

The Value of Third-Party Testing for Outdoor Load Banks

White Paper 108
Revision 0

The Value of Third-Party Testing for Outdoor Load Banks

Safety is a paramount concern to manufacturers, customers, and end-users of electrical equipment. Inspection, testing, and evaluation by qualified experts is necessary to prove that products conform to applicable standards. This document summarizes the evaluation process and explains the value of product review by an independent organization.

SAFETY STANDARDS OVERVIEW

To limit hazards and promote safe design, industry standards specify safety criteria for the design and manufacture of a wide range of electrical products. In North America, the most common design and safety standards are issued by the National Electrical Manufacturers Association (NEMA), the Occupation Safety and Health Administration (OSHA), and Underwriters Laboratories (UL). Standards for safety provide for:

- safe and reliable products
- immediate product acceptance in the marketplace
- assurance that correct components are used
- consumer confidence
- identifying manufacturers of compliant products
- an aid in product liability defense



PRODUCT EVALUATION OVERVIEW

To comply, the equipment must be inspected, tested, and reviewed to compare it with applicable standards to ensure that reasonably foreseeable risks have been minimized or eliminated. These actions must be completed by qualified organizations. To avoid conflicts of interest that could bias objectivity, the organization must not have a financial incentive or other interest in the outcome of the compliance assessment process. For this reason, it is important that reviews be conducted by an independent party. In the United States, OSHA's Nationally Recognized Testing Laboratory (NRTL) program recognizes private sector organizations that can certify products to OSHA safety standards.

To obtain certification, manufacturers typically submit product samples for evaluation by an NRTL certifying organization such as UL. For UL evaluation, the process includes an initial inspection of the construction details of the samples followed by testing that may be prescribed by the standard. Thereafter, a report of the inspection and testing results is prepared. If the samples present issues, the report is sent to the manufacturer describing unmet requirements. If the samples pass testing, the report is reviewed by one or more experts to ensure that the evaluation and testing is valid and that an auditor who is unfamiliar with the product would be able to verify that a product complies with the associated standard. This latter step is necessary because UL may inspect units installed at end user sites to evaluate products under the actual conditions of use.

When a product passes inspection, testing and evaluation, the certifying organization will typically authorize the manufacturer to label the product to indicate compliance with the applicable standard. Organizations such as UL may also list device in a directory of products that have passed evaluation under a specific standard. For this reason, these products are often referenced as “UL-Listed”.

When products pass review, the evaluating organization will grant the manufacturers a right to label the product with its logo to indicate that the device meets the requirements of the standard. As a result, inspectors and users can verify compliance with standards by observing that the appropriate ratings information is labelled on or affixed to an electrical device. Figures 1 and 2 provide examples.

Figure 1: Typical load bank identification tag with required UL information.



Figure 2: UL label for load bank equipment.

Nevertheless, it is important to understand the applicability of each approval. Under some standards, UL issues approvals for entire finished products. UL can also apply a “UL-Recognized” status to certain components or assemblies that could, in turn, be installed into larger equipment. When inspecting labels, it is important to ensure that any UL approval applies to the entire device, not just to certain components or to remote or ancillary products provided with the equipment. If only specific assemblies or components are UL-Listed, there may be insufficient evidence to prove that the entire device is suited for service in its application.

Load banks for outdoor applications should always be housed in a suitable enclosure, such as a NEMA 3R Type enclosure, and rated for outdoor use. Such units should be labelled with required UL information such as control and blower power together with short circuit and environmental ratings. A proper UL sticker or nameplate will indicate the necessary information.

NEED FOR INSPECTION

There are multiple reasons to ensure that products comply with standards through NRTL evaluation. One is that proof of third-party evaluation may be required by installation standards. For instance, the National Electrical Code® requires that many products be UL-Listed in order to be installed in regulated facilities.



A second important reason is that NRTL evaluation is commonly required in project specifications. For instance, a specification may call for a particular type of enclosure, and specify that the enclosure must meet NEMA requirements. Without verifying that the necessary labels are present, there may be insufficient evidence to prove that the installed equipment meets specifications.

Another reason for NRTL evaluation is that local electrical inspectors will look for proof that listed equipment has been installed in accordance with the applicable electrical codes. If there is no proof that a load bank or other equipment is listed to the required standards, the official may withhold inspection approval until the situation is corrected. In the interim, the systems will not be available for use, incurring unanticipated costs due to project changes and delays in operating revenue-producing systems.

THIRD-PARTY INSPECTION PROVIDERS

NRTLs offer third-party product inspection, testing, and listing services. These are commonly performed by one of several providers, including Underwriters Laboratories, Underwriters Laboratories of Canada, TUV Rhineland, Intertek ETL, and others. In some cases, these organization may provide services directly. Some may certify other parties, such as independent electrical testing laboratories, to conduct inspection, testing, and evaluation under their authority.

STANDARD FOR LOAD BANKS

Outdoor load bank power ratings can range from 15 kilowatts (kW) to 3000 kW. Because outdoor load banks can absorb massive amounts of power, they must be designed for safe and proper operation. A key standard for load banks relates to their enclosures and to their safe design. The former is addressed by *NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum)*, which prescribes standards for enclosures for a variety of locations and environments. An overview is provided in our document entitled *Equipment Enclosure Classifications* and will not be further described herein. Nevertheless, appropriate labels should be visible on equipment that must comply with project specifications for third-party assessment of enclosures.

UL does not publish a dedicated standard for load banks. Nevertheless, load banks are usually evaluated against UL 508A because they use motor controllers, overload relays, fused disconnects and/or circuit breakers, buttons, switches, and other gear regulated by that standard. These devices are used in load bank control, cooling, and load circuits, which must be evaluated according to the standard to assign the short circuit ratings needed to properly specify load banks for applications. Because load banks that are not UL-Listed have not been evaluated to these important design criteria, they could present safety, quality, and/or reliability risks.



SUMMARY

Load banks may absorb massive amounts of power. Consequently, they must be designed to manage this power safely using properly rated components. Third-party certification provides an objective means of confirming that a load bank is properly designed for its intended application along with short circuit ratings and individual circuit designs. Finally, NRTL testing ensures that the load bank meets the appropriate specified design standards which reduces any risk mitigation or liability.

References

National Electrical Manufacturers Association, NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum). 2014

ASCO Power Technologies, Inc., Equipment Enclosure Classifications. 2018

Life Is On



ASCO Power Technologies - Load Banks

6255 Halle Drive
Cleveland, OH 44125, USA
Tel: 216 573 7600
LBsales@ascopower.com

Cliffe Road, Easton-on-the-Hill
Stamford PE9 3NP, United Kingdom
Tel: +44 (0) 1780 480033
froment.sales@ascopower.com

whitepapers.ascopower.com
loadbanks.ascopower.com
customercare@ascopower.com