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Voltage Drop Calculation

Customer Information
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Conditions

Equipment:	1 – Solar Edge SE11400A-US inverter - 47.5a maximum continuous output current
	1 – Solar Edge SE5000A-US inverter - 21a maximum continuous output current
	Total maximum continuous output current = 68.5
Trench Length:	490’
Total one way circuit length:	520’
Selected conductor:	Aluminum 350 Kcmil

Calculation
VD = 2 x K x I x Q x D/CM

“VD” = Voltage Drop

“K” = 21.2 (Aluminum)

“I” = Amperage = 68.5a (The load in amperes at 100 percent, not 125 percent for motors or continuous loads)

“Q” = Alternating Current Adjustment Factor: Alternating current circuits **No. 2/0 and larger** must be adjusted for the effects of self-induction (skin effect). The "Q" adjustment factor is determined by dividing alternating current resistance as listed in NEC Chapter 9, Table 9, by the direct current resistance as listed in Chapter 9, Table 8.
350kcmil AC Resistance = 0.061 350kcmil DC Resistance = 0.0605 0.061/0.0605 = 1.0082644

“D” = Distance = 520’

“CM” = Circular-Mils = (2014 NEC Chapter 9, Table 8.) 350 Kcmil = 350,000

VD = (2 x 21.2 x 68.5a x 1.0082644 x 520’) / 350,000
VD = 4.35v

4.35v / 240 = 0.018
0.018 x 100% = **1.8%**

Result
One conductor per phase utilizing a 350 Kcmil Aluminum conductor will limit voltage drop to 1.8% or less when supplying 68.5 amps for 520 feet on a 240 volt 1 phase system.

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