

STANDARD INFORMATION

Standard Number: UL 751

Standard Name: Vending Machines

Standard Edition and Issue Date: 9th Edition Dated July 18, 2016

Date of Revision: October 2, 2018

Date of Previous Revision of Standard: July 18, 2016

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **October 2, 2020**

IMPACT, OVERVIEW, AND ACTION REQUIRED

Impact Statement: A review of all Listing Reports is necessary to determine which products comply with new/revise 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requests in writing that current requirements be used along with their understanding that their listings will be withdrawn on Effective Date noted above, unless the product is found to comply with new/revise requirements.

Overview of Changes

- Revisions to Update Requirements for Controls
- Revision to and Addition of Requirements to Prevent Remote Shut-Off of Vending Machines
- Revisions to and Addition of Requirements to Address Switch Mode Power Supply Units Increasingly Used in Vending Machines
- Revisions to Requirements for Vending Machines Having Two Supply Cords

Specific details of new/revise 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:

Information – To assist our Engineer with review of your Listing Reports, please submit technical information in response to the new/revise paragraphs noted in the attached or explain why these new/revise 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 – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records.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.



STANDARD INFORMATION

CLAUSE	VERDICT	COMMENT
		<i>Additions to existing requirements are <u>underlined</u> and deletions are shown lined out below.</i>
16	Info	Supply Connections For Cord Connected Vending Machines
16.1	Info	Cords and plugs
		<i>New clause added;</i>
16.1.13		Except as specified in 16.1.14, if an accessory is powered from a source of supply separate from that supplying a cord-connected vending machine, disconnection of any one power-supply cord shall automatically cause de-energization of all circuits within the vending machine and accessory.
		<i>New clause added;</i>
16.1.14		With reference to 16.1.13, if a vending machine does not automatically de-energize all circuits, then the vending machine shall be provided with the marking specified in 81.8.
		<i>New clause added;</i>
		A cord connected vending machine and any intended accessory(ies) provided with more than one power supply cord shall comply with all of the following:
		a) The equipment shall consist of two separate units joined together;
		b) Not more than two cords shall be provided;
16.1.15		c) Each cord shall be of the type and rating specified in 16.1.8 and provided with an equipment grounding conductor in accordance with 16.1.12;
		d) Each attachment plug shall be as specified in 16.1.9 – 16.1.11;
		e) The markings specified in 81.9(a) and (c) shall be provided; and,
		g) The instructions shall contain the information specified in 80.3.4.
		<i>New clause added;</i>
16.1.16		In reference to 16.1.15, if the combined rated current input to both supply cords exceeds 80 percent of the branch circuit to which the equipment will be connected, then the unit or cord with the highest rated current input shall be marked adjacent to the supply cord in accordance with 81.9(b).



CLAUSE	VERDICT	COMMENT
24	Info	Motors
24.3	Info	Protective electronic circuits
		A protective electronic circuit providing motor protection in accordance with Overload Protection, Section 24.2 shall comply with one of the following:
24.3.1		<ul style="list-style-type: none"> a) UL 991 b) UL 60730-1 and the specific applicable UL 60730 Part 2 Standard. c) Paragraph 26.25 and the Protective Electronic Circuits Tests, Section 76; or, d) Not create any risk of fire, electric shock or injury to persons under abnormal conditions with the protective electronic circuit rendered ineffective (open or short-circuited), e.g. use of a redundant circuit or control.
24.3.2		<p>With reference to 24.3.1, <u>the following items shall be considered when evaluating the acceptability of a motor protective electronic circuit: the acceptability of a motor protective electronic circuit when applying the Standard for Tests for Safety Related Controls Employing Solid State Devices, UL 991 the following items (a) – (h) shall be considered. When applying the Standard for Automotive Electrical Controls for Household and Similar Use, Part 1: General Requirements, UL 60730-1, or the requirements in 26.22 and Proactive Electrical Circuit Tests, Section 76 the following items (a) – (k) shall be considered.</u></p> <ul style="list-style-type: none"> f) Radio-frequency electromagnetic field immunity: radiated electromagnetic fields – field strength of 3 V/m <u>Evaluate in accordance with 76.3.4 and 76.3.2;</u>
24.3.3		<p>Software in a protective electronic circuit required as part of a motor protective device or system shall comply with one of the following standards:</p> <ul style="list-style-type: none"> a) UL 1998 b) UL 60730-1 as well as the specific applicable Part 2 and be software Class B. c) UL 60335-1 and be software Class B; or d) Not create any risk of fire, electric shock or injury to persons under abnormal conditions with the software rendered ineffective, e.g. use of independent redundant protective devices.
26	Info	Switches and Controllers
		Except as specified in 26.11, a protective control shall comply with one of the following standards:
26.8		<ul style="list-style-type: none"> a) UL 873 b) UL 60730-1 and UL 60730-2-6. The endurance cycle requirements in Table AA.1DV of UL 60730-2-6 for cut-outs shall be applied. c) UL 60730-1 and UL 60730-2-9. The endurance cycle requirements in Table CC.2 of UL 60730-2-9 for cut-outs shall be applied. d) UL 353 e) UL 508. f) UL 1054 g) UL 61058-1; or h) Paragraph 26.25 and the Protective Electronic Circuits Tests, Section 76.



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26.20		An operating control complying with 26.15 shall also comply with the following: a) For electronic controls – Installation Class 2 for electromagnetic compatibility (EMC) shall be in accordance with Electromagnetic Compatibility (EMC) – Part 4-5: Testing and Measurement Techniques – Surge Immunity Test, IEC 61000-4-5 <u>the voltage surge testing in 76.3.6 and comply with the results specified in 76.3.2;</u>
27	Info	Remotely Operated Vending Machines
27.5		A control that operates in response to remote operation commands, external communication or data signals shall not introduce an operating condition or state that could lead to a risk of fire, electric shock or injury to persons. In addition, such a control shall not: e) <u>Allow remote shut-off of a vending machine intended for use with potentially hazardous foods; or,</u>
28	Info	Capacitors <i>New clause added;</i>
28.4		In reference to 28.3, a capacitor shall consist of a single Class Y1 capacitor or two Class Y2 capacitors connected in series if it is connected between: a) Two line conductors in a primary circuit; b) One line conductor and the neutral conductor; c) Primary and accessible secondary circuits; or, d) The primary circuit and protective earth (equipment grounding conductor connection).
37	Info	Optical Isolators and Semiconductor Devices
37.1.1		In addition to complying with 37.1, an optical isolator relied upon to provide feedback between primary and secondary circuits of a switch mode power supply unit shall have a minimum isolation voltage of 1500 V.
37.2		A power switching semiconductor device that is relied upon to provide isolation to ground shall comply with UL 1557. <u>If the switching semiconductor is used as part of a switch mode power supply unit, it shall have a minimum isolation voltage of 1500V.</u>
39	Info	Power Supplies
39.1		A power supply shall comply with one of the following: a) For a Class 2 Power Supply, UL 1310 or UL 60950-1, and with the Class 2 or limited power source requirements. b) For a power supply that is other than Class 2, UL 1012 or UL 60950-1; or c) <u>For a switch mode power supply unit not complying with (a) or (b), the relevant requirements in this Standard, including the Switch Mode Power Supply Units – Overload Test, Section 66A, shall be applied.</u>



CLAUSE	VERDICT	COMMENT
48	Info	Accessories
		<i>New clause added;</i>
48.1.1		A vending machine shall comply with all the requirements of this standard with or without the accessory installed.
		<i>New clause added;</i>
48.5.1		An accessory strain-relief means shall be provided for the wiring if there is a possibility of transmitting stress to the terminal connections during installation. The strain-relief shall comply with the Strain Relief Test, Section 68.
		<i>New clause added;</i>
48.5.2		Unless correct connections are evident, the wiring connections for the accessory shall be identified on both the accessory and on the vending machine.
		<i>New clause added;</i>
48.5.3		The accessory mounting location shall be: a) Identified on the vending machine; or b) Fixed due to the function of the accessory and its arrangement within the vending machine. In this case, the accessory installation instructions shall specify the mounting location of the accessory.
		<i>New clause added;</i>
48.5.4		Accessories intended for connection to a source of field power supply independent of that of the vending machine shall comply with the requirements in: a) Section 16 if intended to be a cord-connected accessory. b) Section 17 if intended to be a permanently connected accessory. A permanently connected accessory shall not be used with any supply cord connected equipment.
54	Info	Pressure-Relief Devices
54.9		If a pressure relief device is required, the pressure-limiting control responsible for limiting the pressure in the vessel shall perform under rated load for 100,000 cycles of operation in accordance with the Standard for Temperature indicating and Regulating Equipment, UL 873 <u>comply with 26.8(b) and 26.14.</u> It shall also prevent the pressure from exceeding 90 percent of the relief device setting under any condition of normal operation. Exception: A pressure limiting control is not required to comply with UL 873 if it complied with the Standard for Automatic Electrical Controls for Household and Similar Use, Part 1: General Requirements, UL 60730-1 and the specific applicable UL 60730 Part 2 Standard.



CLAUSE	VERDICT	COMMENT
66A		<i>New section added;</i> Switch Mode Power Supply Units – Overload Test
66A.1		The test applies to switch mode power supply units as specified in 39.1(c).
66A.2		Each output winding, or section of a tapped winding, is overloaded in turn, one at a time, while the other windings are kept loaded or unloaded, whichever load conditions of normal use is the least favorable.
66A.3		Overloading is carried out by connecting a variable resistor (or an electronic load) across the power supply output. The resistor is adjusted as quickly as possible and readjusted, if necessary, after 1 minute to maintain the applicable overload. No further readjustments are then permitted.
66A.4		For this test, any protective devices such as a fuse, manual reset circuit protector, thermal protector, etc. are allowed to remain in the circuit.
66A.5		If overcurrent protection is provided by an overcurrent protection device, the overload test current is the maximum current which the overcurrent protection device is just capable of passing for 1 hr. If this value cannot be derived from the specification, it is to be established by test.
66A.6		If no overcurrent protection is provided, the maximum overload is the maximum power output obtainable from the power supply.
66A.7		In case of voltage foldback, the overload is to be slowly increased to the point which causes the output voltage to collapse. The overload is then established at the point where the output voltage recovered and held for the duration of the test.
66A.8		The duration of the test is to be for 7 hours or until ultimate results are reached. At the conclusion of the test, there shall be no charring or burning of electrical insulation, no opening of any protective device or any circuit component.
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.		