



Charge Controllers

PV systems that have a battery bank use a charge controller to control battery charging and discharging. There are several different types of charge controllers available for use in a PV system. Having knowledge of the operating principles and features of various charge controllers helps a PV installer choose the correct type and size charge controller for the PV system being installed. This chapter takes a detailed look at common types of charge controllers and their operating principles. A discussion of charge controller features and how to select a charge controller is also included.

Glossary of Terms

algorithm A series of functions programmed into a charge controller so that the controller optimizes system performance during various levels of battery discharging and charging.

charge resumption set point (CRSP) The voltage level setting of a charge controller that results in a charging current being supplied to the batteries.

charge termination set point (CTSP) The voltage level setting of a charge controller that results in the battery charging current being stopped.

low voltage disconnect (LVD) The amount of voltage set on a charge controller that, when reached, causes system loads to be disconnected to prevent battery over-discharging.

maximum power point tracking (MPPT) A charge controller type that is micro-processor controlled to regulate battery charging and to continuously adjust the PV system array operation at its maximum power point even as operating conditions change.

pulse-width modulation A way to simulate a waveform by switching an electronic device ON and OFF at a high rate of speed for variable lengths of time.

PV output circuit The circuit conductors between the PV source circuits (the PV array) and the DC utilization equipment.

self-regulating PV system A PV system that has batteries but no charge controller.

Objectives

Upon completion of this chapter, the student should be able to

- ▶ Demonstrate an understanding of charge controller operating principles.
- ▶ Identify different types of charge controllers.
- ▶ Demonstrate an understanding of common charge controller features.
- ▶ Demonstrate an understanding of how to select a charge controller