

675.11 Collector Rings.

(A) Transmitting Current for Power Purposes. Collector rings shall have a current rating not less than 125 percent of the full-load current of the largest device served plus the full-load current of all other devices served, or as determined from 675.7(A) or 675.22(A).

(B) Control and Signal Purposes. Collector rings for control and signal purposes shall have a current rating not less than 125 percent of the full-load current of the largest device served plus the full-load current of all other devices served.

(C) Grounding. The collector ring used for grounding shall have a current rating not less than that sized in accordance with 675.11(A).

(D) Protection. Collector rings shall be protected from the expected environment and from accidental contact by means of a suitable enclosure.

Δ 675.12 Grounding. The following equipment shall be grounded:

- (1) All electrical equipment on the irrigation machine
- (2) All electrical equipment associated with the irrigation machine
- (3) Metal junction boxes and enclosures
- (4) Control panels or control equipment that supplies or controls electrical equipment to the irrigation machine

Exception: Grounding shall not be required on machines where all of the following provisions are met:

- (1) *The machine is electrically controlled but not electrically driven.*
- (2) *The control voltage is 30 volts or less.*
- (3) *The control or signal circuits are current limited as specified in Chapter 9, Tables 11(A) and 11(B).*

675.13 Methods of Grounding. Machines that require grounding shall have a non-current-carrying equipment grounding conductor provided as an integral part of each cord, cable, or raceway. This equipment grounding conductor shall be sized not less than the largest supply conductor in each cord, cable, or raceway. Feeder circuits supplying power to irrigation machines shall have an equipment grounding conductor sized according to Table 250.122.

675.14 Bonding. Where electrical grounding is required on an irrigation machine, the metallic structure of the machine, metallic conduit, or metallic sheath of cable shall be connected to the equipment grounding conductor. Metal-to-metal contact with a part that is connected to the equipment grounding conductor and the non-current-carrying parts of the machine shall be considered as an acceptable bonding path.

675.15 Lightning Protection. If an irrigation machine has a stationary point, a grounding electrode system in accordance with Article 250, Part III, shall be connected to the machine at the stationary point for lightning protection.

If the electrical power supply to irrigation machine equipment is a service, the requirements of Article 250 for grounding the system and equipment are applicable. Due to the physical location of irrigation equipment, the most likely grounding electrode is a driven ground rod or ground plate. Where lightning protection is installed, NFPA 780, *Standard for the Installation of Lightning Protection Systems*, requires an electrode for that system. In accordance with 250.60, a common electrode is not permitted to serve the dual function of grounding the electric service and grounding the lightning protection system. However, the separate electrode systems are required to be bonded together but separated from each other in accordance with NFPA 780.

675.16 Energy from More Than One Source. Equipment within an enclosure receiving electric energy from more than one source shall not be required to have a disconnecting means for the additional source if its voltage is 30 volts or less and it meets the requirements of Part II of Article 725.

675.17 Connectors. External plugs and connectors on the equipment shall be of the weatherproof type.

Unless provided solely for the connection of circuits meeting the requirements of Part II of Article 725, external plugs and connectors shall be constructed as specified in 250.124(A).

Part II. Center Pivot Irrigation Machines

675.21 General. Part II covers additional special requirements that are peculiar to center pivot irrigation machines. Article 100 for the definition of *Center Pivot Irrigation Machine*.

675.22 Equivalent Current Ratings. To establish ratings of controllers, disconnecting means, conductors, and the like, for the inherent intermittent duty of center pivot irrigation machines, the determinations in 675.22(A) and (B) shall be used.

(A) Continuous-Current Rating. The equivalent continuous-current rating for the selection of branch-circuit conductors and branch-circuit devices shall be equal to 125 percent of the motor nameplate full-load current rating of the largest motor plus 60 percent of the sum of the motor nameplate full-load current ratings of all remaining motors on the circuit.

(B) Locked-Rotor Current. The equivalent locked-rotor current rating shall be equal to the numerical sum of two times the locked-rotor current of the largest motor plus 80 percent of the sum of the motor nameplate full-load current ratings of all the remaining motors on the circuit.