

any conduit connected to them. If enclosures are not attached to mounting surfaces by means of external ears or lugs, the internal screw heads shall be sealed to prevent seepage of water through mounting holes.

(B) Location. Electrical equipment enclosures on piers shall be located so as not to interfere with mooring lines.

555.32 Circuit Breakers, Switches, Panelboards, and Marina Power Outlets. Circuit breakers and switches installed in gasketed enclosures shall be arranged to permit required manual operation without exposing the interior of the enclosure. All such enclosures shall be arranged with a weep hole to discharge condensation.

555.33 Receptacles. Receptacles shall be mounted not less than 305 mm (12 in.) above the deck surface of the pier and not below the electrical datum plane on a fixed pier.

The location of enclosures for receptacles on fixed and floating piers is based on the *electrical datum plane* as defined in Article 100. For floating piers, the datum plane is 12 inches above the deck of the pier. The purpose of this requirement is to prevent submersion of receptacle enclosures.

The requirements for enclosures in 555.33(A)(1) address their exposure to the severe weather (wind-driven rain) and environmental conditions (splashing from breaking waves or wakes) frequently encountered at marine locations.

(A) Shore Power Receptacles.

(1) Enclosures. Receptacles intended to supply shore power to boats shall be enclosed in listed marina power outlets, enclosures listed for wet locations, or shall be installed in listed enclosures protected from the weather. The integrity of the assembly shall not be affected when the receptacles are in use with any type of booted or nonbooted attachment plug/cap inserted.

(2) Strain Relief. Means shall be provided where necessary to reduce the strain on the plug and receptacle caused by the weight and catenary angle of the shore power cord.

(3) Branch Circuits. Each single receptacle that supplies shore power to boats shall be supplied from a marina power outlet or panelboard by an individual branch circuit of the voltage class and rating corresponding to the rating of the receptacle.

Informational Note: Supplying receptacles at voltages other than the voltages marked on the receptacle may cause overheating or malfunctioning of connected equipment, for example, supplying single-phase, 120/240-volt, 3-wire loads from a 208Y/120-volt, 3-wire source.

The requirement that each single receptacle that supplies shore power to boats be supplied from an individual branch circuit can be met through the use of multiwire branch circuits derived from single-phase, 3-wire systems or from 3-phase, 4-wire systems. Although the ungrounded conductors of a multiwire branch circuit share the same grounded (neutral) conductor, this configuration can be considered multiple branch circuits in accordance

with 210.4(A). If multiwire branch circuits are used, they must be provided with a disconnecting means that simultaneously opens all ungrounded circuit conductors at the point the circuit originates in accordance with 210.4(B). This requirement enhances the safety of those who have to work on a particular receptacle, but it could be inconvenient for boaters due to power to more receptacles being interrupted when the multiwire branch-circuit disconnecting means is opened.

See also

300.13(B) and its commentary regarding device removal for multiwire branch circuits

Δ (4) Ratings. Shore power for boats shall be provided by single receptacles rated not less than 30 amperes.

Informational Note: See NFPA 303-2016, *Fire Protection Standard for Marinas and Boatyards*, for locking- and grounding-type receptacles for auxiliary power to boats.

(a) Receptacles rated 30 amperes and 50 amperes shall be of the locking and grounding type.

Informational Note: See ANSI/NEMA WD 6-2016, *Wiring Devices — Dimensional Specifications*, for various configurations and ratings of locking- and grounding-type receptacles and caps.

(b) Receptacles rated 60 amperes or higher shall be of the pin and sleeve type.

Informational Note: See ANSI/UL 1686, *UL Standard for Safety Pin and Sleeve Configurations*, for various configurations and ratings of pin and sleeve receptacles.

Single locking- and grounding-type receptacles and attachment caps are required for providing shore power to boats. This facilitates proper connections and prevents unintentional disconnection of on-board equipment, such as bilge pumps, refrigerators, and so forth. Exhibit 555.2 illustrates a chart of grounding-type locking plug and receptacle configurations. Exhibit 555.3 shows pin-and-sleeve-type receptacle configurations.

(B) Other Than Shore Power. Receptacles other than those supplying shore power to boats shall be permitted to be enclosed in marina power outlets with the receptacles that provide shore power to boats, provided the receptacles are marked to clearly indicate that the receptacles are not to be used to supply power to boats.

All receptacle configurations and locations covered by 210.8, other than those supplying shore power to boats, are required to be GFCI protected.

(C) Replacement Receptacles. The requirements in 555.33 shall apply to the replacement of marina receptacles.

555.34 Wiring Methods and Installation.

(A) Wiring Methods.

(1) General. Wiring methods of Chapter 3 shall be permitted where identified for use in wet locations and shall contain a wire-type insulated equipment grounding conductor.