

The background of the entire page is a blue-tinted photograph of a high-voltage electrical substation. It features several large, vertical insulators with multiple disc-like segments, supporting metal structures and cables. The scene is captured from a low angle, looking up at the equipment. Two large, white, rounded rectangular shapes are overlaid on the image, one in the upper left and one in the lower left, framing the text.

MEDIUM VOLTAGE CABLES

CATALOGUE 2024

BICC CABLES

Cables Crafted With Trust

Index

BICC CABLES Background	01
General Technical Information	03
Introduction	04
Medium Voltage Cable Design	05
Medium Voltage Cable Test	06
General Information	07
Cables Electrical Parameters	08
De-rating Factors	10
Short Circuit Currents	12
Dimension Data of XLPE Cables	13
3.6/6 (7.2) kV - Single Core Cable	14
3.6/6 (7.2) kV - Multi Core Cable - Unarmored	15
3.6/6 (7.2) kV - Multi Core Cable – STA	16
3.6/6 (7.2) kV - Multi Core Cable – SWA	17
6/10 (12) kV - Single Core Cable	18
6/10 (12) kV - Multi Core Cable - Unarmored	19
6/10 (12) kV - Multi Core Cable – STA	20
6/10 (12) kV - Multi Core Cable – SWA	21
8.7/15 (17.5) kV - Single Core Cable	22
8.7/15 (17.5) kV - Multi Core Cable Unarmored	23
8.7/15 (17.5) kV - Multi Core Cable – STA	24
8.7/15 (17.5) kV - Multi Core Cable – SWA	25
12 / 20 (24) kV - Single Core Cable	26
12 / 20 (24) kV - Multi Core Cable Unarmored	27
12 / 20 (24) kV- Multi Core Cable – STA	28
12 / 20 (24) kV - Multi Core Cable – SWA	29
18/30 (36) kV - Single Core Cable	30
18/30 (36) kV - Multi Core Cable Unarmored	31
18/30 (36) kV - Multi Core Cable – STA	32
18/30 (36) kV - Multi Core Cable – SWA	33
Guide to Use and selection of cables	34
Current Carrying Capacity	37
Current Ratings	38
Partners of success	59

BICC CABLES Background



Andrew Fitch
Technical Manager
Since 1996 - 2000

BICC CABLES is a prominent supplier of high-quality electrical cables, holding a substantial market presence in Egypt. Over the years, the company has consistently delivered durable and reliable solutions to meet the evolving needs of various sectors.

Our expertise covers all types of electrical cables, including Building Wires, Low Voltage Cables up to 3.3 kV and Medium Voltage Power Cables up to 66 kV (Copper & Aluminum), Control Cables, Instrument Cables, Fire Resistance & Fire Alarm Cables to Overhead Transmission Lines (AAC, AAAC, ABC, ACSR).

Originally under the ownership of BICC in the UK, the company was given the name “British Insulated Callender’s Cables” and has been actively contributing to the global cable sector since 1890.

BICC CABLES, a renowned division of Sharkia Holding Group, is globally recognized for its exceptional manufacturing, customer service, and innovation capabilities. With the backing of a team of seasoned professionals, the company is committed to offering high-quality products that meet international regulations and standards.

The BICC factory is situated at Abu Rawash Industrial Zone, KM. 28 Cairo – Alexandria Desert Road, Giza, Egypt. Established in 1996 as a joint venture between BICC Cables of the UK and other investors, the site initially focused on the production of low-voltage power cables. Over the years, it has undergone significant expansion, both in production capacity and market share.

This growth has been achieved through strategic investments, including the installation of new machinery. These improvements are dedicated to meet the evolving needs of our clients and ensuring the consistent supply of high-quality cable products.

Our mission

Empower the world’s connections through innovative, reliable, and sustainable wiring solutions. We are committed to delivering high-quality products that exceed industry standards, ensuring the safety and success of our customers’ endeavors.

Our vision

We envision a world seamlessly connected, where our cutting-edge solutions empower industries, communities, and individuals alike.

BICC CABLES Background

Product Range

BICC CABLES Scope of production includes as follows:

- LV Power Cables (Copper, Tinned Copper & Aluminum)
- Medium voltage cables up to 66 kV (Copper & Aluminum)
- Control Cables
- Building Wires
- Instrument Cables
- Fire resistance & Fire Alarm Cables
- Overhead Transmission Lines (AAC, AAAC, ABC, ACSR)

This publication covers our range of production for medium voltage Cables.

Product Quality

Quality Control in all steps of manufacturing is one of the priorities of BICC CABLES, keen to provide its customers with the best quality and meeting deadlines.

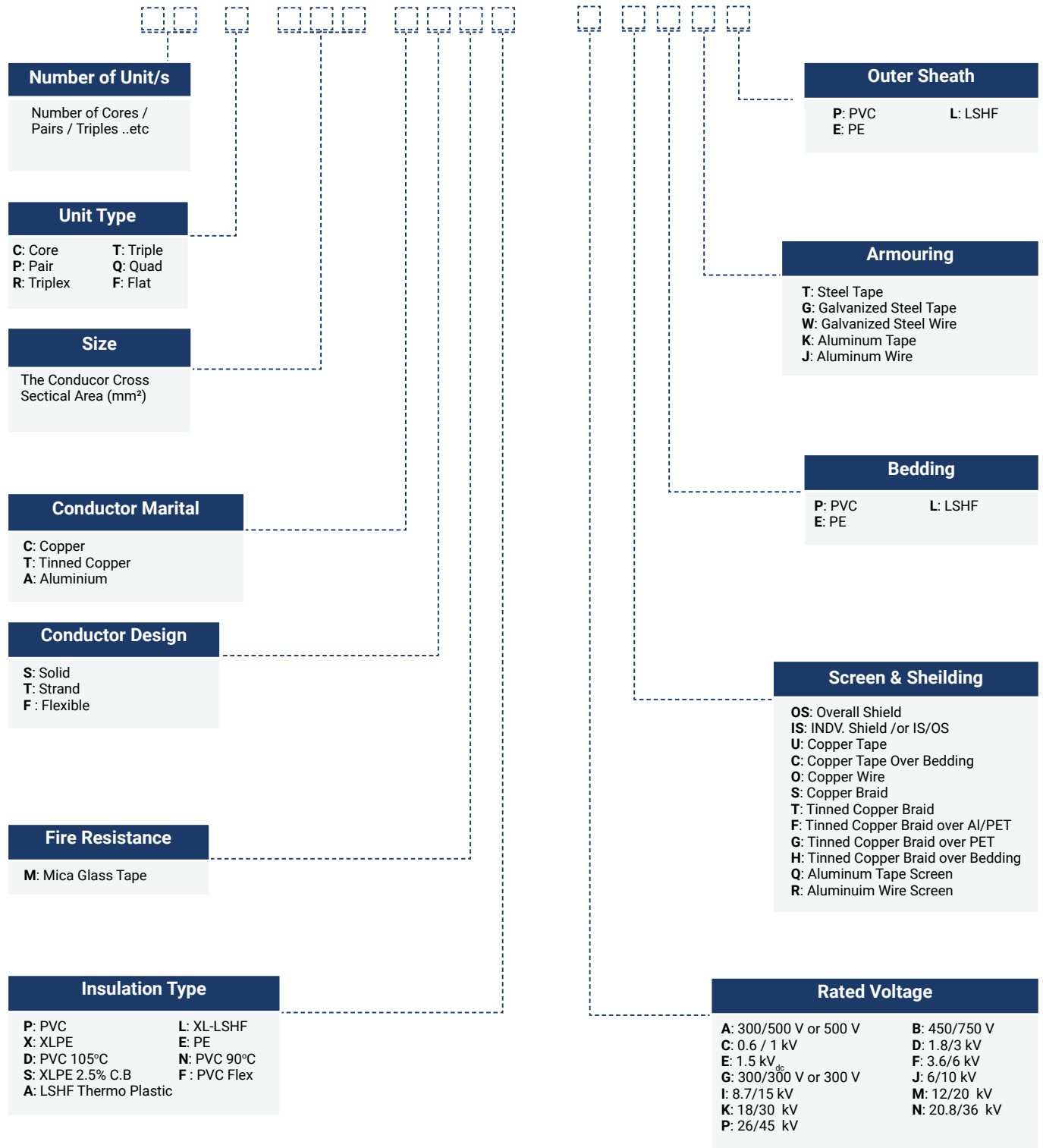
All our facilities operate under the highest ISO: 9001:2015 Standards. We use the latest measuring devices (made in EU) for an effective application of quality standards.

Also, we are using only tried and tested materials and processes in full compliance with all the relevant British and International standards we are very keen to purchase raw materials from the most accredited suppliers either from local market or from abroad.



General Technical Information

Product Code



Introduction

Today, XLPE (Cross-Linked Polyethylene) insulated cables are the most common cables used for power transmission and distribution by the power and energy utilities. XLPE Insulation is a thermo-set material, with an operating temperature of 90°C at normal conditions. Cross-linking is a term to describe the process where individual polymer molecules (in PE) are tied together to form a network structure. This is done using curing techniques, such as Nitrogen curing (Dry-curing). The effects of such cross-linking on the properties of polyethylene include:

- Excellent electrical properties
- Higher operating temperature, therefore higher current capacity of the insulated conductors
- Certain mechanical properties are also improved
- Heat deformation
- Abrasion
- Chemical
- Stress Crack Resistance



This publication covers our range of production for medium voltage Cables.

Product Quality

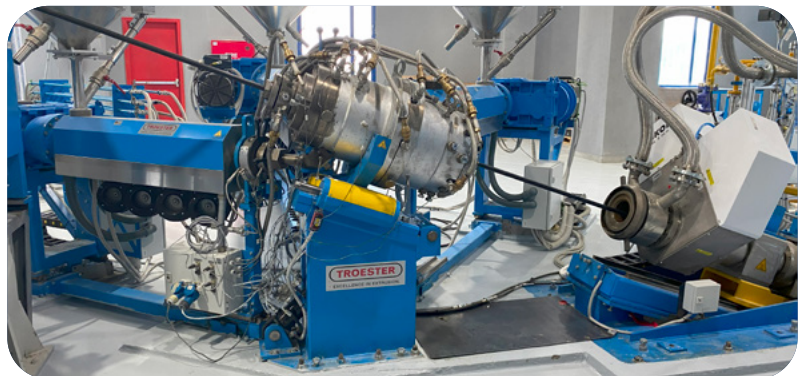
It has been found that by cross-linking PE molecules, the properties of the compound can be improved to a great extent. The operating temperature could be raised from 70°C to 90°C–95°C. The short-circuit temperature is improved from 150°C to 250°C.

The State-of-the-art CCV (Continuous Catenary vulcanization) Line in BICC Cables Company is used for triple extrusion of the inner semi-conductor, XLPE Insulation, and the outer semi-conductor; the three layers are extruded simultaneously.

Throughout the whole voltage range of distribution cables, the swing away from the traditional paper insulated types to polymeric insulated designs with advantages in ease of installation has been very significant. The lower capital cost and higher productivity processes associated with XLPE are likely to ensure a continued demand for these cables.

XLPE insulated cables are now being introduced at EHV, and work on XLPE Insulation that will operate at increased stresses and reduced thicknesses is progressing.

Characteristics of XLPE Compound	
Insulation resistance	10 ¹⁷ (Ω/km)
Surface resistance	10 ¹⁴ (Ω)
Dielectric constant e	2.3-2.5
Loss angle tan at 50 Hz	<0.008
Super clean compound	<0.0001
Breakdown voltage (kV / mm)	45-50
Tensile strength	120-140 kg/cm ²
Elongation approx.	300%-500%



C.V Line

Medium Voltage Cables Design

Single-core or Three-core cables consist of the following:

Conductor

Conductors are made of Copper or Aluminum, Conductor design is circular stranded, and compacted. Our Conductor design is in compliance with requirements of IEC 60228 (Class 2).

Conductor Screen

Conductor screen of an extruded semi-conducting compound shall be applied over the conductor to distribute the electrical field radially.

Insulation

Triple extrusion of inner semi-conductor (conductor screen), XLPE Insulation, and outer semi-conductor (insulation screen) is applied. XLPE Insulation is dry cured. XLPE Insulation material is as per the requirements of IEC 60502-2 and BS 6622. Upon customer request, TR-XLPE Insulation is used.

Insulation Screen

An outer semiconducting layer on insulation helps in distributing the electrical stress perpendicular to the axis of the cable core and it can be bonded or strippable depends on client request.

Metallic Screen

The metallic screen in medium voltage cables shall consist of one or more tapes, or a concentric layer of wires or a combination of wires and tape(s). When choosing the material of the screen, special consideration shall be given to the possibility of corrosion, not only for mechanical safety but also for electrical safety. The nominal cross-sectional area of the screen is given below as recommended from IEC standard

Nominal area of conductor, mm ²	35	50	70	95	120	150	185	240	300	400	500	630
CSA of Screen, mm ²	16	16	16	16	16	25	25	25	25	35	35	35

Armoring

Armor is used to protect cables from damages, which may be caused by a sudden impact due to falling stones and other hard materials. The armor is also utilized for pulling cables through tunnels or ducts during laying and installation. Material can be either Aluminum for single core cables or Steel for multi-core cables. Armor can be either wires or tapes.

Outer Sheath

The outer sheath is made of an extruded layer of PVC or PE material and are in compliance with the requirements of IEC 60502-2 and BS 6622. We are also capable of providing cable sheaths with special requirements to be:

- Termite resistant
- Oil resistant
- Flame retardant (in compliance with requirements of IEC 60332-1 and IEC 60332-3)
- Low Smoke Halogen Free (in Compliance with requirements of BS 7835)

Medium Voltage Cables Tests

Testing of Medium voltage Power Cables

We, BICC Cables Company, are capable of performing all standard routine tests and sample tests that are normally carried out in accordance to IEC 60502-2. We have all necessary equipments for such tests, such as High voltage Labs and special ovens. We are also capable of performing tests in accordance with international or national requirements as agreed upon with our customers.

Routine Tests

Tests made by the manufacturer on each manufactured length of cable to check that each Length meets the specified requirements

The routine tests required by this standard are as follows:

- Measurement of the electrical Resistance of Conductors
- Partial Discharge Test
- High Voltage Test
- Electrical test on over sheath, if required (DC test)

Sample Tests

Tests made by the manufacturer on samples of completed cable or components taken from a Completed cable, at a specified frequency, so as to verify that the finished product meets the Specified requirements.

The routine tests required by this standard are as follows:

- Conductor Examination
- Check of Dimensions
- Hot Set Test for XLPE Insulations



General Information

Selecting MV power cable

The following factors are important when selecting a MV cable:

- Voltage designation
- Load factor
- Required load
- Short circuit current (KA) and duration (Sec).
- Environmental conditions.
- Laying conditions.

Standards

- The cable described in this catalogue are standard types and in accordance with IEC standard where applicable.
- Power cables in accordance to other standards (e.g. BS, HD, VDE) can be manufactured upon request.

Voltage

Cables are designed by $U_0/U (U_m)$

where,

- U_0 : The rated r.m.s. power frequency voltage between conductor and earth or metallic screen.
- U : The rated r.m.s. power frequency voltage between conductors.
- U_m : The maximum r.m.s. power frequency voltage between conductors.

It is the highest voltage that can be sustained under normal operating conditions at any time and in any point in a system.

Rated Voltage of cable	Nominal system voltage	Highest voltage for equipment 3-phase A.C.
U_0 kV	U kV	U_m kV
3.6	6	7.2
6	10	12
8.7	15	17.5
12	20	24
18	30	36

Laying Information

During laying, the bending radius should not be smaller than values given below.

The Radius depends on the outer diameter (D) of the cable.



Type of Cable	Minimum Bending Radius (mm)	
	During Laying	Adjacent to joints or terminations
Single Core Unarmored	20 D	15 D
Single Core Armored	15 D	12 D
Three Core Unarmored	15 D	12 D
Three Core Armored	12 D	10 D

Cables Electrical Parameters

Conductor DC Resistance

The Maximum conductor DC resistance values at 20°C are as per IEC 60228 standard.

For DC resistance per unit length at different conductor temperature, the following formula shall be used:

$R_t = R_{20} [1 + \alpha(t - 20)]$	Ω/Km
R_t : Conductor DC resistance at t °C	Ω/Km
R_{20} : Conductor DC resistance at 20°C	Ω/Km
t: Conductor operating temperature	Ω/Km
α : temperature coefficient at 20 °C	°C
= 0.00393 for copper	1/ °C
= 0.00403 for Aluminum	

Conductor a.c. Resistance

a.c. resistance of the conductor at maximum operating temperature per unit length is given in the relative tables for each type of cable.

$R_{a.c.} = R_t (1 + Y_p + Y_s)$	Ω/Km
Y_p and Y_s are proximity and skin effect factors	

Inductance

The value of inductance is formulated as

$L = K + 0.2 \text{ LN} \left(\frac{2S}{d} \right)$	mH/Km
K: Constant (related to conductor formation)	
d: Conductor diameter	mm
S: Axial spacing between cables in trefoil and in case of flat formation multiply the spacing by 1.26	mm

Insulation Resistance

$R = K * \text{LN} \left(\frac{D}{d} \right)$	$\text{M}\Omega/\text{Km}$
K: Constant (related to insulation material)	Ω/Km
d: Dimeter after conductor screen	Ω/Km
D: Diameter after insulation	Ω/Km
R: Insulation Resistance	$\text{M}\Omega/\text{Km}$

Capacitance

The value of capacitance is formulated as following:

$C = \epsilon_r / [18 \text{LN} \left(\frac{D}{d} \right)]$	$\mu\text{F}/\text{Km}$
C: Capacitance	$\mu\text{F}/\text{Km}$
ϵ_r : relative permittivity of Insulation	
D: Diameter over the Insulation	mm
d: Diameter under the Insulation	mm

Charging Current

the charging current is the capacitive current which flows through the dielectric layers when AC voltage is applied the value can be calculated from the following equation:

$I_c = U_0 \omega C 10^{-6}$	A/Km
U_0 : Phase voltage	V
ω : Angular of velocity ($2\pi f$)	rad/s
f: Frequency	Hz
C: Capacitance to neutral	$\mu\text{F}/\text{Km}$

Dielectric Losses

The dielectric losses of an AC cable are proportional to the capacitance, the frequency, the phase voltage and the power factor. The value can be derived from the following equation:

$W_d = \omega C U_0^2 \tan \delta 10^{-6}$	$\text{W}/\text{Km}/\text{Phase}$
W_d : Dielectric Losses	$\text{W}/\text{Km}/\text{Phase}$
ω : Angular of velocity ($2\pi f$)	
f: Frequency	Hz
C: Capacitance to neutral	$\mu\text{F}/\text{Km}$
U_0 : Phase voltage	v
$\tan \delta$: Dielectric power factor	

Cables Electrical Parameters

Voltage Drop

When current flows in a cable there is a voltage drop between the ends of the cable which is the product of the current and the impedance. The following equations should be used to calculate the voltage drop:

Single phase circuit

$$V_d = 2(R \cos\theta + X \sin\theta)$$

V/amp/meter

Three phase circuit

$$V_d = \sqrt{3}(R \cos\theta + X \sin\theta)$$

V/amp/meter

R: AC resistance at maximum conductor temperature Ω/Km

X: Inductive Reactance Ω/Km

Cos θ : Load Power factor

$X = \omega L 10^{-3}$ Ω/Km

L: Inductance mH/km

Relation between Cos θ and Sin θ :

cos θ	1	0.9	0.85	0.8	0.6
sin θ	0	0.44	0.53	0.6	0.8

Cable Short Circuit Current capacity

Tables 7-8 give the short circuit current for both copper and aluminum conductor insulated by XLPE. Short circuits start from the maximum operating temperature. Maximum temperature during short circuit is 250 °C for XLPE.

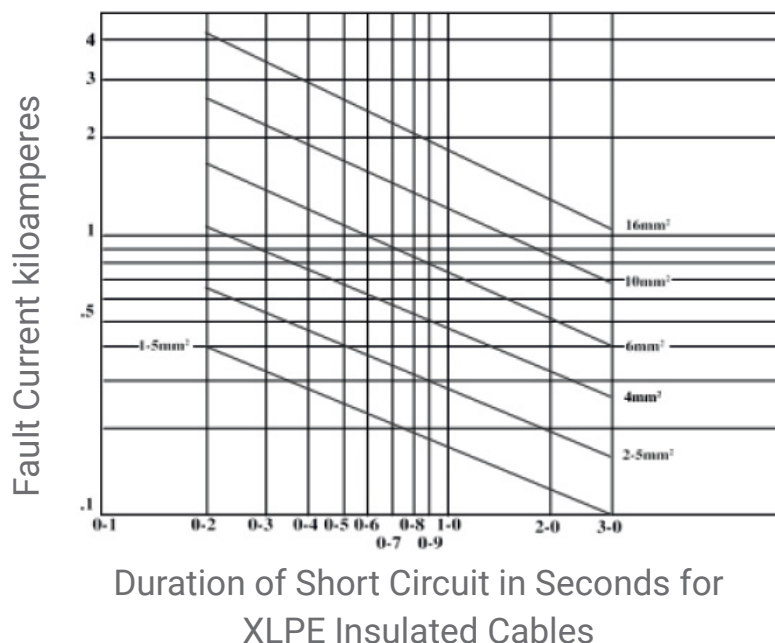
$$I_{s.c.t} = I_{s.c.1} / (\sqrt{t})$$

where

$I_{s.c.t}$: short circuit current for t second KA

$I_{s.c.1}$: short circuit current for 1 second KA

t: duration Sec



Derating factors

Table 1

Air temperature de-rating factors

Air temperature °C	20	25	30	35	40	45	50	55
XLPE cables rated 90 °C	1.08	1.04	1	0.96	0.91	0.87	0.82	0.76

Table 2

Ground temperature de-rating factors

Ground temperature °C	15	20	25	30	35	40	45	50	55
XLPE cables rated 90 °C	1.04	1	0.96	0.93	0.89	0.85	0.8	0.76	0.71

Table 3

Depth of laying de-rating factors

Depth of Laying m	Direct buried			Duct		
	Single core		Three cores	Single core		Three cores
	<= 185 mm ²	> 185 mm ²		<= 185 mm ²	> 185 mm ²	
0.5	1	1	1	1	1	1
0.6	0.98	0.98	0.99	0.98	0.98	0.99
0.8	0.96	0.94	0.96	0.96	0.95	0.97
1	0.94	0.92	0.94	0.94	0.92	0.96
1.25	0.92	0.9	0.92	0.92	0.9	0.94
1.5	0.91	0.88	0.91	0.91	0.89	0.93
1.75	0.9	0.86	0.9	0.9	0.88	0.92
2	0.89	0.85	0.89	0.89	0.87	0.91
2.5	0.88	0.83	0.88	0.88	0.85	0.9
3	0.87	0.81	0.87	0.87	0.84	0.89

Table 4

Soil thermal resistivity de-rating factors

soil thermal resistivity °C.m/W	0.8	0.9	1	1.2	1.5	2	2.5
de-rating factors	1.1	1.05	1	0.92	0.83	0.73	0.66

Derating Factors

Table 5

Trefoil or flat formation de-rating factors for three single core cables laid direct in ground

Number of circuits	Trefoil Formation				Flat Formation	
	Touching		Spacing = 0.15 m		Spacing = 0.30 m	
no	Trefoil	Flat	Trefoil	Flat	Trefoil	Flat
2	0.77	0.80	0.82	0.85	0.88	0.91
3	0.66	0.69	0.73	0.76	0.80	0.83
4	0.60	0.63	0.68	0.71	0.74	0.77
5	0.56	0.59	0.64	0.67	0.72	0.75
6	0.53	0.57	0.61	0.64	0.70	0.73

L = Spacing.

Table 6

Trefoil or flat formation de-rating factors for the multi cores cable laid direct in ground

Number of circuits	Trefoil Formation				Flat Formation	
	Touching		Spacing = 0.15 m		Spacing = 0.30 m	
no	Trefoil	Flat	Trefoil	Flat	Trefoil	Flat
2	0.81	0.81	0.87	0.87	0.91	0.91
3	0.69	0.70	0.76	0.76	0.82	0.84
4	0.62	0.63	0.72	0.74	0.77	0.81
5	0.58	0.60	0.66	0.70	0.73	0.78
6	0.54	0.56	0.63	0.67	0.70	0.76

L = Spacing.

Short Circuit current

Table 7

Short Circuit current for Copper Conductors XLPE insulated (KA) (90 / 250 °C)

CSA mm ²	Duration in second									
	0.1	0.2	0.3	0.4	0.5	1	2	3	4	5
35	15.80	11.20	9.10	7.90	7.08	5.00	3.50	2.89	2.50	2.20
50	22.60	16.00	13.06	11.30	10.10	7.15	5.06	4.10	3.58	3.20
70	31.67	22.40	18.29	15.80	14.16	10.00	7.08	5.78	5.00	4.48
95	42.98	30.39	24.80	21.50	19.20	13.59	9.60	7.80	6.80	6.08
120	54.30	38.39	31.30	27.10	24.28	17.17	12.10	9.90	8.59	7.68
150	67.87	47.99	39.20	33.90	30.35	21.46	15.18	12.39	10.70	9.60
185	83.70	59.19	48.30	41.85	37.40	26.47	18.70	15.28	13.20	11.80
240	108.59	76.79	62.70	54.30	48.56	34.30	24.28	19.80	17.17	15.36
300	135.70	95.98	78.37	67.87	60.70	42.90	30.35	24.78	21.46	19.20
400	181.00	128.00	104.50	90.50	80.90	57.20	40.50	33.00	28.60	25.60
500	226.20	160.00	130.60	113.10	101.20	71.50	50.60	41.30	35.80	32.00
630	285.10	201.60	164.60	142.50	127.50	90.10	63.70	52.00	45.10	40.30

Table 8

Short Circuit current for Aluminum Conductors XLPE insulated (KA) (90 / 250 °C)

CSA mm ²	Duration in second									
	0.1	0.2	0.3	0.4	0.5	1	2	3	4	5
50	14.9	10.56	8.6	7.47	6.68	4.7	3.3	2.7	2.36	2.1
70	20.9	14.79	12.08	10.46	9.35	6.6	4.68	3.8	3.3	2.96
95	28.38	20.07	16.39	14.19	12.69	8.98	6.3	5.18	4.49	4
120	35.85	25.35	20.7	17.9	16	11.3	8	6.5	5.67	5.07
150	44.8	31.69	25.88	22.4	20	14.17	10	8.18	7.09	6.3
185	55.28	39.09	31.9	27.6	24.7	17.48	12.36	10.09	8.7	7.8
240	71.7	50.7	41.4	35.85	32.07	22.68	16	13.09	11.3	10.1
300	89.6	63.38	51.75	44.8	40.09	28.3	20	16.37	14.17	12.68
400	119.5	84.5	69	59.76	53.4	37.79	26.7	21.8	18.9	16.9
500	149.39	105.6	86.25	74.7	66.8	47.2	33.4	27.28	23.6	21.1
630	188.2	133.1	108.68	94.1	84.18	59.5	42.09	34.37	29.76	26.6

Table 9

Short Circuit current for Copper Screen (KA) (90 / 250 °C)

CSA mm ²	Duration in second									
	0.1	0.2	0.3	0.4	0.5	1	2	3	4	5
16	7.20	5.10	4.18	3.60	3.20	2.29	1.60	1.30	1.10	1.00
25	11.30	8.00	6.50	5.66	5.06	3.58	2.50	2.07	1.79	1.60
35	15.80	11.20	9.10	7.90	7.08	5.00	3.50	2.89	2.5	2.20

The image shows a complex industrial manufacturing environment, likely a cable production plant. The machinery is primarily blue and silver, featuring large funnels, extruders, and various pipes. A red fire hose cabinet is visible in the background. The scene is overlaid with a semi-transparent blue filter.

DIMENSION DATA OF XLPE CABLES

ROESTER
CHALLENGE IN EXTRUSION

3.6/6 (7.2) kV - Single Core Cable

Description

Copper or Aluminum
Circular Compacted Conductor
SC/XLPE/SC Insulation

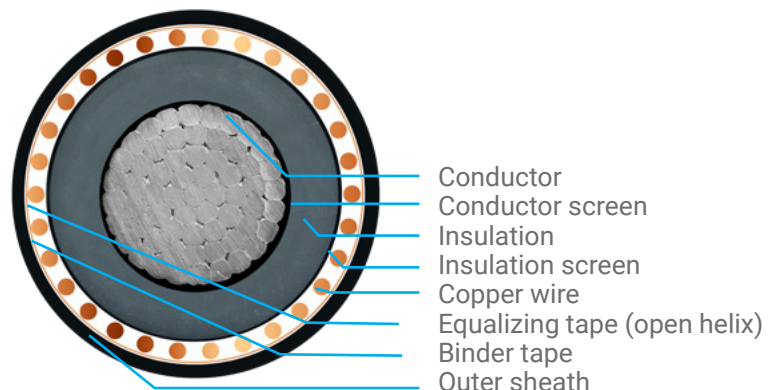
Copper Wires Screen PVC Jacket
Operating Temperature: 90°C.

Nominal Cross-sectional area	Cable code	Nominal Insulation Thickness	Nominal Sheath Thickness	Approximate Overall Diameter	Approximate Weight	
					Copper Kg/Km	Aluminum Kg/Km
mm ²	C: Copper A: Aluminum	mm	mm	mm		
35	01C035C/AT0XF000P	2.5	1.6	19.1	735	-
50	01C050C/AT0XF000P	2.5	1.6	20.2	860	580
70	01C070C/AT0XF000P	2.5	1.7	22.4	1085	690
95	01C095C/AT0XF000P	2.5	1.7	24.0	1350	785
120	01C120C/AT0XF000P	2.5	1.8	25.7	1610	895
150	01C150C/AT0XF000P	2.5	1.8	27.1	1950	1075
185	01C185C/AT0XF000P	2.5	1.9	29.0	2310	1220
240	01C240C/AT0XF000P	2.6	1.9	31.8	2885	1435
300	01C300C/AT0XF000P	2.8	2.0	34.2	3490	1670
400	01C400C/AT0XF000P	3.0	2.2	38.3	4470	2160
500	01C500C/AT0XF000P	3.2	2.3	42.4	5570	2575
630	01C630C/AT0XF000P	3.2	2.4	46.3	6910	3110

Electrical Data

Nominal Cross-sectional area	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance	Reactance Trefoil
	Copper		Aluminum			
	DC at 20 °C	AC at 90 °C	DC at 20 °C	AC at 90 °C		
mm ²	Ω/Km	Ω/Km	Ω/Km	Ω/Km	µf/km	Ω/Km
35	0.524	0.6683	-	-	0.278	0.129
50	0.387	0.4936	0.641	0.8219	0.309	0.121
70	0.268	0.3420	0.443	0.5681	0.365	0.113
95	0.193	0.2465	0.320	0.4105	0.410	0.108
120	0.153	0.1955	0.253	0.3246	0.452	0.103
150	0.124	0.1587	0.206	0.2644	0.491	0.100
185	0.0991	0.1271	0.164	0.2107	0.539	0.097
240	0.0754	0.0971	0.125	0.1608	0.590	0.094
300	0.0601	0.0778	0.100	0.1289	0.598	0.093
400	0.0470	0.0614	0.0778	0.1006	0.634	0.090
500	0.0366	0.0485	0.0605	0.0787	0.675	0.088
630	0.0283	0.0384	0.0469	0.0616	0.755	0.086

The above data is approximate and subjected to manufacturing tolerance
This data is applicable also for 3.8/6.6 kV



3.6/6 (7.2) kV - Multi Core Cable - Unarmored

Description

Copper or Aluminum

Circular Compacted Conductor

SC/XLPE/SC Insulation

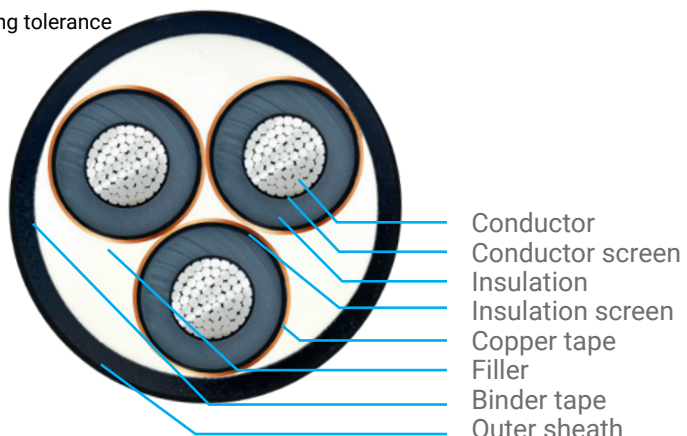
Copper Tape Screen PVC Jacket

Operating Temperature: 90°C.

Nominal Cross-sectional area	Cable code	Nominal Insulation Thickness	Nominal Sheath Thickness	Approximate Overall Diameter	Approximate Weight	
					Copper Kg/Km	Aluminum Kg/Km
mm ²	C: Copper A: Aluminum	mm	mm	mm		
35	03C035CT0XFU00P	2.5	2.2	35.4	1865	-
50	03C050CT0XFU00P	2.5	2.3	37.9	2290	1470
70	03C070CT0XFU00P	2.5	2.4	42.5	3015	1835
95	03C095CT0XFU00P	2.5	2.5	46.1	3870	2175
120	03C120CT0XFU00P	2.5	2.6	49.5	4675	2535
150	03C150CT0XFU00P	2.5	2.7	52.8	5545	2915
185	03C185CT0XFU00P	2.5	2.8	56.6	6670	3380
240	03C240CT0XFU00P	2.6	3.0	63.1	8570	4205
300	03C300CT0XFU00P	2.8	3.2	68.2	10500	5020
400	03C400CT0XFU00P	3.0	3.5	76.4	13265	6360
500	03C500CT0XFU00P	3.2	3.7	85.2	16780	7770

Electrical Data						
Nominal Cross sectional area	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance	Reactance
	Copper		Aluminum			
	DC at 20 °C	AC at 90 °C	DC at 20 °C	AC at 90 °C		
mm ²	Ω/Km	Ω/Km	Ω/Km	Ω/Km	µf/km	Ω/Km
35	0.524	0.6684	-	-	0.278	0.113
50	0.387	0.4939	0.641	0.8221	0.309	0.105
70	0.268	0.3424	0.443	0.5684	0.365	0.099
95	0.193	0.2471	0.320	0.4109	0.410	0.094
120	0.153	0.1964	0.253	0.3252	0.452	0.090
150	0.124	0.1598	0.206	0.2651	0.491	0.088
185	0.0991	0.1285	0.164	0.2116	0.539	0.086
240	0.0754	0.0991	0.125	0.1621	0.590	0.083
300	0.0601	0.0803	0.100	0.1305	0.598	0.082
400	0.0470	0.0646	0.0778	0.1027	0.634	0.080
500	0.0366	0.0526	0.0605	0.0814	0.675	0.079

The above data is approximate and subjected to manufacturing tolerance
This data is applicable also for 3.8/6.6 kV



3.6/6 (7.2) kV - Multi Core Cable – STA

Description

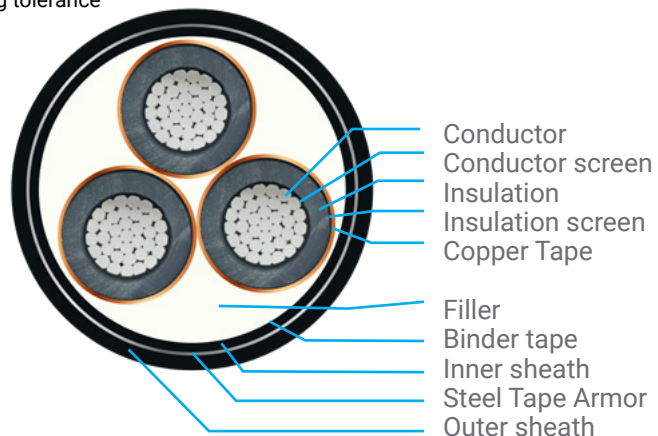
Copper or Aluminum
 Circular Compacted Conductor
 SC/XLPE/SC Insulation
 Copper Tape Screen

Double Steel Tape Armoring
 PVC Jacket
 Operating Temperature: 90°C.

Nominal Cross-sectional area	Cable code	Nominal Insulation Thickness	Steel Tape Thickness	Nominal Sheath Thickness	Approximate Overall Diameter	Approximate Weight	
						Copper Kg/Km	Aluminum Kg/Km
mm ²	C: Copper A: Aluminum	mm	mm	mm	mm		
35	03C035CT0XFUPTP	2.5	0.5	2.3	40.2	2700	-
50	03C050CT0XFUPTP	2.5	0.5	2.4	42.7	3185	2380
70	03C070CT0XFUPTP	2.5	0.5	2.5	47.5	4035	2880
95	03C095CT0XFUPTP	2.5	0.5	2.6	51.1	4975	3280
120	03C120CT0XFUPTP	2.5	0.5	2.8	54.9	5915	3780
150	03C150CT0XFUPTP	2.5	0.5	2.9	58.4	6890	4265
185	03C185CT0XFUPTP	2.5	0.5	3.0	62.2	8110	4820
240	03C240CT0XFUPTP	2.6	0.5	3.2	68.9	10205	5840
300	03C300CT0XFUPTP	2.8	0.5	3.4	74.2	12300	6820
400	03C400CT0XFUPTP	3.0	0.8	3.7	83.8	16120	9100
500	03C500CT0XFUPTP	3.2	0.8	3.9	92.8	20000	10990

Electrical Data						
Nominal Cross sectional area	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance	Reactance
	Copper		Aluminum			
	DC at 20 °C	AC at 90 °C	DC at 20 °C	AC at 90 °C		
mm ²	Ω/Km	Ω/Km	Ω/Km	Ω/Km	µf/km	Ω/Km
35	0.524	0.6684	-	-	0.278	0.113
50	0.387	0.4939	0.641	0.8221	0.309	0.105
70	0.268	0.3424	0.443	0.5684	0.365	0.099
95	0.193	0.2471	0.320	0.4109	0.410	0.094
120	0.153	0.1964	0.253	0.3252	0.452	0.090
150	0.124	0.1598	0.206	0.2651	0.491	0.088
185	0.0991	0.1285	0.164	0.2116	0.539	0.086
240	0.0754	0.0991	0.125	0.1621	0.590	0.083
300	0.0601	0.0803	0.100	0.1305	0.598	0.082
400	0.0470	0.0646	0.0778	0.1027	0.634	0.080
500	0.0366	0.0526	0.0605	0.0814	0.675	0.079

The above data is approximate and subjected to manufacturing tolerance
 This data is applicable also for 3.8/6.6 kV



3.6/6 (7.2) kV - Multi Core Cable – SWA

Description

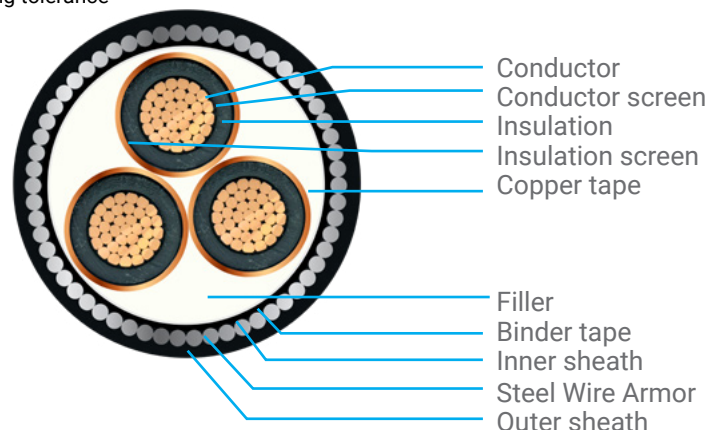
Copper or Aluminum
 Circular Compacted Conductor
 SC/XLPE/SC Insulation
 Copper Tape Screen

Steel Wire Armoring
 PVC Jacket
 Operating Temperature: 90°C.

Nominal Cross-sectional area	Cable code	Nominal Insulation Thickness	Steel Wire Diameter	Nominal Sheath Thickness	Approximate Overall Diameter	Approximate Weight	
						Copper Kg/Km	Aluminum Kg/Km
mm ²	C: Copper A: Aluminum	mm	mm	mm	mm		
35	03C035CT0XFUPWP	2.5	2.5	2.4	43.9	3670	-
50	03C050CT0XFUPWP	2.5	2.5	2.5	46.4	4200	3420
70	03C070CT0XFUPWP	2.5	2.5	2.6	51.2	5180	4045
95	03C095CT0XFUPWP	2.5	2.5	2.7	55	6210	4515
120	03C120CT0XFUPWP	2.5	2.5	2.9	58.6	7235	5090
150	03C150CT0XFUPWP	2.5	2.5	3.0	62.1	8275	5650
185	03C185CT0XFUPWP	2.5	2.5	3.1	65.9	9600	6310
240	03C240CT0XFUPWP	2.6	3.15	3.3	73.9	12525	8160
300	03C300CT0XFUPWP	2.8	3.15	3.5	79.2	14800	9320
400	03C400CT0XFUPWP	3.0	3.15	3.8	87.8	18180	11160
500	03C500CT0XFUPWP	3.2	3.15	4.0	96.8	22220	13210

Electrical Data						
Nominal Cross sectional area	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance	Reactance
	Copper		Aluminum			
	DC at 20 °C	AC at 90 °C	DC at 20 °C	AC at 90 °C		
mm ²	Ω/Km	Ω/Km	Ω/Km	Ω/Km	µf/km	Ω/Km
35	0.524	0.6684	-	-	0.278	0.113
50	0.387	0.4939	0.641	0.8221	0.309	0.105
70	0.268	0.3424	0.443	0.5684	0.365	0.099
95	0.193	0.2471	0.320	0.4109	0.410	0.094
120	0.153	0.1964	0.253	0.3252	0.452	0.090
150	0.124	0.1598	0.206	0.2651	0.491	0.088
185	0.0991	0.1285	0.164	0.2116	0.539	0.086
240	0.0754	0.0991	0.125	0.1621	0.590	0.083
300	0.0601	0.0803	0.100	0.1305	0.598	0.082
400	0.0470	0.0646	0.0778	0.1027	0.634	0.080
500	0.0366	0.0526	0.0605	0.0814	0.675	0.079

The above data is approximate and subjected to manufacturing tolerance
 this data is applicable also for 3.8/6.6 kV



6/10 (12) kV - Single Core Cable

Description

Copper or Aluminum

Circular Compacted Conductor

SC/XLPE/SC Insulation

Copper Wires Screen

PVC Jacket

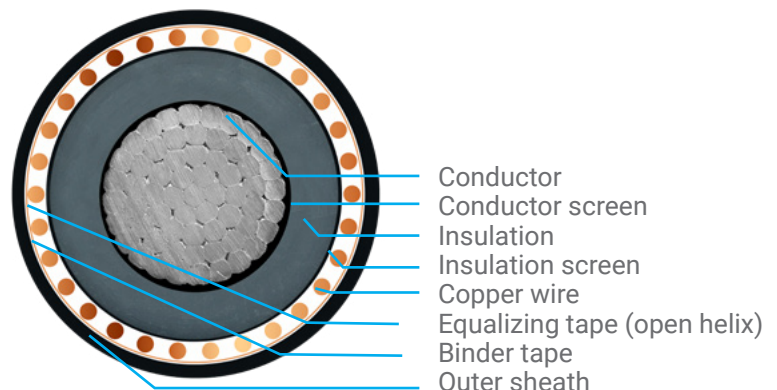
Operating Temperature: 90°C.

Nominal Cross-sectional area	Cable code	Nominal Insulation Thickness	Nominal Sheath Thickness	Approximate Overall Diameter	Approximate Weight	
					Copper Kg/Km	Aluminum Kg/Km
mm ²	N: Copper A: Aluminum	mm	mm	mm		
35	01C035CT0XJ000P	3.4	1.6	20.9	760	-
50	01C050CT0XJ000P	3.4	1.7	22.2	910	645
70	01C070CT0XJ000P	3.4	1.7	24.2	1125	750
95	01C095CT0XJ000P	3.4	1.8	26.0	1405	855
120	01C120CT0XJ000P	3.4	1.8	27.5	1650	955
150	01C150CT0XJ000P	3.4	1.9	29.1	2010	1155
185	01C185CT0XJ000P	3.4	1.9	30.8	2360	1290
240	01C240CT0XJ000P	3.4	2.0	33.6	2945	1520
300	01C300CT0XJ000P	3.4	2.1	35.6	3530	1735
400	01C400CT0XJ000P	3.4	2.2	39.1	4450	2145
500	01C500CT0XJ000P	3.4	2.3	42.8	5515	2555
630	01C630CT0XJ000P	3.4	2.4	49.2	6960	3090

Electrical Data

Nominal Cross sectional area	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance	Reactance
	Copper		Aluminum			
	DC at 20 °C	AC at 90 °C	DC at 20 °C	AC at 90 °C		
mm ²	Ω/Km	Ω/Km	Ω/Km	Ω/Km	µf/km	Ω/Km
35	0.524	0.6684	-	-	0.219	0.135
50	0.387	0.4938	0.641	0.8220	0.243	0.127
70	0.268	0.3423	0.443	0.5682	0.284	0.118
95	0.193	0.2469	0.320	0.4106	0.318	0.113
120	0.153	0.1962	0.253	0.3249	0.349	0.108
150	0.124	0.1595	0.206	0.2648	0.378	0.105
185	0.0991	0.1282	0.164	0.2111	0.413	0.101
240	0.0754	0.0987	0.125	0.1615	0.466	0.097
300	0.0601	0.0799	0.100	0.1298	0.503	0.095
400	0.0470	0.0642	0.0778	0.1019	0.567	0.092
500	0.0366	0.0522	0.0605	0.0804	0.639	0.089
630	0.0283	0.0432	0.0469	0.0640	0.766	0.086

The above data is approximate and subjected to manufacturing tolerance
this data is applicable also for 3.8/6.6 kV



6/10 (12) kV - Multi Core Cable - Unarmored

Description

Copper or Aluminum

Circular Compacted Conductor

SC/XLPE/SC Insulation

Copper Tape Screen

PVC Jacket

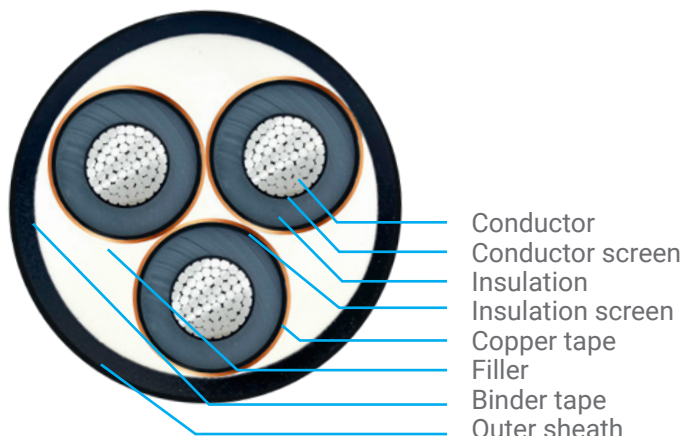
Operating Temperature: 90°C.

Nominal Cross-sectional area	Cable code	Nominal Insulation Thickness	Nominal Sheath Thickness	Approximate Overall Diameter	Approximate Weight	
mm ²	N: Copper A: Aluminum	mm	mm	mm	Copper Kg/Km	Aluminum Kg/Km
35	03C035CT0XJU00P	3.4	2.3	39.4	2095	-
50	03C050CT0XJU00P	3.4	2.4	42	2535	1720
70	03C070CT0XJU00P	3.4	2.5	46.5	3280	2110
95	03C095CT0XJU00P	3.4	2.7	50.4	4185	2490
120	03C120CT0XJU00P	3.4	2.8	53.8	5010	2870
150	03C150CT0XJU00P	3.4	2.9	57.1	5900	3270
185	03C185CT0XJU00P	3.4	3.0	60.9	7045	3755
240	03C240CT0XJU00P	3.4	3.2	66.9	8940	4575
300	03C300CT0XJU00P	3.4	3.3	71	10785	5305
400	03C400CT0XJU00P	3.4	3.6	78.1	13450	6430
500	03C500CT0XJU00P	3.4	3.7	86.1	16885	7875

Electrical Data

Nominal Cross sectional area	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance	Reactance
	Copper		Aluminum			
	DC at 20 °C	AC at 90 °C	DC at 20 °C	AC at 90 °C		
mm ²	Ω/Km	Ω/Km	Ω/Km	Ω/Km	µf/km	Ω/Km
35	0.524	0.6684	-	-	0.219	0.121
50	0.387	0.4938	0.641	0.8221	0.243	0.112
70	0.268	0.3423	0.443	0.5683	0.284	0.105
95	0.193	0.2470	0.320	0.4108	0.318	0.100
120	0.153	0.1963	0.253	0.3251	0.349	0.096
150	0.124	0.1596	0.206	0.2650	0.378	0.093
185	0.0991	0.1283	0.164	0.2115	0.413	0.090
240	0.0754	0.0988	0.125	0.1619	0.466	0.087
300	0.0601	0.0801	0.100	0.1303	0.503	0.085
400	0.0470	0.0645	0.0778	0.1026	0.567	0.082
500	0.0366	0.0525	0.0605	0.0813	0.639	0.080

The above data is approximate and subjected to manufacturing tolerance
this data is applicable also for 6.35/11 kV



6/10 (12) kV - Multi Core Cable – STA

Description

Copper or Aluminum
 Circular Compacted Conductor
 SC/XLPE/SC Insulation
 Copper Tape Screen

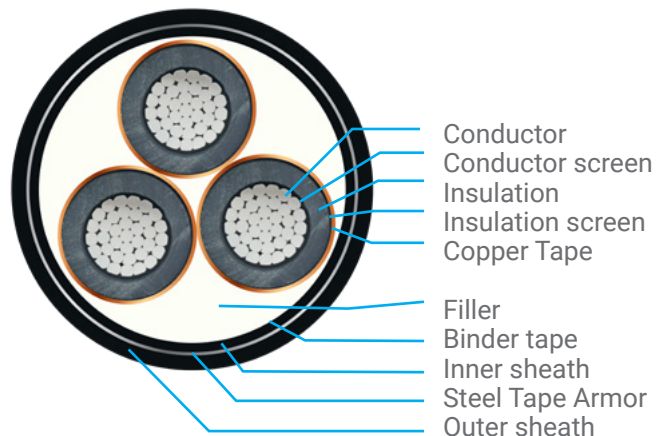
Double Steel Tape Armoring
 PVC Jacket
 Operating Temperature: 90°C.

Nominal Cross-sectional area	Cable code	Nominal Insulation Thickness	Steel Tape Thickness	Nominal Sheath Thickness	Approximate Overall Diameter	Approximate Weight	
mm ²	N: Copper A: Aluminum	mm	mm	mm	mm	Copper Kg/Km	Aluminum Kg/Km
35	03C035CT0XJUPTP	3.4	0.5	2.5	44.4	3040	-
50	03C050CT0XJUPTP	3.4	0.5	2.6	47.2	3570	2775
70	03C070CT0XJUPTP	3.4	0.5	2.7	51.9	4450	3305
95	03C095CT0XJUPTP	3.4	0.5	2.8	55.6	5415	3725
120	03C120CT0XJUPTP	3.4	0.5	2.9	59.2	6350	4420
150	03C150CT0XJUPTP	3.4	0.5	3.0	62.5	7320	4695
185	03C185CT0XJUPTP	3.4	0.5	3.1	66.6	8595	5305
240	03C240CT0XJUPTP	3.4	0.5	3.3	72.8	10670	6305
300	03C300CT0XJUPTP	3.4	0.5	3.5	77.3	12695	7215
400	03C400CT0XJUPTP	3.4	0.8	3.8	85.5	16365	9350
500	03C500CT0XJUPTP	3.4	0.8	4.0	93.9	20185	11175

Electrical Data

Nominal Cross sectional area	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance	Reactance
	Copper		Aluminum			
	DC at 20 °C	AC at 90 °C	DC at 20 °C	AC at 90 °C		
mm ²	Ω/Km	Ω/Km	Ω/Km	Ω/Km	µf/km	Ω/Km
35	0.524	0.6684	-	-	0.219	0.121
50	0.387	0.4938	0.641	0.8221	0.243	0.112
70	0.268	0.3423	0.443	0.5683	0.284	0.105
95	0.193	0.2470	0.320	0.4108	0.318	0.100
120	0.153	0.1963	0.253	0.3251	0.349	0.096
150	0.124	0.1596	0.206	0.2650	0.378	0.093
185	0.0991	0.1283	0.164	0.2115	0.413	0.09
240	0.0754	0.0988	0.125	0.1619	0.466	0.087
300	0.0601	0.0801	0.100	0.1303	0.503	0.085
400	0.0470	0.0645	0.0778	0.1026	0.567	0.082
500	0.0366	0.0525	0.0605	0.0813	0.639	0.080

The above data is approximate and subjected to manufacturing tolerance
 this data is applicable also for 6.35/11 kV



6/10 (12) kV - Multi Core Cable – SWA

Description

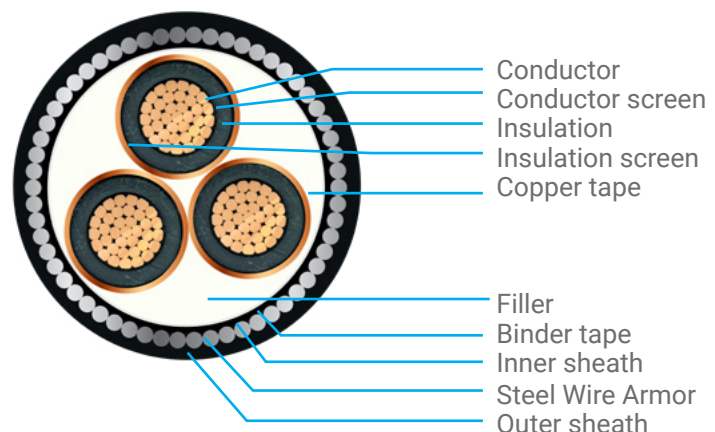
Copper or Aluminum
 Circular Compacted Conducto
 SC/XLPE/SC Insulation
 Copper Tape Screen

Steel Wire Armoring
 PVC Jacket
 Operating Temperature: 90°C.

Nominal Cross-sectional area	Cable code	Nominal Insulation Thickness	Steel Tape Thickness	Nominal Sheath Thickness	Approximate Overall Diameter	Approximate Weight	
						Copper Kg/Km	Aluminum Kg/Km
mm ²	N: Copper A: Aluminum	mm	mm	mm	mm		
35	03C035CT0XJUPWP	3.4	2.5	2.6	48.1	4410	-
50	03C050CT0XJUPWP	3.4	2.5	2.7	50.9	4680	3910
70	03C070CT0XJUPWP	3.4	2.5	2.8	55.6	5690	4565
95	03C095CT0XJUPWP	3.4	2.5	2.9	59.3	6720	5025
120	03C120CT0XJUPWP	3.4	2.5	3.0	62.9	7765	5630
150	03C150CT0XJUPWP	3.4	2.5	3.1	66.2	8805	6175
185	03C185CT0XJUPWP	3.4	2.5	3.2	70.2	10180	6890
240	03C240CT0XJUPWP	3.4	3.15	3.5	77.9	13165	8800
300	03C300CT0XJUPWP	3.4	3.15	3.6	82.2	15280	9800
400	03C400CT0XJUPWP	3.4	3.15	3.9	89.7	18490	11740
500	03C500CT0XJUPWP	3.4	3.15	4.1	97.9	22445	13435

Electrical Data						
Nominal Cross sectional area	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance	Reactance
	Copper		Aluminum			
	DC at 20 °C	AC at 90 °C	DC at 20 °C	AC at 90 °C		
mm ²	Ω/Km	Ω/Km	Ω/Km	Ω/Km	µf/km	Ω/Km
35	0.524	0.6684	-	-	0.219	0.121
50	0.387	0.4938	0.641	0.8221	0.243	0.112
70	0.268	0.3423	0.443	0.5683	0.284	0.105
95	0.193	0.2470	0.320	0.4108	0.318	0.100
120	0.153	0.1963	0.253	0.3251	0.349	0.096
150	0.124	0.1596	0.206	0.2650	0.378	0.093
185	0.0991	0.1283	0.164	0.2115	0.413	0.090
240	0.0754	0.0988	0.125	0.1619	0.466	0.087
300	0.0601	0.0801	0.100	0.1303	0.503	0.085
400	0.0470	0.0645	0.0778	0.1026	0.567	0.082
500	0.0366	0.0525	0.0605	0.0813	0.639	0.080

The above data is approximate and subjected to manufacturing tolerance
 this data is applicable also for 6.35/11 kV



8.7/15 (17.5) kV - Single Core Cable

Description

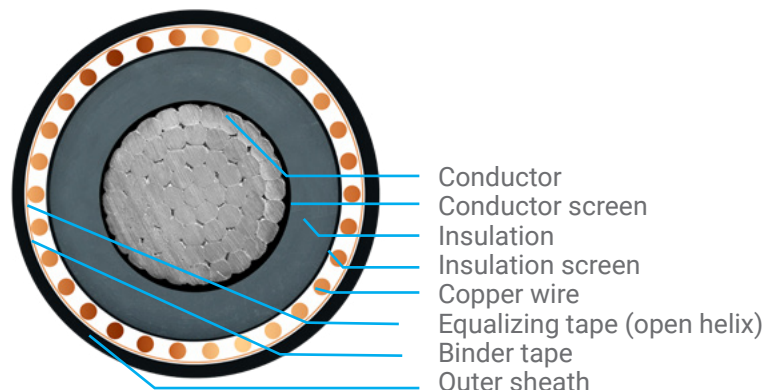
Copper or Aluminum
 Circular Compacted Conductor
 SC/XLPE/SC Insulation

Copper Wires Screen
 PVC Jacket
 Operating Temperature: 90°C.

Nominal Cross-sectional area	Cable code	Nominal Insulation Thickness	Nominal Sheath Thickness	Approximate Overall Diameter	Approximate Weight	
					Copper Kg/Km	Aluminum Kg/Km
mm ²	N: Copper A: Aluminum	mm	mm	mm		
35	01C035CTOXIO00P	4.5	1.7	23.3	850	-
50	01C050CTOXIO00P	4.5	1.7	24.4	985	730
70	01C070CTOXIO00P	4.5	1.8	26.6	1220	855
95	01C095CTOXIO00P	4.5	1.8	28.2	1495	955
120	01C120CTOXIO00P	4.5	1.9	29.9	1760	1075
150	01C150CTOXIO00P	4.5	2.0	31.5	2125	1285
185	01C185CTOXIO00P	4.5	2.0	33.2	2480	1425
240	01C240CTOXIO00P	4.5	2.1	36.0	3075	1670
300	01C300CTOXIO00P	4.5	2.2	38.0	3670	1900
400	01C400CTOXIO00P	4.5	2.3	41.5	4600	2345
500	01C500CTOXIO00P	4.5	2.4	45.2	5685	2775
630	01C630CTOXIO00P	4.5	2.5	51.6	7150	3380

Electrical Data						
Nominal Cross sectional area	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance	Reactance
	Copper		Aluminum			
	DC at 20 °C	AC at 90 °C	DC at 20 °C	AC at 90 °C		
mm ²	Ω/Km	Ω/Km	Ω/Km	Ω/Km	µf/km	Ω/Km
35	0.524	0.6683	-	-	0.179	0.142
50	0.387	0.4937	0.641	0.8220	0.197	0.133
70	0.268	0.3421	0.443	0.5682	0.229	0.124
95	0.193	0.2467	0.320	0.4106	0.255	0.118
120	0.153	0.1959	0.253	0.3248	0.278	0.113
150	0.124	0.1592	0.206	0.2647	0.300	0.110
185	0.0991	0.1278	0.164	0.2111	0.327	0.106
240	0.0754	0.0981	0.125	0.1614	0.368	0.102
300	0.0601	0.0791	0.100	0.1297	0.396	0.099
400	0.0470	0.0632	0.0778	0.1017	0.444	0.095
500	0.0366	0.0510	0.0605	0.0802	0.498	0.092
630	0.0283	0.0418	0.0469	0.0637	0.595	0.089

The above data is approximate and subjected to manufacturing tolerance



8.7/15 (17.5) kV - Multi Core Cable Unarmored

Description

Copper or Aluminum

Circular Compacted Conductor

SC/XLPE/SC Insulation

Copper Tape Screen

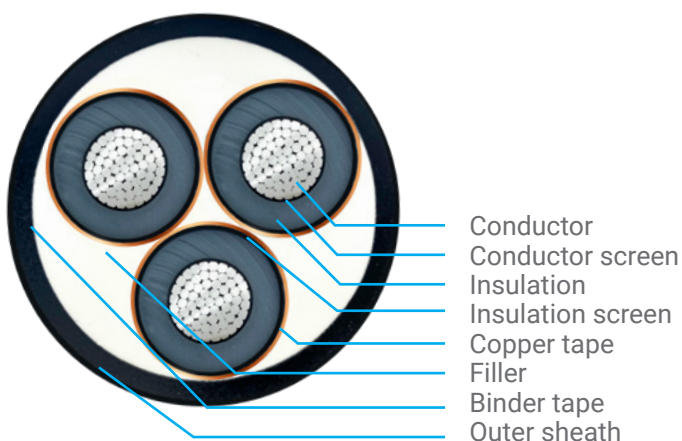
PVC Jacket

Operating Temperature: 90°C.

Nominal Cross-sectional area	Cable code	Nominal Insulation Thickness	Nominal Sheath Thickness	Approximate Overall Diameter	Approximate Weight	
					Copper Kg/Km	Aluminum Kg/Km
mm ²	N: Copper A: Aluminum	mm	mm	mm		
35	03C035CT0XIU00P	4.5	2.5	44.6	2425	-
50	03C050CT0XIU00P	4.5	2.6	47.2	2885	2070
70	03C070CT0XIU00P	4.5	2.7	51.7	3660	2500
95	03C095CT0XIU00P	4.5	2.8	55.3	4565	2875
120	03C120CT0XIU00P	4.5	2.9	58.8	5420	3270
150	03C150CT0XIU00P	4.5	3.0	62.0	6320	3690
185	03C185CT0XIU00P	4.5	3.2	66.1	7530	4240
240	03C240CT0XIU00P	4.5	3.3	71.9	9435	5070
300	03C300CT0XIU00P	4.5	3.5	76.2	11345	5865
400	03C400CT0XIU00P	4.5	3.7	83.3	14055	7165
500	03C500CT0XIU00P	4.5	3.9	91.2	17540	8530

Electrical Data

Nominal Cross sectional area	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance	Reactance
	Copper		Aluminum			
	DC at 20 °C	AC at 90 °C	DC at 20 °C	AC at 90 °C		
mm ²	Ω/Km	Ω/Km	Ω/Km	Ω/Km	µf/km	Ω/Km
35	0.524	0.6684	-	-	0.179	0.129
50	0.387	0.4938	0.641	0.8220	0.197	0.120
70	0.268	0.3422	0.443	0.5683	0.229	0.112
95	0.193	0.2469	0.320	0.4107	0.255	0.107
120	0.153	0.1961	0.253	0.3250	0.278	0.102
150	0.124	0.1594	0.206	0.2649	0.300	0.099
185	0.0991	0.1281	0.164	0.2113	0.327	0.096
240	0.0754	0.0986	0.125	0.1617	0.368	0.092
300	0.0601	0.0798	0.100	0.1301	0.396	0.090
400	0.0470	0.0641	0.0778	0.1024	0.444	0.086
500	0.0366	0.0520	0.0605	0.0810	0.498	0.084



8.7/15 (17.5) kV - Multi Core Cable – STA

Description

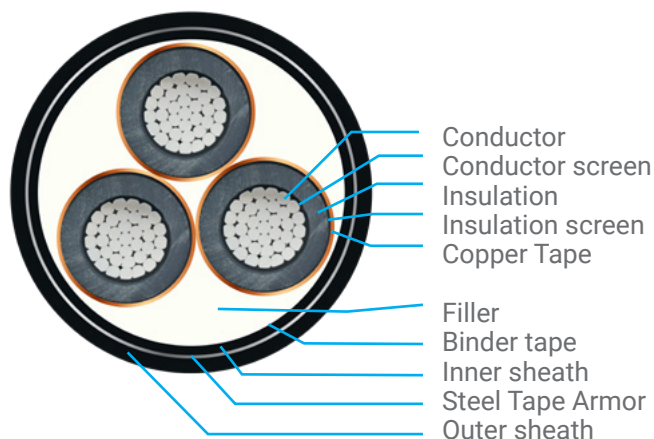
Copper or Aluminum
 Circular Compacted Conductor
 SC/XLPE/SC Insulation
 Copper Tape Screen

Double Steel Tape Armoring
 PVC Jacket
 Operating Temperature: 90°C.

Nominal Cross-sectional area	Cable code	Nominal Insulation Thickness	Steel Tape Thickness	Nominal Sheath Thickness	Approximate Overall Diameter	Approximate Weight	
mm ²	N: Copper A: Aluminum	mm	mm	mm	mm	Copper Kg/Km	Aluminum Kg/Km
35	03C035CT0XIUPTP	4.5	0.5	2.6	49.6	3490	-
50	03C050CT0XIUPTP	4.5	0.5	2.7	52.4	4040	3245
70	03C070CT0XIUPTP	4.5	0.5	2.8	57.1	4955	3820
95	03C095CT0XIUPTP	4.5	0.5	3.0	60.9	5970	4285
120	03C120CT0XIUPTP	4.5	0.5	3.1	64.6	6945	4805
150	03C150CT0XIUPTP	4.5	0.5	3.2	67.8	7925	5300
185	03C185CT0XIUPTP	4.5	0.5	3.3	71.9	9240	5950
240	03C240CT0XIUPTP	4.5	0.5	3.5	78.1	11370	7005
300	03C300CT0XIUPTP	4.5	0.8	3.7	83.6	14190	8710
400	03C400CT0XIUPTP	4.5	0.8	3.9	90.9	17205	10385
500	03C500CT0XIUPTP	4.5	0.8	4.1	99.0	21030	12020

Electrical Data						
Nominal Cross sectional area	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance	Reactance
	Copper		Aluminum			
	DC at 20 °C	AC at 90 °C	DC at 20 °C	AC at 90 °C		
mm ²	Ω/Km	Ω/Km	Ω/Km	Ω/Km	µf/km	Ω/Km
35	0.524	0.6684	-	-	0.179	0.129
50	0.387	0.4938	0.641	0.8220	0.197	0.120
70	0.268	0.3422	0.443	0.5683	0.229	0.112
95	0.193	0.2469	0.320	0.4107	0.255	0.107
120	0.153	0.1961	0.253	0.3250	0.278	0.102
150	0.124	0.1594	0.206	0.2649	0.300	0.099
185	0.0991	0.1281	0.164	0.2113	0.327	0.096
240	0.0754	0.0986	0.125	0.1617	0.368	0.092
300	0.0601	0.0798	0.100	0.1301	0.396	0.090
400	0.0470	0.0641	0.0778	0.1024	0.444	0.086
500	0.0366	0.0520	0.0605	0.0810	0.498	0.084

The above data is approximate and subjected to manufacturing tolerance



8.7/15 (17.5) kV - Multi Core Cable – SWA

Description

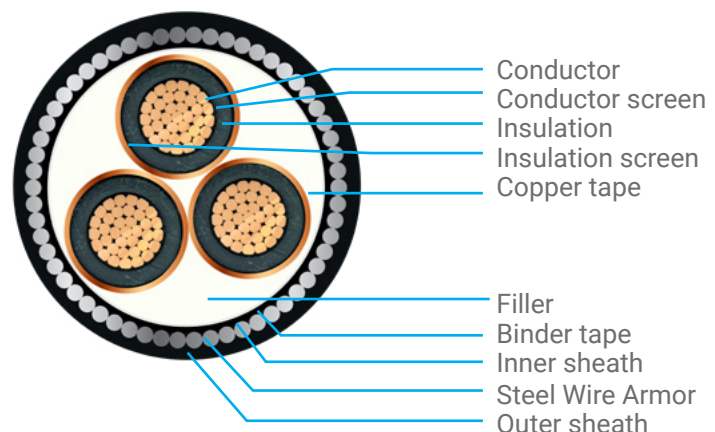
Copper or Aluminum
 Circular Compacted Conductor
 SC/XLPE/SC Insulation
 Copper Tape Screen

Steel Wire Armoring
 PVC Jacket
 Operating Temperature: 90°C.

Nominal Cross-sectional area mm ²	Cable code N: Copper A: Aluminum	Nominal Insulation Thickness mm	Steel Tape Thickness mm	Nominal Sheath Thickness mm	Approximate Overall Diameter mm	Approximate Weight	
						Copper Kg/Km	Aluminum Kg/Km
35	03C035CT0XIUPWP	4.5	2.5	2.7	53.3	4685	-
50	03C050CT0XIUPWP	4.5	2.5	2.8	56.1	5275	4505
70	03C070CT0XIUPWP	4.5	2.5	2.9	60.8	6315	5205
95	03C095CT0XIUPWP	4.5	2.5	3.1	64.6	7400	5715
120	03C120CT0XIUPWP	4.5	2.5	3.2	68.3	8480	6340
150	03C150CT0XIUPWP	4.5	3.15	3.3	72.8	10200	7640
185	03C185CT0XIUPWP	4.5	3.15	3.5	77.1	11745	8455
240	03C240CT0XIUPWP	4.5	3.15	3.6	83.1	14000	9635
300	03C300CT0XIUPWP	4.5	3.15	3.8	87.6	16190	10710
400	03C400CT0XIUPWP	4.5	3.15	4.0	94.9	19410	12605
500	03C500CT0XIUPWP	4.5	3.15	4.2	103	23420	14410

Electrical Data						
Nominal Cross sectional area mm ²	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance µf/km	Reactance Ω/Km
	Copper		Aluminum			
	DC at 20 °C Ω/Km	AC at 90 °C Ω/Km	DC at 20 °C Ω/Km	AC at 90 °C Ω/Km		
35	0.524	0.6684	-	-	0.179	0.129
50	0.387	0.4938	0.641	0.8220	0.197	0.120
70	0.268	0.3422	0.443	0.5683	0.229	0.112
95	0.193	0.2469	0.320	0.4107	0.255	0.107
120	0.153	0.1961	0.253	0.3250	0.278	0.102
150	0.124	0.1594	0.206	0.2649	0.3	0.099
185	0.0991	0.1281	0.164	0.2113	0.327	0.096
240	0.0754	0.0986	0.125	0.1617	0.368	0.092
300	0.0601	0.0798	0.100	0.1301	0.396	0.090
400	0.0470	0.0641	0.0778	0.1024	0.444	0.086
500	0.0366	0.0520	0.0605	0.0810	0.498	0.084

The above data is approximate and subjected to manufacturing tolerance



12 / 20 (24) kV - Single Core Cable

Description

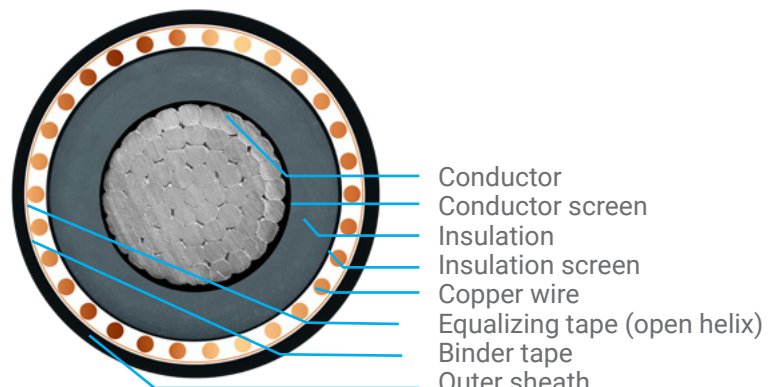
Copper or Aluminum
 Circular Compacted Conductor
 SC/XLPE/SC Insulation

Copper Wires Screen
 PVC Jacket
 Operating Temperature: 90°C.

Nominal Cross-sectional area mm ²	Cable code N: Copper A: Aluminum	Nominal Insulation Thickness mm	Nominal Sheath Thickness mm	Approximate Overall Diameter mm	Approximate Weight	
					Copper Kg/Km	Aluminum Kg/Km
35	01C035CT0XM000P	5.5	1.8	25.5	935	-
50	01C050CT0XM000P	5.5	1.8	26.6	1075	800
70	01C070CT0XM000P	5.5	1.9	28.8	1320	925
95	01C095CT0XM000P	5.5	1.9	30.4	1595	1030
120	01C120CT0XM000P	5.5	2.0	32.1	1865	1155
150	01C150CT0XM000P	5.5	2.0	33.5	2225	1350
185	01C185CT0XM000P	5.5	2.1	35.4	2600	1505
240	01C240CT0XM000P	5.5	2.2	38.2	3205	1755
300	01C300CT0XM000P	5.5	2.2	40.2	3880	2060
400	01C400CT0XM000P	5.5	2.3	43.5	4730	2395
500	01C500CT0XM000P	5.5	2.4	47.2	5825	2830
630	01C630CT0XM000P	5.5	2.5	53.6	7305	3440

Electrical Data						
Nominal Cross sectional area mm ²	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance µf/km	Reactance Ω/Km
	Copper		Aluminum			
	DC at 20 °C Ω/Km	AC at 90 °C Ω/Km	DC at 20 °C Ω/Km	AC at 90 °C Ω/Km		
35	0.524	0.6684	-	-	0.157	0.148
50	0.387	0.4937	0.641	0.8220	0.171	0.138
70	0.268	0.3421	0.443	0.5682	0.198	0.129
95	0.193	0.2467	0.320	0.4106	0.219	0.123
120	0.153	0.1959	0.253	0.3248	0.238	0.117
150	0.124	0.1591	0.206	0.2647	0.256	0.114
185	0.0991	0.1277	0.164	0.2111	0.278	0.110
240	0.0754	0.0980	0.125	0.1614	0.312	0.105
300	0.0601	0.0790	0.100	0.1296	0.335	0.102
400	0.0470	0.0631	0.0778	0.1017	0.375	0.098
500	0.0366	0.0508	0.0605	0.0802	0.419	0.095
630	0.0283	0.0414	0.0469	0.0638	0.498	0.092

The above data is approximate and subjected to manufacturing tolerance
 this data is applicable also for 12.7/22 kV



12 / 20 (24) kV - Multi Core Cable Unarmored

Description

Copper or Aluminum

Circular Compacted Conductor

SC/XLPE/SC Insulation

Copper Tape Screen

PVC Jacket

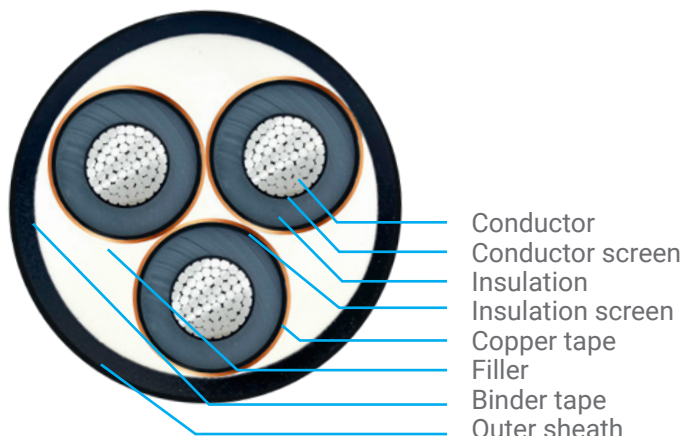
Operating Temperature: 90°C.

Nominal Cross-sectional area	Cable code	Nominal Insulation Thickness	Nominal Sheath Thickness	Approximate Overall Diameter	Approximate Weight	
mm ²	N: Copper A: Aluminum	mm	mm	mm	Copper Kg/Km	Aluminum Kg/Km
35	03C035CT0XMU00P	5.5	2.6	49.3	2755	-
50	03C050CT0XMU00P	5.5	2.7	51.9	3235	2430
70	03C070CT0XMU00P	5.5	2.8	56.4	4045	2885
95	03C095CT0XMU00P	5.5	3.0	60.1	4975	3275
120	03C120CT0XMU00P	5.5	3.1	63.5	5845	3700
150	03C150CT0XMU00P	5.5	3.2	66.7	6765	4140
185	03C185CT0XMU00P	5.5	3.3	70.6	7975	4685
240	03C240CT0XMU00P	5.5	3.5	76.6	9945	5580
300	03C300CT0XMU00P	5.5	3.6	80.7	11845	6365
400	03C400CT0XMU00P	5.5	3.9	88	14645	7765
500	03C500CT0XMU00P	5.5	4.1	96	18190	9180

Electrical Data

Nominal Cross sectional area	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance	Reactance
	Copper		Aluminum			
	DC at 20 °C	AC at 90 °C	DC at 20 °C	AC at 90 °C		
mm ²	Ω/Km	Ω/Km	Ω/Km	Ω/Km	µf/km	Ω/Km
35	0.524	0.6684	-	-	0.157	0.135
50	0.387	0.4938	0.641	0.8220	0.171	0.126
70	0.268	0.3422	0.443	0.5683	0.198	0.118
95	0.193	0.2468	0.320	0.4107	0.219	0.112
120	0.153	0.1960	0.253	0.3249	0.238	0.107
150	0.124	0.1593	0.206	0.2648	0.256	0.104
185	0.0991	0.1280	0.164	0.2112	0.278	0.100
240	0.0754	0.0984	0.125	0.1616	0.312	0.096
300	0.0601	0.0795	0.100	0.1300	0.335	0.094
400	0.0470	0.0638	0.0778	0.1022	0.375	0.090
500	0.0366	0.0517	0.0605	0.0808	0.419	0.087

The above data is approximate and subjected to manufacturing tolerance
this data is applicable also for 12.7/22 kV



12 / 20 (24) kV- Multi Core Cable – STA

Description

Copper or Aluminum
 Circular Compacted Conductor
 SC/XLPE/SC Insulation
 Copper Tape Screen

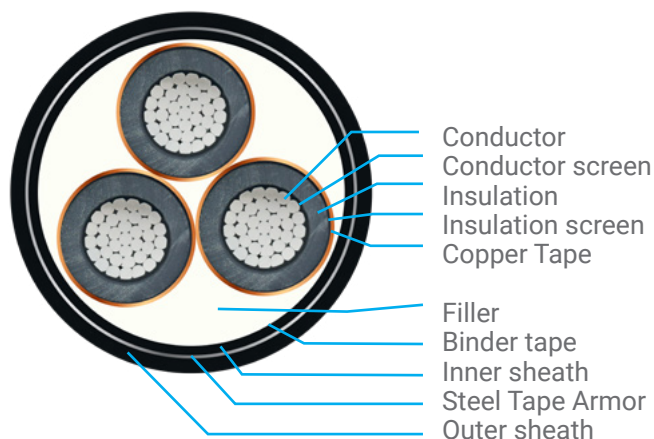
Double Steel Tape Armoring
 PVC Jacket
 Operating Temperature: 90°C.

Nominal Cross-sectional area	Cable code	Nominal Insulation Thickness	Steel Tape Thickness	Nominal Sheath Thickness	Approximate Overall Diameter	Approximate Weight	
mm ²	N: Copper A: Aluminum	mm	mm	mm	mm	Copper Kg/Km	Aluminum Kg/Km
35	03C035CT0XMUPTP	5.5	0.5	2.8	54.5	3960	-
50	03C050CT0XMUPTP	5.5	0.5	2.9	57.3	4530	3750
70	03C070CT0XMUPTP	5.5	0.5	3.0	61.8	5445	4315
95	03C095CT0XMUPTP	5.5	0.5	3.1	65.7	6500	4810
120	03C120CT0XMUPTP	5.5	0.5	3.2	69.3	7490	5350
150	03C150CT0XMUPTP	5.5	0.5	3.3	72.5	8490	5870
185	03C185CT0XMUPTP	5.5	0.5	3.5	76.8	9870	6580
240	03C240CT0XMUPTP	5.5	0.8	3.7	84.0	12810	8445
300	03C300CT0XMUPTP	5.5	0.8	3.8	88.3	14900	9420
400	03C400CT0XMUPTP	5.5	0.8	4.1	95.8	18010	11205
500	03C500CT0XMUPTP	5.5	0.8	4.3	104.0	21905	12895

Electrical Data

Nominal Cross sectional area	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance	Reactance
	Copper		Aluminum			
	DC at 20 °C	AC at 90 °C	DC at 20 °C	AC at 90 °C		
mm ²	Ω/Km	Ω/Km	Ω/Km	Ω/Km	µf/km	Ω/Km
35	0.524	0.6684	-	-	0.157	0.135
50	0.387	0.4938	0.641	0.8220	0.171	0.126
70	0.268	0.3422	0.443	0.5683	0.198	0.118
95	0.193	0.2468	0.320	0.4107	0.219	0.112
120	0.153	0.1960	0.253	0.3249	0.238	0.107
150	0.124	0.1593	0.206	0.2648	0.256	0.104
185	0.0991	0.1280	0.164	0.2112	0.278	0.100
240	0.0754	0.0984	0.125	0.1616	0.312	0.096
300	0.0601	0.0795	0.100	0.1300	0.335	0.094
400	0.0470	0.0638	0.0778	0.1022	0.375	0.090
500	0.0366	0.0517	0.0605	0.0808	0.419	0.087

The above data is approximate and subjected to manufacturing tolerance
 this data is applicable also for 12.7/22 kV



12 / 20 (24) kV - Multi Core Cable – SWA

Description

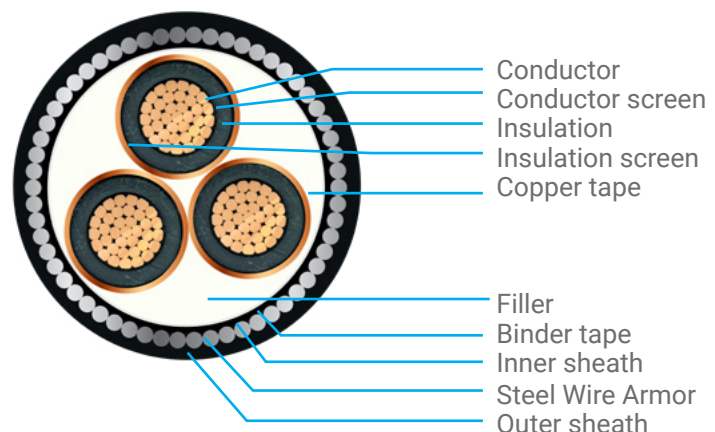
Copper or Aluminum
 Circular Compacted Conductor
 SC/XLPE/SC Insulation
 Copper Tape Screen

Steel Wire Armoring
 PVC Jacket
 Operating Temperature: 90°C.

Nominal Cross-sectional area	Cable code	Nominal Insulation Thickness	Steel Tape Thickness	Nominal Sheath Thickness	Approximate Overall Diameter	Approximate Weight	
mm ²	N: Copper A: Aluminum	mm	mm	mm	mm	Copper Kg/Km	Aluminum Kg/Km
35	03C035CT0XMUPWP	5.5	2.5	2.9	58.2	5245	-
50	03C050CT0XMUPWP	5.5	2.5	3.0	61	5895	5135
70	03C070CT0XMUPWP	5.5	2.5	3.1	65.5	6905	5795
95	03C095CT0XMUPWP	5.5	2.5	3.2	69.4	8060	6365
120	03C120CT0XMUPWP	5.5	3.15	3.4	74.5	9905	7760
150	03C150CT0XMUPWP	5.5	3.15	3.5	77.7	10990	8365
185	03C185CT0XMUPWP	5.5	3.15	3.6	81.8	12465	9175
240	03C240CT0XMUPWP	5.5	3.15	3.8	88	14860	10495
300	03C300CT0XMUPWP	5.5	3.15	3.9	92.3	17040	11560
400	03C400CT0XMUPWP	5.5	3.15	4.2	99.8	20355	13565
500	03C500CT0XMUPWP	5.5	3.15	4.4	108	24435	15420

Electrical Data						
Nominal Cross sectional area	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance	Reactance
	Copper		Aluminum			
	DC at 20 °C	AC at 90 °C	DC at 20 °C	AC at 90 °C		
mm ²	Ω/Km	Ω/Km	Ω/Km	Ω/Km	µf/km	Ω/Km
35	0.524	0.6684	-	-	0.157	0.135
50	0.387	0.4938	0.641	0.8220	0.171	0.126
70	0.268	0.3422	0.443	0.5683	0.198	0.118
95	0.193	0.2468	0.320	0.4107	0.219	0.112
120	0.153	0.1960	0.253	0.3249	0.238	0.107
150	0.124	0.1593	0.206	0.2648	0.256	0.104
185	0.0991	0.1280	0.164	0.2112	0.278	0.100
240	0.0754	0.0984	0.125	0.1616	0.312	0.096
300	0.0601	0.0795	0.100	0.1300	0.335	0.094
400	0.0470	0.0638	0.0778	0.1022	0.375	0.090
500	0.0366	0.0517	0.0605	0.0808	0.419	0.087

The above data is approximate and subjected to manufacturing tolerance
 this data is applicable also for 12.7/22 kV



18/30 (36) kV - Single Core Cable

Description

Copper or Aluminum

Circular Compacted Conductor

SC/XLPE/SC Insulation

Copper Wires Screen

PVC Jacket

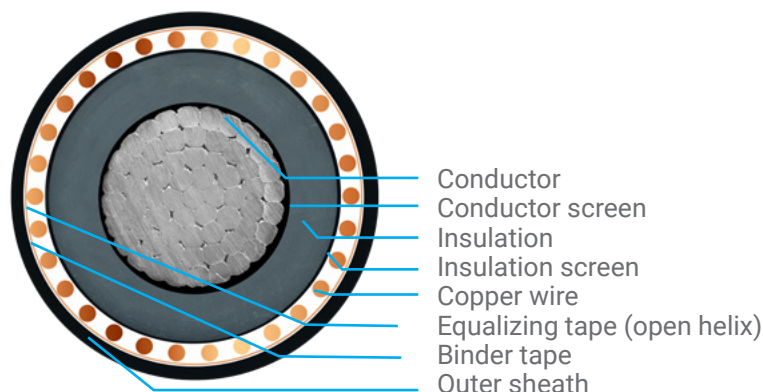
Operating Temperature: 90°C.

Nominal Cross-sectional area mm ²	Cable code N: Copper A: Aluminum	Nominal Insulation Thickness mm	Nominal Sheath Thickness mm	Approximate Overall Diameter mm	Approximate Weight	
					Copper Kg/Km	Aluminum Kg/Km
50	01C050CT0XK000P	8.0	2.0	32.0	1320	1050
70	01C070CT0XK000P	8.0	2.0	34.0	1570	1180
95	01C095CT0XK000P	8.0	2.1	35.8	1875	1310
120	01C120CT0XK000P	8.0	2.1	37.3	2145	1430
150	01C150CT0XK000P	8.0	2.2	38.9	2530	1655
185	01C185CT0XK000P	8.0	2.2	40.6	2905	1810
240	01C240CT0XK000P	8.0	2.3	43.4	3530	2080
300	01C300CT0XK000P	8.0	2.4	45.6	4245	2425
400	01C400CT0XK000P	8.0	2.5	48.9	5120	2790
500	01C500CT0XK000P	8.0	2.6	52.6	6245	3250
630	01C630CT0XK000P	8.0	2.7	59.0	7785	3920

Electrical Data

Nominal Cross sectional area mm ²	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance µf/km	Reactance Ω/Km
	Copper		Aluminum			
	DC at 20 °C Ω/Km	AC at 90 °C Ω/Km	DC at 20 °C Ω/Km	AC at 90 °C Ω/Km		
50	0.387	0.4937	0.641	0.8220	0.134	0.150
70	0.268	0.3421	0.443	0.5682	0.153	0.139
95	0.193	0.2466	0.320	0.4106	0.168	0.133
120	0.153	0.1958	0.253	0.3248	0.181	0.127
150	0.124	0.1590	0.206	0.2646	0.194	0.123
185	0.0991	0.1275	0.164	0.2109	0.209	0.119
240	0.0754	0.0977	0.125	0.1612	0.233	0.113
300	0.0601	0.0787	0.100	0.1294	0.249	0.110
400	0.0470	0.0627	0.0778	0.1014	0.276	0.105
500	0.0366	0.0503	0.0605	0.0798	0.307	0.101
630	0.0283	0.0409	0.0469	0.0632	0.362	0.096

The above data is approximate and subjected to manufacturing tolerance
this data is applicable also for 19/33 kV



18/30 (36) kV - Multi Core Cable Unarmored

Description

Copper or Aluminum

Circular Compacted Conductor

SC/XLPE/SC Insulation

Copper Tape Screen

PVC Jacket

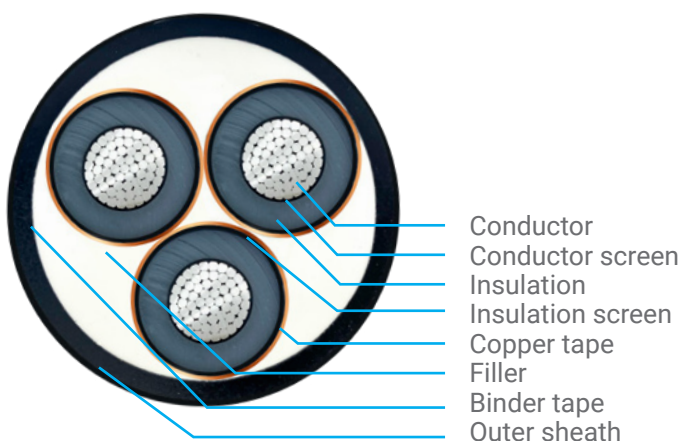
Operating Temperature: 90°C.

Nominal Cross-sectional area	Cable code	Nominal Insulation Thickness	Nominal Sheath Thickness	Approximate Overall Diameter	Approximate Weight	
					Copper Kg/Km	Aluminum Kg/Km
mm ²	N: Copper A: Aluminum	mm	mm	mm		
50	03C050CT0XKU00P	8.0	3.1	63.3	4195	3400
70	03C070CT0XKU00P	8.0	3.2	67.8	5070	3925
95	03C095CT0XKU00P	8.0	3.3	71.7	6090	4395
120	03C120CT0XKU00P	8.0	3.5	75.1	7015	4875
150	03C150CT0XKU00P	8.0	3.6	78.3	7990	5365
185	03C185CT0XKU00P	8.0	3.7	82.2	9255	5965
240	03C240CT0XKU00P	8.0	3.8	88.0	11280	6920
300	03C300CT0XKU00P	8.0	4.0	92.3	13290	7810
400	03C400CT0XKU00P	8.0	4.2	99.4	16155	9305
500	03C500CT0XKU00P	8.0	4.4	107.4	19825	10815

Electrical Data

Nominal Cross sectional area	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance	Reactance
	Copper		Aluminum			
	DC at 20 °C	AC at 90 °C	DC at 20 °C	AC at 90 °C		
mm ²	Ω/Km	Ω/Km	Ω/Km	Ω/Km	µf/km	Ω/Km
50	0.387	0.4937	0.641	0.8220	0.134	0.140
70	0.268	0.3421	0.443	0.5682	0.153	0.130
95	0.193	0.2467	0.320	0.4106	0.168	0.124
120	0.153	0.1959	0.253	0.3248	0.181	0.118
150	0.124	0.1591	0.206	0.2647	0.194	0.114
185	0.0991	0.1277	0.164	0.2111	0.209	0.110
240	0.0754	0.0980	0.125	0.1614	0.233	0.105
300	0.0601	0.0791	0.100	0.1297	0.249	0.103
400	0.0470	0.0632	0.0778	0.1018	0.276	0.098
500	0.0366	0.0510	0.0605	0.0803	0.307	0.094

The above data is approximate and subjected to manufacturing tolerance
this data is applicable also for 19/33 kV



18/30 (36) kV - Multi Core Cable – STA

Description

Copper or Aluminum
 Circular Compacted Conductor
 SC/XLPE/SC Insulation
 Copper Tape Screen

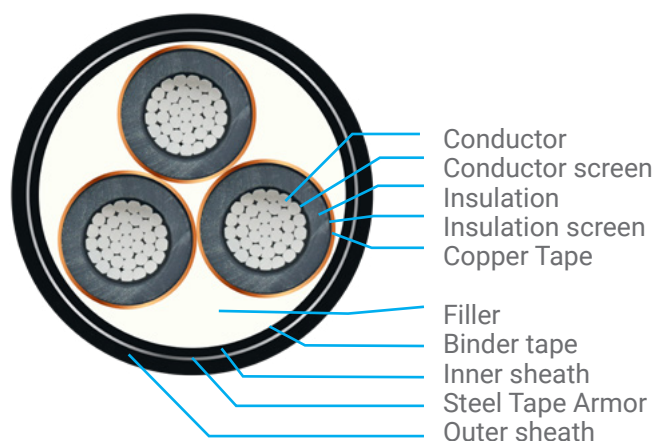
Double Steel Tape Armoring
 PVC Jacket
 Operating Temperature: 90°C.

Nominal Cross-sectional area	Cable code	Nominal Insulation Thickness	Steel Tape Thickness	Nominal Sheath Thickness	Approximate Overall Diameter	Approximate Weight	
mm ²	N: Copper A: Aluminum	mm	mm	mm	mm	Copper Kg/Km	Aluminum Kg/Km
50	03C050CT0XKUPTP	8.0	0.5	3.3	69.3	5865	5095
70	03C070CT0XKUPTP	8.0	0.5	3.4	74.0	6895	5785
95	03C095CT0XKUPTP	8.0	0.5	3.5	77.7	7975	6290
120	03C120CT0XKUPTP	8.0	0.8	3.7	82.5	9820	7690
150	03C150CT0XKUPTP	8.0	0.8	3.8	85.7	10910	8295
185	03C185CT0XKUPTP	8.0	0.8	3.9	89.8	12365	9075
240	03C240CT0XKUPTP	8.0	0.8	4.1	96.0	14700	10335
300	03C300CT0XKUPTP	8.0	0.8	4.2	100.3	16865	11385
400	03C400CT0XKUPTP	8.0	0.8	4.5	107.8	20110	13330
500	03C500CT0XKUPTP	8.0	0.8	4.7	116.0	24140	15130

Electrical Data

Nominal Cross sectional area	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance	Reactance
	Copper		Aluminum			
	DC at 20 °C	AC at 90 °C	DC at 20 °C	AC at 90 °C		
mm ²	Ω/Km	Ω/Km	Ω/Km	Ω/Km	µf/km	Ω/Km
50	0.387	0.4937	0.641	0.8220	0.134	0.140
70	0.268	0.3421	0.443	0.5682	0.153	0.130
95	0.193	0.2467	0.320	0.4106	0.168	0.124
120	0.153	0.1959	0.253	0.3248	0.181	0.118
150	0.124	0.1591	0.206	0.2647	0.194	0.114
185	0.0991	0.1277	0.164	0.2111	0.209	0.110
240	0.0754	0.0980	0.125	0.1614	0.233	0.105
300	0.0601	0.0791	0.100	0.1297	0.249	0.103
400	0.0470	0.0632	0.0778	0.1018	0.276	0.098
500	0.0366	0.0510	0.0605	0.0803	0.307	0.094

The above data is approximate and subjected to manufacturing tolerance
 this data is applicable also for 19/33 kV



18/30 (36) kV - Multi Core Cable – SWA

Description

Copper or Aluminum
 Circular Compacted Conductor
 SC/XLPE/SC Insulation
 Copper Tape Screen

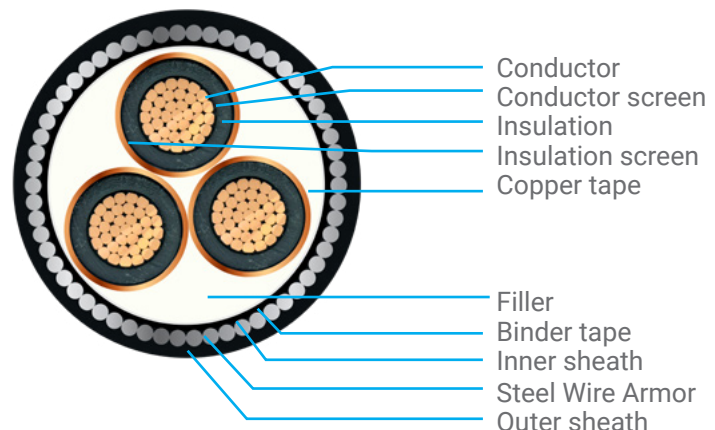
Steel Wire Armoring
 PVC Jacket
 Operating Temperature: 90°C.

Nominal Cross-sectional area	Cable code	Nominal Insulation Thickness	Steel Tape Thickness	Nominal Sheath Thickness	Approximate Overall Diameter	Approximate Weight	
						Copper Kg/Km	Aluminum Kg/Km
mm ²	N: Copper A: Aluminum	mm	mm	mm	mm		
50	03C050CT0XKUPWP	8.0	3.15	3.4	74.3	8190	7465
70	03C070CT0XKUPWP	8.0	3.15	3.5	79.0	9400	8330
95	03C095CT0XKUPWP	8.0	3.15	3.7	82.9	10655	8965
120	03C120CT0XKUPWP	8.0	3.15	3.8	86.5	11850	9710
150	03C150CT0XKUPWP	8.0	3.15	3.9	89.7	12990	10370
185	03C185CT0XKUPWP	8.0	3.15	4.0	93.8	14535	11245
240	03C240CT0XKUPWP	8.0	3.15	4.2	100.0	17040	12675
300	03C300CT0XKUPWP	8.0	3.15	4.3	104.3	19295	13815
400	03C400CT0XKUPWP	8.0	3.15	4.6	111.8	22680	15980
500	03C500CT0XKUPWP	8.0	3.15	4.8	120.0	26955	17945

Electrical Data

Nominal Cross sectional area	Maximum Conductor Resistance		Maximum Conductor Resistance		Capacitance	Reactance
	Copper		Aluminum			
	DC at 20 °C	AC at 90 °C	DC at 20 °C	AC at 90 °C		
mm ²	Ω/Km	Ω/Km	Ω/Km	Ω/Km	µf/km	Ω/Km
50	0.387	0.4937	0.641	0.8220	0.134	0.140
70	0.268	0.3421	0.443	0.5682	0.153	0.130
95	0.193	0.2467	0.320	0.4106	0.168	0.124
120	0.153	0.1959	0.253	0.3248	0.181	0.118
150	0.124	0.1591	0.206	0.2647	0.194	0.114
185	0.0991	0.1277	0.164	0.2111	0.209	0.110
240	0.0754	0.0980	0.125	0.1614	0.233	0.105
300	0.0601	0.0791	0.100	0.1297	0.249	0.103
400	0.0470	0.0632	0.0778	0.1018	0.276	0.098
500	0.0366	0.0510	0.0605	0.0803	0.307	0.094

The above data is approximate and subjected to manufacturing tolerance
 this data is applicable also for 19/33 kV



A photograph of two utility workers in safety gear (hard hats and high-visibility vests) standing near a large power line tower. The worker on the left is wearing an orange hard hat and a red and black plaid shirt under a green safety vest. The worker on the right is wearing a yellow hard hat and a purple shirt under a green safety vest. They are both looking towards the tower. The background shows a clear blue sky with power lines stretching across it. The text "Guide to Use and selection of Cables" is overlaid in white, bold font in the center of the image.

Guide to Use and selection of Cables

Guide to Use and selection of cables

The object of this part is to provide general recommendations for the selection (Taking into account the cable system), storage, transportation and installation of the cables.

Recommendations for selection of cables

According to the particular type of cables, the cables specified in this standard are designed to be buried directly in free soil or in ducts, or installed in air (indoors or outdoors).

System Categories

According to IEC 60183, three categories of voltage systems are considered:

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. This period according to IEC 60183 should not exceed 1 h. For cables covered by this standard 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 category A or B.

Current rating

If cables in accordance with this HD are exposed to localised heat, solar radiation or high temperature ambient conditions, or there is a possibility of higher soil thermal resistivity, the current carrying capacity should be reduced.

Due to the relatively high conductor temperature, there is a risk of drying of the surrounding soil causing an increase in thermal resistivity which in turn would lead to the cable temperature rising to a value higher than anticipated. For cable laid directly in the ground, a suitable de-rating factor should be applied or a lower maximum sustained conductor operating temperature should be assumed to take into account the possible effects of soil drying out.

Recommendation for cable installation

Cables may be either directly buried in earth or pulled into ducts or pipes, or installed on walls and ceiling using cable racks or trays.

The cable route, laying method, climatic conditions and service conditions (operating conditions) should, together be taken into account when selecting the type of cable.

Installation of the cable should be done by authorized and skilled contractors only. All national regulations should be taken into account.

The pulling force should be continuously monitored during the pull-in procedure and should not exceed the permissible values.

Guide to Use and selection of cables

Bending radii during installation

a) Permissible bending radii should take account of:

Type of cable (single-core or three core cables or preassembled cables)

Presence of either lead sheath or a longitudinal applied metallic foil

b) Reduction of permissible bending radii may be considered, provided that the following are all applicable:

the cable is at a temperature of not less than 30°C or heated up to 30°C;

- the cable is bent by means of preformed rollers

Prevention of moisture ingress

Care should be exercised during installation to avoid any damage to cable coverings. The protective cap should not be removed from the ends of the cable until immediately prior to termination or jointing. When the caps have been removed the unprotected ends of the cable should not be exposed to moisture

Installation in ducts/pipes

a) Inner diameter of ducts and pipes should be large enough to allow for free movement and replacement of the cables

b) To protect the pipes against mechanical shock, it is recommended to use sand bedding.

Pulling force

Cables may be pulled either into ducts or direct into earth by using appropriate pulling devices ensuring that the pulling force is evenly distributed on the cable conductors.

Pulling head the maximum pulling force should be:

$$P = S A \text{ (N)}$$

where S is the cross-sectional area of the conductors, in mm², and A is the permissible tensile stress of the conductors, in N/mm²

a) Pulling grip via conductor

The pulling force, recommended for the pulling head, may be applied for the pulling grip.

b) Pulling grip via over sheath

The pulling force can also be applied by a frictional device acting on the over sheath. In this case, the maximum pulling force should be:

$$P = 3D^2 \text{ (N)}$$

where D is the outer cable diameter in millimeters. The pulling force should not be higher than the value calculated with cross section of the conductors.

The image shows an industrial facility with various pieces of machinery. In the foreground, there are large white electrical cabinets with ventilation grilles. One cabinet has a yellow warning triangle symbol. To the left, there is a blue machine with a vertical stainless steel column. The background shows more industrial equipment and structural elements of the building. The entire image is overlaid with a semi-transparent blue filter.

CURRENT CARRYING CAPACITY

Current Rating

Current Ratings:

Cable current carrying capacity is defined as the continuous maximum current that cable can carry at its maximum operating temperature.

The values given in the tables are valid for one circuit on three phase system under below basic assumptions and conditions of installation:

For grouping cables de-rating factors must be used

-Ambient air temperature (shaded)	30°C
-Ground temperature	20°C
-Thermal resistivity of soil	1°C.m/W
-Depth of laying	0.5 m
-Maximum conductor temperature	90°C
-Screens bonded	both ends
-Drying out of the soil	ignored

To obtain the maximum current carrying capacity of a cable operating at different conditions from the standards, you have to multiply the value of current given in the technical information for the corresponding cable by de-rating factors mentioned in the tables from 1 to 6 as follows:

$I_a = K_t I_s$ in amperes

I_a : Current rating at actual operating conditions (amperes)

I_s : Current rating at standard operating conditions, from tables (amperes)

K_t : De-rating factors given in the tables 1 to 6

It has to be noted that K_t is the total de-rating factors $K_t = K_1 * K_2 * \dots * K_n$.





Frequency

Values in this catalogue are based on 50 HZ frequency






3.6/6 (7.2) KV

Single core Unarmored Cables with CU Or AL Conductor

CU/XLPE/PVC

Nominal Cross sectional area	Current Rating				
	Laid in ground			Laid in free air (Shaded)	
	Flat 	Trefoil 	Duct 	Flat Touched 	Trefoil Touched 
mm ²	A	A	A	A	A
35	201	207	149	184	189
50	238	245	179	223	229
70	292	292	228	282	290
95	348	347	270	343	350
120	395	394	310	395	405
150	443	441	351	451	462
185	501	498	400	520	532
240	580	575	468	618	630
300	654	646	546	714	726
400	742	727	619	827	838
500	837	815	709	960	965
630	934	904	804	1098	1098
800	1032	988	902	1232	1232

AL/XLPE/PVC

Nominal Cross sectional area	Current Rating				
	Laid in ground			Laid in free air (Shaded)	
	Flat 	Trefoil 	Duct 	Flat Touched 	Trefoil Touched 
mm ²	A	A	A	A	A
35	156	160	118	114	152
50	185	190	142	174	182
70	222	230	175	223	229
95	269	278	210	270	274
120	309	317	243	310	320
150	340	348	274	352	360
185	390	393	312	410	420
240	452	454	375	484	495
300	513	509	423	560	571
400	587	577	490	655	665
500	671	660	570	769	779
630	762	770	655	895	900
800	858	885	749	1032	1032

3.6/6 (7.2) KV

Multi core Unarmored Cables with CU Or AL Conductor

CU/XLPE/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	197	146	179
50	233	175	217
70	286	216	271
95	342	260	331
120	390	296	383
150	438	337	437
185	495	384	503
240	574	450	596
300	655	519	703
400	731	587	792
500	824	670	914

AL/XLPE/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	155	115	143
50	184	137	173
70	225	170	217
95	269	204	264
120	307	235	306
150	344	265	348
185	391	303	402
240	449	352	466
300	508	403	539
400	582	467	631
500	673	547	753

3.6/6 (7.2) KV

Multi core Armored Cables with CU Or AL Conductor

CU/XLPE/STA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	188	146	177
50	223	174	212
70	273	216	265
95	325	258	319
120	368	294	365
150	412	331	414
185	465	375	473
240	535	433	553
300	599	490	630
400	674	560	721
500	754	634	822

AL/XLPE/STA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	146	113	137
50	173	135	165
70	212	167	205
95	253	201	248
120	287	229	285
150	322	258	323
185	365	294	371
240	421	342	435
300	475	389	498
400	541	450	578
500	615	518	670

3.6/6 (7.2) KV

Multi core Armored Cables with CU Or AL Conductor

CU/XLPE/SWA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	190	149	180
50	225	177	216
70	275	219	269
95	327	260	324
120	370	298	370
150	414	333	419
185	467	378	478
240	535	438	561
300	596	493	635
400	663	553	717
500	734	620	808






AL/XLPE/SWA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	147	115	140
50	174	137	168
70	213	169	208
95	255	202	252
120	289	232	289
150	323	260	327
185	366	297	375
240	423	347	443
300	475	393	504
400	537	448	578
500	605	511	665






6/10 (12) KV

Single core Unarmored Cables with CU Or AL Conductor

CU/XLPE/PVC

Nominal Cross sectional area	Current Rating				
	Laid in ground			Laid in free air (Shaded)	
	Flat 	Trefoil 	Duct 	Flat Touched 	Trefoil Touched 
mm ²	A	A	A	A	A
35	201	207	152	189	193
50	238	245	183	227	233
70	292	292	227	287	295
95	347	347	272	347	356
120	395	394	314	401	412
150	443	441	355	457	466
185	501	498	412	526	536
240	580	575	476	625	634
300	654	646	544	721	729
400	741	727	621	830	840
500	837	815	709	961	966
630	936	904	806	1101	1098
800	1033	988	903	1248	1234

AL/XLPE/PVC

Nominal Cross sectional area	Current Rating				
	Laid in ground			Laid in free air (Shaded)	
	Flat 	Trefoil 	Duct 	Flat Touched 	Trefoil Touched 
mm ²	A	A	A	A	A
35	156	160	119	145	153
50	185	189	142	176	184
70	226	225	177	225	231
95	271	278	212	273	276
120	308	317	244	316	324
150	346	350	276	354	365
185	393	395	315	414	426
240	456	455	377	487	497
300	513	511	424	563	575
400	587	579	492	657	669
500	671	661	572	771	782
630	762	770	657	896	904
800	858	885	750	1036	1037

6/10 (12) KV

Multi core Unarmored Cables with CU Or AL Conductor

CU/XLPE/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	197	148	182
50	233	177	220
70	286	219	275
95	343	263	336
120	390	302	388
150	438	341	442
185	496	388	508
240	575	454	601
300	655	523	706
400	732	590	794
500	825	672	916

AL/XLPE/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	152	115	141
50	181	137	171
70	222	170	214
95	266	204	260
120	303	234	301
150	340	265	343
185	386	303	396
240	449	355	470
300	509	406	542
400	582	469	633
500	673	548	754

6/10 (12) KV

Multi core Armored Cables with CU Or AL Conductor

CU/XLPE/STA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	189	148	179
50	222	176	214
70	272	217	266
95	325	260	321
120	369	297	368
150	413	332	417
185	464	377	475
240	535	436	556
300	598	493	632
400	675	561	724
500	754	634	822

AL/XLPE/STA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	146	115	139
50	173	136	166
70	211	169	206
95	253	202	249
120	288	231	287
150	322	259	326
185	364	296	372
240	421	344	437
300	474	391	499
400	542	451	580
500	615	518	670

6/10 (12) KV

Multi core Armored Cables with CU Or AL Conductor

CU/XLPE/SWA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	190	150	182
50	224	178	217
70	275	221	271
95	327	264	326
120	370	299	373
150	415	336	423
185	466	381	480
240	534	440	561
300	595	495	635
400	663	556	718
500	733	619	808






AL/XLPE/SWA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	147	117	141
50	174	138	169
70	213	170	209
95	254	205	253
120	289	233	291
150	324	262	330
185	365	299	376
240	422	348	443
300	474	394	504
400	536	450	579
500	605	511	664






8.7/15 (17.5) KV

Single core Unarmored Cables with CU Or AL Conductor

CU/XLPE/PVC

Nominal Cross sectional area	Current Rating				
	Laid in ground			Laid in free air (Shaded)	
	Flat 	Trefoil 	Duct 	Flat Touched 	Trefoil Touched 
mm ²	A	A	A	A	A
35	201	207	152	189	193
50	238	245	183	227	234
70	292	295	227	287	295
95	347	351	272	347	356
120	395	398	314	403	412
150	443	445	355	458	466
185	501	502	412	527	536
240	580	578	478	626	634
300	658	648	547	723	731
400	746	726	623	830	841
500	840	817	711	962	968
630	940	906	806	1102	1098
800	1035	988	903	1248	1234

AL/XLPE/PVC

Nominal Cross sectional area	Current Rating				
	Laid in ground			Laid in free air (Shaded)	
	Flat 	Trefoil 	Duct 	Flat Touched 	Trefoil Touched 
mm ²	A	A	A	A	A
35	158	160	119	145	153
50	188	189	146	179	184
70	228	229	181	225	231
95	275	278	216	273	280
120	312	320	249	316	324
150	350	354	280	359	369
185	396	398	319	414	426
240	460	459	377	491	505
300	517	515	429	566	580
400	591	584	497	661	675
500	675	667	575	773	790
630	768	778	660	901	912
800	863	890	760	1042	1042

8.7/15 (17.5) KV

Multi core Unarmored Cables with CU Or AL Conductor

CU/XLPE/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	197	152	187
50	234	181	225
70	286	223	281
95	343	268	341
120	390	307	394
150	438	346	448
185	496	394	514
240	575	461	608
300	657	530	712
400	734	598	802
500	829	682	924

AL/XLPE/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	153	118	145
50	181	140	174
70	222	173	218
95	266	208	265
120	303	238	306
150	340	269	348
185	386	307	401
240	449	360	474
300	509	411	547
400	583	475	637
500	673	554	757

8.7/15 (17.5) KV

Multi core Armored Cables with CU Or AL Conductor

CU/XLPE/STA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	189	151	182
50	223	179	217
70	274	221	271
95	325	263	325
120	368	300	372
150	412	337	421
185	464	381	479
240	534	442	559
300	602	502	640
400	676	568	729
500	755	639	827

AL/XLPE/STA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	146	117	141
50	173	139	168
70	212	171	209
95	253	205	253
120	287	234	290
150	322	263	328
185	364	229	375
240	421	348	440
300	476	397	504
400	542	455	582
500	615	521	673

8.7/15 (17.5) KV

Multi core Armored Cables with CU Or AL Conductor

CU/XLPE/SWA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	190	153	185
50	224	182	220
70	275	223	275
95	327	266	329
120	370	303	376
150	415	342	428
185	464	385	484
240	533	445	564
300	594	498	638
400	663	559	721
500	734	625	812






AL/XLPE/SWA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	147	119	143
50	174	141	171
70	213	173	212
95	254	207	256
120	289	236	293
150	324	267	334
185	365	303	380
240	421	350	445
300	473	397	506
400	536	452	580
500	604	516	666






12/20 (24) KV

Single core Unarmored Cables with CU Or AL Conductor

CU/XLPE/PVC

Nominal Cross sectional area	Current Rating				
	Laid in ground			Laid in free air (Shaded)	
	Flat 	Trefoil 	Duct 	Flat Touched 	Trefoil Touched 
mm ²	A	A	A	A	A
35	201	207	152	189	193
50	238	245	183	227	234
70	292	297	227	287	295
95	347	353	275	347	360
120	397	402	318	403	416
150	443	448	358	460	468
185	501	505	416	523	540
240	580	579	481	630	638
300	662	650	550	725	736
400	750	729	625	832	841
500	844	819	711	962	971
630	945	906	807	1104	1099
800	1035	988	904	1248	1238

AL/XLPE/PVC

Nominal Cross sectional area	Current Rating				
	Laid in ground			Laid in free air (Shaded)	
	Flat 	Trefoil 	Duct 	Flat Touched 	Trefoil Touched 
mm ²	A	A	A	A	A
35	158	160	123	149	153
50	188	189	148	185	188
70	228	232	181	229	235
95	275	278	222	277	284
120	312	320	254	320	328
150	350	354	286	363	372
185	396	405	322	417	428
240	460	465	381	495	509
300	517	520	435	570	586
400	591	600	505	665	680
500	675	675	580	779	798
630	768	790	675	905	920
800	863	894	766	1049	1060

12/20 (24) KV

Multi core Unarmored Cables with CU Or AL Conductor

CU/XLPE/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	200	156	194
50	234	184	229
70	287	226	285
95	343	272	346
120	391	311	398
150	439	351	453
185	496	399	518
240	576	466	613
300	657	536	716
400	736	605	808
500	832	690	931

AL/XLPE/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	155	121	151
50	181	142	177
70	223	176	221
95	266	211	268
120	304	242	310
150	341	272	351
185	386	311	404
240	450	364	478
300	509	415	550
400	584	479	641
500	674	558	760

12/20 (24) KV

Multi core Armored Cables with CU Or AL Conductor

CU/XLPE/STA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	189	153	184
50	223	181	220
70	274	224	274
95	325	267	328
120	368	303	374
150	413	340	424
185	464	385	481
240	537	449	565
300	602	508	643
400	676	571	730
500	756	646	831

AL/XLPE/STA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	146	118	143
50	173	141	171
70	212	173	212
95	253	208	255
120	287	237	292
150	322	265	330
185	364	302	377
240	422	353	444
300	476	400	507
400	541	458	583
500	615	525	674

12/20 (24) KV

Multi core Armored Cables with CU Or AL Conductor

CU/XLPE/SWA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	190	155	186
50	225	183	223
70	275	226	277
95	326	268	331
120	370	307	380
150	413	344	429
185	464	387	486
240	532	447	565
300	593	502	639
400	661	563	721
500	734	628	814






AL/XLPE/SWA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
35	147	120	144
50	174	142	173
70	213	175	214
95	254	209	258
120	289	240	297
150	323	269	335
185	365	304	381
240	421	354	446
300	473	400	507
400	534	455	581
500	604	517	667

18/30 (36) KV

Single core Unarmored Cables with CU Or AL Conductor

CU/XLPE/PVC

Nominal Cross sectional area	Current Rating				
	Laid in ground			Laid in free air (Shaded)	
	Flat 	Trefoil 	Duct 	Flat Touched 	Trefoil Touched 
mm ²	A	A	A	A	A
50	238	245	183	227	238
70	292	297	230	290	295
95	347	356	279	351	364
120	397	404	322	407	420
150	447	451	362	464	471
185	505	509	420	527	544
240	585	583	485	633	641
300	666	654	554	729	740
400	754	731	629	834	845
500	848	821	713	965	973
630	949	908	810	1106	1099
800	1039	990	908	1251	1238

AL/XLPE/PVC

Nominal Cross sectional area	Current Rating				
	Laid in ground			Laid in free air (Shaded)	
	Flat 	Trefoil 	Duct 	Flat Touched 	Trefoil Touched 
mm ²	A	A	A	A	A
50	188	189	152	185	193
70	228	232	189	232	239
95	279	278	222	282	288
120	316	320	259	324	332
150	354	354	290	367	379
185	400	405	322	425	433
240	460	468	386	499	513
300	517	526	440	575	590
400	591	605	510	672	685
500	679	684	587	786	803
630	772	794	680	909	933
800	870	899	772	1053	1075

18/30 (36) KV

Multi core Unarmored Cables with CU Or AL Conductor

CU/XLPE/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
50	236	191	239
70	287	233	292
95	344	280	353
120	391	319	406
150	439	360	461
185	497	409	527
240	577	477	621
300	657	547	722
400	738	619	817
500	836	706	941

AL/XLPE/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
50	183	148	185
70	223	181	226
95	266	217	274
120	304	248	316
150	341	279	357
185	387	318	411
240	450	372	484
300	509	424	556
400	584	489	647
500	674	568	764

18/30 (36) KV

Multi core Armored Cables with CU Or AL Conductor

CU/XLPE/STA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
50	223	186	224
70	273	229	277
95	325	273	333
120	369	310	381
150	414	349	431
185	465	395	489
240	536	456	570
300	602	515	647
400	676	582	736
500	757	655	836

AL/XLPE/STA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
50	173	145	174
70	212	177	215
95	253	212	259
120	288	242	297
150	322	272	335
185	364	310	382
240	421	359	447
300	475	407	509
400	541	466	586
500	615	532	676

18/30 (36) KV

Multi core Armored Cables with CU Or AL Conductor

CU/XLPE/SWA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
50	225	189	227
70	275	232	281
95	326	276	336
120	369	311	383
150	412	349	432
185	462	394	489
240	529	452	567
300	591	508	641
400	660	569	724
500	732	635	817

AL/XLPE/SWA/PVC

Nominal Cross sectional area	Current Rating		
	Gound	Duct	Laid in free air (Shaded)
mm ²	A	A	A
50	175	147	176
70	213	179	218
95	254	215	262
120	288	244	299
150	322	273	337
185	363	310	384
240	419	358	447
300	471	404	508
400	533	460	582
500	602	522	668

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