

MEDIUM VOLTAGE CABLES
Copper 12.7/22 kV – Single core heavy duty screened unarmoured

Application

Electricity distribution network 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 12.7/22 kV – Single core heavy duty screened unarmoured													
Product code: 1CCUX22HD													
Nominal conductor area mm ²	35	50	70	95	120	150	185	240	300	400	500	630	
Nominal conductor diameter mm	7.0	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	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
Approx cable diameter mm	27.9	29.0	30.8	32.5	34.1	35.5	37.5	39.9	42.4	46.3	49.4	53.5	
Approx mass kg/100m	115	140	185	215	240	270	310	370	430	525	630	770	
Max pulling tension on conductor kN	2.5	3.5	4.9	6.7	8.4	11	13	17	21	25	25	25	
Max pulling tension on stocking grip kN	2.5	2.9	3.3	3.7	4.1	4.4	4.9	5.6	6.3	7.5	8.5	10	
Min bending radius* during installation mm	500	520	550	590	610	640	670	720	760	830	890	960	
Min bending radius* set in position mm	330	350	370	390	410	430	450	480	510	560	590	640	
Max conductor resistance, dc @ 20°C Ohm/km	0.524	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	0.668	0.494	0.342	0.247	0.196	0.159	0.128	0.0978	0.0788	0.0627	0.0503	0.0408	
Inductance, trefoil touching mH/km	0.502	0.479	0.444	0.422	0.405	0.392	0.379	0.365	0.353	0.342	0.330	0.321	
Inductive reactance, trefoil touching @ 50Hz Ohm/km	0.158	0.151	0.140	0.133	0.127	0.123	0.119	0.115	0.111	0.108	0.104	0.101	
Zero seq. impedance @ 20°C & 50 Hz Ohm/km	1.09+ j0.0931	0.783+ j0.0868	0.550+ j0.0767	0.475+ j0.0708	0.435+ j0.0660	0.406+ j0.0625	0.381+ j0.0589	0.358+ j0.0550	0.343+ j0.0520	0.330+ j0.0491	0.320+ j0.0460	0.312+ j0.0435	
Capacitance, phase to earth µF/km	0.164	0.179	0.200	0.223	0.241	0.259	0.282	0.310	0.343	0.386	0.426	0.473	
Min insulation resistance @ 20°C MOhm.km	16,000	14,000	13,000	11,000	10,000	9,700	8,900	8,100	7,300	6,500	5,900	5,300	
Electric stress at conductor screen kV/mm	3.64	3.49	3.33	3.21	3.12	3.06	2.99	2.91	2.85	2.78	2.73	2.68	
Charging current @ rated voltage & 50 Hz A/phase/km	0.652	0.713	0.799	0.888	0.961	1.03	1.12	1.24	1.37	1.54	1.70	1.89	
Short circuit rating	Phase conductor kA, 1 sec	5.0	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	5.0	7.1	10	10	10	10	10	10	10	10	10	10
Continuous current rating	In ground, direct buried A	175	205	250	295	335	370	415	480	535	600	670	740
	In ground, in singleway ducts A	170	195	235	275	305	335	370	415	460	510	560	615
	In free air, unenclosed & spaced from wall A	185	220	270	330	375	425	485	565	645	740	845	960

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.