

STANDARD INFORMATION

Standard Number: UL 1647

Standard Name: Motor-Operated Massage and Exercise Machines

Standard Edition and Issue Date: 6th Edition Dated November 18, 2016

Date of Revision: May 18, 2018

Date of Previous Revision of Standard: November 18, 2016

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **December 31, 2019**

IMPACT, OVERVIEW, AND ACTION REQUIRED

Impact Statement: A review of all Listing Reports is necessary to determine which products comply with new/revised requirements and which products will require re-evaluation. **NOTE:** Effective immediately, this revised standard will be exclusively used for evaluation of new products unless the Applicant requests in writing that current requirements be used along with their understanding that their listings will be withdrawn on Effective Date noted above, unless the product is found to comply with new/revised requirements.

Overview of Changes: Addition of requirements for Exercise Machines with Power Generating Function and Utility-Interactive Connectivity. Specific details of new/revised requirements are found in table below.

If the applicable requirements noted in the table are not described in your report(s), these requirements will need to be confirmed as met and added to your report(s) such as markings, instructions, test results, etc. (as required).

Client Action Required:

Information – To assist our Engineer with review of your Listing Reports, please submit technical information in response to the new/revised paragraphs noted in the attached or explain why these new/revised requirements do not apply to your product (s).

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 – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records.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.



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CLAUSE	VERDICT	COMMENT
<i>Additions to existing requirements are underlined and deletions are shown lined out below.</i>		
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<i>New appendix added;</i>		
Appendix A		Specific Requirements for Exercise Machines with Power Generating Function and Utility-Interactive Connectivity
A.1	Info	Scope
A.1.1		These requirements apply to exercise machines (ie; stationary bicycles, elliptical trainers, stair climbers, treadmills) covered under this Standard, that have the additional feature of generating electrical power from user exercise and converting this to output power to be connected to a building branch circuit, effectively serving as a generator. See A.2.4.
A.1.2		These requirements cover exercise machines with an on-board generator and inverter, with provision for connecting output power to building branch circuit power. These exercise machines are utility-interactive and can both accept power from the branch circuit as well as supply power back to the supply circuit.
A.1.3		These requirements do not cover: a) Exercise machines with output power for standby use. b) Exercise machines with output power that charges standby battery packs which are separate from the exercise machine. c) Exercise machines with output power that provides power directly to other loads such as appliances, lighting, etc. via receptacle or interconnection cord that is part of the exercise machine.
A.1.4		The products covered by these requirements, when connected to building power, must be connected in accordance with the National Electric Code, ANSI/NFPA 70.
A.3	Info	Components
A.3.1		A utility-interactive inverter and its electrical interconnection shall comply with the applicable requirements of: a) The Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, UL 1741; b) The Standard for Interconnecting Distributed Resources with Electric Power Systems, IEEE 1547; and c) The Standard for Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems, IEEE 1547.1.
A.3.2		A rotational generator used to produce electric power, provided as part of an exercise machine, shall comply with:



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		<p>a) The applicable requirements for general purpose or component motors of Section 5.16 of this Standard, as applicable, or</p> <p>b) The Standard for Rotating Electrical Machines – General Requirements, UL 1004-1; and the Standard for Electric Generators, UL 1004-4.</p>
A.3.3		A drain resistor, when provided, shall be included with and comply with all tests required by this Standard for the end product. Additionally, electrical insulating material used as part of the resistor construction shall comply with Section 15 of this Standard.
A.4	Info	Power Supply Connections
A.4.1		An exercise machine intended to be connected to a branch circuit system of a building, shall be connected in accordance with the following, and shall be in accordance with applicable parts of the National Electric Code, ANSI/NFPA 70.
		The method of supply connection shall be:
A.4.2		<p>a) Cord connection utilizing Type SJ, SJT, SJO cord, or a type at least equally serviceable for the application, and terminated or connected as specified in A.4.3 and A.4.4; or</p> <p>b) Other methods permitted by Standard For Safety For Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, UL 1741 or National Electric Code, ANSI/NFPA 70 for utility-interactive equipment.</p>
		Cord Termination at building end - If cord connection is employed for power supply connection, the method of cord termination and connection of the cord at the building circuit end shall be one of the following:
A.4.3		<p>a) Cord terminated in a standardized twist-lock attachment plug configuration, such as a NEMA L5-15P.</p> <p>b) Cord terminated with a non-standardized attachment plug configuration, intended for plug-in connection to appropriate mating device (connector or receptacle) installed in wall in the building (See A.4.5). Standard NEMA configurations of Appendix B of Standard for Attachment Plugs and Receptacles, UL 498, other than as specified in (a), shall not be employed.</p> <p>c) Other methods permitted by the Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, UL 1741 or National Electric Code, ANSI/NFPA 70 for utility-interactive equipment, provided that cord is terminated in minimum 6 inch long individual leads, intended for permanent connection to junction box or panel, and means provided to prevent transmission of strain to wiring connections when exercise machines are moved (e.g., via permanent securement of exercise machine, breakaway device, or equivalent).</p>
A.4.4		Cord Termination at product end – If cord connection is employed for power supply connection, the method of connection of the cord at the exercise machine end



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		shall be:
		<p>a) Attached via strain relief, with individual leads connected internally to the exercise machine. Strain relief means and internal connection means shall comply with this Standard;</p> <p>b) General use cord set (i.e.; detachable power supply cord) of standard configuration (i.e. IEC 60320-1 type C13, C15) connection at exercise machine end, additionally secured to the exercise machine via means requiring a tool for detachment; or</p> <p>c) General use cord set other than standard configuration connection at exercise machine end as specified in (b).</p>
A.4.5		If a non-standardized attachment plug configuration is used as specified in A.4.3(b), the female wall receptacle or mating device shall be provided by the exercise machine manufacturer along with instructions for proper installation of the receptacle by qualified personnel.
	Info	PERFORMANCE
A.5	Info	General
A.5.1		The tests of Sections 44 – 76 as applicable shall be conducted. Additions or modifications to the tests shall be as noted in this Appendix.
A.5.2		Any applicable tests from the Standard Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources, UL 1741 for the inverter not conducted on the inverters, or dependent on the combination of the inverter and exercise machine combination, shall be conducted as part of this evaluation.
A.5.3		Cord-connected exercise machines with PGUIC where the pins are accessible at the attachment plug or appliance inlet without the use of a tool shall be subjected to the Backfeed Protection Test as specified in Annex FFF of Standard for Uninterruptible Power Systems, UL 1778.
A.6	Info	Rating
A.6.1		If the exercise machine with PGUIC can consume power in any mode of operation from the building supply to which it is connected, it shall be rated in accordance with Section 80.
A.6.2		In addition to any rating required by A.6.1, exercise machines with PGUIC shall be rated in accordance with utility interactive ratings of Table 62.1 of the Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, UL 1741.
	Info	MARKINGS
A.7	Info	General
A.7.1		Except as noted below, exercise machines with PGUIC feature shall be marked as required by Section 81. Additionally, the inverter component shall be marked as required by the Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, UL 1741.



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		<i>Exception: Markings required on the inverter by UL 1741 are not required to be provided on the inverter if equivalent marking is factory installed with the exercise machine.</i>
A.7.2		Exercise machines with PGUIC shall be marked with the following text or equivalent: WARNING – Improper installation may cause fire or electric shock. Connect only to a dedicated branch circuit suitable for backfeed. Do not disconnect under load. See installation instructions for power connection.
A.7.3		For cord connected machines the marking specified in A.7.2 shall be provided on a cord tag: a) Complying with Section the Permanence of Cord Tag Test, 60, of the Standard for Motor- Operated Appliances UL 73, and b) Applied to the power supply cord within 6 inches of the individual leads or face of the attachment plug.
A.7.4		For permanently connected machines the marking specified in A.7.2 shall be provided near the field wiring terminations.
	Info	INSTRUCTIONS
A.8	Info	General
A.8.1		Except as noted below, exercise machines with PGUIC feature shall be provided with instructions as required by Sections 82 – 86.
A.8.2		The exercise machines shall include shall include instructions required by Sections 65 and 66 of the Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources, UL 1741. <i>Exception: Inverter instructions of UL 1741 are not required to be provided if equivalent instructions are provided with the exercise machine.</i>
A.8.3		The instructions of 83.5 shall include the text of the marking specified in A.7.2. The installation instructions shall include the following, or equivalent:
A.8.4		a) The product must be installed on a dedicated branch circuit. b) The branch circuit protection must be suitable for backfeed. c) The individual branch circuit shall be installed by a qualified electrician in accordance with the National Electric Code, ANSI/NFPA 70. d) Specification of the maximum number of exercise machines with PGUIC feature to be installed on an individual branch circuit and indicate that exercise machines with PGUIC feature should not be installed in numbers greater than specified. e) For cord and plug connected machines, identification of the appropriate receptacle to be installed to mate with the attachment plug provided on the power



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		supply cord and, for a nonstandardized configuration, indicate that the receptacle is provided with the exercise machine.
		CUSTOMERS PLEASE NOTE: This Table and column "Verdict" can be used in determining how your current or future production is or will be in compliance with new/revised requirements.