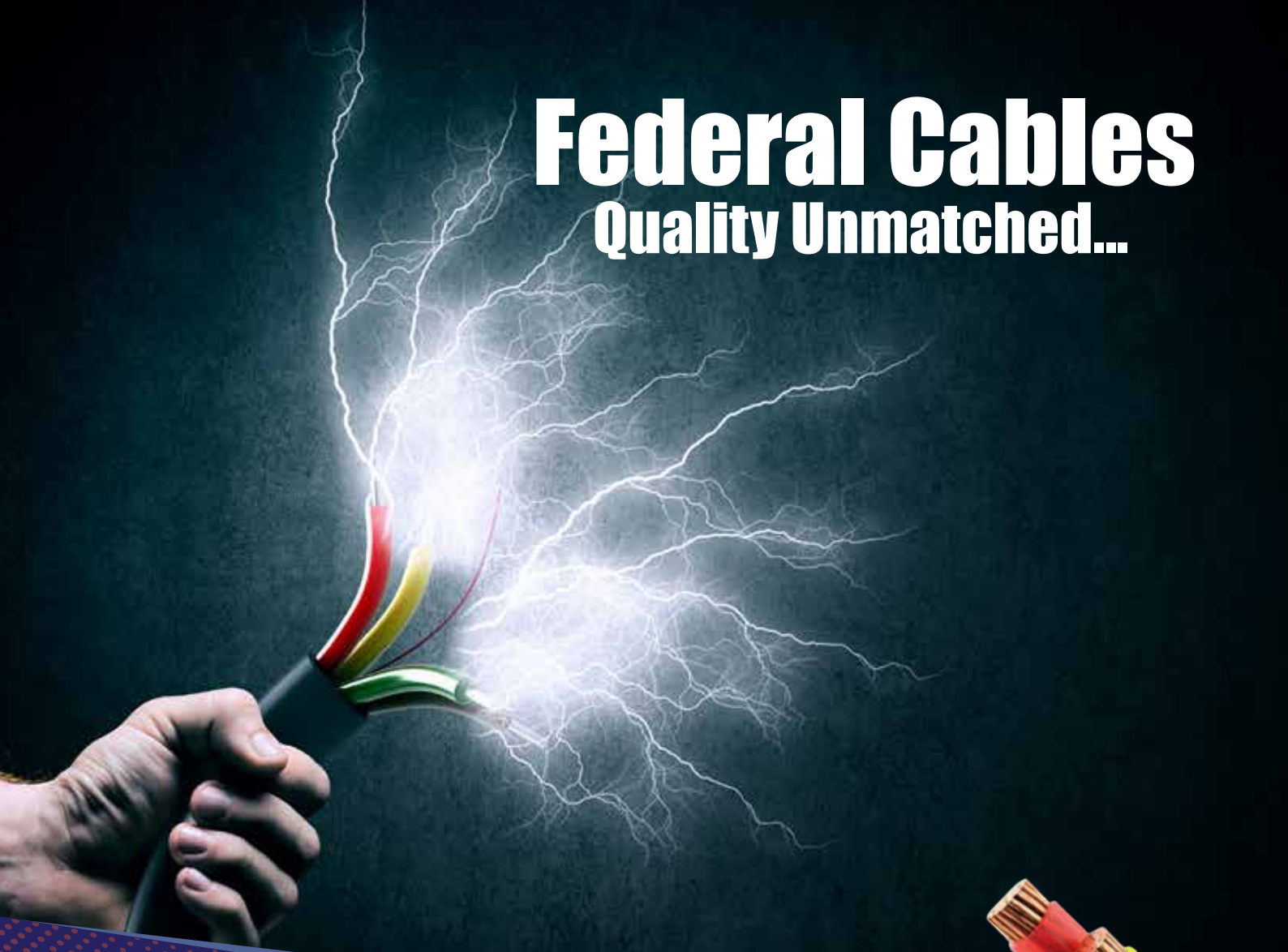
Federal Cables
Quality Unmatched...



Low Voltage
Power Cables

fedcab

Quality Unmatched..

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Index

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Quality Unmatched..

Introduction

"FEDERAL CABLES" (Fedcab) is part of Federal group of companies established in the year 1999. We are proud partners to the various energy needs of Middle east through different sectors. **Fedcab's** manufacturing facility is located in Abu Dhabi, UAE with state of the art machineries and integrated technical expertise. Apart from cables, Federal manufactures power and distribution transformers, bus ducts and switchgear Panels.

Fedcab current range of cables include XLPE, PVC, LSZH and HO7RN-F insulation conforming to international standards such as BS, IEC, VDE, GOST or any other standard that may be desired by a client.

Product Range

- Low Voltage XLPE or PVC Insulated Power Cables
- LV PVC Insulated building wires
- LV PVC Insulated trirated Panel Wires
- PVC Flexible cables
- LV XLPE Insulated LSZH Cables
- LV LSZH Insulated Wires
- Rubber Insulated HO7RN-F cables
- Fire resistant cables
- Instrumentation Cables
- Control & Auxiliary Cables

Technical Advisory Services

Fedcab has a dedicated technical advisory team to assist customers in choosing the apt product technically suitable for their requirements.

Quality Standard

Quality Management System Certified to ISO 9001

Fedcab's Quality Management System conforming to ISO 9001:2015 is certified by TUV NORD Germany.

Certification to the ISO 9001 standard demonstrates that Fedcab has documented procedures to ensure and demonstrate full compliance with all requirements of the standard and that these procedures are followed by every department in the company, thus ensuring that goods leaving **Fedcab's** factory are of the best quality and meet customer's requirements in every respect.

Fedcab is committed to supply best quality products which it articulates with the slogan "Quality Unmatched". Fedcab cables are type tested at DEKRA Certification B.V, The Netherlands as below.

Environmental Management System Certified to ISO 14001

Fedcab's Environmental Management System conforms to the ISO 14001:2015 International Environmental Management Standard and is certified by TUV NORD, Germany.

Certification to the ISO 14001:2015 International standard shows that Fedcab has a well defined structure and established working practices aimed at limiting its impact on the environment. Measurement and monitoring of effects, issuing work instructions, training of personnel and taking corrective actions are all essential elements to limiting the impact on the environment. Fedcab has set improvement targets to reduce the significant environmental impacts associated with its activities and thus ensuring sustainability.

Occupational Health & Safety Assessment Certified To OHSAS 18001:2007

Fedcab is certified to OHSAS, an internationally accepted Standard for occupational health and safety management systems. This certification demonstrates Fedcab's adherence to sound occupational health & safety practices.

Manufacturing, Inhouse Testing & Quality Measures

Fedcab takes utmost care while manufacturing its products. We have the latest plant and equipment from manufacturers such as **Niehoff-Germany, Rosendhal-Austria and Royle systems-USA**. We have online diameter gauges from BETA Lasermike, USA, Sikora, Germany and state of the art cable quicke optical non-contact measurement system from Sweden. We have online high voltage testing facility on our extrusion lines. Entire production process is carried out in-house and quality checks are carried out at each stage of production right from raw material to the finished product. We procure raw materials from best available sources which qualify to our in-house quality standards.

Federal Cables have most modern and fully equipped laboratory for testing materials and finished cables. Raw materials, in process materials and finished cables are all tested as per well documented quality norms. The laboratory is manned by engineers and managers having rich experience. We have complete facility for testing cables for fire performance, flame retardance, low smoke and halogen free characteristics etc.

Final testing is done according to the requirement of the various specifications, ensuring full compliance and long term product reliability. In addition to all electrical testing, all cables are subjected to stringent physical and mechanical testing. We have complete Type Testing facility for all types of cables that we produce.

LV XLPE CABLES

Cable type

Cable type covered are given below.

- Plain Copper Conductor, XLPE insulated, Armoured or unarmoured Cables with PVC, PE or FR PVC Outer sheath.
- Single core cables up to and including 1000mm^2
- 2 core cables up to and including 400mm^2
- 3 core cables up to and including 400mm^2
- 4 core & 3.5 core (4 core with reduced neutral) cables up to and including 400mm2
- 5 core cables up to and including 70 mm^2
- 1.5 mm^2, 2.5 mm2 & 4 mm^2 auxiliary cables.

Cables with separate earth and or overall screen for VFD drives up to and including 300mm2 are also available on request.

Specifications

- BS 5467- XLPE insulated armoured single and multicore power cables & Auxiliary cables
- IEC 60502 (Part 1)-XLPE or PVC insulated single / multicore, armoured / unarmoured, Power & control cables
- BS 7889- XLPE insulated single core unarmoured cables
- Cables as per any other International Standard VDE/DIN, ANSI/ICEA, GOST, NF etc or as per customer's specifications can also be supplied.

Cable Construction

1. CONDUCTOR

Plain annealed copper conductor complying with BS EN 60228. The conductor is stranded circular, stranded circular compacted or shaped compacted as per requirement.

2. INSULATION

Insulation material is Cross Linked Polyethylene (XLPE) complying with IEC 60502-1 or type GP8 as per BS 7655-1.3.

2.1 CORE COLORS

European standard for core identification with specific functional requirement for blue and Green-yellow cores termed as the new colour scheme and is given below.

No. of cores	Old colour scheme	New colour scheme
1	Red or Black	Brown or Blue
2	Red & Black	Brown & Blue
3	Red, Yellow & Blue	Brown, Black & Grey
4	Red, Yellow, Blue & Black	Blue, Brown, Black & Grey
5	Red, Yellow, Blue, Black & Green	Green-Yellow, Blue, Brown, Black & Grey

3. ASSEMBLY

The Insulated cores are laid-up together. Polymeric fillers are provided (if required) in the core interstices to provide circular shape and the assembly is wrapped with polypropylene or polyester binder tapes for holding.

4. METALIC SCREEN

Fedcab provides different types of metallic screen whenever required according to the cable design suitable for specific applications. Common screening materials are Copper tapes and Copper / aluminium laminates.

5. BEDDING

Bedding consists of an extruded PVC or Polyethylene compound as per BS 5467, IEC 60502-1 or relevant cable specification. It forms an inner sheath and a bedding for the armour.

6. ARMOUR

Armour act as a mechanical protection for the cores against physical damages when the cable is laid. Armour can also serve as an Earth Continuity Conductor (ECC).

Different types of Armoring are Galvanized round steel wire (GSW), Aluminium round wire, Galvanized round steel wire plus tinned copper wires (TCW) for achieving lower armor resistance (when required by customer) and Galvanised double steel tapes.

Aluminum round wire armor (AWA) is generally used for single core cables to be used in ac circuits as aluminum is a non-magnetic material and this reduces losses due to induced currents in the armor.

7. OUTER SHEATH OR JACKET

Outer sheath or Jacket is the overall covering of the cable. It protects the cable from any deleterious elements in the environment where the cable is laid. Different types of materials are used as outer sheath depending on the application.

General purpose PVC Type ST2 compound as specified in IEC 60502-1 or its equivalent PVC Type 9 as per BS 7655-4.2

Medium Density Polyethylene (MDPE): Offers higher protection from water ingress and abrasion.

High density Polyethylene (HDPE) - Offers higher protection from water ingress and abrasion.

Anti Termite & Anti Rodent: Termite and rodent resistance can be built in both types of outer sheath mentioned above by compounding with proper additives.

Flame retardance (FR): Special FR compounds can retard propagation of flame through the cable during fire when used as cable jacket. Oxygen Index of such FR compounds generally needs to be above 30%.

Reduced Propagation and Low Acid Fumes (LSF): Retards propagation of flame and restricts generation of hydrochloric acid fumes to considerably low levels. Such materials have Oxygen Index above 30% & acid gas emission less than 18% (by weight).

Installation

Depending on the application and the area of use type of cable required can differ. All cables mentioned in this catalogue can be used indoor or outdoor. However, it is recommended to follow the below guidelines while installing the cable.

A) Unarmoured cables are not recommended for direct buried applications, unless adequate measures are taken to protect the cable from mechanical damage.

B) Armoured cables are not recommended for tray applications, as they may put extra load on the tray, being heavy. In case armoured cables are to be laid in trays, sufficient reinforcement has to be provided to bear the cable weight.

C) Care should be taken while installing the cables not to damage the outer sheath. Since damage of outer sheath may allow moisture or other pollutants in the surroundings entry and thereby corrosion of armoring especially in the case of Aluminum wire armour. This may lead to the loss of earth continuity.

D) Cable end caps should not be removed until immediately prior to termination or jointing. Unprotected ends of cable should not be exposed to moisture.

E) Due to the relatively high conductor temperature, there is a risk of drying out the surrounding soil, when installed in ground causing an increase in thermal resistivity, which in turn would lead to a higher cable temperature than anticipated. For cables laid directly in the ground, a suitable derating factor should be considered or a lower maximum sustained operating temperature should be assumed to take into account the possible effect of soil drying out.

Mnimum Bending Radius

Cable should not be bend below the recommended minimum bending radius as mentioned in Table2. The inner jacket may get damaged if cables are bent on radius less than the recommended values.

Table 2

Cable type	Minimum internal radius of bend
Circular copper conductors	6D
Solid Aluminium or shaped copper conductors	8D

'D' is the overall diameter of the cable.

Maximum Pulling Tension

Maximum pulling tension shall not exceed the below values while installing the cables.

Cables pulled by pulling eye

Copper cables : F = 50 x n x A

Aluminium cables : F = 30 x n x A

Where n = number of cores, A = cross-sectional area of conductor (mm2) and F = Pulling tension in N

Current Rating

The calculation of the current ratings, Current rating equations (100% load factor) and calculation of losses are based on IEC 60287 series , and the values of Current ratings for underground applications (In Duct or Direct Buried) are derived from the latest issue of ERA Report 'Current Rating Standards for distribution cables 69-30 Part V'. The ratings for a cable installed in Air are adopted from BS 7671, IEE Wiring Regulations, 17th edition.

Current ratings mentioned in the tables below are for the following standard installation conditions. For any change in the installation condition, current ratings in the tables should be multiplied by the respective derating factors.

Max. continuous operating conductor temperature: 90°C

Ambient Air Temperature	:	45°C
Ambient Ground Temperature	:	35°C
Depth of laying in ground	:	0.50 m
Soil Thermal Resistivity	:	1.2 K.m/W

IEE Wiring Regulations - Requirement For Cables

The IEE Wiring Regulations for installation and selection of cables cannot be approached in isolation from the other equipments in the installation. In particular the devices providing protection against overload, short circuit, shock by indirect contact and over-heating of protective conductors during an earth fault, affect the selection of cables.

Regulation 543 explains how the cross sectional area of the circuit protective conductor should be calculated to avoid its over-heating during a fault to earth. Again the area required depends on the characteristics of the device providing protection against short circuit.

The steel wire armor of standard cables to BS 5467 (XLPE) and IEC 60502-1 provides the required area or more, when the protective device is one of the standard fuses or MCB's with a rating not higher than the current rating of the cable (assuming disconnection within 5 seconds).

For the most of the cables the armor is still adequate when the fuse rating is one or two steps, or even more, above the current rating of the cable, the margins being greater for the small sizes and 4 core cables than for the larger sizes and two core cables.

Voltage Drop

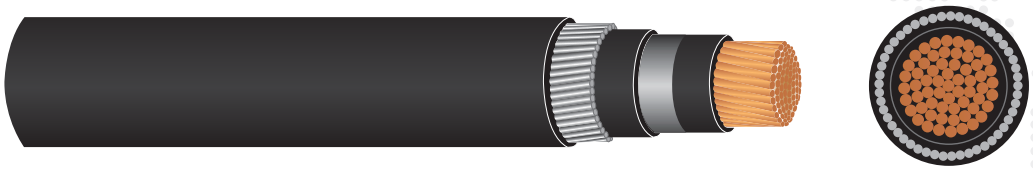
When the current flows in conductor, there is a voltage drop between the ends of the conductor. If the wiring has done on the basis of IEE wiring regulations, the Voltage Drop should not exceed to a particular range to make sure the smooth functioning of the system. For low voltage cable network of normal operation, voltage drop could be of 3-5 %.

Calculation of voltage drop :

Single phase circuit	:	$Vd = 2\ I\ (R \cos\phi + X \sin\phi)\ L$
Three phase circuit	:	$Vd = \sqrt{3}\ I\ (R \cos\phi + X \sin\phi)L$
Where Vd	:	Voltage drop (V)
I	:	Load current (A)
R	:	AC resistance at operating temperature (Ω/km)
X	:	Reactance (Ω/km)
L	:	Length (km)
cosØ	:	Power factor
Ø	:	Phase Angle of load

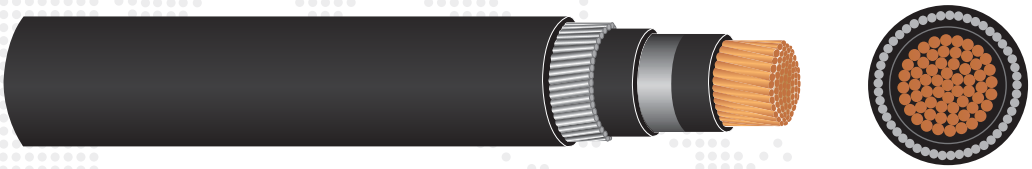
Xlpe Insulated, Armoured, Pvc Sheathed Low Voltage Cables

Single Core Armoured Cables 600/1000 V, CU/XLPE/AWA/PVC as per BS 5467



Nominal Size	Nominal Insulation Thickness	Nominal Thickness of Bedding	Nominal Armour Wire Diameter	Nominal Outer sheath Thickness	Approx. Overall Cable Diameter	Approx. Weight
(mm^2)	(mm)	(mm)	(mm)	(mm)	(mm)	Kg/km
50	1.0	0.8	0.9	1.5	17.0	650
70	1.1	0.8	1.25	1.5	19.0	900
95	1.1	0.8	1.25	1.6	21.0	1180
120	1.2	0.8	1.25	1.6	23.0	1430
150	1.4	1.0	1.6	1.7	26.0	1800
185	1.6	1.0	1.6	1.8	28.0	2220
240	1.7	1.0	1.6	1.8	31.0	2800
300	1.8	1.0	1.6	1.9	33.0	3420
400	2.0	1.2	2.0	2.0	38.0	4430
500	2.2	1.2	2.0	2.1	41.0	5500
630	2.4	1.2	2.0	2.2	46.0	6950
800	2.6	1.4	2.5	2.4	52.0	8990
1000	2.8	1.4	2.5	2.5	57.0	11070

Single Core Armoured cables, DC Resistance, Current ratings & Voltage drop.



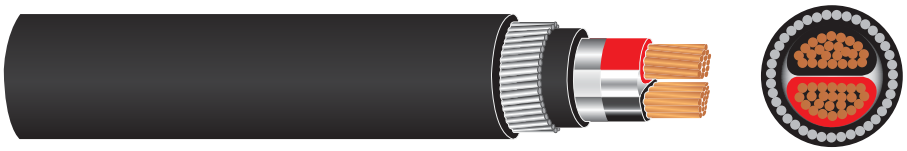
Nominal Size	Maximum DC Resistance at @20° C		Current Rating			Approx Volatge Drop		
	Conductor	Armour	In Air	In Ground	In Duct	In Air	In Ground	In Duct
(mm^2)	(Ω/km)	(Ω/km)	(A)	(A)	(A)	(V/A/km)	(V/A/km)	(V/A/km)
50	0.387	1.3	192	199	199	0.86	0.88	0.92
70	0.268	0.75	245	244	240	0.61	0.63	0.69
95	0.193	0.67	300	292	282	0.46	0.48	0.55
120	0.153	0.61	350	332	315	0.38	0.40	0.47
150	0.124	0.42	400	371	342	0.32	0.34	0.42
185	0.0991	0.38	460	417	376	0.27	0.29	0.38
240	0.0754	0.34	543	480	421	0.23	0.25	0.34
300	0.0601	0.31	618	536	459	0.20	0.22	0.31
400	0.0470	0.22	706	594	488	0.19	0.21	0.29
500	0.0366	0.2	800	658	528	0.17	0.19	0.27
630	0.0283	0.18	900	723	570	0.16	0.18	0.25
800	0.0221	0.13	978	764	595	0.16	0.18	0.24
1000	0.0176	0.12	1060	810	632	0.15	0.17	0.23

In Ground : Three cables directly laid in trefoil touching

In Duct : In single way ducts in trefoil

In Air : Three cables laid in trefoil touching

Two Core Armoured Cables 600/1000 V, CU/XLPE/SWA/PVC as per BS 5467

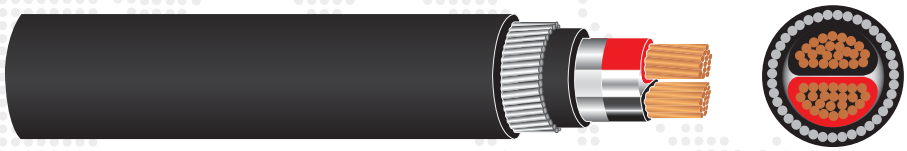


Nominal Size	Nominal Insulation Thickness	Nominal Thickness of Bedding	Nominal Armour Wire Diameter	Nominal Outer Sheath Thickness	Approx. Overall Cable Diameter	Approx. Weight
(mm^2)	(mm)	(mm)	(mm)	(mm)	(mm)	(Kg/km)
1.5 *	0.6	0.8	0.9	1.3	12.0	260
2.5 *	0.7	0.8	0.9	1.4	13.0	320
4 *	0.7	0.8	0.9	1.4	14.5	380
6 *	0.7	0.8	0.9	1.4	15.5	460
10 *	0.7	0.8	0.9	1.5	17.5	600
16 *	0.7	0.8	1.25	1.5	20.0	850
25	0.9	0.8	1.25	1.6	20.0	975
35	0.9	1.0	1.6	1.7	22.0	1380
50	1.0	1.0	1.6	1.8	24.0	1700
70	1.1	1.0	1.6	1.9	28.0	2200
95	1.1	1.2	2.0	2.0	31.5	3020
120	1.2	1.2	2.0	2.1	33.5	3590
150	1.4	1.2	2.0	2.2	37.0	4300
185	1.6	1.4	2.5	2.4	41.0	5480
240	1.7	1.4	2.5	2.5	46.0	6800
300	1.8	1.6	2.5	2.6	49.0	8250
400	2.0	1.6	2.5	2.8	55.0	10100

* Circular conductor.

All others are shaped conductors.

Two Core Armoured cables, DC Resistance, Current ratings & Voltage drop.



Nominal Size	Maximum DC Resistance at @20° C		Current Rating			Approx Volatge Drop		
	Conductor	Armour	In Air	In Ground	In Duct	In Air	In Ground	In Duct
(mm^2)	(Ω/km)	(Ω/km)	(A)	(A)	(A)	(V/A/km)	(V/A/km)	(V/A/km)
1.5	12.1	10.2	25	33	27	31	31	31
2.5	7.41	8.8	34	42	35	19	19	19
4	4.61	7.9	46	56	46	12	12	12
6	3.08	7.0	58	70	58	7.9	7.9	7.9
10	1.83	6.0	80	94	77	4.7	4.7	4.7
16	1.15	3.7	105	121	99	2.89	2.91	2.89
25	0.727	3.7	136	157	127	1.89	1.91	1.89
35	0.524	2.6	168	188	153	1.29	1.31	1.29
50	0.387	2.3	203	223	181	0.99	1.01	0.99
70	0.268	2.0	255	273	224	0.69	0.71	0.69
95	0.193	1.4	315	328	269	0.49	0.51	0.49
120	0.153	1.3	363	372	307	0.39	0.41	0.39
150	0.124	1.2	415	417	345	0.39	0.41	0.39
185	0.0991	0.82	478	470	391	0.29	0.31	0.29
240	0.0754	0.73	565	544	453	0.19	0.21	0.19
300	0.0601	0.67	643	609	509	0.19	0.21	0.19
400	0.0470	0.59	740	687	575	0.18	0.20	0.18

In Ground : Directly laid

In Duct : In Single way ducts

Three Core Armoured Cables 600/1000 V, CU/XLPE/SWA/PVC as per BS 5467

Nominal Size	Nominal Insulation Thickness	Nominal Thickness of Bedding	Nominal Armour Wire Diameter	Nominal Outer Sheath Thickness	Approx. Overall Cable Diameter	Approx. Weight
(mm^2)	(mm)	(mm)	(mm)	(mm)	(mm)	(Kg/km)
1.5 *	0.6	0.8	0.9	1.3	12.5	285
2.5 *	0.7	0.8	0.9	1.4	13.5	360
4 *	0.7	0.8	0.9	1.4	15.0	435
6 *	0.7	0.8	0.9	1.4	16.5	530
10 *	0.7	0.8	1.25	1.5	19.0	810
16 *	0.7	0.8	1.25	1.6	21.0	1035
25	0.9	1.0	1.6	1.7	22.5	1450
35	0.9	1.0	1.6	1.8	25.0	1800
50	1.0	1.0	1.6	1.8	27.5	2260
70	1.1	1.0	1.6	1.9	31.0	3000
95	1.1	1.2	2.0	2.1	35.5	4110
120	1.2	1.2	2.0	2.2	38.5	4940
150	1.4	1.4	2.5	2.3	43.0	6350
185	1.6	1.4	2.5	2.4	47.0	7550
240	1.7	1.4	2.5	2.6	52.0	9450
300	1.8	1.6	2.5	2.7	58.0	11450
400	2.0	1.6	2.5	2.9	63.0	14200

* Circular conductor.

All others are shaped conductors.

Three Core Armoured cables, DC Resistance, Current ratings & Voltage drop.

Nominal Size	Maximum DC Resistance at @20° C		Current Rating			Approx Volatge Drop		
	Conductor	Armour	In Air	In Ground	In Duct	In Air	In Ground	In Duct
(mm^2)	(Ω/km)	(Ω/km)	(A)	(A)	(A)	(V/A/km)	(V/A/km)	(V/A/km)
1.5	12.1	9.5	22	28	22	27	27	27
2.5	7.41	8.2	29	36	29	16	16	16
4	4.61	7.5	39	47	39	10	10	10
6	3.08	6.7	49	59	48	6.8	6.8	6.8
10	1.83	4	68	79	65	4.0	4.0	4.0
16	1.15	3.5	89	102	83	2.5	2.5	2.5
25	0.727	2.5	116	131	107	1.69	1.71	1.69
35	0.542	2.3	143	157	128	1.19	1.21	1.19
50	0.387	2	173	187	152	0.89	0.91	0.89
70	0.268	1.8	218	229	187	0.59	0.61	0.59
95	0.193	1.3	269	274	226	0.49	0.51	0.49
120	0.153	1.2	312	312	258	0.39	0.41	0.39
150	0.124	0.78	357	349	291	0.29	0.31	0.29
185	0.0991	0.71	411	394	329	0.29	0.31	0.29
240	0.0754	0.63	485	455	380	0.19	0.21	0.19
300	0.0601	0.58	553	509	427	0.19	0.21	0.19
400	0.0470	0.52	636	574	490	0.19	0.21	0.19

In Ground : Directly laid

In Duct : In Single way ducts

Four Core Armoured Cables 600/1000 V, CU/XLPE/SWA/PVC as per BS 5467

Nominal Size	Nominal Insulation Thickness	Nominal Thickness of Bedding	Nominal Armour Wire Diameter	Nominal Outer Sheath Thickness	Approx. Overall Cable Diameter	Approx. Weight
(mm^2)	(mm)	(mm)	(mm)	(mm)	(mm)	(Kg/km)
1.5 *	0.6	0.8	0.9	1.3	13.0	320
2.5 *	0.7	0.8	0.9	1.4	14.5	410
4 *	0.7	0.8	0.9	1.4	15.5	510
6 *	0.7	0.8	1.25	1.5	18.0	725
10 *	0.7	0.8	1.25	1.5	20.5	960
16 *	0.7	0.8	1.25	1.6	22.5	1250
25	0.9	1.0	1.6	1.7	25.5	1810
35	0.9	1.0	1.6	1.8	28.5	2280
50	1.0	1.0	1.6	1.9	31.0	2900
70	1.1	1.2	2.0	2.1	37.0	4110
95	1.1	1.2	2.0	2.2	40.5	5240
120	1.2	1.4	2.5	2.3	45.5	6800
150	1.4	1.4	2.5	2.4	50.0	8100
185	1.6	1.4	2.5	2.6	55.0	9800
240	1.7	1.6	2.5	2.7	61.0	12300
300	1.8	1.6	2.5	2.9	66.5	14950
400	2.0	1.8	3.2	3.2	76.0	19500

* Circular conductor.

All others are shaped conductors.

Four core Armoured cables, DC Resistance, Current ratings & Voltage drop.

Nominal Size	Maximum DC Resistance at @20° C		Current Rating			Approx Volatge Drop		
	Conductor	Armour	In Air	In Ground	In Duct	In Air	In Ground	In Duct
(mm^2)	(Ω/km)	(Ω/km)	(A)	(A)	(A)	(V/A/km)	(V/A/km)	(V/A/km)
1.5	12.1	8.8	22	28	22	27	27	27
2.5	7.41	7.7	29	36	29	16	16	16
4	4.61	6.8	39	47	39	10	10	10
6	3.08	4.3	49	59	48	6.8	6.8	6.8
10	1.83	3.7	68	79	65	4.0	4.0	4.0
16	1.15	3.1	89	102	83	2.5	2.5	2.5
25	0.727	2.3	116	131	107	1.69	1.71	1.69
35	0.542	2.0	143	157	128	1.19	1.21	1.19
50	0.387	1.8	173	187	152	0.89	0.91	0.89
70	0.268	1.2	218	229	187	0.59	0.61	0.59
95	0.193	1.1	269	274	226	0.49	0.51	0.49
120	0.153	0.76	312	312	258	0.39	0.41	0.39
150	0.124	0.68	357	349	291	0.29	0.31	0.29
185	0.0991	0.61	411	394	329	0.29	0.31	0.29
240	0.0754	0.54	485	455	380	0.19	0.21	0.19
300	0.0601	0.49	553	509	427	0.19	0.21	0.19
400	0.0470	0.35	636	574	490	0.19	0.21	0.19

In Ground : Directly laid

In Duct : In Single way ducts

Five Core Armoured Cables 600/1000 V, CU/XLPE/SWA/PVC as per BS 5467

Nominal Size	Nominal Insulation Thickness	Nominal Thickness of Bedding	Nominal Armour Wire Diameter	Nominal Outer Sheath Thickness	Approx. Overall Cable Diameter	Approx. Weight
(mm^2)	(mm)	(mm)	(mm)	(mm)	(mm)	(Kg/km)
1.5	0.6	0.8	0.9	1.4	14.0	370
2.5	0.7	0.8	0.9	1.4	15.5	470
4	0.7	0.8	0.9	1.5	17.0	590
6	0.7	0.8	1.25	1.5	19.5	845
10	0.7	0.8	1.25	1.6	22.0	1130
16	0.7	1.0	1.6	1.7	26.0	1640
25	0.9	1.0	1.6	1.8	30.0	2300
35	0.9	1.0	1.6	1.9	33.0	2820
50	1.0	1.2	2.0	2.0	38.5	3940
70	1.1	1.2	2.0	2.2	43.5	5200

Five Core Armoured cables, DC Resistance, Current ratings & Voltage drop.

Nominal Size	Maximum DC Resistance at @20° C		Current Rating			Approx Volatge Drop		
	Conductor	Armour	In Air	In Ground	In Duct	In Air	In Ground	In Duct
(mm^2)	(Ω/km)	(Ω/km)	(A)	(A)	(A)	(V/A/km)	(V/A/km)	(V/A/km)
1.5	12.1	8.2	22	28	22	27	27	27
2.5	7.41	6.8	29	36	29	16	16	16
4	4.61	6.2	39	47	39	10	10	10
6	3.08	3.9	49	59	48	6.8	6.8	6.8
10	1.83	3.4	68	79	65	4.0	4.0	4.0
16	1.15	2.2	89	102	83	2.5	2.5	2.5
25	0.727	1.8	116	131	107	1.69	1.71	1.69
35	0.542	1.6	143	157	128	1.19	1.21	1.19
50	0.387	1.1	173	187	152	0.89	0.91	0.89
70	0.268	0.94	218	229	187	0.59	0.61	0.59

In Ground : Directly laid

In Duct : In Single way ducts

Armoured Auxiliary Cables 600/1000 V, CU/XLPE/SWA/PVC as per BS 5467

Nominal Size	Nominal Insulation Thickness	Nominal Thickness of Bedding	Nominal Armour Wire Diameter	Nominal Outer Sheath Thickness	Approx. Overall Diameter	Approximate Weight
(mm^2)	(mm)	(mm)	(mm)	(mm)	(mm)	(Kg/km)
7x1.5	0.6	0.8	0.9	1.4	15.0	440
12x1.5		0.8	1.25	1.5	19.0	715
19x1.5		0.8	1.25	1.6	21.5	950
27x1.5		1.0	1.6	1.7	26.0	1355
37x1.5		1.0	1.6	1.7	28.5	1650
48x1.5		1.0	1.6	1.8	32.0	2040
7x2.5	0.7	0.8	0.9	1.4	16.5	560
12x2.5		0.8	1.25	1.6	21.5	945
19x2.5		1.0	1.6	1.7	26.0	1440
27x2.5		1.0	1.6	1.8	30.0	1820
37x2.5		1.0	1.6	1.8	33.0	2245
48x2.5		1.2	2.0	2.0	38.5	3020
7x4	0.7	0.8	1.25	1.5	19.0	835
12x4		1.0	1.6	1.6	25.0	1385
19x4		1.0	1.6	1.7	28.5	1800
27x4		1.0	1.6	1.9	33.5	2340
37x4		1.2	2.0	2.0	38.0	3300
48x4		1.2	2.0	2.1	43.0	4000

Armoured Auxiliary Cables, DC Resistance, Current ratings & Voltage drop.

Nominal Size	Maximum DC Resistance at @20° C		Current Rating			Approx Volatge Drop		
	Conductor	Armour	In Air	In Ground	In Duct	In Air	In Ground	In Duct
(mm^2)	(Ω/km)	(Ω/km)	(A)	(A)	(A)	(V/A/km)	(V/A/km)	(V/A/km)
7x1.5	12.1	7.5	16	19	16	27	27	27
12x1.5	12.1	4.0	13	16	13	27	27	27
19x1.5	12.1	3.5	11	13	11	27	27	27
27x1.5	12.1	2.3	10	12	10	27	27	27
37x1.5	12.1	2.0	9	10	9	27	27	27
48x1.5	12.1	1.8	8	9	8	27	27	27
7x2.5	7.41	6.3	22	24	21	16	16	16
12x2.5	7.41	3.5	18	20	18	16	16	16
19x2.5	7.41	2.3	15	17	15	16	16	16
27x2.5	7.41	1.9	12	14	13	16	16	16
37x2.5	7.41	1.7	11	12	11	16	16	16
48x2.5	7.41	1.2	10	12	10	16	16	16
7x4	4.61	4.0	29	32	28	10	10	10
12x4	4.61	2.3	24	27	23	10	10	10
19x4	4.61	2.0	20	22	19	10	10	10
27x4	4.61	1.7	17	20	16	10	10	10
37x4	4.61	1.2	15	17	15	10	10	10
48x4	4.61	1.0	14	16	13	10	10	10

Xlpe Insulated, Unarmoured, Pvc Sheathed Low Voltage Cables

Single Core Unarmoured Cables 600/1000 V, CU/XLPE/PVC as per BS 7889

Nominal Size	Nominal Insulation Thickness	Nominal Outer sheath Thickness	Approx. Overall Cable Diameter	Approx. Cable weight
(mm^2)	(mm)	(mm)	(mm)	(Kg/km)
50	1.0	1.4	14.0	525
70	1.1	1.4	16.0	715
95	1.1	1.5	18.0	970
120	1.2	1.5	20.0	1210
150	1.4	1.6	22.0	1480
185	1.6	1.6	24.5	1800
240	1.7	1.7	27.0	2355
300	1.8	1.8	30.0	2940
400	2.0	1.9	34.0	3730
500	2.2	2.0	38.0	4780
630	2.4	2.2	42.0	6180
800	2.6	2.3	47.0	7880
1000	2.8	2.4	52.0	9790

Single Core Unarmoured Cables, DC Resistance, Current ratings & Voltage drop

Nominal Size	Maximum DC Resistance at @20° C	Current Rating	Approx Volatge Drop
	Conductor	In Air	In Air
(mm^2)	(Ω/km)	(A)	(V/A/km)
50	0.387	185	0.86
70	0.268	236	0.61
95	0.193	292	0.46
120	0.153	342	0.38
150	0.124	394	0.32
185	0.0991	457	0.27
240	0.0754	546	0.23
300	0.0601	632	0.20
400	0.0470	736	0.19
500	0.0366	852	0.17
630	0.0283	984	0.16
800	0.0221	1118	0.16
1000	0.0176	1247	0.15

In Air : Three cables laid in trefoil touching

Two Core Unarmoured Cables 600/1000 V, CU/XLPE/PVC as per IEC 60502-1

Nominal Size	Nominal Insulation Thickness	Nominal Outer sheath Thickness	Approx. Overall Cable Diameter	Approx. Cable weight
(mm^2)	(mm)	(mm)	(mm)	(Kg/km)
1.5 *	0.7	1.8	10.0	115
2.5 *	0.7	1.8	11.0	140
4 *	0.7	1.8	12.0	175
6 *	0.7	1.8	13.0	225
10 *	0.7	1.8	15.0	320
16 *	0.7	1.8	16.5	445
25	0.9	1.8	16.0	610
35	0.9	1.8	18.0	800
50	1.0	1.8	20.0	1040
70	1.1	1.8	22.5	1420
95	1.1	2.0	25.5	1950
120	1.2	2.1	28.0	2440
150	1.4	2.2	31.0	3000
185	1.6	2.3	35.0	3700
240	1.7	2.5	40.0	4830
300	1.8	2.7	44.0	6020
400	2.0	2.9	49.0	7660

* Circular conductor.

All others are shaped conductors.

Two Core Unarmoured Cables, DC Resistance, Current ratings & Voltage drop.

Nominal Size	Maximum DC Resistance at @20° C	Current Rating	Approx Volatge Drop
	Conductor	In Air	In Air
(mm^2)	(Ω/km)	(A)	(V/A/km)
1.5	12.1	23	31
2.5	7.41	32	19
4	4.61	42	12
6	3.08	54	7.9
10	1.83	71	4.7
16	1.15	103	2.89
25	0.727	129	1.89
35	0.524	160	1.29
50	0.387	195	0.99
70	0.268	247	0.69
95	0.193	305	0.49
120	0.153	356	0.39
150	0.124	408	0.39
185	0.0991	472	0.29
240	0.0754	563	0.19
300	0.0601	650	0.19
400	0.0470	756	0.18

Three Core Unarmoured Cables 600/1000 V, CU/XLPE/PVC as per IEC 60502-1

Nominal Size	Nominal Insulation Thickness	Nominal Outer sheath Thickness	Approx. Overall Cable Diameter	Approx. Cable weight
(mm^2)	(mm)	(mm)	(mm)	(Kg/km)
1.5 *	0.7	1.8	10.5	130
2.5 *	0.7	1.8	11.5	160
4 *	0.7	1.8	12.5	220
6 *	0.7	1.8	14.0	280
10 *	0.7	1.8	16.0	430
16 *	0.7	1.8	17.5	610
25	0.9	1.8	18.0	870
35	0.9	1.8	20.0	1150
50	1.0	1.8	23.0	1520
70	1.1	1.9	26.0	2120
95	1.1	2.0	29.0	2860
120	1.2	2.1	32.5	3600
150	1.4	2.3	36.0	4440
185	1.6	2.4	39.5	5480
240	1.7	2.6	45.0	7110
300	1.8	2.8	50.0	8880
400	2.0	3.1	56.0	11290

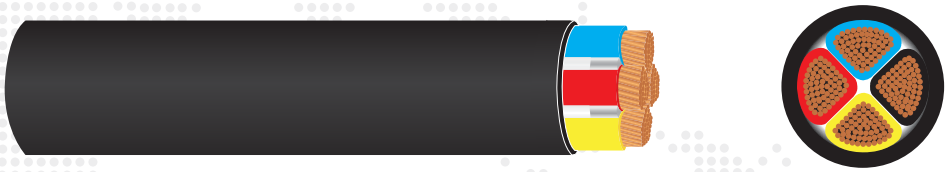
* Circular conductor.

All others are shaped conductors.

Three Core Unarmoured Cables, DC Resistance, Current ratings & Voltage drop.

Nominal Size	Maximum DC Resistance at @20° C	Current Rating	Approx Volatge Drop
	Conductor	In Air	In Air
(mm^2)	(Ω/km)	(A)	(V/A/km)
1.5	12.1	20	27
2.5	7.41	29	16
4	4.61	36	10
6	3.08	47	6.8
10	1.83	61	4.0
16	1.15	89	2.5
25	0.727	111	1.69
35	0.524	137	1.19
50	0.387	167	0.89
70	0.268	212	0.59
95	0.193	262	0.49
120	0.153	306	0.39
150	0.124	351	0.29
185	0.0991	406	0.29
240	0.0754	483	0.19
300	0.0601	558	0.19
400	0.0470	647	0.19

Four Core Unarmoured Cables 600/1000 V, CU/XLPE/PVC as per IEC 60502-1



Nominal Size	Nominal Insulation Thickness	Nominal Outer sheath Thickness	Approx. Overall Cable Diameter	Approx. Cable weight
(mm^2)	(mm)	(mm)	(mm)	(Kg/km)
1.5 *	0.7	1.8	11.0	160
2.5 *	0.7	1.8	12.5	205
4 *	0.7	1.8	13.5	275
6 *	0.7	1.8	15.0	360
10 *	0.7	1.8	17.0	540
16 *	0.7	1.8	19.0	790
25	0.9	1.8	21.5	1155
35	0.9	1.8	23.5	1520
50	1.0	1.9	26.0	2010
70	1.1	2.0	30.5	2820
95	1.1	2.1	34.0	3810
120	1.2	2.3	38.0	4805
150	1.4	2.4	42.5	5900
185	1.6	2.6	47.5	7290
240	1.7	2.8	53.5	9480
300	1.8	3.0	59.5	11810
400	2.0	3.3	68.0	15090

* Circular conductor.

All others are shaped conductors.

Four Core Unarmoured Cables, DC Resistance, Current ratings & Voltage drop.

Nominal Size	Maximum DC Resistance at @20° C	Current Rating	Approx Volatge Drop
	Conductor	In Air	In Air
(mm^2)	(Ω/km)	(A)	(V/A/km)
1.5	12.1	20	27
2.5	7.41	29	16
4	4.61	36	10
6	3.08	47	6.8
10	1.83	61	4.0
16	1.15	89	2.5
25	0.727	111	1.69
35	0.524	137	1.19
50	0.387	167	0.89
70	0.268	212	0.59
95	0.193	262	0.49
120	0.153	306	0.39
150	0.124	351	0.29
185	0.0991	406	0.29
240	0.0754	483	0.19
300	0.0601	558	0.19
400	0.0470	647	0.19

Five Core Unarmoured Cables 600/1000 V, CU/XLPE/PVC as per IEC 60502-1

Nominal Size	Nominal Insulation Thickness	Nominal Outer sheath Thickness	Approx. Overall Cable Diameter	Approx. Cable weight
(mm^2)	(mm)	(mm)	(mm)	(Kg/km)
1.5	0.7	1.8	11.5	170
2.5	0.7	1.8	13.0	220
4	0.7	1.8	14.0	320
6	0.7	1.8	16.0	415
10	0.7	1.8	18.0	650
16	0.7	1.8	20.0	955
25	0.9	1.8	24.0	1440
35	0.9	1.8	27.0	1570
50	1.0	2.0	31.0	2540
70	1.1	2.1	35.5	3500

Five Core Unarmoured Cables, DC Resistance, Current ratings & Voltage drop.

Nominal Size	Maximum DC Resistance at @20° C	Current Rating	Approx Volatge Drop
	Conductor	In Air	In Air
(mm^2)	(Ω/km)	(A)	(V/A/km)
1.5	12.1	20	27
2.5	7.41	27	16
4	4.61	36	10
6	3.08	47	6.8
10	1.83	61	4.0
16	1.15	89	2.5
25	0.727	111	1.69
35	0.524	137	1.19
50	0.387	167	0.89
70	0.268	212	0.59

Unarmoured Auxiliary Cables 600/1000 V, CU/XLPE/PVC as per IEC 60502-1

Nominal Size	Nominal Insulation Thickness	Nominal Outer sheath Thickness	Approx. Overall Cable Diameter	Approx. Cable weight
(mm^2)	(mm)	(mm)	(mm)	(Kg/km)
7x1.5	0.6	1.8	13.0	235
12x1.5		1.8	17.0	350
19x1.5		1.8	19.0	500
27x1.5		1.8	22.5	670
37x1.5		1.8	26.0	880
48x1.5		1.8	29.0	1100
7x2.5	0.7	1.8	14.5	310
12x2.5		1.8	18.0	470
19x2.5		1.8	21.0	690
27x2.5		1.8	25.0	940
37x2.5		1.8	28.0	1240
48x2.5		1.9	32.0	1600
7x4	0.7	1.8	16.0	410
12x4		1.8	20.0	660
19x4		1.8	23.5	970
27x4		1.8	28.5	1350
37x4		1.9	31.5	1810
48x4		2.1	36.0	2340

Unarmoured Auxiliary Cables, DC Resistance, Current ratings & Voltage drop.

Nominal Size	Maximum DC Resistance at @20° C	Current Rating	Approx Volatge Drop
	Conductor	In Air	In Air
(mm^2)	(Ω/km)	(A)	(V/A/km)
7x1.5	12.1	15	27
12x1.5	12.1	12	27
19x1.5	12.1	10	27
27x1.5	12.1	9	27
37x1.5	12.1	8	27
48x1.5	12.1	7	27
7x2.5	7.41	20	16
12x2.5	7.41	16	16
19x2.5	7.41	14	16
27x2.5	7.41	11	16
37x2.5	7.41	10	16
48x2.5	7.41	10	16
7x4	4.61	26	10
12x4	4.61	22	10
19x4	4.61	18	10
27x4	4.61	16	10
37x4	4.61	14	10
48x4	4.61	13	10

Rating Factors

Following rating factors shall be applied to the current ratings when the actual installation conditions differ from the standard conditions mentioned above.

INSTALLATION CONDITION FOR CABLES BURIED UNDER GROUND

For a cable installed direct buried, the following tables will be used to calculate the current rates based on the actual soil thermal resistivity, Ground ambient temperature and the Depth of Laying

Ground temperature	15˚C	20˚C	25˚C	30˚C	35˚C	40˚C	45˚C
Rating factors	1.16	1.13	1.08	1.03	1.00	0.95	0.90

Rating Factors for Depth of Laying

(To Centre Of Cable Or Trefoil Group Of Cables)

Depth of laying	Cables laid direct in ground		
m	Up to 50mm²	70mm2 to 300 mm²	Above 300 mm²
0.50	1.00	1.00	1.00
0.75	0.98	0.97	0.95
0.80	0.97	0.96	0.94
1.00	0.95	0.93	0.92
1.25	0.94	0.92	0.89
1.50	0.93	0.90	0.87
1.75	0.92	0.89	0.86
2.00	0.91	0.88	0.85
2.50	0.90	0.87	0.84
Above 3.00	0.89	0.85	0.82

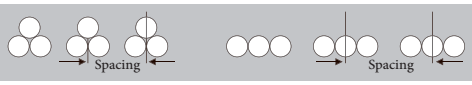
Rating Factors for Variation in Thermal Resistivity of Soil

(Avaerage Values)

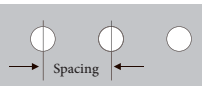
Size (mm²)	Soil thermal resistivity in k. m/W									
	0.7	0.8	0.9	1.0	1.2	1.5	2.0	2.5	3.0	3.5
Single core cables										
Up to 50	1.21	1.16	0.11	1.07	1.0	0.91	0.81	0.73	0.68	0.63
70 to 185	1.22	1.16	1.12	1.07	1.0	0.91	0.81	0.73	0.68	0.63
240 to 1000	1.23	1.17	1.12	1.07	1.0	0.91	0.80	0.73	0.67	0.62

Multicore cables										
Up to 4	1.12	1.09	1.07	1.04	1.0	0.94	0.85	0.79	0.74	0.69
6 to 16	1.15	1.11	1.08	1.05	1.0	0.93	0.84	0.77	0.72	0.66
25 to 50	1.17	1.13	1.09	1.06	1.0	0.92	0.83	0.76	0.71	0.65
70 to 185	1.19	1.14	1.10	1.06	1.0	0.92	0.82	0.75	0.69	0.63
240 to 400	1.20	1.15	1.10	1.07	1.0	0.92	0.81	0.74	0.69	0.63

Group Rating Factors for Circuits of Three Single CoreCables in Trefoil or Laid Flat Touching, In Horizontal Formation

Number of Circuits	Spacing of Circuits 					
	Touching		Spacing			
	Trefoil	Laid flat	cm 15	cm 30	cm 45	cm 60
2	0.78	0.81	0.83	0.88	0.91	0.93
3	0.66	0.70	0.73	0.79	0.84	0.87
4	0.61	0.64	0.68	0.73	0.81	0.85
5	0.56	0.60	0.64	0.73	0.79	0.85
6	0.53	0.57	0.61	0.71	0.78	0.82

Group Rating Factors for Multicore Cables in Horizontal Formation

Number of cables in group	Spacing of Circuits 				
	Touching	cm 15	cm 30	cm 45	cm 60
2	0.81	0.87	0.91	0.93	0.95
3	0.70	0.78	0.84	0.88	0.90
4	0.63	0.74	0.81	0.86	0.89
5	0.59	0.70	0.78	0.84	0.87
6	0.55	0.68	0.77	0.83	0.87

INSTALLATION CONDITIONS FOR CABLES IN DUCTS

A duct is an enclosure of metal or an insulating material other than conduit or cable trunking, intended for the protection of cables which are drawn in after erection of the ducting.

The recommended size of duct with respect to the cable diameter is given below.

RECOMMENDED DUCT DIMENSIONS AND CABLE SIZES

Overall cable diameter	Inside diameter of duct	Outside diameter of duct
≤ 65 mm	100 mm	130 mm
> 65 ≤ 90 mm	125 mm	160 mm

Where conditions of operation can be fairly accurately estimated and details of the soil along the route is available, it is possible to determine the current ratings more precisely by the use of estimated maximum ground temperature, soil thermal resistivity derating, grouping factors, and derating factors for the depths of laying, given in Tables .

Rating Factors of Variation in Thermal Resistivity of Soil For Installation in Ducts (Average Values)

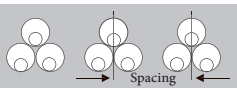
Size mm2	Soil thermal resistivity in k. m/W									
	0.7	0.8	0.9	1.0	1.2	1.5	2.0	2.5	3.0	3.5
Single core cables										
Up to 50	1.11	1.08	1.06	1.04	1.0	0.94	0.87	0.82	0.77	0.73
70 to 185	1.13	1.10	1.07	1.04	1.0	0.94	0.86	0.80	0.75	0.72
240 to 1000	1.15	1.11	1.08	1.05	1.0	0.93	0.85	0.78	0.72	0.68
Multicore cables										
Up to 4	1.04	1.03	1.02	1.02	1.0	0.98	0.94	0.90	0.87	0.85
6 to 16	1.05	1.04	1.03	1.02	1.0	0.97	0.93	0.88	0.86	0.83
25 to 50	1.06	1.05	1.03	1.02	1.0	0.96	0.92	0.87	0.83	0.81
70 to 185	1.08	1.06	1.04	1.03	1.0	0.95	0.90	0.85	0.81	0.78
240 to 400	1.10	1.07	1.05	1.03	1.0	0.95	0.88	0.83	0.78	0.75

Rating Factors Of Depth Of Laying

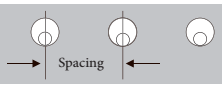
(To Centre Of Duct Or Trefoil Group Of Ducts)

Depth of laying	Cables laid in duct	
m	Single core	Multi core
0.50	1.00	1.00
0.75	0.96	0.98
0.80	0.95	0.98
1.00	0.93	0.96
1.25	0.91	0.95
1.50	0.89	0.94
1.75	0.88	0.94
2.00	0.87	0.93
2.50	0.86	0.92
Above 3.00	0.85	0.91

Group Rating Factors For Single Core Cables In Trefoil Single Way Ducts, Horizontal Formation (Average Values)

Number of cables in group	Spacing of Circuits 		
	Touching	45 cm	60 cm
2	0.87	0.91	0.93
3	0.78	0.84	0.87
4	0.74	0.81	0.85
5	0.70	0.79	0.85
6	0.69	0.78	0.82

Group Rating Factors for Multicore Cables in Single Way Ducts, Horizontal Formation (Average Values)

Number of cables in group	Spacing of Circuits 			
	Touching	30 cm	45 cm	60 cm
2	0.90	0.93	0.95	0.96
3	0.83	0.88	0.91	0.93
4	0.79	0.85	0.89	0.92
5	0.75	0.83	0.88	0.91
6	0.73	0.82	0.87	0.90

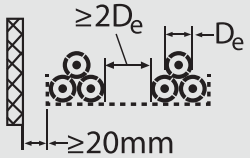
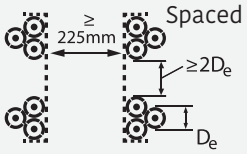
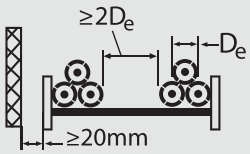
INSTALLATION CONDITIONS FOR CABLES IN AIR

Cables installed in air could have many forms of installation methods as described in BS 7671, IEE wiring regulation 17th edition. It is assumed that cables are not exposed to the direct sunlight and away from any external heat sources. Additionally there are more de-rating factors tables for other methods of installation, the user has to review BS7671- IEE Wiring Regulations for Electrical Installations, 17th Edition for detailed information

Rating Factors for Other Ambient Air Temperatures

Air Temperature	25˚C	30˚C	35˚C	40˚C	45˚C	50˚C	55˚C
Rating Factor	1.28	1.23	1.18	1.13	1.06	1.00	0.94

Group rating factors for more than one circuit of single core cables

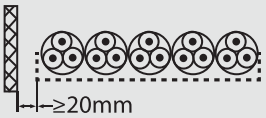
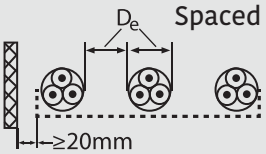
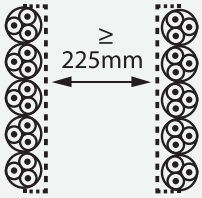
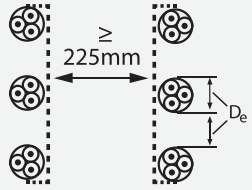
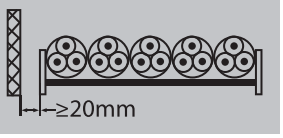
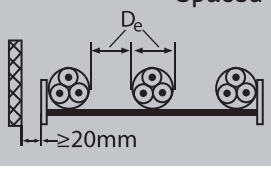
Method of Installation		Number of trays	Number of three-phase circuits (Note 3)			Use as a multiplier to rating for
			1	2	3	
Perforated trays (Note 1)		1	1. 00	0.98	0.96	Three cables intrefoil formation
		2	0.97	0.93	0.89	
		3	0.96	0.92	0.86	
Vertical perforated trays (Note 2)		1	1.00	0.91	0.89	
		2	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 spacings 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 conductors should be considered as a circuit for the purpose of this table.

Group rating factors for more than one multicore cable for installation in Air

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

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

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

AC resistance, Reactance at 50 HZ and Short circuit ratings

Nominal Size	AC resistance at 90°C		Reactance at 50 Hz			Short circuit rating* Duration 1 Sec.
	Single core	Multicore	Single core cables		Multicore cables	
			Armoured	Unrmoured	(Arm & Unarm)	
(mm^2)	(Ω/km)	(Ω/km)	(Ω/km)	(Ω/km)	(Ω/km)	(kA)
1.5	15.43	15.43	--	0.147	0.105	0.215
2.5	9.45	9.45	--	0.137	0.099	0.358
4	5.88	5.88	--	0.128	0.093	0.572
6	3.93	3.93	--	0.119	0.089	0.858
10	2.33	2.33	--	0.111	0.084	1.430
16	1.47	1.47	--	0.103	0.081	2.288
25	0.927	0.927	--	0.103	0.081	3.575
35	0.668	0.669	--	0.098	0.079	5.01
50	0.494	0.494	0.114	0.093	0.078	7.15
70	0.342	0.343	0.106	0.088	0.074	10.01
95	0.247	0.248	0.102	0.086	0.072	13.59
120	0.196	0.197	0.097	0.085	0.072	17.16
150	0.16	0.16	0.096	0.085	0.073	21.45
185	0.128	0.129	0.095	0.083	0.072	26.46
240	0.0988	0.0999	0.093	0.082	0.071	34.32
300	0.0801	0.0814	0.092	0.079	0.071	42.90
400	0.064	0.0659	0.09	0.08	0.07	57.20
500	0.052		0.089	0.078		71.50
630	0.0425		0.087	0.078		90.09
800	0.0358		0.086	0.076		114.40
1000	0.031		0.085	0.075		143.00

* Maximum conductor temperature at the end of short circuit is 250

Common Abbreviations

THERMO PLASTIC

PVC-Polyvinyl Chloride

PE-Polythylene,Polythene

LSZH-Low smoke zero halogen

LDPE-Low Density Polyethylene

MDPE-Medium Density Polyethylene

HDPE-High Density Polyethylene

PUR-Polyurethane (Thermosetting also)

TPE – Thermoplastic elastomer

PA-Polyamide

THERMOSETTING

XLPE-Cross Linked Polyethylene

SR-Silicon Rubber

XLLSZH-Cross Linked LSZH

PUR-Polyurethane

EPR-Ethylene Propylene Rubber

PCP-Polychloroprene

CPE-Chlorinated Polyethylene

EVA-Ethylene Vinyl Acetate

EMA-Ethylene Methyl Acrylate

METALLIC LAYERS

AWA-Aluminum Wire Armour

SWA/GSWA- Galvanized Steel Wire Armour

GSDT - Galvanized Steel Double Tape Armour

PBE-Lead Alloy E barrier sheath

GSWB-Galvanized steel wire braid

TCWB-Tinned Copper Wire Braid

PCWB-Plain Copper Wire Braid

ABWB-Annealed Brass Wire Braid

Al-PE-Aluminuim Polymer Foil

CT – Copper Tape

CABLE MATERIAL CODES

Nil – Copper

A – Aluminium

Y - PVC

2X - XLPE

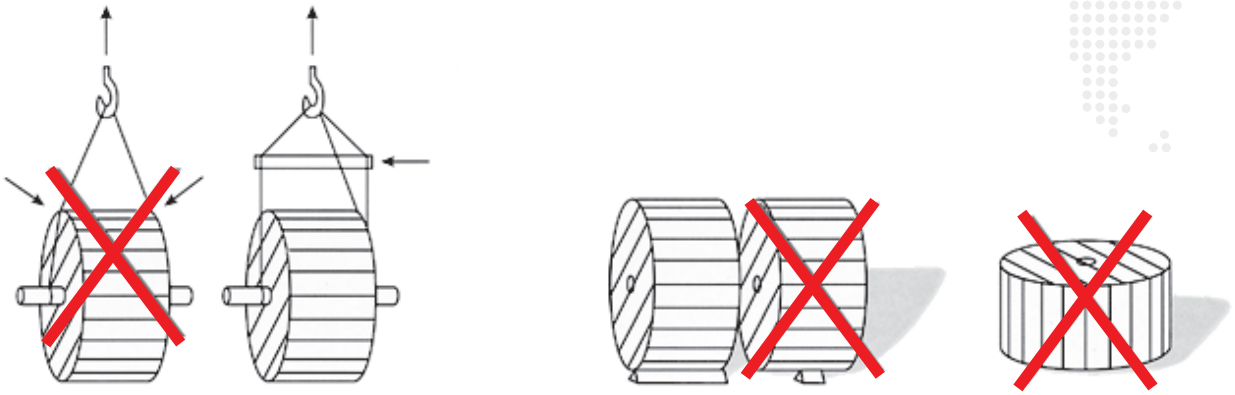
2Y - Polyethylene

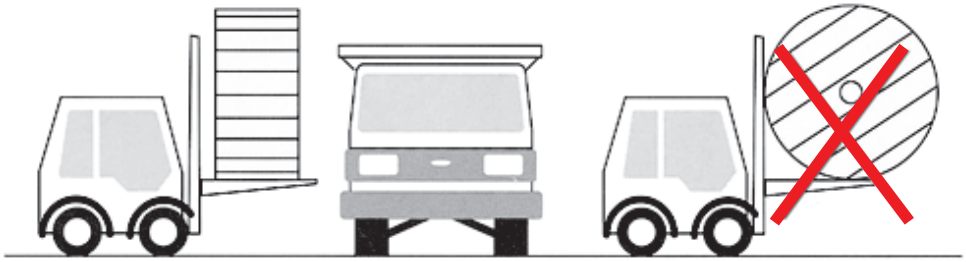
W – Galvanized steel wire armour

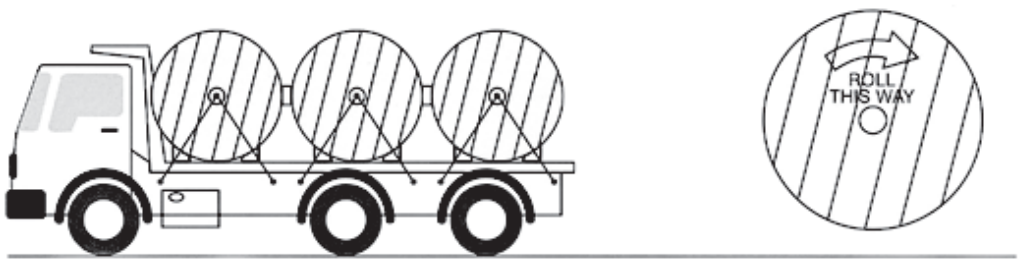
Wa – Aluminium wire armour

Drum Handling Instructions

The movement of cable drums by forklift truck is the preferred method. Most drums of cable are within a weight range that permits their movement by this method. In general, the forklift truck method of drum handling is only applicable where a hard and level ground surface is available. This is required in the intended storage area. In this case a forklift capable of lifting about 12 tones will be required (maximum drum weight plus contingency). It is also necessary to ensure that the forklift truck tines are capable of traversing the width of the drum and provide support to both flanges. For the smaller drums, tines of 1200 mm length will be satisfactory. The larger drums will require tines of 1800 mm length. For the larger drums, for example containing 33 kV or 132 kV cables or long lengths of cable, it will be necessary to have tines at least 2500 mm so that the cable drums are adequately supported by both drum danges







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