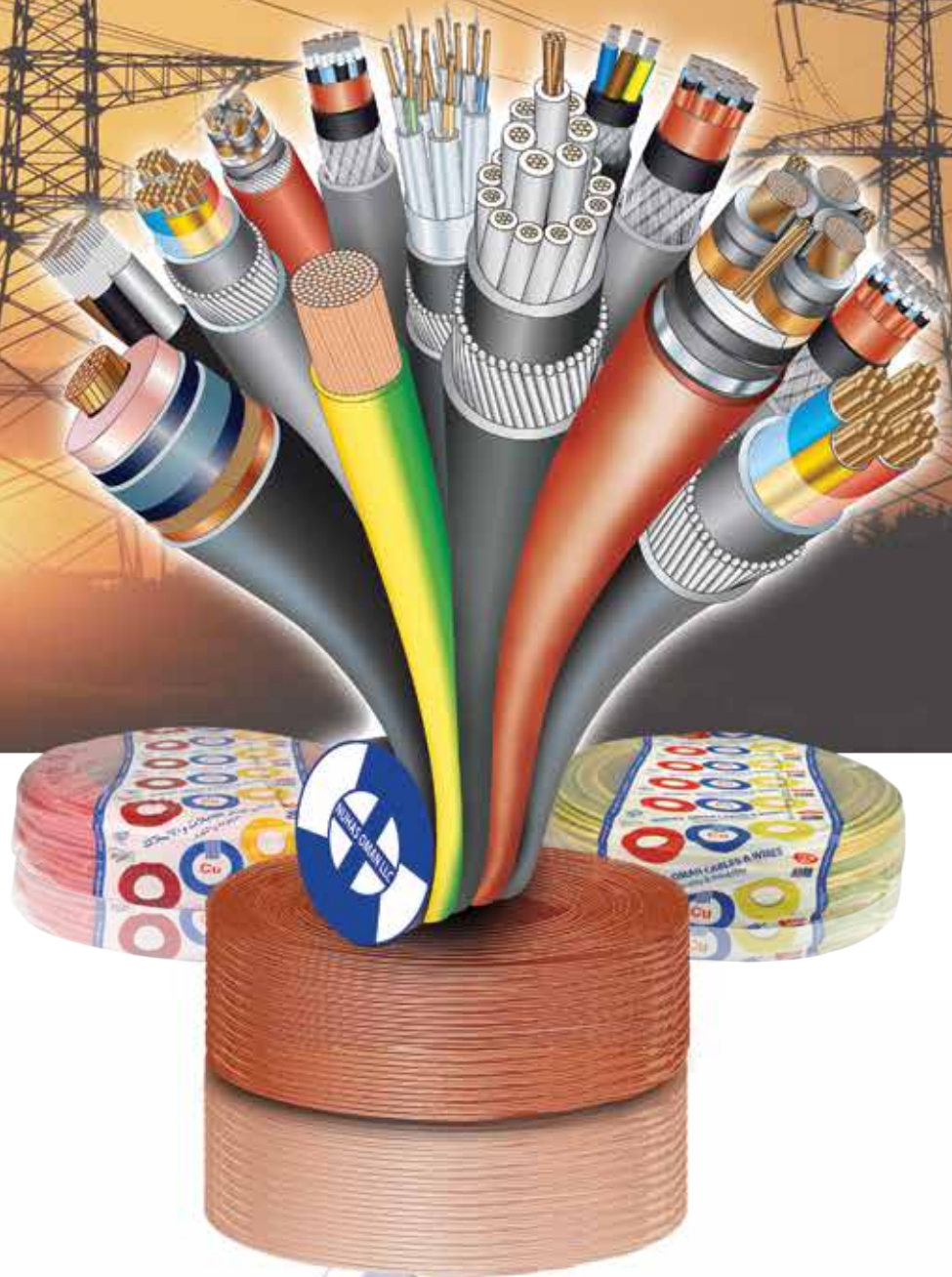


MEDIUM VOLTAGE CABLES ALUMINIUM CONDUCTOR



NUHAS OMAN
CABLES & WIRES

QUALITY & RELIABILITY



NUHAS OMAN - SPECIALITY WIRES & CABLES



شركة نحاس عمان - للأسلاك والكابلات المتخصصة

MEDIUM VOLTAGE CABLES

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COMPANY PROFILE

Nuhas Oman LLC, a member of the Al-Bahja Group of Companies, is an ISO 9001:2015 BASEC, UK certified integrated quality producer of LV and MV Cables, Wires & Conductors and Oxygen Free High Conductivity Continuous Cast Copper Rods in the Sultanate of Oman.

Nuhas is also certified to ISO 14001:2015 and ISO 45001:2018 by Bureau Veritas, Oman for HSE management system.

Our current capabilities are:

1. World-class Speciality Insulated Wires and Cables manufactured in state of art facility.
2. Oxygen Free High Conductivity Continuous Copper rod produced by UPCAST® System.
3. Nuhas Oman offers wide range of Cables :
 - Medium Voltage cables (Copper & Aluminium Conductor) up to 33 kV
 - Low Voltage cables
 - Power & Control Cables (Copper & Aluminium Conductor)
 - Instrumentation Cables
 - Flexible cords and Building wires
 - LPCB approved Fire Resistant Cables
 - LPCB approved Fire Alarm Cables
 - Offshore & Shipboard Cables
 - Multi layer sheathed chemical resistant Cables
 - Rubber Flexible Cables
 - Photovoltaic (Solar) Cables

Our product range meet the requirements of a broad spectrum of applications including - Industrial, Power & Control, Petrochemical, Oil & Gas, Ship Building and Offshore Platforms, Building & Construction, Hospitals, Hotels, Entertainment & Security etc. Nuhas Oman Cables are type test approved by BSI,U.K; KEMA,Netherlands; DEKRA,VDE,UL,LPCB & DNV-GL complying with relevant international BS & IEC Specifications. Our Cables are approved by various utilities, large corporates and global consultants such as Distribution Code Review Panel (DCRP),Oman; NAMA Holding (Mazoon,MEDC,Majan,Tanweer,DPC), Ministry of Electricity & Water,JSRS, Petroleum Development Oman (PDO), Oman Oil Refineries Petroleum Industries Company (ORPIC),Duqm Refinery, Daleel Petroleum,Oman Oil Company,Oman LNG, Oman Gas Company, Ministry of Transport, Ministry of Communications, Ministry of Defence, Royal Oman Police (ROP), Royal Court Affairs (RCA), Ministry of Health, Special Economic Zone Authority Duqm (SEZAD), Muscat Municipality, Occidental (Oxy), BP, Shell, Petrofac, Atkins, Parsons, Worley Parsons, SSH, Khatib and Alami, Mott MacDonald, Renardet etc.

Abu Dhabi Water & Electricity Authority (ADWEA), Abu Dhabi National Oil Company (ADNOC), Qatar General Electricity & Water Authority (Kahramaa), Qatar Civil Defense, Kuwait National Petroleum Company (KNPC), Electricity Distribution Directorate, Kingdom of Bahrain, Ministry of Electricity & Water authority,Kuwait; Saudi Electricity Company, KEO International, Arab Engineering Bureau, COWI etc.

New product development is a continuing activity at Nuhas Oman.

Nuhas is the first producer in the Middle East to have been certified by DNV-GL,Norway capable of manufacturing power, control and instrumentation cables for shipboard,high speed/light craft and off-shore applications. Nuhas Oman manufactures FRC 500 Fire Resistant LV cables and FRC 300 Fire Alarm screened cables which are type approved by LPCB, UK. Nuhas Oman also offers Power, Control & Instrumentation Cables with multilayer (AL-HDPE-PA) sheath as an alternative to Lead sheathed cables for better chemical protection mainly used in Petrochemical industry.

Nuhas is committed to deliver quality products that conform to relevant International standards. Our quality cycle commences from the time of sourcing of raw materials and consumables, in-process production controls and certification of finished goods prior to delivery. A well-equipped in-house quality assurance facility ensures that all products delivered meet stringent quality controls and parameters. Our state-of-the-art laboratory is equipped for testing as per required standards as well as individual customer specifications.

Our production and quality management systems are manned by a team of experienced professionals backed with relevant industry experience. Nuhas Oman is committed to excellence in the management of health, safety, environment and labor practices. We are committed to promoting and protecting the welfare of our employees through "Safety First" work practices and providing a healthy workplace. Nuhas Oman also ensures compliance with the laws and regulations of the land. Nuhas Oman endeavors to be a responsible corporate citizen and fulfills its responsibilities through its Corporate Social Responsibility initiatives. Our global client base extending from Far East Asia, Indian sub-continent, the GCC, Africa to Europe is testimony to customer confidence and satisfaction. The company is committed to meet the challenges of the Domestic & Global markets for supply of world class Cables & Wires, while maintaining the sanctity of our pristine environment.


Table 1
Technical Data
**IEC 60502-2
3.6/6 (7.2) kV**
**Single Core, Aluminium Conductor, XLPE Insulated,
Aluminium Round Wire Armoured Cable**

	50	70	95	120	150	185	240	300	400	500	630	800	1000
Nominal Cross-sectional Area of Conductor	mm ²	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6	23.3	26.3	30.0	34.1
Conductor Diameter (approx)	mm	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.0	3.2	3.2	3.2
Nominal Insulation Thickness	mm	1.6	1.6	1.6	1.6	1.6	2.0	2.0	2.0	2.0	2.5	2.5	2.5
Nominal Armour Wire Diameter	mm	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.2	2.3	2.5	2.6	2.7
Nominal Outer Sheath Thickness	mm	24.0	26.0	28.0	29.0	31.0	33.0	36.0	39.0	42.0	47.0	51.0	55.0
Overall Diameter (approx)	mm	710	820	960	1080	1230	1450	1720	2010	2440	3070	3640	4320
Weight of Cable (approx)	kg/km	500	500	500	500	500	500	500	500	500	500	500	500
Standard Packing Length (± 5%)	m	0.36	0.39	0.42	0.44	0.47	0.50	0.54	0.59	0.63	0.71	0.77	0.83
Minimum Bending Radius during installation	m	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	0.0605	0.0469	0.0367
DC resistance at 20°C (max)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990	0.0770	0.0600	0.0470
AC resistance at 90°C (approx)	Ω/km	0.121	0.115	0.109	0.105	0.102	0.099	0.096	0.094	0.092	0.089	0.086	0.083
Reactance at 50 Hz (approx)	Ω/km	0.827	0.577	0.422	0.340	0.282	0.231	0.187	0.159	0.135	0.118	0.105	0.095
Impedance at 50 Hz (approx)	μF/km	0.34	0.38	0.43	0.47	0.51	0.56	0.61	0.62	0.65	0.69	0.78	0.87
Capacitance at 50 Hz	A/km	0.38	0.43	0.49	0.53	0.58	0.63	0.69	0.70	0.74	0.78	0.88	0.99
Charging Current/phase at U ₀ =3.6 kV, 50 Hz (approx)													
Continuous Current Rating at cond temp. 90°C max													
1. Laid direct in ground	A	150	182	217	246	274	309	355	397	448	494	549	601
2. Laid into ducts	A	142	175	207	235	262	297	342	383	434	482	537	592
3. Laid in air in trefoil touching	A	182	226	275	317	360	413	485	552	638	724	824	927
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6	47.0	59.2	75.2

Assumptions:
1. Ground temperature: 20°C
2. Air temperature: 30°C
3. Thermal resistivity of soil: 1.5 K.m/W
4. Depth of laying: 0.8 m

5. For any other condition(s) please refer to the appropriate table for recommended installation data.

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Table 2
Technical Data
**IEC 60502-2
6/10 (12) kV**
**Single Core, Aluminium Conductor, XLPE Insulated,
Aluminium Round Wire Armoured Cable**

		50	70	95	120	150	185	240	300	400	500	630	800	1000
Nominal Cross-sectional Area of Conductor	mm ²	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6	23.3	26.3	30.0	34.1	38.2
Conductor Diameter (approx)	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
Nominal Insulation Thickness	mm	1.6	1.6	1.6	1.6	2.0	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5
Nominal Armour Wire Diameter	mm	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
Overall Diameter (approx)	mm	26.0	28.0	29.0	31.0	34.0	35.0	38.0	40.0	43.0	47.0	51.0	56.0	60.0
Weight of Cable (approx)	kg/km	800	930	1060	1200	1430	1580	1850	2090	2520	3100	3670	4350	5180
Standard Packing Length (± 5%)	m	500	500	500	500	500	500	500	500	500	500	500	400	300
Minimum Bending Radius during installation	m	0.39	0.42	0.44	0.47	0.51	0.53	0.57	0.60	0.65	0.71	0.77	0.84	0.90
DC resistance at 20°C (max)	Ω/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
AC resistance at 90°C (approx)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990	0.0770	0.0600	0.0470	0.0370
Reactance at 50 Hz (approx)	Ω/km	0.127	0.120	0.114	0.109	0.106	0.103	0.099	0.096	0.093	0.090	0.087	0.084	0.081
Impedance at 50 Hz (approx)	Ω/km	0.828	0.578	0.424	0.341	0.284	0.233	0.188	0.160	0.136	0.118	0.106	0.096	0.089
Capacitance at 50 Hz	µF/km	0.26	0.30	0.33	0.36	0.39	0.43	0.48	0.52	0.58	0.66	0.74	0.83	0.92
Charging Current/phase at U ₀ =6 kV, 50 Hz (approx)	A/km	0.49	0.57	0.62	0.68	0.74	0.81	0.90	0.98	1.09	1.24	1.40	1.56	1.73
Continuous Current Rating at cond temp. 90°C max														
1. Laid direct in ground	A	150	182	217	246	274	309	355	397	448	494	549	601	648
2. Laid into ducts	A	142	175	207	235	262	297	342	383	434	482	537	592	639
3. Laid in air in trefoil touching	A	182	226	275	317	360	413	485	552	638	724	824	927	1020
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6	47.0	59.2	75.2	94.0

1. Ground temperature: 20°C

2. Air temperature: 30°C

3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m

5. For any other condition(s) please refer to the appropriate table for recommended installation data.

Assumptions:

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Table 3
Technical Data
**IEC 60502-2
8.7/15 (17.5) kV**
**Single Core, Aluminium Conductor, XLPE Insulated,
Aluminium Round Wire Armoured Cable**

	50	70	95	120	150	185	240	300	400	500	630	800	1000
Nominal Cross-sectional Area of Conductor	mm ²	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6	23.3	26.3	30.0	34.1
Conductor Diameter (approx)	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
Nominal Insulation Thickness	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
Nominal Armour Wire Diameter	mm	1.9	1.9	2.0	2.1	2.1	2.2	2.3	2.3	2.5	2.6	2.7	2.8
Nominal Outer Sheath Thickness	mm	28.0	30.0	33.0	34.0	36.0	38.0	40.0	42.0	47.0	50.0	54.0	58.0
Overall Diameter (approx)	mm	940	1070	1300	1450	1600	1780	2060	2310	2910	3350	3950	4680
Weight of Cable (approx)	kg/km	500	500	500	500	500	500	500	500	500	500	500	500
Standard Packing Length (± 5%)	m	0.42	0.45	0.50	0.51	0.54	0.57	0.60	0.63	0.71	0.75	0.81	0.87
Minimum Bending Radius during installation	m	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	0.0605	0.0469	0.0367
DC resistance at 20°C (max)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990	0.0770	0.0600	0.0470
AC resistance at 90°C (approx)	Ω/km	0.132	0.125	0.119	0.114	0.111	0.107	0.103	0.100	0.097	0.093	0.090	0.087
Reactance at 50 Hz (approx)	Ω/km	0.829	0.579	0.425	0.343	0.285	0.235	0.190	0.162	0.139	0.121	0.108	0.099
Impedance at 50 Hz (approx)	Ω/km	0.21	0.24	0.27	0.29	0.31	0.34	0.38	0.41	0.46	0.51	0.57	0.64
Capacitance at 50 Hz	µF/km	0.57	0.66	0.74	0.79	0.85	0.93	1.04	1.12	1.26	1.39	1.56	1.75
Charging Current/phase at U ₀ =8.7 kV, 50 Hz (approx)	A/km												
Continuous Current Rating at cond temp. 90°C max													
1. Laid direct in ground	A	150	182	217	246	274	309	355	397	448	494	549	601
2. Laid into ducts	A	142	175	207	235	262	297	342	383	434	482	537	592
3. Laid in air in trefoil touching	A	182	226	275	317	360	413	485	552	638	724	824	927
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6	47.0	59.2	75.2

1. Ground temperature: 20°C

2. Air temperature: 30°C

3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m

5. For any other condition(s) please refer to the appropriate table for recommended installation data.

Assumptions:

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Table 4
Technical Data
**IEC 60502-2
12/20 (24) kV**
**Single Core, Aluminium Conductor, XLPE Insulated,
Aluminium Round Wire Armoured Cable**

	mm ²	50	70	95	120	150	185	240	300	400	500	630	800	1000
Nominal Cross-sectional Area of Conductor														
Conductor Diameter (approx)	mm	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6	23.3	26.3	30.0	34.1	38.2
Nominal Insulation Thickness	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
Nominal Armour Wire Diameter	mm	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
Nominal Outer Sheath Thickness	mm	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
Overall Diameter (approx)	mm	31.0	33.0	35.0	37.0	39.0	40.0	43.0	46.0	49.0	52.0	56.0	61.0	65.0
Weight of Cable (approx)	kg/km	1070	1270	1440	1580	1750	1920	2210	2650	3090	3560	4180	4930	5740
Standard Packing Length (± 5%)	m	500	500	500	500	500	500	500	500	500	500	500	400	300
Minimum Bending Radius during installation	m	0.47	0.50	0.53	0.56	0.59	0.60	0.65	0.69	0.74	0.78	0.84	0.92	0.98
DC resistance at 20°C (max)	Ω/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
AC resistance at 90°C (approx)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990	0.0770	0.0600	0.0470	0.0370
Reactance at 50 Hz (approx)	Ω/km	0.137	0.130	0.123	0.118	0.115	0.111	0.106	0.103	0.100	0.096	0.092	0.088	0.084
Impedance at 50 Hz (approx)	Ω/km	0.829	0.580	0.426	0.344	0.287	0.237	0.192	0.164	0.140	0.123	0.110	0.100	0.092
Capacitance at 50 Hz	µF/km	0.18	0.21	0.23	0.25	0.27	0.29	0.32	0.35	0.39	0.43	0.48	0.54	0.59
Charging Current/phase at U ₀ =12 kV, 50 Hz (approx)	A/km	0.68	0.79	0.87	0.94	1.02	1.09	1.21	1.32	1.47	1.62	1.81	2.02	2.23
Continuous Current Rating at cond temp. 90°C max														
1. Laid direct in ground	A	150	182	217	246	274	309	355	397	448	494	549	601	648
2. Laid into ducts	A	142	175	207	235	262	297	342	383	434	482	537	592	639
3. Laid in air in trefoil touching	A	182	226	275	317	360	413	485	552	638	724	824	927	1020
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6	47.0	59.2	75.2	94.0

1. Ground temperature: 20°C

2. Air temperature: 30°C

3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m

5. For any other condition(s) please refer to the appropriate table for recommended installation data.

Assumptions:

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Table 5
Technical Data
**IEC 60502-2
18/30 (36) kV**
**Single Core, Aluminium Conductor, XLPE Insulated,
Aluminium Round Wire Armoured Cable**

	mm ²	50	70	95	120	150	185	240	300	400	500	630	800	1000
Nominal Cross-sectional Area of Conductor		8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6	23.3	26.3	30.0	34.1	38.2
Conductor Diameter (approx)	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
Nominal Insulation Thickness	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
Nominal Armour Wire Diameter	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
Nominal Outer Sheath Thickness	mm	37.0	39.0	41.0	42.0	45.0	47.0	49.0	52.0	55.0	58.0	62.0	66.0	71.0
Overall Diameter (approx)	mm	1530	1680	1870	2020	2360	2570	2870	3180	3660	4190	4820	5610	6490
Weight of Cable (approx)	kg/km	500	500	500	500	500	500	500	500	500	500	500	400	300
Standard Packing Length (± 5%)	m	0.56	0.59	0.62	0.63	0.68	0.71	0.74	0.78	0.83	0.87	0.93	0.99	1.07
Minimum Bending Radius during installation	m	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
DC resistance at 20°C (max)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990	0.0770	0.0600	0.0470	0.0370
AC resistance at 90°C (approx)	Ω/km	0.137	0.143	0.136	0.130	0.127	0.122	0.117	0.113	0.109	0.104	0.100	0.096	0.092
Reactance at 50 Hz (approx)	Ω/km	0.829	0.583	0.430	0.348	0.292	0.242	0.198	0.171	0.147	0.129	0.117	0.107	0.099
Impedance at 50 Hz (approx)	Ω/km	0.18	0.16	0.18	0.19	0.20	0.22	0.24	0.26	0.29	0.32	0.35	0.39	0.43
Capacitance at 50 Hz	µF/km	1.02	0.90	1.02	1.07	1.13	1.24	1.36	1.47	1.64	1.81	1.98	2.21	2.42
Charging Current/phase at U ₀ =18 kV, 50 Hz (approx)	A/km													
Continuous Current Rating at cond temp. 90°C max														
1. Laid direct in ground	A	150	182	217	246	274	309	355	397	448	494	549	601	648
2. Laid into ducts	A	142	175	207	235	262	297	342	383	434	482	537	592	639
3. Laid in air in trefoil touching	A	182	226	275	317	360	413	485	552	638	724	824	927	1020
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6	47.0	59.2	75.2	94.0

1. Ground temperature: 20°C

2. Air temperature: 30°C

3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m

5. For any other condition(s) please refer to the appropriate table for recommended installation data.

Assumptions:

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Table 6
Technical Data
**IEC 60502-2
3.6/6 (7.2) kV**
Single Core, Aluminium Conductor, XLPE Insulated, Un-Armoured Cable

		50	70	95	120	150	185	240	300	400	500	630	800	1000
Nominal Cross-sectional Area of Conductor	mm ²	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6	23.3	26.3	30.0	34.1	38.2
Conductor Diameter (approx)	mm	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
Nominal Insulation Thickness	mm	1.8	1.8	1.8	1.8	1.8	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.6
Nominal Outer Sheath Thickness	mm	19.0	21.0	23.0	24.0	26.0	27.0	30.0	33.0	36.0	40.0	43.0	48.0	52.0
Overall Diameter (approx)	mm	410	500	610	700	810	950	1180	1400	1740	2140	2650	3300	3900
Weight of Cable (approx)	kg/km	500	500	500	500	500	500	500	500	500	500	500	400	300
Standard Packing Length (± 5%)	m	0.38	0.42	0.46	0.48	0.52	0.54	0.60	0.66	0.72	0.80	0.86	0.96	1.04
Minimum Bending Radius during installation	m	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
DC resistance at 20°C (max)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990	0.0770	0.0600	0.0470	0.0370
AC resistance at 90°C (approx)	Ω/km	0.121	0.115	0.109	0.105	0.102	0.099	0.096	0.094	0.092	0.089	0.086	0.083	0.080
Reactance at 50 Hz (approx)	Ω/km	0.827	0.577	0.422	0.340	0.282	0.231	0.187	0.159	0.135	0.118	0.105	0.095	0.088
Impedance at 50 Hz (approx)	Ω/km	0.34	0.38	0.43	0.47	0.51	0.56	0.61	0.62	0.65	0.69	0.78	0.87	0.97
Capacitance at 50 Hz	µF/km	0.38	0.43	0.49	0.53	0.58	0.63	0.69	0.70	0.74	0.78	0.88	0.99	1.10
Charging Current/phase at U ₀ =3.6 kV, 50 Hz (approx)	A/km													
Continuous Current Rating at cond temp. 90°C max														
1. Laid direct in ground	A	152	186	221	252	281	317	367	414	470	528	599	672	743
2. Laid into ducts	A	144	176	210	240	267	303	351	397	451	512	583	658	731
3. Laid in air in trefoil touching	A	184	230	280	324	368	424	502	577	673	770	896	1033	1167
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6	47.0	59.2	75.2	94.0

1. Ground temperature: 20°C

2. Air temperature: 30°C

3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m

5. For any other condition(s) please refer to the appropriate table for recommended installation data.

Assumptions:

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Table 7
Technical Data
**IEC 60502-2
6/10 (12) kV**
**Single Core, Aluminium Conductor, XLPE Insulated,
Un-Armoured Cable**

Nominal Cross-sectional Area of Conductor	mm ²	50	70	95	120	150	185	240	300	400	500	630	800	1000
Conductor Diameter (approx)	mm	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6	23.3	26.3	30.0	34.1	38.2
Nominal Insulation Thickness	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
Nominal Outer Sheath Thickness	mm	1.8	1.8	1.8	1.8	1.8	1.9	2.0	2.0	2.1	2.2	2.3	2.5	2.6
Overall Diameter (approx)	mm	21.0	23.0	24.0	26.0	28.0	29.0	32.0	34.0	37.0	40.0	44.0	48.0	53.0
Weight of Cable (approx)	kg/km	470	570	680	800	900	1050	1280	1490	1800	2180	2700	3300	4000
Standard Packing Length (± 5%)	m	500	500	500	500	500	500	500	500	500	500	500	400	300
Minimum Bending Radius during installation	m	0.42	0.46	0.48	0.52	0.56	0.58	0.64	0.68	0.74	0.80	0.88	0.96	1.06
DC resistance at 20°C (max)	Ω/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
AC resistance at 90°C (approx)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990	0.0770	0.0600	0.0470	0.0370
Reactance at 50 Hz (approx)	Ω/km	0.127	0.120	0.114	0.109	0.106	0.103	0.099	0.096	0.093	0.090	0.087	0.084	0.081
Impedance at 50 Hz (approx)	Ω/km	0.828	0.578	0.424	0.341	0.284	0.233	0.188	0.160	0.136	0.118	0.106	0.096	0.089
Capacitance at 50 Hz	µF/km	0.26	0.30	0.33	0.36	0.39	0.43	0.48	0.52	0.58	0.66	0.74	0.83	0.92
Charging Current/phase at U ₀ =6 kV, 50 Hz (approx)	A/km	0.49	0.57	0.62	0.68	0.74	0.81	0.90	0.98	1.09	1.24	1.40	1.56	1.73
Continuous Current Rating at cond temp. 90°C max														
1. Laid direct in ground	A	152	186	221	252	281	317	367	414	470	528	599	672	743
2. Laid into ducts	A	144	176	210	240	267	303	351	397	451	512	583	658	731
3. Laid in air in trefoil touching	A	184	230	280	324	368	424	502	577	673	770	896	1033	1167
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6	47.0	59.2	75.2	94.0

Assumptions: 1. Ground temperature: 20°C 2. Air temperature: 30°C 3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m 5. For any other condition(s) please refer to the appropriate table for recommended installation data.

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Table 8
Technical Data IEC 60502-2 8.7/15 (17.5) kV Single Core, Aluminium Conductor, XLPE Insulated, Un-Armoured Cable

		50	70	95	120	150	185	240	300	400	500	630	800	1000
Nominal Cross-sectional Area of Conductor	mm ²	50	70	95	120	150	185	240	300	400	500	630	800	1000
Conductor Diameter (approx)	mm	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6	23.3	26.3	30.0	34.1	38.2
Nominal Insulation Thickness	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
Nominal Outer Sheath Thickness	mm	1.8	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.2	2.3	2.4	2.5	2.7
Overall Diameter (approx)	mm	23.0	25.0	27.0	28.0	30.0	31.0	34.0	36.0	39.0	42.0	46.0	51.0	55.0
Weight of Cable (approx)	kg/km	570	670	780	900	1020	1180	1400	1650	1900	2300	2920	3500	4170
Standard Packing Length (± 5%)	m	500	500	500	500	500	500	500	500	500	500	500	400	300
Minimum Bending Radius during installation	m	0.46	0.50	0.54	0.56	0.60	0.62	0.68	0.72	0.78	0.84	0.92	1.02	1.10
DC resistance at 20°C (max)	Ω/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
AC resistance at 90°C (approx)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990	0.0770	0.0600	0.0470	0.0370
Reactance at 50 Hz (approx)	Ω/km	0.132	0.125	0.119	0.114	0.111	0.107	0.103	0.100	0.097	0.093	0.090	0.087	0.084
Impedance at 50 Hz (approx)	Ω/km	0.829	0.579	0.425	0.343	0.285	0.235	0.190	0.162	0.139	0.121	0.108	0.099	0.092
Capacitance at 50 Hz	µF/km	0.21	0.24	0.27	0.29	0.31	0.34	0.38	0.41	0.46	0.51	0.57	0.64	0.71
Charging Current/phase at U ₀ =8.7 kV, 50 Hz (approx)	A/km	0.57	0.66	0.74	0.79	0.85	0.93	1.04	1.12	1.26	1.39	1.56	1.75	1.94
Continuous Current Rating at cond temp. 90°C max														
1. Laid direct in ground	A	152	186	221	252	281	317	367	414	470	528	599	672	743
2. Laid into ducts	A	144	176	210	240	267	303	351	397	451	512	583	658	731
3. Laid in air in trefoil touching	A	184	230	280	324	368	424	502	577	673	770	896	1033	1167
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6	47.0	59.2	75.2	94.0

Assumptions:

1. Ground temperature: 20°C
 2. Air temperature: 30°C
 3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m
 5. For any other condition(s) please refer to the appropriate table for recommended installation data.

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Table 9

Technical Data		IEC 60502-2 12/20 (24) kV													Single Core, Aluminium Conductor, XLPE Insulated, Un-Armoured Cable												
Nominal Cross-sectional Area of Conductor	mm ²	50	70	95	120	150	185	240	300	400	500	630	800	1000	50	70	95	120	150	185	240	300	400	500	630	800	1000
Conductor Diameter (approx)	mm	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6	23.3	26.3	30.0	34.1	38.2	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6	23.3	26.3	30.0	34.1	38.2
Nominal Insulation Thickness	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	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Nominal Outer Sheath Thickness	mm	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	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
Overall Diameter (approx)	mm	25.0	27.0	29.0	31.0	32.0	34.0	36.0	39.0	42.0	45.0	49.0	53.0	57.0	25.0	27.0	29.0	31.0	32.0	34.0	36.0	39.0	42.0	45.0	49.0	53.0	57.0
Weight of Cable (approx)	kg/km	650	760	890	1030	1150	1300	1550	1800	2150	2550	3100	3700	4450	650	760	890	1030	1150	1300	1550	1800	2150	2550	3100	3700	4450
Standard Packing Length (± 5%)	m	500	500	500	500	500	500	500	500	500	500	500	400	300	500	500	500	500	500	500	500	500	500	500	500	400	300
Minimum Bending Radius during installation	m	0.52	0.54	0.58	0.62	0.64	0.68	0.72	0.78	0.84	0.90	0.98	1.06	1.14	0.52	0.54	0.58	0.62	0.64	0.68	0.72	0.78	0.84	0.90	0.98	1.06	1.14
DC resistance at 20°C (max)	Ω/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	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
AC resistance at 90°C (approx)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990	0.0770	0.0600	0.0470	0.0370	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990	0.0770	0.0600	0.0470	0.0370
Reactance at 50 Hz (approx)	Ω/km	0.137	0.130	0.123	0.118	0.115	0.111	0.106	0.103	0.100	0.096	0.092	0.088	0.084	0.137	0.130	0.123	0.118	0.115	0.111	0.106	0.103	0.100	0.096	0.092	0.088	0.084
Impedance at 50 Hz (approx)	Ω/km	0.829	0.580	0.426	0.344	0.287	0.237	0.192	0.164	0.140	0.123	0.110	0.100	0.092	0.829	0.580	0.426	0.344	0.287	0.237	0.192	0.164	0.140	0.123	0.110	0.100	0.092
Capacitance at 50 Hz	µF/km	0.18	0.21	0.23	0.25	0.27	0.29	0.32	0.35	0.39	0.43	0.48	0.54	0.59	0.18	0.21	0.23	0.25	0.27	0.29	0.32	0.35	0.39	0.43	0.48	0.54	0.59
Charging Current/phase at U ₀ =12 kV, 50 Hz (approx)	A/km	0.68	0.79	0.87	0.94	1.02	1.09	1.21	1.32	1.47	1.62	1.81	2.02	2.23	0.68	0.79	0.87	0.94	1.02	1.09	1.21	1.32	1.47	1.62	1.81	2.02	2.23
Continuous Current Rating at cond temp. 90°C max																											
1. Laid direct in ground	A	152	186	221	252	281	317	367	414	470	528	599	672	743	152	186	221	252	281	317	367	414	470	528	599	672	743
2. Laid into ducts	A	144	176	210	240	267	303	351	397	451	512	583	658	731	144	176	210	240	267	303	351	397	451	512	583	658	731
3. Laid in air in trefoil touching	A	184	230	280	324	368	424	502	577	673	770	896	1033	1167	184	230	280	324	368	424	502	577	673	770	896	1033	1167
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6	47.0	59.2	75.2	94.0	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6	47.0	59.2	75.2	94.0

Assumptions: 1. Ground temperature: 20°C 2. Air temperature: 30°C 3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m 5. For any other condition(s) please refer to the appropriate table for recommended installation data.

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Table 10
Single Core, Aluminium Conductor, XLPE Insulated, Un-Armoured Cable
Technical Data
**IEC 60502-2
18/30 (36) kV**

	50	70	95	120	150	185	240	300	400	500	630	800	1000
Nominal Cross-sectional Area of Conductor	mm ²	8.1	9.7	11.4	12.9	16.0	18.4	20.6	23.3	26.3	30.0	34.1	38.2
Conductor Diameter (approx)	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
Nominal Insulation Thickness	mm	1.9	2.0	2.1	2.1	2.2	2.3	2.3	2.5	2.5	2.7	2.8	2.9
Nominal Outer Sheath Thickness	mm	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Overall Diameter (approx)	mm	9.20	10.50	12.10	13.30	14.70	16.40	19.10	25.80	29.80	35.30	41.90	49.40
Weight of Cable (approx)	kg/km	500	500	500	500	500	500	500	500	500	500	500	500
Standard Packing Length (± 5%)	m	0.62	0.66	0.68	0.72	0.76	0.78	0.84	0.94	1.00	1.08	1.18	1.26
Minimum Bending Radius during installation	m	0.62	0.66	0.68	0.72	0.76	0.78	0.84	0.94	1.00	1.08	1.18	1.26
DC resistance at 20°C (max)	Ω/km	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	0.0605	0.0469	0.0291
AC resistance at 90°C (approx)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990	0.0770	0.0600	0.0370
Reactance at 50 Hz (approx)	Ω/km	0.137	0.143	0.136	0.130	0.127	0.122	0.117	0.113	0.109	0.104	0.100	0.096
Impedance at 50 Hz (approx)	Ω/km	0.829	0.583	0.430	0.348	0.292	0.242	0.198	0.171	0.147	0.129	0.117	0.099
Capacitance at 50 Hz	µF/km	0.18	0.16	0.18	0.19	0.20	0.22	0.24	0.26	0.29	0.32	0.35	0.43
Charging Current/phase at U ₀ =18 kV, 50 Hz (approx)	A/km	1.02	0.90	1.02	1.07	1.13	1.24	1.36	1.47	1.64	1.81	1.98	2.42
Continuous Current Rating at cond temp. 90°C max													
1. Laid direct in ground	A	152	186	221	252	281	317	367	414	470	528	599	672
2. Laid into ducts	A	144	176	210	240	267	303	351	397	451	512	583	658
3. Laid in air in trefoil touching	A	184	230	280	324	368	424	502	577	673	770	896	1033
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6	47.0	59.2	75.2

Assumptions:	1. Ground temperature: 20°C	2. Air temperature: 30°C	3. Thermal resistivity of soil: 1.5 K.m/W
	4. Depth of laying: 0.8 m	5. For any other condition(s) please refer to the appropriate table for recommended installation data.	

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Table 11

Technical Data		IEC 60502-2 3.6/6 (7.2) kV		Three Core, Aluminium Conductor, XLPE Insulated, Steel Round Wire Armoured Cable														
Nominal Cross-sectional Area of Conductor	mm ²	50	70	95	120	150	185	240	300	400								
Conductor Diameter (approx)	mm	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6	23.3								
Nominal Insulation Thickness	mm	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.0								
Nominal Armour Wire Diameter	mm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5								
Nominal Outer Sheath Thickness	mm	2.5	2.6	2.7	2.8	2.9	3.0	3.2	3.5	3.8								
Overall Diameter (approx)	mm	45.0	49.0	53.0	56.0	60.0	64.0	70.0	77.0	85.0								
Weight of Cable (approx)	kg/km	3330	3870	4430	4990	5640	6220	7360	9420	11360								
Standard Packing Length (± 5%)	m	500	500	500	500	500	250	250	250	250								
Minimum Bending Radius during installation	m	0.54	0.59	0.64	0.68	0.72	0.77	0.84	0.93	1.02								
DC resistance at 20°C (max)	Ω/km	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778								
AC resistance at 90°C (approx)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990								
Reactance at 50 Hz (approx)	Ω/km	0.105	0.100	0.095	0.092	0.090	0.087	0.085	0.084	0.082								
Impedance at 50 Hz (approx)	Ω/km	0.825	0.574	0.419	0.336	0.278	0.226	0.181	0.153	0.129								
Capacitance at 50 Hz	µF/km	0.36	0.41	0.46	0.50	0.55	0.60	0.65	0.67	0.70								
Charging Current/phase at U ₀ =3.6 kV, 50 Hz (approx)	A/km	0.41	0.46	0.52	0.57	0.62	0.68	0.74	0.76	0.79								
Continuous Current Rating at cond temp. 90°C max																		
1. Laid direct in ground	A	140	171	204	232	259	293	338	380	432								
2. Laid into ducts	A	123	150	180	206	231	262	304	343	393								
3. Laid in air in trefoil touching	A	159	196	238	274	309	354	415	472	545								
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6								

Assumptions: 1. Ground temperature: 20°C 2. Air temperature: 30°C 3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m 5. For any other condition(s) please refer to the appropriate table for recommended installation data.

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Table 12
Three Core, Aluminium Conductor, XLPE Insulated, Steel Round Wire Armoured Cable
**IEC 60502-2
6/10 (12) kV**
**Technical
Data**

		50	70	95	120	150	185	240	300	400
Nominal Cross-sectional Area of Conductor	mm ²	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6	23.3
Conductor Diameter (approx)	mm	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Nominal Insulation Thickness	mm	2.5	2.5	2.5	2.5	2.5	2.5	3.15	3.15	3.15
Nominal Armour Wire Diameter	mm	2.6	2.7	2.9	3.0	3.1	3.2	3.4	3.6	3.8
Overall Diameter (approx)	mm	49.0	53.0	57.0	61.0	65.0	68.0	75.0	80.0	87.0
Weight of Cable (approx)	kg/km	3800	4320	5000	5560	6180	6860	8770	9920	11620
Standard Packing Length (± 5%)	m	500	500	500	500	250	250	250	250	250
Minimum Bending Radius during installation	m	0.59	0.64	0.69	0.74	0.78	0.82	0.90	0.96	1.05
DC resistance at 20°C (max)	Ω/km	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
AC resistance at 90°C (approx)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990
Reactance at 50 Hz (approx)	Ω/km	0.111	0.106	0.100	0.097	0.094	0.092	0.089	0.086	0.083
Impedance at 50 Hz (approx)	Ω/km	0.825	0.575	0.420	0.337	0.279	0.228	0.183	0.154	0.129
Capacitance at 50 Hz	µF/km	0.28	0.32	0.36	0.39	0.42	0.46	0.51	0.56	0.62
Charging Current/phase at U ₀ =6 kV, 50 Hz (approx)	A/km	0.53	0.60	0.68	0.74	0.79	0.87	0.96	1.06	1.17
Continuous Current Rating at cond temp. 90°C max										
1. Laid direct in ground	A	140	171	204	232	259	293	338	380	432
2. Laid into ducts	A	123	150	180	206	231	262	304	343	393
3. Laid in air in trefoil touching	A	159	196	238	274	309	354	415	472	545
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6

Assumptions:

1. Ground temperature: 20°C

2. Air temperature: 30°C

3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m

5. For any other condition(s) please refer to the appropriate table for recommended installation data.

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Table 13
Technical Data
**IEC 60502-2
8.7/15 (17.5) kV**
**Three Core, Aluminium Conductor, XLPE Insulated,
Steel Round Wire Armoured Cable**

	50	70	95	120	150	185	240	300	400
Nominal Cross-sectional Area of Conductor	mm ²								
Conductor Diameter (approx)	mm	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6
Nominal Insulation Thickness	mm	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Nominal Armour Wire Diameter	mm	2.5	2.5	2.5	2.5	2.5	3.15	3.15	3.15
Nominal Outer Sheath Thickness	mm	2.8	2.9	3.0	3.1	3.2	3.4	3.6	4.0
Overall Diameter (approx)	mm	55.0	58.0	62.0	66.0	70.0	75.0	80.0	86.0
Weight of Cable (approx)	kg/km	4560	5110	5770	6390	7050	8620	9820	10970
Standard Packing Length (± 5%)	m	500	500	500	500	250	250	250	250
Minimum Bending Radius during installation	m	0.66	0.70	0.75	0.80	0.84	0.90	0.96	1.04
DC resistance at 20°C (max)	Ω/km	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100
AC resistance at 90°C (approx)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128
Reactance at 50 Hz (approx)	Ω/km	0.118	0.112	0.106	0.102	0.100	0.097	0.093	0.090
Impedance at 50 Hz (approx)	Ω/km	0.826	0.576	0.422	0.339	0.281	0.230	0.185	0.156
Capacitance at 50 Hz	µF/km	0.23	0.26	0.29	0.31	0.34	0.37	0.41	0.45
Charging Current/phase at U ₀ =8.7 kV, 50 Hz (approx)	A/km	0.63	0.71	0.79	0.85	0.93	1.01	1.12	1.23
Continuous Current Rating at cond temp. 90°C max									
1. Laid direct in ground	A	140	171	204	232	259	293	338	380
2. Laid into ducts	A	123	150	180	206	231	262	304	343
3. Laid in air in trefoil touching	A	159	196	238	274	309	354	415	472
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2

Assumptions:

1. Ground temperature: 20°C

4. Depth of laying: 0.8 m

2. Air temperature: 30°C

3. Thermal resistivity of soil: 1.5 K.m/W

5. For any other condition(s) please refer to the appropriate table for recommended installation data.

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Table 14
Technical Data
**IEC 60502-2
12/20 (24) kV**
**Three Core, Aluminium Conductor, XLPE Insulated,
Steel Round Wire Armoured Cable**

	50	70	95	120	150	185	240	300	400
Nominal Cross-sectional Area of Conductor	mm ²	8.1	11.4	12.9	14.6	16.0	18.4	20.6	23.3
Conductor Diameter (approx)	mm	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Nominal Insulation Thickness	mm	2.5	2.5	3.15	3.15	3.15	3.15	3.15	3.15
Nominal Armour Wire Diameter	mm	2.9	3.1	3.2	3.4	3.6	3.7	3.9	4.1
Nominal Outer Sheath Thickness	mm	60.0	64.0	68.0	73.0	77.0	86.0	91.0	98.0
Overall Diameter (approx)	mm	5070	5690	6390	7750	8550	10540	11710	13620
Weight of Cable (approx)	kg/km	500	500	500	500	500	500	500	500
Standard Packing Length (± 5%)	m	0.72	0.77	0.82	0.88	0.93	0.96	1.04	1.18
Minimum Bending Radius during installation	m	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100
DC resistance at 20°C (max)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128
AC resistance at 90°C (approx)	Ω/km	0.124	0.118	0.111	0.107	0.104	0.101	0.097	0.090
Reactance at 50 Hz (approx)	Ω/km	0.827	0.577	0.423	0.340	0.283	0.232	0.187	0.134
Impedance at 50 Hz (approx)	μF/km	0.20	0.22	0.24	0.26	0.28	0.31	0.34	0.41
Capacitance at 50 Hz	A/km	0.75	0.83	0.90	0.98	1.06	1.17	1.28	1.55
Charging Current/phase at U ₀ =12 kV, 50 Hz (approx)									
Continuous Current Rating at cond temp. 90°C max									
1. Laid direct in ground	A	140	171	204	232	259	293	338	432
2. Laid into ducts	A	123	150	180	206	231	262	304	393
3. Laid in air in trefoil touching	A	159	196	238	274	309	354	415	545
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2

Assumptions:	1. Ground temperature: 20°C	2. Air temperature: 30°C	3. Thermal resistivity of soil: 1.5 K.m/W
	4. Depth of laying: 0.8 m	5. For any other condition(s) please refer to the appropriate table for recommended installation data.	

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Table 15
Technical Data
**IEC 60502-2
18/30 (36) kV**
**Three Core, Aluminium Conductor, XLPE Insulated,
Steel Round Wire Armoured Cable**

	50	70	95	120	150	185	240	300	400
Nominal Cross-sectional Area of Conductor	mm ²	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6
Conductor Diameter (approx)	mm	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Nominal Insulation Thickness	mm	3.15	3.15	3.15	3.15	3.15	3.15	3.15	3.15
Nominal Armour Wire Diameter	mm	3.4	3.5	3.6	3.7	3.8	4.0	4.1	4.3
Nominal Outer Sheath Thickness	mm	74.0	77.0	81.0	85.0	89.0	92.0	98.0	103.0
Overall Diameter (approx)	mm	7620	8370	9100	9890	10660	11530	12840	14210
Weight of Cable (approx)	kg/km	500	250	250	250	250	250	250	250
Standard Packing Length (± 5%)	m	1.11	1.16	1.22	1.28	1.34	1.38	1.47	1.55
Minimum Bending Radius during installation	m	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100
DC resistance at 20°C (max)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128
AC resistance at 90°C (approx)	Ω/km	0.124	0.129	0.122	0.117	0.114	0.110	0.106	0.102
Reactance at 50 Hz (approx)	Ω/km	0.827	0.580	0.426	0.344	0.287	0.236	0.192	0.164
Impedance at 50 Hz (approx)	Ω/km	0.20	0.15	0.17	0.18	0.20	0.21	0.25	0.27
Capacitance at 50 Hz	µF/km	1.13	0.85	0.96	1.02	1.13	1.19	1.41	1.53
Charging Current/phase at U ₀ =18 kV, 50 Hz (approx)	A/km								
Continuous Current Rating at cond temp. 90°C max									
1. Laid direct in ground	A	140	171	204	232	259	293	338	380
2. Laid into ducts	A	123	150	180	206	231	262	304	343
3. Laid in air in trefoil touching	A	159	196	238	274	309	354	415	472
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2

Assumptions:

1. Ground temperature: 20°C

2. Air temperature: 30°C

3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m

5. For any other condition(s) please refer to the appropriate table for recommended installation data.

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Table 16
Three Core, Aluminium Conductor, XLPE Insulated, Un-Armoured Cable
Technical Data
IEC 60502-2
3.6/6 (7.2) kV

	50	70	95	120	150	185	240	300	400
Nominal Cross-sectional Area of Conductor	mm ²								
Conductor Diameter (approx)	mm	8.1	9.7	11.4	12.9	14.6	18.4	20.6	23.3
Nominal Insulation Thickness	mm	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.0
Nominal Outer Sheath Thickness	mm	2.2	2.3	2.5	2.6	2.7	3.0	3.2	3.4
Overall Diameter (approx)	mm	38.0	41.0	45.0	49.0	53.0	62.0	68.0	75.0
Weight of Cable (approx)	kg/km	1350	1680	2080	2410	2830	4070	4930	6230
Standard Packing Length (± 5%)	m	500	500	500	500	500	250	250	250
Minimum Bending Radius during installation	m	0.57	0.62	0.68	0.74	0.80	0.93	1.02	1.13
DC resistance at 20°C (max)	Ω/km	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100
AC resistance at 90°C (approx)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.0990
Reactance at 50 Hz (approx)	Ω/km	0.105	0.100	0.095	0.092	0.090	0.087	0.084	0.082
Impedance at 50 Hz (approx)	Ω/km	0.825	0.574	0.419	0.336	0.278	0.226	0.181	0.129
Capacitance at 50 Hz	µF/km	0.36	0.41	0.46	0.50	0.55	0.60	0.67	0.70
Charging Current/phase at U ₀ =3.6 kV, 50 Hz (approx)	A/km	0.41	0.46	0.52	0.57	0.62	0.68	0.74	0.79
Continuous Current Rating at cond temp. 90°C max									
1. Laid direct in ground	A	140	171	203	232	260	294	340	438
2. Laid into ducts	A	122	150	179	205	231	262	305	398
3. Laid in air in trefoil touching	A	158	196	236	273	309	355	415	552
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2

2. Air temperature: 30°C

3. Thermal resistivity of soil: 1.5 K.m/W

1. Ground temperature: 20°C

4. Depth of laying: 0.8 m

5. For any other condition(s) please refer to the appropriate table for recommended installation data.

Assumptions:

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Table 17
Technical Data
**IEC 60502-2
6/10 (12) kV**
**Three Core, Aluminium Conductor, XLPE Insulated,
Un-Armoured Cable**

	50	70	95	120	150	185	240	300	400
Nominal Cross-sectional Area of Conductor	mm ²								
Conductor Diameter (approx)	mm	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6
Nominal Insulation Thickness	mm	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Nominal Outer Sheath Thickness	mm	2.4	2.5	2.6	2.7	2.8	2.9	3.1	3.3
Overall Diameter (approx)	mm	42.0	46.0	49.0	53.0	57.0	60.0	66.0	71.0
Weight of Cable (approx)	kg/km	1620	1970	2350	2730	3160	3630	4420	5220
Standard Packing Length (± 5%)	m	500	500	500	500	250	250	250	250
Minimum Bending Radius during installation	m	0.63	0.69	0.74	0.80	0.86	0.90	0.99	1.07
DC resistance at 20°C (max)	Ω/km	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100
AC resistance at 90°C (approx)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128
Reactance at 50 Hz (approx)	Ω/km	0.111	0.106	0.100	0.097	0.094	0.092	0.089	0.086
Impedance at 50 Hz (approx)	Ω/km	0.825	0.575	0.420	0.337	0.279	0.228	0.183	0.154
Capacitance at 50 Hz	μF/km	0.28	0.32	0.36	0.39	0.42	0.46	0.51	0.56
Charging Current/phase at U ₀ =6 kV, 50 Hz (approx)	A/km	0.53	0.60	0.68	0.74	0.79	0.87	0.96	1.06
Continuous Current Rating at cond temp. 90°C max									
1. Laid direct in ground	A	140	171	203	232	260	294	340	384
2. Laid into ducts	A	122	150	179	205	231	262	305	346
3. Laid in air in trefoil touching	A	158	196	236	273	309	355	415	475
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2

1. Ground temperature: 20°C

2. Air temperature: 30°C

3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m

5. For any other condition(s) please refer to the appropriate table for recommended installation data.

Assumptions:

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Table 18
Technical Data
**IEC 60502-2
8.7/15 (17.5) kV**
**Three Core, Aluminium Conductor, XLPE Insulated,
Un-Armoured Cable**

	50	70	95	120	150	185	240	300	400
Nominal Cross-sectional Area of Conductor	mm ²	8.1	11.4	14.6	18.4	23.3	30.6	40.0	
Conductor Diameter (approx)	mm	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Nominal Insulation Thickness	mm	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3
Nominal Outer Sheath Thickness	mm	47.0	51.0	55.0	58.0	62.0	65.0	68.0	71.0
Overall Diameter (approx)	mm	2030	2390	2830	3240	3710	4200	4700	5200
Weight of Cable (approx)	kg/km	500	500	500	500	500	500	500	500
Standard Packing Length (± 5%)	m	0.71	0.77	0.83	0.87	0.93	0.98	1.04	1.10
Minimum Bending Radius during installation	m	0.641	0.443	0.320	0.253	0.206	0.164	0.128	0.0990
DC resistance at 20°C (max)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128
AC resistance at 90°C (approx)	Ω/km	0.118	0.112	0.106	0.102	0.100	0.097	0.093	0.087
Reactance at 50 Hz (approx)	Ω/km	0.826	0.576	0.422	0.339	0.281	0.230	0.185	0.132
Impedance at 50 Hz (approx)	μF/km	0.23	0.26	0.29	0.31	0.34	0.37	0.41	0.50
Capacitance at 50 Hz	A/km	0.63	0.71	0.79	0.85	0.93	1.01	1.12	1.23
Charging Current/phase at U ₀ =8.7 kV, 50 Hz (approx)									
Continuous Current Rating at cond temp. 90°C max									
1. Laid direct in ground	A	140	171	203	232	260	294	340	438
2. Laid into ducts	A	122	150	179	205	231	262	305	398
3. Laid in air in trefoil touching	A	158	196	236	273	309	355	415	552
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	37.6

1. Ground temperature: 20°C

2. Air temperature: 30°C

3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m

5. For any other condition(s) please refer to the appropriate table for recommended installation data.

Assumptions:

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Table 19
Technical Data
**IEC 60502-2
12/20 (24) kV**
**Three Core, Aluminium Conductor, XLPE Insulated,
Un-Armoured Cable**

	50	70	95	120	150	185	240	300	400
Nominal Cross-sectional Area of Conductor	mm ²	8.1	11.4	14.6	16.0	18.4	20.6	23.3	
Conductor Diameter (approx)	mm	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Nominal Insulation Thickness	mm	2.7	2.8	2.9	3.0	3.1	3.3	3.4	3.8
Nominal Outer Sheath Thickness	mm	52.0	56.0	60.0	63.0	67.0	71.0	76.0	81.0
Overall Diameter (approx)	mm	2310	2710	3160	3580	4070	4610	5440	6280
Weight of Cable (approx)	kg/km	500	500	500	500	500	500	500	500
Standard Packing Length (± 5%)	m	0.78	0.84	0.90	0.95	1.01	1.07	1.14	1.22
Minimum Bending Radius during installation	m	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100
DC resistance at 20°C (max)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128
AC resistance at 90°C (approx)	Ω/km	0.124	0.118	0.111	0.107	0.104	0.101	0.097	0.090
Reactance at 50 Hz (approx)	Ω/km	0.827	0.577	0.423	0.340	0.283	0.232	0.187	0.134
Impedance at 50 Hz (approx)	μF/km	0.20	0.22	0.24	0.26	0.28	0.31	0.34	0.41
Capacitance at 50 Hz	A/km	0.75	0.83	0.90	0.98	1.06	1.17	1.28	1.40
Charging Current/phase at U ₀ =12 kV, 50 Hz (approx)									
Continuous Current Rating at cond temp. 90°C max									
1. Laid direct in ground	A	140	171	203	232	260	294	340	438
2. Laid into ducts	A	122	150	179	205	231	262	305	398
3. Laid in air in trefoil touching	A	158	196	236	273	309	355	415	552
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2

Assumptions: 1. Ground temperature: 20°C 2. Air temperature: 30°C 3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m 5. For any other condition(s) please refer to the appropriate table for recommended installation data.

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Table 20
Technical Data
**IEC 60502-2
18/30 (36) kV**
**Three Core, Aluminium Conductor, XLPE Insulated,
Un-Armoured Cable**

	mm ²	50	70	95	120	150	185	240	300	400
Nominal Cross-sectional Area of Conductor		8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6	23.3
Conductor Diameter (approx)	mm	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Nominal Insulation Thickness	mm	3.1	3.2	3.3	3.4	3.5	3.6	3.8	4.0	4.2
Nominal Outer Sheath Thickness	mm	64.0	68.0	72.0	75.0	79.0	82.0	88.0	93.0	99.0
Overall Diameter (approx)	mm	3340	3810	4320	4800	5340	5870	6810	7770	9180
Weight of Cable (approx)	kg/km	500	250	250	250	250	250	250	250	250
Standard Packing Length (± 5%)	m	1.28	1.36	1.44	1.50	1.58	1.64	1.76	1.86	1.98
Minimum Bending Radius during installation	m	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
DC resistance at 20°C (max)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990
AC resistance at 90°C (approx)	Ω/km	0.124	0.129	0.122	0.117	0.114	0.110	0.106	0.102	0.098
Reactance at 50 Hz (approx)	Ω/km	0.827	0.580	0.426	0.344	0.287	0.236	0.192	0.164	0.139
Impedance at 50 Hz (approx)	μF/km	0.20	0.15	0.17	0.18	0.20	0.21	0.25	0.27	0.30
Capacitance at 50 Hz	A/km	1.13	0.85	0.96	1.02	1.13	1.19	1.41	1.53	1.70
Charging Current/phase at U ₀ =18 kV, 50 Hz (approx)										
Continuous Current Rating at cond temp. 90°C max										
1. Laid direct in ground	A	140	171	203	232	260	294	340	384	438
2. Laid into ducts	A	122	150	179	205	231	262	305	346	398
3. Laid in air in trefoil touching	A	158	196	236	273	309	355	415	475	552
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6

Assumptions:

1. Ground temperature: 20°C

2. Air temperature: 30°C

3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m

5. For any other condition(s) please refer to the appropriate table for recommended installation data.

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Table 21
Technical Data
**IEC 60502-2
3.6/6 (7.2) kV**
**Three Core, Aluminium Conductor, XLPE Insulated,
Steel Tape Armoured Cable**

	50	70	95	120	150	185	240	300	400
Nominal Cross-sectional Area of Conductor	mm ²	8.1	9.7	11.4	14.6	16.0	18.4	20.6	23.3
Conductor Diameter (approx)	mm	2.5	2.5	2.5	2.5	2.5	2.6	2.8	3.0
Nominal Insulation Thickness	mm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8
Nominal Steel Tape Thickness	mm	2.4	2.5	2.6	2.7	2.9	3.1	3.3	3.6
Overall Diameter (approx)	mm	42.0	46.0	50.0	53.0	60.0	67.0	73.0	82.0
Weight of Cable (approx)	kg/km	2300	2740	3190	3660	4700	5670	6710	9180
Standard Packing Length (± 5%)	m	500	500	500	500	250	250	250	250
Minimum Bending Radius during installation	m	0.53	0.58	0.63	0.67	0.72	0.84	0.92	1.03
DC resistance at 20°C (max)	Ω/km	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.0778
AC resistance at 90°C (approx)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.0990
Reactance at 50 Hz (approx)	Ω/km	0.105	0.100	0.095	0.092	0.090	0.087	0.085	0.082
Impedance at 50 Hz (approx)	Ω/km	0.825	0.574	0.419	0.336	0.278	0.226	0.181	0.129
Capacitance at 50 Hz	μF/km	0.36	0.41	0.46	0.50	0.55	0.60	0.65	0.70
Charging Current/phase at U ₀ =3.6 kV, 50 Hz (approx)	A/km	0.41	0.46	0.52	0.57	0.62	0.68	0.74	0.79
Continuous Current Rating at cond temp. 90°C max									
1. Laid direct in ground	A	140	171	204	232	259	293	338	432
2. Laid into ducts	A	123	150	180	206	231	262	304	393
3. Laid in air in trefoil touching	A	159	196	238	274	309	354	415	545
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	37.6

1. Ground temperature: 20°C

2. Air temperature: 30°C

3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m

5. For any other condition(s) please refer to the appropriate table for recommended installation data.

Assumptions:

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Table 22
**IEC 60502-2
6/10 (12) kV**
**Three Core, Aluminium Conductor, XLPE Insulated,
Steel Tape Armoured Cable**

Technical Data	IEC 60502-2 6/10 (12) kV	50	70	95	120	150	185	240	300	400
Nominal Cross-sectional Area of Conductor	mm ²	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6	23.3
Conductor Diameter (approx)	mm	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Nominal Insulation Thickness	mm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8
Nominal Steel Tape Thickness	mm	2.5	2.6	2.7	2.9	3.0	3.1	3.3	3.4	3.7
Nominal Outer Sheath Thickness	mm	46.0	50.0	54.0	58.0	62.0	65.0	71.0	76.0	84.0
Overall Diameter (approx)	mm	2680	3090	3610	4100	4630	5210	6180	7110	9460
Weight of Cable (approx)	kg/km	500	500	500	500	500	500	500	500	500
Standard Packing Length (± 5%)	m	0.58	0.63	0.68	0.73	0.78	0.82	0.89	0.95	1.05
Minimum Bending Radius during installation	m	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
DC resistance at 20°C (max)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990
AC resistance at 90°C (approx)	Ω/km	0.111	0.106	0.100	0.097	0.094	0.092	0.089	0.086	0.083
Reactance at 50 Hz (approx)	Ω/km	0.825	0.575	0.420	0.337	0.279	0.228	0.183	0.154	0.129
Impedance at 50 Hz (approx)	μF/km	0.28	0.32	0.36	0.39	0.42	0.46	0.51	0.56	0.62
Capacitance at 50 Hz	A/km	0.53	0.60	0.68	0.74	0.79	0.87	0.96	1.06	1.17
Charging Current/phase at U ₀ =6 kV, 50 Hz (approx)										
Continuous Current Rating at cond temp. 90°C max										
1. Laid direct in ground	A	140	171	204	232	259	293	338	380	432
2. Laid into ducts	A	123	150	180	206	231	262	304	343	393
3. Laid in air in trefoil touching	A	159	196	238	274	309	354	415	472	545
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6

Assumptions: 1. Ground temperature: 20°C

2. Air temperature: 30°C

3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m

5. For any other condition(s) please refer to the appropriate table for recommended installation data.

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Table 23
**IEC 60502-2
8.7/15 (17.5) kV**
**Three Core, Aluminium Conductor, XLPE Insulated,
Steel Tape Armoured Cable**

Technical Data	IEC 60502-2 8.7/15 (17.5) kV	50	70	95	120	150	185	240	300	400
Nominal Cross-sectional Area of Conductor	mm ²	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6	23.3
Conductor Diameter (approx)	mm	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Nominal Insulation Thickness	mm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8
Nominal Steel Tape Thickness	mm	2.7	2.8	2.9	3.0	3.1	3.3	3.4	3.6	3.9
Overall Diameter (approx)	mm	52.0	55.0	59.0	63.0	67.0	70.0	76.0	82.0	89.0
Weight of Cable (approx)	kg/km	3250	3710	4240	4770	5330	5980	6970	8850	10480
Standard Packing Length (± 5%)	m	500	500	500	500	250	250	250	250	250
Minimum Bending Radius during installation	m	0.65	0.69	0.74	0.79	0.84	0.88	0.95	1.03	1.12
DC resistance at 20°C (max)	Ω/km	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
AC resistance at 90°C (approx)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990
Reactance at 50 Hz (approx)	Ω/km	0.118	0.112	0.106	0.102	0.100	0.097	0.093	0.090	0.087
Impedance at 50 Hz (approx)	Ω/km	0.826	0.576	0.422	0.339	0.281	0.230	0.185	0.156	0.132
Capacitance at 50 Hz	μF/km	0.23	0.26	0.29	0.31	0.34	0.37	0.41	0.45	0.50
Charging Current/phase at U ₀ =8.7 kV, 50 Hz (approx)	A/km	0.63	0.71	0.79	0.85	0.93	1.01	1.12	1.23	1.37
Continuous Current Rating at cond temp. 90°C max										
1. Laid direct in ground	A	140	171	204	232	259	293	338	380	432
2. Laid into ducts	A	123	150	180	206	231	262	304	343	393
3. Laid in air in trefoil touching	A	159	196	238	274	309	354	415	472	545
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6

Assumptions: 1. Ground temperature: 20°C 2. Air temperature: 30°C 3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m 5. For any other condition(s) please refer to the appropriate table for recommended installation data.

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Table 24
**IEC 60502-2
12/20 (24) kV**
**Three Core, Aluminium Conductor, XLPE Insulated,
Steel Tape Armoured Cable**

Technical Data	IEC 60502-2 12/20 (24) kV	50	70	95	120	150	185	240	300	400
Nominal Cross-sectional Area of Conductor	mm ²	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6	23.3
Conductor Diameter (approx)	mm	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Nominal Insulation Thickness	mm	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8	0.8
Nominal Steel Tape Thickness	mm	2.8	2.9	3.1	3.2	3.3	3.4	3.6	3.8	4.0
Nominal Outer Sheath Thickness	mm	57.0	61.0	65.0	68.0	72.0	76.0	83.0	88.0	94.0
Overall Diameter (approx)	mm	3650	4130	4740	5250	5870	6510	8410	9470	11150
Weight of Cable (approx)	kg/km	500	500	250	250	250	250	250	250	250
Standard Packing Length (± 5%)	m	0.72	0.77	0.82	0.85	0.90	0.95	1.04	1.10	1.18
Minimum Bending Radius during installation	m	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
DC resistance at 20°C (max)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990
AC resistance at 90°C (approx)	Ω/km	0.124	0.118	0.111	0.107	0.104	0.101	0.097	0.094	0.090
Reactance at 50 Hz (approx)	Ω/km	0.827	0.577	0.423	0.340	0.283	0.232	0.187	0.159	0.134
Impedance at 50 Hz (approx)	μF/km	0.20	0.22	0.24	0.26	0.28	0.31	0.34	0.37	0.41
Capacitance at 50 Hz	A/km	0.75	0.83	0.90	0.98	1.06	1.17	1.28	1.40	1.55
Charging Current/phase at U ₀ =12 kV, 50 Hz (approx)										
Continuous Current Rating at cond temp. 90°C max										
1. Laid direct in ground	A	140	171	204	232	259	293	338	380	432
2. Laid into ducts	A	123	150	180	206	231	262	304	343	393
3. Laid in air in trefoil touching	A	159	196	238	274	309	354	415	472	545
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6

Assumptions:	1. Ground temperature: 20°C	2. Air temperature: 30°C	3. Thermal resistivity of soil: 1.5 K.m/W
		4. Depth of laying: 0.8 m	5. For any other condition(s) please refer to the appropriate table for recommended installation data.

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Table 25
**IEC 60502-2
18/30 (36) kV**
**Three Core, Aluminium Conductor, XLPE Insulated,
Steel Tape Armoured Cable**

Technical Data	IEC 60502-2 18/30 (36) kV	50	70	95	120	150	185	240	300	400
Nominal Cross-sectional Area of Conductor	mm ²	8.1	9.7	11.4	12.9	14.6	16.0	18.4	20.6	23.3
Conductor Diameter (approx)	mm	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Nominal Insulation Thickness	mm	0.5	0.5	0.5	0.8	0.8	0.8	0.8	0.8	0.8
Nominal Steel Tape Thickness	mm	3.2	3.3	3.5	3.6	3.7	3.9	4.0	4.2	4.4
Nominal Outer Sheath Thickness	mm	69.0	73.0	77.0	82.0	85.0	89.0	95.0	100.0	106.0
Weight of Cable (approx)	kg/km	5050	5610	6300	7750	8450	9220	10380	11580	13330
Standard Packing Length (± 5%)	m	500	250	250	250	250	250	250	250	250
Minimum Bending Radius during installation	m	1.07	1.14	1.20	1.28	1.32	1.38	1.48	1.55	1.65
DC resistance at 20°C (max)	Ω/km	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778
AC resistance at 90°C (approx)	Ω/km	0.818	0.565	0.408	0.323	0.263	0.209	0.160	0.128	0.0990
Reactance at 50 Hz (approx)	Ω/km	0.124	0.129	0.122	0.117	0.114	0.110	0.106	0.102	0.098
Impedance at 50 Hz (approx)	Ω/km	0.827	0.580	0.426	0.344	0.287	0.236	0.192	0.164	0.139
Capacitance at 50 Hz	µF/km	0.20	0.15	0.17	0.18	0.20	0.21	0.25	0.27	0.30
Charging Current/phase at U ₀ =18 kV, 50 Hz (approx)	A/km	1.13	0.85	0.96	1.02	1.13	1.19	1.41	1.53	1.70
Continuous Current Rating at cond temp. 90°C max										
1. Laid direct in ground	A	140	171	204	232	259	293	338	380	432
2. Laid into ducts	A	123	150	180	206	231	262	304	343	393
3. Laid in air in trefoil touching	A	159	196	238	274	309	354	415	472	545
Short Circuit Current Rating for 1 sec (Cond.temp 90°C initial & 250°C max final)	kA	4.7	6.6	8.9	11.3	14.1	17.4	22.6	28.2	37.6

1. Ground temperature: 20°C

2. Air temperature: 30°C

3. Thermal resistivity of soil: 1.5 K.m/W

4. Depth of laying: 0.8 m

5. For any other condition(s) please refer to the appropriate table for recommended installation data.

Assumptions:

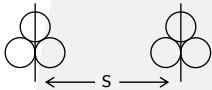
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GENERAL CABLE TECHNICAL DATA & RATING FACTORS



Table 26
Group Rating Factors for Circuits of three single core cables
in Trefoil Laid direct in Ground

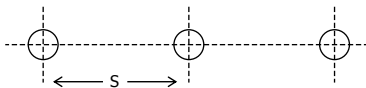
Number of trefoils in group	Touching	Spacing between group centres (S) mm			
		200	400	600	800
2	0.73	0.83	0.88	0.90	0.92
3	0.60	0.73	0.79	0.83	0.86
4	0.54	0.68	0.75	0.80	0.84
5	0.49	0.63	0.72	0.78	0.82
6	0.46	0.61	0.70	0.76	0.81
7	0.43	0.58	0.68	0.75	0.80
8	0.41	0.57	0.67	0.74	-
9	0.39	0.55	0.66	0.73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



S = Spacing between the group's centre

Table 27
Group Rating Factors for Circuits of Three core cables
Laid direct in Ground

Number of trefoils in group	Touching	Spacing between group centres (S) mm			
		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	-	-



S = Spacing between the cable's centre



Table 28
Rating Factors for Variation in Thermal resistivity of soil for three single core cables, Laid direct in Ground

Nominal area of conductor mm ²	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

Table 29
Rating Factors for Variation in Thermal resistivity of soil for three core cables, Laid direct in Ground

Nominal area of conductor mm ²	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

Table 30
Rating Factors for Depth of laying for cable, Laid direct in Ground

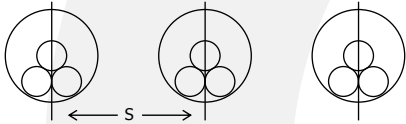
Depth of laying m	Single-core cables		Three-core cables
	Nominal conductor size mm ²		
	≤185 mm ²	>185 mm ²	
0.5	1.04	1.06	1.04
0.6	1.02	1.04	1.03
0.8	1.00	1.00	1.00
1.0	0.98	0.97	0.98
1.25	0.96	0.95	0.96
1.5	0.95	0.93	0.95
1.75	0.94	0.91	0.94
2.0	0.93	0.90	0.93
2.5	0.91	0.88	0.91
3.0	0.90	0.86	0.90

Table 31
**Rating Factors 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

Table 32
Group Rating Factors for Circuits of three single core cables in Ducts in Trefoil

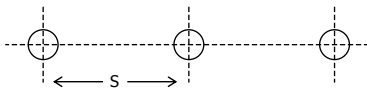
Number of trefoils in group	Touching	Spacing between group centres (S) mm			
		200	400	600	800
2	0.78	0.85	0.89	0.91	0.93
3	0.66	0.75	0.81	0.85	0.88
4	0.59	0.70	0.77	0.82	0.86
5	0.55	0.66	0.74	0.80	0.84
6	0.51	0.64	0.72	0.78	0.83
7	0.48	0.61	0.71	0.77	0.82
8	0.46	0.60	0.70	0.76	-
9	0.44	0.58	0.69	0.76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

Table 33
Group Rating Factors for Circuits of Three core cables, In Duct in Horizontal formation

Number of trefoils in group	Touching	Spacing between group centres (S) mm			
		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's centre

Table 34
Rating Factors for Depth of laying for cable, Laid direct in Duct

Depth of laying m	Single-core cables		Three-core cables
	Nominal conductor size mm ²		
	≤185 mm ²	>185 mm ²	
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

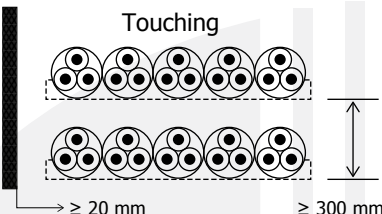
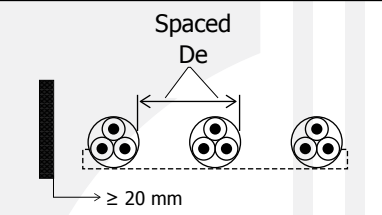
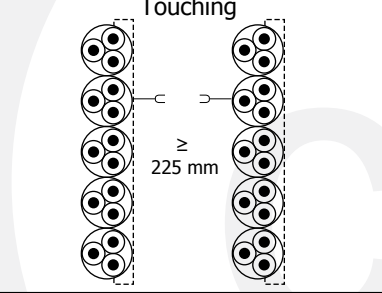
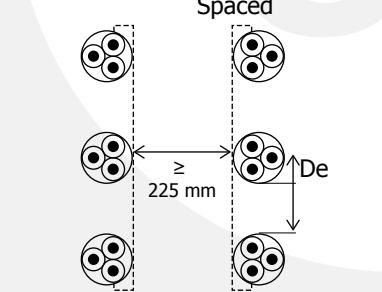
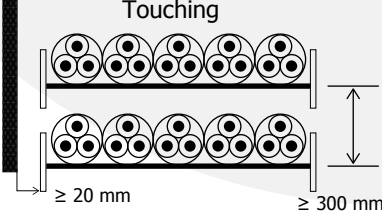
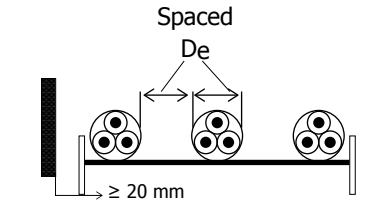
Table 35
**Rating Factors for Variation in
Ground temperature for cable Laid direct in Ducts**

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

Table 36
Rating Factors for Variation in Ambient Air temperature

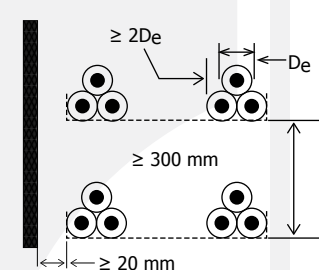
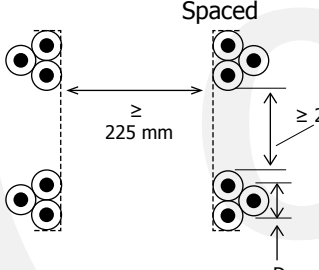
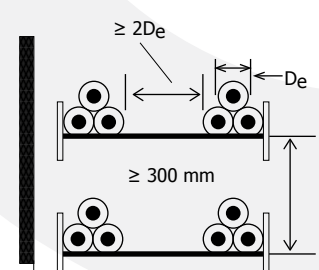
Ambient Temperature °c	20	25	30	35	40	45	50	55	60
Rating Factor	1.08	1.04	1.00	0.96	0.91	0.87	0.82	0.76	0.71

Table 37
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	 <p>Touching</p> <p>≥ 20 mm ≥ 300 mm</p>	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
	 <p>Spaced</p> <p>De</p> <p>≥ 20 mm</p>	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	 <p>Touching</p> <p>≥ 225 mm</p>	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
	 <p>Spaced</p> <p>De</p> <p>≥ 225 mm</p>	1	1.00	0.91	0.89	0.88	0.87	-
		2	1.00	0.91	0.88	0.87	0.85	-
		3	1.00	0.91	0.88	0.87	0.85	-
		4	1.00	0.91	0.88	0.87	0.85	-
Cables on ladder supports, cleats, etc	 <p>Touching</p> <p>≥ 20 mm ≥ 300 mm</p>	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
	 <p>Spaced</p> <p>De</p> <p>≥ 20 mm</p>	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.

Table 38
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) 	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.

Table 39
Recommended Minimum Bending Radius

	Type of cables	Minimum Bending Radius	
	Single core	During Laying	Adjacent to Joints/ termination
Up to 22 kV	1. Unarmoured	20D	15D
	2. Armoured	15D	12D
	3 Core		
	1. Unarmoured	15D	12D
	2. Armoured	12D	10D
	33 kV		Laid in Ducts/Air
1. Unarmoured		20D	15D
2. Armoured		15D	12D

Table 40
Recommended Duct Sizes

Cable Diameter (mm)	Nominal Duct Diameter (mm)
Up to 65	100
Over 65 up to 90	125
Over 90 up to 115	150

Table 41
Maximum Recommended Pulling Tensions Using Pulling Eye on Conductor

Cable Diameter (mm)	Nominal Duct Diameter (mm)
Copper	0.070 kN/mm ²
Aluminium (Stranded)	0.050 kN/mm ²
Using Pulling on Steel wire armour	0.005 kN/mm ²
Using Stocking Grip	0.0035D ² kN





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