

ARTICLE 690

SOLAR PHOTOVOLTAIC (PV) SYSTEMS

Introduction to Article 690—Solar Photovoltaic (PV) Systems

You have seen, or maybe own, devices powered by photovoltaic cells such as night lights, car coolers, and toys. These generally consist of a small solar module powering a small device running on a few volts and a fraction of an ampere. A solar PV system that powers a building or interconnects with an electric utility operates on the same principals but on a much larger scale.

Solar PV systems that provide electrical power to an electrical system are complex. There are many issues that require expert knowledge in electrical, structural, and architectural issues.

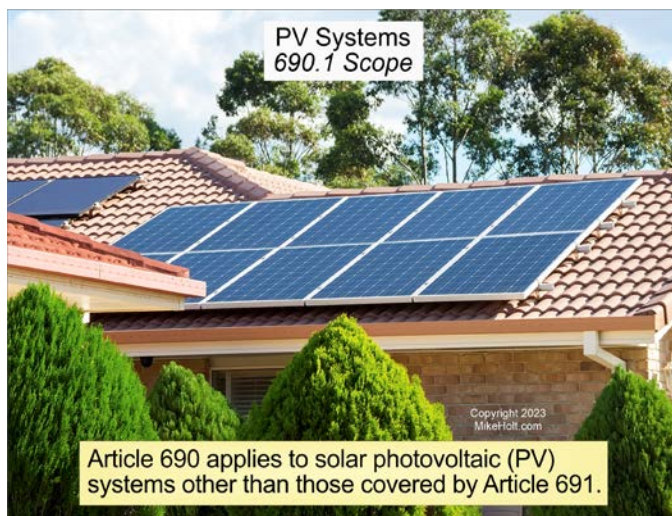
The purpose of the *NEC* is to safeguard persons and property from the hazards arising from the use of electricity [90.2(C)]. Article 690 is focused on the electrical hazards that may arise from installing and operating a PV system. It consists of eight parts.

The general *Code* requirements of Chapters 1 through 4 also apply to these installations, except as specifically modified by this article [90.3].

Part I. General

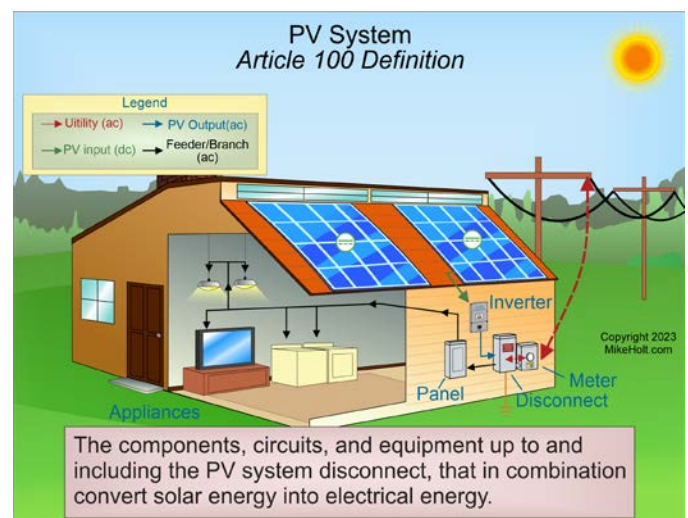
690.1 Scope

The requirements contained in Article 690 apply to solar photovoltaic (PV) systems other than those covered by Article 691. ▶Figure 690-1



▶Figure 690-1

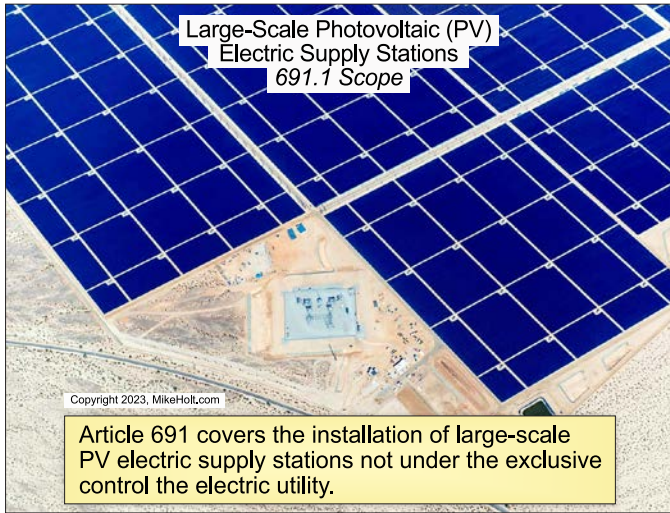
According to Article 100, a “Photovoltaic (PV) System” is the combination of components, circuits, and equipment up to and including the PV system disconnect, that converts solar energy into electrical energy. ▶Figure 690-2



▶Figure 690-2

Note 1: See *NEC* Figure 690.1.

Note 2: Article 691 covers the installation of large-scale PV electric supply stations with an inverter generating capacity of 5000 kW and more, and not under the electric utility control. ▶ [Figure 690-3](#)



▶ [Figure 690-3](#)

According to Article 100, the “Inverter Generating Capacity” is equal to the sum of parallel-connected inverter maximum continuous output power at 40C in watts, kilowatts, volt-amperes, or kilovolt-amperes.

Author’s Comment:

- ▶ Large-scale PV supply stations have specific design and safety features unique to these facilities and are for the sole purpose of providing electric supply to a system operated by a regulated electric utility.