

MEDIUM VOLTAGE CABLES

Copper 19/33 kV – Single core heavy duty screened unarmoured



Application

Electricity distribution or sub-transmission networks cable typically used as primary supply to Commercial, Industrial and urban residential networks. Suitable for high fault level systems rated up to 10kA/1sec. Higher fault current rated constructions are available on request.

Approvals

Approved by all major power Utilities and industrial customers in Australia.

Behaviour in flame and fire:

PVC or LSOH outer sheath exceeds the requirements of IEC 60332-1.

Temperature range

Minimum installation temperature: 0 °C
 Maximum operating temperature: +90 °C
 Minimum operating temperature: -25 °C

Minimum bending radius

Installed cables: 12D (PVC only)
 15D (HDPE)
 During installation: 18D (PVC only)
 25D (HDPE)

Resistance to

Chemical exposure: Accidental
 Mechanical impact: Light (PVC only)
 Heavy (HDPE)
 Water exposure: XLPE – Spray
 EPR – Immersion/Temporary coverage
 Solar radiation and weather exposure: Suitable for direct exposure.

Cable design

Conductor:
 Plain circular compacted copper
 Conductor screen:
 Extruded semi-conductive compound, bonded to the insulation and applied in the same operations as the insulation.
 Insulation:
 Cross Linked Polyethylene (XLPE) – standard
 Ethylene Propylene Rubber (EPR) – alternative
 Insulation screen:
 Extruded, semi-conductive compound
 Metallic screen:
 Plain annealed copper wire: nominal 10kA for 1 second.
 See table next page.
 Sheath:
 Black 5V-90 polyvinyl chloride (PVC) – standard
 Orange 5V-90 PVC inner plus black high density polyethylene (HDPE) outer – alternative
 Low smoke zero halogen (LSOH) – alternative

Installation conditions

In free air
 In duct
 In trench
 In ground with protection

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Physical & electrical characteristics

Copper 19/33 kV – Single core heavy duty screened unarmoured												
Product code: 1CCUX33HD												
Nominal conductor area mm ²	50	70	95	120	150	185	240	300	400	500	630	
Nominal conductor diameter mm	8.2	9.8	11.5	12.9	14.3	16.1	18.2	20.6	23.5	26.6	30.3	
Nominal insulation thickness mm	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Approx cable diameter mm	34.4	36.2	37.9	39.5	40.9	42.9	45.1	47.8	51.5	54.8	58.7	
Approx mass kg/100m	165	210	240	270	300	340	400	465	560	675	815	
Max pulling tension on conductor kN	3.5	4.9	6.7	8.4	11	13	17	21	25	25	25	
Max pulling tension on stocking grip kN	3.5	4.6	5.0	5.5	5.9	6.4	7.1	8.0	9.3	10	12	
Min bending radius* during installation mm	620	650	680	710	740	770	810	860	930	990	1060	
Min bending radius* set in position mm	410	430	460	470	490	510	540	570	620	660	700	
Max conductor resistance, dc @ 20°C Ohm/km	0.387	0.268	0.193	0.153	0.124	0.0991	0.0754	0.0601	0.0470	0.0366	0.0283	
Conductor resistance, ac @ 90°C & 50 Hz Ohm/km	0.494	0.342	0.247	0.196	0.159	0.127	0.0976	0.0785	0.0624	0.0500	0.0404	
Inductance, trefoil touching mH/km	0.515	0.478	0.454	0.436	0.422	0.407	0.391	0.378	0.365	0.352	0.340	
Inductive reactance, trefoil touching @ 50Hz Ohm/km	0.162	0.150	0.143	0.137	0.133	0.128	0.123	0.119	0.115	0.110	0.107	
Zero seq. impedance @ 20°C & 50 Hz Ohm/km	0.783+ j0.0989	0.550+ j0.0881	0.475+ j0.0815	0.435+ j0.0762	0.406+ j0.0723	0.381+ j0.0681	0.358+ j0.0638	0.343+ j0.0601	0.330+ j0.0566	0.320+ j0.0530	0.312+ j0.0499	
Capacitance, phase to earth µF/km	0.139	0.155	0.170	0.183	0.196	0.212	0.231	0.254	0.284	0.312	0.344	
Min insulation resistance @ 20°C MOhm.km	18,000	16,000	15,000	14,000	13,000	12,000	11,000	9,900	8,800	8,000	7,200	
Electric stress at conductor screen kV/mm	4.07	3.85	3.67	3.55	3.46	3.36	3.26	3.16	3.06	2.99	2.93	
Charging current @ rated voltage & 50 Hz A/phase/km	0.831	0.923	1.02	1.09	1.17	1.26	1.38	1.52	1.70	1.86	2.06	
Short circuit rating	Phase conductor kA, 1 sec	7.2	10.0	13.6	17.2	21.5	26.5	34.3	42.9	57.2	71.5	90.1
	Metallic screen kA, 1 sec	7.1	10	10	10	10	10	10	10	10	10	10
Continuous current rating	In ground, direct buried A	205	250	295	335	370	420	480	535	605	675	750
	In ground, in singleway ducts A	200	235	275	310	340	375	425	470	520	575	630
	In free air, unenclosed & spaced from wall A	220	275	335	380	430	490	575	655	750	855	970

The cables described are designed to be used for the supply of electrical energy in fixed applications up to the rated voltages at a nominal power frequency between 49Hz and 61Hz. All values are for XLPE cables only. *Increased radius required for HDPE and nylon incorporating designs.