

MEDIUM VOLTAGE CABLES

Aluminium 1.9/3.3 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:
 Circular compacted aluminium
 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

Aluminium 1.9/3.3 kV – Single core heavy duty screened unarmoured														
Product code: 1CALX3HD														
Nominal conductor area mm ²	25	35	50	70	95	120	150	185	240	300	400	500	630	
Nominal conductor diameter mm	6.1	7.1	8.1	9.8	11.5	12.9	14.2	16.0	18.1	20.6	23.5	26.6	30.2	
Nominal insulation thickness mm	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.2	2.4	
Approx cable diameter mm	18.6	19.6	21.9	23.6	25.3	26.7	28.0	30.0	32.1	34.8	38.5	42.2	46.4	
Approx mass kg/100m	45	55	70	95	120	135	145	160	180	200	235	270	325	
Max pulling tension on conductor kN	1.3	1.8	2.5	3.5	4.8	6.0	7.5	9.3	12	15	20	25	25	
Max pulling tension on stocking grip kN	1.2	1.3	1.7	2.0	2.2	2.5	2.8	3.1	3.6	4.2	5.2	6.2	7.5	
Min bending radius* during installation mm	330	350	390	430	460	480	500	540	580	630	690	760	840	
Min bending radius* set in position mm	220	240	260	280	300	320	340	360	390	420	460	510	560	
Max conductor resistance, dc @ 20°C Ohm/km	1.20	0.868	0.641	0.443	0.320	0.253	0.206	0.164	0.125	0.100	0.0778	0.0605	0.0469	
Conductor resistance, ac @ 90°C & 50 Hz Ohm/km	1.54	1.11	0.822	0.568	0.411	0.325	0.265	0.211	0.161	0.130	0.102	0.0804	0.0638	
Inductance, trefoil touching mH/km	0.449	0.427	0.422	0.389	0.370	0.357	0.347	0.334	0.322	0.311	0.305	0.298	0.291	
Inductive reactance, trefoil touching @ 50Hz Ohm/km	0.141	0.134	0.133	0.122	0.116	0.112	0.109	0.105	0.101	0.0978	0.0958	0.0936	0.0915	
Zero seq. impedance @ 20°C & 50 Hz Ohm/km	2.37+ j0.0720	1.71+ j0.0665	1.24+ j0.0649	0.871+ j0.0563	0.635+ j0.0519	0.535+ j0.0490	0.488+ j0.0466	0.446+ j0.0432	0.407+ j0.0405	0.382+ j0.0381	0.360+ j0.0369	0.343+ j0.0356	0.330+ j0.0342	
Capacitance, phase to earth µF/km	0.316	0.353	0.388	0.448	0.507	0.554	0.601	0.663	0.737	0.824	0.943	0.962	0.993	
Min insulation resistance @ 20°C MOhm.km	8,300	7,300	6,600	5,700	5,000	4,600	4,200	3,800	3,400	3,000	2,700	2,600	2,500	
Electric stress at conductor screen kV/mm	1.19	1.16	1.14	1.11	1.09	1.08	1.07	1.06	1.05	1.03	1.02	0.929	0.850	
Charging current @ rated voltage & 50 Hz A/phase/km	0.189	0.211	0.232	0.267	0.303	0.331	0.359	0.395	0.440	0.492	0.563	0.574	0.593	
Short circuit rating	Phase conductor kA, 1 sec	2.4	3.3	4.7	6.6	9.0	11.3	14.2	17.5	22.7	28.3	37.8	47.2	59.5
	Metallic screen kA, 1 sec	2.4	3.3	4.7	6.6	8.9	10	10	10	10	10	10	10	10
Continuous current rating	In ground, direct buried A	115	135	160	195	230	260	290	330	375	425	480	545	610
	In ground, in singleway ducts A	115	135	155	190	220	245	270	300	335	375	415	465	520
	In free air, unenclosed & spaced from wall A	110	135	165	205	250	285	325	370	435	505	585	680	785

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.