STANDARDS UPDATE NOTICE (SUN)
ISSUED: August 16, 2018

STANDARD INFORMATION

This SUN establishes the Continuing Certification approach to Information Technology Equipment to be Installed Outdoors

Standard Number: UL 60950-22 / CSA C22.2 No. 60950-22
Standard Name: Information Technology Equipment - Safety - Part 22: Equipment to be Installed Outdoors
Standard Edition and Issue Date: 2nd Edition Dated March 31, 2017
Date of Revision: March 31, 2017
Date of Previous Revision of Standard: December 19, 2011

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **No action is required for currently certified products to maintain certification.**

This SUN is being presented to assist users of the standard to appreciate the significance of the changes made to the standard that will apply should the product described be modified after January 1, 2022.

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requests in writing that current requirements be used along with their understanding that their listings will be withdrawn on Effective Date noted above, unless the product is found to comply with new/revised requirements.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

- More extensive requirements for battery ventilation
- Additional requirements for mains transient voltage
- Additional requirements for Protection for socket-outlet in outdoor locations
- New requirements for Protection from excessive dust

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 – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records.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
		Additions to existing requirements are underlined and deletions are shown lined out below.
4	Info	**Conditions for outdoor equipment**
4.2	Info	**Mains supply**
4.2.2		**Mains transient voltage on AC mains supply** Equipment that is part of the building installation, or that may be subject to transient overvoltages exceeding those for overvoltage category II, shall be designed for overvoltage category III or IV, unless additional protection is to be provided internally or externally to the equipment. In this case, the installation instructions shall state the need for such additional protection. Clearances in equipment designed for overvoltage category III or IV shall comply with Annex G of IEC 60950-1:2005. The insulation system used in such equipment shall be capable of withstanding the test voltage given in Table 5C of IEC 60950-1:2005/AMD2:2013.
4.2.3		***New clause added;*** **Mains transient voltage on DC mains supply** The transient on a D.C. MAINS SUPPLY depends on the source and the installation of the D.C. MAINS SUPPLY. When determining the D.C. MAINS TRANSIENT VOLTAGE, the installation and the source of the D.C. MAINS shall be taken into account. If these are not known, the MAINS TRANSIENT VOLTAGE on the D.C. MAINS SUPPLY shall be assumed to be 1,5 kV. The manufacturer shall declare the MAINS TRANSIENT VOLTAGE on the D.C. MAINS SUPPLY in the installation instructions.

6	Info	**Protection from electrical shock in an outdoor location**
6.3		***New clause added;*** **Protection for socket-outlet in outdoor locations** A residual current protective device (RCD) with rated residual operating current not exceeding 30 mA shall be used in the MAINS SUPPLY to socket-outlets intended for general use and with a rated current not exceeding 20 A. The RCD shall be an integral part of the equipment or of the building installation. If the RCD is part of the building installation, instructions for installations of the RCD shall be provided with the equipment.
9	Info	**Protection of equipment within an outdoor enclosure**
9.3	Info	**Protection from excessive dust**
9.3.1		~~**General**~~ ~~If the presence of excessive dust is a consideration, OUTDOOR EQUIPMENT shall have adequate protection against the ingress of the dust through the use of an appropriately rated IPXX ENCLOSURE, or equivalent.~~ Unless the equipment is developed according to the requirements of Pollution Degree 3, OUTDOOR EQUIPMENT shall have adequate protection against the ingress of the dust through the use of an appropriately rated IP5X or IP6X ENCLOSURE, or equivalent (e.g. an equivalent NEMA rated ENCLOSURE).
9.3.2		***New clause added;*** **IP5X equipment** Dust-proof equipment (first characteristic IP numeral 5) shall be tested in a dust chamber similar to that shown in Figure 2 of IEC 60529:1989, in which talcum powder is maintained in suspension by an air current. The chamber shall contain 2 kg of powder for every cubic meter of its volume. The talcum powder used shall be able to pass through a square-meshed sieve whose nominal wire diameter is 50 µm and whose nominal free distance between wires is 75 µm. It shall not have been used for more than 20 tests. The test shall proceed as follows: a) the equipment is suspended outside the dust chamber and operated at rated supply voltage until operating temperature is achieved; b) the equipment, whilst still operating, is placed with the minimum disturbance in the dust chamber; c) the door of the dust chamber is closed; d) the fan/blower causing the talcum powder to be in suspension is switched on; e) after 1 min, the equipment is disconnected and allowed to cool for 3 h whilst the talcum powder remains in suspension.

		NOTE: The 1 min interval between switching on the fan/blower and switching off the equipment is to ensure that the talcum powder is properly in suspension around the equipment during initial cooling, which is most important with smaller equipment. The equipment is operated initially as in item a) to ensure the test chamber is not overheated.
9.3.3		***New clause added;*** **IP6X equipment** Dust-tight equipment (first characteristic IP numeral 6) shall be tested in accordance with 9.3.2.
10	Info	**Mechanical strength of enclosures**
10.2		For equipment with an ENCLOSURE made of polymeric material, the ENCLOSURE of the equipment should be subjected to the low temperature conditioning before the impact test. Subsequently OUTDOOR ENCLOSURES and OUTDOOR EQUIPMENT are to be subjected to the impact test of 4.2.5 of IEC 60950- 1:2005/AMD1:2009 /AMD2:2013. Where the ENCLOSURE is made of polymeric material, the test is carried out at an ambient temperature equal to the minimum ambient temperature specified by the manufacturer or –33 °C if no minimum ambient temperature is specified, for 24 h. The test can be applied to a portion of the enclosure representing the largest unreinforced area, supported in its normal position. NOTE: For requirements in Finland, Norway and Sweden, see 4.1, Note 3. The impacts are applied to doors, covers, seams and the like which could affect the ingress of dust and moisture. The test is performed whether or not failure would give direct access to hazardous parts. The impacts are applied within 2 min of removal from the climatic chamber.
11	Info	**Outdoor equipment containing valve regulated or vented batteries**
11.1		**Risk of explosion from lead acid, NiCd and NiMH batteries** The compartment housing a valve regulated or vented battery, where gassing is possible during normal usage or over-charging, shall have adequate ventilation. In a compartment containing both, a battery and electrical components, the risk of ignition of local concentrations of hydrogen and oxygen by adjacent operational arcing parts, such as contactors and switches close to battery vents or valves, shall be controlled. This shall be achieved, for example, by the use of fully enclosed components, separation of battery compartments or adequate ventilation. The ventilation system shall be so constructed that any potential fault, including distortion of the battery cases due to overheating or thermal runaway, does not result in the ventilation system failing to vent explosive gasses.

If ventilation tubes are used for conducting explosive gas from the battery cases to the outside air, they shall not be the only means of eliminating the build-up of gas from the cabinet. An independent means of natural ventilation that adequately ventilates the enclosure containing the batteries shall be provided.

If mechanical or forced-air ventilation is used, adequate ventilation shall continue to be provided under single-fault failure conditions.

ENCLOSURES with mechanical or electromechanical dampers shall continue to provide adequate ventilation when the damper is in the closed position.

NOTE: Test methods and requirements for stationary batteries are given in IEC 60896-21, IEC 60896-22 and IEC 62485-2.

Compliance is checked by inspection of the ventilation system for compliance with the above, by verifying that the capability of the housing to ventilate hydrogen is in accordance with 11.2 and, if necessary, by the test in 11.3.

Boost charging shall be assumed, unless it can be verified that float charging is maintained under normal and single-fault conditions.

For charging conditions where the boost charge voltage exceeds those found in Table 3, the test in 11.3 shall be conducted.

New clause added;

Ventilation preventing an explosive gas concentration

The requirements of M.7 of IEC 62368-1:2014 apply.

Table 3 shall be used for the calculation of the ventilation air flow instead of Table M.1 of IEC 62368-1:2014.

11.2 For the purpose of calculating the area of ventilation openings required for natural ventilation of this subclause, the air velocity is assumed to be 0,1 m/s.

Alternatively, the following equation can be used:

$A = 28 \times Q$

where:

Q is the ventilation rate of fresh air (m^3/h);

A is the free area of openings in air inlet and outlet (cm^2)

New table added;

Values for current Ifloat and Iboost, factors fg and fs, and voltages Ufloat and Uboost

Table 3

Parameter	Lead-acid batteries vented cells Sb < 3 % [a]	Lead-acid batteries VRLA cells	NiCd batteries vented cells [b]
Gas emission factor fg	1	0,2	1
Gas emission safety factor fs (incl. 10 % faulty cells and ageing)	5	5	5
Float charge voltage Ufloat [c] V/cell	2,23	2,27	1,40
Typical float charge current Ifloat A/Ah	1	1	1
Current (float) Igas mA/ Ah (under float charge conditions relevant for air flow calculation)	5	1	5
Boost charge voltage Uboost [c] V/cell	2,40	2,40	1,55
Typical boost charge current Iboost mA/Ah	4	8	10
Current (boost) Igas mA/Ah (under boost charge conditions relevant for air flow calculation)	20	8	50
[a] For an antimony (Sb) content higher than 3 %, the current used for calculations shall be doubled. [b] For recombination type NiCd and NiMH cells consult the manufacturer. [c] Float and boost charge voltage can vary with the specific gravity of electrolyte in lead-acid cells.			
The values of float and boost charge current increase with temperature. The consequences of an increase in temperature, up to a maximum of 40 °C, have been accommodated in the values in Table 1. In case of use of gas recombination vent plugs, the gas producing current Igas the values for vented cells can be reduced to 50 % of the values for vented cells. The ventilation air volume requirements, for example, for two 48 V strings of VRLA cells in the same battery cabinet and each with 120 Ah rated C10 capacity amount, under float and under boost charge service conditions are: – service with float charge condition only: Q = 0,05 × 24 × 1 × 120 × 0,001 = 0,144 m3/h per string or 288 l/h total; – service with boost charge condition: Q = 0,05 × 24 × 8 × 120 × 0,001 = 1,15 m3/h per string or 2 300 l/h total.			

Annex C Info **Ultraviolet light conditioning test**

Test apparatus

C.1

Samples are exposed to ultraviolet light by using one of the following apparatus:

a) a twin enclosed carbon-arc, (see Clause C.3), with continuous exposure for a minimum of 720 h. The test apparatus shall operate with a black-panel temperature of (63 ± 3) °C in a relative humidity of (50 ± 5) %; or

		b) a xenon-arc (see Clause C.4), with continuous exposure <u>for a minimum of 1 000 h</u>. The test apparatus shall operate with a 6 500 W, water-cooled xenon-arc lamp, a spectral irradiance of 0,35 W/m2 at 340 nm, a black-panel temperature of (63 ± 3) °C in a relative humidity of (50 ± 5) %.
Annex D	Info	**Gasket tests**
D.3		**Compression test** This test is applicable to gaskets with closed cell construction. The set of specimens of gasket material shall be tested to the requirements of a), b) and c) (see Figure D.1). On completion of each test, the specimens shall not show signs of deterioration or cracks that can be seen with normal or corrected vision. a) A cylindrical weight sufficient to apply 69 kPa shall be placed on the middle portion of each specimen for a period of 2 h. At the end of that time the weight shall be removed and the specimen allowed to rest at a room temperature of 25 °C ± 3 °C for 30 min. The thickness of the gasket shall then be determined and compared with a measurement obtained before the application of the weight. The compression set shall not exceed 50 % of the initial thickness of the specimen. b) Following the test specified in a), the same specimens shall be suspended in an air oven at a temperature of 70° C for a period of 5 days. The specimens shall then be tested for compliance with a), approximately 24 h after removal from the oven. c) Following the test specified in b), the same specimens shall be cooled to ~~a temperature of 30°C~~ <u>the minimum temperature specified by the manufacturer or –33 °C if no minimum ambient temperature is specified</u> for a period of 24 h and then subjected to an impact from a hammer of 1,35 kg mass falling from a height of 150 mm upon removal from the cold chamber. The hammer head shall be steel, 28,6 mm in diameter and have a flat striking surface, 25,4 mm in diameter with slightly rounded edges. The specimens being tested shall be placed on short lengths of 50 mm by 100 mm minimum wooden pieces (clear spruce) when being impacted. Following the impact the specimens shall be examined for evidence of cracking or other adverse effects. The test shall be continued and the specimens impacted every 24 h for two more days. The specimens shall then be removed from the cold chamber, allowed to rest at a room temperature of 25 °C ± 3 °C for approximately 24 h, and then again tested for compliance with a).

	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.