

# CONFLEX ELECTRIC CABLE

## CONFLEX - 0.6/1kV Flexible VSD/EMC Cables

### ● Applications

WW VSD/EMC cables are manufactured for use where electrical interference distorts signal transmission in electric motors.

### ● Standard compliance

AS/NZS 5000.1 - Part 1: For working voltages up to and including 0.6/1 (1.2) kV  
 AS/NZS 1125 - Conductors in insulated electric cables, cords and conductors  
 AS/NZS 3808 - Insulating and sheathing materials for electric cables

### ● Configuration

	Series 1	Series 2
Conductor:	plain annealed copper, class 5 fine wires stranded	plain annealed copper, class 5 fine wires stranded
Insulation:	flame retardant polyvinyl chloride PVC V75	cross-linked polyethylene (XLPE)
Filler:	non-hygroscopic material	non-hygroscopic material
Bedding:	flame retardant polyvinyl chloride PVC V75	thermoplastic elastomer (TPE)
Screen:	tinned annealed copper braid	plain annealed copper braid
Sheath:	flame retardant polyvinyl chloride PVC V75	thermoplastic elastomer (TPE)
Sheath identification	Transparent	Black – Ultraviolet radiation stabilised

### ● Core identification

To AS/NZS 5000.1: 3 cores + earth (4G): Red, White, Blue + Green/Yellow  
 4 cores + earth (5G): Red, White, Blue, Black + Green/Yellow  
 To VDE 0293 (optional): 3 cores + earth (4G): Brown, Black, Grey + Green/Yellow  
 4 cores + earth (5G): Brown, Black, Grey, Blue + Green/Yellow

### ● Conductor d.c and a.c characteristics:

Nominal Area mm <sup>2</sup>	Max. wires Dia. Fine-wire strand mm	d.c resist. at 20°C Ω / km	a.c resist. at 75°C Ω / km	a.c resist. at 90°C Ω / km	3-Phase(75°C) Voltage Drop mV/A.m	3-Phase(90°C) Voltage Drop mV/A.m	Reactance	
							Series 1 cable Ω/km	Series 2 cable Ω/km
1.5	0.25	13.3	16.2	17.0	28.0	29.4	0.118	0.118
2.5	0.25	7.98	9.7	10.2	16.8	17.6	0.112	0.112
4	0.30	4.95	6.02	6.31	10.4	10.9	0.108	0.108
6	0.30	3.30	4.01	4.21	6.95	7.29	0.104	0.104
10	0.40	1.91	2.41	2.52	4.17	4.38	0.0982	0.102
16	0.40	1.21	1.47	1.54	2.55	2.68	0.0937	0.0970
25	0.40	0.780	0.889	0.932	1.55	1.62	0.0895	0.0921
35	0.40	0.554	0.652	0.684	1.14	1.19	-	0.0895
50	0.40	0.386	0.490	0.513	0.862	0.902	-	0.0893
70	0.50	0.272	0.325	0.340	0.581	0.608	-	0.0859

--Further conductor types and stranding configuration on request.  
 --Single phase voltage drop is multiplying the three phase values by 1.155.  
 --Please refer to AS/NZS 3008 for details

### ● Current carrying capacity

Lay in air: Ambient air temperature 40°C  
 Other conditions: Balance load, in flexible installation.

Nominal Phase CSA mm <sup>2</sup>	2 core and Earth				3 core and earth, 4 core and earth			
	Protected from sun		Exposed to sun		Protected from sun		Exposed to sun	
	V75 A	XLPE A	V75 A	XLPE A	V75 A	XLPE A	V75 A	XLPE A
6	44	54	34	43	38	46	29	37
10	60	74	46	58	52	63	39	50
16	81	99	60	77	70	85	51	66
25	110	135	80	105	95	115	68	88
35	135	165	95	125	115	140	81	105
50	160	195	110	145	140	165	96	125
70	205	250	140	185	175	215	120	155

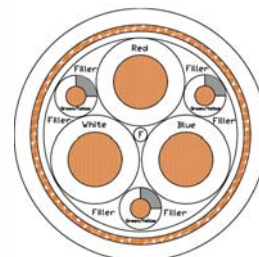
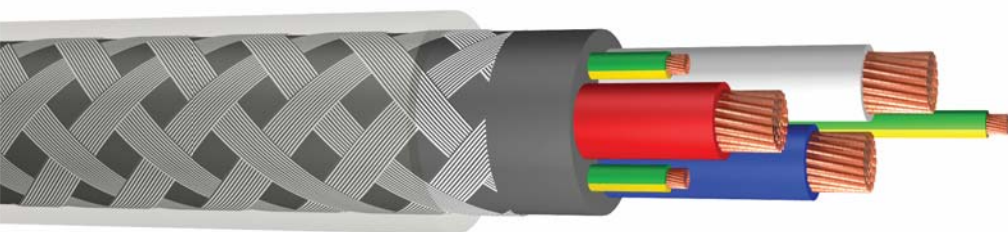
Current rating for flexible cord: 1.5mm<sup>2</sup> - 15A, 2.5mm<sup>2</sup> - 20A, 4mm<sup>2</sup> - 25A, based on ambient air temperature 25°C.



# CONFLEX ELECTRIC CABLE

## 0.6/1kV Flexible VSD/EMC Cables

● **Series 1, Flexible stranded copper conductor, PVC insulation, bedding and sheath, tinned copper braid screened**



Voltage Ranges:	600V / 1000V
Test voltage:	2500V rms between conductors, between conductors and screen.
Conductor operating temp:	- 25°C ~ 75°C
Short circuit temp:	140°C for 5 sec
Minimum bending radius:	7.5xcable O.D
Maximum pulling tension:	20N/mm <sup>2</sup> x total cross-sectional area of phase conductor

--The maximum conductor temperatures specified are based on the properties of the insulation material but in practice may need to be derated to take account of joints and terminations and environmental conditions.

--The cables should not be flexed when either the ambient or cable temperature is below 0°C

--Thermoplastic PVC V75 insulation is subject to deformation at temperature above 70°C.

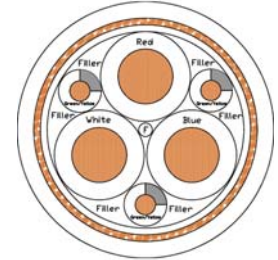
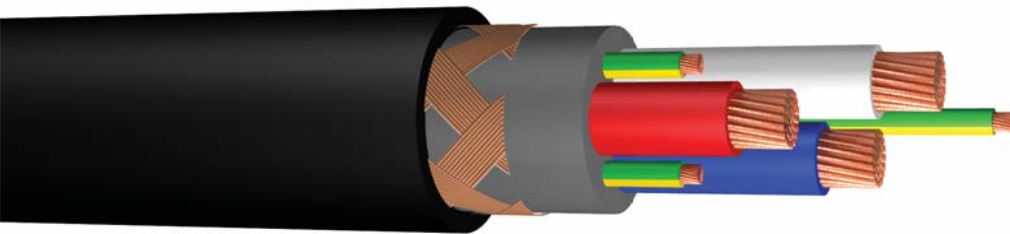
Product Code	No. of Core	Phase Cond. Area (mm <sup>2</sup> )	Core Dia (mm)	Earth Cond. Area (mm <sup>2</sup> )	Core Dia (mm)	Over Bedding Dia (mm)	Cable Dia. (mm)	Approx. Weight (kg/km)
9315	2C+E	1.5	3.2	1.5	3.2	9.8	14.48	220
9325	2C+E	2.5	3.7	2.5	3.7	11.0	15.85	272
9400	3C+E	1.0	2.9	1.0	2.7	9.1	13.62	205
9401	3C+E	1.5	3.2	1.5	3.0	9.8	14.48	238
9402	3C+E	2.5	3.7	2.5	3.5	11.0	15.85	299
9404	3C+E	4	4.7	4	4.7	13.3	18.58	417
9406	3C+3E	6	5.3	1.5	3.0	13.4	16.86	478
9410	3C+3E	10	6.2	1.5	3.0	15.5	19.07	636
9416	3C+3E	16	7.4	2.5	3.5	18.4	22.10	908
9425	3C+3E	25	9.1	4	4.7	22.3	29.12	1357
9435	3C+3E	35	10.3	6	5.3	25.3	32.71	1794
9450	3C+3E	50	12.3	10	6.2	29.5	37.67	2480
9470	3C+3E	70	14.0	10	6.2	33.5	42.75	3323
9501	4C+E	1.5	3.2	1.5	3.0	9.2	13.79	239
9502	4C+E	2.5	3.7	2.5	3.5	10.5	15.21	309
9504	4C+E	4	4.7	2.5	3.5	12.4	17.49	415
9506	4C+E	6	5.3	2.5	3.5	13.6	18.92	516
9511	4C+E	10	6.2	4	4.7	16.1	21.87	753
9516	4C+E	16	7.4	6	5.3	18.7	24.89	1054
9526	4C+E	25	9.1	6	5.3	22.2	29.03	1499
9535	4C+E	35	10.3	10	6.2	25.2	32.51	1987
9551	4C+E	50	12.3	16	7.4	29.6	37.80	2766
9570	4C+E	70	14.0	25	9.1	34.0	43.37	3877



# CONFLEX ELECTRIC CABLE

## 0.6/1kV Flexible VSD/EMC Cables

● **Series 2, Flexible stranded copper conductor, XLPE insulation, TPE bedding and sheath, plain copper braid screened**



Voltage Ranges:	600V / 1000V
Test voltage:	2500V rms between conductors, between conductors and screen
Conductor operating temp:	- 40°C ~ 90°C
Short circuit temp:	250°C for 5 sec
Minimum bending radius:	7.5xcable O.D
Maximum pulling tension:	20N/mm <sup>2</sup> x total cross-sectional area of phase conductor

--The maximum conductor temperatures specified are based on the properties of the insulation material but in practice may need to be derated to take account of joints and terminations and environmental conditions.

--The cables should not be flexed when either the ambient or cable temperature is below 0°C

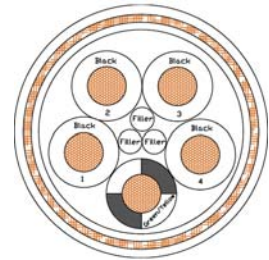
Product Code	No. of Core	Phase Cond. Area (mm <sup>2</sup> )	Core Dia (mm)	Earth Cond. Area (mm <sup>2</sup> )	Core Dia (mm)	Over Bedding Dia (mm)	Cable Dia. (mm)	Approx. Weight (kg/km)
9401XT	3C+E	1.5	3.2	1.5	3.0	8.8	12.26	201
9402XT	3C+E	2.5	3.7	2.5	3.5	10.1	13.56	260
9404XT	3C+3E	4	4.7	1.5	3.0	10.4	13.89	311
9406XT	3C+3E	6	5.3	1.5	3.0	11.7	15.34	393
9410XT	3C+3E	10	6.2	1.5	3.0	13.9	17.64	563
9416XT	3C+3E	16	7.4	2.5	3.5	16.4	20.34	808
9425XT	3C+3E	25	9.1	4	4.1	20.3	24.53	1206
9435XT	3C+3E	35	10.3	6	4.7	23.1	27.49	1608
9450XT	3C+3E	50	12.3	10	5.6	27.0	31.70	2248
9470XT	3C+3E	70	14.0	10	5.6	31.4	36.84	3118
9501XT	4C+E	1.5	3.2	1.5	3.0	9.4	12.65	222
9502XT	4C+E	2.5	3.7	2.5	3.5	10.5	13.89	288
9504XT	4C+E	4	4.7	2.5	3.5	11.6	15.05	362
9506XT	4C+E	6	5.3	2.5	3.5	12.8	16.30	455
9511XT	4C+E	10	6.2	4	4.7	15.2	18.88	676
9516XT	4C+E	16	7.4	6	5.3	18.0	21.95	980
9526XT	4C+E	25	9.1	6	5.3	21.6	25.78	1405
9535XT	4C+E	35	10.3	10	6.2	24.9	29.25	1900
9551XT	4C+E	50	12.3	16	7.4	28.8	33.46	2618
9570XT	4C+E	70	14.0	25	9.1	33.6	38.97	3740



# CONFLEX ELECTRIC CABLE

## 0.6/1kV Flexible EMC Control Cables

● **Flexible stranded plain annealed copper conductor, PVC insulation, PVC bedding, screened with tinned annealed copper braid and thermoplastic (TPE) sheathing.**



Voltage Ranges:	600V / 1000V
Test voltage:	2500V rms between conductors, between conductors and screen
Conductor operating temp:	- 25°C ~ 75°C
Short circuit temp:	140°C for 5 sec
Minimum bending radius:	7.5xcable O.D
Maximum pulling tension:	20N/mm <sup>2</sup> x total cross-sectional area of phase conductor

--The maximum conductor temperatures specified are based on the properties of the insulation material but in practice may need to be derated to take account of joints and terminations and environmental conditions.

--The cables should not be flexed when either the ambient or cable temperature is below 0°C

--Thermoplastic PVC V75 insulation is subject to deformation at temperature above 70°C.

Core identification:	Active core:	black core with white numbering
	Earth core:	green/yellow
Sheath identification:		black

Product Code	No. of Core	Cond. Area (mm <sup>2</sup> )	Core Dia (mm)	Over Bedding Dia (mm)	Cable Dia. (mm)	Approx. Weight (kg/km)	Max d.c. resistance @ 20°C ( Ω / km)
8100	2C+E	1.5	3.1	9.0	12.35	200	13.3
8101	2C+E	2.5	3.6	10.0	13.39	245	7.98
8109	3C+E	4	4.4	13.3	16.68	399	4.95
8102	4C+E	1.5	3.1	10.7	14.10	266	13.3
8103	4C+E	2.5	3.6	12.0	15.39	336	7.98
8110	4C+E	4	4.4	14.6	17.99	470	4.95
8104	6C+E	1.5	3.1	15.6	18.96	400	13.3
8105	6C+E	2.5	3.6	17.6	20.97	512	7.98
8107	11C+E	2.5	3.6	39.1	42.47	1367	7.98

### ● **Standard compliance**

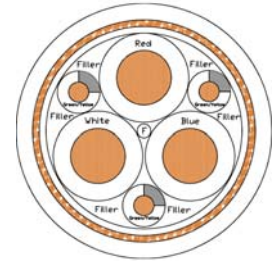
AS/NZS 5000.1	- Electric cables - Polymeric insulated - Part 1: For working voltages up to and including 0.6/1 (1.2) kV
AS/NZS 1125	- Conductors in insulated electric cables, cords and conductors
AS/NZS 3808	- Insulating and sheathing materials for electric cables

### ● **Availability**

Plain annealed copper braid screen is available on request.

# VIPERCON ELECTRIC CABLE

## 0.6/1kV VSD/EMC Cables (Copper Tape Screened)



### ● Configuration

Conductor: plain annealed copper (class 2 strands) of the type specified in AS/NZS 1125.  
 Insulation: polyvinylchloride compound PVC V90.  
 Laying-up: cores are laid up together with a right-hand direction of lay, with non-hygroscopic filler where necessary to form a substantially compact and circular cross-section core assembly.  
 Bedding: flame retardant polyvinylchloride compound PVC V90  
 Screen: plain annealed copper tape with 100% coverage  
 Sheath: the laid-up core is sheathed with a continuous flame retardant polyvinylchloride compound PVC V90 to AS/NZS 3808.

### Core identification

Core: Active core: Red, White, and Blue  
 Earth core: Green/Yellow

Sheath colour: Standard - Orange  
 Optional - Black (Ultraviolet radiation stabilised)

### ● Technical data

Rated voltage: 0.6 / 1 kV  
 Test voltage: 2500V rms between conductors, between conductors and screen  
 6000V rms spark test  
 Conductor operating temp: -25°C ~ 90°C, short circuit: 160°C for 5 sec  
 Minimum ambient temp: 0°C, after installation and only when cable is in a fixed position  
 Minimum bending radius: 18 x cable O.D during installation  
 12 x cable O.D after installation

--The maximum conductor temperatures specified are based on the properties of the insulation material but in practice may need to be derated to take account of joints and terminations and environmental conditions.  
 --Thermoplastic PVC V90 insulation is subject to deformation at temperature above 75°C.

### ● Standards:

International - IEC 60502, IEC 60228, IEC 60332  
 Australian/New Zealand - AS/NZS 5000.1, AS/NZS 3808, AS/NZS 1125, AS/NZS 1660

Product Code	No. of Core	Phase Cond. Area (mm <sup>2</sup> )	Phase Core Dia. (mm)	Earth Cond. Area (mm <sup>2</sup> )	Earth Core Dia. (mm)	Over Bedding Dia. (mm)	Cable Dia. (mm)	Approx. Weight (kg/km)
9401VT	3C+E	1.5	3.2	1.5	3.0	9.8	12.84	272
9402VT	3C+E	2.5	3.7	2.5	3.5	11.0	14.08	340
9404VT	3C+E	4	4.7	4	4.7	13.45	16.57	472
9406VT	3C+3E	6	5.3	1.5	3.0	14.8	16.67	536
9410VT	3C+3E	10	6.2	1.5	3.0	17.1	18.88	707
9416VT	3C+3E	16	7.4	2.5	3.5	20.2	21.91	997
9425VT	3C+3E	25	9.1	4	4.7	22.3	26.15	1455
9435VT	3C+3E	35	10.3	6	5.3	25.3	29.42	1911
9450VT	3C+3E	50	12.3	10	6.2	29.5	33.93	2623
9470VT	3C+3E	70	14.0	10	6.2	33.5	38.16	3350
9495VT	3C+3E	95	15.3	16	7.4	36.2	41.05	4252
9412VT	3C+3E	120	17.1	16	7.4	40.5	45.69	5180
9415VT	3C+3E	150	19.2	25	9.1	45.1	50.63	6520
9418VT	3C+3E	185	21.5	25	9.1	49.9	55.75	7782
9424VT	3C+3E	240	24.2	35	10.3	56.0	62.29	9936
9430VT	3C+3E	300	26.8	50	12.3	61.8	68.43	12357



# VIPERCON ELECTRIC CABLE

## Supplementary Technical Information

### A. Rated voltage designation

Voltage rating for low voltage power cable is expressed in the form  $U_0/U$  ( $U_m$ ), the voltage designation takes into consideration the fact that the system voltage may vary up to 9.1% from the designated voltage.

0.6/1kV (1.2kV):  $U_0 = 0.6\text{kV}$ ,  $U = 1\text{kV}$ ,  $U_m = 1.2\text{kV}$

$U_0$  is the R.M.S power frequency voltage between phase conductor and earth conductor of the supply system.

$U$  is the R.M.S power frequency voltage between phases conductor of the supply system.

$U_m$  is the maximum R.M.S power frequency voltage between any two phases conductor for which cables are designed. It is the highest voltage that can be sustained under normal operating conditions at any time and at any point in a system. It excludes transient voltage variation due to fault condition and sudden disconnection of large load.

The rated voltage of the cable for a given application shall be suitable for the operating condition in the system.

### B. Conductor materials characteristics:

Conductor Material Type	Conductivity %	Resistivity at 20°C $n \Omega \cdot m$	Density $g/cm^3$	Temperature Constant °C
Copper:	100	17.07~17.24	8.92	234.5
Aluminium	61	28.264	2.73	228.1

### C. Conductor maximum d.c resistance at 20°C and a.c resistance at 90°C (Multi-core):

Nominal Area $mm^2$	Max. d.c resistance of conductor at 20°C		a.c resistance of conductor at 90°C	
	Copper / km	Aluminium / km	Copper / km	Aluminium / km
1.5	13.6	-	17.3	-
2.5	7.41	-	9.45	-
4	4.61	-	5.88	-
6	3.08	-	3.93	-
10	1.83	-	2.33	-
16	1.15	-	1.47	-
25	0.7270	1.20	0.927	-
35	0.5238	0.8670	0.669	1.11
50	0.3661	0.6061	0.494	0.822
70	0.2604	0.4310	0.343	0.569
95	0.1931	0.3196	0.248	0.411
120	0.1528	0.2529	0.197	0.325
150	0.1222	0.2023	0.160	0.265
185	0.0991	0.1641	0.129	0.212
240	0.0761	0.1260	0.0998	0.162
300	0.0611	0.1012	0.0812	0.131

\*Further conductor types and stranding configuration on request. Conductor compacted index is not less than 0.9.

### D. Conversion factor for conductor temperatures:

Temperature Rating °C	Conversion Factor	
	Copper	Aluminium
20	1.000	1.000
90	1.275	1.282
105	1.334	1.343
130	1.432	1.443
250	1.904	1.927

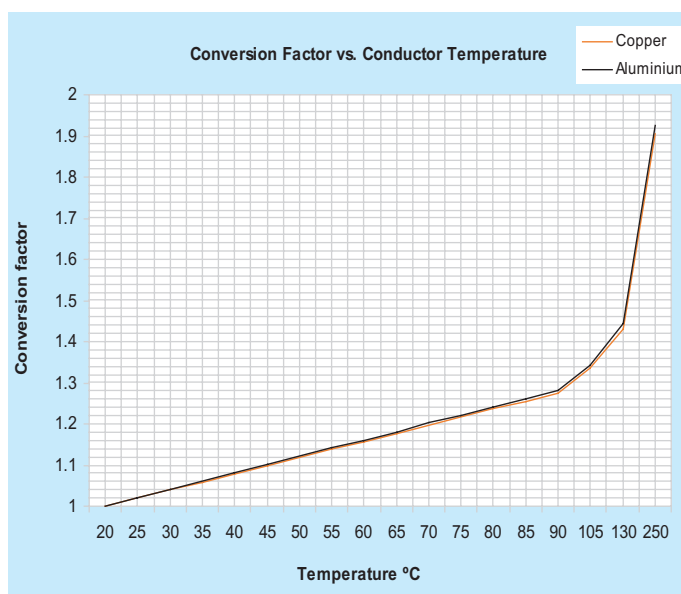
Conversion Example

50mm<sup>2</sup> Cable (Copper)

Max d.c resistance at 20°C = 0.3661  $\Omega$  / km.

Conversion factor for 50mm<sup>2</sup> at 90°C = 1.275

Max d.c resistance at 90°C = 0.3661  $\Omega$  / km \* 1.275 = 0.4668  $\Omega$  / km



# VIPERCON ELECTRIC CABLE

## E. Conductor three phase voltage drop\* at 50Hz. 90°C (mV/A.m)

Nominal Area mm <sup>2</sup>	Copper		Aluminium	
	Max	0.8 power factor	Max	0.8 power factor
1.5	30.0	-	-	-
2.5	16.4	-	-	-
4	10.2	-	-	-
6	6.8	-	-	-
10	4.05	-	-	-
16	2.55	-	-	-
25	1.61	-	-	-
35	1.17	-	1.93	-
50	0.87	-	1.43	-
70	0.61	-	0.993	-
95	0.45	-	0.723	-
120	0.37	-	0.577	-
150	0.31	-	0.476	-
185	0.26	-	0.388	-
240	0.22	0.22	0.307	-
300	0.19	0.19	0.258	-

\*Single phase voltage drop is multiplying the three phase values by 1.155.

## F. Cable reactance at 50Hz ( Ω /km)

Nominal Area mm <sup>2</sup>	PVC insulated Max	XLPE insulated Max
1.5	0.111	-
2.5	0.102	-
4	0.102	-
6	0.0967	-
10	0.0906	-
16	0.0861	-
25	0.0853	-
35	0.0826	-
50	0.0797	-
70	0.0770	-
95	-	0.0725
120	-	0.0713
150	-	0.0718
185	-	0.0720
240	-	0.0709
300	-	0.0704



# VIPERCON ELECTRIC CABLE

## G. Current carrying capacity

The current rating given in this catalogue has been calculated using the method described in IEC 60287 - Calculation of the current rating (All parts), and based on typical Australia installation condition:

Lay in air: Ambient air temperature 40°C

Lay in ground: Ambient soil temperature 25°C,

Specific thermal resistivity 1.2 K.m/W, Buried depth 0.75 ~ 0.8m

Lay in conduits: The current carrying capacity will be reduced by approximate 15 ~ 25%.

Other conditions: Balance load, Unexposed to the direct sunlight.

## Multi - Core cables current rating

Nominal Phase CSA mm <sup>2</sup>	Insulated Material	3G(2C+E) - 2 loaded						4G(3C+E) or 5G(3C+N+E) - 3 loaded						Fault Current Rating	
		Unenclosed Touching		Buried direct		Buried in conduit		Unenclosed touching		Buried direct		Buried in conduit			
		Cu A	Al A	Cu A	Al A	Cu A	Al A	Cu A	Al A	Cu A	Al A	Cu A	Al A	Cu kA	Al kA
1.5	PVC	18	-	28	-	22	-	15	-	24	-	19	-	0.21	-
2.5	PVC	26	-	40	-	31	-	22	-	34	-	26	-	0.36	-
4	PVC	34	-	52	-	40	-	29	-	44	-	34	-	0.57	-
6	PVC	44	-	65	-	51	-	37	-	55	-	43	-	0.86	-
10	PVC	60	-	87	-	68	-	51	-	74	-	57	-	1.43	-
16	PVC	80	-	115	-	88	-	68	-	96	-	74	-	2.29	-
25	PVC	105	-	145	-	115	-	91	-	125	-	96	-	3.58	-
35	PVC	130	100	180	140	140	110	110	87	150	115	115	91	5.01	3.31
50	PVC	160	125	210	165	165	130	135	105	180	140	140	110	7.15	4.73
70	PVC	200	155	260	200	205	160	170	135	220	170	175	135	10.02	6.62
95	XLPE	310	240	360	280	285	220	265	205	300	235	240	185	13.59	8.98
120	XLPE	360	280	410	320	325	255	305	240	345	265	275	215	17.17	11.35
150	XLPE	410	320	460	355	375	290	350	270	385	300	310	240	21.46	14.18
185	XLPE	475	370	520	405	425	330	405	315	435	340	355	280	26.47	17.49
240	XLPE	560	440	600	470	500	390	480	375	500	395	420	330	34.34	22.69
300	XLPE	640	510	680	530	570	450	550	430	570	445	475	375	42.93	28.37

## Single - Core & SDI cables current rating

Copper conductor

Nominal Area mm <sup>2</sup>		6	10	16	25	35	50	70	95	120	150	185	240	300	
90°C PVC	Touching (laid flat)	A	40	54	72	97	120	145	185	230	265	310	355	425	490
	Enclosed in duct (trefoil)	A	34	47	62	87	100	125	155	185	220	250	285	340	390
XLPE	Touching (laid flat)	A	47	65	86	115	145	175	225	280	325	375	435	520	600
	Enclosed in duct (trefoil)	A	42	58	78	110	125	155	190	230	270	310	355	420	485

Aluminium conductor

Nominal Area mm <sup>2</sup>		6	10	16	25	35	50	70	95	120	150	185	240	300
XLPE	Touching (laid flat)	A	-	-	-	110	135	175	215	255	290	340	405	470
	Enclosed in duct (trefoil)	A	-	-	-	105	125	160	195	230	260	300	360	415





# VIPERCON ELECTRIC CABLE

## H. Current rating factor.

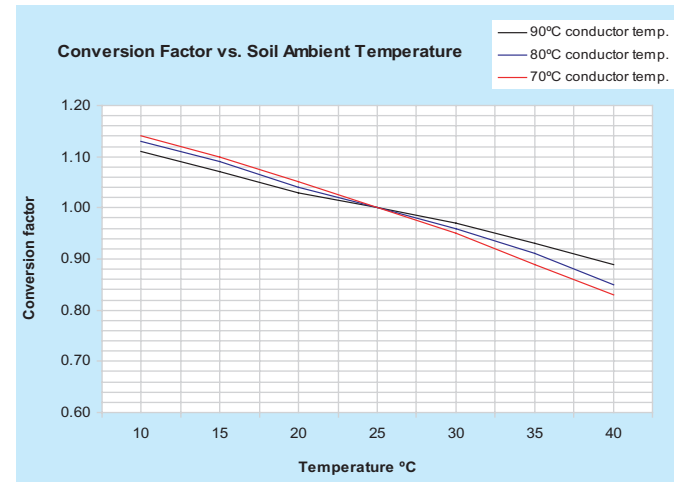
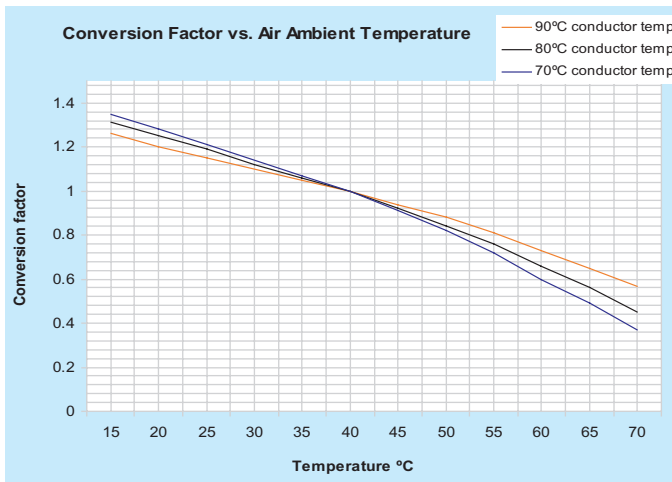
### 1. Depth of laying rating factor

Nominal Area	Conductor area vs. Depth (Laid direct in ground)							
	0.8m	1m	1.25m	1.5m	1.75m	2m	2.5m	+3m
300 mm <sup>2</sup>	1	0.98	0.96	0.95	0.94	0.92	0.91	0.90

### 2. The current carrying capacity of a cable will vary dependent on the installation condition and the cable surrounding condition.

(I) ambient air temperature conversion factor

(II) ambient soil temperature conversion factor



Note: the current rating and the derating factor is referenced from AS/NZS 3008.1, please refer to AS/NZS 3008.1 or AS/NZS 3000 for current rating on other installation condition.

## I. Cable testing criterias

The following test will be conducted at manufacturer's work, and testing method is in accordance with AS/NZS 1660

- Cable construction test, sample test
- Conductor resistance test, routine test
- Insulation spark test (6kV a.c)
- Cable A.C withstand voltage test (3.5kV a.c /5 min.)
- Cable mechanical test, sample test on tensile strength, bending radius.

