Wire Sizing - Example Problem

Consider an array of 33 Sharp NT175U1 modules, three parallel strings of 11. Use the NEC tables to answer the following questions. (Isc = 5.40A)

1.What is the Continuous Current for each string of the array?

2.Each string is connected through an fused combiner box. What is the over current device rating for each string?

3.What is the required ampacity at 30C for each string?

4.We want to use USE02 conductors in these circuits. What is the temperature derating factor if the expected temperature is 135F? What is the conduit fill derating factor?

5. Using NEC tables, select a conductor size.

6.Derate the conductor you selected based on the derating factors above. What is the derated amapacity?

7.Is the derated ampacity greater than the Continous Current ? If yes, move ahead, if no, repeat steps 5,6,7

8. Is the derated ampacity greater than the over current protection device rating? If yes, move ahead, if no, repeat steps 5,6,7,8.

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9. The combiner box terminals are rated at 75C not 90C. What is the ampacity at 30C of the combiner box terminals?

10. Are the combiner box terminals acceptable for this application?

11. The combiner box is outside but not in direct sunlight. The expected temperature is 40C. Is this acceptable?