

INCH-POUND

MIL-PRF-32389

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PERFORMANCE SPECIFICATION

LOAD BANK, ELECTRICAL

This specification is approved for use by the Communication-Electronic Research and Development Center (CERDEC) and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This document specifies the requirements for the design modification, fabrication, integration, test, and verification of a Load Bank, Electrical, hereinafter referred to as Load Bank. The Load Bank is intended to replace the TS-4216/G Load Bank (6625-01-220-2619), which is defined by military specification MIL-L-52366.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

2.2 Government Documents

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

Comments, suggestions, or questions on this document should be addressed to Communication Electronic Research and Development Center (CERDEC), ATTN: RDER-PRO, Aberdeen Proving Ground, MD 21005 or emailed to us at army.apg.cerdec.mbx.standardization-crx@mail.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <https://assist.dla.mil>.

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DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-PRF-28800 Performance Specification, Test Equipment For Use With
Electrical and Electronic Equipment, General Specification

(Copies of this document are available online at <http://quicksearch.dla.mil/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-1472 Human Engineering

MIL-STD-13231 Marking for Electronic Items

(Copies of this document are available online at <http://quicksearch.dla.mil/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Equipment sample requirements. When specified (see 6.2), sample equipment shall be provided for inspections as specified in 3.1.1 and 3.1.2.

3.1.1 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 4.2).

3.1.2 Conformance inspection. When specified (see 6.2), a sample shall be subjected to conformance inspection (see 4.3).

3.2 Mode of Operation Requirements. The overall functional capability of the Load Bank shall be rated for continuous and operational performance providing reliable and safe conditions for testing and maintaining electrical generating equipment.

3.2.1 Load Power Capacity. The Load Bank shall be specified for resistive standard load capacity consisting of single-phase and three-phase voltage ratings. The minimum load capacity ratings are provided in Table 1.

Table I. Load Power Capacity

MIN LOAD CAPACITY	VOLTAGE RATING	PHASE/FREQUENCY	MIN LOAD STEP VALUES
60 kW	208 VAC	3-Phase/60 Hz	5 kW, 10 kW, 15 kW, 30 kW, 60 kW
3 kW	120 VAC	1-Phase/60 Hz	1 kW, 2 kW, 3 kW

3.2.2 Load Capacity. The Load Bank shall support single phase and three-phase load capacities.

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3.2.2.1 Three-Phase Load Capacity. The Load Bank shall provide at least 60 kW three-phase load capacity.

3.2.2.2 Single-Phase Load Capacity. The Load Bank shall provide at least 3 kW single-phase load capacity.

3.2.3 Voltage Rating. The Load Bank shall provide voltage rating for single phase and three phase configurations.

3.2.3.1 Three Phase Voltage Rating. The Load Bank shall provide 208 VAC voltage rating for three-phase load capacity.

3.2.3.2 Single Phase Voltage Rating. The Load Bank shall provide 120 VAC voltage rating for single-phase load capacity.

3.2.4 Phase/Frequency. The Load Bank shall provide operational functions for 60 Hz and 400 Hz generators.

3.2.4.1 60 Hz Generator. The Load Bank shall operate at 60 Hz for single phase and three-phase configurations generators.

3.2.4.2 400 Hz Generator. The Load Bank shall provide functional capability to support 400 Hz generators.

3.2.5 Load Increments. The Load Bank shall provide the capability to adjust loads in step increments.

3.2.5.1 Three Phase Load Increments. The Load Bank while in three phase operation shall, at a minimum, provide adjustable loads in 5 kW steps.

3.2.5.2 Single Phase Load Increments. The Load Bank while in single phase operation shall, at a minimum, provide adjustable loads in 1 kW steps.

3.2.6 Control Power. The Load Bank shall operate from a generator under test with the exception that it may operate with an external 60 Hz source when testing a 400 Hz generator.

3.2.7 Operator's Controls. The Load Bank shall have a control panel with switches and devices capable of selection by the operator.

3.2.7.1 Control Panel. The Load Bank control panel shall provide a Master load on/off switch, a load step on/off switch consisting of a minimum of four load increments, power indicators, and test points to measure the voltage across the load.

3.2.7.2 Panel Orientation. The Load Bank panel shall be capable of being positioned in a face up orientation, as well as face front. The Load Bank shall be stable in both positions in accordance with MIL-PRF-28800.

3.2.8 Measurements. The Load Bank shall be capable of measuring voltage, current, and frequency per phase to at least $\pm 3\%$ accuracy. Accuracy verification shall be performed every twelve months. If calibration is a feature of the instrumentation, it shall be done at that time.

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3.3 External Interface Requirements. The Load Bank shall provide external AC power connections.

3.3.1 Connectors. The modified Load Bank shall support 175 Amp Powerpole type connectors.

3.3.2 Cables. The Load Bank shall include single and 3-phase cable assemblies 8 to 10 feet in length with the generator end terminating in bare metal in a manner to provide size compatibility with all serviced generator lugs from 2 kW to 60 kW.

3.3.3 Cable Conductors. The Load Bank shall provide flexible conductors of an appropriate size (AWG) with insulation, labels or makings colored in black, red, blue, white and green.

3.3.4 Test Points Accessibility. The Load Bank shall support panel-mounted test pins for connecting test leads.

3.3.5 Operator's Interface. The Load Bank shall provide an easily accessible control panel for test instrumentation, load application switches, fan and control power switches, and operation's illuminated indicators.

3.4 Safety Requirements. The Load Bank shall provide safety mechanisms and features to protect the user from electrical and physical hazards.

3.4.1 Personnel Hazards. When handling and working with the Load Bank, personnel shall not be exposed to hazardous voltages or injury from mechanical components. Safety labels shall be placed in areas where a potential hazard can be encountered.

3.4.2 Edge Rounding Exposed. The Load Bank exposed edges shall be rounded to a minimum radius of 0.03 inch (0.75 mm), and exposed corners to a minimum of 0.05 inch (1.3 mm) in accordance with MIL-STD-1472.

3.4.3 Radioactive Material. The Load Bank shall not use radioactive materials (e.g. luminous dials/markings, electron tubes, surge arrestors and lenses).

3.4.4 Over Current Protection. Incoming power shall be fused to prevent over current input to the Load Bank.

3.4.5 Interlock Mechanism. Interlock mechanisms shall be implemented to prevent operation with insufficient cooling airflow to assure that the Load Bank does not overheat.

3.4.6 Flammable Material. The Load Bank shall not contain materials that ignite into flames at operating or storage temperatures.

3.5 Environmental Requirements. The Load Bank shall be classified as Class 2 test equipment in accordance with section 1.2.2 of MIL-PRF-28800 for a transit case protection.

3.5.1 Temperature. The Load Bank shall meet the temperature requirements for a Class 2 test equipment in accordance with MIL-PRF-28800.

3.5.1.1 Operating Temperature. The Load Bank shall operate in accordance with MIL-PRF-28800, Class 2 test equipment in the range of -10°C (14°F) to +55°C (+131°F).

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3.5.1.2 Storage Temperature. The Load Bank shall be in accordance with MIL-PRF-28800, storage temperature for a Class 2 test equipment, -51°C (-60°F) to +71°C (+158°F).

3.5.2 Relative Humidity. The Load Bank shall be subjected to conditions where the relative humidity is 5 to 95±5 percent in the temperature range of 10°C (50°F) to 30°C (86°F), conditions where the relative humidity is 5 to 75±5 percent in the temperature range of 30°C (86°F) to 40°C (104°F), and where the relative humidity is 5 to 45±5 percent in the temperature range above 40°C (104°F) to +55°C (131°F).

3.5.3 Altitude. The Load Bank shall meet the specified performance and accuracy requirements after returning from an altitude of 4600 meters in accordance with MIL-PRF-28800, Class 2 test equipment. The Load Bank is not used at altitudes beyond those specified for the generators.

3.5.4 Vibration. The Load Bank shall be in accordance with the performance and accuracy requirements of MIL-PRF-28800, Class 2 test equipment after vibration tests.

3.5.4.1 Random Vibration. The Load Bank shall be subjected for 30 minutes per axis, to 10-500 Hz with a power spectral density of 0.03 g²/Hz.

3.5.4.2 Sinusoidal Vibration. The Load Bank shall be subjected to sinusoidal vibration in accordance with MIL-PRF-28800, Class 2 test equipment.

3.5.5 Shock, Mechanical. The Load Bank shall meet the specified performance and accuracy requirements in accordance with MIL-PRF-28800, Class 2 test equipment aftershock tests.

3.5.5.1 Shock, Functional. The Load Bank shall be subjected to 30g half-sine shock test in accordance with MIL-PRF-28800, Class 2 test equipment.

3.5.5.2 Transit Drop. The Load Bank shall be subjected to a drop test in accordance with MIL-PRF-28800, Class 2 test equipment.

3.5.6 Fungus. The Load Bank shall not support fungal growth.

3.5.7 Salt Fog. The Load Bank shall meet the specified performance and accuracy requirements in accordance with MIL-PRF-28800, Class 2 test equipment, after exposure.

3.6 Electromagnetic Compatibility (EMC). The Load Bank shall be in accordance with MIL-PRF-28800, Class 2 test equipment.

3.7 Reliability. The design of the equipment shall be such that under normal use and operation the equipment does not fail within 1500 hours of operation with a statistical certainty of 95%. The manufacturer shall provide a summary of maintenance or warranty records to establish the validity of the statistical assertion. Records of the actual equipment model shall be used, unless the Government authorizes the substitution of records from a similar model, due to the lack of sufficient supporting documentation on the offered equipment. The manufacturer shall be able to reasonably establish the claim that the offered equipment shall provide reliability similar to the model used to provide substitute records.

3.8 Maintainability. Maintainability shall be as specified in sections 3.8.1 to 3.8.3

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3.8.1 Fault isolation. To whatever extent possible any required modification of the equipment shall permit isolation of faults, and repair down to the component item or lowest replaceable unit available.

3.8.2 Preventive maintenance. Preventive maintenance shall not require more than 15 minutes per a 30-day period. Preventive maintenance shall not require breaking of the equipment seams where calibration seals would normally be placed.

3.8.3 Maintenance provisions. Equipment shall be as specified in a. through d. to facilitate Maintenance.

a. Accessibility for maintenance. If required, the equipment shall be modified to ensure that maintenance access can be accomplished utilizing ordinary tools. The modifications shall be constructed so that no damage to any component shall occur and no permanent distortion to any structural member shall be caused during maintenance and calibration.

b. Maintenance and calibration aids. When specified, circuit board extenders, special adapters, special tools (see 6.3), and patch cables required for maintenance or calibration shall be provided. They shall be identified as a set with a unique part number and national stock number. Stowage shall be in a reusable pouch or container.

c. Accessibility for repair. The modifications shall be designed so that subassemblies and chassis components can be removed without removing other hardwired subassemblies or components. Printed circuit cards shall be removable without the need to unsolder cables and interconnecting wiring. Printed circuit cards designed primarily to distribute power and signals to other printed cards are excluded from this requirement. When motherboards are used they shall be accessible from both sides to facilitate troubleshooting or repair.

d. Accessibility for adjustment. The modification design shall permit adjustments to be made without removing any component, printed circuit cards, or subassembly. The use of extender cards is permitted.

3.9 Physical Characteristics of the System

3.9.1 Mechanical Parameters. The Load Bank shall have mechanical parameters not to exceed those specified below.

3.9.1.1 Weight. The weight of the Load Bank shall be lightweight, portable, not to exceed a one-man carry weight of 82 lbs in accordance with MIL-STD-1472.

3.9.1.2 Size. The Load Bank unit dimensions shall be in accordance with MIL-STD-1472.

3.9.2 Enclosure. The Load Bank unit shall be housed in a transit case enclosure that shall withstand the environmental requirements herein.

3.9.2.1 Cover, transit case. The transit case shall have a cover that can be closed and fastened. Fasteners shall allow for quick opening. If the cover is removable, fasteners shall not interfere with cover removal.

3.9.2.2 Stacking provisions, transit case. Unless otherwise specified, the transit case shall have a geometric configuration that permits stacking without harm to the enclosure or its contents. The

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maximum stacking height (expressed as a quantity of equipment in excess of one) shall be as specified in the purchase description.

3.9.2.3 Storage. In addition to the Load Bank, the enclosure shall have space available for storing cable assemblies and an operator's manual.

3.9.3 Handles, transit case. Unless otherwise specified, one or more handles shall be provided. The number and location of handles shall be such that the load distribution per handle shall not exceed 20 kg. Handles shall be located above the equipment center of gravity to ensure carrying stability.

3.9.3.1 Handles, hard transit case. Unless otherwise specified, a transit case shall include hinged metal handles with sufficient internal clearance to allow a block 44 mm by 106 mm in cross section with edges rounded to a 24 mm radius to pass through them. The grip portion of the handles shall be of a nonmetallic material at least 89 mm in length with a 19 mm diameter or other approved cross section that is shaped to fit the hand comfortably. Handles shall stop open at 90 degrees, and shall be returned to a closed position by a spring-loaded or retaining mechanism when not in use. Handles shall be recessed or protected. A handle located on the top of the enclosure shall be recessed to facilitate stacking.

3.10 Workmanship. The Load Bank shall meet specified acceptance criteria for workmanship as defined within this requirement.

3.10.1 Cleaning. The Load Bank fabrication, parts, and assembled components shall be cleaned of smudges; loose, spattered or excess solder; weld metal; metal chips and mold release agents; or any other foreign material which might detract from the intended operation, function, or appearance of the Load Bank.

3.10.2 Threaded Part or Devices. The Load Bank shall show no evidence of screws, nuts and bolts of cross threading, mutilation, or detrimental or hazardous burrs.

3.10.3 Bearing Assemblies. The Load Bank bearing assemblies shall be free of rust, discoloration, and imperfections of ground, honed, or lapped surfaces. Contacting surfaces shall be free of tools marks, gouge marks, nicks, or other surface-type defects. There shall be no detrimental interference, binding, or galling.

3.10.4 Wiring. The Load Bank shall have wires and cables positioned or protected to avoid contact with rough or irregular surfaces and sharp edges and to avoid damage to conductors or adjacent parts.

3.10.5 Shielding. The Load Bank shall have wires and cables secured in a manner that will prevent it from contacting or shorting exposed current-carrying parts, and having the ends of any shielding or braid secured to prevent fraying.

3.11 Marking. The Load Bank markings shall be durable enough to withstand the full environmental conditions the surface will be exposed to during field use. A contrasting color shall be used for the markings (e.g., black marking on a green surface). Plates or embossed lettering may be used. Embossed letters need not be highlighted as long as they are legible.

3.11.1 New Markings. The Load Bank markings shall conform to MIL-STD-13231.

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3.11.2 Identification Label. The Load Bank identification label shall be provided, include the following information:

COMMERCIAL LOAD BANK (Three-phase/Single-phase, 0-60 KW)

Model Number

Serial Number

Manufacturer

Manufacturer CAGE CODE

The label shall be located on a visible side of the Load Bank. The material used for the label shall be weather-resistant and capable of withstanding the environmental requirements of this specification.

3.11.3 IUID Marking. The Load Bank shall have IUID Markings in accordance with MIL-STD-130. The label shall be located on a visible side of the Load Bank. The material used for the label shall be weather-resistant and capable of withstanding the environmental requirements of this specification.

4. VERIFICATION

4.1 Classification of inspections. The inspections specified herein are classified as specified in a and b.:

- a. First article inspection (see 4.2).
- b. Conformance inspection (see 4.3).

4.2 First article. The first article inspection, if selected, shall be performed in accordance with MIL-PRF-28800.

4.3 Conformance inspection. The test methods, procedures, and conditions shall be performed in accordance with MIL-PRF-28800, if selected.

4.4 Examinations and test methods. The test methods, procedures, conditions, and failure criteria shall be in accordance with MIL-PRF-28800.

4.5 Electrical Tests.

4.5.1 Load Power Capacity. Test the load capacity of the Load Bank using power sources capable of at least 200 amp 3-phase power at 60 and 400 Hz.

4.5.1.1 Three-Phase Load Capacity. To determine compliance with 3.2.2.1, the modified Load Bank shall be set to draw its maximum 3-phase current which when measured and multiplied by the measured voltage shall meet or exceed 60 kW three-phase load capacity.

4.5.1.2 Three-Phase Voltage Rating. During this test record the voltage applied is 208 VAC $\pm 10\%$ for the three-phase load capacity test in compliance with 3.2.3.1.

4.5.1.3 Single-Phase Load Capacity. To determine compliance with 3.2.2.2, the Load Bank shall be set to draw its maximum single-phase current which when multiplied by the measured voltage shall meet or exceed 3 kW single-phase load capacity.

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4.5.1.4 Single-Phase Voltage Rating. During this test record the voltage applied is 120 VAC $\pm 10\%$ for the single-phase load capacity test in compliance with 3.2.3.2.

4.5.2 Phase/Frequency. Test that the Load Bank can measure 60 Hz and 400 Hz sources.

4.5.2.1 60 Hz Generator. To determine compliance with 3.2.4.1, note that during tests under 4.6.1 that Load Bank measured the 60 Hz single phase and three-phase sources.

4.5.2.2 400 Hz Generator. To determine compliance with 3.2.4.2, repeat tests under 4.6.1 using a 400 Hz source. Note that during these tests the Load Bank measured the 400 Hz single phase and three-phase sources.

4.5.3 Load Increments. Test that the Load Bank provides the capability to adjust loads in step increments.

4.5.3.1 Three Phase Load Increments. Set up the Load Bank as in 4.5.1.2 but set the lowest load increment available. Measure the voltage and current and record the power. Continue the measurement for each settable increment. Note that at a minimum, the Load Bank provides adjustable loads in 5 kW steps up to 60 kW in compliance with 3.2.5.1

4.5.3.2 Single Phase Load Increments. Repeat the test 4.5.3.1 except set up for a single-phase source. The Load Bank shall, at a minimum, provide adjustable loads in 1 kW steps in compliance with 3.2.5.2.

4.5.4 Operator's Controls. Test that the Load Bank has a control panel with switches and devices capable of selection by the operator.

4.5.4.1 Control Panel. To determine compliance with 3.2.7.1, examine the Load Bank control panel to verify it has a Master load on/off switch, a load step on/off switch consisting of a minimum of four load increments, power indicators, and test points to measure the voltage across the load.

4.5.4.2 Panel Orientation. To determine compliance with 3.2.7.2, determine that the Load Bank is capable of being positioned in a face up orientation, as well as face front. Verify stability per MIL-PRF-28800.

4.5.5 Measurements. Verify that the Load Bank complies with 3.2.8 and is capable of measuring voltage, current, and frequency per phase to at least $\pm 3\%$ accuracy.

4.5.5.1 Voltage measurement accuracy. During the tests of sections 4.5.3.1 and 4.5.3.2, measure and record the voltage measurements of the Load Bank and an external voltmeter of at least $\pm 1\%$ accuracy. Note: a voltmeter with $\pm 0.3\%$ or better accuracy is preferred. The external voltage measurements will be made at the test pins.

4.5.5.2 Current measurement accuracy. During the test of sections 4.5.3.1 and 4.5.3.2, measure and record the current measurements of the Load Bank and an external clamp amp meter of at least $\pm 1\%$ accuracy. Note an amp meter with $\pm 0.3\%$ or better accuracy is preferred. The external current measurements will be made at the test cables connected to the Load Bank. Record measurements for at 1 kW, 5 kW, 10 kW, 30 kW, and 60 kW.

4.5.5.3 Frequency measurement accuracy. During the test of sections 4.5.3.1 and 4.5.3.2, measure and record the frequency measurements of the Load Bank and an external frequency counter of

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at least $\pm 1\%$ accuracy. Note a voltmeter with $\pm 0.3\%$ or better accuracy is preferred. The external frequency measurements will be made at the test pins.

4.6 External Interface Requirements.

4.6.1 Connectors. Verify section 3.3.1 that the connectors are compatible with powerpole type connectors for the 3-phase input. There may be a single-phase input connector with a lower rated input of 30 amps or more.

4.6.2 Cables. Verify section 3.3.2 that the cable assemblies are between 8 and 10 feet long exclusive of connectors. Verify that the 3-phase cable assembly termination physically fits in the lugs of the 5 kW through 60 kW Tactical Quiet Generators (TQGs). If there is no separate single-phase cable assembly, verify the 3-phase cable assembly also physically fits in the lug of the 2 kW and 3 kW generators. If there is a separate single-phase cable assembly, verify the termination fits in the lugs of the 2 kW and 3 kW generators.

4.6.3 Cable Conductors. Verify section 3.3.3 that the conductors of the 3-phase cable assembly are at least 2 AWG conductors and the single-phase cable assembly, if provided, uses at least 10 AWG. Note: the conductors are flexible to the extent they do not retain a bend, and are color coded by some means.

4.6.4 Test point accessibility. Verify section 3.3.4, that there are four test points on the front panel that can be used by any typical voltmeter/probe set.

4.6.5 Operator's Interface. Verify section 3.3.5 that the Load Bank control panel provides open, unconstrained access to instrumentation, indicators, and switches.

4.7 Safety Requirements.

4.7.1 Personnel Hazards. Verify section 3.4.1 by inspection that the Load Bank does not expose personnel to any physical hazards; pinching, fan blades, hot surfaces. Ensure no hazardous voltages are accessible. Ensure safety labels are affixed to locations where a potential hazard can be encountered.

4.7.2 Edge Rounding Exposed. Verify section 3.4.2 by inspection that the Load Bank has no exposed sharp edges or corners in accordance with MIL-STD-1472.

4.7.3 Radioactive Material. Verify section 3.4.3 by inspection and analysis that Load Bank uses no radioactive materials.

4.7.4 Over Current Protection. Verify section 3.4.4 by inspection and analysis that the incoming power is fused to prevent over current input to the Load Bank.

4.7.5 Interlock Mechanism. Verify section 3.4.5 by blocking at least 75% of the airflow to the fans that the Load Bank shuts down, disconnecting the load from the source.

4.7.6 Flammable Material. Verify section 3.4.6 by inspection that no materials ignite into flames at operating or storage temperatures during testing sections 4.8.1.1 and 4.8.1.2.

4.8 Environmental Requirements.

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4.8.1 Temperature. Verify section 3.5.1 by testing the Load Bank in accordance with MIL-PRF-28800, Class 2 test equipment.

4.8.1.1 Operating Temperature. Test the Load Bank in accordance with MIL-PRF-28800, Class 2 test equipment in the range of -10°C (14°F) to $+55^{\circ}\text{C}$ ($+131^{\circ}\text{F}$). Verify operation and accuracy by conducting 3.2.2.1 (4.5.1.1) and 3.2.8 (4.5.5) as required. Note the test temperature may not be maintainable and the tests should be performed quickly.

4.8.1.2 Storage Temperature. Test the Load Bank in accordance with MIL-PRF-28800, Class 2 test equipment in the range of -51°C (-60°F) to $+71^{\circ}\text{C}$ ($+158^{\circ}\text{F}$). At the end of the test, verify operation and accuracy by conducting 3.2.2.1 (4.5.1.1) and 3.2.8 (4.5.5) at room temperature.

4.8.2 Relative Humidity. Verify section 3.5.2 by testing the Load Bank in accordance with MIL-PRF-28800, Class 2 test equipment. Test the Load Bank to conditions where the relative humidity is 5 to 95 ± 5 percent in the temperature range of 10°C (50°F) to 30°C (86°F), conditions where the relative humidity is 5 to 75 ± 5 percent in the temperature range of 30°C (86°F) to 40°C (104°F), and where the relative humidity is 5 to 45 ± 5 percent in the temperature range above 40°C (104°F) to $+55^{\circ}\text{C}$ (131°F). Verify operation and accuracy by conducting 3.2.2.1 (4.5.1.1) and 3.2.8 (4.5.5) as required.

4.8.3 Altitude. Verify section 3.5.3 by testing the Load Bank in accordance with MIL-PRF-28800. At the end of the test verify operation and accuracy by conducting 3.2.2.1 (4.5.1.1) and 3.2.8 (4.5.5) at room temperature.

4.8.4 Vibration. Verify section 3.5.4 by testing the Load Bank in accordance with MIL-PRF-28800. At the end of each test verify operation and accuracy by conducting 3.2.2.1 (4.5.1.1) and 3.2.8 (4.5.5) at room temperature.

4.8.4.1 Random Vibration. Test the Load Bank for 30 minutes per axis, to 10-500 Hz with a power spectral density of $0.03 \text{ g}^2/\text{Hz}$ in accordance with MIL-PRF-28800.

4.8.4.2 Sinusoidal Vibration. Test the Load Bank to sinusoidal vibration in accordance with MIL-PRF-28800.

4.8.5 Shock, mechanical. Verify section 3.5.5 by testing the Load Bank for specified performance and accuracy requirements after shock tests in accordance with MIL-PRF-28800.

4.8.5.1 Shock, functional. Test the Load Bank to 30g half-sine shock test in accordance with MIL-PRF-28800, Class 2 test equipment.

4.8.5.2 Transit Drop. Test the Load Bank to a drop test in accordance with MIL-PRF-28800.

4.8.6 Fungus. Verify section 3.5.6 by testing that the Load Bank not support fungal growth in accordance with MIL-PRF-28800.

4.8.7 Salt Fog. Verify section 3.5.7 by testing the Load Bank for the specified performance and accuracy requirements after exposure to salt fog in accordance with MIL-PRF-28800.

4.9 Electromagnetic Compatibility (EMC). Verify section 3.6 by testing the Load Bank in accordance with MIL-PRF-28800.

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4.10 Reliability. Verify section 3.7 by performing analysis in accordance with MIL-PRF-28800.

4.11 Maintainability. Verify section 3.8 by performing Maintainability tests in accordance with MIL-PRF-28800.

4.11.1 Maintainability demonstration. Evaluate the Load Bank for conformance to the requirements specified in 3.8.1 through 3.8.3.

4.12 Physical Characteristics of the System

4.12.1 Mechanical Parameters. Verify section 3.9.1 by measuring the Load Bank to the mechanical parameters specified below.

4.12.1.1 Weight. Weigh the Load Bank with and without the transit case and accessories and verify that the Load Bank does not exceed the one man carry weight in accordance with MIL-STD-1472.

4.12.1.2 Size. Measure the Load Bank and verify that the dimensions do not exceed the load size for reducing the male only carry limit in accordance with MIL-STD-1472.

4.12.2 Enclosure. Verify section 3.9.2 by inspection and test of the Load Bank housed in a transit case enclosure for the appropriate environmental tests.

4.13 Workmanship. Verify the Load Bank meets specified acceptance criteria for workmanship as defined in section 3.10.

4.14 Marking. Verify section 3.11 by inspection that the Load Bank markings are durable enough to withstand the full environmental conditions the surface will be exposed to during field use. Verify a contrasting color is used for the markings (e.g., black marking on a green surface).

4.14.1 New Markings. Verify section 3.11.1 by inspection that new Load Bank markings are in accordance with MIL-STD-13231.

4.14.2 Identification Label. Verify section 3.11.2 by inspecting the Load Bank for an identification label that includes the following information:

COMMERCIAL LOAD BANK (Three-phase/Single-phase, 0-60 KW)

Model Number

Serial Number

Manufacturer

Manufacturer CAGE CODE

Verify the material used for the label is weather-resistant and capable of withstanding the environmental requirements of this specification.

4.14.3 IUID Marking. Verify section 3.11.3 by inspecting the Load Bank for an IUID marking. Verify that the IUID marking is in accordance with MIL-STD-130. Verify the material used for the label is weather-resistant and capable of withstanding the environmental requirements of this specification.

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5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of the materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. Equipment covered by this specification is intended for use in testing single-phase and 3-phase generators under full load.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Title, number, and date of the applicable purchase description.
- c. Equipment sampling requirements (see 3.1).
- d. Verification requirements (see 4.1).
- e. Packaging requirements (see 5.1).

6.3 Subject term (key word) listing

Generator

Load Bank

Single Phase

Three Phase

Custodians:
Army – CR

Preparing Activity:
Army – CR
(Project 6150-2011-003)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil>.