



**Summary of Substantive Changes  
between the 2013 and the 1989 editions of  
CSA C22.2 No. 218.1 “Spas, hot tubs, and associated equipment”**

**Presented to the IAPMO Standards Review Committee on March 10, 2014**

**General: General:** The changes to this standard might have an impact on currently listed products. The substantive changes are:

- Expanded the scope to include electrolytic chlorine and bromine generators (see Clauses 1.2 and 9 and Figures 3, 4, and 5)
- Added requirements for underwater lighting control equipment to be protected by a GFCI (see Clause 4.1.2)
- Added marking requirements for spa and hydro massage control panels (see Clause 4.29)
- Added additional marking and instruction requirements for permanently connected spas and hot tubs (see Clauses 5.1.4 and 5.5)
- Changed the allowable leakage current between two controls and for pure DC power (see Clauses 6.4.1.6, 6.4.2.2, 6.7.2.4 and 6.7.4.4 and Table 6)

Clause 1 Scope:

Clause 1.2: Expanded the scope to include electrolytic chlorine and bromine generators as follows: *Clauses 4 to 6 apply to spas and hot tubs. Clauses 7 to 9 apply to associated equipment, as follows:*

c) [Clause 9 — electrolytic chlorine and bromine generators.](#)

Clause 4.1.2, Ground fault circuit interrupter (GFCI): Clarified the type of equipment to be protected and added requirements for underwater lighting control equipment as follows:

4.1.2.1

~~Electrical equipment~~ [Each permanently-connected unit and each cord-connected unit shall be protected by a Class A ground fault circuit interrupter...](#)

[4.1.2.2](#)

[A control intended to power or switch an underwater luminaire that is not an integral part of a spa or hot tub shall include a ground-fault circuit-interrupter to protect the underwater luminaire circuit.](#)

[4.1.2.3](#)

[In a control or in an equipment assembly intended to control field installed underwater lighting, the conductors on the load side of the ground-fault circuit-interrupter provided to protect an underwater lighting circuit shall not occupy boxes or enclosures containing other conductors unless the additional conductors are also protected by a ground-fault circuit-interrupter.](#)

[Note: Conductors on the load side of a ground-fault circuit-interrupter provided to protect an underwater lighting circuit may occupy the same boxes or enclosures as other conductors if the conductors are](#)



separated by a barrier or if the conductors are segregated, routed, or secured to provide permanent spacing from all other insulated or uninsulated live parts.

#### 4.1.2.4

An enclosure for a control or equipment assembly that contains terminals or conductors on the load side of a ground-fault circuit-interrupter provided to protect the field-installed conductors of an underwater lighting circuit shall be marked as specified in Clause 4.29.4, as applicable, to indicate that the field conductors shall not occupy conduit, boxes, or enclosures with the conductors of other circuits unless all other conductors are also on the load side of a ground-fault circuit-interrupter.

Clause 4.29, Spa and hydro massage control panels: Added marking requirements for spa and hydro massage control panels as follows:

#### 4.29.4

A control that has terminals on the load side of a ground-fault circuit-interrupter provided to protect the field-installed conductors of an underwater lighting circuit shall be marked to indicate that the field-installed conductors shall not occupy conduit, boxes, or enclosures with the conductors of other circuits unless all other conductors are also on the load side of a ground-fault circuit-interrupter.

#### 4.29.5

When required by Clause 4.1.2.3, a control intended to power or switch a field-installed underwater luminaire that complies with the CSA C22.2 No. 89 shall be marked with the following or equivalent: "This control is not provided with integral GFCI protection for the lighting circuit. When this control is used to power or switch an underwater luminaire, suitable GFCI protection shall be provided in the field".

#### 4.29.6

A control that has provisions for connecting or controlling more than one load such as a pump, blower, or light shall be marked to indicate the intended load for each output. Additionally, it shall be marked to indicate the maximum electrical ratings for each output load.

Clause 5 Marking: Added additional marking and instruction requirements for permanently-connected spas and hot tubs as follows:

#### 5.1 Visible after installation

##### 5.1.4

A permanently-connected spa and hot tub shall be marked with the minimum supply conductor ampacity and the ampere rating of the supply conductor overcurrent protective device.

Note: Where the overcurrent protective device is a fuse, it shall be considered to be a "time delay", "D" type unless otherwise specified.

#### 5.3 Instruction manual

##### 5.5

The installation instructions for a permanently-connected spa and hot tub shall specify the minimum supply conductor ampacity and the ampere rating of the supply circuit overcurrent protective device.



Clause 6, Tests: Changed the allowable leakage current between two controls and for pure DC power for the Leakage current test , Leakage current abnormal test, Extra-low voltage isolated circuits test and Leakage current test for a Control providing two levels of mechanical protection, Clauses 6.4.1.6, 6.4.2.2, 6.7.2.4 and 6.7.4.4 were revised as follows:

... *The leakage current shall not exceed 0.5 mA [that specified in Table 6](#).*

Clause 6.5 Water Temperature: A test to determine compliance of temperature limiting controls was removed as follows:

**6.5.2**

*To determine compliance with the temperature requirement in Clause 4.24, the unit shall be operated as described in Clause 6.3 with the regulating control shunted, or the heater otherwise wired so that the limit control will be the only device in the circuit that will limit the temperature of the water. The results shall be acceptable if the temperature of the water at the inlet(s) to the tub does not exceed 50°C.*

Clause 9, Electrolytic chlorine and bromine generators: Added requirements for electrolytic chlorine and bromine generators.

Table 6, Risk of electric shock limits: Added the following table to specify allowable leakage current between locations:

<u>Location</u>	<u>Limit, mA, 50 or 60 Hz</u>	<u>Limit, mA, pure</u>
	<u>AC</u>	<u>DC†</u>
<u>Current circulating in the water from two points immersed in the water</u>	<u>0.5</u>	<u>2.0</u>
<u>tub water and ground</u>	<u>0.5</u>	<u>2.0</u>
<u>Any point accessible to the tub occupant and ground</u>	<u>0.5</u>	<u>2.0</u>
<u>Any point on the tub control and ground*</u>	<u>0.5</u>	<u>2.0</u>
<u>Any two points on the tub control, or between two controls*</u>	<u>5.0</u>	<u>30.0</u>

*\* The outer layer of a membrane switch shall not be relied upon for mitigation of the risk of electric shock.*

*† DC current is considered to be pure dc only if it is confirmed through test that the peak-to-peak value of ripple in the current is not more than 10% of the dc current.*

*Note: The 0.5 and 2.0 mA limits specified correspond to the startle current threshold. The 5.0 and 30 mA limits specified correspond to the let-go current threshold.*

Added the following new figures for electrolytic chlorine and bromine generator requirements:

[Figure 3 Current density test probe \(See Clause 9.6.2.3.\)](#)

[Figure 4 Current density test probe for measuring current density of a solution \(See Clause 9.6.2.3.\)](#)

[Figure 5 Test circuits for measurement of current in series with a ground conductor \(See Clause 9.6.4.3.3.\)](#)