

MEDIUM VOLTAGE CABLES
Copper 19/33 kV – Single core light 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 low fault level or fast fault clearing cable systems.

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 3kA 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 light duty screened unarmoured												
Product code: 1CCUX33LD												
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	33.1	34.7	36.6	38.0	39.6	41.4	43.8	46.5	50.2	53.5	57.4	
Approx mass kg/100m	140	165	195	225	255	295	355	420	515	625	770	
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	4.2	4.7	5.1	5.5	6.0	6.7	7.6	8.8	10	12	
Min bending radius* during installation mm	600	630	660	680	710	740	790	840	900	960	1030	
Min bending radius* set in position mm	400	420	440	460	480	500	530	560	600	640	690	
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	0.0786	0.0625	0.0500	0.0405	
Inductance, trefoil touching mH/km	0.507	0.469	0.447	0.428	0.415	0.400	0.385	0.372	0.359	0.346	0.335	
Inductive reactance, trefoil touching @ 50Hz Ohm/km	0.159	0.147	0.140	0.134	0.130	0.126	0.121	0.117	0.113	0.109	0.105	
Zero seq. impedance @ 20°C & 50 Hz Ohm/km	1.32+ j0.0975	1.20+ j0.0868	1.13+ j0.0802	1.09+ j0.0749	1.06+ j0.0711	1.03+ j0.0670	1.01+ j0.0627	0.995+ j0.0591	0.982+ j0.0556	0.973+ j0.0521	0.965+ j0.0491	
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	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Continuous current rating	In ground, direct buried A	205	250	300	335	380	425	490	555	625	705	795
	In ground, in singleway ducts A	200	245	290	325	360	405	465	520	585	655	735
	In free air, unenclosed & spaced from wall A	220	275	330	380	435	495	580	665	770	885	1015

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.