



Issue Date:	June 2024
Code/Section:	2017 NEC 705.12, 2020 NEC 705.13, 2023 NEC 705.13
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Issue: Can a PCS be used to protect the equipment and conductors in lieu of NEC 705.12?

2017 NEC Section 705.12 provides options for how a solar PV system is connected to the electrical distribution system and the associated loads served. NEC 705.12 includes restrictions or limits on the size of the solar PV connection based upon the limits of the bus and conductor ampacities of the electrical distribution it is being connected to, in order to prevent the current from exceeding the respective ampacities of the conductors or equipment.

2017 NEC 705.12 results in either:

1. a limit in the size of the solar PV system that can be connected to an existing electrical service, subpanel, etc. – or –
2. the existing service, subpanel, etc. being replaced by a larger service or subpanel – or –
3. the main overcurrent device of the service or subpanel being derated.

A Power Control System (PCS) is a listed electrical product that monitors the current on equipment and conductors and controls the output of power production equipment, such as Solar Photovoltaic Systems (PV), and/or Energy Storage Systems (ESS), to prevent the overloading of the monitored equipment and conductors.

Use of a listed PCS allows a larger solar PV system to be installed to serve more of the loads at the property while at the same time not requiring the service to be replaced.

Interpretation: Yes.

The intent of 2017 NEC 705.12 is to limit the current applied to equipment and conductors by power production equipment and/or energy storage systems to prevent overloading and is based on the current being considered the maximum current that the source can produce, since there are no monitoring or controls.

The 2020 NEC added a new section 705.13 for Power Control Systems (PCS). 2023 NEC revised this section to refer to Energy Management Systems (EMS) and notes that a listed PCS is a type of EMS. A PCS is permitted to limit the current and loading on the busbars and conductors supplied by one or more interconnected electric power production or energy storage sources to prevent overloading. Since the installation of a listed Power Control System (PCS) to monitor and control the current, in accordance with Section 705.13 in either 2020 NEC or 2023 NEC, prevents the overloading of equipment and conductors; it meets the intent of 705.12.

The code reads:

2020 NEC 705.13 Power Control Systems.

A power control system (PCS) shall be listed and evaluated to control the output of one or more power production sources, energy storage systems (ESS), and other equipment. The PCS shall limit current and loading on the busbars and conductors supplied by the PCS. For the circuits connected to a PCS, the PCS shall limit the current to the ampacity of the conductors or the ratings of the busbars to which it is connected in accordance with 705.13(A) through (E).

- ❖ The use of a power control system that involves monitoring and control of all the individual sources can prevent the feeder or busbar from being overloaded while making efficient use of the variable resources.

2020 NEC 705.13(A) Monitoring.

The PCS controller shall monitor all currents within the PCS. Any busbar or conductor on the load side of the service disconnecting means that is not monitored by the PCS shall comply with 705.12. Where the PCS is connected in accordance with 705.11, the PCS shall monitor the service conductors and prevent overload of these conductors.

2020 NEC 705.13(B) Settings.

The sum of all PCS-controlled currents plus all monitored currents from other sources of supply shall not exceed the ampacity of any busbar or conductor supplied by the power production sources. Where the PCS is connected to an overcurrent device protecting any busbar or conductor not monitored by the PCS, the setting of the PCS controller shall be set within the ratings of that overcurrent device.

2020 NEC 705.13(C) Overcurrent Protection.

The PCS shall provide overcurrent protection either by overcurrent devices or by the PCS including the functionality as an overcurrent device in the product listing.

Informational Note: Some PCS are listed to provide overcurrent protection.

2020 NEC 705.13(D) Single Power Source Rating.

The rating of the overcurrent device for any single power source controlled by the PCS shall not exceed the rating of the busbar or the ampacity of the conductors to which it is connected.

2020 NEC 705.13(E) Access to Settings.

The access to settings of the PCS shall be restricted to qualified personnel in accordance with the requirements of 240.6(C).

2023 NEC 705.13 Energy Management Systems (EMS).

An EMS in accordance with 750.30 shall be permitted to limit current and loading on the busbars and conductors supplied by the output of one or more interconnected electric power production or energy storage sources.