

STANDARD INFORMATION

Standard: ANSI/CAN/UL 2743

Standard ID: Portable Power Packs [ANSI/CAN/UL 2743:2018 Ed.2+R:14Apr2023]

Previous Standard ID: Portable Power Packs [ANSI/CAN/UL 2743:2018 Ed.2+R:30Apr2020]

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **October 4, 2025**

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. Reports not updated to this version by the effective date above will be withdrawn.

Overview of Changes:

- Addition of definition of "portable or moveable"
- Receptacle output not supplied by AC mains
- Double insulated products with functional earthing
- Addition of mass limitation for stability test
- Addition of the induction output and energy hazard measurement test
- Addition of LVLE circuit requirements and test
- Option of single fault condition in control circuit besides functional safety evaluation
- Charging current for Overcharging Test
- Additional requirements for large energy storage systems (ESS)
- Strain relief test for interconnecting cable
- Updates to the Impact Test and Drop Test

Specific details of new/revised 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 – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records.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 | | | | | | | | | | | | | | |
|---|--------------------|--|--------------------------------|--------------------|--|-----|----|----------------------|----|-----|------------------------|----|----|----------------------------|---|------|
| <p>Additions to existing requirements are <u>underlined</u> and deletions are shown lined-out below.</p> | | | | | | | | | | | | | | | | |
| 1 | Info | <p>Scope</p> <p><i>New clause added;</i></p> | | | | | | | | | | | | | | |
| 1.7 | | <p>These requirements do not cover power packs having a capacity exceeding the limits specified in Table 1.1 which are covered by the Standard for Energy Storage Systems and Equipment, UL 9540.</p> <p><i>New table added;</i></p> <p>Portable Power Pack Threshold Quantities</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th rowspan="2" style="width: 60%;">Portable power pack technology</th> <th colspan="2" style="text-align: center;">Aggregate capacity</th> </tr> <tr> <th style="text-align: center;">kWh</th> <th style="text-align: center;">MJ</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Lead-acid, all types</td> <td style="text-align: center;">70</td> <td style="text-align: center;">252</td> </tr> <tr> <td style="text-align: center;">Lithium-ion, all types</td> <td style="text-align: center;">20</td> <td style="text-align: center;">72</td> </tr> <tr> <td style="text-align: center;">Electrochemical Capacitors</td> <td style="text-align: center;">3</td> <td style="text-align: center;">10.8</td> </tr> </tbody> </table> | Portable power pack technology | Aggregate capacity | | kWh | MJ | Lead-acid, all types | 70 | 252 | Lithium-ion, all types | 20 | 72 | Electrochemical Capacitors | 3 | 10.8 |
| Portable power pack technology | Aggregate capacity | | | | | | | | | | | | | | | |
| | kWh | MJ | | | | | | | | | | | | | | |
| Lead-acid, all types | 70 | 252 | | | | | | | | | | | | | | |
| Lithium-ion, all types | 20 | 72 | | | | | | | | | | | | | | |
| Electrochemical Capacitors | 3 | 10.8 | | | | | | | | | | | | | | |
| Table 1.1 | | | | | | | | | | | | | | | | |
| 12 | Info | <p>Output Connections</p> | | | | | | | | | | | | | | |
| 12.1 | Info | <p>General</p> <p><i>New clause added;</i></p> | | | | | | | | | | | | | | |
| 12.1.3 | | <p>If two or more bare parts (one of which may be earthed) of an output can be accessed and bridged by the test probe as illustrated in Figure 7.1 in a straight position without appreciable force, the maximum available power from the output shall not be more than 240 VA. Compliance shall be confirmed by the Energy Hazard Measurement Test, Section 47A.</p> | | | | | | | | | | | | | | |
| 12.3 | Info | <p>Receptacles</p> | | | | | | | | | | | | | | |
| 12.3.1 | | <p>Receptacles provided as an output on power packs shall be of a NEMA type receptacle that is in accordance with the Standard for Attachment Plugs and Receptacles, UL 498, and General Use Receptacles, Attachment Plugs and Similar Wiring Devices, CSA C22.2 No. 42. <u>Each AC output power circuit shall be provided with overcurrent protection for all ungrounded conductors in accordance with Section 31, Output Alternating Current Power Circuits, of the Standard for Power Units Other Than Class 2, UL 1012.</u> Except as indicated in 12.3.1A, receptacles shall be rated 120 Vac, 15 A maximum, and shall consist of a double blade, ungrounded configuration.</p> | | | | | | | | | | | | | | |



| CLAUSE | VERDICT | COMMENT |
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| | | <i>New clause added;</i> |
| | | Polarized receptacles rated 120 Vac, 30 A maximum, and that consist of a grounding configuration may be acceptable provided the criteria in either (a) or (b) is met: |
| 12.3.1A | | a) The following criteria is met: 1) The polarized receptacles including their ground terminals are isolated from any of the AC mains input circuits by double insulation in accordance with Section 14, Double Insulation Products; and 2) The portable power pack is marked per 70.24 and provided with instructions per 72.3(q). b) The polarized receptacles have GFCI protection for portable power pack users on all polarized receptacle outlets. The GFCIs shall be in accordance with the Standard for Ground-Fault Circuit interrupters, UL 943, and shall interrupt the output supply circuit in the event of a ground fault of receptacles. |
| 12.6 | | <i>New section added;</i> Induction power transmitter |
| 12.6.1 | | The induction power transmitter provided as an output on a power pack shall comply with 12.6.2. |
| 12.6.2 | | The maximum power input to any single transmitting coil RF conversion circuit, with or without a single component fault of short or open circuit within power pack, shall not exceed 240 VA when the power pack is tested in accordance with the Energy Hazard Measurement Test, Section 47A. |
| 12A | | <i>New section added;</i> LVLE Circuits See standard for details. |
| 14 | Info | Double Insulated Products |
| 14.2 | | <u>With reference to 14.1, hazardous parts shall be insulated from accessible conductive parts and accessible low voltage circuits by double insulation. The spacing requirement, Dielectric Voltage-Withstand Test, and Leakage Current Test requirements in UL 1097 shall be applied to the system of double insulation instead of the requirements in this Standard.</u> In addition, the system of double insulation shall comply with the requirements in this Standard. |
| 14.4 | | <i>New clause added;</i> If an earthing conductor in the mains supply cord for a power pack is only used for establishing functional earthing, and the power pack is provided with a system of double insulation, then the power pack shall bear the symbol IEC 60417-6092. |



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| | | <i>New clause added;</i> |
| 14.5 | | With reference to 14.4, wiring terminals to be used only for the connection of functional earthing shall be marked with the symbol IEC 60417-5018. These terminals shall not be marked with the symbol IEC 60417-5017, or with the symbol IEC 60417-5019, unless these symbols are provided on a component (for example, a terminal block) or subassembly. |
| | | <i>New clause added;</i> |
| 14.6 | | With reference to 14.4, the power pack inlet, if used, shall comply with the creepage distance and clearance requirements for double insulation or reinforced insulation. |
| 17 | Info | Separation of Circuits |
| | | <i>New clause added;</i> |
| 17.5 | | Hazardous output circuits shall be isolated from DC low-voltage input circuit and DC low-voltage output circuits that may be user accessible by double insulation in accordance with Section 14, Double Insulation Products. |
| 28 | Info | Internal Battery |
| 28.3 | Info | Lithium-ion batteries |
| | | <i>New clause added;</i> |
| 28.3.7 | | A lithium-ion power pack with rated energy larger than 1 kWh shall be subjected to the Thermal Propagation Test in 50.11. |
| | Info | PROTECTION AGAINST INJURY TO PERSONS |
| 32 | Info | General |
| | | <i>New clause added;</i> |
| 32.4 | | Portable power pack with rated capacity larger than 1 kWh shall be marked in accordance with 70.23. |
| | | <i>New section added;</i> |
| 47A | | Energy Hazard Measurement Test |
| | | See standard for details. |
| | | <i>New section added;</i> |
| 47B | | LVLE Circuit Test |
| | | See standard for details. |



| CLAUSE | VERDICT | COMMENT |
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| 50 | Info | Abnormal Operation Tests |
| 50.2 | Info | Output connections short circuit test |
| 50.2.2 | | With reference to 50.2.1, fuses and other protective devices provided as part of the power pack are to remain in the circuit. The output connections of the power pack are to be short-circuited at the connector <u>with a resistance not exceeding 10mΩ</u> and the power pack connected to a source of supply adjusted to its rated voltage. The test is to be continued until the internal protection opens or constant temperatures are obtained. When an automatically reset protector or a manually reset protector ends the test, the test is to be continued as indicated in 50.1.6. |
| 50.9 | Info | Overcharging test |
| 50.9.2 | | The power pack is to be placed on a soft wood surface covered by two layers of tissue paper and one layer of untreated 100 percent cotton medical gauze and charged at a rate of 10 times the manufacturer's recommended rate for the battery for 1.25 hours or at the maximum output that is available from an external source provided with the pack. <u>The battery is to be charged at a rate as described in (a) or (b) for 1.25 hours:</u> a) <u>For a universal charging port, the maximum charging voltage and 3 times the maximum charging current for the power pack, with or without a single fault condition in the charging protection circuit; or</u> b) <u>For a non-universal charging port, the maximum voltage and current output that is available from an external charger or internal charging circuit provided for the battery with or without a single fault condition in the charging protection circuit.</u> |
| 50.11 | | <i>New section added;</i> Thermal propagation test |
| 50.11.1 | | A lithium-ion power pack with rated energy larger than 1 kWh shall be tested in accordance with Single Cell Failure Design Tolerance Test in the Standard for Batteries for Use in Stationary and Motive Auxiliary Power Applications, UL 1973. |
| 50.11.2 | | During the test, external batteries or attachments are to be installed or detached as intended which results in the most severe condition. Batteries are to be fully charged before testing. |
| 50.11.3 | | As a result of testing, there shall be no fire propagating from the DUT or explosion of the DUT. |
| 54 | Info | Strain Relief Test |
| 54.1 | | <i>New section added;</i> Direct-pull strain relief test See standard for details. |



| CLAUSE | VERDICT | COMMENT |
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| 55 | Info | Strength of Enclosure Tests |
| 55.2 | Info | Impact test |
| 55.2.1 | | Two samples of the power pack are to be subjected to the Impact Test. The first sample is to be tested in the as-received condition. The second sample is to be conditioned in a cold chamber at 0°C (32°F), <u>or the minimum operating temperature specified by the manufacturer if lower than 0 °C (32 °F)</u> , for 4 hours. The sample is to be removed from the cold chamber and immediately subjected to the impact described in 55.2.2. During handling of the sample, gloves are to be worn to minimize heat transfer. |
| 55.3 | Info | Drop test |
| 55.3.1 | | Two samples of the power pack are to be subjected to the Drop Test. The first sample is to be tested in the as-received condition. The second sample is to be conditioned in a cold chamber at 0°C (32°F), <u>or the minimum operating temperature specified by the manufacturer if lower than 0 °C (32 °F)</u> , for 4 hours. The sample is to be removed from the cold chamber and immediately subjected to the impact described in 55.3.2. During handling of the sample, gloves are to be worn to minimize heat transfer. Following the test, the power pack shall be in accordance with 55.1.1 (a) – (c). |
| 55.3.2 | | The sample <u>of a portable power pack weighing equal to or less than 18 kg (39.7 pounds)</u> is to be dropped three times from a height of 0.9 m (3 feet) to strike a concrete surface in the positions most likely to produce adverse results. <u>The sample of a movable power pack weighing more than 18 kg (39.7 pounds) is to be dropped one time from a height of 0.9 m (3 feet) to strike a concrete surface in the position most likely to produce adverse results.</u> |
| 60 | Info | Rain Test |
| 60.2 | | Enclosures shall have no <u>wetting of a hazardous voltage or hazardous energy live part</u> nor have entrance of water above the lowest hazardous voltage or hazardous energy live part inside the enclosure at the conclusion of this test. <u>Additionally, the power pack shall comply with the Leakage Current Test, Section 46, at the conclusion of this test.</u> |
| 60.2A | | <i>New clause added;</i> The product may be marked “rainproof” per 69.1 if it complies with 60.2. The product may be marked “raintight” per 69.1 if no water enters the enclosure of the power pack as specified in 60.4. NOTE: In addition to electric shock hazard, wetting of a hazardous energy live circuit of a power pack may result in a fire hazard of a battery. |
| 60.4 | | After the exposure, the outside of the enclosure is to be dried with a towel. <u>A power pack with hazardous voltage circuits shall be subjected to and comply with the Leakage Current Test, Section 46. Finally, the enclosure is to be opened. The product is to be inspected for the presence of water.</u> |



| CLAUSE | VERDICT | COMMENT |
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| 65 | Info | Power Pack Ampacity Test |
| 65.1 | | A lead-acid power pack with a booster function shall be subjected to the Power Pack Ampacity Test for 10 seconds. Lead acid batteries are to be loaded <u>at the maximum discharge current or power specified by the manufacturer to the discharge cutoff voltage</u> of 7.2 volts. For Lithium-Ion powered units with protection circuitry, the Power Pack Ampacity Test is to be conducted for 5 seconds and the battery packs may be <u>loaded at the maximum discharge current or power specified by the manufacturer to the lowest discharge cutoff voltage that the battery pack will allow. The ampacity rating along with the time duration of the ampacity output shall be included in the battery pack's rating.</u> The ampacity is to be recorded for the duration of the test. At the end of the test, the ampacity is to be recorded and this shall be the power pack's ampacity rating. The Power Pack Ampacity Temperature Test, see 47.3, is to be conducted at the same time as the Power Pack Ampacity Test, but note it is continued longer than to obtain the ampacity rating. |
| | Info | MARKINGS |
| 69 | Info | General |
| 69.1 | | A product shall be legibly and permanently marked with the following: c) <u>The electrical rating of voltage, current or power, frequency; for booster output, the maximum ampacity, and the discharge/cranking duration if lithium ion power pack;</u> f) <u>The "Rainproof" or "Raintight" rating for an enclosure for temporary outdoor use or outdoor use products.</u> |
| 70 | Info | Cautionary Markings |
| | | <i>New clause added;</i> |
| 70.23 | | A portable power pack with rated capacity larger than 1 kWh shall be marked "WARNING" and the following or equivalent: "Risk of Fire. This device contains energy higher than 1 kWh. Do not use in a sleeping room or any habitable space of a dwelling unit." |
| | | <i>New clause added;</i> |
| 70.24 | | With reference to 12.3.1A(a)(2), a portable power pack shall be marked with the word "CAUTION" and the following or the equivalent: "Risk of Electric Shock. Never use portable power pack to supply power tools to cut or access live parts or live wirings." |



| CLAUSE | VERDICT | COMMENT |
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| 72 | Info | <p>Instructions Pertaining to Risk of Fire, Electric Shock, or Injury to Persons</p> <p>The instructions pertaining to a risk of fire, electric shock, or injury to persons shall include those items in the following list that are applicable to the product. The statement “IMPORTANT SAFETY INSTRUCTIONS” or the equivalent shall precede the list, and the statement “SAVE THESE INSTRUCTIONS” or the equivalent shall either precede or follow the list. The word “WARNING” shall be entirely in upper case letters or shall be emphasized to distinguish it from the rest of the text.</p> <p>IMPORTANT SAFETY INSTRUCTIONS</p> <p>WARNING – When using this product, basic precautions should always be followed, including the following:</p> <p><u>g) Risk of Electric Shock. Never use power pack to supply power tools to cut or access to live parts or live wirings, or materials that may contain live parts or live wirings inside, such as building walls, etc.</u></p> <p><u>NOTE: Item (g) applies to a portable power pack with construction in accordance with 12.3.1A(a).</u></p> <p>j) WARNING – RISK OF EXPLOSIVE GASES.</p> <p>1) <u>WORKING IN VICINITY OF A LEAD ACID BATTERY IS DANGEROUS. LEAD-ACID BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON, IT IS OF THE UTMOST IMPORTANCE THAT YOU FOLLOW THE INSTRUCTIONS EACH TIME YOU USE (THE BOOSTER FUNCTION OF) THE POWER PACK.</u></p> <p>2) To reduce risk of battery explosion, follow these instructions and those published by battery manufacturer and manufacturer of any equipment you intend to use in vicinity of the battery. Review cautionary marking on these products and on engine.</p> <p><u>NOTE: Item (j) applies to a power pack with a lead-acid battery. However, a power pack with a booster function should include this instruction since the power pack will boost a lead-acid battery in the vehicle.</u></p> <p>p) Attach output cables to a battery and chassis as indicated below. Never allow the output clamps to touch one another.</p> <p><u>3) For a booster cable that has the potential of arcing when connecting or disconnecting the battery terminal, the following or equivalent warning shall be added:</u></p> <p><u>“Always attach the booster output negative jaw to chassis away from battery terminals area after the positive terminal has been connected. Always disconnect the booster output negative jaw from chassis before disconnecting the positive terminal.”</u></p> |
| 72.3 | | |