UL 1090

STANDARD FOR SAFETY

Electric Snow Movers

UL Standard for Safety for Electric Snow Movers, UL 1090

Seventh Edition, Dated October 5, 2016

Summary of Topics

This revision of ANSI/UL 1090 dated March 14, 2022 includes revisions to cold testing to harmonize with ISO 8437 and ANSI B71.3; 25.3(b), 36.2, 44.2.2, 45.2.1, SA2.2(b).

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

The new and revised requirements are substantially in accordance with Proposal(s) on this subject dated February 14, 2020.

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UL 1090

Standard for Electric Snow Movers

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Seventh Edition

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This ANSI/UL Standard for Safety consists of the Seventh Edition including revisions through March 14, 2022.

The most recent designation of ANSI/UL 1090 as an American National Standard (ANSI) occurred on March 14, 2022. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at https://csds.ul.com.

No Text on This Page

CONTENTS

INTRODUCTION

CONSTRUCTION

PROTECTION AGAINST INJURY TO PERSONS

PERFORMANCE

POLYMERIC ENCLOSURES

MANUFACTURING AND PRODUCTION TESTS

RATINGS

MARKINGS

INSTRUCTIONS

DOUBLE-INSULATED SNOW MOVERS

SUPPLEMENT SA – BATTERY POWERED SNOW MOVERS

No Text on This Page

INTRODUCTION

1 Scope

1.1 These requirements cover cord-connected electrically operated snow movers rated 250 V or less to be employed in accordance with the National Electrical Code, ANSI/NFPA 70.

1.2 These requirements also cover battery-operated snow movers as specified in Battery Powered Gardening Appliances, Supplement SA, in this Standard.

1.3 These requirements do not cover riding-type snow movers or snow movers intended for commercial or industrial use or for use in hazardous locations as defined in the National Electrical Code, ANSI/NFPA 70.

1.4 In addition to the requirements in this standard, a snow mover shall comply with 5.1, 5.2.2, 5.2.3, 5.2.5, 6, 7, 10.1 – 10.3, 11.1, and 12 of the Snow Throwers – Safety Specifications, ANSI B71.3.

Exception: Markings shall be considered durable and permanent if they comply with Permanency of Marking, Section 42, of this standard.

2 Units of Measurement

2.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

2.2 Unless otherwise indicated, all voltage and current values specified in this standard are root-mean-square.

3 Undated References

3.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

4 Glossary

4.1 For the purpose of this standard the following definitions apply.

4.2 APPLIANCE COUPLER – A single-outlet, female contact device for attachment to a flexible cord as part of a detachable power-supply cord to be connected to an appliance inlet (motor attachment plug).

4.3 APPLIANCE INLET (Motor Attachment Plug) – A male contact device mounted on an end product appliance to provide an integral blade configuration for the connection of an appliance coupler or cord connector.

4.4 APPLIANCE (FLATIRON) PLUG – An appliance coupler type of device having a cord guard and a slot configuration specified for use with heating or cooking appliances.

4.5 AUTOMATICALLY CONTROLLED PRODUCT – A product is determined to be automatically controlled if it complies with one or more of the following conditions:

a) The repeated starting of the product is independent of any manual control after one complete cycle of operation, after which some form of limit device opens the circuit.

b) During any single preset cycle of operation, the motor is caused to stop and restart.

c) When the product is energized, the initial starting of the motor may be intentionally delayed beyond intended, conventional starting.

d) For a product employing a motor with a separate starting winding, during any single predetermined cycle of operation, automatic changing of the mechanical load reduces the motor speed sufficiently to reestablish starting-winding connections to the supply circuit.

4.6 COMPONENT – A device or fabricated part of the appliance covered by the scope of a safety standard dedicated to the purpose. When incorporated in an appliance, equipment otherwise typically field installed (e.g. luminaire) is considered to be a component. Unless otherwise specified, materials that compose a device or fabricated part, such as thermoplastic or copper, are not considered components.

4.7 CONTROL, AUTOMATIC ACTION – A control in which at least one aspect is non-manual.

4.8 CONTROL, AUXILIARY – A device or assembly of devices that provides a functional utility, is not relied upon as an operational or protective control, and therefore is not relied upon for safety. For example, an efficiency control not relied upon to reduce the risk of fire, electric shock, or injury to persons during normal or abnormal operation of the end product is considered an auxiliary control.

4.9 CONTROL, MANUAL – A device that requires direct human interaction to activate or rest the control.

4.10 CONTROL, OPERATING – A device or assembly of devices, the operation of which starts or regulates the end product during normal operation. For example, a thermostat, the failure of which a thermal cutout/limiter or another layer of protection would mitigate the risk of fire, electric shock, or injury to persons, is considered an operating control. Operating controls are also referred to as "regulating controls".

4.11 CONTROL, PROTECTIVE – A device or assembly of devices, the operation of which is intended to reduce the risk of fire, electric shock, or injury to persons during normal and reasonably anticipated abnormal operation of the appliance, whereby during the evaluation of the protective control/circuit, the protective functions are verified under normal and single-fault conditions of the control. For example, a thermal cutout/limiter, or any other control/circuit relied upon for normal and abnormal conditions, is considered a protective control. Protective controls are also referred to as "limiting controls" and "safety controls".

4.12 CONTROL, TYPE 1 ACTION – The actuation of an automatic control for which the manufacturing deviation and the drift (tolerance before and after certain conditions) of its operating value, operating time, or operating sequence has not been declared and tested under this standard.

4.13 CONTROL, TYPE 2 ACTION – The actuation of an automatic control for which the manufacturing deviation and the drift (tolerance before and after certain conditions) of its operating value, operating time, or operating sequence have been declared and tested under this standard.

4.14 CORD CONNECTOR – A female contact device wired on flexible cord for use as an extension from an outlet to make a detachable electrical connection to an attachment plug or, as an appliance coupler, to an equipment inlet.

4.4.15 DIRECTLY ACCESSIBLE MOTOR – A motor that can be contacted without opening or removing any part, or that is located so as to be accessible to contact.

4.16 ENCLOSURE – That portion of the snow mover that:

a) Renders inaccessible all parts that may otherwise present a risk of electric shock or injury to persons, or

b) Prevents propagation of flame initiated by electrical disturbances occurring within, or both.

4.17 GROUND-SUPPORTED SNOW MOVER – A snow mover that, during normal operation, is supported entirely or in part by the ground.

4.18 HAND-SUPPORTED SNOW MOVER – A snow mover that, at some time during normal operation, is intended to be completely supported by the user.

4.19 INDIRECTLY ACCESSIBLE MOTOR – A motor that is accessible only by opening or removing a part of the outer enclosure, such as a guard or panel, that can be opened or removed without using a tool, or that is located at such a height or is otherwise guarded or enclosed so that it is unlikely to be contacted.

4.20 LEAKAGE CURRENT – All current or currents, including capacitively-coupled current, that may be conveyed between exposed conductive surfaces of a snow mover and ground or other exposed conductive surfaces of the snow mover.

4.21 LIVE PART – A part energized with respect to earth or energized with respect to some other part.

CONSTRUCTION

5 Components

5.1 General

5.1.1 A component of a product covered by this standard shall:

a) Comply with the requirements for that component as indicated in 5.2 – 5.25;

b) Be used in accordance with its rating(s) established for the intended conditions of use;

c) Be used within its established use limitations or conditions of acceptability;

d) Additionally comply with the applicable requirements of this end product standard; and

e) Not contain mercury.

Exception No. 1: A component of a product covered by this standard is not required to comply with a specific component requirement that:

a) Involves a feature or characteristic not required in the application of the component in the product;

b) Is superseded by a requirement in this standard; or

c) Is separately investigated when forming part of another component, provided the component is used within its established ratings and limitations.

Exception No. 2: A component that complies with a UL component standard other than those specified in 5.2 – 5.25 is acceptable if:

a) The component also complies with the applicable component standard specified in 5.2 – 5.25; or

b) The component standard:

1) Is compatible with the ampacity and overcurrent protection requirements in the National Electrical Code, ANSI/NFPA 70, where applicable;

2) Considers long-term thermal properties of polymeric insulating materials in accordance with the Standard for Polymeric Materials – Long Term Property Evaluations, UL 746B; and

3) Any use limitations of the other component UL standards are identified and appropriately accommodated in the end use application. For example, a component used in a household application, but intended for industrial use and complying with the relevant component standard may assume user expertise not common in household applications.

5.1.2 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

5.1.3 A component that is also intended to perform other functions, such as over current protection, ground-fault circuit-interruption, surge suppression, any other similar functions, or any combination thereof, shall comply additionally with the requirements of the applicable UL standard(s) that cover devices that provide those functions.

Exception: Where these other functions are not required for the application and not identified as part of markings, instructions, or packaging for the appliance, the additional component UL standard(s) need not be applied.

5.1.4 A component not anticipated by the requirements of this end product standard, not specifically covered by the component standards in 5.2 – 5.25, and that involves a risk of fire, electric shock, or injury to persons, shall be additionally investigated in accordance with the applicable UL standard, and shall comply with 5.1.1 (b) – (d).

5.1.5 With regard to a component being additionally investigated, reference to construction and performance requirements in another UL end product standard is appropriate where that standard anticipates normal and abnormal use conditions consistent with the application of UL 1090.

5.2 Attachment plugs, receptacles, connectors, and terminals

5.2.1 Attachment plugs, receptacles, appliance couplers, appliance inlets (motor attachment plugs), and appliance (flatiron) plugs shall comply with the Standard for Attachment Plugs and Receptacles, UL 498. See 5.2.9.

Exception No. 1: Attachment plugs and appliance couplers integral to cord sets or power supply cords that are investigated in accordance with the requirements in the Standard for Cord Sets and Power-Supply Cords, UL 817, are not required to comply with UL 498.

Exception No. 2: A fabricated pin terminal assembly(ies) need not comply with UL 498 if it complies with Live Parts, Section 11, Electrical Insulation, Section 13, and Spacings, Section 18, of this end product standard.

5.2.2 Quick-connect terminals, both connectors and tabs, for use with one or two 22 – 10 AWG copper conductors, having nominal widths of 2.8, 3.2, 4.8, 5.2, and 6.3 mm (0.110, 0.125, 0.187, 0.205, and 0.250 in), intended for internal wiring connections in appliances, or for the field termination of conductors to appliance, shall comply with the Standard for Electrical Quick-Connect Terminals, UL 310.

Exception: Other sizes of quick-connect terminals shall be investigated with respect to crimp pull out, insertion-withdrawal, temperature rise, and all tests shall be conducted in accordance with UL 310.

5.2.3 Single and multipole connectors for use in data, signal, control and power applications within and between electrical equipment, and that are intended for factory assembly to copper or copper alloy conductors, or for factory assembly to printed wiring boards, shall comply with the Standard for Component Connectors for Use in Data, Signal, Control and Power Applications, UL 1977. See 5.2.9.

5.2.4 Wire connectors shall comply with the Standard for Wire Connectors, UL 486A-486B.

5.2.5 Splicing wire connectors shall comply with the Standard for Splicing Wire Connectors, UL 486C.

5.2.6 Multi-pole splicing wire connectors that are intended to facilitate the connection of hard-wired utilization equipment to the branch-circuit conductors of buildings shall comply with the Standard for Insulated Multi-Pole Splicing Wire Connectors, UL 2459. See 5.2.9.

5.2.7 Equipment wiring terminals for use with all alloys of copper, aluminum, or copper-clad aluminum conductors, shall comply with the Standard for Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors, UL 486E.

5.2.8 Terminal blocks shall comply with the Standard for Terminal Blocks, UL 1059, and, if applicable, be suitably rated for field wiring.

Exception: A fabricated part performing the function of a terminal block need not comply with UL 1059 if the part complies with the requirements of Live Parts, Section 11, Electrical Insulation, Section 13, and Spacings, Section 18, of this end product standard. This exception does not apply to protective conductor terminal blocks.

5.2.9 Female devices (such as receptacles, appliance couplers, and connectors) that are intended, or that may be used, to interrupt current in the end product, shall be suitably rated for current interruption of the specific type of load, when evaluated with its mating plug or connector. For example, an appliance coupler that can be used to interrupt the current of a motor load shall have a suitable horsepower rating when tested with its mating plug.

5.4 Boxes and raceways

5.4.1 Electrical boxes and the associated bushings and fittings, and raceways, of the types specified in Chapter 3, Wiring Methods and Materials, of the National Electrical Code, NFPA 70 and that comply with the relevant UL standard (such as the Standard for Metallic Outlet Boxes, UL 514A, the Standard for Nonmetallic Outlet Boxes, Flush-Devices Boxes, and Covers, UL 514C, the Standard for Cover Plates for Flush-Mounted Wiring Devices, UL 514D) and Components – General, Section 5.1 are considered to comply with the requirements in this end product standard.

5.5 Capacitors and filters

5.5.1 A power capacitor employing a dielectric medium of wax or of liquid other than askarel shall comply with the requirements for protected oil-filled capacitors in the Standard for Capacitors, UL 810, and shall be used within its rated voltage.

5.5.2 An electromagnetic interference filter shall comply with the Standard for Electromagnetic Interference Filters, UL 1283.

5.6 Controls

5.6.1 General

5.6.1.1 Auxiliary controls shall be evaluated using the applicable requirements of this end product standard and the requirements in the Standard for Controls – End Product Test Parameters, Section 20.

5.6.1.2 Operating (regulating) controls shall be evaluated using the applicable component standard requirements specified in 5.6.2 – 5.6.7 and if applicable, the requirements in Controls – End Product Test Parameters, Section 20, unless otherwise specified in this end product standard.

5.6.1.3 Operating controls that rely upon software for the normal operation of the end product where deviation or drift of the control may result in a risk of fire, electric shock, or injury to persons, such as a speed control unexpectedly changing its output, shall comply with one or both of the following standards:

a) The Standard for Tests for Safety-Related Controls Employing Solid-State Devices, UL 991, and the Standard for Software in Programmable Components, UL 1998; or

b) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements, UL 60730-1.

5.6.1.4 Protective (limiting) controls shall be evaluated using the applicable component standard requirements specified in 5.6.2 – 5.6.7 and if applicable, the parameters in Controls – End Product Test Parameters, Section 20, unless otherwise specified in this end product standard.

5.6.1.5 Solid-state protective controls that do not rely upon software as a protective component shall comply with one or both of the following standards:

a) The Standard for Tests for Safety-Related Controls Employing Solid-State Devices, UL 991; or

b) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements, UL 60730-1, except for the Controls Using Software requirements.

5.6.1.6 Protective controls that rely upon software as a protective component shall comply with one or both of the following standards:

a) The Standard for Tests for Safety-Related Controls Employing Solid-State Devices, UL 991, and Standard for Software in Programmable Components, UL 1998; or

b) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements, UL 60730-1.

5.6.1.7 An electronic, non-protective control that is simple in design need only be subjected to the applicable requirements of this end-product standard. A control that does not include an integrated circuit or microprocessor, but does consist of a discrete switching device, capacitors, transistors, or resistors is considered simple in design.

5.6.2 Electromechanical and electronic controls

5.6.2.1 A control, other than as specified in 5.6.2 – 5.6.7, shall comply with one of the following:

a) The Standard for Solid-State Controls for Appliances, UL 244A;

b) The Standard for Temperature-Indicating and -Regulating Equipment, UL 873; or

c) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements, UL 60730-1.

5.6.3 Liquid level controls

5.6.3.1 A liquid level control shall comply with one of the following:

a) The Standard for Solid-State Controls for Appliances, UL 244A;

b) The Standard for Temperature-Indicating and -Regulating Equipment, UL 873;

c) The Standard for Industrial Control Equipment, UL 508; or

d) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements, UL 60730-1, and;

1) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Automatic Electrical Water Level Controls of the Float Type for Household and Similar Applications, UL 60730-2-15; or

2) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Automatic Electrical Water Level Controls of the Float Type for Household and Similar Applications, UL 60730-2-15.

5.6.4 Motor and speed controls

5.6.4.1 A control used to start, stop, regulate or control the speed of a motor shall comply with one of the following:

a) The Standard for Solid-State Controls for Appliances,UL 244A;

b) The Standard for Temperature-Indicating and -Regulating Equipment, UL 873;

c) The Standard for Industrial Control Equipment, UL 508;

d) The Standard for Adjustable Speed Electrical Power Drive Systems – Part 5-1: Safety Requirements – Electrical, Thermal, and Energy, UL 61800-5-1; or

e) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements, UL 60730-1.

5.6.5 Pressure controls

5.6.5.1 A pressure control shall comply with one of the following:

a) The Standard for Temperature-Indicating and -Regulating Equipment, UL 873;

b) The Standard for Industrial Control Equipment, UL 508; or

c) The Standard for Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements, UL 60730-1; and the Standard for Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Automatic Electrical Pressure Sensing Controls Including Mechanical Requirements, UL 60730-2-6.

5.6.6 Temperature controls

5.6.6.1 A temperature control shall comply with one of the following: