

STANDARD INFORMATION

Standard: ANSI/CAN/UL 2743

Standard ID: Portable Power Packs [ANSI/CAN/UL 2743:2025 Ed.3]

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

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **September 24, 2027**

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 Reports not updated to this version by the effective date above will be withdrawn.

This standard contains Functional Safety requirements.

This SUN supersedes the Continuing Certification from the previous ANSI/CAN/UL 2743 SUN. All products certified to ANSI/CAN/UL 2743 must be certified to the 3rd edition prior to the effective date.

Overview of Changes:

- Addition of UPS standard for power pack with AC pass through function
- PV input with hazardous voltage level or hazardous energy level
- Protective bonding through trace of Printed-wiring board
- Revision to the drop test for power packs with wheels for movement
- Detachable or external battery packs
- Cord and Plug Connection
- Addition of Valve Regulated Nickel and Sodium-ion battery
- Addition of requirement for backpacked portable power pack
- Peak discharge current rating 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 – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records.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
		<i>Additions to existing requirements are <u>underlined</u> and deletions are shown lined-out below.</i>
1	Info	Scope
1.1		These requirements cover portable and movable power packs provided with one or more batteries, electrochemical capacitors, or electrochemical capacitor modules, <u>to provide power to different types of appliances or equipment on site.</u> The batteries or electrochemical capacitors shall be internal components of the power pack, <u>external batteries may be connected to the power pack to expand the capacity of the power pack.</u> The power packs are provided with one or more inputs and one or more outputs. For power packs provided with a booster function, the power packs are used for providing a temporary power source to a depleted land vehicle battery, rated 24 V dc maximum, to provide emergency starting power.
		<i>New clause added;</i>
1.9		These requirements do not cover power packs that are permanently connected to a premise wiring system or having a function to supply power to a premise wiring system, or have utility interactive function, which are covered by the Standard for Energy Storage Systems and Equipment, UL 9540.
6	Info	General
		<i>New clause added;</i>
6.5		A portable power pack to be moved and lifted shall not exceed the weight limit specified in 5.35. Each individual external battery pack or accessory of the power pack that is intended to be moved and lifted separately shall also comply with the portable or moveable criteria specified in 5.35.
		<i>New clause added;</i>
		With reference to 6.5, the weight of all detachable battery packs shall be included in the total weight of the power pack.
6.6		Exception: The weight of some or all detachable battery packs may be excluded from the total weight of the power pack if the power pack is marked to indicate that these battery packs must be removed before lifting. In such cases, each individual detachable battery pack shall also comply with the portable or moveable criteria specified in 5.35.



CLAUSE	VERDICT	COMMENT
7	Ino	Frame and Enclosure
7.1	Info	General
7.1.4		The enclosure for a power pack provided with an internal lead acid battery <u>or valve regulated nickel battery</u> shall be ventilated to permit dispersion of gases from the internal battery during normal use and charging. See 7.4.
		<i>New section added;</i>
		Wirings and Terminals
9		Wiring shall be insulated and acceptable for the purpose, when considered with respect to temperature, voltage, and the conditions of service to which the wiring is likely to be subjected within the equipment. See standard for details.
12	Info	Supply Connections
12.1	Info	General
		Power packs shall be provided with one or more of the following input options:
12.1.2		a) Cord and plug connection, rated at 240 V ac maximum, 60 Hz; b) <u>DC voltage input connector intended for connection to the output of an external power supply;</u> c) Photovoltaic panel or device with inverter; d) Vehicle adapter, rated 24 V dc maximum; e) USB input port (can also act as output port); f) Cables for charging from a vehicle battery rated up to 24 V dc maximum; or g) <u>DC voltage input connector intended for connection to the output of other external DC source, such as detachable or external battery pack.</u>
		<i>New clause added;</i>
		Power packs with AC pass through function shall additionally comply with the applicable requirements of the UL 1778 / CSA C22.2 No. 107.3. As a minimum, the following sections shall be considered:
12.1.3		a) Backfeed Protection and the Annex for Backfeed Protection Test; b) Provisions for Earthing and Bonding and the Annex for Earthing and Bonding; c) Overcurrent and Earth Fault Protection in Primary Circuits; d) Abnormal Operating and Fault Conditions; e) The Annex for Additional Component Requirements; f) The Annex for Harmonic Distortion Test; and g) For lead-acid batteries, the Annex for Ventilation of Battery Compartments.



CLAUSE	VERDICT	COMMENT
12.2	Info	Cord and plug connection
12.2.1	Info	General
		For cord and plug connected devices, the power pack shall be connected to the supply circuit by means of one of the following:
12.2.1.1		a) A cord set or power-supply cord in accordance with UL 817; or b) <u>A power-supply cord consisting of an attachment plug in accordance with UL 498, assembled to a flexible cord in accordance with UL 62.</u>
		<i>New clause added;</i>
12.2.1.5		The ampacity of an attachment plug for a portable power pack intended to be continuously loaded for 3 hours or more shall not be less than 125 % of the input rating of the portable power pack.
		<u>A flexible cord shall be a hard usage or extra-hard usage type and be rated for oil-resistance. A flexible cord intended to be used in an outdoor or temporary outdoor application shall be additionally rated for a wet application, indicated by a suffix "W".</u>
12.2.1.6		Exception: A flexible cord that connects between the external batteries and the power pack shall comply with 9.5. NOTE: Examples of a flexible cord for hard usage or extra-hard usage type and rated for oil-resistance are Type SO, SJO, SJEO, and SJTO. Examples of a flexible cord for use in an outdoor or temporary outdoor application are SJOW or SJTW.
12.2.1.7		<u>The length of a power-supply cord shall not be less than 1.8 m (6 feet) as measured from the face of the attachment plug to the point of entry to the device. The length of a cord set shall not be less than 1.8 m (6 feet) as measured from the face of the attachment plug to the face of the load fitting.</u>
12.5	Info	Photovoltaic panels
12.5.1		Power packs provided with a photovoltaic panel as an input for charging the internal battery, <u>and with rated voltage exceeding hazardous voltage levels as defined in 5.26 or energy exceeding hazardous energy levels as defined in 5.25,</u> shall be provided with an inverter and/or a charge controller and shall be in accordance with the applicable requirements in UL 1741; or with the applicable requirements in UL 62109-1.



CLAUSE	VERDICT	COMMENT
13	Info	Output Connections
13.2	Info	Booster cable assemblies
13.2.1	Info	General
		<i>New clause added;</i>
13.2.1.4		The power pack with a booster function shall be provided with a means of reverse polarity protection to prevent reverse connect to a starter battery in the vehicle. Compliance is determined by the Reverse Polarity of Booster Cables Test, 55.3.
13.3	Info	Receptacles
		Receptacles <u>other than as indicated in 13.3.1</u> , may be acceptable provided the criteria in either (a) – (c) is met:
		a) The following criteria is met: <ol style="list-style-type: none"> 1) The receptacles including their ground terminals are isolated from any of the AC mains input circuits by double insulation in accordance with Section 16, Double Insulation Products; and 2) The portable power pack is marked per 75.24 and provided with instructions per 77.3(q).
13.3.2		b) <u>For portable power packs with inverter output which the grounded conductor (Neutral) was bonded to any ground terminal</u> , the receptacles shall have the output circuits protected by <u>integral ground-fault circuit-interrupters intended for the current involved</u> , GFCI protection provided integral to the power pack for all receptacle outlets. The GFCIs shall be in accordance with UL 943 and shall interrupt the output supply circuit in the event of a ground fault of receptacles; or c) <u>For power packs with AC pass through function, compliance is determined per the applicable requirements of UL 1778 / CSA C22.2 No. 107.3. See 12.1.3.</u>
30	Info	Battery
30.1	Info	General
30.1.2		<u>Internal batteries provided as part of power packs shall be in accordance with 30.2 or 30.3. Detachable batteries are considered a form of internal batteries and shall comply with all the requirements of this Standard for internal batteries unless otherwise required. External batteries provided as accessories of power packs to expand the capacity of the power packs shall be in accordance with 30.4.</u>
		<i>New clause added;</i>
30.1.4		For power packs intended for use in a repair facility, a detachable or an external battery pack shall be provided with a means to ensure that the battery pack cannot be inadvertently detached during use.



CLAUSE	VERDICT	COMMENT
		<i>New clause added;</i>
30.1.7		A lithium-ion power pack with <u>a sum of</u> rated energy larger than 1 kWh, <u>including all its internal detachable, and external batteries</u> , shall be subjected to the Thermal propagation test, 55.11.
30.3	Info	Internal lithium-ion batteries or sodium-ion batteries
		<i>New clause added;</i>
30.3.2		A Sodium-ion battery cell shall comply with the cell requirements in UL/ULC 2580 or UL 1973.
		<i>New section added;</i>
		External batteries
30.4		An external battery used to expand the power capacity of the power pack shall comply with: See standard for details.
35	Info	Back Feed Protection
		<i>New clause added;</i>
35.2		Power packs that employ the AC pass through function shall comply with the Annex for Backfeed Protection Test of UL 1778 / CSA C22.2 No. 107.3.
40	Info	Strength of Handles
40.1		A handle, <u>shoulder harness, belt harness, or other supporting means</u> used to support or carry a product shall be subjected to the Strength of Handles Test, Section 62.
		<i>New section added;</i>
		Design of Shoulder Harnesses
41		A portable power pack may be provided with a single shoulder harness, double shoulder harness or belt harness for supporting a portable power pack on the body of the operator. See standard for details.
	Info	PERFORMANCE
44		General
44.6		The end of discharge voltages are 1.75 V/cell for lead acid batteries, <u>1.0 V/cell for valve regulated nickel batteries, 1.5 V/cell for sodium-ion batteries, and 2.5 V/cell for lithium-ion batteries</u> , unless the cell manufacturer specifies a different voltage.



CLAUSE	VERDICT	COMMENT
46	Info	Normal Charging Operation Test
46.1		Charging a lithium-ion or a sodium-ion battery under normal conditions shall not exceed the specified operating region for charging of the cell.
49	Info	Leakage Current Test
49.1		<p>A power pack with hazardous voltage circuits shall be tested in accordance with 49.2 – 49.7. Leakage current shall not be more than 0.5 mA.</p> <p>Exception No. 1: The leakage current of a power pack provided with no AC supply shall be measured with the measurement instrument connected <u>between the output ground terminal and any user accessible conductive parts</u>. In addition, there shall be no risk of electric shock between the hazardous circuit (input or output) to output ground terminal and/or any user accessible conductive parts, see 5.42.</p> <p>Exception No. 2: For power packs with AC pass through function, leakage current in a <u>protective bonding conductor shall not be more than 3.5 mA as determined per the applicable requirements of UL 1778 / CSA C22.2 No. 107.3</u>.</p>
50	Info	Normal Temperature Test
50.3	Info	Power pack ampacity temperature test
50.3.1		<p>When conducting the Power Pack Ampacity Test of Section 70, the Power Pack Ampacity Temperature Test is also to be conducted. The Power Pack Ampacity Test is to be conducted for a duration of 25 seconds, or whatever duration is allowed by the inherent functionality of the battery pack. <u>If the power pack can be discharged again after a specified time interval, the discharge shall be continued until the power pack can no longer output at maximum discharge or peak discharge current</u>. At the end of duration, the output of the power pack is to be turned "off". During this time, the temperatures of the battery and all internal affected components including cables are to be recorded and shall be within the limits specified in Table 50.1. Additionally, the temperatures of the clamps are to be monitored from the start of the test and continuing through 2 minutes after the current is turned "off". At no time during this test shall the temperatures exceed those in Table 50.2:</p>
55	Info	Abnormal Operation Tests
55.11	Info	Thermal propagation test
55.11.3		<p><i>New clause added;</i></p> <p>The single cell selected for failure during the test shall represent the worst-case scenario, taking into account its location in the internal battery, as well as in the detachable or external battery, if applicable. If it is difficult to determine the worst-case scenario, the Thermal Propagation Test shall be repeated to failure by a single cell at a different location.</p>



CLAUSE	VERDICT	COMMENT
		Exception: Individual detachable or external batteries that have been subjected to an equivalent Thermal Propagation Test do not need to have one of its cells failed in the test.
60	Info	Strength of Enclosure Tests
60.3	Info	Drop test
60.3.2		<p>The sample of a portable power pack weighing equal to or less than 18 kg (39.7 pounds) 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. The sample of a movable power pack weighing more than 18 kg (39.7 pounds) <u>and to be equipped with handle(s)</u> 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.</p> <p><u>Exception: The sample of a movable power pack weighing more than 25 kg (55.1 pounds) and to be equipped with wheel(s) for ease of movement is to be dropped one time from a height of 0.5 m (1.6 feet) to strike a concrete surface in the intended use position to simulate a sudden drop from vehicles.</u></p>
62	Info	Strength of Handles Test
62.1		<p>A handle, shoulder harness, belt harness, or other supporting <u>means</u> used to lift or carry a power pack shall withstand a force of four times the weight of the power pack without breakage of the handle, its securing means, or that portion of the enclosure to which the handle is attached.</p>
62.2		<p>To determine whether a power pack complies with the requirements in 62.1, a force equal to four times the weight of the power pack is to be uniformly applied over a 76-mm (3-inch) width at the center of the handle, <u>the shoulder harness, or belt harness</u>, without clamping. The load is to be started at zero and is to be gradually increased so that the test value will be attained in 5 to 10 seconds and maintained at that value for 1 minute. If more than one handle, <u>shoulder harness, or belt harness</u> is provided on a power pack and the power pack cannot be carried by one handle or the <u>shoulder or belt</u> alone, the force is to be distributed between the handles, <u>shoulder harness, or belt harness</u>. The distribution of forces is to be determined by measuring the percentage of the weight of the power pack sustained by each handle, <u>shoulder harness, or belt harness</u> with the power pack in the normal carrying position. If a power pack is furnished with more than one handle, <u>shoulder harness, or belt</u> and can be carried by one handle, <u>shoulder harness, or belt harness</u> only, each handle, <u>shoulder harness, or belt harness</u> shall withstand the total force.</p>
70	Info	Power Pack Ampacity Test
70.1		<p><u>A power pack</u> with a booster function shall be subjected to the Power Pack Ampacity Test. Lead acid <u>or valve regulated nickel batteries</u> are to be loaded for 10 seconds at the maximum discharge current or power specified by the manufacturer to the discharge cutoff voltage of 7.2 volts. For lithium-ion <u>or sodium-ion powered</u></p>



CLAUSE	VERDICT	COMMENT
		<p><u>units</u> with protection circuitry, the Power Pack Ampacity Test is to be conducted for 5 seconds, and the battery packs may be 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 pack's rating <u>if less than 10 seconds for lead acid or valve regulated nickel powered unit, or less than 5 seconds for lithium-ion or sodium-ion powered units.</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.</p>
		<p><i>New clause added;</i></p>
70.2		<p>In addition to the maximum discharge current rating, if a peak discharge current rating has been declared by manufacturer for the power pack with boost function, the Power Pack Ampacity Test shall be repeated with the power pack loaded at the output (clamps) at the peak discharge current for a duration of 100 ms or a duration specified by the manufacturer, whichever is longer. The declared peak current rating along with the time duration of the peak current output shall be included in the power pack's rating. The current is to be recorded for the duration of the test. At the end of the test, the current is to be recorded, and this shall be the power pack's peak current rating.</p>
	Info	MARKINGS
74	Info	General
		<p>A product shall be legibly and permanently marked with the following:</p> <ul style="list-style-type: none">a) The manufacturer's name, trade name, trademark, or other descriptive marking by which the organization responsible for the product may be identified;b) A distinctive model number or the equivalent;c) The electrical rating of voltage, current or power, frequency <u>if applicable, for all input and output;</u>d) For portable power pack with booster function, the maximum ampacity <u>and peak ampacity if applicable, and the discharge/cranking duration per 70.1 and 70.2 if applicable;</u>e) The operating temperature range as specified by the manufacturer;f) The date or other dating period of manufacture not exceeding any three consecutive months; andg) The "Rainproof" or "Raintight" rating for an enclosure for temporary outdoor use or outdoor use products. <p>Exception: The date of manufacture may be abbreviated; or may be in a nationally accepted conventional code or in a code affirmed by the manufacturer, provided that the code:</p> <ul style="list-style-type: none">a) Does not repeat in less than 10 years; and



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		b) Does not require reference to the production records of the manufacturer to determine when the product was manufactured.
75	Info	Cautionary Markings A power pack that contains a lead-acid <u>or valve regulated nickel</u> battery that is to be charged shall be marked with the word "WARNING" and the following or equivalent: 75.11 a) "Do not overcharge the internal battery. See Instruction Manual." b) "Do not smoke, strike a match, or cause a spark in the vicinity of the power pack." c) "Only charge the internal battery in a well ventilated area."
77	Info	Instructions Pertaining to Risk of Fire, Electric Shock, or Injury to Persons 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 style="text-align: center;">IMPORTANT SAFETY INSTRUCTIONS</p> 77.3 WARNING – When using this product, basic precautions should always be followed, including the following: k) PERSONAL PRECAUTIONS 1) Consider having someone close enough by to come to your aid when you work near a lead-acid <u>or valve regulated nickel battery</u> . 7) Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid <u>or valve regulated nickel battery</u> . A lead-acid <u>or valve regulated nickel</u> battery can produce a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn. r) <u>For a portable power pack provided with a quick release system for a shoulder harness as required in Section 41, instructions regarding the operation of the quick release system.</u>