

## STANDARD INFORMATION

**Standard:** UL 231

**Standard ID:** Power Outlets [UL 231:2016 Ed.10+R:24Jun2020]

**Previous Standard ID:** Power Outlets [UL 231:2016 Ed.10+R:05Jul2019]

## EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

**Effective Date:** **June 24, 2022**

## IMPACT, OVERVIEW, AND ACTION REQUIRED

**Impact Statement:** Per our accreditation, Intertek is required to review reports against the standard revisions to confirm compliance. Once compliance is confirmed, the standard reference in the report is updated to show continued compliance to the technical requirements of the standard.

### Overview of Changes:

- Update of GFCI requirements for power outlets and introduction of GFPE requirement
- Updates to limit number of service disconnects to one
- Add requirements for the accessibility of live parts on the line side of the service disconnect
- Use of 8 AWG bonding conductors for boatyard and marina applications
- Updated marking requirements for marina power outlets

Specific details of new/revise requirements are found in table below.

***Current Listings Not Active? – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records. We will do this at no charge as long as Intertek is notified in writing prior to the review of your reports.***



## STANDARD INFORMATION

CLAUSE	VERDICT	COMMENT
		<i>Additions to existing requirements are <u>underlined</u> and deletions are shown lined out below.</i>
8	Info	<b>Receptacles</b>
		<b>Required receptacle patterns</b>
Table 8.1		Footnote c and f have been added to other power outlet types. Footnote h has been modified to reflect the changes to NEC 2020. See standard for details.
		<b><i>New section added;</i></b>
8.5		<b>Ground-fault circuit protection (GFCI) for personnel and ground-fault protection of equipment (GFPE)</b>
8.5.1		Unless modified by provisions in 8.5.3 – 8.5.7, all 125-volts through 250-volt receptacles intended to be supplied by a circuit rated 150 volts or less to ground and provided in a power outlet or fitting shall be provided with ground-fault circuit protection (GFCI) for personnel that complies with the Standard for Ground-Fault Circuit-Interrupters, UL 943. See markings in 35.57 – 35.60.  Exception: Receptacles of the TT-30R pattern may omit ground-fault protection if marked as specified in 35.77.
8.5.3		Power outlets or fittings marked for use as temporary site service equipment may omit GFCI protection for receptacles rated other than 125-volt, single-phase, 15-, 20-, and 30-amperes. Power outlets or fittings without GFCI protection on all receptacles shall be marked as specified in 35.75.
8.5.4		Power outlets or fittings marked for use in recreational vehicle site applications may omit GFCI protection for personnel for receptacles other than receptacles rated 125-volt, 15- and 20-amperes.
8.5.5		Power outlets or fittings marked for use as mobile home service equipment may omit GFCI protection for personnel for receptacles other than receptacles rated 125- volt, 15- and 20-amperes.
8.5.6		Power outlets or fittings marked for use in marina and boatyard applications may omit GFCI protection for receptacles providing shore power to boats.



CLAUSE	VERDICT	COMMENT
8.5.7		<p>Power outlet or fittings marked for use in marina and boatyard applications shall be provided with GFCI protection for personnel on receptacles not intended to provide shore power to boats as follows:</p> <p>a) All non-shore power receptacles rated 125-volt through 250-volt, intended to be supplied by a single-phase circuit rated 150 volts or less to ground and 50 amperes or less; and</p> <p>b) All non-shore power receptacles intended to be supplied by three-phase circuits rated 150 volts or less to ground and 100 amperes or less.</p> <p>Receptacles not intended to provide shore power to boats shall be marked in accordance with 35.79.</p>
8.5.8		<p>Receptacles on power outlets or fittings marked for use in marina and boatyard applications shall be provided with ground-fault protection of equipment (GFPE) that complies with the Standard for Ground- Fault Sensing and Relaying Equipment, UL 1053. Each receptacle shall be protected by a GFPE set to open at currents not exceeding 30 milliamperes.</p>
11	Info	<b>Service Equipment Use</b>
11.1	Info	<b>General</b>
		<i><b>New clause added;</b></i>
11.1.3		<p>Power outlets marked for a service application shall be constructed such that, with the service disconnect in the off position, no ungrounded uninsulated live part is exposed to inadvertent contact by persons while servicing any field connected load terminal, including a neutral load terminal, a branch circuit equipment grounding terminal, or the neutral disconnect link. Exposure to inadvertent contact is determined by use of the probe illustrated in Figure 11.1. If restriction to the line-side of the service disconnect is dependent on the installation of field installed service conductors, conductors sized in accordance with 10.1 shall be installed in the terminals when determining exposure to inadvertent contact. All live parts of the line side service terminal, including the connector body and pressure screw, shall be evaluated.</p>
		<i><b>New figure added;</b></i>
Figure 11.1		<b>Straight Probe</b>
		See standard for details.



CLAUSE	VERDICT	COMMENT
11.1.4		<p><b><i>New clause added;</i></b></p> <p>Metal barriers provided to limit exposure to inadvertent contact shall:</p> <p>a) Have a thickness not less than 0.032 inch (0.81 mm) if uncoated, not less than 0.034 inch (0.86 mm) if galvanized, and not less than 0.050 inch (1.27 mm) if aluminum.</p> <p>b) Be constructed so that it can be readily removed or repositioned, and then reinstalled, without the likelihood of contacting bare live parts or damage the insulation of any insulated live part.</p> <p>Exception: Factory installed barriers that limit access to factory installed wiring and terminations are not required to be constructed so that they can be removed or repositioned.</p>
11.1.5		<p><b><i>New clause added;</i></b></p> <p>Nonmetallic barriers provided to limit exposure to inadvertent contact shall:</p> <p>a) Comply with requirements in 15.2 for insulating barriers.</p> <p>b) Be constructed so that it can be readily removed or repositioned, and then reinstalled, to allow access to the terminal for servicing.</p> <p>Exception: Factory installed barriers that limit access to factory installed wiring and terminations are not required to be constructed so that they can be removed or repositioned.</p>
11.1.6		<p><b><i>New clause added;</i></b></p> <p>Power Outlets marked “Suitable for use as service equipment” shall be permitted to provide the protection from inadvertent contact in 11.1.3 in a field installable kit when marked in accordance with 35.26A.</p>
12	Info	<p><b>Disconnecting Means</b></p>
12.1		<p>A power outlet intended and marked for use as service equipment shall be constructed so that all ungrounded load conductors can be disconnected from the source of supply by the operation of not more than <u>one operating handle</u>. <del>when all of the disconnecting means for which space is provided are installed at the factory or in the field. The operation of a handle shall simultaneously disconnect all ungrounded conductors of the circuits controlled by that handle. Markings in accordance with 35.17 – 35.26 shall be provided.</del> <u>one operating handle. The operation of the handle shall simultaneously disconnect all ungrounded conductors of the power outlet. Markings in accordance with 35.17 – 35.26A shall be provided.</u></p>



CLAUSE	VERDICT	COMMENT
14	Info	<b>Overcurrent Protection</b>
14.3		In a power outlet intended for use as service equipment, the overcurrent protection required in 14.1 <del>may</del> <u>shall</u> consist of a main overcurrent device (a fuse or a circuit-breaker pole) in series with each ungrounded service conductor. <del>or no more than six overcurrent devices connected to each ungrounded service conductor and which feed separate loads.</del>
17	Info	<b>Grounding and Bonding</b>
17.9	Info	<b>Bonding means for metallic conduit</b>
17.9.5		The size of a separate component bonding conductor shall not be less than specified in Table 17.2 or less than the size of the conductor supplying the component, whichever is smaller. <u>For power outlets or power outlet fittings marked for marina or boatyard applications, a separate component bonding conductor shall be copper, minimum 8 AWG (8.4 mm<sup>2</sup>), and not less than specified in Table 17.2.</u>  <u>Exception: Other than power outlets or power outlet fittings marked for marina or boatyard applications, the size of the bonding conductor may be reduced if it complies with requirements specified in 19.2.1.</u>
18	Info	<b>Luminaires</b>
18.2		A luminaire supplied by the same source as the power outlet, as shown in Example 1 of Figure 18.1, <del>shall be connected to a circuit breaker or a fused switch that is rated 20 amperes maximum and is suitable for use as a service disconnect. The fuse of the fused switch shall be of the branch circuit type (not a miscellaneous or miniature fuse) and the switch shall be either a pull-out type, a panelboard type, or a molded case type.</del> <u>shall be provided with overcurrent protection as specified in Overcurrent Protection, Section 14.</u>
18.3		For a luminaire supplied by a separate source ifrom the power outlet, as shown in Example 2 of Figure 18.1, the power outlet and the luminaire shall comply with the following:  a) <del>The power outlet and the luminaire shall be separated by a barrier and provided with separation of circuits. Additionally, the marking specified in 35.20 shall also state that the luminaire circuit is not included as part of the service equipment.</del> b) The power outlet shall be marked to specify two ratings and to specify a multiple source warning as specified in 35.4 and 35.11, respectively. c) <u>The luminaire shall be provided with branch circuit type overcurrent protection rated a maximum of 20 amperes as specified in Overcurrent Protection, Section 14. Regarding short circuit ratings, the construction shall comply with 2.1.8.</u>  <u>Exception: The luminaire need not be provided with the overcurrent protection specified if the power outlet is marked as indicated in 35.12 and 35.74.</u>
	Info	<b>MARKINGS</b>



CLAUSE	VERDICT	COMMENT
35	Info	<b>Details</b>
35.23		<p>If provided with the enclosure factory bonded to the neutral, a power outlet shall comply with (a) and (b) and shall be marked: "Suitable only for use as service equipment. Install no more than six main disconnecting means." If provided with an insulated but bondable neutral, a power outlet intended for use as service equipment that could accommodate more than six main disconnects shall comply with (a) and (b) and shall be marked "Suitable for use as service equipment when no more than six main disconnecting means are provided."</p> <p><u>If provided with the enclosure factory bonded to the neutral, a power outlet shall comply with (a) and (b) and shall be marked: "Suitable only for use as service equipment." If provided with an insulated but bondable neutral, a power outlet intended for use as service equipment shall be capable of accommodating no more than one main disconnect.</u></p> <p><b><i>New clause added;</i></b></p>
35.26A		<p>Power outlets marked "Suitable for use as service equipment" and provided with protection from inadvertent contact in a field installable kit, as permitted in 11.1.6, shall be marked "Install Service Barrier Kit, Cat. Number ____" or equivalent.</p> <p><b><i>New clause added;</i></b></p>
35.79		<p>A power outlet or fitting marked for marina and boatyard use and provided with receptacles that are not intended to provide shore power to boats in accordance with 8.5.6 shall be provided with the following marking beside those receptacles not intended to provide shore power to boats: "This Receptacle Not For Use To Supply Power to Boats", or equivalent.</p>
38	Info	<b>Mounting of Marina Type Equipment</b>
38.1		<p>The following, or equivalent, details shall be provided with installation instructions on equipment marked for use in Marina and Boatyard applications: ELECTRICAL CONNECTIONS – All electrical connections shall be located at least 12 inches above the deck of a floating pier. <u>Electrical connections located at least 12 inches above the deck of a floating pier, but below the electrical datum plane for floating piers, shall be rated for submersion.</u> All electrical connections shall be located at least 12 inches above the deck of a fixed pier but not below the electrical datum plane. Refer to National Electrical Code, Article for Marinas, Boatyards, and Commercial and Noncommercial Docking Facilities.</p>