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NABCEP – What you need to know

- Series vs. Parallel

Learning Objectives

- An understanding of series connections vs. parallel connections
- How to use with sample NABCEP Problems

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Series vs. Parallel

Memorize the Rule…

In Series:
Volts ↑ (increase)
Amps = (stay the same)

In Parallel:
Volts = (stay the same)
Amps ↑ (increase)

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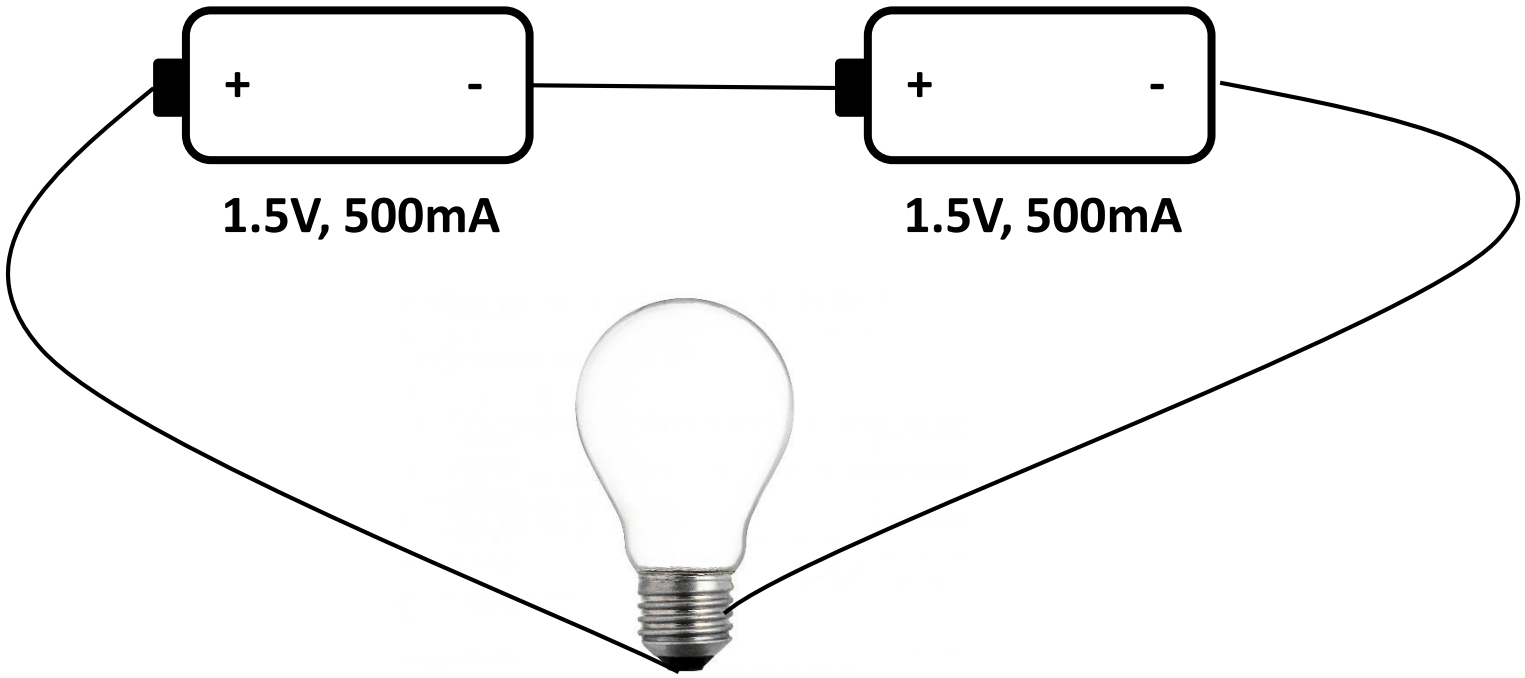
Series vs. Parallel

Let's see it in action:

Batteries in Series



Circuit:

3V

500mA

AC vs. DC considerations:

Do not Setup AC circuits in series – as they must remain a constant voltage.

Connected from negative to positive

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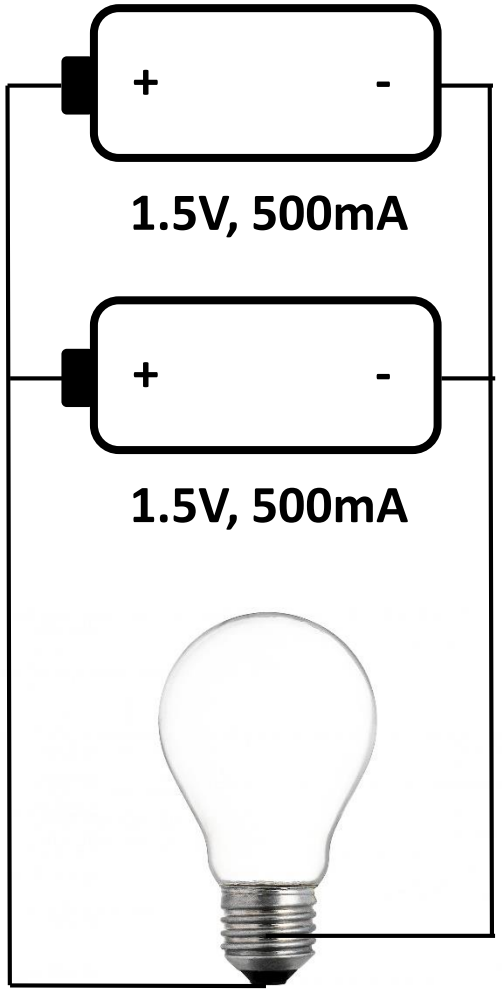
Let's see it in action:

Batteries in Parallel



AC vs. DC considerations:

AC circuits are typically run in parallel (and are called branch circuits).

Circuit:

1.5V

1000mA (or 1A)

Connect all positives and all negatives to load

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PHOTOVOLTAICS: DESIGN AND INSTALLATION MANUAL

Exercise B: DESIGN A 24V SYSTEM WITH FOUR 12V PV MODULES

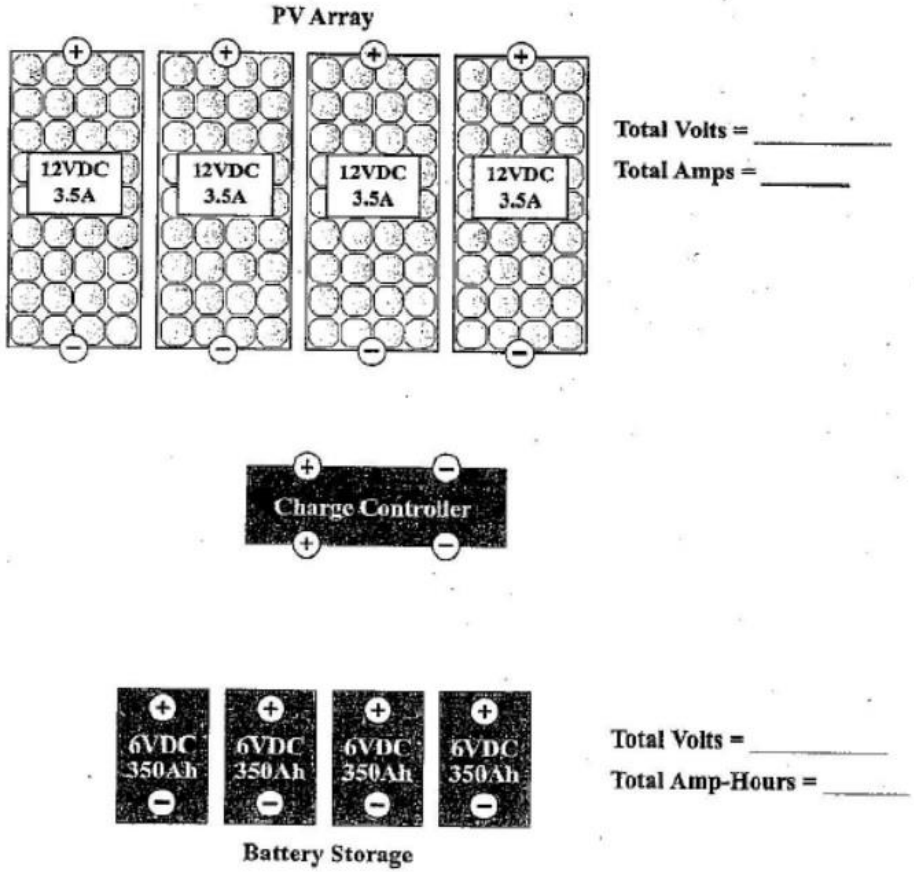

Image from Photovoltaics: Design and Installation Manual, by SEI

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Answer B: 24V SYSTEM WITH FOUR 12V PV MODULES

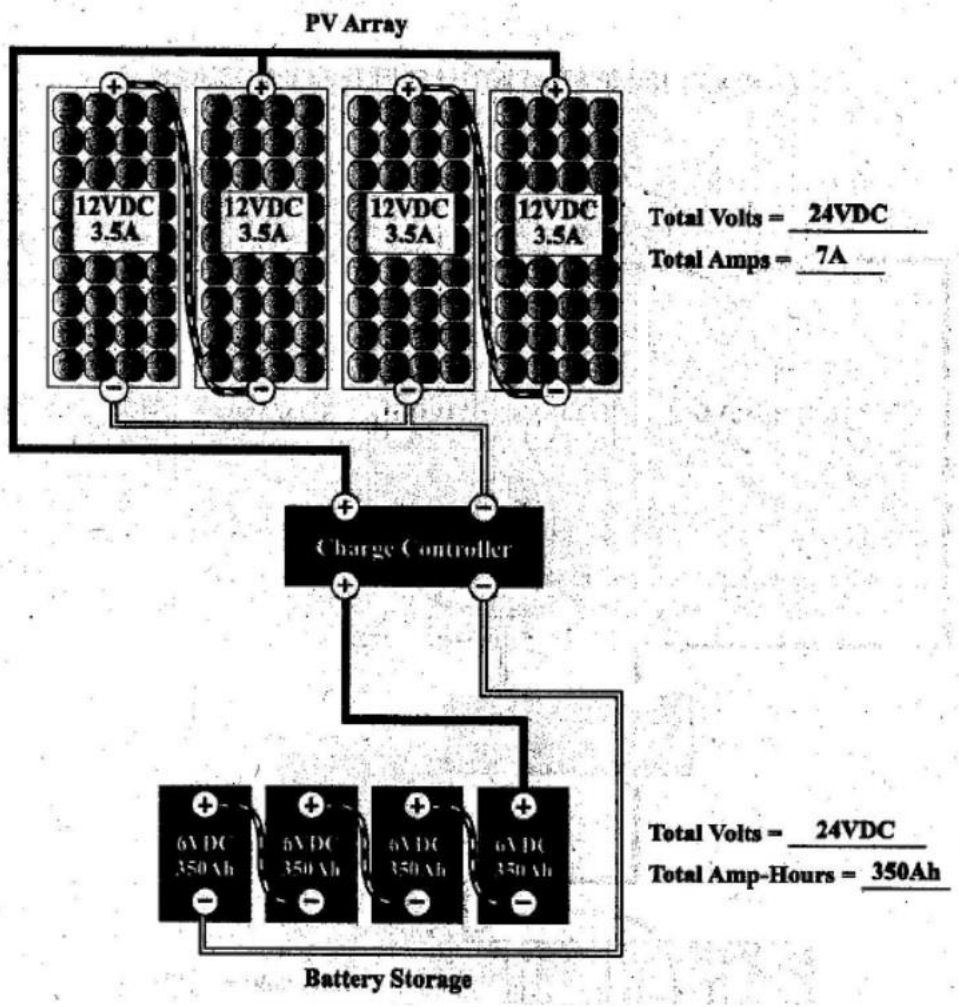

Image from Photovoltaics: Design and Installation Manual, by SEI

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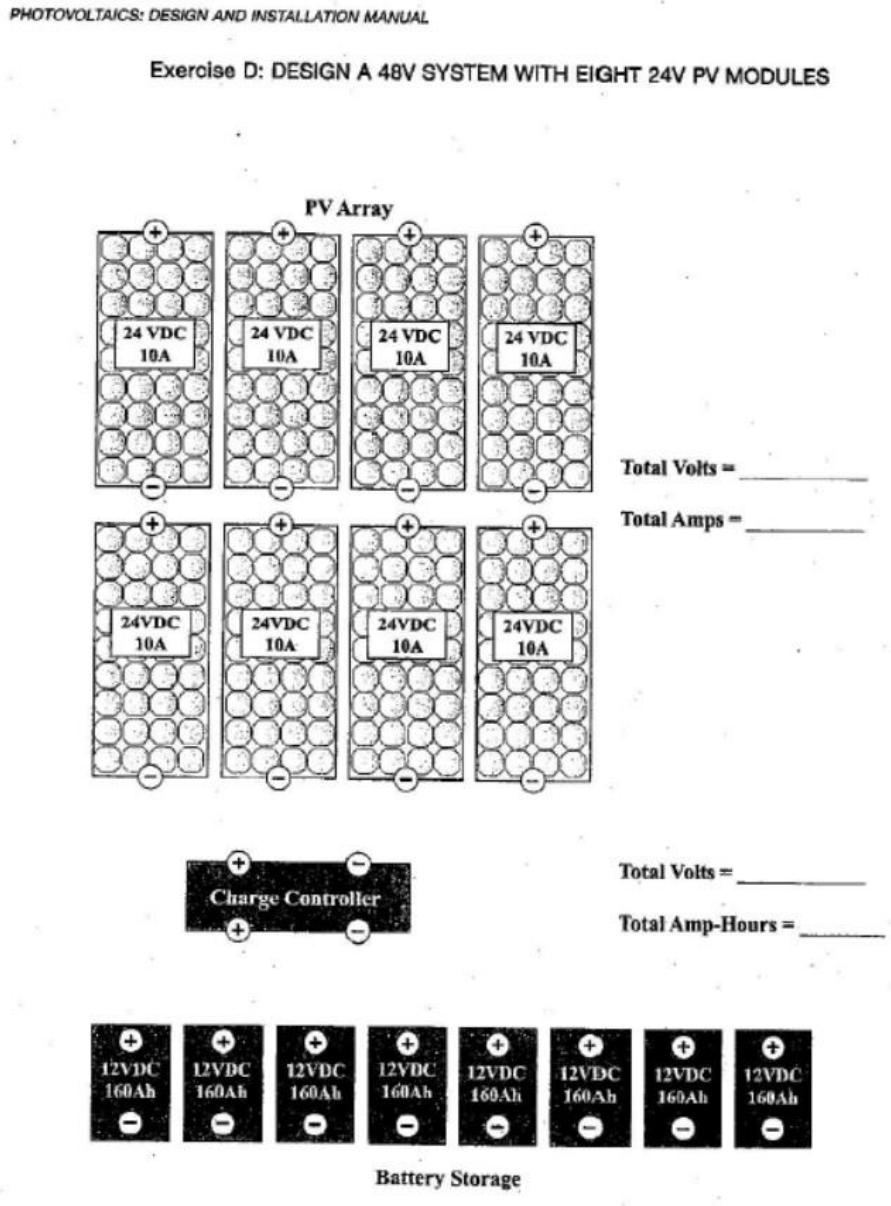

Image from Photovoltaics: Design and Installation Manual, by SEI

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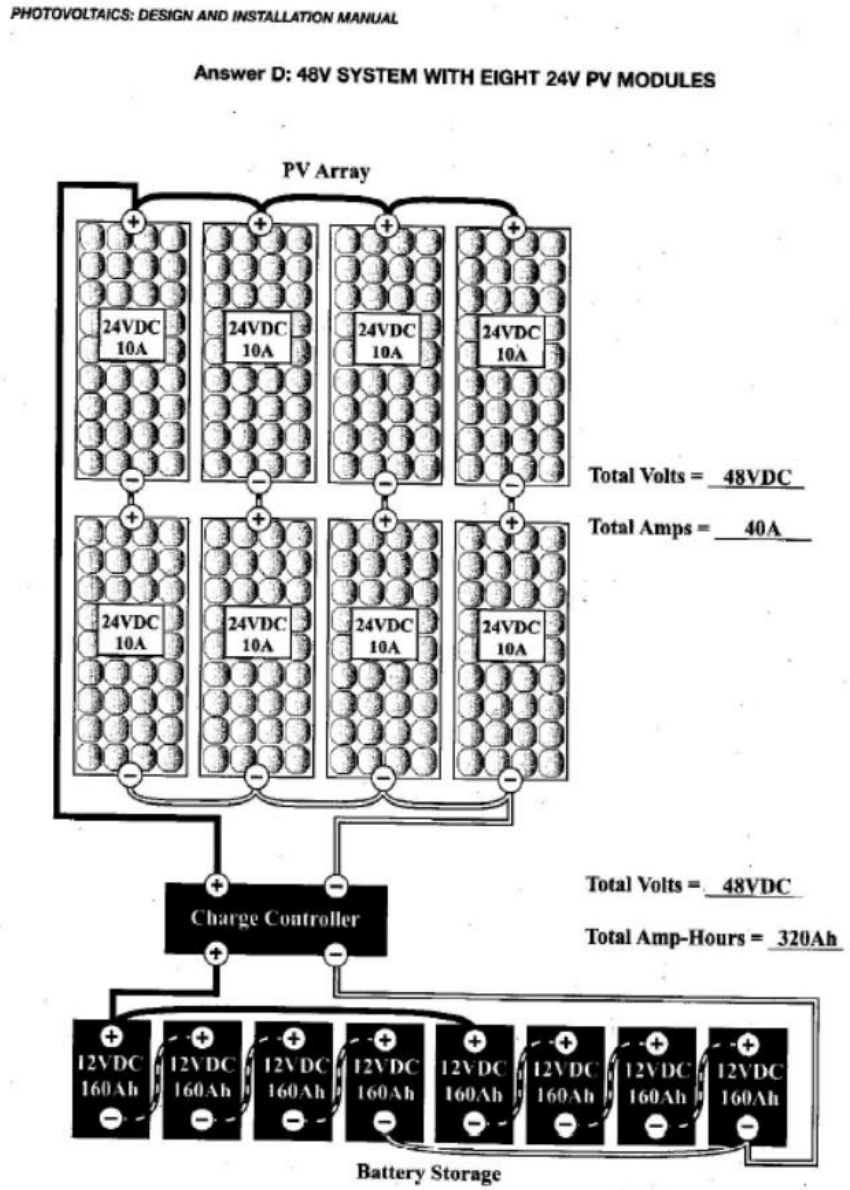

Image from Photovoltaics: Design and Installation Manual, by SEI

SAMPLE NABCEP TYPE QUESTION

Q: There are 24 300W modules in a system. We can not exceed the 600V residential maximum for this string system. The specs of the modules are 40V VOC and 7A ISC. How should we design the system?

A: 2 strings of 12 modules. 40V x 12 modules = 480V, 7A x 2 strings = 14A.

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Thank You

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