

Safetrack 3

SHROUDED CONDUCTORS

VOLTAGE DROP CALCULATIONS

Shrouded Conductor System For Cranes / Hoist

Electric Trolleys/ Material Handlings Equipments

VOLTAGE DROP

A.C

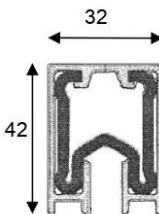
$$V_d = \sqrt{3} \cdot l \cdot I_{total} \cdot Z_{ac}$$



D.C

$$V_d = 2 \cdot l \cdot I_{total} \cdot R_{dc}$$

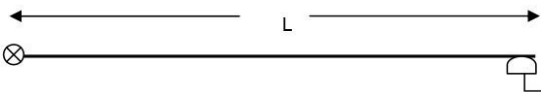
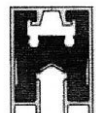

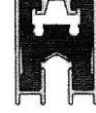
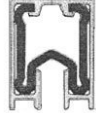
32

42



V_d = Voltage Drop in Volts
 I_{total} = Total Current in Amps
 Z_{ac} = Impedence in Ohms/Mtr
 R_{dc} = Resistance in Ohms/Mtr
 l = Effective Length in Mtrs
 L = System length in Mtrs
 = Power Feed
 = Collector

CONDUCTOR			500A	800A	1000A	500A	800A	1000A		
Material			Aluminium/SS			Copper				
Impedence	Ohms/M	+35 °C	.000158	.000145	.000138	.000162	.000138	.000128		
DC Resistance	Ohms/M	+35 °C	.000098	.000075	.000052	.000105	.000058	.000035		

Power Feed Position ⊗	Schematic Diagram . Collector Symbol Indicates Position Of Maximum Voltage Drop	Effective Length l for voltage drop calculation
End Feed		$l = L$
For two cranes ; total current assumed 900A With 1000A Aluminium Busbar Bay length 245Mtrs	$V_d = \sqrt{3} \cdot l \cdot I_{total} \cdot Z_{ac}$ $= 1.73 \cdot 245 \cdot 900 \cdot .000138$ $= 52.6 \text{ Volts drop}$	
For two cranes ; total current assumed 900A With 1000A copper busbar Bay Length 245Mtrs	$V_d = \sqrt{3} \cdot l \cdot I_{total} \cdot Z_{ac}$ $= 1.73 \cdot 245 \cdot 900 \cdot .000128$ $= 48.8 \text{ Volts drop}$	
For one crane ; total current assumed 1000A With 1000A Aluminium Busbar Bay length 250Mtrs	$V_d = \sqrt{3} \cdot l \cdot I_{total} \cdot Z_{ac}$ $= 1.73 \cdot 250 \cdot 1000 \cdot .000138$ $= 59.7 \text{ Volts drop}$	
For one crane ; total current assumed 1000A With 1000A copper busbar Bay Length 250Mtrs	$V_d = \sqrt{3} \cdot l \cdot I_{total} \cdot Z_{ac}$ $= 1.73 \cdot 250 \cdot 1000 \cdot .000128$ $= 55.4 \text{ Volts drop}$	

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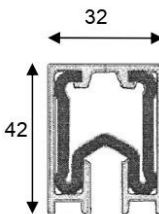
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D.C

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32

42



V_d

=

Voltage Drop in Volts

I_{total}

=

Total Current in Amps

Z_{ac}

=

Impedence in Ohms/Mtr

R_{dc}

=

Resistance in Ohms/Mtr

l


=

Effective Length in Mtrs

L


=

System length in Mtrs



=

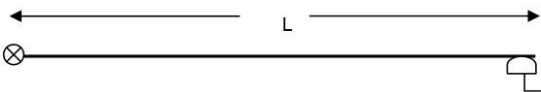
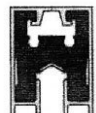

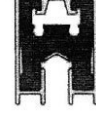
Power Feed



=

Collector

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