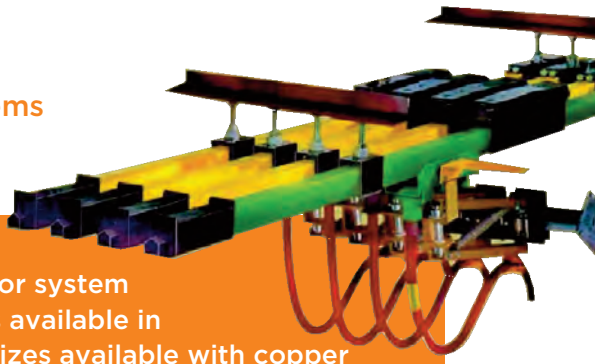
Conductor Systems

SIMBAL 'Powerline V' Single Pole Conductor systems



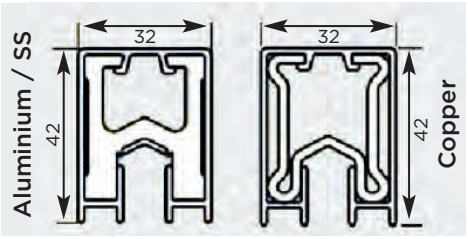
Introduction

'Powerline V' is a high capacity single–pole conductor system distributed exclusively in the UK by SIMBAL Ltd, it is available in intensities from 500 Amp up to 2000 Amp with all sizes available with copper conductors, in addition the 500 / 800 / 1000 Amp systems are also available in aluminium with a stainless steel running strip.

'Powerline V' also provides a solution for applications where high ambient temperatures are present, the standard system is suitable for operating temp–eratures from – 30 up to + 55 deg C, in addition a high temperature version is available which is designed to withstand temperatures up to 115 deg C.

'Powerline V' offers many advantages when compared with other popular conductor systems as follows :

- Finger proof insulation preventing accidental contact with live parts
- Quick & easy installation
- Compact cross section all sizes from 500 to 2000Amp in same section
- 500, 800 & 1000 Amps – Aluminium / Stainless steel conductor
- 500, 800, 1000, 1250 & 2000 Amps – Copper conductor
- 4.50m standard bar length
- Horizontal or Vertical installation
- Joint cover provides total protection of joints
- Enclosed wiring connections on collectors for safe, simple installation
- No expansion joints on systems up to 200m

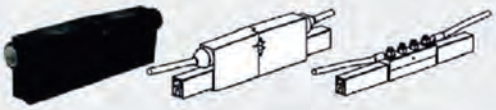


Profile cross section (same for all intensities 500–2000 Amps)

Current Collectors

500A Collector (2x 250A)

250A Collector



Power feed cover & assembly

Joint cover

Conductor joint

Hanger clamp with insulator

Hanger clamp

Collector bracket

Web bracket

End cover / assembly

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'Powerline V' – Technical Data

Conductor Bar System	Aluminium / Stainless Steel				Copper				
Type	VA–500	VA–800	VA–1000	VA–1250	VC–500	VC–800	VC–1000	VC–1250	VC–2000
Nominal current (A) at 100% Duty and 35° C	500	800	1000	1250	500	800	1000	1250	2000
DC resistance (Ω/M) at +35° C	0.000097	0.000074	0.000051	0.000028	0.000104	0.000057	0.000033	0.000022	0.000011
Impedence (Ω/M) at 80mm bar spacing and at +35° C	0.000157	0.000144	0.000137	0.000099	0.000161	0.000136	0.000127	0.000094	0.000061
Voltage grade (V)	600								
Support spacing (mm)	1125								
Bar length (mm)	4500								
Outside dimensions (mm)	42 x 32								
Permissible ambient temperature	–30°C + 55°C (standard insulation) –30°C + 85°C (high temperature insulation)								

Current Capacity Factors for different ambient temperatures

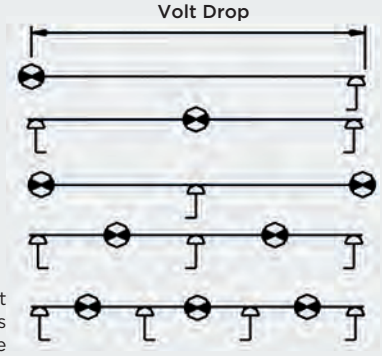
Ambient temperature			35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C	75°C	80°C	85°C
Standard Insulation	Aluminium Rail	fA	1.0	0.92	0.81	0.76	0.68						
	Copper Rail		1.0	0.93	0.87	0.82	0.78						
High Temperature Insulation	Aluminium Rail	fA					1.0	0.92	0.81	0.76	0.68	0.63	0.59
	Copper Rail						1.0	0.93	0.87	0.82	0.78	0.74	0.72

Intermittent Conductor Rating

	% Rating			
	100%	80%	60%	40%
Allowable Current (AMPS)	500	555	645	780
	800	888	1032	1264
	1000	1110	1290	1590
	1250	1380	1612	2038

Effects of various power feed positions on volt drop calculations

Selection of feed–in points. The feed–in point for every application must be selected because the length L between power feed and conductor rail end is used for calculating the voltage drop. Following feed–in points can normally be used.

Powerfeed Position	Schematic Diagram Collector symbol indicates positions of Maximum Volt Drop	Effective length to be used in Volt Drop Calculations
Endfeed		LVD = L
Centre feed		$LVD = \frac{L}{2}$
Two end feed		$LVD = \frac{L}{4}$
Two feeds both in from end		$LVD = \frac{L}{6}$
$\frac{L}{10}$ in from ends and centre		$LVD = \frac{L}{10}$

Voltage Drop

The allowable volt drop determines the allowable resistance of conductor. The value of volt drop within a conductor system is effected by effective length of system and current drawn.

Voltage Drop Calculation

For AC Machine 3 phase

Δ U Volt drop = length (D) x Impedance (Z) x Current (I) x $3\sqrt{}$

$$U\% = \frac{\Delta U}{Un} \times 100\ (\%)$$

Typical assembly of system