	1.176	0.876	0.618	0.459	0.378	0.319	0.270	0.225	0.201	0.182
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.27	0.29	0.33	0.38	0.42	0.47	0.51	0.55	0.60	0.62	0.65
7.0	Approximate charging current per phase at U <sub>0</sub> = 3.6 kV and f = 50 Hz	mA/m	0.31	0.33	0.37	0.43	0.48	0.53	0.58	0.62	0.68	0.70	0.74
8.0	Sustained current ratings:-												
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	129	154	181	220	263	298	332	374	431	482	541
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	112	134	158	194	232	264	296	335	387	435	492
8.3	Laid singly in air, ambient temp. = 30 °C	A	143	172	205	253	307	352	397	453	529	599	683
9.0	Short circuit current rating of conductor for 1 second	kA	3.58	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20
<b>(ii) Armour</b>													
1.0	DC resistance at 20 °C (Approximate)	ohm/km	1.100	1.030	0.779	0.706	0.646	0.595	0.552	0.515	0.460	0.336	0.299
2.0	AC resistance at 80 °C (Approximate)	ohm/km	1.397	1.308	0.989	0.897	0.820	0.756	0.701	0.654	0.584	0.427	0.380
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	6.27	6.71	8.88	9.79	10.70	11.62	12.53	13.44	15.03	20.61	23.14

SECTION D - TABLE 1

Galvanised Steel Wire Armour

Bedding

Metallic Copper Screen

(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)

XLPE Insulation

Conductor Screen (Semi-conductive)

Copper Conductor

Insulation Screen (Semi-conductive)

PP Fillers

Binder tape

Outer Sheath



6/10 (12) kV

Three Core Copper Conductor  
XLPE Insulated Steel

Wire Armoured To IEC 60502-2  
(Suitable for 6.35/11 kV  
Earthed System)

3 CORE, 2XCEWY, G. S. Wire armoured Cables, 6/10 kV to IEC 60502-2

Sr. No.	Nominal Area of Conductor (A)	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	665	922	1242	1800	2500	3152	3888	4875	6425	8039	10301
3.0	Insulation thickness (Nominal)	mm	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
4.0	Separation sheath thickness (Nominal)	mm	1.3	1.3	1.4	1.4	1.5	1.6	1.6	1.7	1.8	1.9	2.0
5.0	Armour wire diameter (Nominal)	mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.15	3.15	3.15
6.0	Outer sheath thickness (Nominal)	mm	2.4	2.5	2.6	2.7	2.9	3.0	3.1	3.2	3.4	3.6	3.8
7.0	Outer sheath thickness (Minimum)	mm	1.72	1.80	1.88	1.96	2.12	2.20	2.28	2.36	2.52	2.68	2.84
8.0	Cable overall diameter (Approximate)	mm	45.5	48.0	51.0	54.5	58.5	62.0	65.0	69.5	76.5	82.0	89.0
9.0	Cable weight (Approximate)	kg/km	3795	4305	4920	5845	6955	8000	9055	10525	13620	15905	19235
10.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	500	500	500	500	250	250	250
11.0	Minimum bending radius of cable (During installation)	mm	546	576	612	654	702	744	780	834	918	984	1068
<b>(B) Electrical Parameters</b>													
<b>(i) Conductor</b>													
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.928	0.669	0.494	0.343	0.247	0.197	0.160	0.129	0.099	0.080	0.065
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.127	0.121	0.116	0.107	0.102	0.098	0.096	0.092	0.089	0.086	0.084
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.937	0.680	0.507	0.359	0.267	0.220	0.187	0.158	0.133	0.117	0.106
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.623	1.178	0.878	0.622	0.462	0.381	0.324	0.274	0.230	0.203	0.184
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.21	0.23	0.26	0.29	0.33	0.36	0.39	0.42	0.48	0.52	0.58
7.0	Approximate charging current per phase at U <sub>0</sub> = 6 kV and f = 50 Hz	mA/m	0.40	0.43	0.49	0.55	0.62	0.68	0.74	0.79	0.90	0.98	1.09
8.0	Sustained current ratings:-												
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	129	154	181	220	263	298	332	374	431	482	541
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	112	134	158	194	232	264	296	335	387	435	492
8.3	Laid singly in air, ambient temp. = 30 °C	A	143	172	205	253	307	352	397	453	529	599	683
9.0	Short circuit current rating of conductor for 1 second	kA	3.58	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20
<b>(ii) Armour</b>													
1.0	DC resistance at 20 °C (Approximate)	ohm/km	0.799	0.741	0.690	0.633	0.584	0.542	0.515	0.474	0.348	0.324	0.290
2.0	AC resistance at 80 °C (Approximate)	ohm/km	1.015	0.941	0.876	0.804	0.742	0.688	0.654	0.602	0.442	0.411	0.368
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	8.66	9.34	10.02	10.93	11.84	12.75	13.44	14.58	19.89	21.33	23.87

SECTION D - TABLE 2

Galvanised Steel Wire Armour

Bedding

Metallic Copper Screen

(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)

XLPE Insulation

Conductor Screen (Semi-conductive)

Copper Conductor

Insulation Screen (Semi-conductive)

PP Fillers

Binder tape

Outer Sheath

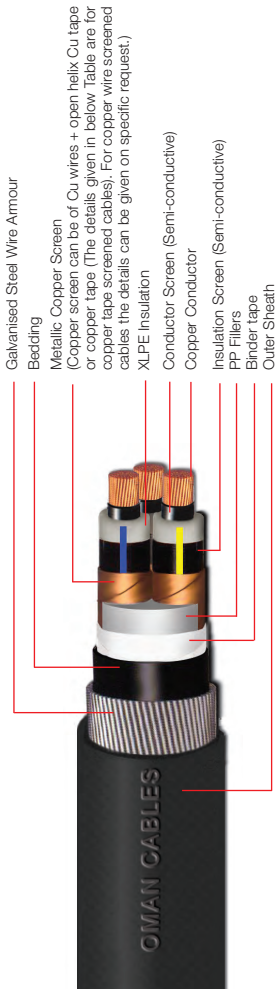


## 8.7/15 (17.5) kV Three Core Copper Conductor XLPE Insulated Steel Wire Armoured To IEC 60502-2 (Suitable for 8.7/15 kV Earthed System)

**3 CORE, 2XCEWY, G. S. Wire armoured Cables, 8.7/15 kV to IEC 60502-2**

Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400
<b>(A) Manufacturing Dimensions</b>													
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	665	922	1242	1800	2500	3152	3888	4875	6425	8039	10301
3.0	Insulation thickness (Nominal)	mm	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
4.0	Separation sheath thickness (Nominal)	mm	1.4	1.4	1.5	1.5	1.6	1.7	1.7	1.8	1.9	2.0	2.1
5.0	Armour wire diameter (Nominal)	mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.15	3.15	3.15	3.15
6.0	Outer sheath thickness (Nominal)	mm	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.4	3.6	3.7	4.0
7.0	Outer sheath thickness (Minimum)	mm	1.88	1.96	2.04	2.12	2.20	2.28	2.36	2.52	2.68	2.76	3.00
8.0	Cable overall diameter (Approximate)	mm	51.0	53.0	56.0	59.5	63.5	67.5	70.5	76.0	82.0	87.0	94.5
9.0	Cable weight (Approximate)	kg/km	4405	4890	5505	6455	7635	8710	9785	12135	14475	16820	20190
10.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	500	500	500	250	250	250	250
11.0	Minimum bending radius of cable (During installation)	mm	612	636	672	714	762	810	846	912	984	1044	1134
<b>(B) Electrical Parameters</b>													
<b>(i) Conductor</b>													
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.928	0.669	0.494	0.343	0.247	0.197	0.160	0.128	0.099	0.080	0.064
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.136	0.129	0.123	0.114	0.108	0.104	0.101	0.097	0.093	0.091	0.088
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.938	0.681	0.509	0.361	0.270	0.223	0.189	0.161	0.136	0.121	0.109
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.625	1.180	0.882	0.625	0.468	0.386	0.327	0.279	0.236	0.210	0.189
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.17	0.19	0.21	0.24	0.26	0.29	0.31	0.34	0.37	0.41	0.46
7.0	Approximate charging current per phase at U <sub>0</sub> = 8.7 kV and f = 50 Hz	mA/m	0.46	0.52	0.57	0.66	0.71	0.79	0.85	0.93	1.01	1.12	1.26
8.0	Sustained current ratings:-												
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	129	154	181	220	263	298	332	374	431	482	541
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	112	134	158	194	232	264	296	335	387	435	492
8.3	Laid singly in air, ambient temp. = 30 °C	A	143	172	205	253	307	352	397	453	529	599	683
9.0	Short circuit current rating of conductor for 1 second	kA	3.58	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20
<b>(ii) Armour</b>													
1.0	DC resistance at 20 °C (Approximate)	ohm/km	0.690	0.660	0.620	0.573	0.523	0.490	0.467	0.354	0.324	0.299	0.273
2.0	AC resistance at 80 °C (Approximate)	ohm/km	0.876	0.838	0.787	0.728	0.664	0.622	0.593	0.450	0.411	0.380	0.347
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	10.02	10.48	11.16	12.07	13.21	14.12	14.80	19.53	21.33	23.14	25.31

# 12/20 (24) kV Three Core Copper Conductor XLPE Insulated Steel Wire Armoured To IEC 60502-2 (Suitable for 12.7/22 kV Earthed System)



COPPER CONDUCTOR		3 CORE, 2XCEWY, G. S. Wire armoured Cables, 12/20 kV to IEC 60502-2										
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	35	50	70	95	120	150	185	240	300	400
<b>(A) Manufacturing Dimensions</b>												
1.0	Conductor diameter (Approximate)	mm	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	922	1242	1800	2500	3152	3888	4875	6425	8039	10301
3.0	Insulation thickness (Nominal)	mm	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
4.0	Separation sheath thickness (Nominal)	mm	1.5	1.6	1.6	1.7	1.7	1.8	1.9	2.0	2.0	2.2
5.0	Armour wire diameter (Nominal)	mm	2.5	2.5	2.5	2.5	3.15	3.15	3.15	3.15	3.15	3.15
6.0	Outer sheath thickness (Nominal)	mm	2.8	2.9	3.1	3.2	3.3	3.4	3.6	3.7	3.9	4.1
7.0	Outer sheath thickness (Minimum)	mm	2.04	2.12	2.28	2.36	2.44	2.52	2.68	2.76	2.92	3.08
8.0	Cable overall diameter (Approximate)	mm	58.0	61.0	65.0	69.0	73.5	77.0	81.5	87.0	92.0	99.5
9.0	Cable weight (Approximate)	kg/km	5505	6165	7170	8340	10285	11425	13045	15390	17715	21090
10.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	250	250	250	250	250	250
11.0	Minimum bending radius of cable (During installation)	mm	696	732	780	828	882	924	978	1044	1104	1194
<b>(B) Electrical Parameters</b>												
<b>(i) Conductor</b>												
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.669	0.494	0.343	0.247	0.196	0.160	0.128	0.099	0.080	0.064
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.136	0.130	0.120	0.114	0.110	0.106	0.102	0.098	0.095	0.092
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.683	0.511	0.363	0.272	0.225	0.192	0.164	0.139	0.124	0.112
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.183	0.885	0.629	0.471	0.390	0.333	0.284	0.241	0.215	0.194
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.17	0.18	0.20	0.23	0.25	0.26	0.29	0.32	0.35	0.38
7.0	Approximate charging current per phase at U <sub>0</sub> = 12 kV and f = 50 Hz	mA/m	0.64	0.68	0.75	0.87	0.94	0.98	1.09	1.21	1.32	1.43
8.0	Sustained current ratings:-											
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	154	181	220	263	298	332	374	431	482	541
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	134	158	194	232	264	296	335	387	435	492
8.3	Laid singly in air, ambient temp. = 30 °C	A	172	205	253	307	352	397	453	529	599	683
9.0	Short circuit current rating of conductor for 1 second	kA	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20
<b>(ii) Armour</b>												
1.0	DC resistance at 20 °C (Approximate)	ohm/km	0.584	0.552	0.515	0.482	0.361	0.348	0.324	0.299	0.281	0.258
2.0	AC resistance at 80 °C (Approximate)	ohm/km	0.742	0.701	0.654	0.612	0.458	0.442	0.411	0.380	0.357	0.328
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	11.84	12.53	13.44	14.35	19.16	19.89	21.33	23.14	24.59	26.76

SECTION D - TABLE 4

Galvanised Steel Wire Armour

Bedding

Metallic Copper Screen

(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)

XLPE Insulation

Conductor Screen (Semi-conductive)

Copper Conductor

Insulation Screen (Semi-conductive)

PP Fillers

Binder tape

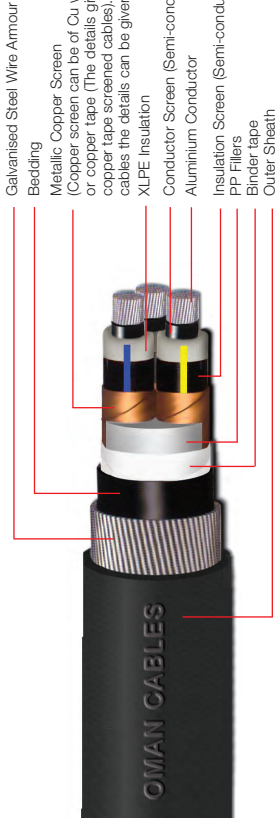
Outer Sheath

# 18/30 (36) kV Three Core Copper Conductor XLPE Insulated Steel Wire Armoured To IEC 60502-2 (Suitable for 19/33 kV Earthed System)



3 CORE, 2XCEWY, G. S. Wire armoured Cables, 18/30 kV to IEC 60502-2

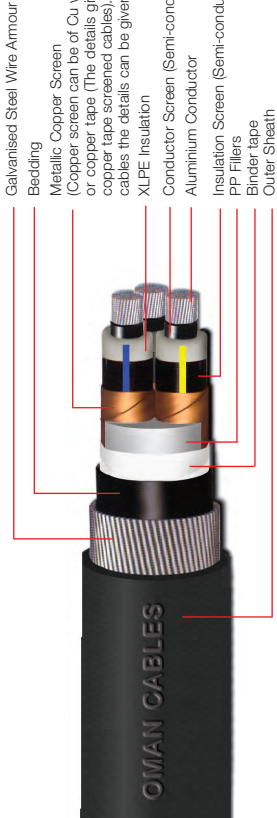
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	50	70	95	120	150	185	240	300	400
<b>COPPER CONDUCTOR</b>											
<b>(A) Manufacturing Dimensions</b>											
1.0	Conductor diameter (Approximate)	mm	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	1242	1800	2500	3152	3888	4875	6425	8039	10301
3.0	Insulation thickness (Nominal)	mm	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
4.0	Separation sheath thickness (Nominal)	mm	1.8	1.8	1.9	2.0	2.0	2.1	2.2	2.3	2.4
5.0	Armour wire diameter (Nominal)	mm	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15
6.0	Outer sheath thickness (Nominal)	mm	3.4	3.5	3.6	3.7	3.8	4.0	4.1	4.3	4.5
7.0	Outer sheath thickness (Minimum)	mm	2.52	2.60	2.68	2.76	2.84	3.00	3.08	3.24	3.40
8.0	Cable overall diameter (Approximate)	mm	74.5	78.0	82.5	86.0	89.0	93.5	99.0	104.0	111.5
9.0	Cable weight (Approximate)	kg/km	8695	9765	11105	12300	13460	15160	17550	20005	23505
10.0	Standard drum length (±5% Tolerance)	m	250	250	250	250	250	250	250	250	250
11.0	Minimum bending radius of cable (During installation)	mm	894	936	990	1032	1068	1122	1188	1248	1338
<b>(B) Electrical Parameters</b>											
<b>(i) Conductor</b>											
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.494	0.343	0.247	0.196	0.160	0.128	0.098	0.079	0.063
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.143	0.132	0.125	0.120	0.117	0.112	0.107	0.103	0.100
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.514	0.368	0.277	0.230	0.198	0.170	0.145	0.130	0.118
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	0.890	0.637	0.480	0.398	0.343	0.294	0.251	0.225	0.204
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.14	0.16	0.17	0.19	0.20	0.22	0.24	0.26	0.28
7.0	Approximate charging current per phase at U <sub>0</sub> = 18 kV and f = 50 Hz	mA/m	0.79	0.90	0.96	1.07	1.13	1.24	1.36	1.47	1.58
8.0	Sustained current ratings:-										
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	181	220	263	298	332	374	431	482	541
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	158	194	232	264	296	335	387	435	492
8.3	Laid singly in air, ambient temp. = 30 °C	A	205	253	307	352	397	453	529	599	683
9.0	Short circuit current rating of conductor for 1 second	kA	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20
<b>(ii) Armour</b>											
1.0	DC resistance at 20 °C (Approximate)	ohm/km	0.361	0.342	0.319	0.304	0.294	0.277	0.258	0.245	0.228
2.0	AC resistance at 80 °C (Approximate)	ohm/km	0.458	0.434	0.405	0.386	0.373	0.352	0.328	0.311	0.290
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	19.16	20.25	21.70	22.78	23.50	24.95	26.76	28.20	30.37



**3.6/6 (7.2) kV  
 Three Core Aluminium Conductor  
 XLPE Insulated Steel Wire  
 Armoured To IEC 60502-2  
 (Suitable for 3.8/6.6 kV  
 Earthed System)**

ALUMINIUM CONDUCTOR		3 CORE, A2XCEWY, G. S. Wire armoured Cables, 3.6/6 kV to IEC 60502-2											
Sr. No.	Nominal Area of Conductor (A)	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400
<b>Manufacturing Dimensions</b>													
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	203	280	381	553	764	965	1186	1500	1967	2445	3126
3.0	Insulation thickness (Nominal)	mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.0
4.0	Separation sheath thickness (Nominal)	mm	1.2	1.2	1.3	1.4	1.4	1.5	1.5	1.6	1.7	1.8	2.0
5.0	Armour wire diameter (Nominal)	mm	2.0	2.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.15	3.15
6.0	Outer sheath thickness (Nominal)	mm	2.3	2.3	2.5	2.6	2.7	2.8	2.9	3.0	3.2	3.5	3.8
7.0	Outer sheath thickness (Minimum)	mm	1.64	1.64	1.80	1.88	1.96	2.04	2.12	2.20	2.36	2.60	2.84
8.0	Cable overall diameter (Approximate)	mm	40.0	42.5	46.5	50.5	54.0	57.5	61.0	65.0	71.0	79.0	87.5
9.0	Cable weight (Approximate)	kg/km	2550	2795	3565	4100	4680	5225	5785	6510	7685	9835	11735
10.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	500	500	500	500	500	250	250
11.0	Minimum bending radius of cable (During installation)	mm	480	510	558	606	648	690	732	780	852	948	1050
<b>Electrical Parameters</b>													
<b>(i) Conductor</b>													
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.54	1.11	0.823	0.569	0.411	0.326	0.266	0.212	0.162	0.131	0.103
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.120	0.114	0.109	0.100	0.096	0.093	0.091	0.087	0.085	0.084	0.082
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.54	1.12	0.830	0.578	0.422	0.339	0.281	0.229	0.183	0.156	0.132
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	2.667	1.940	1.438	1.001	0.731	0.587	0.487	0.397	0.317	0.270	0.229
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.27	0.29	0.33	0.38	0.42	0.47	0.51	0.55	0.60	0.62	0.65
7.0	Approximate charging current per phase at U <sub>0</sub> = 3.6 kV and f = 50 Hz	mA/m	0.31	0.33	0.37	0.43	0.48	0.53	0.58	0.62	0.68	0.70	0.74
8.0	Sustained current ratings:-												
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	100	119	140	171	204	232	259	293	338	380	432
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	87	104	123	150	180	206	231	262	304	343	393
8.3	Laid singly in air, ambient temp. = 30 °C	A	111	133	159	196	238	274	309	354	415	472	545
9.0	Short circuit current rating of conductor for 1 second	kA	2.35	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60
<b>(ii) Armour</b>													
1.0	DC resistance at 20 °C (Approximate)	ohm/km	1.100	1.030	0.779	0.706	0.646	0.595	0.552	0.515	0.460	0.336	0.299
2.0	AC resistance at 80 °C (Approximate)	ohm/km	1.397	1.308	0.989	0.897	0.820	0.756	0.701	0.654	0.584	0.427	0.380
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	6.27	6.71	8.88	9.79	10.70	11.62	12.53	13.44	15.03	20.61	23.14

SECTION D - TABLE 6

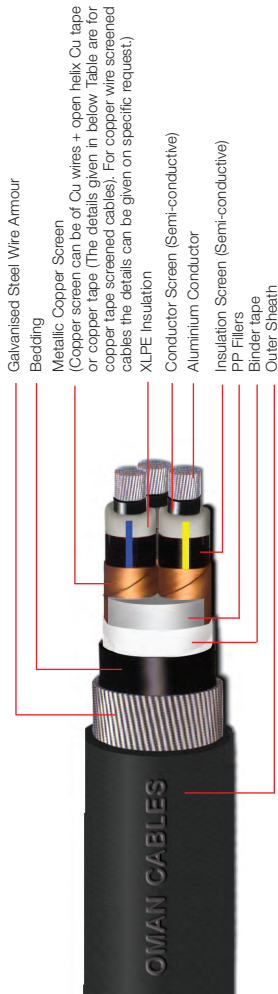


## 6/10 (12) kV Three Core Aluminium Conductor XLPE Insulated Steel Wire Armoured To IEC 60502-2 (Suitable for 6.35/11 kV Earthed System)

**3 CORE, A2XCEWY, G. S. Wire armoured Cables, 6/10 kV to IEC 60502-2**

Sr. No.	ALUMINIUM CONDUCTOR	3 CORE, A2XCEWY, G. S. Wire armoured Cables, 6/10 kV to IEC 60502-2											
		mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400
<b>(A) Manufacturing Dimensions</b>													
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	203	280	381	553	764	965	1186	1500	1967	2445	3126
3.0	Insulation thickness (Nominal)	mm	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
4.0	Separation sheath thickness (Nominal)	mm	1.3	1.3	1.4	1.4	1.5	1.6	1.6	1.7	1.8	1.9	2.0
5.0	Armour wire diameter (Nominal)	mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.15	3.15	3.15
6.0	Outer sheath thickness (Nominal)	mm	2.4	2.5	2.6	2.7	2.9	3.0	3.1	3.2	3.4	3.6	3.8
7.0	Outer sheath thickness (Minimum)	mm	1.72	1.80	1.88	1.96	2.12	2.20	2.28	2.36	2.52	2.68	2.84
8.0	Cable overall diameter (Approximate)	mm	45.5	48.0	51.0	54.5	58.5	62.0	65.0	69.5	76.5	82.0	89.0
9.0	Cable weight (Approximate)	kg/km	3335	3660	4060	4600	5220	5815	6355	7145	9160	10310	12060
10.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	500	500	500	500	250	250	250
11.0	Minimum bending radius of cable (During installation)	mm	546	576	612	654	702	744	780	834	918	984	1068
<b>(B) Electrical Parameters</b>													
<b>(i) Conductor</b>													
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.54	1.11	0.823	0.569	0.411	0.326	0.265	0.212	0.162	0.131	0.103
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.127	0.121	0.116	0.107	0.102	0.098	0.096	0.092	0.089	0.086	0.084
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.55	1.12	0.831	0.579	0.423	0.340	0.282	0.231	0.185	0.157	0.133
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	2.685	1.940	1.439	1.003	0.733	0.589	0.488	0.400	0.320	0.272	0.230
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.21	0.23	0.26	0.29	0.33	0.36	0.39	0.42	0.48	0.52	0.58
7.0	Approximate charging current per phase at U <sub>0</sub> = 6 kV and f = 50 Hz	mA/m	0.40	0.43	0.49	0.55	0.62	0.68	0.74	0.79	0.90	0.98	1.09
8.0	Sustained current ratings:-												
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	100	119	140	171	204	232	259	293	338	380	432
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	87	104	123	150	180	206	231	262	304	343	393
8.3	Laid singly in air, ambient temp. = 30 °C	A	111	133	159	196	238	274	309	354	415	472	545
9.0	Short circuit current rating of conductor for 1 second	kA	2.35	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60
<b>(ii) Armour</b>													
1.0	DC resistance at 20 °C (Approximate)	ohm/km	0.799	0.741	0.690	0.633	0.584	0.542	0.515	0.474	0.348	0.324	0.290
2.0	AC resistance at 80 °C (Approximate)	ohm/km	1.015	0.941	0.876	0.804	0.742	0.688	0.654	0.602	0.442	0.411	0.368
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	8.66	9.34	10.02	10.93	11.84	12.75	13.44	14.58	19.89	21.33	23.87

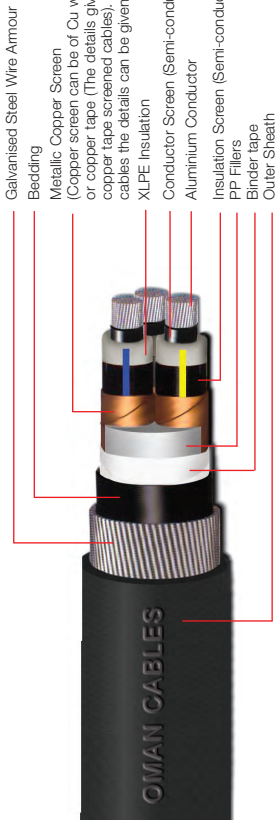




## 8.7/15 (17.5) kV Three Core Aluminium Conductor XLPE Insulated Steel Wire Armoured To IEC 60502-2 (Suitable for 8.7/15 kV Earthed System)

Sr. No. (A)		3 CORE, A2XCEWY, G. S. Wire armoured Cables, 8.7/15 kV to IEC 60502-2										
		25	35	50	70	95	120	150	185	240	300	400
<b>Nominal Area of Conductor</b>		mm <sup>2</sup>										
<b>Manufacturing Dimensions</b>												
1.0	Conductor diameter (Approximate)	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	203	280	381	553	764	965	1186	1500	1967	2445	3126
3.0	Insulation thickness (Nominal)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
4.0	Separation sheath thickness (Nominal)	1.4	1.4	1.5	1.5	1.6	1.7	1.7	1.8	1.9	2.0	2.1
5.0	Armour wire diameter (Nominal)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.15	3.15	3.15	3.15
6.0	Outer sheath thickness (Nominal)	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.4	3.6	3.7	4.0
7.0	Outer sheath thickness (Minimum)	1.88	1.96	2.04	2.12	2.20	2.28	2.36	2.52	2.68	2.76	3.00
8.0	Cable overall diameter (Approximate)	51.0	53.0	56.0	59.5	63.5	67.5	70.5	76.0	82.0	87.0	94.5
9.0	Cable weight (Approximate)	3945	4250	4645	5210	5900	6520	7080	8755	10015	11230	13010
10.0	Standard drum length ( $\pm 5\%$ Tolerance)	500	500	500	500	500	500	500	500	500	500	500
11.0	Minimum bending radius of cable (During installation)	612	636	672	714	762	810	846	912	984	1044	1134
<b>Electrical Parameters</b>												
<b>(i) Conductor</b>												
1.0	DC resistance of conductor at 20 °C (Maximum)	1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
2.0	AC resistance of conductor at 90 °C (Approximate)	1.54	1.11	0.823	0.569	0.411	0.325	0.265	0.212	0.162	0.130	0.103
3.0	Reactance at 50 Hz (Approximate)	0.136	0.129	0.123	0.114	0.108	0.104	0.101	0.097	0.093	0.091	0.088
4.0	Impedance at 50 Hz (Approximate)	1.55	1.12	0.832	0.580	0.425	0.341	0.284	0.233	0.187	0.159	0.135
5.0	Voltage drop (Approximate for 3 phase system)	2.685	1.940	1.441	1.005	0.736	0.591	0.492	0.404	0.324	0.275	0.234
6.0	Capacitance at 50 Hz (Approximate)	0.17	0.19	0.21	0.24	0.26	0.29	0.31	0.34	0.37	0.41	0.46
7.0	Approximate charging current per phase at U <sub>o</sub> = 8.7 kV and f = 50 Hz	0.46	0.52	0.57	0.66	0.71	0.79	0.85	0.93	1.01	1.12	1.26
8.0	Sustained current ratings:-											
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	100	119	140	171	204	232	259	293	338	380	432
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	87	104	123	150	180	206	231	262	304	343	393
8.3	Laid singly in air, ambient temp. = 30 °C	111	133	159	196	238	274	309	354	415	472	545
9.0	Short circuit current rating of conductor for 1 second	2.35	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60
<b>(ii) Armour</b>												
1.0	DC resistance at 20 °C (Approximate)	0.690	0.660	0.620	0.573	0.523	0.490	0.467	0.354	0.324	0.299	0.273
2.0	AC resistance at 80 °C (Approximate)	0.876	0.838	0.787	0.728	0.664	0.622	0.593	0.450	0.411	0.380	0.347
3.0	Short circuit current rating of armour for 1 second (Approximate)	10.02	10.48	11.16	12.07	13.21	14.12	14.80	19.53	21.33	23.14	25.31

SECTION D - TABLE 8



**12/20 (24) kV  
Three Core Aluminium Conductor  
XLPE Insulated Steel Wire  
Armoured To IEC 60502-2  
(Suitable for 12.7/22 kV  
Earthed System)**

**3 CORE, A2XCEWY, G. S. Wire armoured Cables, 12/20 kV to IEC 60502-2**

Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	35	50	70	95	120	150	185	240	300	400
<b>ALUMINIUM CONDUCTOR</b>												
<b>(A) Manufacturing Dimensions</b>												
1.0	Conductor diameter (Approximate)	mm	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	280	381	553	764	965	1186	1500	1967	2445	3126
3.0	Insulation thickness (Nominal)	mm	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
4.0	Separation sheath thickness (Nominal)	mm	1.5	1.6	1.6	1.7	1.7	1.8	1.9	2.0	2.0	2.2
5.0	Armour wire diameter (Nominal)	mm	2.5	2.5	2.5	2.5	3.15	3.15	3.15	3.15	3.15	3.15
6.0	Outer sheath thickness (Nominal)	mm	2.8	2.9	3.1	3.2	3.3	3.4	3.6	3.7	3.9	4.1
7.0	Outer sheath thickness (Minimum)	mm	2.04	2.12	2.28	2.36	2.44	2.52	2.68	2.76	2.92	3.08
8.0	Cable overall diameter (Approximate)	mm	58.0	61.0	65.0	69.0	73.5	77.0	81.5	87.0	92.0	99.5
9.0	Cable weight (Approximate)	kg/km	4865	5305	5925	6605	8100	8725	9670	10935	12125	13915
10.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	250	250	250	250	250	250
11.0	Minimum bending radius of cable (During installation)	mm	696	732	780	828	882	924	978	1044	1104	1194
<b>(B) Electrical Parameters</b>												
<b>(i) Conductor</b>												
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.11	0.823	0.569	0.411	0.325	0.265	0.212	0.162	0.130	0.102
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.136	0.130	0.120	0.114	0.110	0.106	0.102	0.098	0.095	0.092
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.12	0.833	0.582	0.427	0.343	0.285	0.235	0.189	0.161	0.137
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.940	1.443	1.008	0.740	0.594	0.494	0.407	0.327	0.279	0.237
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.17	0.18	0.20	0.23	0.25	0.26	0.29	0.32	0.35	0.38
7.0	Approximate charging current per phase at U <sub>0</sub> = 12 kV and f = 50 Hz	mA/m	0.64	0.68	0.75	0.87	0.94	0.98	1.09	1.21	1.32	1.43
8.0	Sustained current ratings:-											
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	119	140	171	204	232	259	293	338	380	432
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	104	123	150	180	206	231	262	304	343	393
8.3	Laid singly in air, ambient temp. = 30 °C	A	133	159	196	238	274	309	354	415	472	545
9.0	Short circuit current rating of conductor for 1 second	kA	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60
<b>(ii) Armour</b>												
1.0	DC resistance at 20 °C (Approximate)	ohm/km	0.584	0.552	0.515	0.482	0.361	0.348	0.324	0.299	0.281	0.258
2.0	AC resistance at 80 °C (Approximate)	ohm/km	0.742	0.701	0.654	0.612	0.458	0.442	0.411	0.380	0.357	0.328
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	11.84	12.53	13.44	14.35	19.16	19.89	21.33	23.14	24.59	26.76

Galvanised Steel Wire Armour  
Bedding  
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request)  
XLPE insulation  
Conductor Screen (Semi-conductive)  
Aluminium Conductor  
Insulation Screen (Semi-conductive)  
PP Fillers  
Binder tape  
Outer Sheath



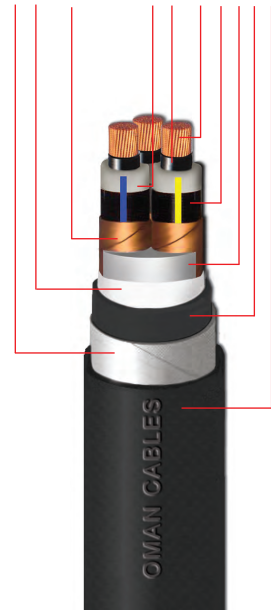
## 18/30 (36) kV Three Core Aluminium Conductor XLPE Insulated Steel Wire Armoured To IEC 60502-2 (Suitable for 19/33 kV Earthed System)

**3 CORE, A2XCEWY, G. S. Wire armoured Cables, 18/30 kV to IEC 60502-2**

Sr. No.	Nominal Area of Conductor (A)	mm <sup>2</sup>	50	70	95	120	150	185	240	300	400
<b>ALUMINIUM CONDUCTOR</b>											
<b>Manufacturing Dimensions</b>											
1.0	Conductor diameter (Approximate)	mm	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	381	553	764	965	1186	1500	1967	2445	3126
3.0	Insulation thickness (Nominal)	mm	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
4.0	Separation sheath thickness (Nominal)	mm	1.8	1.8	1.9	2.0	2.0	2.1	2.2	2.3	2.4
5.0	Armour wire diameter (Nominal)	mm	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15
6.0	Outer sheath thickness (Nominal)	mm	3.4	3.5	3.6	3.7	3.8	4.0	4.1	4.3	4.5
7.0	Outer sheath thickness (Minimum)	mm	2.52	2.60	2.68	2.76	2.84	3.00	3.08	3.24	3.40
8.0	Cable overall diameter (Approximate)	mm	74.5	78.0	82.5	86.0	89.0	93.5	99.0	104.0	111.5
9.0	Cable weight (Approximate)	kg/km	7835	8520	9370	10115	10760	11780	13095	14410	16325
10.0	Standard drum length (±5% Tolerance)	m	250	250	250	250	250	250	250	250	250
11.0	Minimum bending radius of cable (During installation)	mm	894	936	990	1032	1068	1122	1188	1248	1338
<b>Electrical Parameters</b>											
<b>(i) Conductor</b>											
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.823	0.569	0.411	0.325	0.265	0.212	0.162	0.130	0.102
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.143	0.132	0.125	0.120	0.117	0.112	0.107	0.103	0.100
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.835	0.584	0.430	0.346	0.290	0.240	0.194	0.166	0.143
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.446	1.012	0.745	0.599	0.502	0.416	0.336	0.288	0.248
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.14	0.16	0.17	0.19	0.20	0.22	0.24	0.26	0.28
7.0	Approximate charging current per phase at U <sub>0</sub> = 18 kV and f = 50 Hz	mA/m	0.79	0.90	0.96	1.07	1.13	1.24	1.36	1.47	1.58
8.0	Sustained current ratings:-										
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	140	171	204	232	259	293	338	380	432
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	123	150	180	206	231	262	304	343	393
8.3	Laid singly in air, ambient temp. = 30 °C	A	159	196	238	274	309	354	415	472	545
9.0	Short circuit current rating of conductor for 1 second	kA	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60
<b>(ii) Armour</b>											
1.0	DC resistance at 20 °C (Approximate)	ohm/km	0.361	0.342	0.319	0.304	0.294	0.277	0.258	0.245	0.228
2.0	AC resistance at 80 °C (Approximate)	ohm/km	0.458	0.434	0.405	0.386	0.373	0.352	0.328	0.311	0.290
3.0	Short circuit current rating of armour for 1 second (Approximate)	kA	19.16	20.25	21.70	22.78	23.50	24.95	26.76	28.20	30.37

**SECTION D - TABLE 10**

Steel Tape Armour  
 Binder Tape  
 Metallic Copper Screen  
 (Copper screen can be of Cu wires + open helix Cu tape or copper tape. (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)  
 XLPE Insulation  
 Conductor Screen (Semi-conductive)  
 Copper Conductor  
 Insulation Screen (Semi-conductive)  
 PP Filler  
 Bedding  
 Outer Sheath



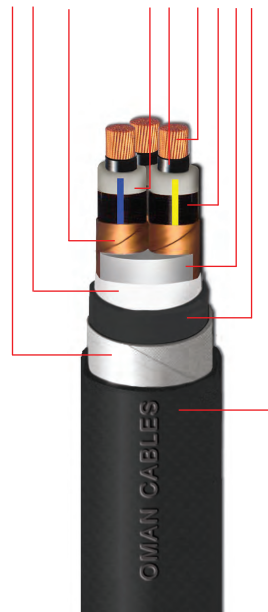
**3.6/6 (7.2) kV  
 Three Core Copper Conductor  
 XLPE Insulated  
 Double Steel Tape Armoured  
 To IEC 60502-2 (Suitable  
 for 3.8/6.6 kV Earthed System)**

**3 CORE, 2XCETgY, Double Steel Tape Armoured Cables, 3.6/6 kV to IEC 60502-2**

Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400
<b>(A) Manufacturing Dimensions</b>													
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	665	922	1242	1800	2500	3152	3888	4875	6425	8039	10301
3.0	Insulation thickness (Nominal)	mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.0
4.0	Separation sheath thickness (Nominal)	mm	1.2	1.2	1.3	1.4	1.4	1.5	1.5	1.6	1.7	1.8	2.0
5.0	Steel tape thickness (Nominal)	mm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8
6.0	Outer sheath thickness (Nominal)	mm	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.1	3.3	3.6
7.0	Outer sheath thickness (Minimum)	mm	1.56	1.64	1.72	1.80	1.88	1.96	2.04	2.12	2.28	2.44	2.68
8.0	Cable overall diameter (Approximate)	mm	38.0	40.5	43.5	47.0	51.0	54.5	57.5	61.5	68.0	74.0	84.0
9.0	Cable weight (Approximate)	kg/km	2245	2645	3160	3975	4930	5845	6775	8065	10120	12285	16240
10.0	Standard drum length (±5% Tolerance)	m	1000	500	500	500	500	500	500	500	500	250	250
11.0	Minimum bending radius of cable (During installation)	mm	570	608	653	705	765	818	863	923	1020	1110	1260
<b>(B) Electrical Parameters</b>													
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.928	0.669	0.494	0.343	0.247	0.197	0.160	0.129	0.099	0.080	0.065
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.120	0.114	0.109	0.100	0.096	0.093	0.091	0.087	0.085	0.084	0.082
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.936	0.679	0.506	0.357	0.265	0.218	0.184	0.156	0.130	0.116	0.105
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.621	1.176	0.876	0.618	0.459	0.378	0.319	0.270	0.225	0.201	0.182
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.27	0.29	0.33	0.38	0.42	0.47	0.51	0.55	0.60	0.62	0.65
7.0	Approximate charging current per phase at U <sub>0</sub> = 3.6 kV and f = 50 Hz	mA/m	0.31	0.33	0.37	0.43	0.48	0.53	0.58	0.62	0.68	0.70	0.74
8.0	Sustained current ratings:-												
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	129	154	181	220	263	298	332	374	431	482	541
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	112	134	158	194	232	264	296	335	387	435	492
8.3	Laid singly in air, ambient temp. = 30 °C	A	143	172	205	253	307	352	397	453	529	599	683
9.0	Short circuit current rating of conductor for 1 second	kA	3.58	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20

**SECTION E - TABLE 1**

Steel Tape Armour  
Binder Tape  
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape or copper tape (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)  
XLPE Insulation  
Conductor Screen (Semi-conductive)  
Copper Conductor  
Insulation Screen (Semi-conductive)  
PP Filler  
Bedding  
Outer Sheath



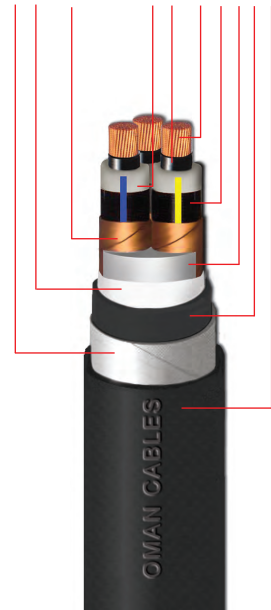
## 6/10 (12) kV Three Core Copper Conductor XLPE Insulated Double Steel Tape Armoured To IEC 60502-2 (Suitable for 6.35/11 kV Earthed System)

**3 CORE, 2XCETgY, Double Steel Tape Armoured Cables, 6/10 kV to IEC 60502-2**

Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400
<b>(A) Manufacturing Dimensions</b>													
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	665	922	1242	1800	2500	3152	3888	4875	6425	8039	10301
3.0	Insulation thickness (Nominal)	mm	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
4.0	Separation sheath thickness (Nominal)	mm	1.3	1.3	1.4	1.4	1.5	1.6	1.6	1.7	1.8	1.9	2.0
5.0	Steel tape thickness (Nominal)	mm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8
6.0	Outer sheath thickness (Nominal)	mm	2.3	2.4	2.5	2.6	2.7	2.9	3.0	3.1	3.3	3.4	3.7
7.0	Outer sheath thickness (Minimum)	mm	1.64	1.72	1.80	1.88	1.96	2.12	2.20	2.28	2.44	2.52	2.76
8.0	Cable overall diameter (Approximate)	mm	42.0	44.5	47.5	51.0	55.5	59.0	62.0	66.0	72.0	77.0	86.0
9.0	Cable weight (Approximate)	kg/km	2565	2980	3515	4325	5330	6265	7240	8560	10605	12660	16520
10.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	500	500	500	500	500	250	250
11.0	Minimum bending radius of cable (During installation)	mm	630	668	713	765	833	885	930	990	1080	1155	1290
<b>(B) Electrical Parameters</b>													
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.928	0.669	0.494	0.343	0.247	0.197	0.160	0.129	0.099	0.080	0.065
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.127	0.121	0.116	0.107	0.102	0.098	0.096	0.092	0.089	0.086	0.084
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.937	0.680	0.507	0.359	0.267	0.220	0.187	0.158	0.133	0.117	0.106
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.623	1.178	0.878	0.622	0.462	0.381	0.324	0.274	0.230	0.203	0.184
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.21	0.23	0.26	0.29	0.33	0.36	0.39	0.42	0.48	0.52	0.58
7.0	Approximate charging current per phase at U <sub>0</sub> = 6 kV and f = 50 Hz	mA/m	0.40	0.43	0.49	0.55	0.62	0.68	0.74	0.79	0.90	0.98	1.09
8.0	Sustained current ratings:-												
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	129	154	181	220	263	298	332	374	431	482	541
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	112	134	158	194	232	264	296	335	387	435	492
8.3	Laid singly in air, ambient temp. = 30 °C	A	143	172	205	253	307	352	397	453	529	599	683
9.0	Short circuit current rating of conductor for 1 second	KA	3.58	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20

**SECTION E - TABLE 2**

Steel Tape Armour  
 Binder Tape  
 Metallic Copper Screen  
 (Copper screen can be of Cu wires + open helix Cu tape or copper tape. (The details given in below Table are for copper tape screened cables). For copper wire screened cables the details can be given on specific request.)  
 XLPE Insulation  
 Conductor Screen (Semi-conductive)  
 Copper Conductor  
 Insulation Screen (Semi-conductive)  
 PP Filler  
 Bedding  
 Outer Sheath

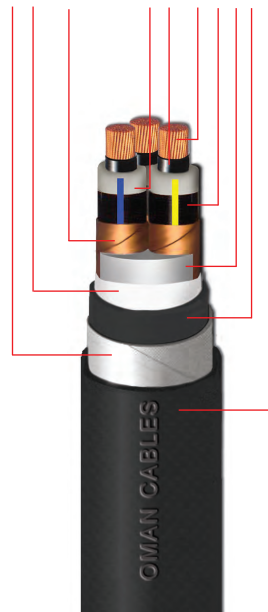


**8.7/15 (17.5) kV  
 Three Core Copper Conductor  
 XLPE Insulated  
 Double Steel Tape Armoured  
 To IEC 60502-2 (Suitable  
 for 8.7/15 kV Earthed System)**

**3 CORE, 2XCETgY, Double Steel Tape Armoured Cables, 8.7/15 kV to IEC 60502-2**

COPPER CONDUCTOR		25	35	50	70	95	120	150	185	240	300	400
<b>Sr. No.</b>	<b>Nominal Area of Conductor</b>	mm <sup>2</sup>										
<b>(A)</b>	<b>Manufacturing Dimensions</b>											
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	665	922	1242	1800	2500	3152	3888	4875	6039	10301
3.0	Insulation thickness (Nominal)	mm	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
4.0	Separation sheath thickness (Nominal)	mm	1.4	1.4	1.5	1.5	1.6	1.7	1.7	1.8	1.9	2.0
5.0	Steel tape thickness (Nominal)	mm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8
6.0	Outer sheath thickness (Nominal)	mm	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.3	3.4	3.9
7.0	Outer sheath thickness (Minimum)	mm	1.80	1.88	1.96	2.04	2.12	2.20	2.28	2.44	2.52	2.68
8.0	Cable overall diameter (Approximate)	mm	47.5	50.0	53.0	56.5	60.5	64.0	67.0	71.5	77.0	83.5
9.0	Cable weight (Approximate)	kg/km	3000	3435	3990	4805	5835	6800	7795	9175	11230	14185
10.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	500	500	500	500	250	250
11.0	Minimum bending radius of cable (During installation)	mm	713	750	795	848	908	960	1005	1073	1155	1253
<b>(B)</b>	<b>Electrical Parameters</b>											
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.727	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0470
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.928	0.669	0.494	0.343	0.247	0.197	0.160	0.128	0.099	0.064
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.136	0.129	0.123	0.114	0.108	0.104	0.101	0.097	0.093	0.088
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.938	0.681	0.509	0.361	0.270	0.223	0.189	0.161	0.136	0.109
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.625	1.180	0.882	0.625	0.468	0.386	0.327	0.279	0.236	0.189
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.17	0.19	0.21	0.24	0.26	0.29	0.31	0.34	0.37	0.46
7.0	Approximate charging current per phase at U <sub>0</sub> = 8.7 kV and f = 50 Hz	mA/m	0.46	0.52	0.57	0.66	0.71	0.79	0.85	0.93	1.01	1.12
8.0	Sustained current ratings:-											
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	129	154	181	220	263	298	332	374	431	482
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	112	134	158	194	232	264	296	335	387	435
8.3	Laid singly in air, ambient temp. = 30 °C	A	143	172	205	253	307	352	397	453	529	683
9.0	Short circuit current rating of conductor for 1 second	kA	3.58	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90

Steel Tape Armour  
Binder Tape  
Metallic Copper Screen  
(Copper screen can be of Cu wires + open helix Cu tape  
or copper tape (The details given in below Table are for  
copper tape screened cables). For copper wire screened  
cables the details can be given on specific request.)  
XLPE Insulation  
Conductor Screen (Semi-conductive)  
Copper Conductor  
Insulation Screen (Semi-conductive)  
PP Filler  
Bedding  
Outer Sheath



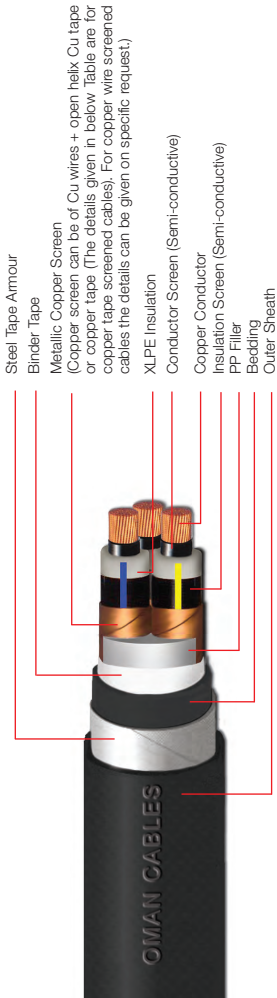
## 12/20 (24) kV Three Core Copper Conductor XLPE Insulated Double Steel Tape Armoured To IEC 60502-2 (Suitable for 12.7/22 kV Earthed System)

**3 CORE, 2XCETgY, Double Steel Tape Armoured Cables, 12/20 kV to IEC 60502-2**

Sr. No.	mm <sup>2</sup>	35	50	70	95	120	150	185	240	300	400	
<b>COPPER CONDUCTOR</b>												
<b>(A) Nominal Area of Conductor</b>												
1.0	Conductor diameter (Approximate)	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	
2.0	Conductor weight (Approximate)	922	1242	1800	2500	3152	3888	4875	6425	8039	10301	
3.0	Insulation thickness (Nominal)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
4.0	Separation sheath thickness (Nominal)	1.5	1.6	1.6	1.7	1.7	1.8	1.9	2.0	2.0	2.2	
5.0	Steel tape thickness (Nominal)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8	0.8	
6.0	Outer sheath thickness (Nominal)	2.7	2.8	2.9	3.1	3.2	3.3	3.4	3.6	3.8	4.0	
7.0	Outer sheath thickness (Minimum)	1.96	2.04	2.12	2.28	2.36	2.44	2.52	2.68	2.84	3.00	
8.0	Cable overall diameter (Approximate)	55.0	58.0	61.5	66.0	69.0	72.5	76.5	83.5	89.0	96.5	
9.0	Cable weight (Approximate)	3905	4460	5320	6410	7365	8420	9800	12755	14935	18140	
10.0	Standard drum length (±5% Tolerance)	500	500	500	500	500	500	250	250	250	250	
11.0	Minimum bending radius of cable (During installation)	825	870	923	990	1035	1088	1148	1253	1335	1448	
<b>(B) Electrical Parameters</b>												
1.0	DC resistance of conductor at 20 °C (Maximum)	0.524	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	
2.0	AC resistance of conductor at 90 °C (Approximate)	0.669	0.494	0.343	0.247	0.196	0.160	0.128	0.099	0.080	0.064	
3.0	Reactance at 50 Hz (Approximate)	0.136	0.130	0.120	0.114	0.110	0.106	0.102	0.098	0.095	0.092	
4.0	Impedance at 50 Hz (Approximate)	0.683	0.511	0.363	0.272	0.225	0.192	0.164	0.139	0.124	0.112	
5.0	Voltage drop (Approximate for 3 phase system)	1.183	0.885	0.629	0.471	0.390	0.333	0.284	0.241	0.215	0.194	
6.0	Capacitance at 50 Hz (Approximate)	0.17	0.18	0.20	0.23	0.25	0.26	0.29	0.32	0.35	0.38	
7.0	Approximate charging current per phase at U <sub>0</sub> = 12 kV and f = 50 Hz	0.64	0.68	0.75	0.87	0.94	0.98	1.09	1.21	1.32	1.43	
8.0	Sustained current ratings:-											
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	154	181	220	263	298	332	374	431	482	541
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	134	158	194	232	264	296	335	387	435	492
8.3	Laid singly in air, ambient temp. = 30 °C	A	172	205	253	307	352	397	453	529	599	683
9.0	Short circuit current rating of conductor for 1 second	kA	5.01	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20

**SECTION E - TABLE 4**

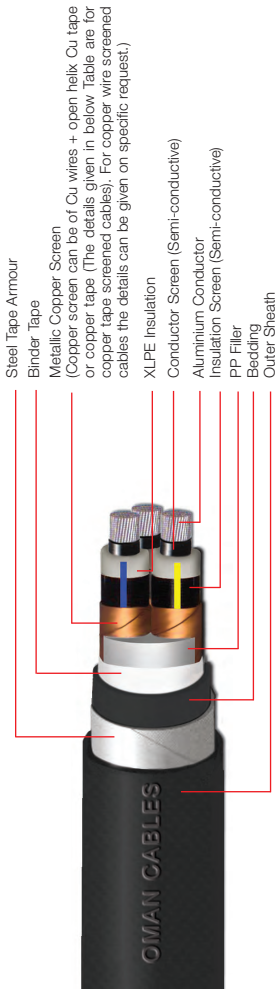
**18/30 (36) kV**  
**Three Core Copper Conductor**  
**XLPE Insulated**  
**Double Steel Tape Armoured**  
**To IEC 60502-2 (Suitable**  
**for 19/33 kV Earthed System)**



		<b>3 CORE, 2XCETgY, Double Steel Tape Armoured Cables, 18/30 kV to IEC 60502-2</b>										
<b>Sr. No.</b>	<b>Nominal Area of Conductor</b>	<b>mm<sup>2</sup></b>	<b>50</b>	<b>70</b>	<b>95</b>	<b>120</b>	<b>150</b>	<b>185</b>	<b>240</b>	<b>300</b>	<b>400</b>	
<b>(A)</b>	<b>Manufacturing Dimensions</b>											
1.0	Conductor diameter (Approximate)	mm	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	
2.0	Conductor weight (Approximate)	kg/km	1242	1800	2500	3152	3888	4875	6425	8039	10301	
3.0	Insulation thickness (Nominal)	mm	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
4.0	Separation sheath thickness (Nominal)	mm	1.8	1.8	1.9	2.0	2.0	2.1	2.2	2.3	2.4	
5.0	Steel tape thickness (Nominal)	mm	0.50	0.50	0.50	0.80	0.80	0.80	0.80	0.80	0.80	
6.0	Outer sheath thickness (Nominal)	mm	3.2	3.3	3.5	3.6	3.7	3.9	4.0	4.2	4.4	
7.0	Outer sheath thickness (Minimum)	mm	2.36	2.44	2.60	2.68	2.76	2.92	3.00	3.16	3.32	
8.0	Cable overall diameter (Approximate)	mm	70.0	73.5	78.0	82.5	85.5	90.0	95.5	101.0	108.0	
9.0	Cable weight (Approximate)	kg/km	5750	6675	7840	9700	10805	12335	14585	16860	20135	
10.0	Standard drum length (±5% Tolerance)	m	500	250	250	250	250	250	250	250	250	
11.0	Minimum bending radius of cable (During installation)	mm	1050	1103	1170	1238	1283	1350	1433	1515	1620	
<b>(B)</b>	<b>Electrical Parameters</b>											
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.494	0.343	0.247	0.196	0.160	0.128	0.098	0.079	0.063	
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.143	0.132	0.125	0.120	0.117	0.112	0.107	0.103	0.100	
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.514	0.368	0.277	0.230	0.198	0.170	0.145	0.130	0.118	
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	0.890	0.637	0.480	0.398	0.343	0.294	0.251	0.225	0.204	
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.14	0.16	0.17	0.19	0.20	0.22	0.24	0.26	0.28	
7.0	Approximate charging current per phase at U <sub>0</sub> = 18 kV and f= 50 Hz	mA/m	0.79	0.90	0.96	1.07	1.13	1.24	1.36	1.47	1.58	
8.0	Sustained current ratings:-											
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	181	220	263	298	332	374	431	482	541	
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	158	194	232	264	296	335	387	435	492	
8.3	Laid singly in air, ambient temp. = 30 °C	A	205	253	307	352	397	453	529	599	683	
9.0	Short circuit current rating of conductor for 1 second	kA	7.15	10.01	13.59	17.16	21.45	26.46	34.32	42.90	57.20	



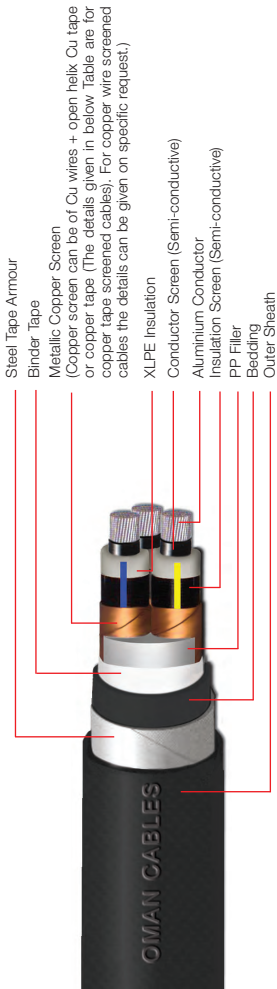
**3.6/6 (7.2) kV  
Three Core Aluminium Conductor  
XLPE Insulated  
Double Steel Tape Armoured  
To IEC 60502-2 (Suitable  
for 3.8/6.6 kV Earthed System)**



ALUMINIUM CONDUCTOR		3 CORE, A2XCETgY, Double Steel Tape Armoured Cables, 3.6/6 kV to IEC 60502-2											
Sr. No.	Nominal Area of Conductor (A)	25	35	50	70	95	120	150	185	240	300	400	
1.0	Conductor diameter (Approximate)	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3	
2.0	Conductor weight (Approximate)	203	280	381	553	764	965	1186	1500	1967	2445	3126	
3.0	Insulation thickness (Nominal)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.0	
4.0	Separation sheath thickness (Nominal)	1.2	1.2	1.3	1.4	1.4	1.5	1.5	1.6	1.7	1.8	2.0	
5.0	Steel tape thickness (Nominal)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	
6.0	Outer sheath thickness (Nominal)	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.1	3.3	3.6	
7.0	Outer sheath thickness (Minimum)	1.56	1.64	1.72	1.80	1.88	1.96	2.04	2.12	2.28	2.44	2.68	
8.0	Cable overall diameter (Approximate)	38.0	40.5	43.5	47.0	51.0	54.5	57.5	61.5	68.0	74.0	84.0	
9.0	Cable weight (Approximate)	1785	2005	2300	2730	3195	3660	4070	4690	5665	6690	9060	
10.0	Standard drum length (±5% Tolerance)	1000	500	500	500	500	500	500	500	500	250	250	
11.0	Minimum bending radius of cable (During installation)	570	608	653	705	765	818	863	923	1020	1110	1260	
<b>(B) Electrical Parameters</b>													
1.0	DC resistance of conductor at 20 °C (Maximum)	1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	
2.0	AC resistance of conductor at 90 °C (Approximate)	1.54	1.11	0.823	0.569	0.411	0.326	0.266	0.212	0.162	0.131	0.103	
3.0	Reactance at 50 Hz (Approximate)	0.120	0.114	0.109	0.100	0.096	0.093	0.091	0.087	0.085	0.084	0.082	
4.0	Impedance at 50 Hz (Approximate)	1.54	1.12	0.830	0.578	0.422	0.339	0.281	0.229	0.183	0.156	0.132	
5.0	Voltage drop (Approximate for 3 phase system)	2.667	1.940	1.438	1.001	0.731	0.587	0.487	0.397	0.317	0.270	0.229	
6.0	Capacitance at 50 Hz (Approximate)	0.27	0.29	0.33	0.38	0.42	0.47	0.51	0.55	0.60	0.62	0.65	
7.0	Approximate charging current per phase at U <sub>0</sub> = 3.6 kV and f = 50 Hz	0.31	0.33	0.37	0.43	0.48	0.53	0.58	0.62	0.68	0.70	0.74	
8.0	Sustained current ratings:-												
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	100	119	140	171	204	232	259	293	338	380	432
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	87	104	123	150	180	206	231	262	304	343	393
8.3	Laid singly in air, ambient temp. = 30 °C	A	111	133	159	196	238	274	309	354	415	472	545
9.0	Short circuit current rating of conductor for 1 second	kA	2.35	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60

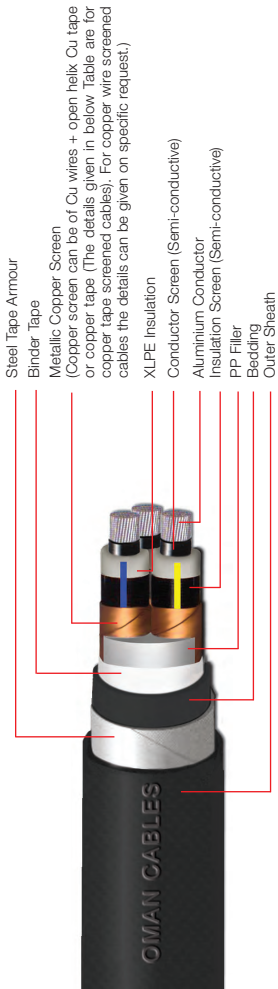
SECTION E - TABLE 6

**6/10 (12) kV  
Three Core Aluminium Conductor  
XLPE Insulated  
Double Steel Tape Armoured  
To IEC 60502-2 (Suitable  
for 6.35/11 kV Earthed System)**



		<b>3 CORE, A2XCETgY, Double Steel Tape Armoured Cables, 6/10 kV to IEC 60502-2</b>											
		<b>ALUMINIUM CONDUCTOR</b>											
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400
<b>(A) Manufacturing Dimensions</b>													
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	203	280	381	553	764	965	1186	1500	1967	2445	3126
3.0	Insulation thickness (Nominal)	mm	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
4.0	Separation sheath thickness (Nominal)	mm	1.3	1.3	1.4	1.4	1.5	1.6	1.6	1.7	1.8	1.9	2.0
5.0	Steel tape thickness (Nominal)	mm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8
6.0	Outer sheath thickness (Nominal)	mm	2.3	2.4	2.5	2.6	2.7	2.9	3.0	3.1	3.3	3.4	3.7
7.0	Outer sheath thickness (Minimum)	mm	1.64	1.72	1.80	1.88	1.96	2.12	2.20	2.28	2.44	2.52	2.76
8.0	Cable overall diameter (Approximate)	mm	42.0	44.5	47.5	51.0	55.5	59.0	62.0	66.0	72.0	77.0	86.0
9.0	Cable weight (Approximate)	kg/km	2100	2335	2650	3080	3595	4080	4535	5180	6145	7070	9340
10.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	500	500	500	500	500	250	250
11.0	Minimum bending radius of cable (During installation)	mm	630	668	713	765	833	885	930	990	1080	1155	1290
<b>(B) Electrical Parameters</b>													
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.54	1.11	0.823	0.569	0.411	0.326	0.265	0.212	0.162	0.131	0.103
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.127	0.121	0.116	0.107	0.102	0.098	0.096	0.092	0.089	0.086	0.084
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.55	1.12	0.831	0.579	0.423	0.340	0.282	0.231	0.185	0.157	0.133
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	2.685	1.940	1.439	1.003	0.733	0.589	0.488	0.400	0.320	0.272	0.230
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.21	0.23	0.26	0.29	0.33	0.36	0.39	0.42	0.48	0.52	0.58
7.0	Approximate charging current per phase at U <sub>0</sub> = 6 kV and f = 50 Hz	mA/m	0.40	0.43	0.49	0.55	0.62	0.68	0.74	0.79	0.90	0.98	1.09
8.0	Sustained current ratings:-												
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	100	119	140	171	204	232	259	293	338	380	432
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	87	104	123	150	180	206	231	262	304	343	393
8.3	Laid singly in air, ambient temp. = 30 °C	A	111	133	159	196	238	274	309	354	415	472	545
9.0	Short circuit current rating of conductor for 1 second	kA	2.35	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60

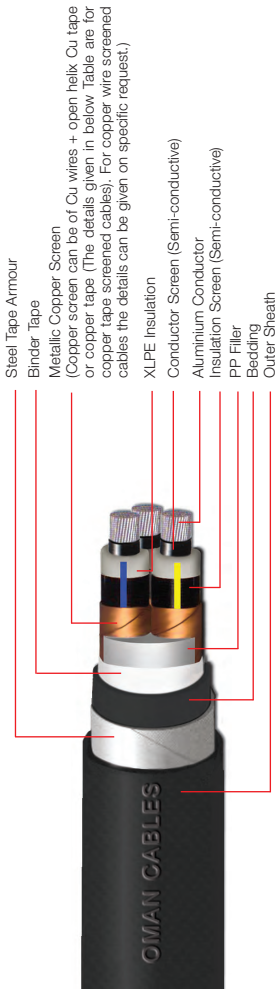
**8.7/15 (17.5) kV  
Three Core Aluminium Conductor  
XLPE Insulated  
Double Steel Tape Armoured  
To IEC 60502-2 (Suitable  
for 8.7/15 kV Earthed System)**



ALUMINIUM CONDUCTOR		3 CORE, A2XCETgY, Double Steel Tape Armoured Cables, 8.7/15 kV to IEC 60502-2											
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	25	35	50	70	95	120	150	185	240	300	400
<b>(A) Manufacturing Dimensions</b>													
1.0	Conductor diameter (Approximate)	mm	5.9	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	203	280	381	553	764	965	1186	1500	1967	2445	3126
3.0	Insulation thickness (Nominal)	mm	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
4.0	Separation sheath thickness (Nominal)	mm	1.4	1.4	1.5	1.5	1.6	1.7	1.7	1.8	1.9	2.0	2.1
5.0	Steel tape thickness (Nominal)	mm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8
6.0	Outer sheath thickness (Nominal)	mm	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.3	3.4	3.6	3.9
7.0	Outer sheath thickness (Minimum)	mm	1.80	1.88	1.96	2.04	2.12	2.20	2.28	2.44	2.52	2.68	2.92
8.0	Cable overall diameter (Approximate)	mm	47.5	50.0	53.0	56.5	60.5	64.0	67.0	71.5	77.0	83.5	91.0
9.0	Cable weight (Approximate)	kg/km	2540	2790	3130	3555	4100	4610	5090	5800	6775	8590	10155
10.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	500	500	500	500	250	250	250
11.0	Minimum bending radius of cable (During installation)	mm	713	750	795	848	908	960	1005	1073	1155	1253	1365
<b>(B) Electrical Parameters</b>													
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.54	1.11	0.823	0.569	0.411	0.325	0.265	0.212	0.162	0.130	0.103
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.136	0.129	0.123	0.114	0.108	0.104	0.101	0.097	0.093	0.091	0.088
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.55	1.12	0.832	0.580	0.425	0.341	0.284	0.233	0.187	0.159	0.135
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	2.685	1.940	1.441	1.005	0.736	0.591	0.492	0.404	0.324	0.275	0.234
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.17	0.19	0.21	0.24	0.26	0.29	0.31	0.34	0.37	0.41	0.46
7.0	Approximate charging current per phase at U <sub>0</sub> = 8.7 kV and f = 50 Hz	mA/m	0.46	0.52	0.57	0.66	0.71	0.79	0.85	0.93	1.01	1.12	1.26
8.0	Sustained current ratings:-												
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	100	119	140	171	204	232	259	293	338	380	432
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	87	104	123	150	180	206	231	262	304	343	393
8.3	Laid singly in air, ambient temp. = 30 °C	A	111	133	159	196	238	274	309	354	415	472	545
9.0	Short circuit current rating of conductor for 1 second	kA	2.35	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60

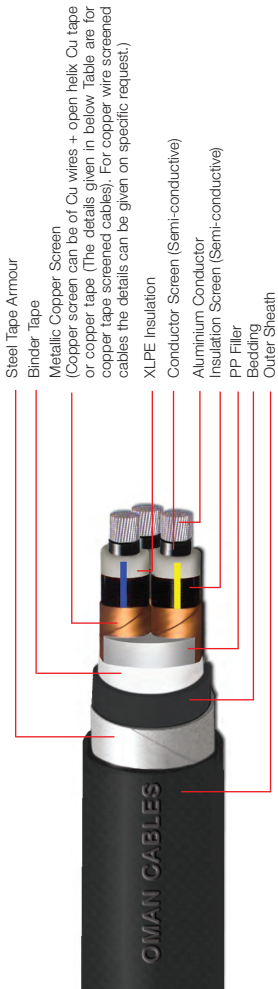
**SECTION E - TABLE 8**

**12/20 (24) kV**  
**Three Core Aluminium Conductor**  
**XLPE Insulated**  
**Double Steel Tape Armoured**  
**To IEC 60502-2 (Suitable**  
**for 12.7/22 kV Earthed System)**



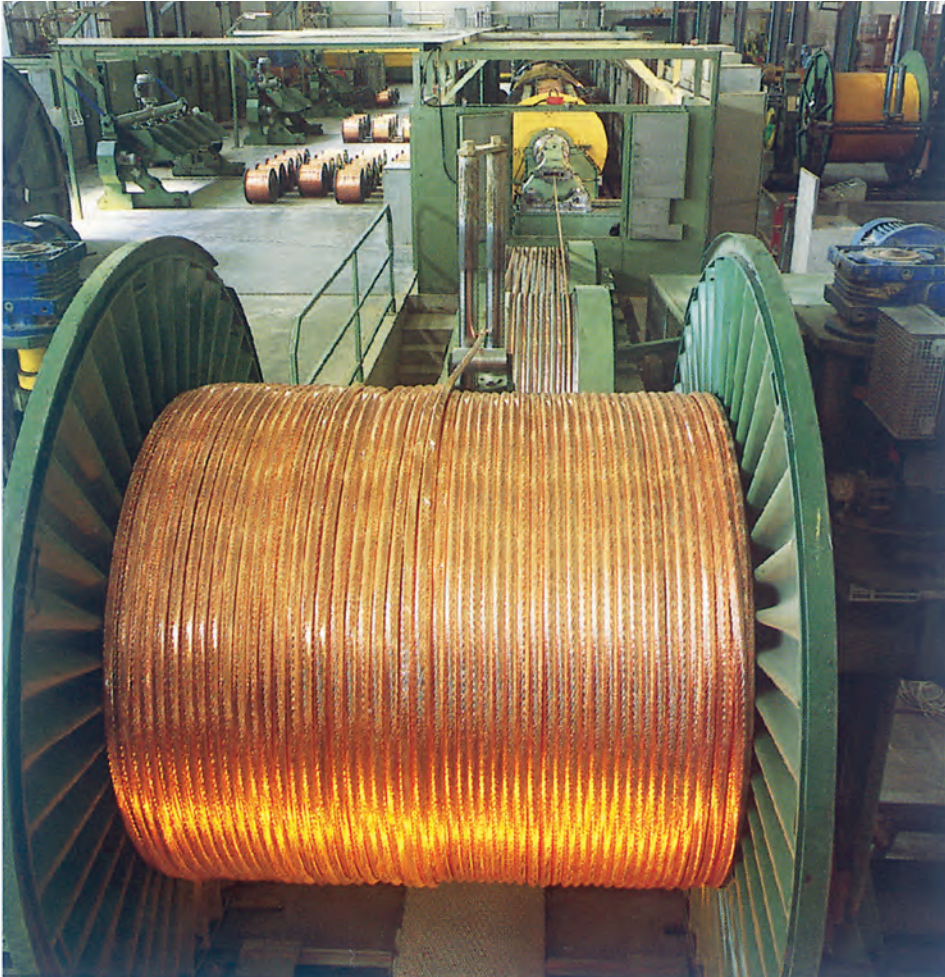
ALUMINIUM CONDUCTOR		3 CORE, A2XGETgY, Double Steel Tape Armoured Cables, 12/20 kV to IEC 60502-2										
Sr. No.	Nominal Area of Conductor (A)	mm <sup>2</sup>	35	50	70	95	120	150	185	240	300	400
1.0	Conductor diameter (Approximate)	mm	6.9	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	280	381	553	764	965	1186	1500	1967	2445	3126
3.0	Insulation thickness (Nominal)	mm	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
4.0	Separation sheath thickness (Nominal)	mm	1.5	1.6	1.6	1.7	1.7	1.8	1.9	2.0	2.0	2.2
5.0	Steel tape thickness (Nominal)	mm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8	0.8
6.0	Outer sheath thickness (Nominal)	mm	2.7	2.8	2.9	3.1	3.2	3.3	3.4	3.6	3.8	4.0
7.0	Outer sheath thickness (Minimum)	mm	1.96	2.04	2.12	2.28	2.36	2.44	2.52	2.68	2.84	3.00
8.0	Cable overall diameter (Approximate)	mm	55.0	58.0	61.5	66.0	69.0	72.5	76.5	83.5	89.0	96.5
9.0	Cable weight (Approximate)	kg/km	3260	3595	4075	4675	5180	5720	6425	8300	9345	10965
10.0	Standard drum length (±5% Tolerance)	m	500	500	500	500	500	500	250	250	250	250
11.0	Minimum bending radius of cable (During installation)	mm	825	870	923	990	1035	1088	1148	1253	1335	1448
<b>(B) Electrical Parameters</b>												
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	1.11	0.823	0.569	0.411	0.325	0.265	0.212	0.162	0.130	0.102
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.136	0.130	0.120	0.114	0.110	0.106	0.102	0.098	0.095	0.092
4.0	Impedance at 50 Hz (Approximate)	ohm/km	1.12	0.833	0.582	0.427	0.343	0.285	0.235	0.189	0.161	0.137
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.940	1.443	1.008	0.740	0.594	0.494	0.407	0.327	0.279	0.237
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.17	0.18	0.20	0.23	0.25	0.26	0.29	0.32	0.35	0.38
7.0	Approximate charging current per phase at U <sub>0</sub> = 12 kV and f= 50 Hz	mA/m	0.64	0.68	0.75	0.87	0.94	0.98	1.09	1.21	1.32	1.43
8.0	Sustained current ratings:-											
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	119	140	171	204	232	259	293	338	380	432
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	104	123	150	180	206	231	262	304	343	393
8.3	Laid singly in air, ambient temp. = 30 °C	A	133	159	196	238	274	309	354	415	472	545
9.0	Short circuit current rating of conductor for 1 second	kA	3.29	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60

**18/30 (36) kV**  
**Three Core Aluminium Conductor**  
**XLPE Insulated**  
**Double Steel Tape Armoured**  
**To IEC 60502-2 (Suitable**  
**for 19/33 kV Earthed System)**



ALUMINIUM CONDUCTOR		3 CORE, A2XCETgY, Double Steel Tape Armoured Cables, 18/30 kV to IEC 60502-2									
Sr. No.	Nominal Area of Conductor	mm <sup>2</sup>	50	70	95	120	150	185	240	300	400
<b>(A) Manufacturing Dimensions</b>											
1.0	Conductor diameter (Approximate)	mm	8.1	9.7	11.4	12.9	14.3	16.0	18.4	20.6	23.3
2.0	Conductor weight (Approximate)	kg/km	381	553	764	965	1186	1500	1967	2445	3126
3.0	Insulation thickness (Nominal)	mm	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
4.0	Separation sheath thickness (Nominal)	mm	1.8	1.8	1.9	2.0	2.0	2.1	2.2	2.3	2.4
5.0	Steel tape thickness (Nominal)	mm	0.50	0.50	0.50	0.80	0.80	0.80	0.80	0.80	0.80
6.0	Outer sheath thickness (Nominal)	mm	3.2	3.3	3.5	3.6	3.7	3.9	4.0	4.2	4.4
7.0	Outer sheath thickness (Minimum)	mm	2.36	2.44	2.60	2.68	2.76	2.92	3.00	3.16	3.32
8.0	Cable overall diameter (Approximate)	mm	70.0	73.5	78.0	82.5	85.5	90.0	95.5	101.0	108.0
9.0	Cable weight (Approximate)	kg/km	4890	5425	6105	7515	8100	8960	10130	11265	12960
10.0	Standard drum length (±5% Tolerance)	m	500	250	250	250	250	250	250	250	250
11.0	Minimum bending radius of cable (During installation)	mm	1050	1103	1170	1238	1283	1350	1433	1515	1620
<b>(B) Electrical Parameters</b>											
1.0	DC resistance of conductor at 20 °C (Maximum)	ohm/km	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
2.0	AC resistance of conductor at 90 °C (Approximate)	ohm/km	0.823	0.569	0.411	0.325	0.265	0.212	0.162	0.130	0.102
3.0	Reactance at 50 Hz (Approximate)	ohm/km	0.143	0.132	0.125	0.120	0.117	0.112	0.107	0.103	0.100
4.0	Impedance at 50 Hz (Approximate)	ohm/km	0.835	0.584	0.430	0.346	0.290	0.240	0.194	0.166	0.143
5.0	Voltage drop (Approximate for 3 phase system)	v/amp/km	1.446	1.012	0.745	0.599	0.502	0.416	0.336	0.288	0.248
6.0	Capacitance at 50 Hz (Approximate)	µF/km	0.14	0.16	0.17	0.19	0.20	0.22	0.24	0.26	0.28
7.0	Approximate charging current per phase at U <sub>0</sub> = 18 kV and f = 50 Hz	mA/m	0.79	0.90	0.96	1.07	1.13	1.24	1.36	1.47	1.58
8.0	Sustained current ratings:-										
8.1	Laid direct, ground temp. = 20 °C & Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m laid singly	A	140	171	204	232	259	293	338	380	432
8.2	Drawn into earthenware ducts, ground temp. = 20 °C and Thermal resistivity of soil = 1.5 °C m/W, depth of laying = 0.8 m, laid singly	A	123	150	180	206	231	262	304	343	393
8.3	Laid singly in air, ambient temp. = 30 °C	A	159	196	238	274	309	354	415	472	545
9.0	Short circuit current rating of conductor for 1 second	kA	4.70	6.58	8.93	11.28	14.10	17.39	22.56	28.20	37.60

**SECTION E - TABLE 10**



Conductor Stranding Machine



150 mm Sheathing Line



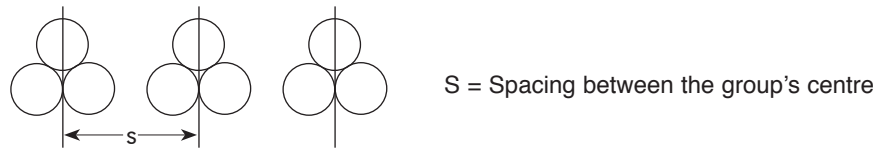
# Section F





## GROUP RATING FACTORS FOR CIRCUITS OF THREE SINGLE CORE CABLES, IN TREFOIL LAID DIRECT IN GROUND

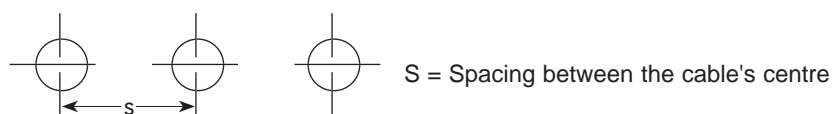
Number of trefoils in group	Spacing between group centres (S) mm				
	Touching	200	400	600	800
2	0.73	0.83	0.88	0.90	0.92
3	0.60	0.73	0.79	0.83	0.86
4	0.54	0.68	0.75	0.80	0.84
5	0.49	0.63	0.72	0.78	0.82
6	0.46	0.61	0.70	0.76	0.81
7	0.43	0.58	0.68	0.75	0.80
8	0.41	0.57	0.67	0.74	-
9	0.39	0.55	0.66	0.73	-
10	0.37	0.54	0.65	-	-
11	0.36	0.53	0.64	-	-
12	0.35	0.52	0.64	-	-



**SECTION F - TABLE 1**

## GROUP RATING FACTORS FOR CIRCUITS OF THREE CORE CABLES, LAID DIRECT IN GROUND

Number of cables in group	Spacing between group centres (S) mm				
	Touching	200	400	600	800
2	0.80	0.86	0.90	0.92	0.94
3	0.69	0.77	0.82	0.86	0.89
4	0.62	0.72	0.79	0.83	0.87
5	0.57	0.68	0.76	0.81	0.85
6	0.54	0.65	0.74	0.80	0.84
7	0.51	0.63	0.72	0.78	0.83
8	0.49	0.61	0.71	0.78	-
9	0.47	0.60	0.70	0.77	-
10	0.46	0.59	0.69	-	-
11	0.45	0.57	0.69	-	-
12	0.43	0.56	0.68	-	-



**SECTION F - TABLE 2**

## RATING FACTORS FOR VARIATION IN THERMAL RESISTIVITY OF SOIL FOR THREE SINGLE CORE CABLES LAID DIRECT IN GROUND

Nominal area of conductor mm <sup>2</sup>	Values of soil thermal resistivity °C - m/W							
	0.7	0.8	0.9	1	1.5	2	2.5	3
25	1.30	1.25	1.20	1.16	1.00	0.89	0.81	0.75
35	1.30	1.25	1.21	1.16	1.00	0.89	0.81	0.75
50	1.32	1.26	1.21	1.16	1.00	0.89	0.81	0.74
70	1.33	1.27	1.22	1.17	1.00	0.89	0.81	0.74
95	1.34	1.28	1.22	1.18	1.00	0.89	0.80	0.74
120	1.34	1.28	1.22	1.18	1.00	0.88	0.80	0.74
150	1.35	1.28	1.23	1.18	1.00	0.88	0.80	0.74
185	1.35	1.29	1.23	1.18	1.00	0.88	0.80	0.74
240	1.36	1.29	1.23	1.18	1.00	0.88	0.80	0.73
300	1.36	1.30	1.24	1.19	1.00	0.88	0.80	0.73
400 & above	1.37	1.30	1.24	1.19	1.00	0.88	0.79	0.73

**SECTION F - TABLE 3**

## RATING FACTORS FOR VARIATION IN THERMAL RESISTIVITY OF SOIL FOR THREE CORE CABLES LAID DIRECT IN GROUND

Nominal area of conductor mm <sup>2</sup>	Values of soil thermal resistivity °C - m/W							
	0.7	0.8	0.9	1	1.5	2	2.5	3
25	1.24	1.20	1.16	1.13	1.00	0.91	0.84	0.78
35	1.25	1.21	1.17	1.13	1.00	0.91	0.83	0.78
50	1.25	1.21	1.17	1.14	1.00	0.91	0.83	0.77
70	1.26	1.21	1.18	1.14	1.00	0.90	0.83	0.77
95	1.26	1.22	1.18	1.14	1.00	0.90	0.83	0.77
120	1.26	1.22	1.18	1.14	1.00	0.90	0.83	0.77
150	1.27	1.22	1.18	1.15	1.00	0.90	0.83	0.77
185	1.27	1.23	1.18	1.15	1.00	0.90	0.83	0.77
240	1.28	1.23	1.19	1.15	1.00	0.90	0.83	0.77
300	1.28	1.23	1.19	1.15	1.00	0.90	0.82	0.77
400	1.28	1.23	1.19	1.15	1.00	0.90	0.82	0.76

**SECTION F - TABLE 4**

## RATING FACTOR FOR DEPTH OF LAYING FOR CABLE LAID DIRECT IN GROUND

Depth of laying m	Single-core cables		Three-core cables
	Nominal conductor size mm <sup>2</sup>		
	≤185 mm <sup>2</sup>	>185 mm <sup>2</sup>	
0.5	1.04	1.06	1.04
0.6	1.02	1.04	1.03
0.8	1.00	1.00	1.00
1.0	0.98	0.97	0.98
1.25	0.96	0.95	0.96
1.5	0.95	0.93	0.95
1.75	0.94	0.91	0.94
2.0	0.93	0.90	0.93
2.5	0.91	0.88	0.91
3.0	0.90	0.86	0.90

**SECTION F - TABLE 5**

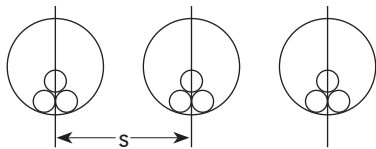
## RATING FACTOR FOR VARIATION IN GROUND TEMPERATURE FOR CABLE LAID DIRECT IN GROUND

GROUND TEMPERATURE °C	10	15	20	25	30	35	40	45	50
RATING FACTOR	1.07	1.04	1.00	0.96	0.93	0.89	0.85	0.80	0.76

**SECTION F - TABLE 6**

## GROUP RATING FACTORS FOR CIRCUITS OF THREE SINGLE CORE CABLES, IN DUCTS IN TREFOIL

Number of trefoils in group	Spacing between duct group centres (S) mm				
	Touching	200	400	600	800
2	0.78	0.85	0.89	0.91	0.93
3	0.66	0.75	0.81	0.85	0.88
4	0.59	0.70	0.77	0.82	0.86
5	0.55	0.66	0.74	0.80	0.84
6	0.51	0.64	0.72	0.78	0.83
7	0.48	0.61	0.71	0.77	0.82
8	0.46	0.60	0.70	0.76	-
9	0.44	0.58	0.69	0.76	-
10	0.43	0.57	0.68	-	-
11	0.42	0.56	0.67	-	-
12	0.40	0.55	0.67	-	-

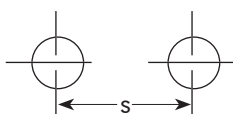


S = Spacing between the Trefoil group centres in mm

**SECTION F - TABLE 7**

## GROUP RATING FACTORS FOR CIRCUITS OF THREE CORE CABLES, IN DUCT IN HORIZONTAL FORMATION

Number of cables in group	Spacing between group centres (S) mm				
	Touching	200	400	600	800
2	0.85	0.88	0.92	0.94	0.95
3	0.75	0.80	0.85	0.88	0.91
4	0.69	0.75	0.82	0.86	0.89
5	0.65	0.72	0.79	0.84	0.87
6	0.62	0.69	0.77	0.83	0.87
7	0.59	0.67	0.76	0.82	0.86
8	0.57	0.65	0.75	0.81	-
9	0.55	0.64	0.74	0.80	-
10	0.54	0.63	0.73	-	-
11	0.52	0.62	0.73	-	-
12	0.51	0.61	0.72	-	-



S = Spacing between the cable centres in mm

**SECTION F - TABLE 8**

## RATING FACTORS FOR VARIATION IN THERMAL RESISTIVITY OF SOIL FOR THREE SINGLE CORE CABLES LAID DIRECT IN DUCT

Nominal area of conductor	Values of soil thermal resistivity °C - m/W							
	0.7	0.8	0.9	1	1.5	2	2.5	3
25	1.21	1.17	1.14	1.12	1.00	0.91	0.85	0.79
35	1.21	1.18	1.15	1.12	1.00	0.91	0.84	0.79
50	1.21	1.18	1.15	1.12	1.00	0.91	0.84	0.78
70	1.22	1.19	1.15	1.12	1.00	0.91	0.84	0.78
95	1.23	1.19	1.16	1.13	1.00	0.91	0.84	0.78
120	1.23	1.20	1.16	1.13	1.00	0.91	0.84	0.78
150	1.24	1.20	1.16	1.13	1.00	0.91	0.83	0.78
185	1.24	1.20	1.17	1.13	1.00	0.91	0.83	0.78
240	1.25	1.21	1.17	1.14	1.00	0.90	0.83	0.77
300	1.25	1.21	1.17	1.14	1.00	0.90	0.83	0.77
400 & above	1.25	1.21	1.17	1.14	1.00	0.90	0.83	0.77

**SECTION F - TABLE 9**

## RATING FACTORS FOR VARIATION IN THERMAL RESISTIVITY OF SOIL FOR THREE CORE CABLE LAID IN SINGLE WAY DUCT

Nominal area of conductor	Values of soil thermal resistivity °C - m/W							
	0.7	0.8	0.9	1	1.5	2	2.5	3
25	1.14	1.12	1.10	1.08	1.00	0.94	0.89	0.84
35	1.14	1.12	1.10	1.08	1.00	0.94	0.88	0.84
50	1.14	1.12	1.10	1.08	1.00	0.94	0.88	0.84
70	1.15	1.13	1.11	1.09	1.00	0.94	0.88	0.83
95	1.15	1.13	1.11	1.09	1.00	0.94	0.88	0.83
120	1.15	1.13	1.11	1.09	1.00	0.93	0.88	0.83
150	1.16	1.13	1.11	1.09	1.00	0.93	0.88	0.83
185	1.16	1.14	1.11	1.09	1.00	0.93	0.87	0.83
240	1.16	1.14	1.12	1.10	1.00	0.93	0.87	0.82
300	1.17	1.14	1.12	1.10	1.00	0.93	0.87	0.82
400	1.17	1.14	1.12	1.10	1.00	0.92	0.86	0.81

**SECTION F - TABLE 10**

## RATING FACTOR FOR DEPTH OF LAYING FOR CABLES LAID DIRECT IN DUCT

Depth of laying m	Single-core cables		Three-core cables
	Nominal conductor size mm <sup>2</sup>		
	≤185 mm <sup>2</sup>	>185 mm <sup>2</sup>	
0.5	1.04	1.05	1.03
0.6	1.02	1.03	1.02
0.8	1.00	1.00	1.00
1.0	0.98	0.97	0.99
1.25	0.96	0.95	0.97
1.5	0.95	0.93	0.96
1.75	0.94	0.92	0.95
2.0	0.93	0.91	0.94
2.5	0.91	0.89	0.93
3.0	0.90	0.88	0.92

SECTION F - TABLE 11

## RATING FACTOR FOR VARIATION IN GROUND TEMPERATURE FOR CABLE LAID DIRECT IN DUCTS

GROUND TEMPERATURE °C	10	15	20	25	30	35	40	45	50
RATING FACTOR	1.07	1.04	1.00	0.96	0.93	0.89	0.85	0.80	0.76

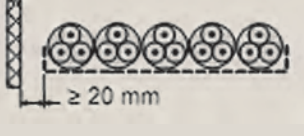
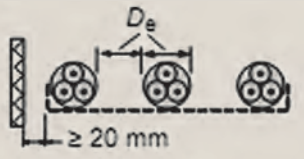
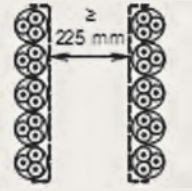
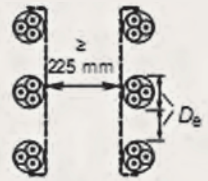
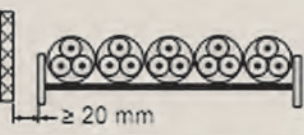
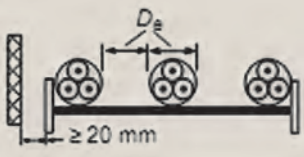
SECTION F - TABLE 12

## RATING FACTOR FOR VARIATION IN AMBIENT AIR TEMPERATURE

AMBIENT TEMPERATURE °C	20	25	30	35	40	45	50	55	60
RATING FACTOR	1.08	1.04	1.00	0.96	0.91	0.87	0.82	0.76	0.71

SECTION F - TABLE 13

**GROUP RATING FACTORS FOR GROUPS OF MORE THAN ONE  
MULTI - CORE CABLE IN AIR - TO BE APPLIED TO THE CURRENT CARRYING  
CAPACITY FOR ONE MULTI-CORE CABLE IN FREE AIR**

Method of Installation		Number of trays	Number of cables						
			1	2	3	4	6	9	
Cables on perforated trays	Touching 	1	1.00	0.88	0.82	0.79	0.76	0.73	
		2	1.00	0.87	0.80	0.77	0.73	0.68	
		3	1.00	0.86	0.79	0.76	0.71	0.66	
	Spaced 	1	1.00	1.00	0.98	0.95	0.91	-	
		2	1.00	0.99	0.96	0.92	0.87	-	
		3	1.00	0.98	0.95	0.91	0.85	-	
Cables on vertical perforated trays	Touching 	1	1.00	0.88	0.82	0.78	0.73	0.72	
		2	1.00	0.88	0.81	0.76	0.71	0.70	
	Spaced 	1	1.00	0.91	0.89	0.88	0.87	-	
		2	1.00	0.91	0.88	0.87	0.85	-	
	Cables on ladder supports, cleats, etc	Touching 	1	1.00	0.87	0.82	0.80	0.79	0.78
			2	1.00	0.86	0.80	0.78	0.76	0.73
3			1.00	0.85	0.79	0.76	0.73	0.70	
Spaced 		1	1.00	1.00	1.00	1.00	1.00	-	
		2	1.00	0.99	0.98	0.97	0.96	-	
		3	1.00	0.98	0.97	0.96	0.93	-	

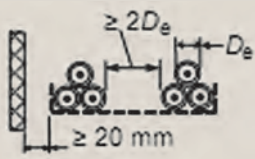
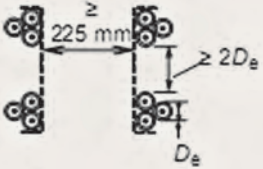
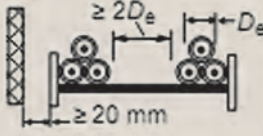
**Note 1:** Values are given for vertical spacings between trays of 300 mm and at least 20 mm between trays and wall. For closer spacing, the factors should be reduced.

**Note 2:** Values are given for horizontal spacing between trays of 225 mm with trays mounted back to back. For closer spacing, the factors should be reduced.

**SECTION F - TABLE 14**



**GROUP RATING FACTORS FOR GROUPS OF MORE THAN ONE CIRCUIT OF SINGLE-CORE CABLES - TO BE APPLIED TO THE CURRENT - CARRYING CAPACITY FOR ONE CIRCUIT OF SINGLE - CORE CABLES IN FREE AIR**

Method of Installation	Number of trays	Number of three-phase circuits (Note 3)			Use as a multiplier to rating for	
		1	2	3		
Perforated trays (Note 1)		1	1.00	0.98	0.96	Three cables in trefoil formation
		2	0.97	0.93	0.89	
		3	0.96	0.92	0.86	
Vertical perforated trays (Note 2)	<p style="text-align: center;"><b>Spaced</b></p> 	1	1.00	0.91	0.89	
		2	1.00	0.90	0.86	
Ladder supports, cleats, etc. (Note 1)		1	1.00	1.00	1.00	
		2	0.97	0.95	0.93	
		3	0.96	0.94	0.90	

**Note 1:** Values are given for vertical spacings between trays of 300 mm. For closer spacing, the factors should be reduced.

**Note 2:** Values are given for horizontal spacing between trays of 225 mm with trays mounted back to back. For closer spacing, the factors should be reduced.

**Note 3:** For circuits having more than one cable in parallel per phase, each three phase set of conductors should be considered as a circuit for the purpose of this table.

**SECTION F - TABLE 15**

## RECOMMENDED MINIMUM BEDING RADIUS (FOR PVC SHEATHED CABLES)

TYPE OF CABLE	DURING INSTALLATION	DURING TERMINATION
(A) SINGLE CORE		
Unarmoured	20 x D	15 x D
Armoured	15 x D	12 X D
(B) THREE CORE		
Unarmoured	15 x D	12 x D
Armoured (SWA)	12 x D	10 x D
Armoured (Steel Tape)	15 x D	15 x D
D - Overall diameter of cable		

### SECTION F - TABLE 16

## D.C. TEST VOLTAGE AFTER INSTALLATION\*

VOLTAGE GRADE (kV)	D.C. VOLTAGE (kV) (TEST DURATION - 15 MINUTES)
3.6/6	15
6/10	24
8.7/15	35
12/20	48
18/30	72

\* Given test voltages are for New installation only (Reference - IEC - 60502-2)

### SECTION F - TABLE 17

#### Copper wire screen area for Single core unarmoured cable

It is always advisable to design the cable for specific fault current as per the system requirement. However as a common practice copper wire screen area as per the table given below may be provided for single core unarmoured cables. This screen area is irrespective of voltage grade of the cable.

Conductor cross-sectional area (mm <sup>2</sup> )	Copper wire screen area (mm <sup>2</sup> )
25-120	16
150-300	25
400 and above	35



# Short Circuit Charts



## SHORT CIRCUIT RATING

The short circuit ratings (r.m.s. values) of XLPE insulated cables have been calculated on the following assumptions.

1. Conductor temperature prior to short circuit 90 °C
2. Max permissible temperature during short circuit 250 °C
3. Specific gravity
  - a. Copper 8.89 gm/cc
  - b. Aluminium 2.703 gm/cc
4. Resistivity
  - a. Copper  $17.241 \times 10^{-6} \Omega \text{ mm}$
  - b. Aluminium  $28.264 \times 10^{-6} \Omega \text{ mm}$

The Maximum short circuit current is calculated with the following formula

$$I_{sh} = \sqrt{\frac{K \times A}{t}} \text{ (kA)}$$

Where  $I_{sh}$  = r.m.s. value of short circuit current (kA)

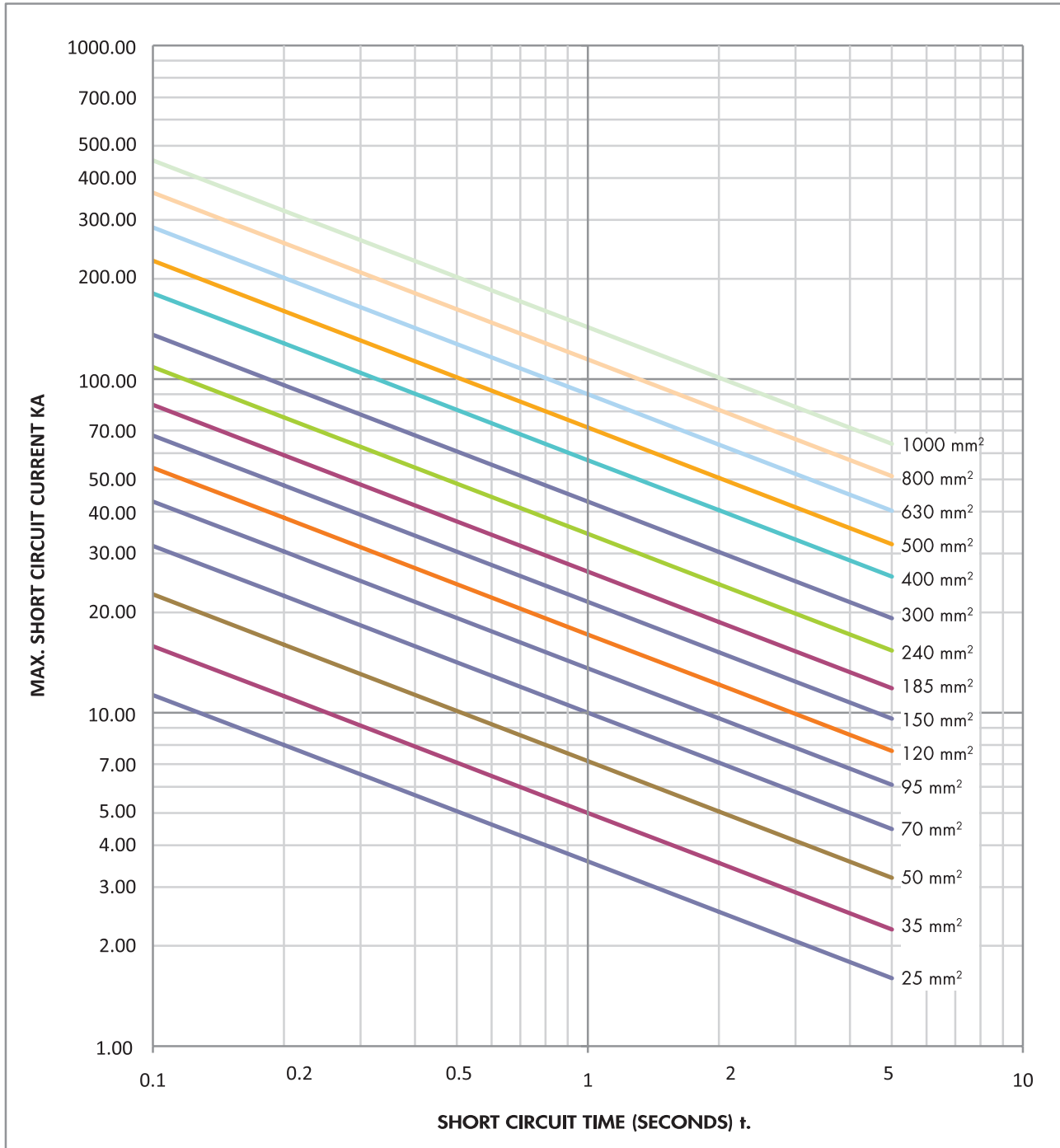
K = a constant (0.143 & 0.094 for copper & aluminum respectively)

A = nominal area of the conductor (mm<sup>2</sup>)

t = duration of the short circuit (sec)

# COPPER CONDUCTOR

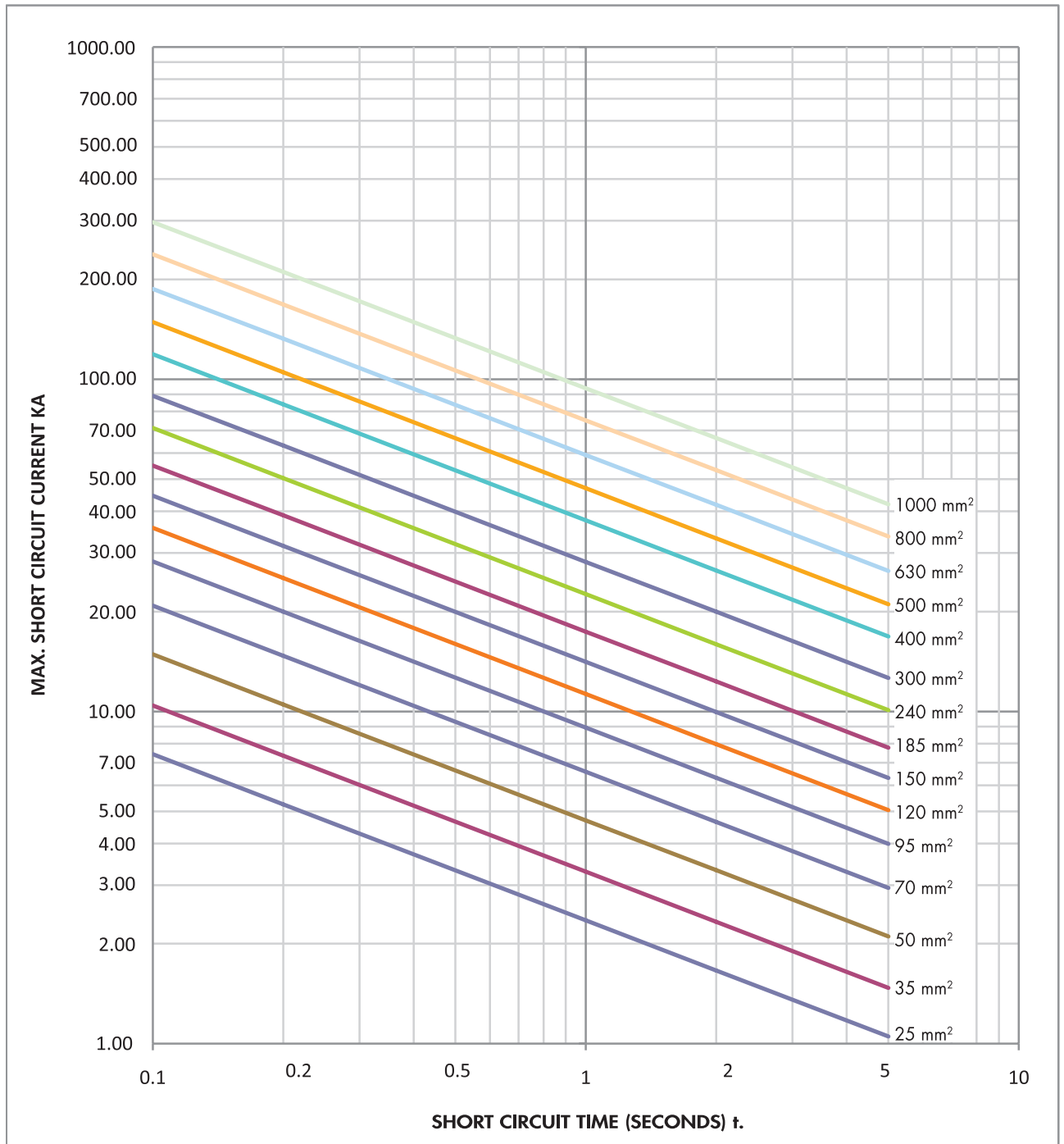
SHORT CIRCUIT CURRENT CURVES FOR  
COPPER CONDUCTOR XLPE INSULATED CABLES



## Short Circuit Characteristics

# ALUMINIUM CONDUCTOR

SHORT CIRCUIT CURRENT CURVES FOR ALUMINIUM CONDUCTOR XLPE INSULATED CABLES



Short Circuit Characteristics



## Laying and Installation of Cables

- After arrival at the site the cable should be examined visually to check any exterior damage.
- At site the cable drum should be rolled only in the direction shown on the flange otherwise the cable may become loose & hence difficult to handle.
- The route of the cable should be decided before hand considering the points like transportation of the cable at these points, atmosphere and ground conditions, where joints and terminations will be done, etc.
- While laying up the cable minimum bending radius as required to be strictly maintained.
- If the cable is pulled by pulling eye or winch, utmost care should be taken that tensile stress on the cable is within its limit.
- If the cable is laid in duct or pipe, outer diameter of the duct or pipe should be at least 1.5 times the diameter of the cable.
- Suitable derating factors should be applied as per the environmental & installation conditions while selecting the size of the cable.
- After laying up the cable system must be subject to the DC voltage as mentioned in the table no. 17. The system should be energized after it has withstood this test.

## Special Guidelines for LSF (LSOH/LSZH) sheathed cables

LSF (low smoke & fume) (LSOH/LSZH) sheath does not have the same mechanical strength as other sheath material, particularly at higher temperatures.

It is therefore recommended that LSF (LSOH/LSZH) sheathed cables should be used mainly indoors, and only where cables have been specified to have low smoke and toxic gas emission property.

### Installation

We recommend the following special guidelines, in conjunction with the standard installation instructions.

- The cables should be stored in proper packed condition, in the shade and direct exposure to sun should be avoided.
- As LSF (LSOH/LSZH) has lower tear strength property as compared to PVC/PE sheath, special care should be taken during installation to avoid any damage. Even a small cut on the LSF (LSOH/LSZH) sheath could result in sheath cracking, as it will run in longitudinal direction due to lower tear strength property of LSF (LSOH/LSZH) sheath.
- Use pay-in rollers and corner rollers of non-metallic material (Nylon or Teflon) at least every 3 to 4 meters while laying the cable.
- As far as possible installation should be undercover or indoors. For outdoor installation, direct exposure to sunlight should be avoided by using a suitable cable tray.
- The cables should not be in contact with any hot surface.
- The requirement of minimum bending radius should be followed as per data sheet.
- Any clamping device should not be applied directly on the outer sheath. There should be some cushion (for instance a rubber pad of approx. 3 mm thickness) between the cable's outer sheath and clamps.
- Maximum distance of unsupported length of cable for horizontal and vertical run should be as below:

Overall diameter of cable (mm)	Max. spacing between the supports for horizontal run (mm)	Max. spacing between the supports for vertical run (mm)
0-14.9	350	450
15-19.9	400	550
20-39.9	450	600
40-59.9	700	900
60 & above	1100	1300

### Re-winding

In case re-winding should be necessary, extreme caution should be taken during the process to avoid damage. The following should be adhered to :

- The winding should be done equally and uniformly with no over-riding of the coils or pinching on the sides of the drum.
- The pay-off drum should have an adequate braking system to prevent the cable from coming loose on the drum.

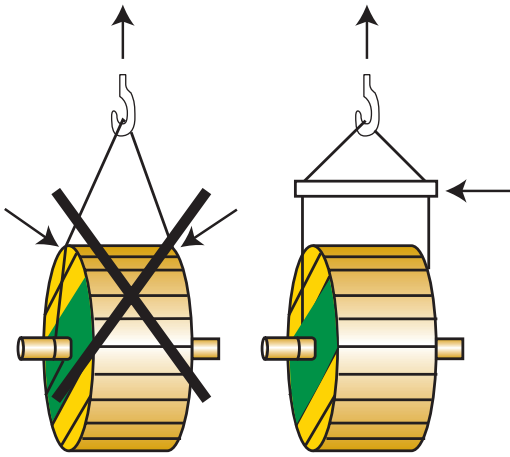
## Cable Construction Coding Chart

ABBREVIATION	DESCRIPTION
Blank (No Code)	Cooper Conductor
A	Aluminium Conductor
2X	XLPE Insulation
C	Copper Screen for Single core Cable
CE	Individual core Copper Screen for Three core Cable
S	Collective Screen for Three core Cable
Wa	Aluminium Wire Armour
W	Steel Wire Armour
Tg	Double Steel Tape Armour
F	Flat Strip Armour
Y	PVC Sheath
2Y	PE Sheath

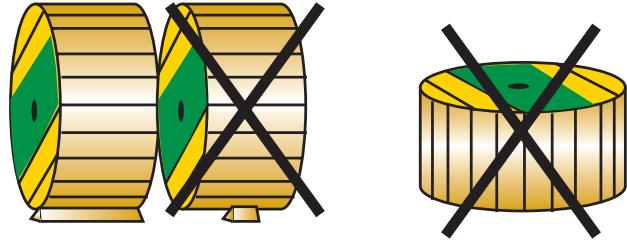
**Example:** 3C X 120 mm<sup>2</sup>, Copper Conductor, XLPE Insulated, copper tape screened over individual core, PVC bedding, round wire armoured and overall PVC sheathed cable, 3.6/6 kV.

Hence cable can be denoted as : 3C x 120 mm<sup>2</sup>, 2XCEWY, 3.6/6 kV

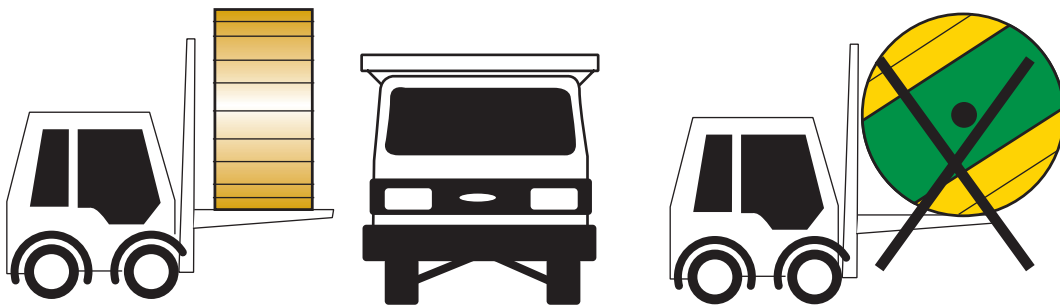
# Drum Handling Instructions



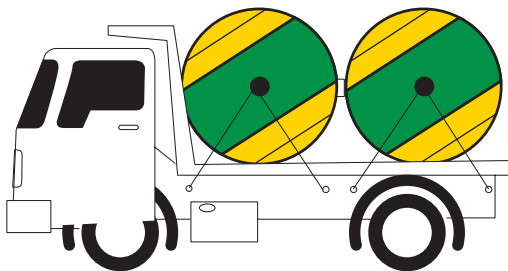
Lifting cable drums using crane



Do not lay drums flat on their sides, use proper wedges to prevent drums rolling



Lift drums on fork trucks correctly



Secure drums adequately before transportation



Roll in the direction shown by the arrow

## Recommendations for the selection of cables rated voltage

The rated voltage of the cable for a given application should be suitable for the operating conditions in the system in which the cable is used. To facilitate the selection of the cable, systems are divided into three categories as follows:

- Category A:** This category comprises those systems in which any phase conductor that comes in contact with earth or an earth conductor is disconnected from the system within 1 min.
- Category B:** This category comprises those systems which, under fault conditions, are operated for a short time with one phase earthed. IEC 60183 recommends that this period should not exceed 1 h. For cables specified in BS 6622/IEC-60502-2, a longer period, not exceeding 8 h on any occasion, can be tolerated. The total duration of earth faults in any year should not exceed 125 h.
- Category C:** This category comprises all systems which do not fall into categories A or B.

**NOTE:** In a system in which an earth fault is not automatically and promptly isolated, the extra stresses on the insulation of cables during the earth fault might reduce the life of the cables. If the system is expected to be operated fairly often with a permanent earth fault, it might be advisable to classify the system as category C.

The below Table gives the lowest rated voltage of cable that should be used according to the system voltage and category.

### Selection of cables for three-phase A.C. systems

System voltage		System category	Minimum rated voltage of cable, $U_0/U$
Nominal voltage, U	Maximum sustained voltage, $U_m$		
kV	kV		kV
6.6 or 6	7.2	A or B	3.6/6
6.6 or 6	7.2	C	6/10
11 or 10	12	A or B	6/10
11 or 10	12	C	8.7/15
15	17.5	A or B	8.7/15
15	17.5	C	12/20
22 or 20	24	A or B	12/20
22 or 20	24	C	18/30
33 or 30	36	A or B	18/30

The nominal system voltage, U, given in above Table is the nominal voltage between phases.

The maximum sustained system voltage  $U_m$ , is the highest voltage between phases that can be sustained under normal operating conditions at any time and at any point in the system. It excludes transient voltage variations, due to lightning impulses, fault conditions and rapid disconnection of loads.

The normal system voltages shown in above Table are generally in accordance with series 1 as given in IEC 60038. For system voltages intermediate between the values in above Table, the cable should be selected with a rated voltage not less than the next highest value (e.g. for a 13.8 kV system of category A or B, the cable should have a rated voltage not less than 8.7/15 kV and for a 13.8 kV system of category C, not less than 12/20 kV).