

# STANDARDS UPDATE NOTICE (SUN)

## ISSUED: March 29, 2018

**Standard Number:** UL 399

**Standard Name:** Standard for Drinking-Water Coolers

**Standard Edition and Issue Date:** 8<sup>th</sup> Edition Dated March 30, 2017

**Date of Revision:** March 30, 2017

**Date of Previous Revision of Standard:** 7<sup>th</sup> Edition Revision Dated October 18, 2013.

**Effective Date:** **March 30, 2019**

**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requests in writing that current requirements be used along with their understanding that their listings will be withdrawn on Effective Date noted above, unless the product is found to comply with new/revised requirements.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:

- Align controls requirements with water heater controls requirements.
- Revisions to Supplement SB for drinking water coolers employing a flammable refrigerant.
- Addition of requirements for remotely operated drinking water coolers.
- Addition of requirements for household drinking-water coolers incorporating button or coin cell batteries.

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 – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records.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



## STANDARD INFORMATION

CLAUSE	VERDICT	COMMENT
		<i>Additions to existing requirements are <u>underlined</u> and deletions are shown <del>lined out</del> below.</i>
6	Info	<b>Installation And Operating Instructions</b> <i><b>New clause added;</b></i>
6.7		In reference to 22.4, the instructions for a water cooler intended to be remotely operated and in which the water cooler attachment plug and receptacle serve as the manual means for disconnecting remote operation commands, external communication or data signals shall specify that unplugging the water cooler disconnects the remote functions.
9	Info	<b>Assembly</b>
9.2	Info	<b>Pressurized beverage product system</b>
9.2.2		A pressure-relief valve complying with either 54.3 or <u>with the Start-To-Discharge Test in Section 82</u> shall be installed in a pressurized beverage product system. There shall be no shutoff valve between the relief valve and any parts of the system under pressure.
17	Info	<b>Bonding for Grounding</b>
17.16		<i><b>New clause added;</b></i> Functional grounding shall not be relied upon for equipment grounding or bonding.
18		<i><b>New section added;</b></i> <b>Button or Coin Cell Batteries</b>
18.1		A product, or any accessory of the product such as a wireless control, intended for use with one or more single cell batteries shall comply with 18.2 if the batteries are sized with a maximum:  a) Diameter of 1.25 inches (32 mm); and b) Height that is less than its diameter.



---

A product for household use and provided with one or more batteries as specified in 18.1 shall comply with the Standard for Products Incorporating Button or Coin Cell Batteries of Lithium Technologies, UL 4200A or be intended for one of the following:

18.2

- a) Countertop use only;
- b) Built-in, column mount or wall-hung installation and with the batteries located at a height not less than 4 feet (1.2 m) above the floor; or
- c) Use where the batteries are not intended to be replaced and are not referenced in the product markings or in any instructions provided with the product.

---

21

Info

### **Switches And Controllers**

#### ***New clause added;***

Except as specified in 21.9, a switch or other control device shall have current rating(s) based on the use applications specified in (a) – (d) and be acceptably rated for voltage, power factor, control device ambient temperature and other similar parameters as determined by the Temperature and Pressure Test, Section 62. Power factor requirements for each specific load type are specified in 74.5(a) – (d).

a) A manually operated control device having a marked off position and intended to control a hermetic refrigerant motor-compressor with or without other loads shall have a current rating that is at least 115 percent of the sum of:

21.8

- 1) The rated load current, maximum rated current or branch-circuit selection current of the motor-compressor, whichever is greater, and
- 2) The rated current of any other controlled loads.

b) A control device intended to control a motor load, such as a motor-compressor, shall have a current interrupting capacity equal to the larger of the locked-rotor current, maximum operating current or maximum rated current of the largest motor load plus the full load or maximum operating current of any other loads controlled by the switch.

c) A control device intended to control an inductive load, such as a transformer, shall have a current rating of not less than twice the total marked current ratings of the inductive loads that it controls.

d) Any switch or control device other than as specified in (a) – (c) shall have a current rating not less than the load it controls as determined by the Temperature and Pressure Test, Section 62.

---

#### ***New clause added;***

21.9

A switch or other control device not complying with 21.8 shall comply with the Overload and Endurance Test for Operating Controls, Section 74.

---



---

***New clause added;***

21.11 Except as specified in 21.12, a temperature limiting (protective) control or replaceable thermal cutoff shall be provided to protect a water heater in a drinking water cooler against risk of fire or electrical shock. Compliance shall be determined by conducting the Burnout Test, Section 75, with the water heater operated dry and with any water heater temperature regulating (operating) controls electrically bypassed.

---

***New clause added;***

21.12 In reference to 21.11, a water heater not provided with or protected by a temperature limiting (protective) control or replaceable thermal cutoff shall comply with the Burnout Test in Section 75.1 with the water heater operated dry and with any water heater temperature regulating (operating) controls electrically bypassed.

---

***New clause added;***

A protective control, other than a motor or motor-compressor overload protective device (covered in Section 24), shall comply with one of the following:

- 21.13
- a) Standard for Temperature-Indicating and Regulating Equipment, UL 873. The control shall comply with the endurance cycle requirements for safety controls in Table 46.1 of UL 873.
  - b) 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. The endurance cycle requirements in Table AA.1DV of UL 60730-2-6 for cut-outs shall be applied.
  - c) 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 Temperature Sensing Controls, UL 60730-2-9. The endurance cycle requirements in Table CC.2 of UL 60730-2-9 for cut-outs shall be applied.
  - d) Standard for Limit Controls, UL 353.
  - e) Standard for Industrial Control Equipment, UL 508.
  - f) Standard for Switches for Appliances – Part 1: General Requirements, UL 61058-1; or
  - g) Paragraph 21.32 and the protective electronic circuits tests in Section 83.

---

***New clause added;***

21.15 A water heater protective temperature control not complying with the endurance requirements specified in 21.13 or 21.14 shall comply with the Water Heating Protective Controls Endurance Tests in 73.1.

---



---

***New clause added;***

- 21.16 In reference to 21.13(b), (c), (f) and (g), when determining the acceptability of a protective control, the control pollution degree shall be as specified in 48.3(a) – (d). In addition, if the protective control:
- a) Has a protective electronic circuit, the factors in Table 24.2 shall be considered; and
  - b) Uses software as a required part of the protective electronic circuit, the software shall comply with 24.5.2(b) or (c).

---

***New clause added;***

- 21.19 A water heater temperature protective control shall comply with the calibration requirements specified by one of the following:
- a) Section 44 (Calibration-Verification Test) of UL 873 with the water heater temperature limiting control requirements being applied;
  - b) Table AADV.1 of UL 60730-2-9 with the storage water heater thermal cut-out requirements being applied; or
  - c) Water Heating Protective Controls Calibration Test in 73.2 such that the protective control:
    - 1) Opens within  $\pm 5^{\circ}\text{F}$  ( $\pm 3^{\circ}\text{C}$ ) of the control set-point temperature as declared by the manufacturer; and
    - 2) Does not vary from the control initial (as-received) opening temperature by more than  $10^{\circ}\text{F}$  ( $6^{\circ}\text{C}$ ) or 5 percent, whichever is greater, following the Water Heating Protective Controls Endurance Tests in 73.1.

---

***New clause added;***

- 21.20 If the Water Heating Protective Controls Endurance Tests in 73.1 are conducted, the protective temperature control shall comply with the calibration requirement in 21.19(c)(2) following the endurance cycling of the control.

---

***New clause added;***

- 21.21 For a temperature protective control other than a water-heater temperature protective control, the cutout calibration temperature shall be  $\pm 10^{\circ}\text{F}$  ( $\pm 6^{\circ}\text{C}$ ) of its maximum marked set-point temperature.

---

***New clause added;***

- 21.22 The cutout calibration pressure of a pressure protective control (pressure-limiting device) shall not exceed 105 percent of its maximum marked setting.
-



---

***New clause added;***

An operating control not complying with 21.19:

21.24

- a) Shall be powered entirely by no more than one extra-low-voltage circuit; comply with the Limiting Impedance Test in UL 508; or comply with the low-power test requirement determined as specified in Clause 19.11.1 of UL 60335-1; and
- b) If used to control a motor-compressor, shall comply with the endurance cycle requirements in UL 60730-2-9, Table CC.2 for air conditioning and refrigeration applications.

---

***New clause added;***

An operating control complying with 21.19 shall also comply with the following:

21.25

- a) For electronic controls – Installation class 2 for electromagnetic compatibility (EMC) shall be in accordance with IEC 61000-4-5;
- b) Category II shall be the overvoltage category;
- c) Insulating materials shall have a minimum comparative tracking index (CTI) of 100 (material group III);
- d) The applicable Pollution Degree shall be as specified in 48.3, sub-items (a) – (d); and
- e) The endurance cycle requirements specified by either of the following:
  - 1) Table CC.2 of UL 60730-2-9 with the operating control (limiters) endurance cycle requirements being applied; or
  - 2) The Overload and Endurance Test for Operating Controls, Section 74.

---

***New clause added;***

21.26

If an operating control complying with 21.19 indirectly controls the load through a switching device, the endurance cycle requirements in 21.25(e) shall be applied to the switching device.

---

***New clause added;***

21.29

Appendix B, Operating and Protective (“Safety Critical”) Control Functions, shall be referenced to determine whether a control function is considered to result in a risk of fire, electrical shock or injury to persons.

---



---

***New clause added;***

21.30

If a control can be used to reduce the risk of fire, electric shock or injury to persons under abnormal operating conditions of the appliance, but a redundant control (of similar or different design) operates to perform the identical function, the circuit shall be evaluated to determine which control will be relied upon as the protective control. The control determined to be the protective control shall comply with the protective control requirements in 21.13. The control determined to be the operating control is not required to comply with the protective control requirements but shall comply with the operating control requirements in 21.24 or with 21.19 and 21.25.

---

***New clause added;***

21.31

A thermistor shall comply with Annex J of the Standard for Automatic Electrical Controls for Household and Similar Use, Part 1: General Requirements, UL 60730-1 or the Standard for Thermistor-Type Devices, UL 1434. The calibration shall be as specified in 21.19 if used as part of a water heater temperature protective control or in accordance with 21.21 if used with other controls. If a thermistor is used:

- a) To reduce the risk of fire, electric shock or injury to persons under abnormal operating conditions of the appliance, the minimum number of endurance cycles shall be 100,000.
- b) In other sensing applications of the appliance, the minimum number of endurance cycles shall be 6,000.

---

21.32

A protective control as referenced in 21.13(g) or 24.5.1(c) and having a protective electronic circuit:

- a) In which electronic disconnection of the circuit could fail, shall have at least two components whose combined operation provides the load disconnection;
- b) Shall prevent a risk of fire, electric shock or injury to persons under the relevant fault conditions specified in Section 83.2;
- c) In which an overcurrent protective device opens during application of any of the fault conditions specified in 83.2, shall utilize an overcurrent protective device complying with the requirements applicable to that component. The fault condition causing the overcurrent protective device to open shall be repeated and the overcurrent protective device shall again open the protective electronic circuit. If the overcurrent protective device complies with IEC 60127-1 Standard for Miniature Fuses: Part 1, Definitions for Miniature Fuses and General Requirements for Miniature Fuse-Links as well as an applicable Part 2, then the protective device shall additionally comply with the Fuse-Link Test in Section 83.5;
- d) In which a conductor of the printed wiring board becomes open-circuited during the fault conditions test in 83.2, then:

- 1) The printed wiring board shall comply with the Needle-Flame Test in Annex E of Standard for Safety of Household and Similar Electrical Appliances, Part 1: General Requirements, UL 60335-1 or have a minimum flammability rating of V-0 when tested in accordance with the vertical flame test



---

described in the Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances, UL 94;

- 2) Any loosened conductor shall not reduce spacings below the values specified in the relevant Sections 46 – 48; and
- 3) The specific test in which the printed wiring became open-circuited shall be repeated a second time. There shall be no risk of fire, electric shock or injury to persons and spacings shall not be reduced below the values specified in the relevant Sections 46 – 48.

e) Shall maintain its required functions when subjected to the EMC related stresses specified in the Electromagnetic Compatibility (EMC) Tests, Section 83.3; and  
f) That relies upon a programmable component for one or more of its safety functions shall be subjected to the Programmable Component Reduced Supply Voltage Test, Section 83.4, unless restarting at any point in the operating cycle after interruption of operation due to a supply voltage dip will not result in a risk of fire, electric shock or injury to persons. The test shall be carried out after removal of all batteries and other components intended to maintain the programmable component supply voltage during supply source (mains) voltage dips, interruptions and variations.

---

***New section added;***

22

**Remotely Operated Water Coolers**

This section contains requirements for any water cooler function enabled in response to external communication or data signals (see standard for details).

---

25

Info

**Electric Water Heaters**

---

***New section added;***

25.2

**Water heater thermal cutoffs**

---

25.2.1

Thermal cutoffs shall comply with the requirements in the Standard for Thermal-Links – Requirements and Application Guide, UL 60691.

---

25.2.2

A thermal cutoff shall be secured in place and located so that:

- a) It will be accessible for replacement without damaging other connections; and
- b) Replacement of the thermal cutoff will not result in displacement or disturbance of internal wiring other than leads to the cutoff itself or to a heating element assembly on which the cutoff is mounted.

---

44

Info

**Across-The-Line Capacitors, Antenna-Coupling Components, Line-Bypass Components and Fixed Capacitors for Use in Electronic Equipment**

---





---

***New clause added;***

In reference to 44.1, a capacitor complying with UL 60384-14 shall have specifications as follows:

- 44.2
- a) Operating voltage – Not less than 110 percent of the water cooler rated voltage;
  - b) For capacitors connected across the line (phase-to-phase) – Subclass X1 ( $\leq 4.0$  kV) or X2 ( $\leq 2.5$  kV) for impulse voltage (based on minimum Overvoltage Category of II);
  - c) For capacitors connected from line to ground – Subclass Y1 or Y2 for any water coolers having a rated voltage not exceeding 500 volts; or as an alternate, subclass Y4 if a water cooler has a rated voltage not exceeding 150 volts;
  - d) Upper category temperature – Based on the maximum capacitor surface temperature measured during the Temperature and Pressure Test in Section 62, but not less than 185°F (85°C);
  - e) Lower category temperature – Based on the minimum surface temperature for which the capacitor has been designed to operate when installed within a water cooler as intended, but not greater than 149°F (minus 10°C);
  - f) Duration of the damp-heat steady-state test – Not less than 21 days; and
  - g) Passive flammability category B or C. As an alternate, a polymeric capacitor case shall have a V-0 flame rating as described in the Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances, UL 94.

---

***New section added;***

45

**Information Technology Equipment**

45.1 Information technology equipment such as a printer, visual display unit, router, communication connectors/data ports or computer shall comply with the Standard for Information Technology Equipment, Part 1: General Requirements, UL 60950-1.

73

Info

**Water Heating Protective Controls Tests**

73.1

Info

**Endurance test**

---

***New clause added;***

73.1.7

After the endurance test, a water heater protective control is to be subjected to the Calibration Test specified in 73.2.2 – 73.2.5 and the control initial (as-received) opening temperature is to be compared with the control opening temperature following the endurance test. The protective control shall comply with the calibration requirement in 21.19(c)(2).

73.2

Info

**Calibration test**

---



---

### Calibration test

- 73.2.1 A water operating (temperature regulating) control, see 45.1.2(a), and a protective (temperature limiting) control, see 45.1.2 (b) or (c), shall comply with one of the following pertaining to the calibration of protective (temperature limiting) controls:
- a) The Temperature Indicating and Regulating Equipment, UL 873 ; or
  - b) 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 Temperature Sensing Controls, UL 60730-2-9.

A water heater temperature protective control not complying with the calibration requirements specified in 21.19(a) or (b) shall comply with 21.19(c) when tested as specified in 73.2.2 – 73.2.5.

---

#### ***New clause added;***

- 73.2.2 The calibration-verification tests on a water heater temperature protective control are to be performed on representative production samples that have been produced and calibrated within the same tolerances permitted in factory production. The set-point temperature declared by the manufacturer for the sample is to be the maximum for which the device is intended. The tests are to be performed in a manner that will provide a true and measurable sensing-element temperature.

---

#### ***New clause added;***

- 73.2.3 Thermocouples are to be attached to the sensing element, on an adjacent identical element, or located in air adjacent to the element. Indication of cutout is to be obtained by a low-energy circuit of such value as to not provide a current assist, and the cutout temperature is to be determined as the average of two trials.

---

#### ***New clause added;***

- 73.2.4 A protective temperature control is to be tested in accordance with one of the following:
- a) Immersion-element type controls are to be tested with the element inserted into a circulating-water system; or
  - b) Other types of controls are to be mounted in an air oven having forced circulation of at least 100 feet (30.5 m) per minute, and designed so as to nullify the effects of radiation.
-



		<b><i>New clause added;</i></b>
73.2.5		Prior to calibration verification, uniform temperatures of all parts of a control are to be maintained by holding the temperature approximately 20°F (11°C) below the set point until conditions of equilibrium have been established. The temperature is then to be raised at a rate of not more than 1.0°F (0.5°C) per minute until the control functions.
		<b><i>New section added;</i></b>
74		<b>Overload and Endurance Test for Operating Controls</b>
		This section contains requirements for overload and endurance test for operating controls (see standard for details).
		<b><i>New section added;</i></b>
82		<b>Start-To-Discharge Test</b>
82.1		Pressure-relief device not complying with 54.3 but used in a pressurized beverage product system, shall relieve at a pressure not exceeding its rated start-to-discharge pressure.
82.2		Three samples of the pressure-relief device are to be tested. Each sample is to be connected to a gas source, such as air, carbon dioxide, or nitrogen, but oxygen or any flammable gas is not to be used. The sample is to be immersed in water, and the pressure is to be gradually increased until the device starts to discharge as evidenced by the occurrence of bubbles in the water. The highest value obtained in tests of the three samples is to be used to determine compliance with 82.1.
		<b><i>New section added;</i></b>
83		<b>Protective Electronic Circuit Tests</b>
		This section contains requirements for appliances provided with a protective electronic circuit (see standard for details).
		<b><i>New section added;</i></b>
96		<b>Protective Electronic Circuit Test</b>
96.1		The manufacturer shall periodically conduct a test of the protective electronic circuit to verify the device is functional for protecting against conditions that could cause risk of fire, electric shock or injury to persons.
Supplement SB	Info	<b>REQUIREMENTS FOR DRINKING WATER COOLERS EMPLOYING A FLAMMABLE REFRIGERANT IN THE REFRIGERATING SYSTEM</b>
SB4	Info	<b>Construction</b>
SB4.2	Info	<b>Tubings and fittings</b>




---

***New clause added;***

A part of the water cooler that is charged on site and requires brazing or welding in the installation shall not be shipped with a flammable refrigerant charge. Joints made in the installation between parts of the refrigerating system, with at least one part charged, shall be made in accordance with the following:

SB.4.2.3

- a) A brazed, welded, or mechanical connection shall be made before opening the valves to permit refrigerant to flow between the refrigerating system parts. A vacuum valve shall be provided to evacuate the interconnecting pipe and/or any uncharged refrigerating system part;
- b) Refrigerant tubing shall be protected or enclosed to avoid damage; and
- c) Flexible refrigerant connectors that may be displaced during normal operations shall be protected against mechanical damage.

---

SB6

Info

**Marking, Installation and Operating Instructions**

---

SB6.2

Info

**Installation and operating instructions**

---

***New clause added;***

SB6.2.4

Installation clearances used during the Leakage Test in accordance with SB5.1.1.4 shall be specified in the installation and operating instructions.

---

***New appendix added;***

Appendix B

**Operating and Protective (“Safety Critical”) Control Functions**

This appendix contains requirements for safety critical control functions (see standard for details).

---

**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.