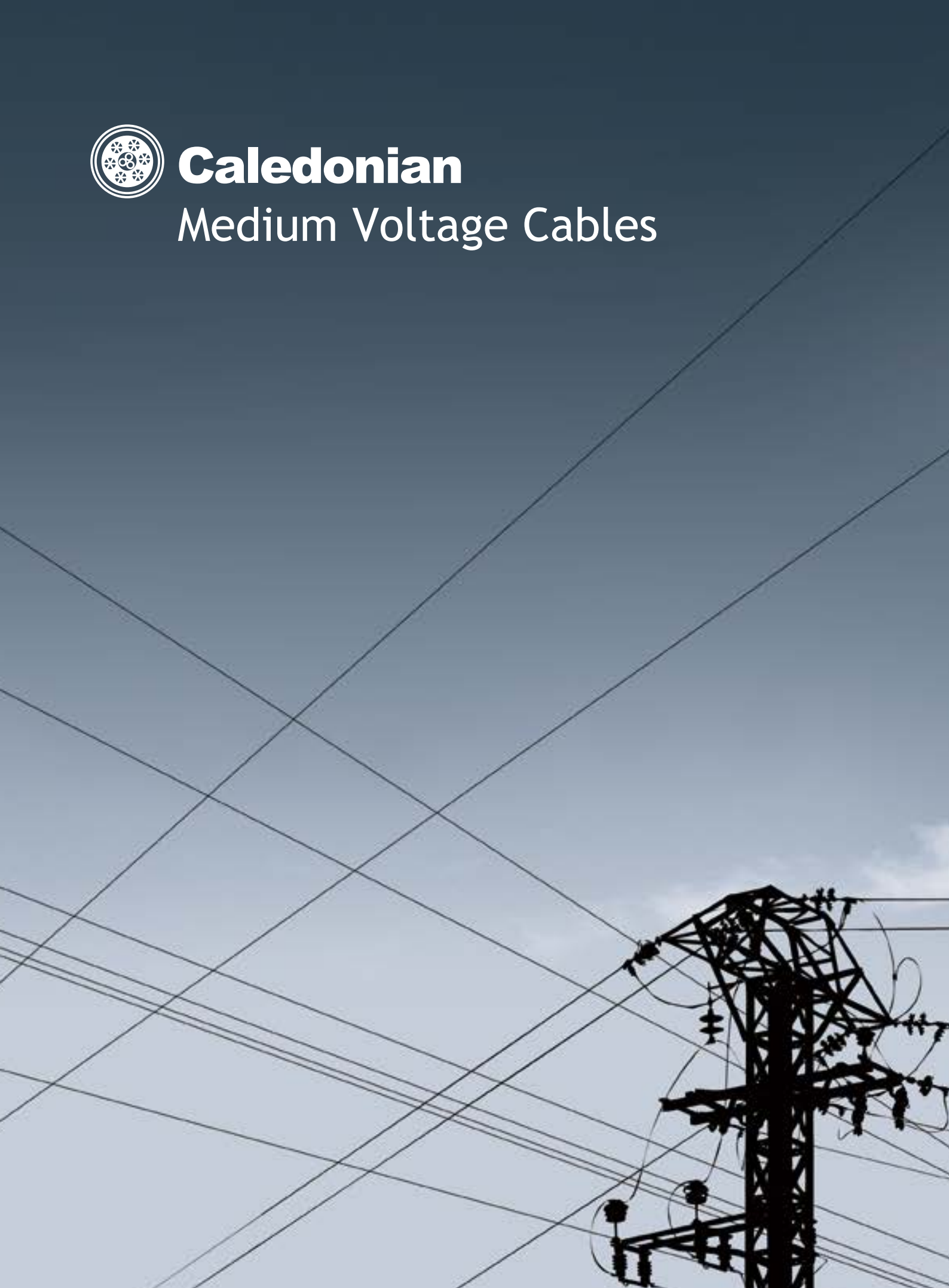
Caledonian

Medium Voltage Cables



Caledonian

Caledonian Medium Voltage Cables

Company Profile

Caledonian develops, manufactures and markets a totally integrated product line of Medium Voltage Cables for a diverse variety of technological applications.

The company offers an unrivalled experience and vast product range developed organically at the leading edge of technology. It manufactures a variety of products, which include medium voltage power cables, low voltage power and control cables, instrumentation cables, pilot cables, building wires & flexible cables. It can also offer cables with special features like flame retardant properties, low smoke & halogen free (LSZH) properties, cables with anti-termite treatment, UV resistant outer sheath, etc, being suitable for different types of applications or environmental conditions.

Caledonian holds several important international approvals and manufactures its products in accordance with relevant IEC, VDE, CENELEC and British Standard. The quality management system is accredited to ISO 9001.


ISO 9001
REGISTERED FIRM

Registration Certificate

Caledonian Cables Limited / Addison Technology Limited

ISO 9001 : 2008

On behalf of QAS International

Caledonian has maintained an enviable growth record year on year. The products manufactured by Caledonian are sold not only in Europe by also beyond to Australia, China, Japan, South Korea, Arab countries. They have been installed in variety of applications including power plants, oil refineries, petroleum & gas facilities, hospitals, hotels, airports etc.

This catalogue contains technical information on all medium voltage cables including armoured and unarmoured designs, single and multicore constructions and different sheathing and screening options. All cable designs outlined in this section follow the constructions covered by IEC 60502, BS 6622 and VDE 0276. However, Caledonian can also supply a range of alternative designs to meet specific customer needs including different sheathing, screening, armouring and sheath color options, together with enhanced fire performance, water sealing of conductors and screens, and added environmental protection. Cables can be made to individual customer specifications or other recognized standards. These standards include ICEA S-66-524 WC 7, AS 1429, JIS C 3606, EDF HN 33-S-23, ASTM etc.

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Cable Properties

Special features which we can offer for MV cables:

- Watertight construction (both radial and longitudinal).
- Lead sheath available for options.
- Resistant to heavy vibration.
- Available in long delivery lengths to reduce number of joints.
- Corrosion-free screen area.
- Copper or aluminum conductor up to 2000mm².
- Metallic sheath and radial moisture barrier made of copper wire or tape.
- Different options for outer PE jackets (LDPE, MDPE & HDPE).
- Different options for LSF, LSZH & FRPVC, being anti-termite or UV resistant as per BS 7835, IEC 60332 etc.
- Strippable insulation screen.
- Metallic screen made of multiple layers of copper tapes or a combination of copper wires and tapes to increase the earth fault current carrying capacity.
- Increased armour conductivity by insertion of hard drawn copper wires in armour.

Cable Construction

Caledonian medium voltage cables are manufactured using the monosil process. Caledonian provides the highly specialized plant, state-of-the-art research facilities and meticulous quality control procedures that are required for the manufacturing of PVC insulated cables for use up to 6KV and XLPE/EPR insulated cables for use at voltages up to 42 KV. The materials are all kept in cleanliness-controlled conditions throughout the production process in order to ensure the absolute homogeneity of the finished insulation materials.

Conductors

Either aluminium or copper conductors are used. Conductors up to 800mm² will be circular, compacted & stranded and shall comply with IEC 60228 class 2. 1000mm² conductor will be circular stranded type on which a layer of semi-conducting tape will be applied.

Conductor Screen

This will be an extruded layer of semi-conducting crosslinkable compound applied under simultaneous triple extrusion process over the conductor along with the insulation and the insulation screen. The triple extrusion is a single high precision operation that eliminates the possibility of any contamination between the layers which could create irregularities in the electrical field. By careful material selection and special attention to process parameters, Caledonian produces the insulation screen layers with the required degree of stripping force as stipulated by the applicable national or international standard.

Caledonian Medium Voltage Cables

Insulation

This will be an extruded layer of XLPE or EPR applied over conductor screen under triple extrusion process along with conductor screen and insulation screen. PVC may be used for 1.8/3KV and 3.6/6KV cables.

Insulation Screen

This will be a layer of semi-conducting crosslinkable compound which will be applied by triple extrusion process over the insulation.

Metallic Screen

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

Laying-Up

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

Inner Sheath (Bedding) for Armoured Cables

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

Armouring

In case of armoured cables, the armour is applied helically over inner sheath. For single core cables, it is of aluminium wires and for multicore cables, the armour can be of one among the following options:

a) Galvanized steel wire.
b) Galvanized steel tape.
c) Galvanized steel strip.

Over Sheath

An extruded layer is applied over the armour in case of armoured cables and over laid up cores in case of unarmoured cables. Outer sheath material can be either PVC, PE, HDPE or MDPE. Caledonian medium voltage cables are normally supplied with red PVC over sheaths complying with BS 6622 or IEC 60502. Other colors may be provided to suit a range of installation considerations such as the effect of UV radiations and differing soil compositions. Anti-termite formulations can also be supplied in addition to graphite-coated over sheaths where on-site testing of the sheath is required.

Fire Performance on Cable Sheaths

Cables can also be supplied with special flame retardant PVC over sheaths to comply with the IEC 60332 standard. We can also supply cables with Low Smoke Halogen Free (LSZH) sheaths according to IEC 60754-1, EN 50267-2-1, IEC 60754-2, EN50267-2-2, IEC 61034-2, EN 61034-2 standards or other equivalent international standards.

Cable Machinery & Equipments

The MV cable manufacturing facility at Caledonian is the most modern facility available today with the state of the art machinery & equipments. The entire MV cables manufacturing plant at Caledonian is fully air-conditioned with humidity control to ensure contamination free atmosphere. The heart of MV cable manufacturing facility is the CCV line. This line supplied by Troester, Germany and which incorporates some of the most modern features like,

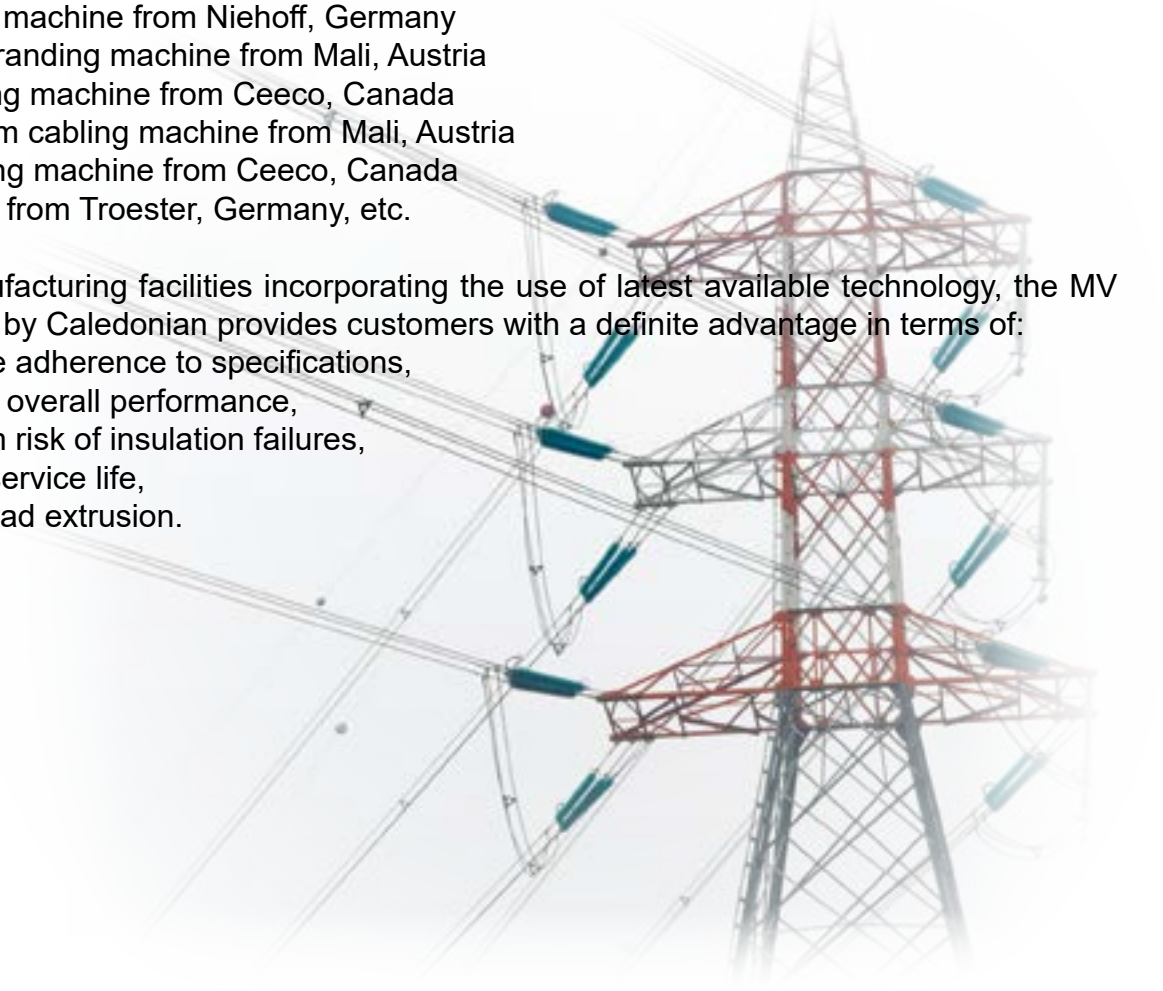
- Triple extrusion head to ensure superior quality of extrusion and uniform bonding of conductor screen, XLPE insulation and the insulation screen.
- CDCC – Completely dry curing & cooling in an inert atmosphere of nitrogen.
- In line X-ray machine for checking proper concentricity as well as measuring thickness of extruded materials.
- Fully computerized auto-cure control system, which controls all driving parameters to achieve best curing of extruded materials.
- Fully automatic compound handling system in a positive pressure atmosphere ensuring a contamination free line, which is absolutely essential to achieve superior quality product.

Some of the other machines include:

- Drawing machine from Niehoff, Germany
- Cable stranding machine from Mali, Austria
- Screening machine from Ceeco, Canada
- Five drum cabling machine from Mali, Austria
- Armouring machine from Ceeco, Canada
- Extruder from Troester, Germany, etc.

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

- Compete adherence to specifications,
- Superior overall performance,
- Minimum risk of insulation failures,
- Longer service life,
- Triple head extrusion.



Caledonian Medium Voltage Cables

Product Testing

Caledonian has made major investment in the testing facilities for its MV cables factory. We have equipped ourselves with the latest and most advanced cable testing facility available in the world.
Our major testing facilities include:
a) DC withstand voltage test system from Hipotronics USA.
b) Partial discharge test system from Haefely, Switzerland.
c) HV test system from Haefely, Switzerland.
d) On line conductor resistance meter from Aesa, Switzerland
Effective quality assurance procedures are essential to ensure the consistency and long term reliability and performance of all products. Caledonian always recognises the importance of quality assurance and this commitment is reflected in the company achievement of ISO 9001 certification. The design validation for our MV Cables has been done at recognized international laboratories.
With the above state of the art testing facility, we can conduct all type, routine as well as special tests mentioned in IEC 60502 Part 2, BS 6622 & other international specifications, in-house. While 100% of the cables are tested for routine tests prior to dispatch, however upon customers' request, other type/special tests can be carried out in house or by any third party laboratory.

The tests can be divided into different categories:

Type Tests

The type test is conducted by KEMA, Netherlands to validate a special cable design type. Electrical type tests include the following:

- Partial discharge test (IEC 60502 clause 18.1.3)
- Bending test (IEC 60502 clause18.1.4)
- Sheath measurement (IEC 60502 clause 18.1.5)
- Heating cycle test (IEC 60502 clause 18.1.6)
- Impulse withstand test followed by a.c. voltage test (IEC 60502 18.1.7)
- High voltage test for 4 hours (IEC 60502 clause 18.1.8)
- Resistivity of semiconducting screens (IEC 60502 clause 18.1.9)

Non electrical type tests include the following:

- All non electrical type tests as required by IEC 60502

Routine Tests

Routine tests are carried out on each finished length of cable to control the overall quality of the cable. They comprise:

- Measurement of dimensions.
- Measurement of conductor resistance: the D.C. resistance of each conductor, when corrected to 20°C and 1 Km, shall not exceed the appropriate maximum value specified in IEC 60228 respectively.
- Measurement of screen resistance.

- High voltage test: an a.c. voltage of 3.5 Uo shall be applied for 5 minutes between each conductor and metallic screen. No breakdown shall occur.
- Partial discharge test: the magnitude of discharge at 1.73 Uo shall not exceed 10pC.
- Measurement of dielectric losses and capacity.

Special Tests

Special tests are carried out on 10% of the lengths for each production lot, in any case on one length. They are carried out if major changes in design are introduced.
They comprise:

- Measurement of dimensions
- Checking sheath identification
- Testing shrinkage of PE sheath
- Conductor examination
- Carrying out voltage test
- Carrying out hot set test for XLPE insulation

At Caledonian, quality assurance is an integrated part of the production process and maintained from order entry and manufacture through to testing, packaging and shipping. All quality assurance procedures are regularly audited by recognised quality organisations and all routine voltage testing is carried to more stringent levels than that required by international standards.

Specification for testing is designed in accordance to the following international standards:

- IEC 60502
- IEC 60811
- BS 5368
- DIN 56283/VDE 0273
- EDF HN 33S23
- AS&JIS
- ASTM
- etc.

We have also installed many in line devices/facilities for checking the product quality during the manufacturing process like the X-ray machine installed in the CCV line, curing optimization software, etc, to avoid any risk or failure & to ensure a long service life for our products. With these modern equipment & facilities, we ensure to maintain close manufacturing tolerances, high accuracy to customer specifications as well as effective monitoring of the entire manufacturing process to offer a world class product.

The following In-Process testing is conducted during the cable manufacturing :

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- **Tandem Line**
  - Visual and physical tests
  - Electrical tests
  - Resistance & resistance unbalance tests
  - Open & short circuit test

- **High Voltage Test**
  - Group twinner
    - Visual & physical tests
    - Electrical tests
  - Resistance & resistance unbalance tests
  - Mutual capacitance test
  - Open & short circuit test
  - Insulation resistance test

- **Sheathing**
  - Dimensional test
  - Water penetration test
  - Spark test
  - Overlaps & seal bonding inspection

- **Armoring**
  - Dimensional test
  - Visual inspection

- **Jacketing**
  - Dimensional test
  - Overlap inspection
  - Spark test

- **Final Testing**
  - Routine testing
  - Resistance & resistance unbalance tests
  - Mutual capacitance test
  - Transmission test
  - Capacitance & capacitance unbalance tests (pair to pair and pair to ground)
  - Attenuation & cross talk tests.

Cable Options & Ordering Information

Cable Options

It is essential that the type of cable ordered is suitable for its intended use. Cable choice will be based on a whole range of factors including installation requirements, relevant local regulations and the electrical characteristics of appropriate cable types. The factors to be considered are:

- Nominal voltage of system.
- Highest voltage of system.
- Impulse withstand voltage.
- System frequency.
- Maximum rated current.
- For continous operation.
  - For cyclic operation (a load curve is essential)
  - For overload operation, if any (duration is essential)
- Symmetrical and asymmetrical short circuit current , both between pulses and to earth.
- Duration of fault in second.
- Required screen bonding scheme
  - Both ends bonded
  - Single point bonded
  - Cross bonded

Ordering Information

VDE CODE: ABCDEFGH

A. Conductor

N- Standard construction in accordance to VDE standard (copper conductor)
NA- Aluminium conductor
NFA- Standard construction for twisted cable (aluminium conductor)

B. Insulation Material

Y- PVC
2X- XLPE
3G- EPR

C. Concentric Conductor Shielding Material

C- Concentric conductors of copper wires and copper tape, helically wounded
CW- Concentric conductors of copper wires in waveconal formation and and copper tape, helically wounded
CE- Concentric conductors of copper wires and copper tape over each individual conductor, helically wounded
Blank- No screen

Caledonian Medium Voltage Cables

D.Shielding Material
S- Shielding of copper wires and copper tape, helically wounded
SE- Shielding of copper wires and copper tape over each individual conductor, helically wounded
(F)- Longitudinally water proof shielding
Blank- No screen

E. Bedding Material
2Y- PE
Y- PVC
H- LSZH
K- Lead sheath
Blank- No bedding

F. Armoring Material
B- Double steel tape armouring
R- Round steel wire armouring
F- Flat steel wire armouring
Gb- Helical steel tape armouring
Blank- No armour

G. Jacket Material
2Y- PE
Y- PVC
H- LSZH
K- Lead sheath

H. Cable Types
J- Cables with green-yellow conductor are marked with protective conductor
O- Cables without green-yellow conductor are marked without protective conductor

Caledonian Order Code

MVA-BCDEFGH-IJ

A Cable Design Standard
6622- BS6622 standard
7835- BS7835 standard
502- IEC60502 standard
276- VDE0276 standard

B Conductor
A- Aluminium conductor
Blank- Copper conductor

Cable Options & Ordering Information

C Insulation Material
Y- PVC
2X-XLPE
3G-EPR

D Concentric Conductor Shielding Material
C- Concentric conductors of copper wires and copper tape, helically wounded
CW- Concentric conductors of copper wires in waveconal formation and and copper tape, helically wounded
CE- Concentric conductors of copper wires and copper tape over each individual conductor, helically wounded
Blank- No screen

E Shielding Material
S- Shielding of copper wires and copper tape, helically wounded
SE- Shielding of copper wires and copper tape over each individual conductor, helically wounded
(F)- Longitudinally water proof shielding
Blank- No screen

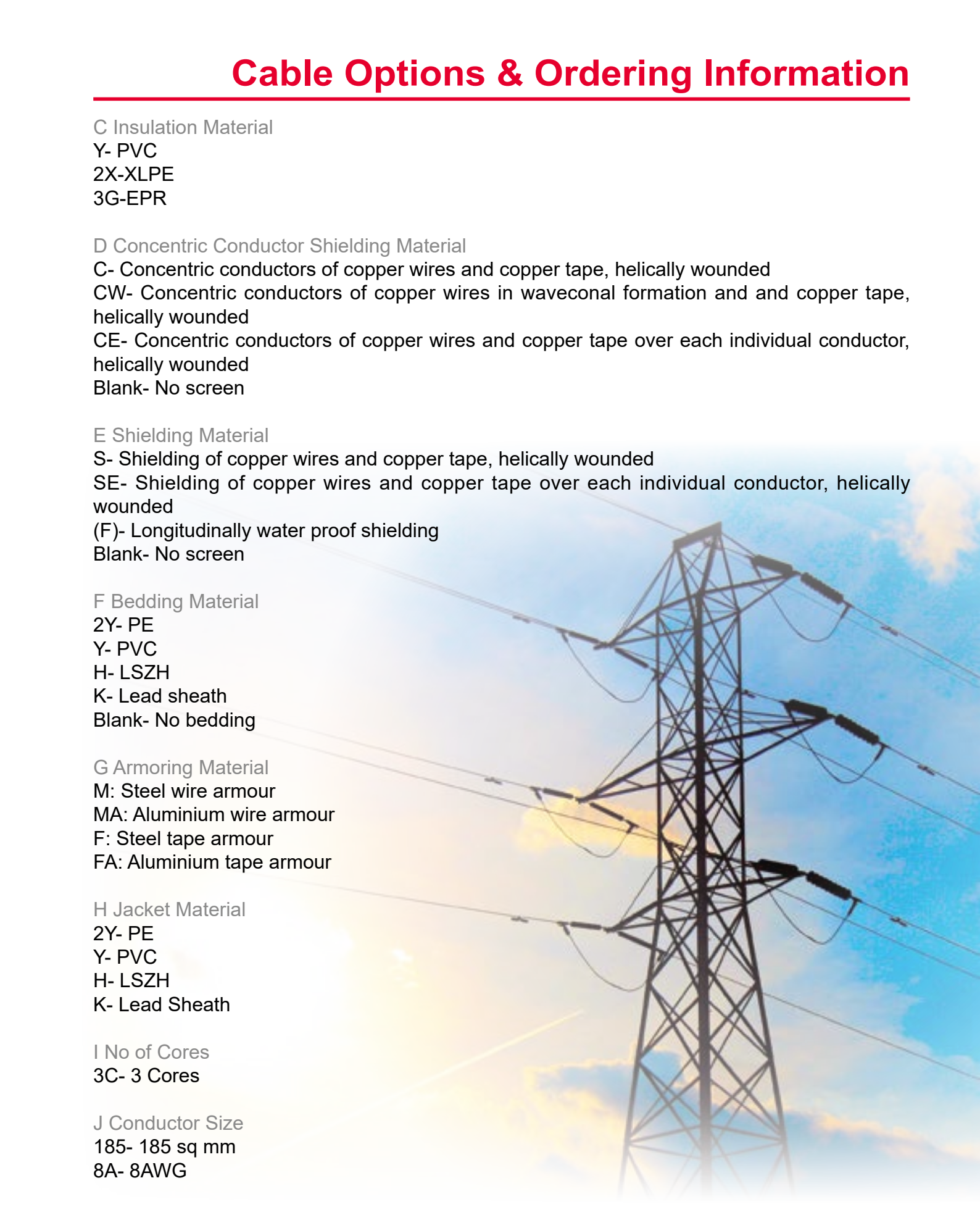
F Bedding Material
2Y- PE
Y- PVC
H- LSZH
K- Lead sheath
Blank- No bedding

G Armoring Material
M: Steel wire armour
MA: Aluminium wire armour
F: Steel tape armour
FA: Aluminium tape armour

H Jacket Material
2Y- PE
Y- PVC
H- LSZH
K- Lead Sheath

I No of Cores
3C- 3 Cores

J Conductor Size
185- 185 sq mm
8A- 8AWG



Caledonian Medium Voltage Cables

Ordering Information

TYPE CODES FOR MEDIUM VOLTAGE CABLES

FGD400 A-B-C-D-E-F

F No. of Cores
1C: Single core
3C: 3 cores

E Outer Sheath
X: PE
V: PVC
Ld : Lead sheath
APT: Aluminum sheath

D Armour
M: Steel wire armour
MA: Aluminium wire armour
F: Steel tape armour
FA: Aluminium tape armour

C Bedding
X: PE
V: PVC
Ld: Lead sheath
APT: Aluminum sheath

B Insulation
R: XLPE
V: PVC
E: EPR
X: PE

A Voltage
3: 1.8/3kV (Um=3.6kV)
7: 3.6/6kV (Um=7.2kV)
12: 6/10kV (Um=12kV)
17: 8.7/17.5kV (Um=17kV)
24: 12/20kV (Um=24kV)
36: 18/30kV (Um=36kV)
42: 21/35kV (Um=42kV)

Cable Options & Ordering Information

FTX400 A-B-C-D-E-F

F No. of Cores
1C: Single core
3C: 3 cores

E Outer Sheath
Z1: LSZH
Ld : Lead sheath
APT: Aluminum sheath

D Armour
M: Steel wire armour
MA: Aluminium wire armour
F: Steel tape armour
FA: Aluminium tape armour

C Bedding
H: LSZH
Ld: Lead sheath
APT: Aluminum sheath

B Insulation
R: XLPE
V: PVC
E: EPR
X: PE

A Voltage
3: 1.8/3kV (Um=3.6kV)
7: 3.6/6kV (Um=7.2kV)
12: 6/10kV (Um=12kV)
17: 8.7/17.5kV (Um=17kV)
24: 12/20kV (Um=24kV)
36: 18/30kV (Um=36kV)
42: 21/35kV (Um=42kV)

Caledonian Medium Voltage Cables

II

I	II	III	IV	V
Medium Voltage Cables to BS 6622/BS 7835				
Single Core Cables to BS 6622/BS 7835				
Three Core Cables to BS 6622/BS 7835				

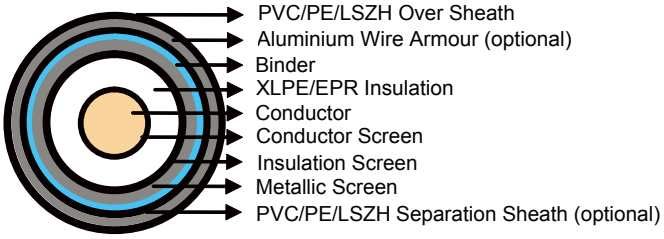
Single Core Cables to BS 6622/BS 7835

APPLICATIONS:

The single core cables are designed for distribution of electrical power with nominal voltage Uo/U ranging from 3.8/6.6KV to 19/33KV and frequency 50Hz. They are suitable for installation mostly in power supply stations, indoors and in cable ducts, outdoors, underground and in water as well as for installation on cable trays for industries, switchboards and power stations.

STANDARD:

BS 6622
BS 7835 (LSZH Version)



CONSTRUCTION:

Conductor: Plain annealed copper or aluminium complying with IEC 60228/BS 6360. Copper conductors shall be stranded (class 2) and aluminium conductors shall be either solid or stranded (class 2).
Conductor Screen: Extruded layer of semi-conducting cross-linkable compound is applied over the conductor and shall cover the surface completely. The minimum thickness is 0.3mm and the maximum resistivity shall not exceed 500 Ohm-m at 90°C.
Insulation: Insulation is of cross-linked polyethylene compound XLPE (GP8) conforming to BS 7655-1.3 or EPR (GP7), conforming to BS 7655-1.2.

Table 1. Insulation Thickness

Nom. Cross Section Area	Insulation Thickness at Nominal Voltage				
	3.8/6.6KV (Um=7.2KV)	6.35/11KV (Um=12KV)	8.7/15KV(Um=17.5KV)	12.7/22KV(Um=24KV)	19/33KV(Um=36KV)
mm²	mm	mm	mm	mm	mm
70 – 185	2.5	3.4	4.5	5.5	8.0
240	2.6	3.4	4.5	5.5	8.0
300	2.8	3.4	4.5	5.5	8.0
400	3.0	3.4	4.5	5.5	8.0
Above 500	3.2	3.4	4.5	5.5	8.0

Insulaton Screen: Extruded layer of semi-conducting cross-linkable compound is applied over the insulation. The extruded semi-conducting layer shall consist of bonded or cold strippable semi-conducting compound capable of removal for jointing or terminating. As an option, a semi-conducting tape may be applied over the extruded semi-conducting layer as a bedding for the metallic layer. The minimum thickness is 0.3 mm and the maximum resistivity is 500 Ohm-m at 90°C. The screen is tightly fitted to the insulation to exclude all air voids and can be easily hand stripped on site.

Metallic Layer: The metallic layer shall consist of either copper tapes or a concentric layer of copper wires or a combination of tapes and wires. The metallic layer provides an earth fault current path, capable of withstanding fault current to earth of 1000A for one second at maximum temperature 160°C. Copper wires are applied over the conducting water blocking layer with a minimum diameter of 0.5mm. As an alternative, copper tape(s) with minimum thickness of 0.1mm can be applied with overlap. Total cross section of copper wire screen and copper tape screen layer are shown in Table 2a and 2b.

Table 2a. Total Cross Section and Max. DC Resistance of Copper Wire Screen

Nominal Cross-Section of Cables mm²	Total Cross Section					Max. DC Resistance of Copper Wire Screen at 20℃
	3.8/6.6KV (Um=7.2KV)	6.35/11KV (Um=12KV)	8.7/15KV (Um=17.5KV)	12.7/22KV (Um=24KV)	19/33KV (Um=36KV)	
mm²	mm²					Ω
70	16	16	16	16	16	1.19
95	16	16	16	16	16	1.19
120	16	16	16	16	16	1.19
150	25	25	25	25	25	0.759
185	25	25	25	25	25	0.759
240	25	25	25	25	25	0.759
300	25	25	25	25	25	0.759
400	35	35	35	35	35	0.271
500	35	35	35	35	35	0.217
630	35	35	35	35	35	0.271

Table 2b. Total Cross Section and Max. DC Resistance of Copper Tape Screen (0.1mm)

Nominal Cross-Section of Conductor	Total Cross Section & Max DC Resistance									
	3.8/6.6KV (Um=7.2KV)		6.35/11KV (Um=12KV)		8.7/15KV (Um=17.5KV)		12.7/22KV (Um=24KV)		19/33KV (Um=36KV)	
	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃
mm²	mm²	Ω	mm²	Ω	mm²	Ω	mm²	Ω	mm²	Ω
70	7.4	2.314	8.2	2.106	9.1	1.897	9.9	1.740	11.9	1.442
95	8.2	2.095	8.9	1.923	9.8	1.748	10.7	1.614	12.7	1.354
120	9.0	1.905	9.8	1.761	10.7	1.613	11.5	1.498	13.5	1.272
150	9.7	1.781	10.4	1.655	11.3	1.523	12.1	1.420	14.2	1.215
185	10.6	1.626	11.2	1.540	12.2	1.407	12.9	1.335	14.9	1.153
240	11.7	1.465	12.4	1.388	13.3	1.294	14.1	1.219	16.2	1.065
300	12.9	1.334	13.4	1.285	14.3	1.204	15.1	1.139	17.1	1.003

Nominal Cross-Section of Conductor	Total Cross Section & Max DC Resistance									
	3.8/6.6KV (Um=7.2KV)		6.35/11KV (Um=12KV)		8.7/15KV (Um=17.5KV)		12.7/22KV (Um=24KV)		19/33KV (Um=36KV)	
	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃
mm²	mm²	Ω	mm²	Ω	mm²	Ω	mm²	Ω	mm²	Ω
400	14.3	1.205	14.6	1.178	15.5	1.110	16.3	1.054	18.4	0.937
500	15.7	1.094	16.2	1.061	17.1	1.005	17.5	0.982	20.0	0.861
630	17.3	0.992	18.9	0.912	18.7	0.918	19.5	0.880	21.6	0.797

Separation Sheath (for armoured cable): The separation sheath comprises a layer of extruded PVC, PE or LSZH. The nominal thickness is calculated by 0.02Du + 0.6mm where Du is the fictitious diameter under the sheath in mm. The nominal separation sheath thickness shall not be less than 1.2mm.

Armour (for armoured cable): The armour consists of round aluminium wire with diameter specified as in Table 3.

Table 3. Armour Wire Diameter

Fictitious Diameter under the Armour		Armour Wire Diameter
mm		mm
>	<	
-	25	1.6
25	35	2.0
35	60	2.5
60	-	3.15

Over Sheath: Overall sheath comprises a layer of extruded either PVC type 9 conforming to BS 7665-4.2 or MDPE type TS2 conforming to BS 7655-10.1. LSZH can be offered as an option. The over sheath is normally black in colour. When a DC voltage test is to be performed on the over sheath, a semi-conducting layer such as graphite coating shall be applied over the surface of the extruded over sheath. The nominal over sheath thickness is calculated by 0.035D+1.0 where D is the diameter immediately under the over sheath in mm. For cables with the over sheath not applied over the armour, the nominal over sheath thickness shall not be less than 1.4mm. And for cables with over sheath applied over the armour, the nominal over sheath thickness shall not be less than 1.8mm.

PHYSICAL PROPERTIES:

Operating Temperature: up to 90°C

Temperature Range: -5°C (PVC or LSZH sheath); -20°C (PE sheath)

Short Circuit Temperature: 250°C (short circuit duration up to 5 seconds)

Bending Radius: 12 x OD

Table 4. Nominal /Operating /Test Voltages

Rated Voltage Uo/U	Operating Voltage (Um)	Testing Voltage (rms)
3.8/6.6KV	7.2KV	15KV
6.35/11KV	12KV	25.5KV

Caledonian Medium Voltage Cables

Rated Voltage Uo/U	Operating Voltage (Um)	Testing Voltage (rms)
8.7/15KV	17.5KV	35KV
12.7/22KV	24KV	51KV
19/33KV	36KV	76KV

Single Core 3.8/6.6KV (Um=7.2KV)

Dimensional Data

Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Wire Screen Area	Copper Tape Screen Area	Nom. Bedding Thickness	Nom. Armour Wire Diameter	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
								CU	AL
mm²	mm	mm²	mm²	mm	mm	mm	mm	kg/km	
70	2.5	16	7.4	1.2	1.6	1.8	30.0	1740	1300
95	2.5	16	8.2	1.2	1.6	1.9	31.8	2030	1430
120	2.5	16	9.0	1.2	1.6	1.9	33.2	2310	1550
150	2.5	25	9.7	1.2	1.6	2.0	35.1	2660	1720
185	2.5	25	10.6	1.2	2.0	2.0	37.4	3120	1950
240	2.6	25	11.7	1.2	2.0	2.1	40.3	3740	2200
300	2.8	25	12.9	1.2	2.0	2.2	42.9	4400	2520
400	3.0	35	14.3	1.2	2.0	2.3	47.2	5490	2960
500	3.2	35	15.7	1.3	2.5	2.5	51.6	6760	3660
630	3.2	35	17.3	1.4	2.5	2.6	57.0	8200	4160

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Screen 1 sec		Reactance		Inductance		Impedance			
						Copper Wire	Copper Tape	Trefoil	Flat spaced	Trefoil	Flat Spaced	Trefoil		Flat Spaced	
												CU	AL	CU	AL
mm²	µΩ/m	µΩ/m	kA	pF/m	mA/m	kA		µΩ/m	µΩ/m	nH/m	nH/m	µΩ/ m		µΩ/m	
70	268/443	343/568	9.8/6.3	371	0.45	1.96	1.09	115	173	370	550	364	583	386	597
95	193/320	248/410	13.3/8.5	417	0.50	1.96	1.20	110	168	350	540	272	427	300	446
120	153/253	196/325	17.2/11.0	459	0.55	1.96	1.32	107	165	340	520	225	345	257	367
150	124/206	159/265	21.2/13.5	494	0.59	3.06	1.41	103	161	330	510	193	287	229	313
185	99/164	128/211	26.6/17.0	543	0.65	3.06	1.54	100	158	320	500	165	237	206	267
240	75/125	98/161	34.9/22.3	583	0.70	3.06	1.71	97	155	310	490	140	191	185	226
300	60/100	80/130	43.8/28.0	602	0.72	3.06	1.88	95	153	300	490	126	163	174	203
400	47/78	64/102	57.3/36.6	627	0.75	4.29	2.08	92	150	290	480	113	141	164	184
500	36/60	51/81	72.3/46.2	654	0.79	4.29	2.30	90	149	290	470	105	124	158	171
630	28/47	42/64	91.2/58.3	726	0.87	4.29	2.53	87	145	280	460	97	110	151	160

Medium Voltage Cables to BS 6622/BS 7835

Single Core 6.35/11KV (Um=12KV)
Dimensional Data

Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Wire Screen Area	Copper Tape Screen Area	Nom. Bedding Thickness	Nom. Armour Wire Diameter	Nom.Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
								CU	AL
mm²	mm	mm²	mm²	mm	mm	mm	mm	kg/km	
70	3.4	16	8.2	1.2	1.6	1.9	32.0	1840	1400
95	3.4	16	8.9	1.2	1.6	1.9	33.6	2130	1530
120	3.4	16	9.8	1.2	1.6	2.0	35.2	2430	1670
150	3.4	25	10.4	1.2	1.6	2.1	37.9	2870	1930
185	3.4	25	11.2	1.2	2.0	2.1	39.4	3240	2080
240	3.4	25	12.4	1.2	2.0	2.2	42.1	3490	2330
300	3.4	25	13.4	1.2	2.0	2.2	44.1	4490	2560
400	3.4	35	14.6	1.2	2.0	2.4	48.2	5589	3040
500	3.4	35	16.2	1.3	2.5	2.5	52.0	6780	3680
630	3.4	35	18.9	1.4	2.5	2.6	57.4	8230	4200

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Screen 1 sec		Reactance		Inductance		Impedance			
						Copper Wire	Copper Tape	Trefoil	Flat Spaced	Trefoil	Flat Spaced	Trefoil		Flat Spaced	
												CU	AL	CU	AL
mm²	µΩ/m	µΩ/m	kA	pF/m	mA/m	kA		µΩ/m	µΩ/m	nH/m	nH/m	µΩ/m		µΩ/m	
70	268/443	343/568	9.8/6.3	288	0.58	1.96	1.19	122	188	390	600	364	583	386	597
95	193/320	248/410	13.3/8.5	323	0.65	1.96	1.31	122	182	390	580	272	427	300	446
120	153/253	196//325	17.2/11.0	353	0.71	1.96	1.43	116	172	370	550	225	345	257	367
150	124/206	159/265	21.2/13.5	380	0.76	3.06	1.52	110	166	350	530	193	287	229	313
185	99/164	128/211	26.6/17.0	416	0.83	3.06	1.63	107	166	340	530	165	237	206	267
240	75/125	98/161	34.9/22.3	460	0.92	3.06	1.81	104	163	330	520	140	191	185	226
300	60/100	80/130	43.8/28.0	506	1.01	3.06	1.95	100	157	320	500	126	163	174	203
400	47/78	64/102	57.3/36.6	561	1.12	4.29	2.13	94	154	300	490	113	141	164	184
500	37/60	51/81	72.3/46.2	619	1.24	4.29	2.37	91	151	290	480	105	124	158	171
630	28/47	42/64	91.2/58.3	698	1.37	4.29	2.75	91	148	290	470	97	110	151	160

Caledonian Medium Voltage Cables

Single Core 8.7/15KV (Um=17.5KV)

Dimensional Data

Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Wire Screen Area	Copper Tape Screen Area	Nom. Bedding Thickness	Nom. Armour Wire Diameter	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
								CU	AL
mm²	mm	mm²	mm²	mm	mm	mm	mm	kg/km	
70	4.5	16	9.1	1.2	1.6	1.9	34.2	1970	1520
95	4.5	16	9.8	1.2	2.0	2.0	36.8	2370	1770
120	4.5	16	10.7	1.2	2.0	2.1	38.4	2670	1910
150	4.5	25	11.3	1.2	2.0	2.1	40.1	3020	2080
185	4.5	25	12.2	1.2	2.0	2.2	41.8	3420	2240
240	4.5	25	13.3	1.2	2.0	2.3	44.5	4050	2500
300	4.5	25	14.3	1.2	2.0	2.3	46.5	4680	2780
400	4.5	35	15.5	1.3	2.5	2.5	51.8	5970	3430
500	4.5	35	17.1	1.3	2.5	2.6	54.4	7010	3910
630	4.5	35	18.7	1.4	2.5	2.7	59.8	8480	4420

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Screen 1 sec		Reactance		Inductance		Impedance			
						Copper Wire	Copper Tape	Trefoil	Flat spaced	Trefoil	Flat Spaced	Trefoil		Flat Spaced	
												CU	AL	CU	AL
mm²	µΩ/m	µΩ/m	kA	pF/m	mA/m	kA		µΩ/m	µΩ/m	nH/m	nH/m	µΩ/ m		µΩ/m	
70	268/443	343/568	9.8/6.3	232	0.63	1.96	1.32	132	188	420	600	364	583	386	597
95	193/320	248/410	13.3/8.5	258	0.70	1.96	1.44	126	182	400	580	272	427	300	446
120	153/253	196/325	17.2/11.0	281	0.77	1.96	1.56	119	179	380	570	225	345	257	367
150	124/206	159/265	21.2/13.5	301	0.82	3.06	1.65	113	176	360	560	193	287	229	313
185	99/164	128/211	26.6/17.0	329	0.90	3.06	1.79	110	170	350	540	165	237	206	267
240	75/125	98/161	34.9/22.3	363	0.99	3.06	1.94	107	166	340	530	140	191	185	226
300	60/100	80/130	43.8/28.0	398	1.09	3.06	2.09	104	160	330	510	126	163	174	203
400	47/78	64/102	57.3/36.6	439	1.20	4.29	2.26	97	157	310	500	113	141	164	184
500	37/60	51/81	72.3/46.2	483	1.32	4.29	2.50	94	154	300	490	105	124	158	171
630	28/47	42/64	91.2/58.3	534	1.46	4.29	2.73	91	151	290	480	97	110	151	160

Medium Voltage Cables to BS 6622/BS 7835

Single Core 12.7/22KV (Um=24KV)
Dimensional Data

Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Wire Screen Area	Copper Tape Screen Area	Nom.Bedding Thickness	Nom. Armour Wire Diameter	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
								CU	AL
mm²	mm	mm²	mm²	mm	mm	mm	mm	kg/km	
70	5.5	16	9.9	1.2	2.0	2.0	37.2	2190	1750
95	5.5	16	10.7	1.2	2.0	2.1	39.0	2510	1900
120	5.5	16	11.5	1.2	2.0	2.1	40.4	2810	2040
150	5.5	25	12.1	1.2	2.0	2.2	42.3	3180	2240
185	5.5	25	12.9	1.2	2.0	2.2	43.8	3560	2380
240	5.5	25	14.1	1.2	2.0	2.3	46.5	4200	2640
300	5.5	25	15.1	1.3	2.5	2.4	49.9	5030	3130
400	5.5	35	16.3	1.3	2.5	2.5	53.8	6140	3600
500	5.5	35	17.5	1.4	2.5	2.6	56.6	7210	4100
630	5.5	35	19.5	1.4	2.5	2.8	62.0	8700	4650

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Screen 1 sec		Reactance		Inductance		Impedance			
						Copper Wire	Copper Tape	Trefoil	Flat Spaced	Trefoil	Flat Spaced	Trefoil		Flat Spaced	
												CU	AL	CU	AL
mm²	µΩ/m	µΩ/m	kA	pF/m	mA/m	kA		µΩ/m	µΩ/m	nH/m	nH/m	µΩ/m		µΩ/m	
70	268/443	343/568	9.8/6.3	200	0.8	1.96	1.44	135	195	430	620	364	583	386	597
95	193/320	248/410	13.3/8.5	222	0.9	1.96	1.56	129	188	410	600	272	427	300	446
120	153/253	196/325	17.2/11.0	241	0.9	1.96	1.68	122	182	390	580	225	345	257	367
150	124/206	159/265	21.2/13.5	257	1.0	3.06	1.77	116	176	370	560	193	287	229	313
185	99/164	128/211	26.6/17.0	280	1.0	3.06	1.88	116	173	370	550	165	237	206	267
240	75/125	98/161	34.9/22.3	307	1.1	3.06	2.06	110	170	350	540	140	191	185	226
300	60/100	80/130	43.8/28.0	336	1.2	3.06	2.21	107	166	340	530	126	163	174	203
400	47/78	64/102	57.3/36.6	370	1.3	4.29	2.38	100	160	320	510	113	141	164	184
500	37/60	51/81	72.3/46.2	406	1.4	4.29	2.56	97	154	310	490	105	124	158	171
630	28/47	42/64	91.2/58.3	449	1.5	4.29	2.85	94	151	300	480	97	110	151	160

Caledonian Medium Voltage Cables

Single Core 19/33KV (Um=36KV)
Dimensional Data

Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Wire Screen Area	Copper Tape Screen Area	Nom.Bedding Thickness	Nom. Armour Wire Diameter	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
								CU	AL
mm²	mm	mm²	mm²	mm	mm	mm	mm	kg/km	
70	8.0	16	11.9	1.2	2.0	2.2	42.6	2560	2120
95	8.0	16	12.7	1.2	2.0	2.3	44.4	2890	2290
120	8.0	16	13.5	1.2	2.0	2.3	45.8	3200	2430
150	8.0	25	14.2	1.3	2.5	2.4	48.9	3760	2830
185	8.0	25	14.9	1.3	2.5	2.5	50.6	4180	3010
240	8.0	25	16.2	1.3	2.5	2.5	53.1	4830	3270
300	8.0	25	17.1	1.4	2.5	2.6	55.5	5540	3630
400	8.0	35	18.4	1.4	2.5	2.7	59.4	6680	4130
500	8.0	35	20.0	1.5	2.5	2.8	62.2	7790	4690
630	8.0	35	21.6	1.5	2.5	2.9	67.4	9290	5220

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Screen 1 sec		Reactance		Inductance		Impedance			
						Copper Wire	Copper Tape	Trefoil	Flat Spaced	Trefoil	Flat Spaced	Trefoil		Flat Spaced	
												CU	AL	CU	AL
mm²	µΩ/m	µΩ/m	kA	pF/m	mA/m	kA		µΩ/m	µΩ/m	nH/m	nH/m	µΩ/m		µΩ/m	
70	268/443	343/568	9.8/6.3	154	0.92	1.96	1.74	144	201	460	640	364	583	386	597
95	193/320	248/410	13.3/8.5	169	1.01	1.96	1.85	138	195	440	620	272	427	300	446
120	153/253	196/325	17.2/11.0	183	1.10	1.96	1.97	132	188	420	600	225	345	257	367
150	124/206	159/265	21.2/13.5	194	1.16	3.06	2.07	126	182	400	580	193	287	229	313
185	99/164	128/211	26.6/17.0	210	1.26	3.06	2.18	122	182	390	580	165	237	206	267
240	75/125	98/161	34.9/22.3	229	1.37	3.06	2.36	119	176	380	560	140	191	185	226
300	60/100	80/130	43.8/28.0	249	1.49	3.06	2.50	113	173	360	550	126	163	174	203
400	47/78	64/102	57.3/36.6	273	1.64	4.29	2.68	107	163	340	520	113	141	164	184
500	37/60	51/81	72.3/46.2	298	1.79	4.29	2.92	104	163	330	520	105	124	158	171
630	28/47	42/64	91.2/58.3	327	1.96	4.29	3.15	100	160	320	510	97	110	151	160

Medium Voltage Cables to BS 6622/BS 7835

Current Rating for 3.8/6.6KV (Um=7.2KV), 6.35/11KV (Um=12KV) & 8.7/15KV (Um=17.5KV)

Nom. Cross-Section Area	Ground				Duct				Air			
	Trefoil Unarm'd/Arm'd		Flat Spaced Unarm'd/Arm'd		Trefoil Unarm'd/Arm'd		Flat Touching Unarm'd/Arm'd		Trefoil Unarm'd/Arm'd		Flat Spaced Unarm'd/Arm'd	
	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL
mm²	A		A		A		A		A		A	
70	270/270	210.210	280/280	215/215	270/260	215/210	270/270	210/210	285/310	225/240	370/370	290/290
95	320/320	250/250	335/335	260/260	320/305	255/245	325/325	250/250	360/375	280/295	455/460	350/355
120	360/360	280/280	380/380	295/295	360/340	285/275	370/370	285/285	415/430	320/355	520/530	410/410
150	410/410	320/315	430/430	330/330	400/375	315/300	415/410	320/320	470/490	365/380	600/600	465/465
185	460/455	360/355	485/485	375/375	440/410	350/335	465/460	360/360	540/550	425/435	690/690	530/530
240	530/520	415/405	560/560	440/440	505/460	405/380	540/540	420/420	640/650	500/510	820/820	640/630
300	600/580	475/455	640/640	495/495	560/500	455/420	610/610	475/470	740/740	580/580	940/940	730/730
400	680/650	540/510	730/730	570/570	610/530	510/455	690/690	540/540	840/840	670/670	1100/1100	860/860
500	750/710	610/570	830/830	650/650	680/570	570/500	790/780	620/620	940/930	790/770	1280/1280	1010/1010
630	830/760	680/640	940/940	750/750	750/620	640/550	890/890	710/700	1110/1040	910/880	1500/1480	1190/1180

Current Rating for 12.7/22KV (Um=24KV)

Nom. Cross-Section Area	Ground				Duct				Air			
	Trefoil Unarm'd/Arm'd		Flat Spaced Unarm'd/Arm'd		Trefoil Unarm'd/Arm'd		Flat Touching Unarm'd/Arm'd		Trefoil Unarm'd/Arm'd		Flat Spaced Unarm'd/Arm'd	
	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL
mm²	A		A		A		A		A		A	
70	270/270	210/210	280/280	215/215	270/260	210/205	270/270	210/210	300/320	235/245	365/370	285/285
95	320/320	250/245	335/335	260/260	320/300	250/245	320/325	250/250	360/380	280/295	450/450	345/350
120	360/360	280/280	380/380	295/295	360/340	280/275	365/365	285/285	425/440	330/340	520/520	400/400
150	410/410	320/310	430/430	330/330	405/370	320/300	410/410	320/315	485/490	375/385	590/590	455/455
185	460/450	360/350	485/485	375/375	445/400	350/335	460/460	360/360	550/560	430/440	670/670	520/520
240	530/510	415/405	560/560	440/440	520/450	415/380	530/530	415/415	650/650	510/510	800/800	620/620
300	600/570	475/450	640/640	495/495	570/490	460/415	600/600	470/470	740/730	580/580	920/910	710/710
400	690/640	550/510	730/730	570/570	630/530	520/460	690/680	540/530	850/830	680/670	1070/1060	840/830
500	760/700	610/570	830/830	650/650	700/570	570/510	780/770	610/610	980/940	790/770	1250/1230	980/970
630	850/760	690/640	950/940	750/750	780/610	650/560	890/880	700/700	1130/1050	920/880	1450/1430	1060/1140

Caledonian Medium Voltage Cables

Current Rating for 19/33KV (Um=36KV)

Nom. Cross-Section Area	Ground				Duct				Air			
	Trefoil Unarm'd/Arm'd		Flat Spaced Unarm'd/Arm'd		Trefoil Unarm'd/Arm'd		Flat Touching Unarm'd/Arm'd		Trefoil Unarm'd/Arm'd		Flat Spaced Unarm'd/Arm'd	
	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL
mm²	A		A		A		A		A		A	
70	270/270	210.210	280/280	215/215	270/260	210/205	270/270	210/210	300/320	235/245	365/370	285/285
95	320/320	250/245	335/335	260/260	320/300	250/245	320/325	250/250	360/380	280/295	450/450	345/350
120	360/360	280/280	380/380	295/295	360/340	280/275	365/365	285/285	425/440	330/340	520/520	400/400
150	410/410	320/310	430/430	330/330	405/370	320/300	410/410	320/315	485/490	375/385	590/590	455/455
185	460/450	360/350	485/485	375/375	445/400	350/335	460/460	360/360	550/560	430/440	670/670	520/520
240	530/510	415/405	560/560	440/440	520/450	415/380	530/530	415/415	650/650	510/510	800/800	620/620
300	600/570	475/450	640/640	495/495	570/490	460/415	600/600	470/470	740/730	580/580	920/910	710/710
400	690/640	550/510	730/730	570/570	630/530	520/460	690/680	540/530	850/830	680/670	1070/1060	840/830
500	760/700	610/570	830/830	650/650	700/570	570/510	780/770	610/610	980/940	790/770	1250/1230	980/970
630	850/760	690/640	940/940	750/750	780/610	650/560	890/880	700/700	1130/1050	920/880	1450/1430	1060/1140

Current Rating Conditions:

Ground Temperature: 20°C
Ambient Temperature (air): 30°C
Depth of Soil: 0.8m
Thermal Resistance of Soil: 1.5K•m/W

Three Core Cables to BS 6622/BS 7835

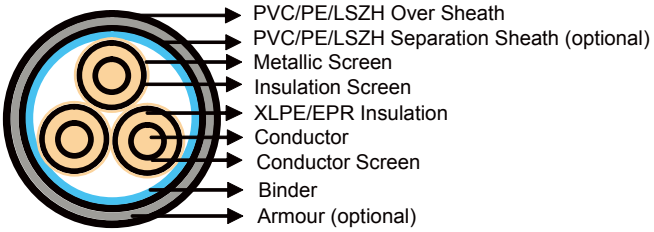
APPLICATIONS:

The three core cables are designed for distribution of electrical power with nominal voltage Uo/U ranging from 3.6/6.6KV to 19/33KV and frequency 50Hz. They are suitable for installation mostly in power supply stations, indoors and in cable ducts, outdoors, underground and in water as well as for installation on cable trays for industries, switchboards and power stations.

STANDARD:

BS 6622
BS 7835 (LSZH Version)

CONSTRUCTION:



Conductor: Plain annealed copper or aluminium complying with IEC 60228/BS 6360. Copper conductors shall be stranded (class 2) and aluminium conductors shall be either solid or stranded (class 2).
Conductor Screen: Extruded layer of semi-conducting cross-linkable compound is applied over the conductor and shall cover the surface completely. The minimum thickness is 0.3mm and the maximum resistivity shall not exceed 500 Ohm-m at 90°C.
Insulation: Insulation is of cross-linked polyethylene compound XLPE (GP8) conforming to BS 7655-1.3 or EPR (GP7), conforming to BS 7655-1.2.

Table 1. Insulation Thickness

Nom. Cross Section Area	Insulation Thickness at Nom. Voltage				
	3.8/6.6KV(Um=7.2KV)	6.35/11KV(Um=12KV)	8.7/15KV(Um=17.5KV)	12.7/22KV(Um=24KV)	19/33KV(Um=36KV)
mm²	mm	mm	mm	mm	mm
70 – 185	2.5	3.4	4.5	5.5	8.0
240	2.6	3.4	4.5	5.5	8.0
300	2.8	3.4	4.5	5.5	8.0
400	3.0	3.4	4.5	5.5	8.0
Above 500	3.2	3.4	4.5	5.5	8.0

Insulaton Screen: Extruded layer of semi-conducting cross-linkable compound is applied over the insulation. The extruded semi-conducting layer shall consist of bonded or cold strippable semi-conducting compound capable of removal for jointing or terminating. As an

option, a semi-conducting tape may be applied over the extruded semi-conducting layer as a bedding for the metallic layer. The minimum thickness is 0.3 mm and the maximum resistivity is 500 Ohm-m at 90°C. The screen is tightly fitted to the insulation to exclude all air voids and can be easily hand stripped on site.

Inner Covering & Fillers: For cables with a collective metallic layer or cables with a metallic layer over each individual cores with additional collective metallic layers, semi-conducting inner covering and fillers shall be applied over the laid up cores. The inner covering is made of non hygroscopic material, except if the cable is to be made longitudinally watertight. The inner covering shall be extruded or lapped.

The approximate thickness of extruded inner coverings is given in Table 2:

Table 2. Approximate Thickness of Extruded Inner Coverings

Ficititous Diameter over Laid Up Cores		Approx. Thickness of Extruded Inner Covering
mm		mm
>	<	
-	25	1.0
25	35	1.2
35	45	1.4
45	60	1.6
60	80	1.8
80	-	2.0

*The approximate thickness of lapped inner coverings shall be 0.6mm.

Metallic Layer: The metallic layer shall be applied over each core or applied as a collective screen. The metallic screen shall consist of either copper tapes or a concentric layer of copper wires or a combination of tapes and wires. The metallic layer provides an earth fault current path, capable of withstanding fault current to earth of 1000A for one second at maximum temperature 160°C. Copper wires are applied over the conducting water blocking layer with a minimum diameter of 0.5mm. As an alternative, copper tape(s) with minimum thickness of 0.1mm can be applied with overlap. Total cross section of copper wire screen and copper tape screen layer are shown in Table 3a and 3b.

Table 3a. Total Cross Section and Max. DC Resistance of Copper Wire Screen

Nominal Cross-Section of Cables	Total Cross Section					Max. DC Resistance of Copper Wire Screen at 20℃
	3.8/6.6KV (Um=7.2KV)	6.35/11KV (Um=12KV)	8.7/15KV (Um=17.5KV)	12.7/22KV (Um=24KV)	19/33KV (Um=36KV)	
mm²	mm²					Ω
70	16	16	16	16	16	1.19
95	16	16	16	16	16	1.19
120	16	16	16	16	16	1.19
150	25	25	25	25	25	0.759
185	25	25	25	25	25	0.759
240	25	25	25	25	25	0.759
300	25	25	25	25	25	0.759
400	35	35	35	35	35	0.271
500	35	35	35	35	35	0.271
630	35	35	35	35	35	0.271

Table 3b. Total Cross Section and Max. DC Resistance of Copper Tape Screen (0.1mm)

Nominal Cross-Section of Cables	Total Cross Section & Max DC Resistance									
	3.8/6.6KV (Um=7.2KV)		6.35/11KV (Um=12KV)		8.7/15KV (Um=17.5KV)		12.7/22KV (Um=24KV)		19/33KV (Um=36KV)	
	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃
mm²	mm²	Ω	mm²	Ω	mm²	Ω	mm²	Ω	mm²	Ω
70	6.6	2.616	7.23	2.380	8.02	2.145	8.7	1.967	10.5	1.075
95	7.3	2.369	7.91	2.174	8.71	1.975	9.4	1.824	11.2	1.075
120	8.0	2.153	8.64	1.991	9.43	1.823	10.2	1.694	12.0	1.075
150	8.5	2.013	9.19	1.871	9.99	1.722	10.7	1.606	12.5	0.688
185	9.4	1.838	9.88	1.741	10.82	1.590	11.4	1.509	13.2	0.688
240	10.4	1.656	10.96	1.569	11.76	1.463	12.5	1.378	14.3	0.688
300	11.4	1.508	11.84	1.452	12.64	1.361	13.4	1.287	15.2	0.688
400	12.6	1.362	12.92	1.332	13.71	1.254	14.4	1.192	16.2	0.491
500	13.9	1.237	14.34	1.199	15.14	1.136	15.5	1.110	17.7	0.491
630	15.3	1.121	16.68	1.031	16.57	1.038	17.3	0.995	19.1	0.491

Separation Sheath (for armoured cable): The separation sheath comprises a layer of extruded PVC, PE or LSZH. The nominal thickness is calculated by 0.02Du + 0.6mm where Du is the fictitious diameter under the sheath in mm. The nominal separation sheath thickness shall not be less than 1.2mm.

Armour (for armoured cable): The armour consists of galvanized steel wire applied over the inner covering with diameter specified as in Table 4.

Table 4. Armour Wire Diameter

Fictitiious Diameter under the Armour		Armour Wire Diameter
mm		mm
>	<	
-	25	1.6
25	35	2.0
35	60	2.5
60	-	3.15

Over Sheath: Overall sheath comprises a layer of extruded either PVC type 9 conforming to BS 7665-4.2 or MDPE type TS2 conforming to BS 7655-10.1; LSZH can be offered as an option. The over sheath is normally black in colour. When a DC voltage test is to be performed on the over sheath, a semi-conducting layer such as graphite coating shall be applied over the surface of the extruded over sheath. The nominal over sheath thickness is calculated by 0.035D+1 where D is the diameter immediately under the over sheath in mm. For cables with the over sheath not applied over the armour, the nominal over sheath thickness shall not be less than 1.4mm. And for cables with over sheath applied over the armour, the nominal over sheath thickness shall not be less than 1.8mm.

Caledonian Medium Voltage Cables

PHYSICAL PROPERTIES:

Operating Temperature: up to 90°C
Temperature Range: -5°C (PVC or LSZH sheath); -20°C (PE sheath)
Short Circuit Temperature: 250°C (short circuit duration up to 5 seconds)
Bending Radius: 12 x OD

Table 5. Nominal /Operating /Test Voltages

Rated Voltage Uo/U	Operating Voltage (Um)	Testing Voltage (rms)
3.8/6.6KV	7.2KV	15KV
6.35/11KV	12KV	25.5KV
8.7/15KV	17.5KV	35KV
12.7/22KV	24KV	51KV
19/33KV	36KV	76KV

Three Core 3.8/6.6KV (Um=7.2KV)
Dimensional Data

Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Wire Screen Area	Copper Tape Screen Area	Nom.Bedding Thickness	Nom. Armour Wire Diameter	Nom.Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
								CU	AL
mm²	mm	mm²	mm²	mm	mm	mm	mm	kg/km	
70	2.5	16	6.6	1.3	2.5	2.6	55.0	6570	5240
95	2.5	16	7.3	1.4	2.5	2.7	58.9	7760	5890
120	2.5	16	8.0	1.5	2.5	2.8	62.1	8810	6510
150	2.5	25	8.5	1.5	2.5	2.9	65.8	10110	7310
185	2.5	25	9.4	1.6	2.5	3.0	69.5	11520	7960
240	2.6	25	10.4	1.7	2.5	3.2	75.9	13920	9140
300	2.8	25	11.4	1.8	3.15	3.5	83.1	17400	11620
400	3.0	35	12.6	2.0	3.15	3.7	93.0	21900	13980

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Screen 1 sec		Reac-tance	Induc-tance	Current Ratings					
										Ground		Duct		Air	
						Copper Wire	Copper Tape			CU	AL	CU	AL	CU	AL
mm²	µΩ/m	µΩ/m	kA	pF/m	mA/m	kA		µΩ/m	nH/m	A		A		A	
70	268/443	343/568	9.8/6.3	383	0.46	1.96	0.96	97	310	255	195	215	165	270	210
95	193/320	248/410	13.3/8.5	432	0.52	1.96	1.06	92	290	300	230	255	200	330	250
120	153/253	196/325	17.2/11.0	474	0.57	1.96	1.17	89	280	340	265	290	225	375	295
150	124/206	159/265	21.2/13.5	511	0.61	3.06	1.25	87	280	380	295	330	255	430	330
185	99/164	128/211	26.6/17.0	562	0.67	3.06	1.37	86	270	430	335	370	290	490	385
240	75/125	98/161	34.9/22.3	602	0.72	3.06	1.52	83	260	490	380	425	335	570	450
300	60/100	80/130	43.8/28.0	622	0.75	3.06	1.67	82	260	540	435	470	375	650	510
400	47/78	64/102	57.3/36.6	648	0.78	4.29	1.84	80	250	590	480	520	420	700	570

Medium Voltage Cables to BS 6622/BS 7835

Three Core 6.35/11KV (Um=12KV)
Dimensional Data

Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Wire Screen Area	Copper Tape Screen Area	Nom.Bedding Thickness	Nom. Armour Wire Diameter	Nom.Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
								CU	AL
mm²	mm	mm²	mm²	mm	mm	mm	mm	kg/km	
70	3.4	16	7.23	1.4	2.5	2.7	59.2	7200	5870
95	3.4	16	7.91	1.5	2.5	2.8	63.2	8420	6550
120	3.4	16	8.64	1.6	2.5	3.0	67.0	9580	7190
150	3.4	25	9.19	1.6	2.5	3.1	70.3	10830	8030
185	3.4	25	9.88	1.7	2.5	3.2	73.9	12290	8720
240	3.4	25	10.96	1.8	3.15	3.4	81.2	15620	10790
300	3.4	25	11.84	1.9	3.15	3.6	86.1	18030	12240
400	3.4	35	12.92	2.0	3.15	3.8	95.0	22350	14350

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Screen 1 sec		Reac-tance	Induc-tance	Current Ratings					
										Ground		Duct		Air	
						Copper Wire	Copper Tape			CU	AL	CU	AL	CU	AL
mm²	µ Ω/m	µ Ω/m	kA	pF/m	mA/m	kA		µΩ/m	nH/m	A		A		A	
70	268/443	343/568	9.8/6.3	298	0.60	1.96	1.05	103	330	255	195	215	165	270	210
95	193/320	248/410	13.3/8.5	334	0.67	1.96	1.16	99	310	300	230	255	200	330	250
120	153/253	196/325	17.2/11.0	365	0.73	1.96	1.26	96	310	340	265	290	225	375	295
150	124/206	159/265	21.2/13.5	392	0.78	3.06	1.34	93	300	380	295	330	255	430	330
185	99/164	128/211	26.6/17.0	430	0.86	3.06	1.44	90	290	430	335	370	290	490	385
240	75/125	98/161	34.9/22.3	476	0.95	3.06	1.60	87	280	490	380	425	335	570	450
300	60/100	80/130	43.8/28.0	524	1.05	3.06	1.73	85	270	540	435	470	375	650	510
400	47/78	64/102	57.3/36.6	580	1.16	4.29	1.89	81	260	590	480	520	420	700	570

Caledonian Medium Voltage Cables

Three Core 8.7/15KV (Um=17.5KV)
Dimensional Data

Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Wire Screen Area	Copper Tape Screen Area	Nom. Bedding Thickness	Nom. Armour Wire Diameter	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
								CU	AL
mm²	mm	mm²	mm²	mm	mm	mm	mm	kg/km	
70	4.5	16	8.02	1.5	2.5	2.9	64.6	8030	6700
95	4.5	16	8.71	1.6	2.5	3.0	68.2	9160	7330
120	4.5	16	9.43	1.7	2.5	3.1	71.7	10340	8030
150	4.5	25	9.99	1.7	2.5	3.2	75.4	11730	8930
185	4.5	25	10.82	1.8	3.15	3.4	80.6	14170	10570
240	4.5	25	11.76	1.9	3.15	3.6	86.6	16670	11810
300	4.5	25	12.64	2.0	3.15	3.7	91.3	19140	13340
400	4.5	35	13.71	2.1	3.15	4.0	100.0	23360	15410

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Screen 1 sec		Reac-tance	Induc-tance	Current Ratings					
										Ground		Duct		Air	
						Copper Wire	Copper Tape			CU	AL	CU	AL	CU	AL
mm²	μΩ/m	μΩ/m	kA	pF/m	mA/m	kA		μΩ/m	nH/m	A		A		A	
70	268/443	343/568	9.8/6.3	240	0.65	1.96	1.17	110	350	255	195	215	165	270	210
95	193/320	248/410	13.3/8.5	267	0.73	1.96	1.27	105	330	300	230	255	200	330	250
120	153/253	196//325	17.2/11.0	291	0.79	1.96	1.38	102	320	340	265	290	225	375	295
150	124/206	159/265	21.2/13.5	312	0.85	3.06	1.46	98	310	380	300	330	255	430	330
185	99/164	128/211	26.6/17.0	340	0.93	3.06	1.58	95	300	430	335	370	290	490	385
240	75/125	98/161	34.9/22.3	375	1.02	3.06	1.72	91	290	490	380	425	335	570	450
300	60/100	80/130	43.8/28.0	411	1.12	3.06	1.85	89	280	540	435	470	375	650	510
400	47/78	64/102	57.3/36.6	454	1.24	4.29	2.00	84	270	590	480	520	420	700	570

Medium Voltage Cables to BS 6622/BS 7835

Three Core 12.7/22KV (Um=24KV)
Dimensional Data

Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Wire Screen Area	Copper Tape Screen Area	Nom.Bedding Thickness	Nom. Armour Wire Diameter	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
								CU	AL
mm²	mm	mm²	mm²	mm	mm	mm	mm	kg/km	
70	5.5	16	8.7	1.6	2.5	3.0	69.0	8710	7370
95	5.5	16	9.4	1.7	2.5	3.2	73.1	10000	8130
120	5.5	16	10.2	1.7	3.15	3.3	77.7	12040	9730
150	5.5	25	10.7	1.8	3.15	3.4	81.7	13550	10750
185	5.5	25	11.4	1.9	3.15	3.6	85.5	15150	11610
240	5.5	25	12.5	2.0	3.15	3.7	91.3	17710	12840
300	5.5	25	13.4	2.0	3.15	3.9	96.0	20170	14360
400	5.5	35	14.4	2.2	3.15	4.1	104.8	24520	16480

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Screen 1 sec		Reac-tance	Induc-tance	Current Ratings					
										Ground		Duct		Air	
						Copper Wire	Copper Tape			CU	AL	CU	AL	CU	AL
mm²	µΩ/m	µΩ/m	kA	pF/m	mA/m	kA		µΩ/m	nH/m	A		A		A	
70	268/443	343/568	9.8/6.3	207	0.83	1.96	1.28	115	370	255	195	225	170	275	215
95	193/320	248/410	13.3/8.5	229	0.92	1.96	1.38	110	350	295	230	260	205	330	260
120	153/253	196/325	17.2/11.0	249	1.00	1.96	1.48	106	340	335	260	300	235	380	300
150	124/206	159/265	21.2/13.5	266	1.06	3.06	1.56	103	330	375	290	335	265	430	335
185	99/164	128/211	26.6/17.0	289	1.16	3.06	1.66	100	320	420	330	380	300	490	390
240	75/125	98/161	34.9/22.3	318	1.27	3.06	1.82	95	300	480	380	430	345	570	460
300	60/100	80/130	43.8/28.0	348	1.39	3.06	1.95	93	300	530	425	480	385	650	520
400	47/78	64/102	57.3/36.6	383	1.53	4.29	2.11	87	280	590	480	520	420	700	570

Caledonian Medium Voltage Cables

Three Core 19/33KV (Um=36KV)
Dimensional Data

Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Wire Screen Area	Copper Tape Screen Area	Nom.Bedding Thickness	Nom. Armour Wire Diameter	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
								CU	AL
mm²	mm	mm²	mm²	mm	mm	mm	mm	kg/km	
70	8.0	16	10.5	1.8	3.15	3.5	82.5	11840	10440
95	8.0	16	11.2	1.9	3.15	3.6	86.4	13200	11350
120	8.0	16	12.0	2.0	3.15	3.7	89.9	14520	12190
150	8.0	25	12.5	2.0	3.15	3.8	93.6	16070	13280
185	8.0	25	13.2	2.1	3.15	3.9	97.3	17710	14090
240	8.0	25	14.3	2.2	3.15	4.1	103.2	20370	15460
300	8.0	25	15.2	2.3	3.15	4.3	108.2	22980	17210
400	8.0	35	16.2	2.4	3.15	4.5	116.8	27480	19450

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Screen 1 sec		Reac-tance	Induc-tance	Current Ratings					
						Copper Wire	Copper Tape			Ground		Duct		Air	
										CU	AL	CU	AL	CU	AL
mm²	µΩ/m	µΩ/m	kA	pF/m	mA/m	kA		µΩ/m	nH/m	A		A		A	
70	268/443	343/568	9.8/6.3	159	0.95	1.96	1.54	127	400	255	195	225	170	275	215
95	193/320	248/410	13.3/8.5	175	1.05	1.96	1.64	121	390	295	230	260	205	330	260
120	153/253	196/325	17.2/11.0	189	1.13	1.96	1.75	117	370	335	260	300	235	380	300
150	124/206	159/265	21.2/13.5	201	1.21	3.06	1.83	113	360	375	290	335	265	430	335
185	99/164	128/211	26.6/17.0	217	1.30	3.06	1.93	109	350	420	330	380	300	490	390
240	75/125	98/161	34.9/22.3	237	1.42	3.06	2.09	104	330	480	380	430	345	570	460
300	60/100	80/130	43.8/28.0	258	1.55	3.06	2.21	101	320	530	425	480	385	650	520
400	47/78	64/102	57.3/36.6	282	1.69	4.29	2.37	96	290	590	480	520	420	700	570

Caledonian Medium Voltage Cables

III

I	II	III	IV	V

Medium Voltage Cables to IEC 60502

Single Core Cables to IEC 60502

Three Core Cables to IEC 60502

Caledonian Medium Voltage Cables

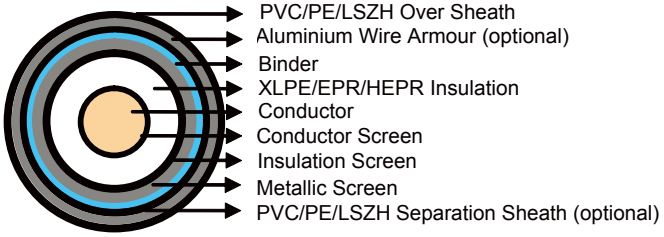
Single Core Cables to IEC 60502

APPLICATIONS:

The single core cables are designed for distribution of electrical power with nominal voltage Uo/U ranging from 1.8/3KV to 18/30KV and frequency 50Hz. They are suitable for installation mostly in power supply stations, indoors and in cable ducts, outdoors, underground and in water as well as for installation on cable trays for industries, switchboards and power stations.

STANDARD:

IEC 60502 Part 1(1.8/3KV)
IEC 60502 Part 2(3.6/6KV to 18/30KV)



CONSTRUCTION:

Conductor: Plain annealed copper or aluminium complying with IEC 60228 class 1 or 2.
Conductor Screen: The conductor screen consists of an extruded layer of non metallic, semi-conducting compound firmly bonded to the insulation to exclude all air voids. The conductor screen is not necessary for both PVC and EPR/HEPR insulated 1.8/3KV and 3.6/6KV cables.
Insulation: Insulation is of polyvinyl chloride (PVC) intended for 1.8/3KV and 3.6/6KV cables, cross-linked polyethylene compound (XLPE) or ethylene propylene rubber (EPR/HEPR).

Table 1. Insulation Thickness of XLPE or EPR/HEPR Insulation

Nom. Cross Section Area	Insulation Thickness at Nominal Voltage							
	1.8/3KV (Um=3.6KV)	3.6/6KV (Um=7.2KV)			6/10KV (Um=12KV)	8.7/15KV (Um=17.5KV)	12/20KV (Um=24KV)	18/30KV (Um=36KV)
mm²	mm	mm			mm	mm	mm	mm
	XLPE/EPR	XLPE	EPR		XLPE/EPR	XLPE/EPR	XLPE/EPR	XLPE/EPR
			Unscreened	Screened				
10	2.0	2.5	3.0	2.5	-	-	-	-
16	2.0	2.5	3.0	2.5	3.4	-	-	-
25	2.0	2.5	3.0	2.5	3.4	4.5	-	-
35	2.0	2.5	3.0	2.5	3.4	4.5	5.5	-
50 – 185	2.0	2.5	3.0	2.5	3.4	4.5	5.5	8.0
240	2.0	2.6	3.0	2.6	3.4	4.5	5.5	8.0
300	2.0	2.8	3.0	2.8	3.4	4.5	5.5	8.0
400	2.0	3.0	3.0	3.0	3.4	4.5	5.5	8.0
500 - 1600	2.2-2.8	3.2	3.2	3.2	3.4	4.5	5.5	8.0

*Insulation Thickness of PVC is 3.4mm (1- 1600mm sq) for 3.6/6KV cables.

Insulaton Screen: The insulation screen consists of an extruded layer of non metallic, semi-conducting compound extruded over the insulation. The extruded semi-conducting layer shall consist of bonded or cold strippable semi-conducting compound capable of removal for jointing or terminating. As an option, a semi-conducting tape may be applied over the extruded semi-conducting layer as a bedding for the metallic layer. The minimum thickness is 0.3 mm and the maximum resistivity is 500 Ohm-m at 90°C. The screen is tightly fitted to the insulation to exclude all air voids and can be easily hand stripped on site. The insulation screen is not necessary for both PVC and EPR/HEPR insulated 1.8/3KV and 3.6/6KV cables. The screen may be covered by semi-conductive water blocking swellable tape to ensure longitudinal watertightness.

Metallic Layer: The concentric copper screen wire is applied over the insulation, or over the insulation screen or over an inner covering. As an alternative, copper tape(s) with minimum thickness of 0.1mm can be applied with overlap. Total cross section of copper wire screen and copper tape screen layer are shown in Table 2a and 2b.

Table 2a. Total Cross Section and Max. DC Resistance of Copper Wire Screen

Nom. Cross Section Area of Conductor	Total Cross Section					Max. DC Resistance at 20 ℃
	3.6/6KV (Um=7.2KV)	6/10KV (Um=12KV)	8.7/15KV (Um=17.5KV)	12/20KV (Um=24KV)	18/30KV (Um=36KV)	
mm²	mm	mm	mm	mm	mm	Ω
10	10	10	10	10	10	1.075
16	16	16	16	16	16	1.075
25	16	16	16	16	16	1.075
35	16	16	16	16	16	1.075
50	16	16	16	16	16	1.075
70	16	16	16	16	16	1.075
95	16	16	16	16	16	1.075
120	16	16	16	16	16	1.075
150	25	25	25	25	25	0.688
185	25	25	25	25	25	0.688
240	25	25	25	25	25	0.688
300	25	25	25	25	25	0.688
400	35	35	35	35	35	0.491
500	35	35	35	35	35	0.491
630	35	35	35	35	35	0.491
800	50	50	50	50	50	0.344
1000	50	50	50	50	50	0.344

Table 2a. Total Cross Section and Max. DC Resistance of Copper Tape Screen (0.1mm)

Nom. Cross Section Area of Conductor	Total Cross Section & Max. DC Resistance									
	3.6/6KV (Um=7.2KV)		6/10KV (Um=12KV)		8.7/15KV (Um=17.5KV)		12/20KV (Um=24KV)		18/30KV (Um=36KV)	
	Total Cross Section	Max. DC Resistance at 20 ℃	Total Cross Section	Max. DC Resistance at 20 ℃	Total Cross Section	Max. DC Resistance at 20 ℃	Total Cross Section	Max. DC Resistance at 20 ℃	Total Cross Section	Max. DC Resistance at 20 ℃
mm²	mm		mm		mm		mm		mm	
10	4.7	3.646	-	-	-	-	-	-	-	-
16	5.1	3.342	5.9	2.925	-	-	-	-	-	-
25	5.7	3.025	6.4	2.679	7.3	2.350	8.1	2.114	-	-
35	6.2	2.796	6.9	2.498	7.8	2.210	8.6	2.000	-	-
50	6.7	2.568	7.4	2.314	8.3	2.064	9.1	1.880	11.2	0.579
70	7.4	2.314	8.2	2.106	9.1	1.897	9.9	1.740	11.9	0.543
95	8.2	2.095	8.9	2.925	9.8	1.748	10.7	1.614	12.7	0.510
120	9.0	1.905	9.8	2.679	10.7	1.613	11.5	1.498	13.5	0.479

Caledonian Medium Voltage Cables

Nom. Cross Section Area of Conductor	Total Cross Section & Max. DC Resistance									
	3.6/6KV (Um=7.2KV)		6/10KV (Um=12KV)		8.7/15KV (Um=17.5KV)		12/20KV (Um=24KV)		18/30KV (Um=36KV)	
	Total Cross Section	Max. DC Resistance at 20 ℃	Total Cross Section	Max. DC Resistance at 20 ℃	Total Cross Section	Max. DC Resistance at 20 ℃	Total Cross Section	Max. DC Resistance at 20 ℃	Total Cross Section	Max. DC Resistance at 20 ℃
mm²	mm		mm		mm		mm		mm	
150	9.7	1.781	10.4	2.498	11.3	1.523	12.1	1.420	14.2	0.458
185	10.6	1.626	11.2	2.314	12.2	1.407	12.9	1.335	14.9	0.434
240	11.7	1.465	12.4	2.106	2.106	1.294	14.1	1.219	16.2	0.401
300	12.9	1.334	13.4	1.923	1.923	1.204	15.1	1.139	17.1	0.378
400	14.3	1.205	14.6	1.761	1.761	1.110	16.3	1.054	18.4	0.353
500	15.7	1.094	16.2	1.655	1.655	1.005	17.5	0.982	20.0	0.325
630	17.3	0.992	18.9	1.540	1.540	0.918	19.5	0.880	21.6	0.300
800	20.3	0.849	20.4	1.388	21.3	0.807	22.1	0.777	24.2	0.268
1000	22.3	0.771	22.4	1.285	23.3	0.738	24.1	0.713	26.2	0.248

Separation Sheath (for armoured cable): The separation sheath comprises a layer of extruded PVC, PE or LSZH, applied under the armour. The nominal thickness is calculated by 0.02Du + 0.6mm where Du is the fictitious diameter under the sheath in mm. For cables without a lead sheath, the nominal separation sheath thickness shall not be less than 1.2mm. For cables where the separation sheath is applied over the lead sheath, the nominal separation sheath thickness shall not be less than 1.0mm.

Lapped Bedding (for armoured lead sheathed cable): The lapped bedding consists of either impregnated/synthetic compounded paper tapes or a combination of two layers of these paper tapes followed by a few layers of compounded fabulous materials. The thickness is around 1.5mm.

Armour (for armoured cable): The armour consists of round aluminium wire armour applied helically over an extruded separation sheath.

Table 3. Round Armour Wire Diameter

Fictitious Diameter under the Armour		Armour Wire Diameter
mm		mm
>	<	
-	10	0.8
10	15	1.25
15	25	1.6
25	35	2.0
35	60	2.5
60	-	3.15

Over Sheath: Overall sheath comprises a layer of extruded thermoplastic compound (PVC, PE or LSZH can be offered as an option.) or elastomeric compound (polychlorprene CSP or chlorosulfonated PE). The nominal over sheath thickness is calculated by 0.035D+1 where D is the fictitiuous diameter immediately under the over sheath in mm. For unarmoured cables and cables with the over sheath not applied over the armour, metallic screen or concentric conductor, the nominal over sheath thickness shall not be less than 1.4mm. And for cables with over sheath applied over the armour, metallic screen or concentric conductor, the nominal over sheath thickness shall not be less than 1.8mm.

PHYSICAL PROPERTIES:

Operating Temperature: up to 70°C (PVC insulation); up to 90°C (XLPE or EPR insulation)
Temperature Range: -5°C (PVC or LSZH sheath); -20°C (PE sheath)
Short Circuit Temperature(5 seconds maximum duration): 140-160°C (PVC insulation); 250°C (XLPE or EPR insulation)
Bending Radius: 20 x OD

Table 4. Nominal /Operating /Testing Voltages

Rated Voltage Uo/U	Operating Voltage (Um)	Testing Voltage (rms)
1.8/3KV	3.6KV	6.5KV
3.6/6KV	7.2KV	12.5KV
6/10KV	12KV	21KV
8.7/15KV	17.5KV	30.5KV
12/20KV	24KV	42KV
18/30KV	36KV	63KV

*21/35KV and 26/35KV power frequency voltage test can be made under the following conditions: 2.5Uo x 30mins or 3.0Uo x 15mins. Numbers in brackets refer to the test values for 3.0Uo x 1.5mins.

Single Core 1.8/3KV (Um=3.6KV)
Dimensional Data

Nom. Cross-Section Area		Unarmoured Cables				Aluminium Wire Armoured Cables					
	Nom. Insulation Thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight		Nom. Bedding Thickness	Armour Wire Size	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
				CU	AL					CU	AL
mm²	mm	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
10	2.0	1.8	13	240	180	1.2	1.6	1.8	18	460	400
16	2.0	1.8	13	300	200	1.2	1.6	1.8	19	530	430
25	2.0	1.8	15	410	250	1.2	1.6	1.8	20	650	500
35	2.0	1.8	16	510	300	1.2	1.6	1.8	21	780	560
50	2.0	1.8	17	640	350	1.2	1.6	1.8	22	930	640
70	2.0	1.8	19	850	440	1.2	1.6	1.8	24	1170	750
95	2.0	1.8	20	1130	540	1.2	1.6	1.8	26	1460	870
120	2.0	1.8	22	1370	630	1.2	1.6	1.8	27	1730	990
150	2.0	1.8	23	1650	730	1.2	1.6	1.8	29	2030	1110
185	2.0	1.8	25	2010	860	1.2	1.6	1.9	30	2430	1280
240	2.0	1.8	27	2570	1050	1.2	1.6	2.0	33	3040	1530
300	2.0	1.8	29	3160	1250	1.2	2.0	2.1	36	3760	1860
400	2.0	1.9	33	3980	1560	1.2	2.0	2.2	39	4660	2230
500	2.2	2.1	35.5	4910	1905	1.3	2.5	2.5	43	5930	2930
630	2.4	2.2	39.7	6340	2420	1.4	2.5	2.6	49	7370	3430
800	2.6	2.3	44.5	7890	2980	1.4	2.5	2.7	52	9070	4230
1000	2.8	2.5	49.4	9890	3700	1.5	2.5	2.9	56	11100	4950

Caledonian Medium Voltage Cables

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Reactance		Inductance		Impedance			
						Trefoil	Flat Spaced	Trefoil	Flat Spaced	Trefoil		Flat Spaced	
										CU	AL	CU	AL
mm²	µΩ/m	µΩm	kA	pF/m	mA/m	µΩ/m		nH/m		µΩ/ m		µΩ/ m	
10	1830/3080	2330/3920	1.4/0.9	182	0.27	151	201	384	558	2332	3846	2332	3840
16	1150/1910	1460/2420	2.2/1.4	201	0.29	140	193	362	546	1462	2411	1478	2420
25	727/1200	927/1538	3.6/2.3	222	0.32	131	185	345	535	936	1544	952	1554
35	524/868	668/1113	5.0/3.2	251	0.35	122	178	327	524	679	1121	695	1131
50	387/641	494/822	6.8/4.4	281	0.39	116	172	313	514	511	834	527	844
70	268/443	343/568	9.8/6.3	341	0.45	110	165	300	495	364	583	386	597
95	193/320	248/410	13.3/8.5	397	0.50	104	160	287	485	272	427	300	446
120	153/253	196/325	17.2/11.0	430	0.55	104	159	283	480	225	345	257	367
150	124/206	159/266	21.2/13.5	464	0.59	100	156	280	475	193	287	229	313
185	99/164	128/211	26.6/17.0	513	0.65	98	154	274	465	165	237	206	267
240	75/125	98/161	34.9/22.3	573	0.70	94	150	267	459	140	191	185	226
300	60/100	80/130	43.8/28.0	652	0.72	91	147	260	455	128	163	174	203
400	47/78	64/102	57.3/36.6	727	0.75	90	147	253	445	113	141	164	184
500	37/60	51/81	72.3/46.2	754	0.79	89	145	248	435	105	124	158	171
630	28/47	42/64	91.2/58.3	786	0.87	86	143	245	425	97	110	151	160
800	22/37	35/55	114.4/75.0	846	0.91	85	142	243	415	92	101	147	153
1000	18/29	30/46	143.0/94.0	916	0.99	83	141	239	405	88	95	144	148

Single Core 3.6/6KV (Um=7.2KV)
Dimensional Data

Nom. Cross-Section Area				Unarmoured Cables				Aluminium Wire Armoured Cables					
	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight		Nom. Bedding Thickness	Armour Wire Size	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
						CU	AL					CU	AL
mm²	mm	mm²	mm²	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
10	2.5	4.7	10	1.8	16	320	260	1.2	1.6	1.8	22	610	550
16	2.5	5.1	10	1.8	16	390	290	1.2	1.6	1.8	22	680	580
25	2.5	5.7	16	1.8	18	500	340	1.2	1.6	1.8	23	810	660
35	2.5	6.2	16	1.8	19	610	400	1.2	1.6	1.8	24	940	730
50	2.5	6.7	16	1.8	20	750	450	1.2	1.6	1.8	26	1100	810
70	2.5	7.4	16	1.8	22	970	550	1.2	1.6	1.8	27	1350	930
95	2.5	8.2	16	1.8	23	1250	660	1.2	1.6	1.9	29	1670	1080
120	2.5	9.0	16	1.8	25	1500	760	1.2	1.6	1.9	31	1950	1200
150	2.5	9.7	25	1.8	26	1790	860	1.2	1.6	2.0	32	2270	1350
185	2.5	10.6	25	1.8	28	2150	1000	1.2	2.0	2.1	35	2770	1620
240	2.6	11.7	25	1.9	31	2770	1250	1.2	2.0	2.2	38	3440	1930
300	2.8	12.9	25	2.0	34	3400	1500	1.2	2.0	2.2	41	4120	2210
400	3.0	14.3	35	2.1	38	4280	1850	1.3	2.5	2.4	46	5250	2820
500	3.2	15.7	35	2.1	41.5	5325	2240	1.4	2.5	2.6	50	6520	3520
630	3.2	17.3	35	2.2	45.3	6745	2750	1.5	2.5	2.7	56	7960	4020
800	3.2	20.3	50	2.4	49.9	8290	3310	1.5	2.5	2.8	59	9660	4820
1000	3.2	22.3	50	2.5	54.2	10255	3990	1.6	2.5	3.0	63	11690	5540

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Copper Wire Screen 1 sec	Short Circuit Rating of Copper Tape Screen 1 sec	Reactance		Inductance		Impedance			
								Trefoil	Flat Spaced	Trefoil	Flat Spaced	Trefoil		Flat Spaced	
												CU	AL	CU	AL
mm²	µΩ/m	µΩm	kA	pF/m	mA/m	kA	kA	µΩ/m		nH/m		µΩ/ m		µΩ/m	
10	1830/3080	2330/3920	1.4/0.9	202	0.26	1.23	0.69	160	214	420	610	2332	3846	2345	3840
16	1150/1910	1460/2420	2.2/1.4	232	0.29	1.96	0.75	152	205	410	600	1462	2411	1478	2421
25	727/1200	927/1538	3.6/2.3	262	0.32	1.96	0.83	142	196	400	590	936	1544	952	1554
35	524/868	668/1113	5.0/3.2	291	0.35	1.96	0.90	133	187	390	580	679	1121	695	1131
50	387/641	494/822	6.8/4.4	321	0.39	1.96	0.98	121	179	380	570	511	834	527	844
70	268/443	343/568	9.8/6.3	371	0.45	1.96	1.09	115	173	370	550	364	583	386	597
95	193/320	248/410	13.3/8.5	417	0.50	1.96	1.20	110	168	350	540	272	427	300	446
120	153/253	196/325	17.2/11.0	459	0.55	1.96	1.32	107	165	340	520	225	345	257	367
150	124/206	159/265	21.2/13.5	494	0.59	3.06	1.41	103	161	330	510	193	287	229	313
185	99/164	128/211	26.6/17.0	543	0.65	3.06	1.54	100	158	320	500	165	237	206	267
240	75/125	98/161	34.9/22.3	583	0.70	3.06	1.71	97	155	310	490	140	191	185	226
300	60/100	80/130	43.8/28.0	602	0.72	3.06	1.88	95	153	300	490	126	163	174	203
400	47/78	64/102	57.3/36.6	627	0.75	4.29	2.08	92	150	290	480	113	141	164	184
500	37/60	51/81	72.3/46.2	654	0.79	4.29	2.30	90	147	290	470	105	124	158	171
630	28/47	42/64	91.2/58.3	726	0.87	4.29	2.53	87	145	280	460	97	110	151	160
800	22/37	35/55	114.4/75.0	786	0.91	6.13	2.96	85	143	270	460	92	101	147	153
1000	18/29	30/46	143.0/94.0	856	0.99	6.13	3.26	83	141	260	450	88	95	144	148

* For capacitance & charging current values, multiply values shown by 1.2 for EPR insulated cables.

Caledonian Medium Voltage Cables

Single Core 6/10KV (Um=12KV)
Dimensional Data

Nom. Cross-Section Area				Unarmoured Cables				Aluminium Wire Armoured Cables					
	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area*	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight		Nom. Bedding Thickness	Armour Wire Size	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
						CU	AL					CU	AL
mm²	mm	mm²	mm²	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
16	3.4	5.9	16	1.8	18	450	350	1.2	1.6	1.8	24	770	670
25	3.4	6.4	16	1.8	20	560	400	1.2	1.6	1.8	25	910	750
35	3.4	6.9	16	1.8	21	680	460	1.2	1.6	1.8	26	1040	820
50	3.4	7.4	16	1.8	22	810	520	1.2	1.6	1.8	28	1190	900
70	3.4	8.2	16	1.8	24	1050	620	1.2	1.6	1.9	29	1470	1040
95	3.4	8.9	16	1.8	25	1320	730	1.2	1.6	2.0	31	1780	1190
120	3.4	9.8	16	1.8	27	1580	840	1.2	2.0	2.0	34	2150	1410
150	3.4	10.4	25	1.9	28	1880	960	1.2	2.0	2.1	35	2480	1560
185	3.4	11.2	25	1.9	30	2250	1100	1.2	2.0	2.1	37	2890	1730
240	3.4	12.4	25	2.0	33	2870	1350	1.2	2.0	2.2	40	3570	2050
300	3.4	13.4	25	2.1	35	3490	1580	1.2	2.0	2.3	42	4230	2330
400	3.4	14.6	35	2.2	39	4350	1920	1.3	2.5	2.4	47	5320	2890
500	3.4	16.2	35	2.2	39.9	5235	2240	1.4	2.5	2.5	51	6510	3530
630	3.4	18.9	35	2.3	43.7	6675	2765	1.5	2.5	2.6	56	7960	4050
800	3.4	20.4	50	2.5	48.6	8225	3330	1.5	2.5	2.7	59	9670	4850
1000	3.4	22.4	50	2.6	52.9	10210	4030	1.6	2.5	2.9	63	11710	5570

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Copper Wire Screen 1 sec	Short Circuit Rating of Copper Tape Screen 1 sec	Reactance		Inductance		Impedance			
								Trefoil	Flat Spaced	Trefoil	Flat Spaced	Trefoil		Flat spaced	
												CU	AL	CU	AL
mm²	µΩ/m	µΩm	kA	pF/m	mA/m	kA	kA	µΩ/m		nH/m		µΩ/ m		µΩ/m	
16	1150/1910	1460/2420	2.2/1.4	187	0.39	1.96	0.86	152	216	480	680	1462	2411	1478	2421
25	727/1200	927/1538	3.6/2.3	208	0.42	1.96	0.94	144	210	460	660	936	1544	952	1554
35	524/868	668/1113	5.0/3.2	229	0.46	1.96	1.01	136	200	440	640	679	1121	695	1131
50	387/641	494/822	6.8/4.4	252	0.50	1.96	1.09	131	195	420	620	511	834	527	844
70	268/443	343/568	9.8/6.3	288	0.58	1.96	1.19	122	188	390	600	364	583	386	597
95	193/320	248/410	13.3/8.5	323	0.65	1.96	1.31	122	182	390	580	272	427	300	446
120	153/253	196/325	17.2/11.0	353	0.71	1.96	1.43	116	172	370	550	225	345	257	367
150	124/206	159/265	21.2/13.5	380	0.76	3.06	1.52	110	166	350	530	193	287	229	313
185	99/164	128/211	26.6/17.0	416	0.83	3.06	1.63	107	166	340	530	165	237	206	267
240	75/125	98/161	34.9/22.3	460	0.92	3.06	1.81	104	163	330	520	140	191	185	226
300	60/100	80/130	43.8/28.0	506	1.01	3.06	1.95	100	157	320	500	126	163	174	203
400	47/78	64/102	57.3/36.6	561	1.12	4.29	2.13	94	154	300	490	113	141	164	184
500	37/60	51/81.0	72.3/46.2	619	1.24	4.29	2.37	91	151	290	480	105	124	158	171
630	28/47	42/64.0	91.2/58.3	698	1.37	4.29	2.75	91	148	290	470	97	110	151	160
800	22/37	35/55	114.4/75.0	780	1.39	6.13	2.98	88	144	280	470	92	101	147	153
1000	18/29	30/46	143.0/94.0	860	1.54	6.13	3.27	85	143	270	460	88	95	144	148

* For capacitance & charging current values, multiply values shown by 1.2 for EPR insulated cables.

Medium Voltage Cables to IEC 60502

Single Core 8.7/15KV (Um=17.5KV)
Dimensional Data

Nom. Cross-Section Area				Unarmoured Cables				Aluminium Wire Armoured Cables					
	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area*	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight		Nom. Bedding Thickness	Armour Wire Size	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
						CU	AL					CU	AL
mm²	mm	mm²	mm²	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
25	4.5	7.3	16	1.8	22	640	480	1.2	1.6	1.8	28	1020	860
35	4.5	7.8	16	1.8	23	760	540	1.2	1.6	1.9	29	1170	950
50	4.5	8.3	16	1.8	24	900	610	1.2	1.6	1.9	30	1340	1040
70	4.5	9.1	16	1.8	26	1140	710	1.2	1.6	2.0	32	1610	1190
95	4.5	9.8	16	1.8	27	1420	830	1.2	2.0	2.1	35	2020	1430
120	4.5	10.7	16	1.9	29	1700	950	1.2	2.0	2.1	36	2310	1570
150	4.5	11.3	25	1.9	31	1990	1070	1.2	2.0	2.2	38	2660	1740
185	4.5	12.2	25	2.0	32	2380	1230	1.2	2.0	2.2	39	3070	1920
240	4.5	13.3	25	2.1	35	3010	1490	1.2	2.0	2.3	42	3750	2240
300	4.5	14.3	25	2.1	37	3620	1720	1.3	2.5	2.4	46	4590	2690
400	4.5	15.5	35	2.2	41	4490	2070	1.3	2.5	2.5	49	5550	3120
500	4.5	17.1	35	2.3	43	5460	2460	1.3	2.5	2.6	52	6590	3600
630	4.5	18.7	35	2.4	48	6790	2590	1.4	2.5	2.7	57	8060	4110
800	4.5	21.3	50	2.6	52	8420	3570	1.5	2.5	2.8	61	9800	4970
1000	4.5	23.3	50	2.7	55	10330	4180	1.6	2.5	3.0	65	10850	5710

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Copper Wire Screen 1 sec	Short Circuit Rating of Copper Tape Screen 1 sec	Reactance		Inductance		Impedance			
								Trefoil	Flat Spaced	Trefoil	Flat Spaced	Trefoil		Flat spaced	
												CU	AL	CU	AL
mm²	µΩ/m	µΩm	kA	pF/m	mA/m	kA	kA	µΩ/m		nH/m		µΩ/ m		µΩ/m	
25	727/1200	927/1538	3.6/2.3	171	0.47	1.96	1.07	150	210	480	680	936	1544	952	1554
35	524/868	668/1113	5.0/3.2	187	0.51	1.96	1.14	141	207	460	660	679	1121	695	1131
50	387/641	494/822	6.8/4.4	204	0.57	1.96	1.22	138	195	440	640	511	834	527	844
70	268/443	343/568	9.8/6.3	232	0.63	1.96	1.32	132	188	420	600	364	583	386	597
95	193/320	248/410	13.3/8.5	258	0.71	1.96	1.44	126	182	400	580	272	427	300	446
120	153/253	196/325	17.2/11.0	281	0.74	1.96	1.56	119	179	380	570	225	345	257	367
150	124/206	159/265	21.2/13.5	301	0.79	3.06	1.65	113	176	360	560	193	287	229	313
185	99/164	128/211	26.6/17.0	329	0.87	3.06	1.79	110	170	350	540	165	237	206	267
240	75/125	98/161	34.9/22.3	363	0.96	3.06	1.94	107	166	340	530	140	191	185	226
300	60/100	80/130	43.8/28.0	398	1.03	3.06	2.09	104	160	330	510	126	163	174	203
400	47/78	64/102	57.3/36.6	439	1.17	4.29	2.26	97	157	310	500	113	141	164	184
500	37/60	51/81	72.3/46.2	483	1.28	4.29	2.50	94	154	300	490	105	124	158	171
630	28/47	42/64	91.2/58.3	534	1.42	4.29	2.73	91	151	290	480	97	110	151	160
800	22/37	35/55	114.4/75.0	590	1.61	6.13	3.11	91	147	290	470	92	101	147	153
1000	18/29	30/46	143.0/94.0	640	1.75	6.13	3.40	88	144	280	460	88	95	144	148

* For capacitance & charging current values, multiply values shown by 1.2 for EPR insulated cables.

Caledonian Medium Voltage Cables

Single Core 12/20KV (Um=24KV)
Dimensional Data

Nom. Cross-Section Area				Unarmoured Cables				Aluminium Wire Armoured Cables					
	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area*	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight		Nom. Bedding Thickness	Armour Wire Size	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
						CU	AL					CU	AL
mm²	mm	mm²	mm²	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
25	5.5	8.1	16	1.8	24	720	560	1.2	1.6	1.8	29	1200	980
35	5.5	8.6	16	1.8	25	840	620	1.2	1.6	1.9	30	1350	1070
50	5.5	9.1	16	1.8	26	990	690	1.2	2.0	2.0	33	1550	1250
70	5.5	9.9	16	1.8	28	1230	800	1.2	2.0	2.1	35	1840	1420
95	5.5	10.7	16	1.9	30	1530	940	1.2	2.0	2.1	37	2160	1570
120	5.5	11.5	16	2.0	31	1810	1050	1.2	2.0	2.2	38	2470	1730
150	5.5	12.1	25	2.0	33	2110	1190	1.2	2.0	2.2	40	2810	1890
185	5.5	12.9	25	2.1	35	2510	1360	1.2	2.0	2.3	42	3240	2090
240	5.5	14.1	25	2.1	38	3130	1610	1.3	2.5	2.4	45	4150	2580
300	5.5	15.1	25	2.2	40	3760	1860	1.3	2.5	2.5	48	4800	2890
400	5.5	16.3	35	2.3	43	4650	2220	1.4	2.5	2.6	52	5780	3350
500	5.5	17.5	35	2.4	46	5530	2545	1.5	2.5	2.7	55	6850	3850
630	5.5	19.5	35	2.5	50	6700	3100	1.5	2.5	2.9	60	8380	4400
800	5.5	22.1	50	2.6	55	8580	3690	1.6	2.5	3.0	64	10130	5270
1000	5.5	24.1	50	2.7	59	10620	4445	1.7	2.5	3.1	68	12180	6000

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Copper Wire Screen 1 sec	Short Circuit Rating of Copper Tape Screen 1 sec	Reactance		Inductance		Impedance			
								Trefoil	Flat Spaced	Trefoil	Flat Spaced	Trefoil		Flat spaced	
												CU	AL	CU	AL
mm²	µΩ/m	µΩm	kA	pF/m	mA/m	kA	kA	µΩ/m		nH/m		µΩ/ m		µΩ/m	
25	727/1200	927/1538	3.6/2.3	142	0.62	1.96	1.19	162	214	490	680	936	1544	952	1554
35	524/868	668/1113	5.0/3.2	162	0.65	1.96	1.26	150	207	470	660	679	1121	695	1131
50	387/641	494/822	6.8/4.4	177	0.71	1.96	1.34	141	201	450	640	511	834	527	844
70	268/443	343/568	9.8/6.3	200	0.80	1.96	1.44	135	195	430	620	364	583	386	597
95	193/320	248/410	13.3/8.5	222	0.89	1.96	1.56	129	188	410	600	272	427	300	446
120	153/253	196/325	17.2/11.0	241	0.96	1.96	1.68	122	182	390	580	225	345	257	367
150	124/206	159/265	21.2/13.5	257	1.03	3.06	1.77	116	176	370	560	193	287	229	313
185	99/164	128/211	26.6/17.0	280	1.12	3.06	1.88	116	173	370	550	165	237	206	267
240	75/125	98/161	34.9/22.3	307	1.23	3.06	2.06	110	170	350	540	140	191	185	226
300	60/100	80/130	43.8/28.0	336	1.34	3.06	2.21	107	166	340	530	126	163	174	203
400	47/78	64/102	57.3/36.6	370	1.48	4.29	2.38	100	160	320	510	113	141	164	184
500	37/60	51/81	72.3/46.2	406	1.62	4.29	2.56	97	154	310	490	105	124	158	171
630	28/47	42/64	91.2/58.3	449	1.80	4.29	2.85	94	151	300	480	97	110	151	160
800	22/37	35/55	114.4/75.0	490	1.85	6.13	3.23	91	151	290	480	92	101	147	153
1000	18/29	30/46	143.0/94.0	540	2.03	6.13	3.52	87	148	280	470	88	95	144	148

* For capacitance & charging current values, multiply values shown by 1.2 for EPR insulated cables.

Medium Voltage Cables to IEC 60502

Single Core 18/30KV (Um=36KV)
Dimensional Data

Nom. Cross-Section Area				Unarmoured Cables				Aluminium Wire Armoured Cables					
	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area*	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight		Nom. Bedding Thickness	Armour Wire Size	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
						CU	AL					CU	AL
mm²	mm	mm²	mm²	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
50	8.0	11.2	16	2.0	31	1250	960	1.2	2.0	2.2	38	1910	1640
70	8.0	11.9	16	2.0	34	1510	1090	1.2	2.0	2.3	41	2240	1820
95	8.0	12.7	16	2.1	35	1830	1240	1.2	2.0	2.3	42	2570	1980
120	8.0	13.5	16	2.1	37	2110	1360	1.3	2.5	2.4	45	3060	2310
150	8.0	14.2	25	2.2	38	2420	1510	1.3	2.5	2.5	47	3430	2510
185	8.0	14.9	25	2.2	40	2830	1680	1.3	2.5	2.5	50	3890	2720
240	8.0	16.2	25	2.3	43	3500	1980	1.4	2.5	2.6	52	4630	3120
300	8.0	17.1	25	2.4	45	4150	2250	1.4	2.5	2.7	54	5330	3430
400	8.0	18.4	35	2.5	49	5070	2640	1.5	2.5	2.8	58	6360	3930
500	8.0	20.0	35	2.6	52	5945	2965	1.6	2.5	2.9	61	7670	4490
630	8.0	21.6	35	2.7	56	7445	3555	1.7	2.5	3.0	65	8870	5020
800	8.0	24.2	50	2.8	61	9060	4180	1.9	2.5	3.2	69	10790	5980
1000	8.0	26.2	50	2.9	65	11140	4980	2.0	2.5	3.3	73	12860	6730

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Copper Wire Screen 1 sec	Short Circuit Rating of Copper Tape Screen 1 sec	Reactance		Inductance		Impedance			
								Trefoil	Flat spaced	Trefoil	Flat spaced	Trefoil		Flat spaced	
												CU	AL	CU	AL
mm²	µΩ/m	µΩ/m	kA	pF/m	mA/m	kA	kA	µΩ/m		nH/m		µΩ/ m		µΩ/ m	
50	387/641	494/822	6.8/4.4	138	0.83	1.96	1.63	151	214	480	680	511	834	527	844
70	268/443	343/568	9.8/6.3	154	0.92	1.96	1.74	144	201	460	640	364	583	386	597
95	193/320	248/410	13.3/8.5	169	1.01	1.96	1.85	138	195	440	620	272	427	300	446
120	153/253	196/325	17.2/11.0	183	1.10	1.96	1.97	132	188	420	600	225	345	257	367
150	124/206	159/265	21.2/13.5	194	1.16	3.06	2.07	126	182	400	580	193	287	229	313
185	99/164	128/211	26.6/17.0	210	1.26	3.06	2.18	122	182	390	580	165	237	206	267
240	75/125	98/161	34.9/22.3	229	1.37	3.06	2.36	119	176	380	560	140	191	185	226
300	60/100	80/130	43.8/28.0	249	1.49	3.06	2.50	113	173	360	550	126	163	174	203
400	47/78	64/102	57.3/36.6	273	1.64	4.29	2.68	107	163	340	520	113	141	164	184
500	37/60	51/81	72.3/46.2	298	1.79	4.29	2.92	104	163	330	520	105	124	158	171
630	28/47	42/64	91.2/58.3	327	1.96	4.29	3.15	100	160	320	510	97	110	151	160
800	22/37	35/55	114.4/75.0	350	1.98	6.13	3.53	97	154	310	490	92	101	147	153
1000	18/29	30/46	143.0/94.0	380	2.15	6.13	3.82	94	149	300	490	88	95	144	148

* For capacitance & charging current values, multiply values shown by 1.2 for EPR insulated cables.

Caledonian Medium Voltage Cables

Current Rating for Single Core 3.6/6KV(Um=7.2KV) to 18/30KV(Um=36KV) XLPE Insulation

Nom. Cross-Section Area	Buried direct in Ground				Laid in Single Way Duct				Laid in Air					
	Trefoil		Flat spaced		Trefoil		Flat Touching		Trefoil		Flat Touching		Flat spaced	
	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL
mm²	A		A		A		A		A		A		A	
10	84	59	87	62	78	55	98	56	103	75	106	77	122	88
16	109	84	113	88	103	80	104	81	125	97	128	99	150	116
25	140	108	144	112	132	102	133	103	163	127	167	130	196	153
35	166	129	172	134	157	122	159	123	198	154	203	157	238	185
50	196	152	203	157	186	144	188	146	238	184	243	189	286	222
70	239	186	246	192	227	176	229	178	296	230	303	236	356	278
95	285	221	293	229	271	210	274	213	361	280	369	287	434	338
120	323	252	332	260	308	240	311	242	417	324	426	332	500	391
150	361	281	366	288	343	267	347	271	473	368	481	376	559	440
185	406	317	410	324	387	303	391	307	543	424	550	432	637	504
240	469	367	470	373	447	351	453	356	641	502	647	511	745	593
300	526	414	524	419	504	397	510	402	735	577	739	586	846	677
400	590	470	572	466	564	451	571	457	845	673	837	676	938	769
500	650	530	672	546	604	504	661	537	935	773	938	776	1118	919
630	700	600	882	646	654	554	771	617	1045	883	1048	886	1318	1089
800	750	660	1002	756	694	594	871	717	1145	983	1148	986	1528	1279
1000	800	720	1112	856	724	644	971	807	1235	1083	1238	1086	1738	1469

Current Rating for Single Core 3.6/6KV(Um=7.2KV) to 18/30KV(Um=36KV) EPR Insulation

Nom. Cross-Section Area	Buried direct in Ground				Laid in Single Way Duct				Laid in Air					
	Trefoil		Flat spaced		Trefoil		Flat Touching		Trefoil		Flat Touching		Flat spaced	
	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL
mm²	A		A		A		A		A		A		A	
10	81	57	83	58	74	52	94	53	94	68	97	70	110	79
16	106	82	109	84	99	77	100	78	116	90	119	92	138	107
25	136	105	140	109	128	99	129	100	153	119	156	121	181	141
35	162	126	167	130	153	118	154	120	186	144	190	147	221	171
50	192	149	198	153	181	140	183	142	224	174	229	178	266	207
70	234	182	242	188	222	172	224	174	280	218	287	223	334	259
95	280	217	289	224	266	206	269	208	343	266	352	273	409	317
120	319	247	329	256	303	235	306	238	398	309	407	317	474	368
150	357	277	369	287	341	264	344	267	454	352	465	361	540	419
185	403	314	417	325	386	300	390	303	522	406	534	417	621	484
240	467	364	484	377	449	350	454	354	619	483	634	495	736	575
300	526	411	545	426	509	397	515	401	712	556	728	570	843	659
400	597	471	618	487	580	456	588	462	825	651	843	667	977	770
500	657	531	718	567	620	509	678	542	915	751	849	767	1157	920
630	707	601	928	667	670	559	788	622	1025	862	1054	876	1357	1090
800	757	661	1048	777	710	599	888	722	1125	961	1154	977	1567	1280
1000	807	721	1158	877	740	649	988	812	1215	1061	1244	1077	1777	1470

Current Rating Conditions:

Ground Temperature: 20°C
Ambient Temperature (air): 30°C
Depth of Soil: 0.8m
Thermal Resistance of Soil: 1.5K•m/W

Three Core Cables to IEC 60502

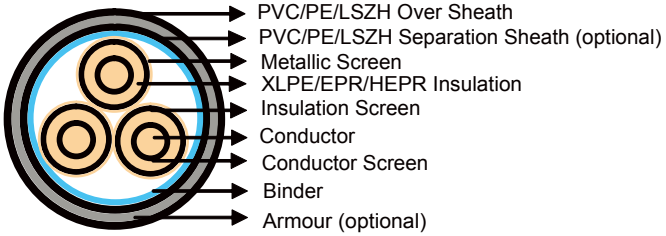
APPLICATIONS:

The three core cables are designed for distribution of electrical power with nominal voltage Uo/U ranging from 1.8/3KV to 26/35KV and frequency 50Hz. They are suitable for installation mostly in power supply stations, indoors and in cable ducts, outdoors, underground and in water as well as for installation on cable trays for industries, switchboards and power stations.

STANDARD:

IEC 60502 Part 1(1.8/3KV)
IEC 60502 Part 2(3.6/6KV to 18/30KV)

CONSTRUCTION:



Conductor: Plain annealed copper or aluminium complying with IEC 60228 class 1 or 2.
Conductor Screen: The conductor screen consists of an extruded layer of non metallic, semi-conducting compound applied on top of a semi-conducting tape. The conductor screen is applied under triple extrusion process over the conductor along with the insulation and the insulation screen. The extruded semi-conducting compound is firmly bonded to the insulation to exclude all air voids and can be easily hand stripped on site. The conductor screen is not necessary for both PVC and EPR/HEPR insulated 1.8/3.6KV and 3.6/6KV cables.
Insulation: Insulation is of polyvinyl chloride (PVC) intended for 1.8/3.6KV and 3.6/6KV cables, cross-linked polyethylene compound (XLPE) or ethylene propylene rubber (EPR/HEPR).

Table 1. Insulation Thickness of XLPE or EPR/HEPR Insulation

Nom. Cross Section Area		Insulation Thickness at Nom. Voltage						
	1.8/3KV (Um=3.6KV)	3.6/6KV (Um=7.2KV)			6/10KV (Um=12KV)	8.7/15KV (Um=17KV)	12/20KV (Um=24KV)	18/30KV (Um=36KV)
mm²	mm	mm			mm	mm	mm	mm
	XLPE/EPR	XLPE	EPR		XLPE/EPR	XLPE/EPR	XLPE/EPR	XLPE/EPR
			Unscreened	Screened				
10	2.0	2.5	3.0	2.5	-	-	-	-
16	2.0	2.5	3.0	2.5	3.4	-	-	-
25	2.0	2.5	3.0	2.5	3.4	4.5	-	-
35	2.0	2.5	3.0	2.5	3.4	4.5	5.5	-
50 – 185	2.0	2.5	3.0	2.5	3.4	4.5	5.5	8.0
240	2.0	2.6	3.0	2.6	3.4	4.5	5.5	8.0
300	2.0	2.8	3.0	2.8	3.4	4.5	5.5	8.0
400	2.0	3.0	3.0	3.0	3.4	4.5	5.5	8.0
500 - 1600	2.2-2.8	3.2	3.2	3.2	3.4	4.5	5.5	8.0

Insulaton Screen: The insulation screen consists of an extruded layer of non metallic, semi-conducting compound extruded over the insulation of each core. The extruded semi-conducting layer shall consist of bonded or cold strippable semi-conducting compound

capable of removal for jointing or terminating. As an option, a semi-conducting tape may be applied over the individual cores or core assembly as a bedding for the metallic layer. The minimum thickness is 0.3 mm and the maximum resistivity is 500 Ohm-m at 90°C. The screen is tightly fitted to the insulation to exclude all air voids and can be easily hand stripped on site. The insulation screen is not necessary for both PVC and EPR/HEPR insulated 1.8/3.6KV and 3.6/6KV cables. The screen may be covered by semi-conductive water blocking swellable tape to ensure longitudinal watertightness.

Inner Covering & Fillers: For cables with a collective metallic layer or cables with a metallic layer over each individual cores with additional collective metallic layers, semi-conducting inner covering and fillers shall be applied over the laid up cores. The inner covering and fillers are made of non hygroscopic material like polypropylene, except if the cable is to be made longitudinally watertight. The inner covering is extruded in general but may be lapped if the interstices between the cores are filled.

The approximate thickness of extruded inner coverings is given in Table 2:

Table 2. Approximate Thickness of Extruded Inner Coverings

Ficititous Diameter over Laid Up Cores		Approx. Thickness of Extruded Inner Covering
mm		mm
>	<	
-	25	1.0
25	35	1.2
35	45	1.4
45	60	1.6
60	80	1.8
80	-	2.0

*The approximate thickness of lapped inner coverings shall be 0.4mm for fictitious diameters over the laid up cores up to and including 40mm and 0.6mm for larger diameter.

Metallic Layer: The concentric copper screen wire is applied over the insulation, or over the insulation screen or over an inner covering. As an alternative, copper tape(s) with minimum thickness of 0.1mm can be applied with overlap. Total cross section of copper wire screen and copper tape screen layer are shown in Table 3a and 3b.

Table 3a. Total Cross Section and Max. DC Resistance of Copper Wire Screen

Nom. Cross Section Area of Conductor	Total Cross Section					Max. DC Resistance at 20℃
	3.6/6KV (Um=7.2KV)	6/10KV (Um=12KV)	8.7/15KV (Um=17KV)	12/20KV (Um=24KV)	18/30KV (Um=36KV)	
mm²	mm	mm	mm	mm	mm	Ω
10	10	-	-	-	-	1.075
16	16	16	-	-	-	1.075
25	16	16	16	16	-	1.075
35	16	16	16	16	-	1.075
50	16	16	16	16	16	1.075
70	16	16	16	16	16	1.075
95	16	16	16	16	16	1.075
120	16	16	16	16	16	1.075
150	25	25	25	25	25	0.688
185	25	25	25	25	25	0.688
240	25	25	25	25	25	0.688
300	25	25	25	25	25	0.688
400	35	35	35	35	35	0.491
500	35	35	35	35	35	0.491
630	35	35	35	35	35	0.491

Table 3b. Total Cross Section and Max. DC Resistance of Copper Tape Screen (0.1mm)

Nom. Cross Section Area of Conductor	Total Cross Section & Max. DC Resistance									
	3.6/6KV (Um=7.2KV)		6/10KV (Um=12KV)		8.7/15KV (Um=17KV)		12/20KV (Um=24KV)		18/30KV (Um=36KV)	
	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃
mm²	mm	Ω	mm	Ω	mm	Ω	mm	Ω	mm	Ω
10	4.2	4.122	-		-		-		-	-
16	4.6	3.778	5.20	3.306	-		-		-	-
25	5.0	3.420	5.68	3.029	6.47	2.657	7.2	2.390	-	-
35	5.4	3.161	6.09	2.824	6.89	2.498	7.6	2.261	-	-
50	5.9	2.903	6.58	2.616	7.37	2.334	8.1	2.125	9.9	1.738
70	6.6	2.616	7.23	2.380	8.02	2.145	8.7	1.967	10.5	1.630
95	7.3	2.369	7.91	2.174	8.71	1.975	9.4	1.824	11.2	1.531
120	8.0	2.153	8.64	1.991	9.43	1.823	10.2	1.694	12.0	1.438
150	8.5	2.013	9.19	1.871	9.99	1.722	10.7	1.606	12.5	1.374
185	9.4	1.838	9.88	1.741	10.82	1.590	11.4	1.509	13.2	1.303
240	10.4	1.656	10.96	1.569	11.76	1.463	12.5	1.378	14.3	1.204
300	11.4	1.508	11.84	1.452	12.64	1.361	13.4	1.287	15.2	1.134
400	12.6	1.362	12.92	1.332	13.71	1.254	14.4	1.192	16.2	1.059
500	13.9	1.237	14.34	1.199	15.14	1.136	15.5	1.110	17.7	0.974
630	15.3	1.121	16.68	1.031	16.57	1.038	17.3	0.995	19.1	0.901

Separation Sheath (for armoured cable): The separation sheath comprises a layer of extruded PVC, PE or LSZH applied over the laid up cores under the armour. PVC is normally of grade ST2 and PE of grade ST7. The nominal thickness is calculated by 0.02Du + 0.6mm where Du is the fictitious diameter under the sheath in mm. For cables without a lead sheath, the nominal separation sheath thickness shall not be less than 1.2mm. For cables where the separation sheath is applied over the lead sheath, the nominal separation sheath thickness shall not be less than 1.0mm.

Tabel 4. Separation Thickness

Cores Diameter		Approx. Thickness of Inner Sheath
mm		mm
>	<	
35	45	1.4
45	60	1.6
60	80	1.8
80	-	2.0

Lapped Bedding (for armoured lead sheathed cable): The lapped bedding applied to the lead sheath consists of either impregnated/synthetic compounded paper tapes or a combination of two layers of these paper tapes followed by a few layers of compounded fabulous materials. The thickness is around 1.5mm.

Armour (for armoured cable): The armour is applied over the inner covering helically. It consists of either flat galvanized steel wire armour (strip), round galvanized steel wire armour, and double steel tape armour.

Table 5. Round Armour Wire Diameter

Fictitious Diameter under the Armour		Armour Wire Diameter
mm		mm
>	<	
-	10	0.8
10	15	1.25
15	25	1.6
25	35	2.0
35	60	2.5
60	-	3.15

Table 6. Armour Tape Thickness

Fictitious Diameter under the Armour		Galvanized Steel / Steel	Aluminum / Aluminium Alloy
mm		mm	mm
>	<		
-	30	0.2	0.5
30	70	0.5	0.5
70	-	0.8	0.8

For flat wire armour and fictitious diameter under the armour greater than 15mm, the nominal thickness of the flat steel wire diameter shall be 0.8mm.Cables with fictitious diameter under the armour up to and including 15mm, flat wire armour will not be used. The tape armour is applied helically in two layers so that the outer tape is approximately central over the gap of the inner tape. If tape armour is used, the inner covering shall be reinforced by taped bedding.

Over Sheath: Overall sheath comprises a layer of extruded either thermoplastic compound (PVC ST3 type or PE ST7 type or LSZH) or elastomeric compound (polychlorprene CSP or chlorosulfonated PE). The nominal over sheath thickness is calculated by 0.035D+1 where D is the fictitiuous diameter immediately under the over sheath in mm. For unarmoured cables and cables with the over sheath not applied over the armour, metallic screen or concentric conductor, the nominal over sheath thickness shall not be less than 1.4mm. And for cables with over sheath applied over the armour, metallic screen or concentric conductor, the nominal over sheath thickness shall not be less than 1.8mm.

PHYSICAL PROPERTIES:

Operating Temperature: up to 70°C (PVC insulation); up to 90°C (XLPE or EPR insulation)
Temperature Range: -5°C (PVC or LSZH sheath); -20°C (PE sheath)
Short Circuit Temperature(5 seconds maximum duration): 140-160 °C (PVC insulation); 250°C (XLPE or EPR insulation)
Bending Radius: 15 x OD

Table 7. Nominal /Operating /Testing Voltages

Rated Voltage Uo/U	Operating Voltage (Um)	Testing Voltage (rms)
1.8/3KV	3.6KV	6.5KV
3.6/6KV	7.2KV	12.5KV
6/10KV	12KV	21KV
8.7/15KV	17.5KV	30.5KV
12/20KV	24KV	42KV
18/30KV	36KV	63KV

*21/35KV and 26/35KV power frequency voltage test can be made under the following conditions: 2.5Uo x 30mins or 3.0Uo x 15mins. Numbers in brackets refer to the test values for 3.0Uo x 1.5mins.

Three Core 1.8/3KV (Um=3.6KV)
Dimensional Data

		Unarmoured Cables				Steel Round-Wire Armoured Cables					
Nom. Cross-Section Area	Nom. Insulation Thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight		Nom. Bedding Thickness	Armour Wire Size	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
				CU	AL					CU	AL
mm²	mm	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
10	2.0	1.8	23	650	460	1.2	1.6	1.8	28	1480	1290
16	2.0	1.8	24	840	540	1.2	1.6	1.9	29	1720	1410
25	2.0	1.8	26	1160	680	1.2	1.6	1.9	32	2130	1650
35	2.0	1.8	29	1490	820	1.2	2.0	2.1	36	2810	2140
50	2.0	1.9	32	1900	1000	1.2	2.0	2.2	39	3340	2450
70	2.0	2.0	36	2580	1290	1.2	2.0	2.3	42	4200	2910
95	2.0	2.2	40	3440	1640	1.3	2.5	2.4	47	5620	3820
120	2.0	2.3	43	4220	1950	1.3	2.5	2.5	51	6580	4310
150	2.0	2.4	46	5090	2290	1.4	2.5	2.7	54	7680	4870
185	2.0	2.5	50	6240	2730	1.5	2.5	2.8	58	9060	5560
240	2.0	2.7	56	8030	3430	1.6	2.5	3.0	64	11200	6600
300	2.0	2.8	60	9890	4100	1.6	2.5	3.1	69	13590	7500
400	2.0	3.1	68	12530	5150	1.8	3.15	3.4	78	17260	9880
500	2.2	3.3	75.7	16680	7510	1.8	3.15	3.5	84.3	21780	13025
630	2.4	3.5	84.9	21770	10040	1.8	3.15	3.8	94.6	27400	16050

Caledonian Medium Voltage Cables

Nom. Cross-Section Area	Steel Flat Wire Armoured Cables						Double Steel Tape Armoured Cables					
	Nom. Bedding Thickness	Armour Wire Size	Nom.Sheath Thickness	Approx. Overall Diameter	Approx. Weight		Nom. Bedding Thickness	No of Steel Tapes x Nom Tape Thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
					CU	AL					CU	AL
mm²	mm	mm	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
10	1.2	0.8	1.8	24.5	1245	1065	1.2	2 x 0.2	1.8	23.6	925	750
16	1.2	0.8	1.8	27.1	1565	1280	1.2	2 x 0.2	1.8	26.2	1205	925
25	1.2	0.8	1.8	29.7	1975	1525	1.2	2 x 0.2	1.9	29.0	1590	1145
35	1.2	0.8	1.9	32.5	2420	1805	1.2	2 x 0.2	1.9	31.6	1985	1370
50	1.2	0.8	2.0	35	2860	2080	1.2	2 x 0.2	2.0	34.1	2400	1605
70	1.2	0.8	2.1	38.7	3685	2525	1.2	2 x 0.5	2.2	39.5	3570	2410
95	1.3	0.8	2.2	42.9	4695	3080	1.3	2 x 0.5	2.3	43.7	4570	2950
120	1.3	0.8	2.3	46.4	5650	3585	1.3	2 x 0.5	2.4	46.1	5510	3440
150	1.4	0.8	2.4	49.6	6630	4085	1.4	2 x 0.5	2.6	50.6	6500	3955
185	1.5	0.8	2.6	54.1	7990	4820	1.5	2 x 0.5	2.7	54.9	7825	4650
240	1.6	0.8	2.7	59.2	10060	5790	1.6	2 x 0.5	2.8	60.0	9825	5600
300	1.6	0.8	2.9	64.6	12230	6865	1.6	2 x0.5	3.0	65.4	12030	6660
400	1.8	0.8	3.1	71.0	15200	8280	1.8	2 x 0.5	3.2	71.8	14970	8055
500	1.8	0.8	3.3	79.5	19090	10255	1.8	2 x 0.8	3.5	80.5	18880	10035
630	1.8	0.8	3.6	89.8	24400	12920	1.8	2 x 0.8	3.8	92.3	25070	13620

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Reactance	Inductance
mm²	μΩ/m	μΩ/m	kA	pF/m	mA/m	μΩ/m	nH/m
10	1830/3080	2330/3920	1.4/0.9	160	0.25	101	390
16	1150/1910	1460/2420	2.2/1.4	180	0.27	98	370
25	727/1200	929/1538	3.6/2.3	220	0.29	95	350
35	524/868	668/1113	5.0/3.2	250	0.31	92	330
50	387/641	494/822	6.8/4.4	270	0.33	88	310
70	268/443	343/568	9.8/6.3	310	0.35	84	290
95	193/320	248/410	13.3/8.5	350	0.38	81	270
120	153/253	196/325	17.2/11.0	380	0.46	79	250
150	124/206	159/265	21.2/13.5	420	0.50	77	260
185	99/164	128/211	26.6/17.0	460	0.56	76	250
240	75/125	98/161	34.9/22.3	510	0.61	74	240
300	60/100	80/130	43.8/28.0	570	0.68	73	250
400	47/78	64/102	57.3/36.6	590	0.70	71	240
500	37/60	57/81	72.3/46.2	610	0.72	69	230
630	28/47	42/64	91.2/58.3	630	0.74	67	220

Medium Voltage Cables to IEC 60502

Three Core 3.6/6KV (Um=7.2KV)
Dimensional Data

				Unarmoured Cables				Steel Round-Wire Armoured Cables					
Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Nom. Sheath Thickness	Approx. Overall Diameter	Approx.Weight		Nom. Bedding Thickness	Armour Wire Size	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
						CU	AL					CU	AL
mm²	mm	mm²	mm²	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
10	2.5	4.2	16	2.0	30	980	790	1.2	2.0	2.1	36	2310	2120
16	2.5	4.6	16	2.0	31	1190	890	1.2	2.0	2.2	38	2600	2290
25	2.5	5.0	16	2.1	34	1560	1080	1.2	2.0	2.3	41	3080	2600
35	2.5	5.4	16	2.2	37	1930	1270	1.3	2.5	2.4	45	3950	3280
50	2.5	5.9	16	2.3	40	2370	1480	1.3	2.5	2.5	47	4530	3630
70	2.5	6.6	16	2.4	43	3110	1820	1.4	2.5	2.6	51	5510	4210
95	2.5	7.3	16	2.5	47	4000	2200	1.5	2.5	2.8	55	6660	4860
120	2.5	8.0	16	2.6	50	4820	2550	1.5	2.5	2.9	59	7630	5360
150	2.5	8.5	25	2.8	54	5770	2970	1.6	2.5	3.0	62	8800	6000
185	2.5	9.4	25	2.9	58	6960	3460	1.6	2.5	3.1	66	10180	6670
240	2.6	10.4	25	3.1	65	8940	4340	1.8	3.15	3.4	75	13480	8870
300	2.8	11.4	25	3.3	70	10980	5190	1.9	3.15	3.6	81	15920	10130
400	3.0	12.6	35	3.5	79	13820	6440	2.0	3.5	3.9	90	19980	12590
500	3.2	13.9	35	3.7	87	19100	10755	2.1	3.5	4.1	98	24160	14820
630	3.2	15.3	35	4.0	95	30470	13150	2.2	3.5	4.4	107	29650	17710

	Steel Flat Wire Armoured Cables						Double Steel Tape Armoured Cables					
Nom. Cross-Section Area	Nom. Bedding Thickness	Armour Wire Size	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight		Nom. Bedding Thickness	No of Steel tapes x nom tape thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
					CU	AL					CU	AL
mm²	mm	mm	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
10	1.2	0.8	1.8	26.9	1415	1235	1.2	2X0.2	1.8	26	1060	885
16	1.2	0.8	1.8	29.2	1725	1445	1.2	2X0.2	1.8	28.3	1340	1055
25	1.2	0.8	1.9	32.2	2165	1735	1.2	2X0.2	1.9	31.3	1735	1305
35	1.3	0.8	2.0	35.0	2645	2025	1.3	2X0.2	2.0	34.1	2170	1555
50	1.3	0.8	2.1	37.4	3075	2295	1.3	2X0.5	2.1	38.0	2950	2170
70	1.4	0.8	2.2	41.0	3915	2755	1.4	2X0.5	2.3	41.8	3795	2635
95	1.5	0.8	2.3	45.3	4840	3335	1.5	2X0.5	2.4	46.1	4810	3200
120	1.5	0.8	2.4	48.7	5915	3855	1.5	2X0.5	2.5	49.5	5770	3705
150	1.6	0.8	2.5	52.1	6930	4395	1.6	2X0.5	2.6	52.9	6775	4235
185	1.6	0.8	2.6	56.2	8265	5100	1.6	2X0.5	2.8	57.2	8120	4950
240	1.8	0.8	2.8	62.2	10440	6220	1.8	2X0.5	2.9	63.0	10250	6025
300	1.9	0.8	3.0	68.2	12780	7420	1.9	2X0.5	3.1	69.0	12570	7200
400	2.0	0.8	3.3	75.9	15970	9110	2.0	2X0.5	3.4	76.7	15740	8870
500	2.1	0.8	3.5	84.2	19940	11130	2.1	2X0.8	3.6	86.5	20550	11750
630	2.2	0.8	3.7	93.5	25120	13670	2.2	2X0.8	3.9	96.0	25830	14400

Caledonian Medium Voltage Cables

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Copper Wire Screen Per Core 1 sec	Short Circuit Rating of Copper Tape Screen Per Core 1 sec	Reactance	Inductance
mm²	µΩ/m	µΩ/m	kA	pF/m	mA/m	kA	kA	µΩ/m	nH/m
10	1830/3080	2330/3920	1.4/0.9	212	0.27	1.23	0.61	132	410
16	1150/1910	1470/2420	2.2/1.4	242	0.30	1.96	0.66	124	390
25	727/1200	927/1538	3.6/2.3	272	0.33	1.96	0.73	116	370
35	524/868	668/1113	5.0/3.2	301	0.36	1.96	0.79	108	350
50	387/641	494/822	6.8/4.4	332	0.40	1.96	0.87	102	330
70	268/443	343/568	9.8/6.3	383	0.46	1.96	0.96	97	310
95	193/320	248/410	13.3/8.5	432	0.52	1.96	1.06	92	290
120	153/253	196/325	17.2/11.0	474	0.57	1.96	1.17	89	280
150	124/206	159/265	21.2/13.5	511	0.61	3.06	1.25	87	280
185	99/164	128/211	26.6/17.0	562	0.67	3.06	1.37	86	270
240	75/125	98/161	34.9/22.3	602	0.72	3.06	1.52	83	260
300	60/100	80/130	43.8/28.0	622	0.75	3.06	1.67	82	260
400	47/78	64/102	57.3/36.6	648	0.78	4.29	1.84	80	250
500	37/60	51/81	72.3/46.2	668	0.82	4.29	2.03	78	250
630	28/47	42/64	91.2/58.3	758	0.92	4.29	2.24	76	240

Three Core 6/10KV (Um=12KV)
Dimensional Data

				Unarmoured Cables				Steel Round-Wire Armoured Cables					
Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight		Nom. Bedding Thickness	Armour Wire Size	Nom. Sheath Thickness	Approx Overall Diameter	Approx. Weight	
						CU	AL					CU	AL
mm²	mm	mm²	mm²	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
16	3.4	5.20	16	2.2	36	1410	1110	1.2	2.0	2.4	42	3000	2700
25	3.4	5.68	16	2.3	39	1800	1320	1.3	2.5	2.5	46	3900	3430
35	3.4	6.09	16	2.3	41	2170	1500	1.3	2.5	2.6	49	4430	3770
50	3.4	6.58	16	2.4	44	2630	1730	1.4	2.5	2.7	52	5080	4190
70	3.4	7.23	16	2.6	48	3400	2110	1.5	2.5	2.8	56	6050	4750
95	3.4	7.91	16	2.7	52	4310	2510	1.5	2.5	2.9	60	7180	5380
120	3.4	8.64	16	2.8	55	5150	2890	1.6	2.5	3.0	63	8230	5960
150	3.4	9.19	25	2.9	58	6100	3300	1.7	2.5	3.1	67	9380	6580
185	3.4	9.88	25	3.0	62	7310	3810	1.7	3.15	3.3	72	11610	8110
240	3.4	10.96	25	3.2	69	9290	4680	1.8	3.15	3.5	79	14110	9510
300	3.4	11.84	25	3.3	73	11240	5450	1.9	3.15	3.7	84	16420	10630
400	3.4	12.92	35	3.6	81	14040	6660	2.0	3.5	3.9	92	20620	12880
500	3.4	14.34	35	3.7	88	17830	8450	2.1	3.5	4.0	99.	25090	16530
630	3.4	16.68	35	3.9	96	20030	10895	2.2	3.5	4.1	109	30880	19670

Medium Voltage Cables to IEC 60502

	Steel Flat Wire Armoured Cables						Double Steel Tape Armoured Cables					
Nom. Cross-Section Area	Nom. Bedding Thickness	Armour Wire Size	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight		Nom. Bedding Thickness	No of Steel tapes x nom tape thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
					CU	AL					CU	AL
mm²	mm	mm	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
16	1.2	0.8	2.2	39.7	2795	2515	1.2	2x0.5	2.3	40.5	2680	2395
25	1.3	0.8	2.2	42.7	3305	2885	1.3	2x0.5	2.4	43.7	3195	2775
35	1.3	0.8	2.3	45.2	3835	3215	1.3	2x0.5	2.5	46.2	3720	3100
50	1.4	0.8	2.4	47.8	4325	3570	1.4	2x0.5	2.6	48.8	4200	3445
70	1.5	0.8	2.5	51.8	5320	4185	1.5	2x0.5	2.7	52.8	5185	4050
95	1.5	0.8	2.7	56.1	6450	4875	1.5	2x0.5	2.8	56.9	6280	4700
120	1.6	0.8	2.8	59.7	7545	5510	1.6	2x0.5	2.9	60.5	7360	5325
150	1.7	0.8	2.9	63.1	8610	6150	1.7	2x0.5	3.0	63.9	8420	5950
185	1.7	0.8	3.0	67.4	10120	6995	1.7	2x0.5	3.1	68.2	9910	6780
240	1.8	0.8	3.2	73.0	12430	8205	1.8	2x0.5	3.3	73.8	12200	7970
300	1.9	0.8	3.3	78.3	14775	9455	1.9	2x0.5	3.4	79.1	14530	9200
400	2.0	0.8	3.5	85.2	17950	11190	2.0	2x0.8	3.7	87.7	18600	11850
500	2.1	0.8	3.7	92.8	21970	13270	2.1	2x0.8	3.9	95.3	22680	13990
630	2.2	0.8	4.0	102.7	27480	16160	2.2	2x0.8	4.1	105.0	28200	16910

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Copper Wire Screen Per Core 1 sec	Short Circuit Rating of Copper Tape Screen Per Core 1 sec	Reactance	Inductance
mm²	µΩ/m	µΩ/m	kA	pF/m	mA/m	kA	kA	µΩ/m	nH/m
16	1150/1910	1470/2420	2.2/1.4	186	0.40	1.96	0.76	131	410
25	727/1200	927/1538	3.6/2.3	216	0.43	1.96	0.83	123	390
35	524/868	668/1113	5.0/3.2	237	0.47	1.96	0.89	115	370
50	387/641	494/822	6.8/4.4	266	0.52	1.96	0.96	109	350
70	268/443	343/568	9.8/6.3	298	0.60	1.96	1.05	103	330
95	193/320	248/410	13.3/8.5	334	0.67	1.96	1.16	99	320
120	153/253	196/325	17.2/11.0	365	0.73	1.96	1.26	96	310
150	124/206	159/265	21.2/13.5	392	0.78	3.06	1.34	93	300
185	99/164	128/211	26.6/17.0	430	0.86	3.06	1.44	90	290
240	75/125	98/161	34.9/22.3	476	0.95	3.06	1.60	87	280
300	60/100	80/130	43.8/28.0	524	1.05	3.06	1.73	85	270
400	47/78	64/102	57.3/36.6	580	1.16	4.29	1.89	81	260
500	37/60	51/81	72.3/46.2	630	1.26	4.29	2.09	78	250
630	28/47	42/64	91.2/58.3	690	1.36	4.29	2.44	76	240

Caledonian Medium Voltage Cables

Three Core 8.7/15KV (Um=17.5KV)
Dimensional Data

				Unarmoured Cables				Steel Round-Wire Armoured Cables					
Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight		Nom. Bedding Thickness	Armour Wire Size	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
						CU	AL					CU	AL
mm²	mm	mm²	mm²	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
25	4.5	6.47	16	2.4	44	2100	1620	1.4	2.5	2.7	52	4560	4080
35	4.5	6.89	16	2.5	46	2510	1840	1.4	2.5	2.7	54	5080	4410
50	4.5	7.37	16	2.6	49	2980	2080	1.5	2.5	2.9	57	5740	4840
70	4.5	8.02	16	2.7	53	3760	2470	1.6	2.5	3.0	62	6770	5480
95	4.5	8.71	16	2.8	57	4700	2900	1.6	2.5	3.1	65	7890	6100
120	4.5	9.43	16	3.0	60	5590	3320	1.7	2.5	3.2	69	8970	6700
150	4.5	9.99	25	3.1	64	6560	3760	1.8	3.15	3.4	74	11030	8220
185	4.5	10.82	25	3.2	67	7800	4300	1.8	3.15	3.5	78	12490	8980
240	4.5	11.76	25	3.4	74	9820	5220	1.9	3.15	3.7	84	15040	10440
300	4.5	12.64	25	3.5	79	11800	6010	2.0	3.5	3.8	90	17920	12130
400	4.5	13.71	35	3.7	86	14620	7240	2.1	3.5	4.1	98	21360	13970
500	4.5	15.14	35	3.8	93	18160	9355	2.2	3.5	4.3	106	26490	17830

	Steel Flat Wire Armoured Cables						Double Steel Tape Armoured Cables					
Nom. Cross-Section Area	Nom. Bedding Thickness	Armour Wire Size	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight		Nom. Bedding Thickness	No of Steel tapes x Nom Tape Thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
					CU	AL					CU	AL
mm²	mm	mm	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
25	1.4	0.8	2.4	48.0	3915	3495	1.4	2x0.5	2.5	48.8	3770	3345
35	1.4	0.8	2.5	50.8	4510	3890	1.4	2x0.5	2.6	51.6	4350	3735
50	1.5	0.8	2.6	53.3	5020	4270	1.5	2x0.5	2.7	54.1	4855	4105
70	1.6	0.8	2.7	57.0	5990	4870	1.6	2x0.5	2.8	57.8	5815	4690
95	1.6	0.8	2.8	61.2	7170	5600	1.6	2x0.5	3.0	62.2	7010	5435
120	1.7	0.8	2.9	65.1	8340	6320	1.7	2x0.5	3.1	66.1	8170	6145
150	1.8	0.8	3.0	68.3	9440	6955	1.8	2x0.5	3.2	69.3	9260	6770
185	1.8	0.8	3.2	72.8	10990	7880	1.8	2x0.5	3.3	73.6	10760	7650
240	1.9	0.8	3.3	78.3	13370	9155	1.9	2x0.5	3.4	79.1	13120	8900
300	2.0	0.8	3.5	83.7	15760	10460	2.0	2x0.8	3.6	86.0	16360	11070
400	2.1	0.8	3.7	90.5	19050	12260	2.1	2x0.8	3.9	93.0	19750	12960
500	2.2	0.8	3.9	98.2	23160	14430	2.2	2x0.8	4.1	100.7	23900	15190

Medium Voltage Cables to IEC 60502

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capacitance	Charging Current	Short Circuit Rating of Copper Wire Screen Per Core 1 sec	Short Circuit Rating of Copper Tape Screen Per Core 1 sec	Reactance	Inductance
mm²	μΩm	μΩ/m	kA	pF/m	mA/m	kA	kA	μΩm	nH/m
25	727/1200	927/1538	3.6/2.3	176	0.48	1.96	0.95	132	410
35	524/868	668/1113	5.0/3.2	193	0.53	1.96	1.01	123	390
50	387/641	494/822	6.8/4.4	211	0.58	1.96	1.08	116	370
70	268/443	343/568	9.8/6.3	240	0.65	1.96	1.17	110	350
95	193/320	248/410	13.3/8.5	267	0.73	1.96	1.27	105	330
120	153/253	196/325	17.2/11.0	291	0.79	1.96	1.38	102	320
150	124/206	159/265	21.2/13.5	312	0.85	3.06	1.46	98	310
185	99/164	128/211	26.6/17.0	340	0.93	3.06	1.58	95	300
240	75/125	98/161	34.9/22.3	375	1.02	3.06	1.72	91	290
300	60/100	80/130	43.8/28.0	411	1.12	3.06	1.85	89	280
400	47/78	64/102	57.3/36.6	454	1.24	4.29	2.00	84	270
500	37/60	51/81	72.3/46.2	504	1.34	4.29	2.21	78	250

Three Core12/20KV (Um=24KV)

Dimensional Data

				Unarmoured Cables				Steel Round-Wire Armoured Cables					
Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight		Nom. Bedding Thickness	Armour Wire Size	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
						CU	AL					CU	AL
mm²	mm	mm²	mm²	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
35	5.5	7.6	16	2.7	51	2850	2180	1.5	2.5	2.9	60	5700	5010
50	5.5	8.1	16	2.8	54	3340	2450	1.6	2.5	3.0	62	6370	5480
70	5.5	8.7	16	2.9	58	4150	2850	1.6	2.5	3.1	66	7370	6070
95	5.5	9.4	16	3.0	62	5110	3310	1.7	3.15	3.3	72	9400	7600
120	5.5	10.2	16	3.1	65	5990	3730	1.8	3.15	3.4	75	10530	8270
150	5.5	10.7	25	3.2	68	6980	4180	1.8	3.15	3.5	80	11800	8940
185	5.5	11.4	25	3.3	72	8240	4740	1.9	3.15	3.7	83	13350	9850
240	5.5	12.5	25	3.6	79	10310	5700	2.0	3.5	3.8	90	16430	11820
300	5.5	13.4	25	3.7	84	12360	6570	2.1	3.5	4.0	95	18870	13080
400	5.5	14.4	35	3.9	91	15220	7830	2.2	4.0	4.3	103	23260	15930
500	5.5	15.5	35	4.1	97	19105	10325	2.3	4.2	4.5	110	27800	19170

Caledonian Medium Voltage Cables

Nom. Cross-Section Area	Steel Flat Wire Armoured Cables						Double Steel Tape Armoured Cables					
	Nom. Bedding Thickness	Armour Wire Size	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight		Nom. Bedding Thickness	No of Steel tapes x nom tape thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
					CU	AL					CU	AL
mm²	mm	mm	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
35	1.5	0.8	2.7	55.7	5150	4530	1.5	2x0.5	2.8	56.5	4975	4355
50	1.6	0.8	2.8	58.2	5675	4935	1.6	2x0.5	2.9	59.0	5495	4750
70	1.6	0.8	2.9	61.9	6685	5570	1.6	2x0.5	3.0	62.7	6490	5375
95	1.7	0.8	3.0	66.4	7945	6390	1.7	2x0.5	3.1	67.2	7735	6180
120	1.8	0.8	3.1	70.0	9110	7103	1.8	2x0.5	3.2	70.8	8890	6880
150	1.8	0.8	3.2	73.2	10240	7770	1.8	2x0.5	3.3	74.0	10010	7535
185	1.9	0.8	3.3	77.7	11840	8750	1.9	2x0.5	3.4	78.5	11600	8500
240	2.0	0.8	3.5	83.2	14270	10070	2.0	2x0.8	3.6	85.5	14870	10680
300	2.1	0.8	3.6	88.6	16730	11440	2.1	2x0.8	3.8	91.1	17400	12130
400	2.2	0.8	3.9	95.6	20130	13350	2.2	2x0.8	4.0	97.9	20820	14050
500	2.3	0.8	4.1	103.3	24310	15600	2.3	2x0.8	4.2	105.6	25050	16350

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Copper Wire Screen Per Core 1 sec	Short Circuit Rating of Copper Tape Screen Per Core 1 sec	Reactance	Inductance
mm²	μΩ/m	μΩ/m	kA	pF/m	mA/m	kA	kA	μΩ/m	nH/m
35	524/868	668/1113	5.0/3.2	168	0.67	1.96	1.11	129	410
50	387/641	494/822	6.8/4.4	183	0.73	1.96	1.18	122	390
70	268/443	343/568	9.8/6.3	207	0.83	1.96	1.28	115	370
95	193/320	248/410	13.3/8.5	229	0.92	1.96	1.38	110	350
120	153/253	196/325	17.2/11.0	249	1.00	1.96	1.48	106	340
150	124/206	159/265	21.2/13.5	266	1.06	3.06	1.56	103	330
185	99/164	128/211	26.6/17.0	289	1.16	3.06	1.66	100	320
240	75/125	98/161	34.9/22.3	318	1.27	3.06	1.82	95	300
300	60/100	80/130	43.8/28.0	348	1.39	3.06	1.95	93	290
400	47/78	64/102	57.3/36.6	388	1.53	4.29	2.11	87	280
500	37/60	51/81	72.3/46.2	422	1.67	4.29	2.26	78	250

Medium Voltage Cables to IEC 60502

Three Core 18/30KV (Um=36KV)
Dimensional Data

				Unarmoured Cables				Steel Round-Wire Armoured Cables					
Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight		Nom. Bedding Thickness	Armour Wire Size	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
						CU	AL					CU	AL
mm²	mm	mm	mm²	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
50	8.0	9.9	16	3.2	65	4340	3460	1.8	3.15	3.5	75	8950	8080
70	8.0	10.5	16	3.3	70	5220	3930	1.9	3.15	3.6	80	10150	8860
95	8.0	11.2	16	3.4	74	6240	4440	1.9	3.15	3.7	84	11390	9590
120	8.0	12.0	16	3.5	77	7180	4910	2.0	3.5	3.8	89	13200	10860
150	8.0	12.5	25	3.6	80	8220	5420	2.1	3.5	4.0	92	14520	11720
185	8.0	13.2	25	3.7	84	9540	6040	2.1	4.0	4.1	97	17020	13510
240	8.0	14.3	25	3.9	91	11720	7110	2.2	4.0	4.3	104	19810	15200
300	8.0	15.2	25	4.0	95	13790	8000	2.3	4.5	4.5	108	23310	17470
400	8.0	16.2	35	4.3	103	16820	9430	2.4	4.5	4.7	117	27010	19620
500	8.0	17.7	35	4.5	110	21550	12880	2.5	4.5	4.9	124	31130	22610

	Steel Flat Wire Armoured Cables						Double Steel Tape Armoured Cables					
Nom. Cross-Section Area	Nom. Bedding Thickness	Armour Wire Size	Nom. Sheath Thickness	Approx. Oveall Diameter	Approx. Weight		Nom. Bedding Thickness	No of Steel tapes x nom tape thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
					CU	AL					CU	AL
mm²	mm	mm	mm	mm	kg/km		mm	mm	mm	mm	kg/km	
50	1.8	0.8	3.1	70.2	7490	6775	1.8	2x0.5	3.3	71.2	7300	6585
70	1.9	0.8	3.2	74.0	8590	7540	1.9	2x0.5	3.4	75.0	8390	7335
95	1.9	0.8	3.4	78.5	9990	8460	1.9	2x0.5	3.5	79.3	9740	8210
120	2.0	0.8	3.5	82.2	11250	9270	2.0	2x0.8	3.6	84.5	11845	9875
150	2.1	0.8	3.6	85.6	12510	10070	2.1	2x0.8	3.7	87.9	13120	10700
185	2.1	0.8	3.7	89.8	14155	11100	2.1	2x0.8	3.9	92.3	14850	11800
240	2.2	0.8	3.8	95.4	16740	12575	2.2	2x0.8	4.0	97.9	17480	13320
300	2.3	0.8	4.0	100.9	19310	14120	2.3	2x0.8	4.2	103.4	20080	14900
400	2.4	0.8	4.2	107.8	22840	16170	2.4	2x0.8	4.4	110.3	23660	17000
500	2.5	0.8	4.4	115.5	27200	18610	2.5	2x0.8	4.6	118.0	28080	19510

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capacitance	Charging Current	Short Circuit Rating of Copper Wire Screen Per Core 1 sec	Short Circuit Rating of Copper Tape Screen Per Core 1 sec	Reactance	Inductance
mm²	µΩ/m	µΩ/m	kA	pF/m	mA/m	kA	kA	µΩ/m	nH/m
50	387/641	494/822	6.8/4.4	142	0.85	1.96	1.45	134	430
70	268/443	343/568	9.8/6.3	159	0.95	1.96	1.54	127	400
95	193/320	248/410	13.3/8.5	175	1.05	1.96	1.64	121	390
120	153/253	196/325	17.2/11.0	189	1.13	1.96	1.75	117	370
150	124/206	159/265	21.2/13.5	201	1.21	3.06	1.83	113	360
185	99/164	128/211	26.6/17.0	217	1.3	3.06	1.93	109	350
240	75/125	98/161	34.9/22.3	237	1.42	3.06	2.09	104	330
300	60/100	80/130	43.8/28.0	258	1.55	3.06	2.21	101	320
400	47/78	64/102	57.3/36.6	282	1.69	4.29	2.37	96	290
500	37/60	51/81	72.3/46.2	302	1.79	4.29	2.58	78	250

Caledonian Medium Voltage Cables

Current Rating for Three Core 3.6/6KV(Um=7.2)KV to 18/30KV(Um=36KV) XLPE Insulation

Nom. Cross-Section Area	Unarmored						Armored					
	Buried direct in Ground		Laid in Single Way Duct		Laid in Air		Buried direct in Ground		Laid in Single Way Duct		Laid in Air	
	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL
mm²	A		A		A		A		A		A	
10	76	53	62	42	87	62	76	53	63	43	88	63
16	101	78	87	67	109	84	101	78	88	68	110	85
25	129	100	112	87	142	110	129	100	112	87	143	111
35	153	119	133	103	170	132	154	119	134	104	172	133
50	181	140	158	122	204	158	181	140	158	123	205	159
70	221	171	193	150	253	196	220	171	194	150	253	196
95	262	203	231	179	304	236	263	204	232	180	307	238
120	298	232	264	205	351	273	298	232	264	206	352	274
150	334	260	297	231	398	309	332	259	296	231	397	309
185	377	294	336	262	455	355	374	293	335	262	453	354
240	434	340	390	305	531	415	431	338	387	304	529	415
300	489	384	441	346	606	475	482	380	435	343	599	472
400	553	438	501	398	696	552	541	432	492	393	683	545
500	613	498	541	451	786	652	601	492	532	446	773	645
630	663	568	591	501	896	762	651	562	582	496	883	755

Current Rating for Three Core 3.6/6KV(Um=7.2)KV to 18/30KV(Um=36KV) EPR Insulation

Nom. Cross-Section Area	Unarmored						Armored					
	Buried direct in Ground		Laid in Single Way Duct		Laid in Air		Buried direct in Ground		Laid in Single Way Duct		Laid in Air	
	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL
mm²	A		A		A		A		A		A	
10	73	51	59	40	82	58	73	51	60	41	82	59
16	98	76	84	65	104	80	98	76	85	66	104	81
25	125	97	109	84	135	105	125	97	109	85	136	105
35	150	116	130	101	164	127	150	116	131	101	164	127
50	176	137	154	119	195	151	177	137	155	120	197	153
70	216	167	189	147	243	189	216	168	190	147	244	190
95	258	200	227	176	296	229	257	200	227	176	296	230
120	292	227	258	201	339	263	292	227	259	201	339	264
150	328	255	291	226	385	299	327	254	291	226	385	300
185	371	289	330	257	441	343	368	288	328	257	439	343
240	429	335	384	300	519	406	424	332	381	299	513	402
300	482	378	434	340	590	462	475	374	429	338	583	459
400	545	432	494	392	678	538	534	426	485	387	666	530
500	605	492	534	445	768	638	594	486	525	440	756	630
630	655	562	584	495	878	749	644	556	575	490	862	741

Current Rating Conditions:

Ground Temperature: 20°C
Ambient Temperature (air): 30°C
Depth of Soil: 0.8 m
Thermal Resistance of Soil: 1.5K•m/W

Caledonian Medium Voltage Cables

IV

I	II	III	IV	V

Medium Voltage Cables to VDE 0276

Single Core Cables to VDE 0276

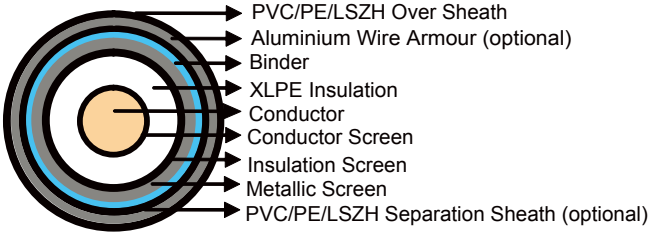
Three Core Cables to VDE 0276

Caledonian Medium Voltage Cables

Single Core Cables to VDE 0276

APPLICATIONS:

The single core cables are designed for distribution of electrical power with nominal voltage Uo/U ranging from 3.6/6KV to 18/30KV and frequency 50Hz. They are suitable for installation mostly in power supply stations, indoors and in cable ducts, outdoors, underground and in water as well as for installation on cable trays for industries, switchboards and power stations.



STANDARD:

DIN VDE 0276 Part 620-622
HD 620 S1

CONSTRUCTION:

Conductor: Stranded compacted circular copper or aluminium conductors according to IEC 60228 class 2 / VDE 0276 class 2 / VDE 0295 HD 383. All internal interstices of the conductor are filled with water blocking compound to prevent ingress of water through conductor during storage, handing, installation and operation of the cable.
Conductor Screen: The conductor screen consists of an extruded layer of non metallic, semi-conducting compound firmly bonded to the insulation to exclude all air voids. The screen has a minimum thickness of 0.3mm and the maximum volume resistivity of 500 Ohm-m at 90°C.
Insulation: Insulation is of extruded XLPE compound type 2XI1 according to DIN VDE 0207 part 22 and HD 620.1 with high degree of cross-linking, free from contaminants, air voids and heat resistant by dry cured process.
The nominal insulation wall thickness is shown in table 1.

Table 1. Insulation Thickness

Nom. Cross Section Area of Conductor	Insulation Thickness at Nom. Voltage				
	3.6/6KV(Um=7.2KV)	6/10KV(Um=12KV)	8.7/15KV(Um=17.5KV)	12/20KV(Um=24KV)	18/30KV(Um=36KV)
mm²	mm	mm	mm	mm	mm
35	2.5	3.4	4.5	5.5	-
50	2.5	3.4	4.5	5.5	8.0
70	2.5	3.4	4.5	5.5	8.0
95	2.5	3.4	4.5	5.5	8.0
120	2.5	3.4	4.5	5.5	8.0
150	2.5	3.4	4.5	5.5	8.0
185	2.5	3.4	4.5	5.5	8.0
240	2.6	3.4	4.5	5.5	8.0
300	2.8	3.4	4.5	5.5	8.0
400	3.0	3.4	4.5	5.5	8.0

Insulation Screen: The insulation screen consists of extruded non metallic, semi-conducting compound extruded over the insulation. The extruded semi-conducting layer shall consist of bonded or cold strippable semi-conducting compound capable of removal for jointing or terminating.The minimum thickness is 0.3mm and the maximum volume resistivity of 500 Ohm-m at 90°C. The screen is tightly fitted to the insulation to exclude all air voids and can be easily hand stripped on site.

Conducting Water Blocking Layer: The insulation screen may be coverd by semi-conductive water blocking tape which will swell up under the influence of moisture of water to ensure longitudinal watertightness.

Metallic Layer: The metallic layer shall consist of either copper tapes or a concentric layer of copper wires or a combination of tapes and wires. The metallic layer provides an earth fault current path, capable of withstanding fault current to earth of 1000A for one second at maximum temperature 160°C. Copper wires are applied over the conducting water blocking layer with a minimum diameter of 0.5mm. As an alternative, copper tape(s) with minimum thickness of 0.1mm can be applied with overlap. Total cross section of copper wire screen and copper tape screen layer are shown in Table 2a and 2b.

Table 2a. Total Cross Section and Max. DC Resistance of Copper Wire Screen

Nominal Cross-Section of Cables mm²	Total Cross Section					Max. DC Resistance of Copper Wire Screen at 20℃
	3.6/6KV (Um=7.2KV)	6/10KV (Um=12KV)	8.7/15KV (Um=17.5KV)	12/20KV (Um=24KV)	18/30KV (Um=36KV)	
mm²	mm²					Ω
70	16	16	16	16	16	1.19
95	16	16	16	16	16	1.19
120	16	16	16	16	16	1.19
150	25	25	25	25	25	0.759
185	25	25	25	25	25	0.759
240	25	25	25	25	25	0.759
300	25	25	25	25	25	0.759
400	35	35	35	35	35	0.271
500	35	35	35	35	35	0.217
630	35	35	35	35	35	0.271

Table 2b. Total Cross Section and Max. DC Resistance of Copper Tape Screen (0.1mm)

Nominal Cross-Section of Cables mm²	Total Cross Section & Max. DC Resistance									
	3.6/6KV (Um=7.2KV)		6/10KV (Um=12KV)		8.7/15KV (Um=17.5KV)		12/20KV (Um=24KV)		18/30KV (Um=36KV)	
	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃	Total Cross Section	Max. DC Resistance at 20℃
mm²	mm²	Ω	mm²	Ω	mm²	Ω	mm²	Ω	mm²	Ω
70	7.4	2.314	8.2	2.106	9.1	1.897	9.9	1.740	11.9	1.442
95	8.2	2.095	8.9	1.923	9.8	1.748	10.7	1.614	12.7	1.354
120	9.0	1.905	9.8	1.761	10.7	1.613	11.5	1.498	13.5	1.272
150	9.7	1.781	10.4	1.655	11.3	1.523	12.1	1.420	14.2	1.215
185	10.6	1.626	11.2	1.540	12.2	1.407	12.9	1.335	14.9	1.153
240	11.7	1.465	12.4	1.388	13.3	1.294	14.1	1.219	16.2	1.065
300	12.9	1.334	13.4	1.285	14.3	1.204	15.1	1.139	17.1	1.003
400	14.3	1.205	14.6	1.178	15.5	1.110	16.3	1.054	18.4	0.937
500	15.7	1.094	16.2	1.061	17.1	1.005	17.5	0.982	20.0	0.861
630	17.3	0.992	18.9	0.912	18.7	0.918	19.5	0.880	21.6	0.797

Separator / Water Blocking Layer: The metallic screen may be covered by non-conducting water blocking tape which will swell up under the influence of moisture of water to ensure longitudinal watertightness.

Separation Sheath (for armoured cable): The separation sheath comprises a layer of extruded PVC, PE or LSZH, applied under the armour. Thickness of separation sheath as shown in table 3.

Table 3. Separation Sheath Thickness

Core Diameter		Approx.Thickess of Inner Sheath
mm		mm
>	<	
35	45	1.4
45	60	1.6
60	80	1.8
80	-	2.0

Armour (for armoured cable): The armour consists of round aluminium wire armour applied helically over an extruded separation sheath.

Table 4. Round Armour Wire Diameter

Fictitious Diameter under the Armour		Armour Wire Diameter
mm		mm
>	<	
-	10	0.8
10	15	1.25
15	25	1.6
25	35	2.0
35	60	2.5
60	-	3.15

Over Sheath: Overall sheath comprises a layer of extruded PE compound DMP2 according to HD620.1 and 2YM3 type to DIN VDE 0276 Part 3, or PVC compound DMV6 according to HD620.1 and YM5 to DIN VDE 0276 Part 6. LSZH can be offered as an option. Normal wall thickness is 2.5mm (for 1/500mmsq 18/30KV, wall thickness is 2.6mm), suitable for exposure to sun-light or other local atmospheric environments and for the operating temperature of the cable.

PHYSICAL PROPERTIES:

Operating Temperature: up to 90°C
Temperature Range: -5°C (PVC or LSZH sheath); -20°C (PE sheath)
Short Circuit Temperature: 250°C (short circuit duration up to 5 seconds)
Bending Radius: 15 x OD (Cable without metal sheath)
30 x OD (Cable with aluminium sheath)

Table 5. Nominal /Operating /Testing Voltages

Nominal Voltage Uo/U	Operating Voltage (max)	Testing Voltage
3.6/6KV	8KV	10KV
6/10KV	12KV	15KV
8.7/15KV	18KV	22.5KV
12/20KV	24KV	30KV
18/30KV	36KV	45KV

Caledonian Medium Voltage Cables

TYPE CODES:

Cores

N	According to VDE Standard (No abbreviation for copper conductor)
A	Aluminium Conductor
2X	XLPE Insulation
Y	PVC Insulation

Screen

S	Screen of copper wires and copper tape, helically wound.
SE	Screen of copper wire plus copper tape over each individual cores, helically wound
(F)	Longitudinally waterproof screen.

Concentric Conductor Screen

C	Concentric conductor screen of copper wires and copper tape, helically wound.
CE	Concentric conductor screen of copper wire plus copper tape over each individual cores, helically wound.

Jacket

2Y	PE Jacket
Y	PVC Jacket
H	LSZH Jacket

Single Core 1.8/3KV (Um=3.6KV)
Dimensional Data

Nom. Cross-Section Area	Nom. Insulation Thickness	Nom. Sheath Thickness	Nom. Overall Diameter	Approx. Weight					
				N2XSY/ N2XSH CU	NA2XSY/ NA2XSH AL	N2XS2Y CU	NA2XS2Y AL	N2XS(F)2Y CU	NA2XS(F) 2Y AL
mm²	mm	mm	mm	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km
25	2.0	1.4	13	500	180	480	140	500	230
35	2.0	1.4	14	620	280	600	240	620	330
50	2.0	1.4	15	700	380	750	290	750	430
70	2.0	1.5	17	900	480	800	380	1000	560
95	2.0	1.5	19	1200	590	1050	460	1300	670
120	2.0	1.6	21	1450	700	1300	550	1500	800
150	2.0	1.6	22	1700	800	1550	650	1800	900
185	2.0	1.7	24	2050	850	1900	750	2150	950
240	2.0	1.8	27	2550	1050	2350	900	2650	1150
300	2.0	1.8	29	3150	1250	2950	1050	3250	1350
400	2.0	1.9	32	3950	1550	3800	1450	4100	1650
500	2.2	2.0	35	5000	2000	4800	1800	5200	2150
630	2.4	2.2	38	6200	2200	6300	2100	6400	2350
800	2.6	2.3	44	8000	2900	7900	2800	8200	3050

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Reactance		Inductance		Impedance			
										Trefoil		Flat Spaced	
						Trefoil	Flat Spaced	Trefoil	Flat Spaced	CU	AL	CU	AL
mm²	µΩ/m	µΩm	kA	pF/m	mA/m	µΩ/m		nH/m		µΩ/ m		µΩ/ m	
25	727/1200	929/1538	3.6/2.3	222	0.32	131	185	345	535	936	1544	952	1554
35	524/868	668/1113	5.0/3.2	251	0.35	122	178	327	524	679	1121	695	1131
50	387/641	494/822	6.8/4.4	281	0.39	116	172	313	514	511	834	527	844
70	268/443	343/568	9.8/6.3	341	0.45	110	165	300	495	364	583	386	597
95	193/320	248/410	13.3/8.5	397	0.50	104	160	287	485	272	427	300	446
120	153/253	196/325	17.2/11.0	430	0.55	104	159	280	475	225	345	257	367
150	124/206	159/265	21.2/13.5	464	0.59	100	156	274	465	193	287	229	313
185	99/164	128/211	26.6/17.0	513	0.65	98	154	267	459	165	237	206	267
240	75/125	98/161	34.9/22.3	573	0.70	94	150	260	455	140	191	185	226
300	60/100	80/130	43.8/28.0	652	0.72	91	147	253	445	128	163	174	203
400	47/78	64/102	57.3/36.6	727	0.75	90	147	248	435	113	141	164	184
500	37/60	51/81	72.3/46.2	754	0.79	89	145	245	425	105	124	158	171
630	28/47	42/64	91.2/58.3	786	0.87	86	143	243	415	97	110	151	160

Caledonian Medium Voltage Cables

Single Core 3.6/6KV (Um=7.2 KV)
Dimensional Data

Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Nom. Sheath Thickness	Nom. Overall Diameter	Approx. Weight					
						N2XSY/ N2XSH CU	NA2XSY/ NA2XSH AL	N2XS2Y CU	NA2XS2Y AL	N2XS(F)2Y CU	NA2XS(F)2Y AL
mm²	mm	mm²	mm²	mm	mm	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km
25	2.5	5.7	16	1.5	18	700	480	600	550	700	560
35	2.5	6.2	16	1.6	20	820	580	800	560	900	660
50	2.5	6.7	16	1.6	21	1000	680	900	570	1050	750
70	2.5	7.4	16	1.7	23	1200	770	1100	650	1300	850
95	2.5	8.2	16	1.7	24	1500	890	1350	760	1550	990
120	2.5	9.0	16	1.8	26	1850	1000	1700	850	1900	1150
150	2.5	9.7	25	1.8	27	2100	1100	1950	1050	2200	1250
185	2.5	10.6	25	1.9	29	2450	1250	2300	1200	2550	1300
240	2.6	11.7	25	1.9	32	3050	1550	2850	1400	3150	1650
300	2.8	12.9	25	2.0	35	3650	1850	3450	1650	3750	1950
400	3.0	14.3	35	2.1	38	4550	2250	4400	2050	4700	2350
500	3.2	15.7	35	2.3	42	5700	2700	5500	2500	5900	2850
630	3.2	17.3	35	2.4	48	7090	3020	6890	2820	7290	3200
800	3.2	20.3	35	2.5	52	8900	3700	8700	3500	9100	3850

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Copper Wire Screen 1 sec	Short Circuit Rating of Copper Tape Screen 1 sec	Reactance		Inductance		Impedance			
								Trefoil	Flat Spaced	Trefoil	Flat Spaced	Trefoil		Flat Spaced	
												CU	AL	CU	AL
mm²	µΩ/m	µΩm	kA	pF/m	mA/m	kA	kA	µΩ/m		nH/m		µΩ/ m		µΩ/m	
25	727/1200	927/1538	3.6/2.3	262	0.32	1.96	0.83	142	196	400	590	936	1544	952	1554
35	524/868	668/1113	5.0/3.2	291	0.35	1.96	0.90	133	187	390	580	679	1121	695	1131
50	387/641	494/822	6.8/4.4	321	0.39	1.96	0.98	121	179	380	570	511	834	527	844
70	268/443	343/568	9.8/6.3	371	0.45	1.96	1.09	115	173	370	550	364	583	386	597
95	193/320	248/410	13.3/8.5	417	0.50	1.96	1.20	110	168	350	540	272	427	300	446
120	153/253	196/325	17.2/11.0	459	0.55	3.06	1.32	107	165	340	520	225	345	257	367
150	124/206	159/265	21.2/13.5	494	0.59	3.06	1.41	103	161	330	510	193	287	229	313
185	99/164	128/211	26.6/17.0	543	0.65	3.06	1.54	100	158	320	500	165	237	206	267
240	75/125	98/161	34.9/22.3	583	0.70	3.06	1.71	97	155	310	490	140	191	185	226
300	60/100	80/130	43.8/28.0	602	0.72	4.29	1.88	95	153	300	490	126	163	174	203
400	47/78	64/102	57.3/36.6	627	0.75	4.29	2.08	92	150	290	480	113	141	164	184
500	37/60	51/81	72.3/46.2	654	0.79	4.29	2.30	90	147	290	470	105	124	158	171
630	28/47	42/64	91.2/58.3	726	0.87	6.13	2.53	87	145	280	460	97	110	151	160
800	22/37	35/55	114.4/75.0	786	0.91	5.8	2.96	85	143	270	460	92	101	147	153

* For capacitance & charging current values, multiply values shown by 1.2 for EPR insulated cables.

Single Core 6/10KV (Um=12 KV)
Dimensional Data

Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Nom. Sheath Thickness	Nom. Overall Diameter	Approx. Weight					
						N2XSY/ N2XSH CU	NA2XSY/ NA2XSH AL	N2XS2Y CU	NA2XS2Y AL	N2X(F)2Y CU	NA2XS(F)2Y AL
mm²	mm	mm²	mm²	mm	mm	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km
25	3.4	6.4	16	1.6	25	820	580	720	550	900	650
35	3.4	6.9	16	1.6	25	920	680	900	570	980	750
50	3.4	7.4	16	1.7	26	1100	780	950	670	1150	850
70	3.4	8.2	16	1.7	28	1300	870	1200	750	1400	950
95	3.4	8.9	16	1.8	30	1600	990	1450	860	1650	1100
120	3.4	9.8	16	1.8	32	1950	1100	1800	950	2050	1250
150	3.4	10.4	25	1.9	33	2200	1200	2050	1150	2300	1350
185	3.4	11.2	25	1.9	34	2550	1350	2400	1300	2650	1500
240	3.4	12.4	25	2.0	36	3150	1650	2950	1500	3250	1750
300	3.4	13.4	25	2.1	38	3750	1950	3550	1750	3850	2050
400	3.4	14.6	35	2.2	43	4650	2350	4500	2150	4800	2450
500	3.4	16.2	35	2.3	45	5800	2800	5700	2600	6000	2950
630	3.4	18.9	35	2.4	50	7300	3100	7010	2950	7500	3300
800	3.4	20.4	35	2.5	50	9100	3900	8900	3700	9300	4000

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Copper Wire Screen 1 sec	Short Circuit Rating of Copper Tape Screen 1 sec	Reactance		Inductance		Impedance			
								Trefoil	Flat Spaced	Trefoil	Flat Spaced	Trefoil		Flat Spaced	
												CU	AL	CU	AL
mm²	µΩ/m	µΩm	kA	pF/m	mA/m	kA	kA	µΩ/m		nH/m		µΩ/ m		µΩ/m	
25	727/1200	927/1538	3.6/2.3	208	0.42	1.96	0.94	144	210	460	660	936	1544	952	1554
35	524/868	668/1113	5.0/3.2	229	0.46	1.96	1.01	136	200	440	640	679	1121	695	1131
50	387/641	494/822	6.8/4.4	252	0.50	1.96	1.09	131	195	420	620	511	834	527	844
70	268/443	343/568	9.8/6.3	288	0.58	1.96	1.19	122	188	390	600	364	583	386	597
95	193/320	248/410	13.3/8.5	323	0.65	1.96	1.31	122	182	390	580	272	427	300	446
120	153/253	196/325	17.2/11.0	353	0.71	1.96	1.43	116	172	370	550	225	345	257	367
150	124/206	159/265	21.2/13.5	380	0.76	3.06	1.52	110	166	350	530	193	287	229	313
185	99/164	128/211	26.6/17.0	416	0.83	3.06	1.63	107	166	340	530	165	237	206	267
240	75/125	98/161	34.9/22.3	460	0.92	3.06	1.81	104	163	330	520	140	191	185	226
300	60/100	80/130	43.8/28.0	506	1.01	3.06	1.95	100	157	320	500	126	163	174	203
400	47/78	64/102	57.3/36.6	561	1.12	4.29	2.13	94	154	300	490	113	141	164	184
500	37/60	51/81.0	72.3/46.2	619	1.24	4.29	2.37	91	151	290	480	105	124	158	171
630	28/47	42/64.0	91.2/58.3	698	1.37	4.29	2.75	91	148	290	470	97	110	151	160
800	22/37	35/55	114.4/75.0	780	1.39	6.13	2.98	88	144	280	470	92	101	147	153

Caledonian Medium Voltage Cables

Single Core 8.7/15KV (Um=17.5KV)
Dimensional Data

Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Nom. Sheath Thickness	Nom. Overall Diameter	Approx. Weight					
						N2XSY/ N2XSH CU	NA2XSY/ NA2XSH AL	N2XS2Y CU	NA2XS2Y AL	N2XS(F)2Y CU	NA2XS(F)2Y AL
mm²	mm	mm²	mm²	mm	mm	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km
25	4.5	7.3	16	1.7	26	900	600	880	500	900	700
35	4.5	7.8	16	1.7	26	1020	700	1000	600	1060	800
50	4.5	8.3	16	1.7	27	1200	880	1050	770	1250	950
70	4.5	9.1	16	1.8	29	1400	970	1300	850	1500	1050
95	4.5	9.8	16	1.8	31	1700	1090	1550	960	1750	1200
120	4.5	10.7	16	1.9	32	2050	1200	1900	1150	2100	1300
150	4.5	11.3	25	1.9	33	2300	1400	2150	1250	2400	1500
185	4.5	12.2	25	2.0	35	2650	1650	2500	1400	2750	1750
240	4.5	13.3	25	2.1	37	3250	1750	3050	1600	3350	1850
300	4.5	14.3	25	2.1	39	3850	2050	3650	1850	3950	2150
400	4.5	15.5	35	2.3	43	4850	2550	4700	2250	5000	2550
500	4.5	17.1	35	2.3	45	5900	2900	5700	2600	6100	3050
630	4.5	18.7	35	2.5	51	7500	3200	7200	3100	8000	3400
800	4.5	21.3	35	2.6	51	9300	4200	9100	4000	9500	4300

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Copper Wire Screen 1 sec	Short Circuit Rating of Copper Tape Screen 1 sec	Reactance		Inductance		Impedance			
								Trefoil	Flat Spaced	Trefoil Spaced	Flat	Trefoil		Flat Spaced	
												CU	AL	CU	AL
mm²	µΩ/m	µΩm	kA	pF/m	mA/m	kA	kA	µΩ/m		nH/m		µΩ/ m		µΩ/m	
25	727/1200	927/1538	3.6/2.3	171	0.47	1.96	1.07	150	210	480	680	936	1544	952	1554
35	524/868	668/1113	5.0/3.2	187	0.51	1.96	1.14	141	207	460	660	679	1121	695	1131
50	387/641	494/822	6.8/4.4	204	0.57	1.96	1.22	138	195	440	640	511	834	527	844
70	268/443	343/568	9.8/6.3	232	0.63	1.96	1.32	132	188	420	600	364	583	386	597
95	193/320	248/410	13.3/8.5	258	0.71	1.96	1.44	126	182	400	580	272	427	300	446
120	153/253	196/325	17.2/11.0	281	0.74	1.96	1.56	119	179	380	570	225	345	257	367
150	124/206	159/265	21.2/13.5	301	0.79	3.06	1.65	113	176	360	560	193	287	229	313
185	99/164	128/211	26.6/17.0	329	0.87	3.06	1.79	110	170	350	540	165	237	206	267
240	75/125	98/161	34.9/22.3	363	0.96	3.06	1.94	107	166	340	530	140	191	185	226
300	60/100	80/130	43.8/28.0	398	1.03	3.06	2.09	104	160	330	510	126	163	174	203
400	47/78	64/102	57.3/36.6	439	1.17	4.29	2.26	97	157	310	500	113	141	164	184
500	37/60	51/81	72.3/46.2	483	1.28	4.29	2.50	94	154	300	490	105	124	158	171
630	28/47	42/64	91.2/58.3	534	1.42	4.29	2.73	91	151	290	480	97	110	151	160
800	22/37	35/55	114.4/75.0	590	1.61	6.13	3.11	91	147	290	470	92	101	147	153

Medium Voltage Cables to VDE 0276

Single Core 12/20KV (Um=24KV)
Dimensional Data

Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Nom. Sheath Thickness	Nom. Overall Diameter	Approx. Weight					
						N2XSY/ N2XSH CU	NA2XSY/ NA2XSH AL	N2XS2Y CU	NA2XS2Y AL	N2XS(F)2Y CU	NA2XS(F)2Y AL
mm²	mm	mm²	mm²	mm	mm	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km
25	5.5	8.1	16	1.8	29	1000	750	900	630	1100	850
35	5.5	8.6	16	1.8	30	1100	850	1050	730	1200	950
50	5.5	9.1	16	1.8	31	1250	970	1150	830	1350	1050
70	5.5	9.9	16	1.9	33	1500	1100	1350	920	1600	1200
95	5.5	10.7	16	1.9	34	1800	1200	1650	1050	1900	1300
120	5.5	11.5	16	2.0	35	2150	1350	1900	1150	2250	1450
150	5.5	12.1	25	2.0	37	2400	1500	2250	1350	2500	1650
185	5.5	12.9	25	2.1	38	2800	1700	2600	1550	2900	1800
240	5.5	14.1	25	2.1	42	3400	1900	3200	1750	3500	2050
300	5.5	15.1	25	2.2	43	4000	2200	3800	2000	4150	2300
400	5.5	16.3	35	2.3	44	4950	2600	4750	2400	5100	2800
500	5.5	17.5	35	2.4	46	6050	3000	5800	2800	6200	3200
630	5.5	19.5	35	2.5	50	8150	3600	8050	3400	8300	3750
800	5.5	22.1	35	2.6	53	9600	4400	9450	4200	9800	4300

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Copper Wire Screen 1 sec	Short Circuit Rating of Copper Tape Screen 1 sec	Reactance		Inductance		Impedance			
								Trefoil	Flat Spaced	Trefoil	Flat Spaced	Trefoil		Flat Spaced	
												CU	AL	CU	AL
mm²	µΩ/m	µΩm	kA	pF/m	mA/m	kA	kA	µΩ/m		nH/m		µΩ/ m		µΩ/m	
25	727/1200	927/1538	3.6/2.3	142	0.62	1.96	1.19	162	214	490	680	936	1544	952	1554
35	524/868	668/1113	5.0/3.2	162	0.65	1.96	1.26	150	207	470	660	679	1121	695	1131
50	387/641	494/822	6.8/4.4	177	0.71	1.96	1.34	141	201	450	640	511	834	527	844
70	268/443	343/568	9.8/6.3	200	0.80	1.96	1.44	135	195	430	620	364	583	386	597
95	193/320	248/410	13.3/8.5	222	0.89	1.96	1.56	129	188	410	600	272	427	300	446
120	153/253	196/325	17.2/11.0	241	0.96	1.96	1.68	122	182	390	580	225	345	257	367
150	124/206	159/265	21.2/13.5	257	1.03	3.06	1.77	116	176	370	560	193	287	229	313
185	99/164	128/211	26.6/17.0	280	1.12	3.06	1.88	116	173	370	550	165	237	206	267
240	75/125	98/161	34.9/22.3	307	1.23	3.06	2.06	110	170	350	540	140	191	185	226
300	60/100	80/130	43.8/28.0	336	1.34	3.06	2.21	107	166	340	530	126	163	174	203
400	47/78	64/102	57.3/36.6	370	1.48	4.29	2.38	100	160	320	510	113	141	164	184
500	37/60	51/81	72.3/46.2	406	1.62	4.29	2.56	97	154	310	490	105	124	158	171
630	28/47	42/64	91.2/58.3	449	1.80	4.29	2.85	94	151	300	480	97	110	151	160
800	22/37	35/55	114.4/75.0	490	1.85	6.13	3.23	91	151	290	480	92	101	147	153

Caledonian Medium Voltage Cables

Single Core 18/30KV (Um=36KV)
Dimensional Data

Nom. Cross-Section Area	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Nom. Sheath Thickness	Nom. Overall Diameter	Approx. Weight					
						N2XSY/ N2XSH CU	NA2XSY/ NA2XSH AL	N2XS2Y CU	NA2XS2Y AL	N2XS(F)2Y CU	NA2XS(F)2Y AL
mm²	mm	mm²	mm²	mm	mm	kg/km	kg/km	kg/km	kg/km	kg/km	kg/km
50	8.0	11.2	16	2.0	35	1550	1250	1350	1100	1650	1350
70	8.0	11.9	16	2.0	37	1750	1350	1600	1200	1900	1450
95	8.0	12.7	16	2.1	39	2050	1500	1900	1300	2150	1600
120	8.0	13.5	16	2.1	41	2350	1600	2150	1450	2450	1750
150	8.0	14.2	25	2.2	42	2700	1850	2550	1650	2750	1950
185	8.0	14.9	25	2.2	44	3100	2000	2900	1800	3150	2150
240	8.0	16.2	25	2.3	46	3700	2250	3500	2050	3800	2400
300	8.0	17.1	25	2.4	49	4350	2550	4150	2300	4400	2700
400	8.0	18.4	35	2.5	52	5350	3000	5100	2750	5450	3200
500	8.0	20.0	35	2.6	54	6450	3450	6200	3150	6550	3650
630	8.0	21.6	35	2.7	59	8300	3780	8100	3600	8600	4100
800	8.0	24.2	35	2.8	59	9900	4500	9700	4320	10300	4800

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Copper Wire Screen 1 sec	Short Circuit Rating of Copper Tape Screen 1 sec	Reactance		Inductance		Impedance			
								Trefoil	Flat	Trefoil	Flat	Trefoil		Flat spaced	
												CU	AL	CU	AL
mm²	µΩ/m	µΩ/m	kA	pF/m	mA/m	kA	kA	µΩ/m		nH/m		µΩ/ m		µΩ/ m	
50	387/641	494/822	6.8/4.4	138	0.83	1.96	1.63	151	214	480	680	511	834	527	844
70	268/443	343/568	9.8/6.3	154	0.92	1.96	1.74	144	201	460	640	364	583	386	597
95	193/320	248/410	13.3/8.5	169	1.01	1.96	1.85	138	195	440	620	272	427	300	446
120	153/253	196/325	17.2/11.0	183	1.10	1.96	1.97	132	188	420	600	225	345	257	367
150	124/206	159/265	21.2/13.5	194	1.16	3.06	2.07	126	182	400	580	193	287	229	313
185	99/164	128/211	26.6/17.0	210	1.26	3.06	2.18	122	182	390	580	165	237	206	267
240	75/125	98/161	34.9/22.3	229	1.37	3.06	2.36	119	176	380	560	140	191	185	226
300	60/100	80/130	43.8/28.0	249	1.49	3.06	2.50	113	173	360	550	126	163	174	203
400	47/78	64/102	57.3/36.6	273	1.64	4.29	2.68	107	163	340	520	113	141	164	184
500	37/60	51/81	72.3/46.2	298	1.79	4.29	2.92	104	163	330	520	105	124	158	171
630	28/47	42/64	91.2/58.3	327	1.96	4.29	3.15	99	160	320	510	97	110	151	160
800	22/37	35/55	114.4/75.0	350	1.98	6.13	3.53	98	154	310	490	92	101	147	153

Medium Voltage Cables to VDE 0276

Current Rating for Single Core 1.8/3KV(Um=3.6KV) to 18/30KV(Um=36KV) XLPE Insulation

Nom. Cross-Section Area	Buried direct in Ground				Laid in Single Way Duct				Laid in Air					
	Trefoil		Flat spaced		Trefoil		Flat touching		Trefoil		Flat Touching		Flat spaced	
	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL
mm²	A		A		A		A		A		A		A	
10	84	59	87	62	78	55	98	56	103	75	106	77	122	88
16	109	84	113	88	103	80	104	81	125	97	128	99	150	116
25	140	108	144	112	132	102	133	103	163	127	167	130	196	153
35	166	129	172	134	157	122	159	123	198	154	203	157	238	185
50	196	152	203	157	186	144	188	146	238	184	243	189	286	222
70	239	186	246	192	227	176	229	178	296	230	303	236	356	278
95	285	221	293	229	271	210	274	213	361	280	369	287	434	338
120	323	252	332	260	308	240	311	242	417	324	426	332	500	391
150	361	281	366	288	343	267	347	271	473	368	481	376	559	440
185	406	317	410	324	387	303	391	307	543	424	550	432	637	504
240	469	367	470	373	447	351	453	356	641	502	647	511	745	593
300	526	414	524	419	504	397	510	402	735	577	739	586	846	677
400	590	470	572	466	564	451	571	457	845	673	837	676	938	769
500	650	530	672	546	604	504	661	537	935	773	938	776	1118	919
630	700	600	882	646	654	554	771	617	1045	883	1048	886	1318	1089
800	750	660	1002	756	694	594	871	717	1145	983	1148	986	1528	1279
1000	800	720	1112	856	724	644	971	807	1235	1083	1238	1086	1738	1469

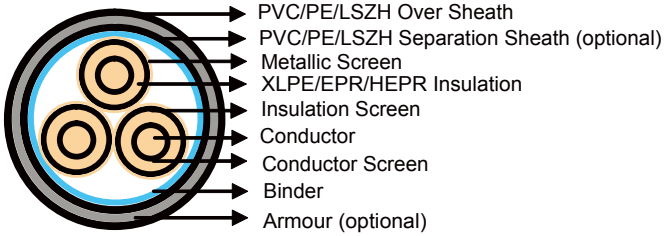
Caledonian Medium Voltage Cables

Three Core Cables to VDE 0276

APPLICATIONS:

The three core cables are designed for distribution of electrical power with nominal voltage Uo/U ranging from 3.6/6KV to 18/30KV and frequency 50Hz. They are suitable for installation mostly in power supply stations, indoors and in cable ducts, outdoors, underground and in water as well as for installation on cable trays for industries, switchboards and power stations.

STANDARD:



DIN VDE 0276 Part 620-622
HD 620 S1

CONSTRUCTION:

Conductor: Stranded compacted circular copper or aluminium conductors according to IEC 60228 class 2 / VDE 0276 class 2 / VDE 0295 HD 383. All internal interstices of the conductor are filled with water blocking compound to prevent ingress of water through conductor during storage, handing, installation and operating of the cable.
Conductor Screen: The conductor screen consists of an extruded layer of non metallic, semi-conducting compound firmly bonded to the insulation to exclude all air voids. The screen has a minimum thickness of 0.3mm and the maximum volume resistivity of 500 Ohm-m at 90°C.
Insulation: Insulation is of extruded XLPE compound type 2XI1 according to DIN VDE 0207 part 22 and HD 620.1 with high degree of cross-linking, free from contaminants, air voids and heat resistant by dry cured process.
The nominal insulation wall thickness is shown in table 1.

Table 1. Insulation Thickness

Nom. Cross-Section Area	Insulation Thickness at Nom. Voltage				
	3.6/6KV (Um=7.2)KV	6/10KV (Um=12KV)	8.7/15KV (Um=17KV)	12/20KV (Um=24KV)	18/30KV (Um=36KV)
mm²	mm	mm	mm	mm	mm
	XLPE	XLPE	XLPE	XLPE	XLPE
35	2.5	3.4	4.5	5.5	-
50	2.5	3.4	4.5	5.5	8.0
70	2.5	3.4	4.5	5.5	8.0
95	2.5	3.4	4.5	5.5	8.0
120	2.5	3.4	4.5	5.5	8.0
150	2.5	3.4	4.5	5.5	8.0
185	2.5	3.4	4.5	5.5	8.0
240	2.6	3.4	4.5	5.5	8.0
300	2.8	3.4	4.5	5.5	8.0
400	3.0	3.4	4.5	5.5	8.0

Insulation Screen: The insulation screen consists of extruded non metallic, semi-conducting compound extruded over the insulation. The extruded semi-conducting layer shall consist of bonded or cold strippable semi-conducting compound capable of removal for jointing or terminating. The minimum thickness is 0.3mm and the maximum volume resistivity of 500 Ohm-m at 90°C. The screen is tightly fitted to the insulation to exclude all air voids and can be easily hand stripped on site.

Conducting Water Blocking Layer: The insulation screen may be covered by semi-conductive water blocking tape which will swell up under the influence of moisture of water to ensure longitudinal watertightness.

Metallic Layer: The metallic layer shall be applied over each core or applied as a collective screen. The metallic screen shall consist of either copper tapes or a concentric layer of copper wires or a combination of tapes and wires. The metallic layer provides an earth fault current path, capable of withstanding fault current to earth of 1000A for one second at maximum temperature 160°C. Copper wires are applied over the conducting water blocking layer with a minimum diameter of 0.5mm. As an alternative, copper tape(s) with minimum thickness of 0.1mm can be applied with overlap. Total cross section of copper wire screen and copper tape screen layer are shown in Table 2a and 2b.

Table 2a. Total Cross Section and Max. DC Resistance of Copper Wire Screen

Nominal Cross-Section of Cables	Total Cross Section					Max. DC Resistance of Copper Wire Screen at 20℃
	3.6/6KV (Um=7.2KV)	6/10KV (Um=12KV)	8.7/15KV (Um=17.5KV)	12/20KV (Um=24KV)	18/30KV (Um=36KV)	
mm²	mm²					Ω
70	16	16	16	16	16	1.19
95	16	16	16	16	16	1.19
120	16	16	16	16	16	1.19
150	25	25	25	25	25	0.759
185	25	25	25	25	25	0.759

Nominal Cross-Section of Cables	Total Cross Section					Max. DC Resistance of Copper Wire Screen at 20℃
	3.6/6KV (Um=7.2KV)	6/10KV (Um=12KV)	8.7/15KV (Um=17.5KV)	12/20KV (Um=24KV)	18/30KV (Um=36KV)	
mm²	mm²					Ω
240	25	25	25	25	25	0.759
300	25	25	25	25	25	0.759
400	35	35	35	35	35	0.271
500	35	35	35	35	35	0.271
630	35	35	35	35	35	0.271

Table 2b. Total Cross Section and Max. DC Resistance of Copper Tape Screen (0.1mm)

Nominal Cross-Section of Cables	Total Cross Section & Max. DC Resistance									
	3.6/6KV (Um=7.2KV)		6/10KV (Um=12KV)		8.7/15KV (Um=17.5KV)		12/20KV (Um=24KV)		18/30KV (Um=36KV)	
	Total Cross Section	Max. DC Resistance at 20℃	Cross Section	Max. DC Resistance at 20℃	Cross Section	Max. DC Resistance at 20℃	Cross Section	Max. DC Resistance at 20℃	Cross Section	Max. DC Resistance at 20℃
mm²	mm²	Ω	mm²	Ω	mm²	Ω	mm²	Ω	mm²	Ω
70	6.6	2.616	7.23	2.380	8.02	2.145	8.7	1.967	10.5	1.075
95	7.3	2.369	7.91	2.174	8.71	1.975	9.4	1.824	11.2	1.075
120	8.0	2.153	8.64	1.991	9.43	1.823	10.2	1.694	12.0	1.075
150	8.5	2.013	9.19	1.871	9.99	1.722	10.7	1.606	12.5	0.688
185	9.4	1.838	9.88	1.741	10.82	1.590	11.4	1.509	13.2	0.688
240	10.4	1.656	10.96	1.569	11.76	1.463	12.5	1.378	14.3	0.688
300	11.4	1.508	11.84	1.452	12.64	1.361	13.4	1.287	15.2	0.688
400	12.6	1.362	12.92	1.332	13.71	1.254	14.4	1.192	16.2	0.491
500	13.9	1.237	14.34	1.199	15.14	1.136	15.5	1.110	17.7	0.491
630	15.3	1.121	16.68	1.031	16.57	1.038	17.3	0.995	19.1	0.491

Separator / Water Blocking Layer: The metallic screen may be covered by non-conducting water blocking tape which will swell up under the influence of moisture of water to ensure longitudinal watertightness.

Separation Sheath (for armoured cable): The separation sheath comprises a layer of extruded PVC, PE or LSZH, applied under the armour. Thickness of separation sheath is shown in table 3.

Table 3. Separation Sheath Thickness

Cores Diameter		Approx.Thickess of Inner Sheath
mm		mm
>	<	
35	45	1.4
45	60	1.6
60	80	1.8
80	-	2.0

Armour(for armoured cable):

The armour consists of:

1) Double layers of galvanized steel tape are applied helically with proper inner overlapping over an extruded separation sheath. Thickness of the steel tape is shown in table 4.

Tabel 4. Galvanized Steel Tape Thickness

Inner Diameter		Thickness of Galvanized Steel Tape
mm		mm
>	<	
-	30	0.2
30	70	0.5
70	-	0.8

2) Galvanized flat steel wires with thickness of 0.8 mm are applied helically over the surface of inner sheath with minimum of 90% coverage. And galvanized Steel tape with nominal thickness of 0.3 mm is applied helically with 50% coverage to cover the surface of the flat wires.

Over Sheath: Overall sheath comprises a layer of extruded PE compound DMP2 according to HD620.1 and 2YM3 type to DIN VDE 0276 Part 3, or PVC compound DMV6 according to HD620.1 and YM5 to DIN VDE 0276 Part 6. LSZH can be offered as an option. Normal wall thickness is 2.5mm (for 1/500mmsq 18/30KV, wall thickness is 2.6mm), suitable for exposure to sun-light or other local atmospheric environments and for the operating temperature of the cable.

PHYSICAL PROPERTIES:

Operating Temperature: up to 90°C
Temperature Range: -5°C (PVC or LZSH sheath); -20°C (PE sheath)
Short Circuit Temperature: 250°C (short circuit duration up to 5 seconds)
Bending Radius: 15 x OD (Cable without metal sheath)
30 x OD (Cable with aluminium sheath)

Table 5. Nominal /Operating /Testing Voltages

Nominal Voltage Uo/U	Operating Voltage (Um)	Testing Voltage
3.6/6KV	8KV	12.5KV
6/10KV	12KV	21KV
8.7/15KV	18KV	30.5KV
12/20KV	24KV	42KV
18/30KV	36KV	63KV

TYPE CODES:

Conductor

N According to VDE Standard (No abbreviation for copper conductor)
A Aluminium conductor
- Copper conductor

Caledonian Medium Voltage Cables

Insulation

2X XLPE

Screen

C Concentric conductor of copper
CE Concentric conductor of copper over each individual core
S Screen of copper wires & copper tape, helically wound
SE Screen of copper wires over each individual cores
(G) Longitudinally waterproof

Armour

F Armour of galvanized flat steel wire(strip)
Gb Counter Helix of galvanized steel tape
B Steel tape armouring
R Armour of galvanized round steel wire
Ra Armour of round aluminium wire

Sheath

2Y PE
Y PVC
H LSZH
K Lead sheath
KL Aluminium sheath

Three Core 3.6/6KV (Um=7.2KV)
N2XSEY
NA2XSEY
Dimensional Data

Nom. Cross-Section Area	Approx. Conductor Diameter	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Approx. Insulation Diameter	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
								CU	AL
mm²	mm	mm	mm²	mm²	mm	mm	mm	kg/km	kg/km
25	6.05	2.5	15.1	16	12.5	1.5	37	2100	1600
35	7.10	2.5	16.3	16	13.5	1.6	39	2500	1800
50	8.25	2.5	17.8	16	14.7	1.6	42	3000	2100
70	9.90	2.5	19.7	16	16.3	1.7	46	3800	2500
95	11.7	2.5	21.8	16	18.1	1.7	50	4800	3000
120	13.1	2.5	24.0	16	19.5	1.8	53	5800	3500
150	14.3	2.5	25.6	25	20.7	1.8	56	6700	3900
185	16.3	2.5	28.1	25	22.7	1.9	60	8100	4600
240	18.7	2.6	31.2	25	25.3	1.9	66	10200	5600
300	20.9	2.8	34.2	25	27.9	2.0	72	12500	6700
400	23.7	3.0	37.9	35	31.1	2.1	80	15600	8200

Three Core 3.6/6KV (Um=7.2KV) Galvanized Steel Tape Armoured Cables
N2XSEYBY
NA2XSEYBY
Dimensional Data

Nom. Cross-Section Area	Approx. Conductor Diameter	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Approx. Insulation Diameter	Nom. Armour Thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
									CU	AL
mm²	mm	mm	mm²	mm²	mm	mm	mm	mm	kg/km	kg/km
25	6.05	2.5	5.0	16	12.5	0.5	2.2	39	2800	2300
35	7.10	2.5	5.4	16	13.5	0.5	2.3	42	3200	2600
50	8.25	2.5	5.9	16	14.7	0.5	2.4	45	3800	2900
70	9.90	2.5	6.6	16	16.3	0.5	2.5	49	4700	3400
95	11.7	2.5	7.3	16	18.1	0.5	2.6	53	5800	4000
120	13.1	2.5	8.0	16	19.5	0.5	2.7	56	6800	4600
150	14.3	2.5	8.5	25	20.7	0.5	2.8	59	7900	5100
185	16.3	2.5	9.4	25	22.7	0.8	2.9	64	9400	5900
240	18.7	2.6	10.4	25	25.3	0.8	3.1	70	11700	7000
300	20.9	2.8	11.4	25	27.9	0.8	3.3	76	14100	8300
400	23.7	3.0	12.6	35	31.1	0.8	3.6	85	18300	10900

Three Core 3.6/6KV (Um=7.2KV) Galvanized Flat Steel Wire+Steel Tape Armoured Cables
N2XSEYFGbY
NA2XSEYFGbY
Dimensional Data

Nom. Cross-Section Area	Approx. Conductor Diameter	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Approx. Insulation Diameter	Nom. Armour Thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
									CU	AL
mm²	mm	mm	mm²	mm²	mm	mm	mm	mm	kg/km	kg/km
25	6.05	2.5	5.0	16	12.5	0.8	2.2	40	2900	2400
35	7.10	2.5	5.4	16	13.7	0.8	2.3	42	3300	2700
50	8.25	2.5	5.9	16	14.7	0.8	2.4	45	3900	3000
70	9.90	2.5	6.6	16	16.3	0.8	2.5	49	4900	3600
95	11.7	2.5	7.3	16	18.1	0.8	2.6	53	6000	4200
120	13.1	2.5	8.0	16	19.5	0.8	2.7	56	7000	4700
150	14.3	2.5	8.5	25	20.7	0.8	2.8	59	8100	5200
185	16.3	2.5	9.4	25	22.7	0.8	2.9	64	9600	6100
240	18.7	2.6	10.4	25	25.3	0.8	3.1	70	11900	7200
300	20.9	2.8	11.4	25	27.9	0.8	3.3	76	14300	8600
400	23.7	3.0	12.6	35	31.1	0.8	3.6	84	17700	10300

Caledonian Medium Voltage Cables

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capacitance	Charging Current	Short Circuit Rating of Copper Wire Screen Per Core 1 sec	Short Circuit Rating of Copper Tape Screen Per Core 1 sec	Reactance	Inductance
mm²	μΩ/m	μΩ/m	kA	pF/m	mA/m	kA	kA	μΩ/m	nH/m
25	727/1200	927/1538	3.6/2.3	272	0.33	1.96	0.73	116	370
35	524/868	668/1113	5.0/3.2	301	0.36	1.96	0.79	108	350
50	387/641	494/822	6.8/4.4	332	0.40	1.96	0.87	102	330
70	268/443	343/568	9.8/6.3	383	0.46	1.96	0.96	97	310
95	193/320	248/410	13.3/8.5	432	0.52	1.96	1.06	92	290
120	153/253	196/325	17.2/11.0	474	0.57	1.96	1.17	89	280
150	124/206	159/265	21.2/13.5	511	0.61	3.06	1.25	87	280
185	99/164	128/211	26.6/17.0	562	0.67	3.06	1.37	86	270
240	75/125	98/161	34.9/22.3	602	0.72	3.06	1.52	83	260
300	60/100	80/130	43.8/28.0	622	0.75	3.06	1.67	82	260
400	47/78	64/102	57.3/36.6	648	0.78	4.29	1.84	80	250

Three Core 6/10KV (Um=12KV)
N2XSEY
NA2XSEY
Dimensional Data

Nom. Cross-Section Area	Approx. Conductor Diameter	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Approx. Insulation Diameter	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
								CU	AL
mm²	mm	mm	mm²	mm²	mm	mm	mm	kg/km	kg/km
25	6.05	3.4	5.68	16	14.3	1.6	41	2400	1900
35	7.10	3.4	6.09	16	15.3	1.6	43	2800	2200
50	8.25	3.4	6.58	16	16.5	1.7	46	3400	2500
70	9.90	3.4	7.23	16	18.1	1.7	50	4200	2900
95	11.7	3.4	7.91	16	19.9	1.8	54	5300	3400
120	13.1	3.4	8.64	16	21.3	1.8	57	6200	3900
150	14.3	3.4	9.19	25	22.5	1.9	60	7200	4400
185	16.3	3.4	9.88	25	24.5	1.9	64	8600	5100
240	18.7	3.4	10.96	25	26.9	2.0	70	10700	6100
300	20.9	3.4	11.84	25	29.1	2.1	75	12900	7100
400	23.7	3.4	12.92	35	31.9	2.2	81	15900	8500

Three Core 6/10KV (Um=12KV) Galvanized Steel Tape Armoured Cables
N2XSEYBY
NA2XSEYBY
Dimensional Data

Nom. Cross-Section Area	Approx. Conductor Diameter	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Approx. Insulation Diameter	Nom. Armour Thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
									CU	AL
mm²	mm	mm	mm²	mm²	mm	mm	mm	mm	kg/km	kg/km
25	6.05	3.4	5.68	16	14.3	0.5	2.3	44	3200	2700
35	7.10	3.4	6.09	16	15.3	0.5	2.4	46	3700	3000
50	8.25	3.4	6.58	16	16.5	0.5	2.5	49	4300	3400
70	9.90	3.4	7.23	16	18.1	0.5	2.6	53	5200	3900
95	11.7	3.4	7.91	16	19.9	0.5	2.8	57	6400	4600
120	13.1	3.4	8.64	16	21.3	0.5	2.9	61	7400	5200
150	14.3	3.4	9.19	25	22.5	0.5	3.0	64	8500	5700
185	16.3	3.4	9.88	25	24.5	0.5	3.1	68	10000	6500
240	18.7	3.4	10.96	25	26.9	0.5	3.3	74	12300	7600
300	20.9	3.4	11.84	25	29.1	0.5	3.4	79	14600	8800
400	23.7	3.4	12.92	35	31.9	0.8	3.7	87	18700	11300

Three Core 6/10KV (Um=12KV) Galvanized Flat Steel Wire+Steel Tape Armoured Cables
N2XSEYFGbY
NA2XSEYFGbY
Dimensional Data

Nom. Cross-Section Area	Approx. Conductor Diameter	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Approx. Insulation Diameter	Nom. Armour Thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
									CU	AL
mm²	mm	mm	mm²	mm²	mm	mm	mm	mm	kg/km	kg/km
25	6.05	3.4	5.68	16	14.3	0.8	2.3	44	3300	2800
35	7.10	3.4	6.09	16	15.3	0.8	2.4	46	3800	3100
50	8.25	3.4	6.58	16	16.5	0.8	2.5	49	4400	3500
70	9.90	3.4	7.23	16	18.1	0.8	2.6	53	5400	4100
95	11.7	3.4	7.91	16	19.9	0.8	2.8	57	6500	4700
120	13.1	3.4	8.64	16	21.3	0.8	2.9	61	7600	5300
150	14.3	3.4	9.19	25	22.5	0.8	3.0	64	8700	5900
185	16.3	3.4	9.88	25	24.5	0.8	3.1	68	10200	6800
240	18.7	3.4	10.96	25	26.9	0.8	3.3	74	12500	7900
300	20.9	3.4	11.84	25	29.1	0.8	3.4	79	14900	9100
400	23.7	3.4	12.92	35	31.9	0.8	3.7	86	18000	10600

Caledonian Medium Voltage Cables

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capacitance	Charging Current	Short Circuit Rating of Copper Wire Screen Per Core 1 sec	Short Circuit Rating of Copper Tape Screen Per Core 1 sec	Reactance	Inductance
mm²	μΩ/m	μΩ/m	kA	pF/m	mA/m	kA	kA	μΩ/m	nH/m
25	727/1200	927/1538	3.6/2.3	204	0.43	1.96	0.83	129	405
35	524/868	668/1113	5.0/3.2	237	0.47	1.96	0.89	115	370
50	387/641	494/822	6.8/4.4	260	0.52	1.96	0.96	109	350
70	268/443	343/568	9.8/6.3	298	0.60	1.96	1.05	103	330
95	193/320	248/410	13.3/8.5	334	0.67	1.96	1.16	99	320
120	153/253	196/325	17.2/11.0	365	0.73	1.96	1.26	96	310
150	124/206	159/265	21.2/13.5	392	0.78	3.06	1.34	93	300
185	99/164	128/211	26.6/17.0	430	0.86	3.06	1.44	90	290
240	75/125	98/161	34.9/22.3	476	0.95	3.06	1.60	87	280
300	60/100	80/130	43.8/28.0	524	1.05	3.06	1.73	85	270
400	47/78	64/102	57.3/36.6	580	1.16	4.29	1.89	81	260

Three Core 8.7/15KV (Um=17.5KV)
N2XSEY
NA2XSEY
Dimensional Data

Nom. Cross-Section Area	Approx. Conductor Diameter	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Approx. Insulation Diameter	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
								CU	AL
mm²	mm	mm	mm²	mm²	mm	mm	mm	kg/km	kg/km
25	6.05	4.5	6.47	16	16.5	1.7	46	3500	2400
35	7.10	4.5	6.89	16	17.5	1.7	48	3800	2600
50	8.25	4.5	7.37	16	18.7	1.7	51	4400	3000
70	9.90	4.5	8.02	16	20.3	1.8	55	5300	3400
95	11.7	4.5	8.71	16	22.1	1.8	59	6400	4000
120	13.1	4.5	9.43	16	23.5	1.9	62	7400	4500
150	14.3	4.5	9.99	25	24.7	1.9	65	8500	5000
185	16.3	4.5	10.82	25	26.7	2.0	69	10000	5800
240	18.7	4.5	11.76	25	29.1	2.1	75	12200	6800
300	20.9	4.5	12.64	25	31.3	2.1	80	14400	7900
400	23.7	4.5	13.71	35	34.1	2.2	87	17500	9300

Three Core 8.7/15KV (Um=17.5KV) Galvanized Steel Tape Armoured Cables
N2XSEYBY
NA2XSEYBY
Dimensional Data

Nom. Cross-Section Area	Approx Conductor Diameter	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Approx Insulation Diameter	Nom. Armour Thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
									CU	AL
mm²	mm	mm	mm²	mm²	mm	mm	mm	mm	kg/km	kg/km
25	6.05	4.5	6.47	16	16.5	0.5	2.5	49	3800	3300
35	7.10	4.5	6.89	16	17.5	0.5	2.6	51	4300	3600
50	8.25	4.5	7.37	16	18.7	0.5	2.7	54	4900	4000
70	9.90	4.5	8.02	16	20.3	0.5	2.8	58	5900	4600
95	11.7	4.5	8.71	16	22.1	0.5	2.9	62	7100	5300
120	13.1	4.5	9.43	16	23.5	0.5	3.0	66	8100	5900
150	14.3	4.5	9.99	25	24.7	0.5	3.1	69	9200	6400
185	16.3	4.5	10.82	25	26.7	0.5	3.3	74	10900	7400
240	18.7	4.5	11.76	25	29.1	0.5	3.4	79	13100	8500
300	20.9	4.5	12.64	25	31.3	0.5	3.6	86	16400	10600
400	23.7	4.5	13.71	35	34.1	0.8	3.9	93	19700	12300

Three Core 8.7/15KV (Um=17.5KV) Galvanized Flat Steel Wire+Steel Tape Armoured Cables
N2XSEYFGbY
NA2XSEYFGbY
Dimensional Data

Nom. Cross-Section Area	Approx. Conductor Diameter	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Approx. Insulation Diameter	Nom. Armour Thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
									CU	AL
mm²	mm	mm	mm²	mm²	mm	mm	mm	mm	kg/km	kg/km
25	6.05	4.5	6.47	16	16.5	0.8	2.5	49	3400	3400
35	7.10	4.5	6.89	16	17.5	0.8	2.6	51	4400	3800
50	8.25	4.5	7.37	16	18.7	0.8	2.7	54	5100	4200
70	9.90	4.5	8.02	16	20.3	0.8	2.8	58	6000	4700
95	11.7	4.5	8.71	16	22.1	0.8	2.9	62	7300	5400
120	13.1	4.5	9.43	16	23.5	0.8	3.0	66	8300	6100
150	14.3	4.5	9.99	25	24.7	0.8	3.1	69	9400	6600
185	16.3	4.5	10.82	25	26.7	0.8	3.3	74	11100	7600
240	18.7	4.5	11.76	25	29.1	0.8	3.4	79	13400	8700
300	20.9	4.5	12.64	25	31.3	0.8	3.6	85	15800	10000
400	23.7	4.5	13.71	35	34.1	0.8	3.9	91	19000	11600

Caledonian Medium Voltage Cables

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capacitance	Charging Current	Short Circuit Rating of Copper Wire Screen Per Core 1 sec	Short Circuit Rating of Copper Tape Screen Per Core 1 sec	Reactance	Inductance
mm²	μΩm	μΩ/m	kA	pF/m	mA/m	kA	kA	μΩm	nH/m
25	727/1200	927/1538	3.6/2.3	176	0.48	1.96	0.95	132	410
35	524/868	668/1113	5.0/3.2	193	0.53	1.96	1.01	123	390
50	387/641	494/822	6.8/4.4	211	0.58	1.96	1.08	116	370
70	268/443	343/568	9.8/6.3	240	0.65	1.96	1.17	110	350
95	193/320	248/410	13.3/8.5	267	0.73	1.96	1.27	105	330
120	153/253	196/325	17.2/11.0	291	0.79	1.96	1.38	102	320
150	124/206	159/265	21.2/13.5	312	0.85	3.06	1.46	98	310
185	99/164	128/211	26.6/17.0	340	0.93	3.06	1.58	95	300
240	75/125	98/161	34.9/22.3	375	1.02	3.06	1.72	91	290
300	60/100	80/130	43.8/28.0	411	1.12	3.06	1.85	89	280
400	47/78	64/102	57.3/36.6	454	1.24	4.29	2.00	84	270

Three Core 12/20KV (Um=24KV)
N2XSEY
NA2XSEY
Dimensional Data

Nom. Cross-Section Area	Approx. Conductor Diameter	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Approx. Insulation Diameter	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
								CU	AL
mm²	mm	mm	mm²	mm²	mm	mm	mm	kg/km	kg/km
35	7.10	5.5	7.6	16	19.7	1.8	53	3800	3100
50	8.25	5.5	8.1	16	20.9	1.8	56	4400	3500
70	9.90	5.5	8.7	16	22.5	1.9	60	5300	4000
95	11.7	5.5	9.4	16	24.3	1.9	64	6400	4600
120	13.1	5.5	10.2	16	25.7	2.0	67	7400	5200
150	14.3	5.5	10.7	25	26.9	2.0	70	8500	5700
185	16.3	5.5	11.4	25	28.9	2.1	75	10000	6500
240	18.7	5.5	12.5	25	31.3	2.1	80	12200	7500
300	20.9	5.5	13.4	25	33.5	2.2	85	14400	8700
400	23.7	5.5	14.4	35	36.3	2.3	91	17500	10200

Three Core 12/20KV (Um=24KV) Galvanized Steel Tape Armoured Cables
N2XSEYBY
NA2XSEYBY
Dimensional Data

Nom. Cross-Section Area	Approx. Conductor Diameter	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Approx. Insulation Diameter	Nom. Armour Thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
									CU	AL
mm²	mm	mm	mm²	mm²	mm	mm	mm	mm	kg/km	kg/km
35	7.10	5.5	7.6	16	19.7	0.5	2.7	57	4900	4200
50	8.25	5.5	8.1	16	20.9	0.5	2.9	60	5600	4700
70	9.90	5.5	8.7	16	22.5	0.5	3.0	64	6600	5300
95	11.7	5.5	9.4	16	24.3	0.5	3.1	68	7800	6000
120	13.1	5.5	10.2	16	25.7	0.5	3.2	71	8900	6600
150	14.3	5.5	10.7	25	26.9	0.5	3.3	74	10100	7200
185	16.3	5.5	11.4	25	28.9	0.5	3.4	79	11700	8200
240	18.7	5.5	12.5	25	31.3	0.8	3.6	86	14900	10200
300	20.9	5.5	13.4	25	33.5	0.8	3.8	91	17400	11600
400	23.7	5.5	14.4	35	36.3	0.8	4.0	98	20800	13400

Caledonian Medium Voltage Cables

Three Core 12/20KV (Um=24KV) Galvanized Flat Steel Wire+Steel Tape Armoured Cables
N2XSEYFGbY
NA2XSEYFGbY
Dimensional Data

Nom. Cross-Section Area	Approx. Conductor Diameter	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Approx. Insulation Diameter	Nom. Armour Thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
									CU	AL
mm²	mm	mm	mm²	mm²	mm	mm	mm	mm	kg/km	kg/km
35	7.10	5.5	7.6	16	19.7	0.8	2.7	57	5000	4400
50	8.25	5.5	8.1	16	20.9	0.8	2.9	60	5700	4800
70	9.90	5.5	8.7	16	22.5	0.8	3.0	64	6800	5400
95	11.7	5.5	9.4	16	24.3	0.8	3.1	68	8000	6200
120	13.1	5.5	10.2	16	25.7	0.8	3.2	71	9100	6800
150	14.3	5.5	10.7	25	26.9	0.8	3.3	74	10300	7500
185	16.3	5.5	11.4	25	28.9	0.8	3.4	79	11900	8400
240	18.7	5.5	12.5	25	31.3	0.8	3.6	85	14300	9600
300	20.9	5.5	13.4	25	33.5	0.8	3.8	90	16700	10900
400	23.7	5.5	14.4	35	36.3	0.8	4.0	97	20100	12700

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capaci-tance	Charging Current	Short Circuit Rating of Copper Wire Screen Per Core 1 sec	Short Circuit Rating of Copper Tape Screen Per Core 1 sec	Reactance	Inductance
mm²	μΩ/m	μΩ/m	kA	pF/m	mA/m	kA	kA	μΩ/m	nH/m
35	524/868	668/1113	5.0/3.2	168	0.67	1.96	1.11	129	410
50	387/641	494/822	6.8/4.4	183	0.73	1.96	1.18	122	390
70	268/443	343/568	9.8/6.3	207	0.83	1.96	1.28	115	370
95	193/320	248/410	13.3/8.5	229	0.92	1.96	1.38	110	350
120	153/253	196/325	17.2/11.0	249	1.00	1.96	1.48	106	340
150	124/206	159/265	21.2/13.5	266	1.06	3.06	1.56	103	330
185	99/164	128/211	26.6/17.0	289	1.16	3.06	1.66	100	320
240	75/125	98/161	34.9/22.3	318	1.27	3.06	1.82	95	300
300	60/100	80/130	43.8/28.0	348	1.39	3.06	1.95	93	300
400	47/78	64/102	57.3/36.6	388	1.53	4.29	2.11	87	280

Three Core 18/30KV (Um=36KV)
N2XSEY
NA2XSEY
Dimensional Data

Nom. Cross-Section Area	Approx. Conductor Diameter	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Approx. Insulation Diameter	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
								CU	AL
mm²	mm	mm	mm²	mm²	mm	mm	mm	kg/km	kg/km
50	8.25	8.0	9.9	16	25.9	2.0	68	5800	4900
70	9.90	8.0	10.5	16	27.5	2.0	71	6800	5500
95	11.7	8.0	11.2	16	29.3	2.1	75	8000	6100
120	13.1	8.0	12.0	16	30.7	2.1	79	9000	6700
150	14.3	8.0	12.5	25	31.9	2.2	81	10100	7300
185	16.3	8.0	13.2	25	33.9	2.2	86	11800	8300
240	18.7	8.0	14.3	25	36.3	2.3	91	14000	9400
300	20.9	8.0	15.2	25	38.5	2.4	97	16500	10700
400	23.7	8.0	16.2	35	41.3	2.5	103	19700	12300

Three Core 18/30KV (Um=36KV) Galvanized Steel Tape Armoured Cables
N2XSEYBY
NA2XSEYBY
Dimensional Data

Nom. Cross-Section Area	Approx. Conductor Diameter	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Approx. Insulation Diameter	Nom. Armour Thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
									CU	AL
mm²	mm	mm	mm²	mm²	mm	mm	mm	mm	kg/km	kg/km
50	8.25	8.0	9.9	16	25.9	0.5	3.2	72	7300	6400
70	9.90	8.0	10.5	16	27.5	0.5	3.3	75	8400	7100
95	11.7	8.0	11.2	16	29.3	0.5	3.5	80	9700	7900
120	13.1	8.0	12.0	16	30.7	0.8	3.6	84	11700	9400
150	14.3	8.0	12.5	25	31.9	0.8	3.7	87	12900	10100
185	16.3	8.0	13.2	25	33.9	0.8	3.9	92	14800	11300
240	18.7	8.0	14.3	25	36.3	0.8	4.0	98	17300	12600
300	20.9	8.0	15.2	25	38.5	0.8	4.2	103	20000	14100
400	23.7	8.0	16.2	35	41.3	0.8	4.4	110	23500	16000

Caledonian Medium Voltage Cables

Three Core 18/30KV (Um=36KV) Galvanized Flat Steel Wire+Steel Tape Armoured Cables
N2XSEYFGbY
NA2XSEYFGbY
Dimensional Data

Nom. Cross-Section Area	Approx. Conductor Diameter	Nom. Insulation Thickness	Copper Tape Screen Area (0.1mm)	Copper Wire Screen Area	Approx. Insulation Diameter	Nom. Armour Thickness	Nom. Sheath Thickness	Approx. Overall Diameter	Approx. Weight	
									CU	AL
mm²	mm	mm	mm²	mm²	mm	mm	mm	mm	kg/km	kg/km
50	8.25	8.0	9.9	16	25.9	0.8	3.2	72	7500	6600
70	9.90	8.0	10.5	16	27.5	0.8	3.3	76	8600	7300
95	11.7	8.0	11.2	16	29.3	0.8	3.5	80	10000	8100
120	13.1	8.0	12.0	16	30.7	0.8	3.6	83	11200	8900
150	14.3	8.0	12.5	25	31.9	0.8	3.7	86	12400	9500
185	16.3	8.0	13.2	25	33.9	0.8	3.9	91	14100	10600
240	18.7	8.0	14.3	25	36.3	0.8	4.0	97	16600	11900
300	20.9	8.0	15.2	25	38.5	0.8	4.2	102	19200	13400
400	23.7	8.0	16.2	35	41.3	0.8	4.4	109	22700	15300

Electrical Data

Nom. Cross-Section Area	D C Resistance CU / AL	A C Resistance CU / AL	Short Circuit Rating of Conductor CU / AL 1 sec	Capacitance	Charging Current	Short Circuit Rating of Copper Wire Screen Per Core 1 sec	Short Circuit Rating of Copper Tape Screen Per Core 1 sec	Reactance	Inductance
mm²	µΩ/m	µΩ/m	kA	pF/m	mA/m	kA	kA	µΩ/m	nH/m
50	387/641	494/822	6.8/4.4	142	0.85	1.96	1.45	134	430
70	268/443	343/568	9.8/6.3	159	0.95	1.96	1.54	127	400
95	193/320	248/410	13.3/8.5	175	1.05	1.96	1.64	121	390
120	153/253	196/325	17.2/11.0	189	1.13	1.96	1.75	117	370
150	124/206	159/265	21.2/13.5	201	1.21	3.06	1.83	113	360
185	99/164	128/211	26.6/17.0	217	1.3	3.06	1.93	109	350
240	75/125	98/161	34.9/22.3	237	1.42	3.06	2.09	104	330
300	60/100	80/130	43.8/28.0	258	1.55	3.06	2.21	101	320
400	47/78	64/102	57.3/36.6	282	1.69	4.29	2.37	96	290

Current Rating for Three Core 1.8/3KV(Um=7.2KV) to 26/35KV(Um=42KV) XLPE Insulation

Nom. Cross-Section Area	Unarmored						Armored					
	Buried direct in Ground		Laid in Single Way Duct		Laid in Air		Buried direct in Ground		Laid in Single Way Duct		Laid in Air	
	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL	CU	AL
mm²	A		A		A		A		A		A	
10	76	53	62	42	87	62	76	53	63	43	88	63
16	101	78	87	67	109	84	101	78	88	68	110	85
25	129	100	112	87	142	110	129	100	112	87	143	111
35	153	119	133	103	170	132	154	119	134	104	172	133
50	181	140	158	122	204	158	181	140	158	123	205	159
70	221	171	193	150	253	196	220	171	194	150	253	196
95	262	203	231	179	304	236	263	204	232	180	307	238
120	298	232	264	205	351	273	298	232	264	206	352	274
150	334	260	297	231	398	309	332	259	296	231	397	309
185	377	294	336	262	455	355	374	293	335	262	453	354
240	434	340	390	305	531	415	431	338	387	304	529	415
300	489	384	441	346	606	475	482	380	435	343	599	472
400	553	438	501	398	696	552	541	432	492	393	683	545
500	613	498	541	451	786	652	601	492	532	446	773	645
630	663	568	591	501	896	762	651	562	582	496	883	755

Caledonian Medium Voltage Cables

V

I	II	III	IV	V
Technical Information				

Technical Information

Current Ratings

The current ratings given on the previous pages are based on the standard conditions of installation detailed bellows:

Maximum conductor temperature: 90°C
Maximum ambient temperature: In air 30°C
In ground 20°C
Ground thermal resistivity: 1.5K•m/W
Laying depth: 0.8m
Spacing between cable laid: In flat formation 2 times of cable overall diameter
In trefoil With cable touching

Where the site conditions differ from the standard conditions mentioned, it will be necessary to multiply the tabulated ratings by the actors given in the following tables. These factors are for variation in ambient ground temperature, soil thermal resistivity and depth of laying. Where more than one circuit is installed in close proximity, then will be necessary to derate further in accordance with the group rating factors given.

Rating Factors

Cables laid direct in ground:
Variation in ground temperature

Ground Temperature	15	20	25	30	35	40	45
Cabe Type	Rating Factor						
All Cables	1.00	0.97	0.93	0.89	0.86	0.82	0.76

Rating factor for depth of laying (To center of cable or trefoil group of cables)

Depth of laying	1.9/3.3KV (1.8/3KV) to 19/33KV (18/30KV) Cables	
m	Up to 300 mm²	Above 300 mm²
0.50	-	-
0.60	-	-
0.80	1.00	1.00
1.00	0.98	0.97
1.25	0.96	0.95
1.50	0.95	0.94
1.75	0.94	0.92
2.00	0.92	0.90
2.50	0.91	0.89
3.00 or more	0.90	0.88

Rating factor for variation in thermal resistivity of soil depth

Nom.Cross-Section Area	Soil thermal resistivity K.m/W						
	0.8	0.9	1.0	1.5	2.0	2.5	3.0
Single							
50	1.15	1.11	1.07	0.91	0.81	0.73	0.68
70	1.16	1.12	1.07	0.91	0.81	0.73	0.68

Caledonian Medium Voltage Cables

Nom.Cross-Section Area	Soil thermal resistivity K.m/W						
	0.8	0.9	1.0	1.5	2.0	2.5	3.0
95	1.16	1.12	1.07	0.91	0.81	0.73	0.68
120	1.16	1.12	1.07	0.91	0.81	0.73	0.68
150	1.17	1.12	1.07	0.91	0.81	0.73	0.68
185	1.17	1.12	1.07	0.91	0.81	0.73	0.68
240	1.17	1.12	1.07	0.91	0.80	0.73	0.68
300	1.18	1.12	1.07	0.91	0.80	0.73	0.68
400	1.18	1.12	1.07	0.91	0.80	0.73	0.67
500	1.18	1.12	1.07	0.91	0.80	0.73	0.67
630	1.18	1.12	1.07	0.91	0.80	0.73	0.67
800	1.18	1.12	1.07	0.91	0.80	0.72	0.67
1000	1.18	1.12	1.07	0.91	0.80	0.72	0.67
Multicore							
16	1.12	1.08	1.05	0.93	0.84	0.77	0.72
25	1.13	1.09	1.05	0.93	0.83	0.77	0.71
35	1.13	1.09	1.06	0.92	0.83	0.76	0.71
50	1.13	1.09	1.06	0.92	0.83	0.76	0.71
70	1.14	1.09	1.06	0.92	0.83	0.75	0.70
95	1.14	1.09	1.06	0.92	0.83	0.75	0.70
120	1.14	1.10	1.06	0.92	0.82	0.75	0.69
150	1.14	1.10	1.06	0.92	0.82	0.75	0.69
185	1.14	1.10	1.06	0.92	0.82	0.74	0.69
240	1.15	1.10	1.07	0.92	0.82	0.74	0.69
300	1.15	1.10	1.07	0.92	0.82	0.74	0.69
400	1.15	1.10	1.07	0.92	0.82	0.74	0.69

Group rating factor for circuits of three single core cables. In trefoil and laid flat touching, horizontal formation (average values)

	No. of circuits	Spacing of circuits					
		Touching					
		Trefoil	Laid Flat	0.15m*	0.3m	0.45m	0.6m
1.9/3.3KV(1.8/3KV) to 12.7/22KV (12/20KV) Cables	2	0.78	0.80	0.81	0.85	0.88	0.90
	3	0.66	0.68	0.71	0.76	0.80	0.83
	4	0.59	0.62	0.65	0.72	0.76	0.80
	5	0.55	0.58	0.61	0.68	0.73	0.77
	6	0.52	0.55	0.58	0.66	0.72	0.76
19/33KV(18/30KV) Cables	2	0.79	0.81	0.81	0.85	0.88	0.90
	3	0.67	0.70	0.71	0.76	0.80	0.83
	4	0.62	0.65	0.65	0.72	0.76	0.80
	5	0.57	0.60	0.60	0.68	0.73	0.77
	6	0.54	0.57	0.57	0.66	0.70	0.76

*This configuration, at 0.15m spacing, may not be practical for the larger size cables.

Group rating factor for multicore cables in horizontal formation (average values)

	No. of cables in group	Spacing				
		Touching	0.15m	0.3m	0.45m	0.6m
1.9/3.3KV(1.8/3KV) to 12.7/22KV (12/20KV) Cables	2	0.80	0.85	0.89	0.90	0.92
	3	0.68	0.75	0.80	0.84	0.86
	4	0.62	0.70	0.77	0.80	0.84
	5	0.57	0.66	0.73	0.78	0.81
	6	0.55	0.63	0.71	0.76	0.80
19/33KV(18/30KV) Cables	2	0.80	0.83	0.87	0.89	0.91
	3	0.70	0.73	0.78	0.82	0.85
	4	0.64	0.68	0.74	0.78	0.82
	5	0.59	0.63	0.70	0.75	0.79
	6	0.56	0.60	0.68	0.74	0.78

Cables laid direct in single way ducts:
(The term “ducts” applies to single earthenware, fibre or plastic pipes).

Variation in ground temperature

Ground Temperature	15	20	25	30	35	40	45
Cabe Type	Rating Factor						
All Cables	1.00	0.97	0.93	0.89	0.86	0.82	0.76

Rating factor for depth of laying (To center of cable or trefoil group of cables)

Depth of Laying	600/1000V cables		1900/3300V to 19000/33000V cables	
m	Single Core	Multicore	Single Core	Multicore
0.50	1.00	1.00	-	-
0.60	0.98	0.99	-	-
0.80	0.95	0.97	1.00	1.00
1.00	0.93	0.96	0.98	0.99
1.25	0.90	0.95	0.95	0.97
1.50	0.89	0.94	0.93	0.96
1.75	0.88	0.94	0.92	0.95
2.00	0.87	0.93	0.90	0.95
2.50	0.86	0.92	0.89	0.93
3.00 or more	0.85	0.91	0.88	0.92

Rating factor for variation in thermal resistivity of soil depth

Nom.Cross-Section Area mm²	Soil thermal resistivity K.m/W						
	0.8	0.9	1.0	1.5	2.0	2.5	3.0
Single Core							
50	1.08	1.06	1.04	0.94	0.87	0.82	0.77
70	1.09	1.06	1.04	0.94	0.87	0.81	0.76
95	1.09	1.06	1.04	0.94	0.87	0.81	0.76
120	1.10	1.07	1.04	0.94	0.86	0.80	0.75
150	1.10	1.07	1.04	0.94	0.86	0.80	0.75

Caledonian Medium Voltage Cables

Nom.Cross-Section Area mm²	Soil thermal resistivity K.m/W						
	0.8	0.9	1.0	1.5	2.0	2.5	3.0
185	1.10	1.07	1.04	0.93	0.86	0.79	0.75
240	1.11	1.07	1.05	0.93	0.86	0.79	0.74
300	1.11	1.08	1.05	0.93	0.85	0.79	0.74
400	1.11	1.08	1.05	0.93	0.85	0.78	0.73
500	1.11	1.08	1.05	0.93	0.85	0.78	0.73
630	1.12	1.08	1.05	0.93	0.84	0.78	0.72
800	1.12	1.09	1.05	0.93	0.84	0.77	0.72
1000	1.13	1.09	1.05	0.93	0.84	0.77	0.71
Multicore							
16	1.04	1.03	1.02	0.97	0.92	0.88	0.85
25	1.05	1.03	1.02	0.96	0.92	0.88	0.84
35	1.05	1.03	1.02	0.96	0.92	0.87	0.83
50	1.05	1.03	1.02	0.96	0.91	0.87	0.83
70	1.05	1.04	1.02	0.96	0.91	0.86	0.82
95	1.06	1.04	1.02	0.96	0.91	0.86	0.82
120	1.06	1.04	1.03	0.95	0.90	0.85	0.81
150	1.06	1.04	1.03	0.95	0.90	0.85	0.80
185	1.07	1.05	1.03	0.95	0.89	0.84	0.80
240	1.07	1.05	1.03	0.95	0.89	0.84	0.79
300	1.07	1.05	1.03	0.95	0.88	0.83	0.78
400	1.07	1.05	1.03	0.95	0.88	0.83	0.78

Group rating factor for circuits of three single core cables
In trefoil single way ducts, horizontal formation (average values)

	No. of circuits	Spacing		
		Touching	0.45m	0.60m
1.9/3.3KV(1.8/3KV) to 12.7/22KV(12/20KV) Cables	2	0.85	0.88	0.90
	3	0.75	0.80	0.83
	4	0.70	0.76	0.80
	5	0.67	0.73	0.77
	6	0.64	0.71	0.76
19/33KV(18/30KV) Cables	2	0.85	0.88	0.90
	3	0.76	0.80	0.83
	4	0.71	0.76	0.80
	5	0.67	0.73	0.77
	6	0.65	0.71	0.76

Group rating factor for multicore cables in single way ducts, horizontal formation (average values)

	No. of ducts in group	Spacing			
		Touching	0.30m	0.45m	0.60m
1.9/3.3KV(1.8/3KV) to 12.7/22KV(12/20KV) Cables	2	0.88	0.91	0.93	0.94
	3	0.80	0.84	0.87	0.89
	4	0.75	0.81	0.84	0.87
	5	0.71	0.77	0.82	0.85
	6	0.69	0.75	0.80	0.84
19/33KV(18/30KV) Cables	2	0.87	0.89	0.92	0.93
	3	0.78	0.82	0.85	0.87
	4	0.73	0.78	0.82	0.85
	5	0.69	0.75	0.79	0.83
	6	0.67	0.73	0.78	0.82

Cables laid direct in free air:
Variation in air temperature

Ground Temperature	25	30	35	40	45	50	55
Cabe Type	Rating Factor						
Cable Type up to 3.3KV	1.02	1.00	0.96	0.91	0.87	0.82	0.76
6.6KV or Above	1.00	0.95	0.91	0.86	0.80	0.75	0.69

Effect of grouping cables

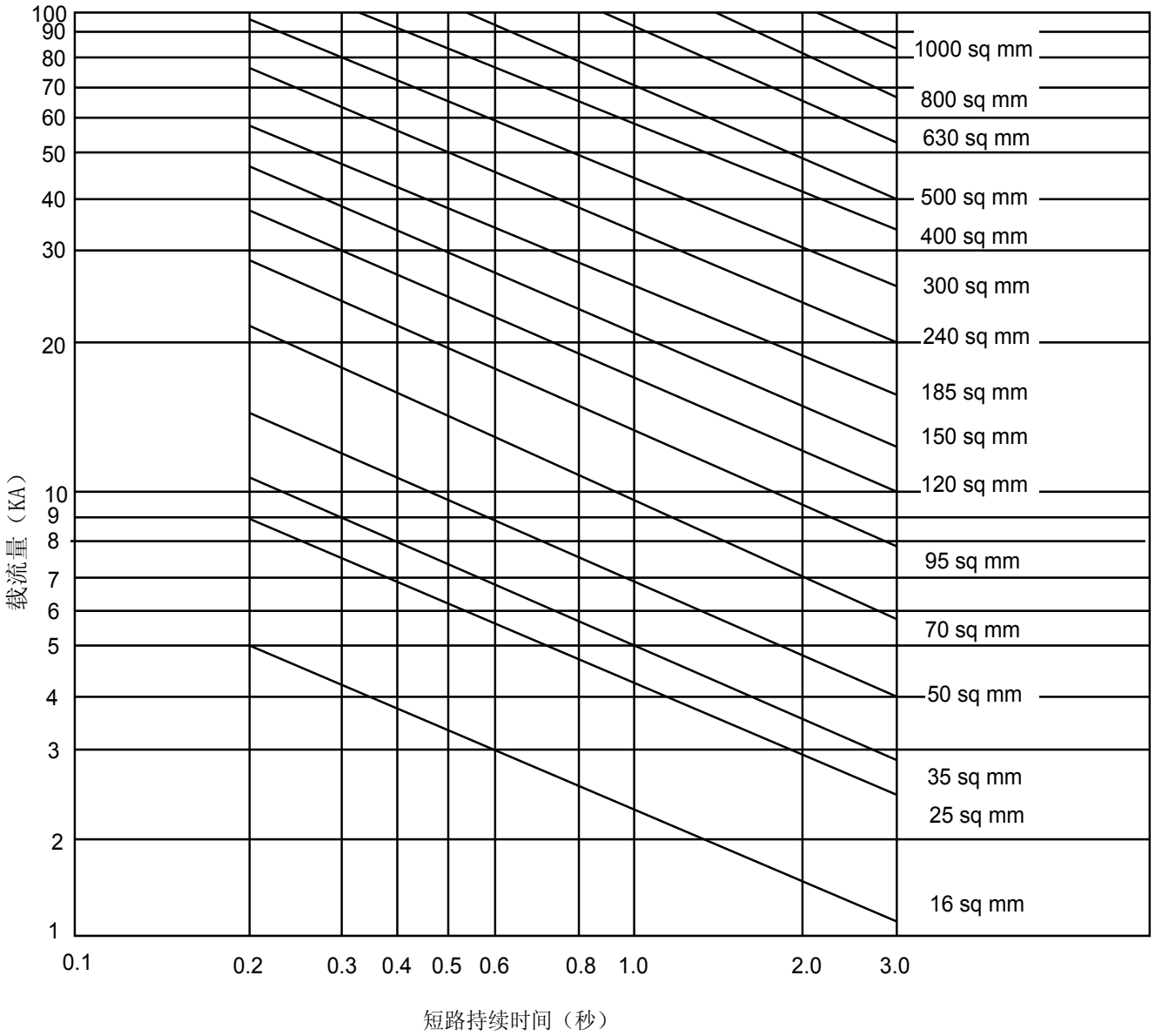
No reduction in rating is necessary where there is free circulation of air around the circuits providing that:

1) The horizontal clearance between circuits is not less than twice the overall diameter of an individual cable.
2) The vertical clearance between circuits is not less than four times the diameter of an individual cable.
3) If the number of circuits exceeds three, they are installed in a horizontal plane.

Caledonian Medium Voltage Cables

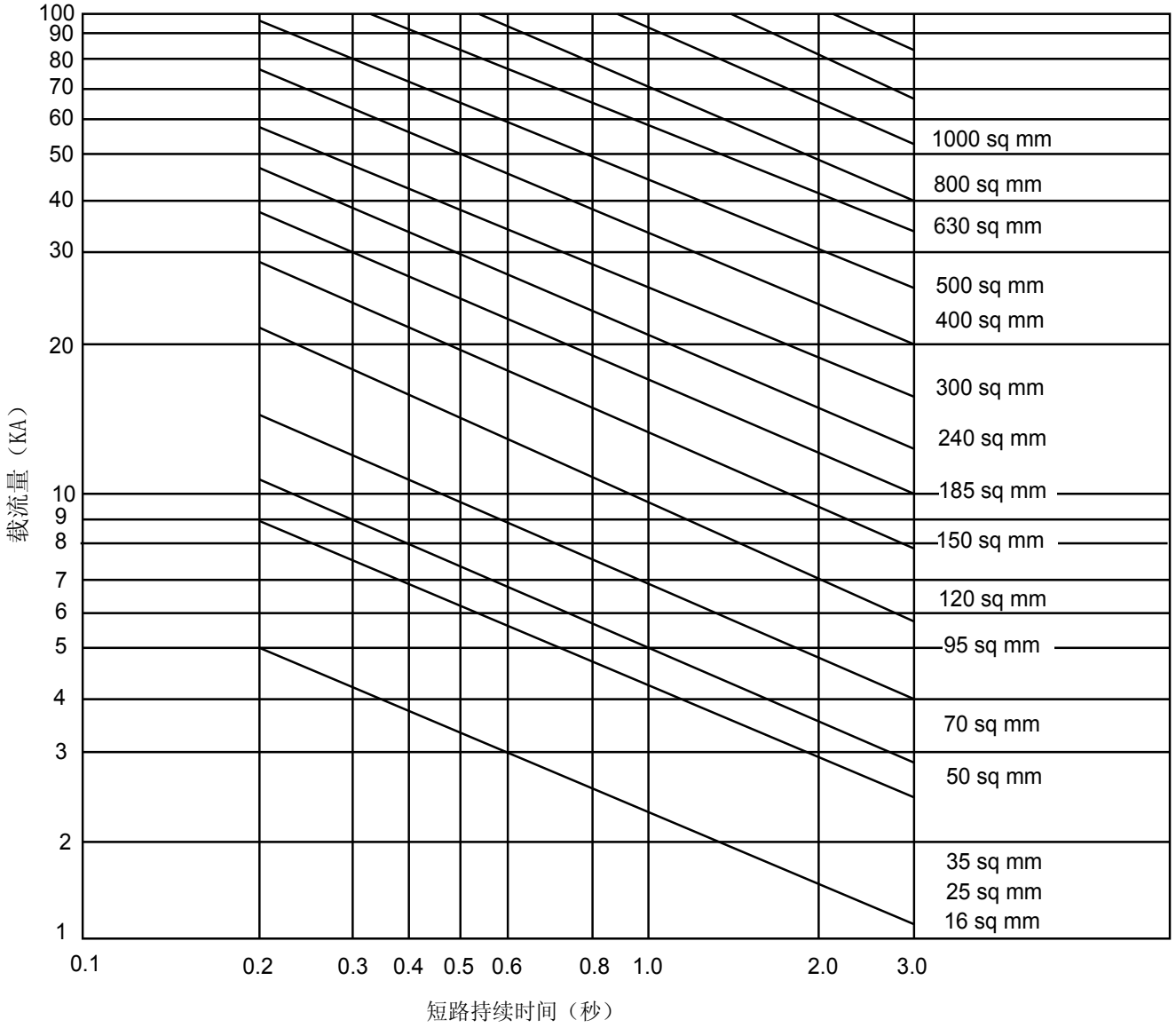
Short Circuit Ratings

Short circuit rating –Copper conductor current in kiloamps



Basis:
1. Cable fully located at start of short circuit. (Conductor temperature: 90°C)
2. Conductor temperature at end of short circuit: 250°C

Short circuit rating –Aluminium conductor current in kiloamps



Basis:
1. Cable fully located at start of short circuit. (Conductor temperature: 90°C)
2. Conductor temperature at end of short circuit: 250°C

Caledonian Medium Voltage Cables

Armour fault current

Nom. Cross-Section Area mm²	Aluminium Wire Armoured Cables					Steel Wire Armoured Cables				
	3.8/6.6 (3.6/6) KV	6.35/11 (6/12) KV	8.7/15 KV	12.7/22 (12/20) KV	18/30 (19/33) KV	3.8/6.6 (3.6/6) KV	6.35/11 (6/12) KV	8.7/15 KV	12.7/22 (12/20) KV	18/30 (19/33) KV
25						7370	10160	11510		
35						7800	10830	11960	13090	
50	6150	6660	7340	7860	12010	10380	11290	12640	13770	21500
70	6660	7170	7860	10680	12810	11290	12190	13540	14670	22580
95	7170	7690	10410	11210	13350	12190	13320	14450	19710	24010
120	7520	8030	10940	11750	13880	13090	14220	15350	20790	25090
150	8030	10680	11480	12280	18350	13770	14900	16030	21860	25810
185	10680	11480	12280	12810	19190	14900	15800	21860	23300	27240
240	11750	12280	13060	13880	20020	16480	21860	23660	25090	29030
300	12550	13080	13880	18770	21690	22580	23660	25090	26520	30830
400	13880	14150	19190	20020	22940	25090	25810	27240	28670	
500	19190	19610	20440	21690	24610					
630	21270	21270	22530	23360	26280					
800	23360	23360	24610	25450	28790					
1000	25450	25450	26700	27530	30870					

Wire screen

Nom.Cross-Section Area	Maximum DC resistance at 20°C	Short Circuit Rating
mm²	Ohm/km	A
16	1.19	2040
25	0.759	3200
35	0.542	4480

Copper wire applied helically or tape screen applied individually to each screened core, or collectively over laid up provide an earth fault current path.

Product Range of Medium Voltage Cable

Standard	Voltage	Size(sq mm)	No. of Cores
BS 6622/BS 7835	3.8/6.6KV	25-630	Single
BS 6622/BS 7835	6.35/11KV	25-630	Single
BS 6622/BS 7835	8.7/15KV	25-630	Single
BS 6622/BS 7835	12.7/22KV	35-630	Single
BS 6622/BS 7835	19/33KV	50-630	Single
BS 6622/BS 7835	3.8/6.6KV	25-400	Three
BS 6622/BS 7835	6.35/11KV	25-400	Three
BS 6622/BS 7835	8.7/15KV	25-400	Three
BS 6622/BS 7835	12.7/22KV	35-400	Three
BS 6622/BS 7835	19/33KV	35-400	Three
IEC 60502	1.8/3KV	10-1000	Single
IEC 60502	3.6/6KV	10-1000	Single
IEC 60502	6/10KV	16-1000	Single
IEC 60502	8.7/15KV	25-1000	Single
IEC 60502	12/20KV	25-1000	Single
IEC 60502	18/30KV	50-1000	Single
IEC 60502	21/35KV	50-400	Single
IEC 60502	26/35KV	50-400	Single
IEC 60502	1.8/3KV	10-630	Three
IEC 60502	3.6/6KV	10-630	Three
IEC 60502	6/10KV	16-630	Three
IEC 60502	8.7/15KV	25-500	Three
IEC 60502	12/20KV	35-500	Three
IEC 60502	18/30KV	50-500	Three
IEC 60502	21/35KV	50-400	Three
IEC 60502	26/35KV	50-400	Three
VDE 0276	1.8/3KV	25-800	Single
VDE 0276	3.6/6KV	25-800	Single
VDE 0276	6/10KV	25-800	Single
VDE 0276	8.7/15KV	25-800	Single
VDE 0276	12/20KV	25-800	Single
VDE 0276	18/30KV	25-800	Single
VDE 0276	1.8/3KV	25-400	Three
VDE 0276	3.6/6KV	25-400	Three
VDE 0276	6/10KV	25-400	Three
VDE 0276	8.7/15KV	25-400	Three
VDE 0276	12/20KV	35-400	Three
VDE 0276	18/30KV	50-400	Three

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