

BSR/UL 924, Standard for Safety for Emergency Lighting and Power Equipment

1. Addition of a definition and requirements for directly controlled luminaires

4.13.1 Directly Controlled Luminaire - A luminaire with ALCR functionality to automatically override any control setting (such as dim or "off") and restore full (or some other pre-set) illumination level upon loss of normal power. The ALCR functionality can be integral to the luminaire or through a control signal input.

73.1.44 A directly controlled luminaire evaluated and found to comply with the applicable requirements of this standard is permitted to be marked "directly controlled luminaire."

73.1.45 A directly controlled luminaire whose emergency operation is dependent on receiving a specific control signal input shall identify the control signal generating device with which it has been found suitable. This shall be accomplished with a marking, such as "For use only with _____" (where the blank is to include the manufacturer and model number(s) of the qualified equipment) or "See www.xxx.com for compatible control equipment". The marking shall be permanent and visible after installation, per 73.1.2 and 73.1.3.

SG2.3.1 A luminaire whose light output under emergency power conditions can be set at less than full illumination shall be tested at the lowest available output setting or as identified in the installation and operating instructions.

SG3.3 The installation instructions for a luminaire whose light output under emergency operating conditions can be set, at the factory or in the field, at less than full illumination shall include guidance for setting the appropriate output level and the need to perform illumination measurements after installation to validate compliance with the applicable code requirements.

2. Test switch exemption for equipment with self-test/self-diagnostic capability

29.1 Emergency lighting and power equipment provided with an automatic load control relay switching device shall be provided with a manually operable test switch, or provisions for the connection of an external test switch, to simulate the conditions under which the load control relay switching device is intended to operate (such as loss of the normal supply). The test switch shall be evaluated per 47.6.

Exception: Equipment that has self-test/self-diagnostic capabilities in accordance with Self-Testing/Self-Diagnostic Equipment, Section 30, need not be provided with a manually operable test switch.

3. Clarification of battery standard references and compliance

22.2 A battery shall be of the rechargeable (secondary) type and shall include a protective housing (casing) that allows it to be handled without risk of damage to the cells contained. ~~comply with the Short Circuit, Abnormal Charging, and Forced-Discharge Tests of the Standard for Household and Commercial Batteries, UL 2054.~~

Exception: Lithium ion batteries shall comply with the same tests of the Standard for Lithium Batteries, UL 1642.

22.2.1 A rechargeable battery shall comply with the Standard for Household and Commercial Batteries, UL 2054. Cells within the battery that are constructed of lithium metal, lithium alloy or lithium ion shall additionally comply with the Standard for Lithium Batteries, UL 1642.

22.2.2 The location of a battery within the equipment housing, and the presence of current- or temperature-limiting components (such as resistors, fuses, or PTC thermistors) in the battery charging or discharge circuitry of the equipment, can be considered when determining compliance with the battery standards noted in 22.2.1.

4. Separate shipment of batteries

22.10 Central station and unit equipment is permitted to be shipped without the batteries it has been evaluated for use with when marked per 73.1.20 and provided with instructions per 73.1.11.

73.1.11 Instructions necessary for the intended installation, operation, and maintenance of equipment shall be permanently attached to the equipment. The instructions for central station and unit equipment shipped without batteries, as permitted by 22.10, shall identify the intended batteries by manufacturer and part number.

Exception No. 1: The instructions are permitted to be separately provided in a manual if the equipment is marked "See instruction manual for installation, operation, and maintenance instructions."

Exception No. 2: The instructions are permitted to be separately provided on a publicly accessible web site if the equipment is marked "See (specific URL inserted here) for installation, operation, and maintenance instructions."

73.1.20 Equipment incorporating or intended to incorporate batteries shall be marked with "CAUTION: Replace battery only with (blank) part number (blank) Install only (blank) battery. The first blank is to be filled in with the battery manufacturer (or equivalent) identification and the second blank is to contain the battery catalog designation. This information is to be placed on the unit in a location visible during battery replacement. Markings that appear only on the battery are not considered in compliance with this marking requirement.

Exception No. 1: This marking is not required if unit is marked in accordance with 73.1.14.

Exception No. 2: The marking is permitted to additionally, or alternatively, state "See (specific URL inserted here) for eligible battery types". The manufacturer shall maintain this website without restrictions (such as password or registration requirements).

5. Revision to the battery discharge test

48.3 Where lumen output measurements are to be made, in accordance with the Exception to 48.1, the tests are to be performed in a completely darkened room with dark colored walls. The light meter used is to be color and cosine corrected. The light meter is to be mounted approximately 6 feet (1.8 m) from the light source, located in a plane that is perpendicular to the light source, and at the same distance from the light source for the measurements after steps (c) and (j) of 48.6.

48.6 The equipment shall be subject to the following test sequence. Measurements shall be taken at steps (d), (f), and after step (j) to validate that battery terminal voltage is not less than 87.5 percent of the nominal rated voltage or, if applicable, the lumen output is not less than 60 percent of the level measured in step (c).

- a) The battery is to be charged as specified in 48.7. The time of charge is not to exceed 168 hours.
- b) For a wet lead-acid battery, the specific gravity of the electrolyte is to be measured with a hydrometer and recorded.
- c) The charged battery is then to be connected to its maximum rated load and permitted to discharge. For equipment subject to lumen output measurements, a lumen measurement shall be recorded one minute into the discharge.
- d) Permit the battery to discharge at maximum rated load for the indicated marked rated time (not less than 1-1/2 hours). At the end of the discharge, measure the closed-circuit battery terminal voltage or the lumen output, as applicable.

- e) ~~Following the measurement, r~~ Recharge the battery as specified in 48.7, but for not more than 24 hours.
- f) ~~Discharge the battery at maximum rated load for 1 hour, and then measure the closed-circuit battery terminal voltage or the lumen output, as applicable.~~
- g) ~~Following the measurement, r~~ Recharge the battery as specified in 48.7, but not more than 168 hours.
- h) Discharge the battery at maximum rated load for 24 hours. An automatic cutoff circuit provided to prevent discharge of the battery beyond a fixed point is not to be defeated if provided as part of the unit.
- i) Recharge the battery as specified in 48.7, but for not more than 168 hours.
- j) Discharge the battery at maximum rated load for the indicated marked rated time, and then measure the closed-circuit battery terminal voltage or lumen output, as applicable.

6. Adjustment of the emergency luminaire and battery pack maximum mounting height identification

SA4.6 An emergency battery pack tested in accordance with SG2.2 shall be marked to indicate the maximum mounting height of the connected luminaire, in accordance with SG3.2. If the battery pack is suitable for use with more than one luminaire or luminaire configuration whose maximum mounting height differs, the pack shall be marked to refer to the installation instructions where the maximum mounting height for each configuration shall be noted, as indicated in SG3.2.

SG3.2 The installation instructions for a luminaire tested at a mounting height of 7.17 feet (2.2 m) or greater per SG2.2, shall specify the maximum mounting height based on the height of the lowest portion of the luminaire during the test of SG2.2 and the following calculation: below. For luminaires eligible to use different lamps, optical elements, or power sources (i.e., emergency battery packs), the instructions are permitted to include a table or similar means to correlate the various available configurations with the applicable maximum mounting height. This information is permitted to be on a manufacturer-controlled website when the website address is included in the installation instructions, with text such as "For mounting height information for different luminaire configurations, see abc.com/lamps".

$$\text{Maximum mounting height} = H_t (fc_t)^{1/2}$$

in which

H_t is the luminaire test height, in feet, and

fc_t is the average of the two illuminance measurements on the ground, in foot-candles, at the test height.

7. Simplify the damp and wet location equipment humidity conditioning

SB4.1 For 24 hours prior to, and during, the ~~Temperature Test, Section 52, Dielectric Voltage-Withstand Test, Section 56, and Battery Discharge Test, Section 48, if applicable,~~ equipment shall be placed in a chamber maintained at 88 ± 5 percent relative humidity and 5°C (9°F) above the equipment's maximum rated ambient temperature. ~~For equipment rated for both low and high temperature ambients, the humidity conditioning need only occur associated with the high temperature ambient test.~~

SC4.9.1 For 24 hours prior to, and during, the ~~Temperature Test, Section 52, Dielectric Voltage-Withstand Test, Section 56, and Battery Discharge Test, Section 48, if applicable,~~ equipment shall be placed in a chamber maintained at 88 ± 5 percent relative humidity and 5°C (9°F) above the equipment's

maximum rated ambient temperature. ~~For equipment rated for both low and high temperature ambients, the humidity conditioning need only occur associated with the high temperature ambient test.~~

8. Clarify the indoor wet location equipment marking

SC5.1 Equipment that complies with this supplement is permitted to be marked "Suitable for wet locations-" or, if appropriate per the Exception to SC2.5.1, "Suitable for indoor wet locations."

9. Clarifications for minimum light output (Supplement SG)

SG2.2 The test chamber shall be of any convenient size sufficient for this test, with all interior surfaces painted flat black and an interior ambient light level of 0.01 ft-candle (0.108 lux) or less. The luminaire under test shall be mounted in the chamber with no part of the luminaire less than 7.17 feet (2.2 m) above the floor, centered along a wall or on the ceiling, in accordance with its intended use. If adjustable, a lamphead is to be oriented to provide maximum illuminance on the floor. ~~Inverter~~ Emergency battery packs are to be connected to or installed within a luminaire in accordance with the manufacturer's instructions.

Exception: The luminaire under test may be mounted at a lesser height if it has a horizontal projection from the wall surface of 4 inches (101.6 mm) or less when mounted as intended. The test height shall be in accordance with the maximum mounting height marked on the product, per SG3.1.

SG2.3 A luminaire powered by an integral battery shall be tested using an external power supply set at the DC voltage level measured one minute into the Battery Discharge Test, Section 48. A luminaire powered by an external supply is to be operated at rated input voltage. Incandescent luminaires shall be new; all other fluorescent luminaires shall be conditioned for 100 hours prior to testing. ~~Other lighting technologies are to be "seasoned" only to the extent necessary for light output stability.~~

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