INCH-POUND
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COMMERCIAL ITEM DESCRIPTION

LOAD BANK, ELECTRICAL
250 kilowatts, 400 Hertz

The General Services Administration has authorized the use of this commercial item description for all federal agencies.

1. SCOPE. This Commercial Item Description (CID) describes a 400 Hertz (Hz), 250 kilowatt (kW), portable type, resistive load bank and accessories. The commercially available, portable, enclosed, forced air cooled, industrial load bank is used for electrical performance testing of ground power supplies including diesel engine and electrical motor driven generators designed to supply 400 Hz power for aircraft ground power applications.

2. SALIENT CHARACTERISTICS

2.1 Safety and environmental. The equipment shall meet all safety and environmental requirements as specified in National Fire Protection Association (NFPA) 70 – National Electrical Code (NEC), ANSI/IEEE C2 – National Electrical Safety Code and the latest applicable National Electrical Manufacturer's Association (NEMA) standards except as stated herein. All resistive load element buses shall be over-current protected. Air flow failure shall cause the load bank to automatically drop all connected load before an over-temperature condition occurs.

2.2 Electrical power sources. The load bank shall be completely self-contained and require no power source to operate other than the generator under test. The operating power for internal circuits, instruments, or (and) fan(s) shall be derived only from the power source under test.

2.3 Operating temperature. The equipment shall meet its performance and accuracy requirements in an operating environment of 0 degrees F to +120 degrees F.

2.4 Non-operating temperature. The equipment shall meet its performance and accuracy requirements after being in a non-operating environment (storage temperature) of 0 degrees F to +160 degrees F.

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data that may improve this document should be sent to: WR-ALC/GRVEA, Robins AFB GA 31098-1813. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.daps.dla.mil/online .

2.5 Calibration and maintenance adjustments. The design of the system shall provide for readily accessible calibration adjustments and maintenance adjustments. The calibration adjustments, wherever possible, shall be accessible without removal of the instrument case or modules. These adjustments shall be provided by variable value components, which are adjustable, by the use of simple means. The calibration by substitution of selected components or parts is unacceptable unless specifically approved. The calibration interval shall be a period of one year or greater based on an operating time of 2,000 hours.

2.6 Accessories. Accessories to be supplied by the manufacturer with each deliverable load bank unit shall include standard and optional accessories as provided by the manufacturer and listed in the manufacturer's catalog or data sheet. A written user's manual, a written programmer reference manual (if applicable), and a traceable calibration certificate shall also be provided with each load bank unit. The user manual(s) shall include complete details for the operation, troubleshooting and maintenance of the load bank and shall include interconnect drawings and electrical schematics for all power and control circuits and devices. A complete parts listing including original manufacturers name, part numbers, ratings and identifications shall be included with each load bank unit.

2.7 Environmental requirements. The load bank shall be designed for indoor or sheltered use and indoor storage. The load bank shall be clearly marked "NOT FOR USE IN HAZARDOUS LOCATIONS".

2.8 Performance characteristics. The load bank shall be capable of continuous, resistive load testing of aircraft ground power generator sets producing up to 250 kW at 115/200 volts alternating current (VAC) (nominal), 3 phase, 4 wire, 400 Hz power. The load bank shall have a single, local control panel to contain all the meters, indicators, switches, and controls necessary to operate the unit.

2.8.1 Meters. The control panel of the load bank shall be equipped with meters for monitoring voltage (0-250 VAC), frequency (360-440 Hz), and current (0-300 AC amps) and total power (0-300 kW). Meter accuracy shall be not less than 1.5%, full scale.

2.8.2 Phase selector switch. The load bank shall have a phase selector switch on the control panel for measuring the current of each phase of incoming power (A,B,C). Voltage measurements shall be selectable for both line-to-neutral and line-to-line for each phase on incoming power.

2.8.3 Phase rotation indicator. The load bank shall have a phase rotation indicator to indicate phase orientation and to indicate the presence of voltage on each phase (ABC, CBA).

2.8.4 E-F circuit. The load bank shall be equipped with a mode safety interlock circuit to simulate the safety interlock circuitry present on some aircraft through pins E & F of the input receptacles (see 2.8.7). The interlock circuit shall have a user selectable "LOOP" mode circuit. In LOOP mode, the load bank shall convert the incoming 115/200 VAC, 400 Hz power to 28 (+/- 1) volts direct current (VDC) and send a +28 VDC signal to the generator set under test on Pin E of the receptacles. The signal return path to the load bank shall be Pin F of the input

receptacles. The E-F indicator shall illuminate and allow normal load bank and generator operations if the circuit is completed (i.e.: Signal returned to the load bank on pin F).

2.8.5 E-F circuit indicator. An E-F LOOP circuit indicator lamp shall be provided on the control panel to indicate when the E-F circuit is complete and operational in LOOP mode (see 2.8.4).

2.8.6 External connections. The control panel shall have external connection points (banana jack style) for user connection of external instrumentation. The set of connection points shall provide access for use with the voltage meter contained on the control panel of the load bank. The external connections shall work in conjunction with the phase selector switch (see 2.8.2) to monitor the selected phase of incoming power.

2.8.7 AC input receptacles. The load bank shall be equipped with four each, SAE AS90362 Part Number MS90362-3 or commercial equivalent, 115/200 VAC, 3 phase, 4 wire, 400 Hz, male, six pin, aircraft type receptacles suitable for use with four standard U.S. Air Force (USAF), aircraft ground power generator cables (minimum 60 feet in length) with female connectors. Each SAE AS90362 Part Number MS90362-3 (or equivalent) connector shall be connected in parallel with the other connectors and each be equipped with shields (SAE AS17845 Part Number MS17845-1 or equivalent) and covers to prevent hazard to personnel when not in use.

2.8.8 Load elements. The load bank load elements shall be of the purely resistive type and shall be designed so that a load of any magnitude within the range of one to 250 kW may be absorbed and shall be protected from damage by the use of user resettable circuit breakers, user replaceable fuses, or automatically resetting thermal switches. All load elements shall be connectable to incoming power by means of electrical contractors.

2.8.9 Step loading. The load bank shall provide a means to apply incremental loading (step loading). The following load steps should be available (at a minimum): 1kw, 2kw, 5kw, 10kw, 20kw, 40kw, 80kw. The use of multiple load steps of the same size is acceptable. Load steps of a different resolution may be acceptable, based upon Government review. The tolerance of each load step shall be no more than 5%. These loads shall be selectable individually or in combinations to provide loads up to and including 250 kW.

2.8.10 Shock loading. The load bank shall have a single master load switch for shock loading the unit under test at any load setting available described in 2.8.9. The switch may also serve as a master load disconnect switch.

2.8.11 Grounding. Electrical grounding shall be accomplished in accordance with NFPA 70 - NEC, Section 250. The negative side of the 28 VDC power supply for the E-F circuit shall also be connected to the chassis ground. An external ground terminal shall be provided so that a separate external user ground connection may be added. This ground terminal shall be bonded to the main metal frame and chassis of the load bank and be clearly marked. The ground terminal shall be capable of accommodating grounding wires up to size 0000 (4/0) American Wire Gage (AWG).

2.8.12 Over-temperature. The load bank shall contain adequate protection circuitry to protect the load elements and controls and shall cease operation in the event of a cooling failure or over-temperature condition.

2.8.13 Load disconnect. The load bank shall have provision for the manual de-activation of load elements in the case of a failure of the automatic protection system. The load disconnect shall provide a single point for instantaneous load removal from the load bank.

2.8.14 Continuous operation. The load bank shall be capable of a continuous run at full load for up to four hours. The load bank shall be capable of cool down within five minutes, under no load conditions, and be capable of performing multiple back to back full loads without damage to components. The load bank shall be capable of withstanding instantaneous input power disconnection or stoppage at full load without damage to the load bank components.

2.9 Construction. The load bank shall be constructed to withstand the strains, jars, vibrations, and other conditions incident to shipping, storage, service and operation. Electrical components shall be designed to withstand voltage and current level sags and surges associated with load testing stand-alone generator sets. Enclosure finishes and other components shall employ best commercial design practices and be designed to withstand the high temperatures and exposures normally associated with load bank operations.

2.9.1 Transportability. The load bank shall be provided with wheels having a diameter of nine (+/- 1) inches in diameter on lockable casters, to allow easy movement over hard surfaces. The load bank shall be constructed to have the capability of being lifted and transported by a forklift without sustaining damage.

2.9.2 Size. The load bank external dimensions shall not exceed 60"L x 36"Wx 48"H, including handles.

2.9.3 Weight. The weight of the load bank shall not exceed 850 pounds.

2.9.4 Fire prevention and safety. The enclosure of the load bank shall employ best commercial design practices to reduce the danger to personnel from fire and explosion. Suitable vents and drains shall be incorporated into the enclosure of the load bank to reduce the risk of hazards.

2.9.5 Workmanship and wiring. The load bank shall be manufactured with the best commercial practices and be free from defects. All wiring shall be neatly routed, terminated and identified.

3. REGULATORY REQUIREMENTS.

3.1 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs. The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with 23.403 of the Federal Acquisition Regulation (FAR). However, used, rebuilt, or refurbished items shall not be provided.

3.2 Green Procurement Program. Green Procurement Program (GPP) is a mandatory federal acquisition program that focuses on the purchase and use of environmentally preferable products and services. GPP requirements apply to all acquisitions using appropriated funds, including services and new requirements. FAR 23.404(b) applies and states the GPP requires 100% of EPA designated product purchase that are included in the Comprehensive Procurement Guidelines list that contains recovered materials, unless the item cannot be acquired: a) competitively within a reasonable timeframe; b) meet appropriate performance standards, or c) at a reasonable price. The prime contractor is responsible for ensuring that all subcontractors comply with this requirement.

4. PRODUCT CONFORMANCE PROVISIONS

4.1 Product conformance. The products provided shall meet the salient characteristics of this CID, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale to the Government or in the commercial market place. The Government reserves the right to require proof of such conformance.

4.2 Contractor certification. The contractor shall certify and maintain substantiating evidence that the product conforms to the producer’s own drawings, specifications, standards, and quality assurance practices, and is the same product offered for sale in the commercial marketplace. The Government reserves the right to require proof of such conformance. Proof of conformance may include, but shall not be limited to the performance of operational tests, lab tests, modeling and simulation and delivery of reports and data from these tests.

4.3 Responsibility of inspection. Unless otherwise specified in the contract or CID, the contractor is responsible for the performance of all inspection, examination, and test requirements specified herein. Except as otherwise specified in the contract or CID, the contractor may use his own facilities or any other facilities suitable for the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to set forth in this description where such inspections, examinations and tests are deemed necessary to assure supplies and services conform to prescribed requirements.

4.4 Examination of product. Each load bank shall be examined to verify compliance with the requirements herein prior to accomplishing any other tests listed in 4.5. A contractor-generated, Government-approved checklist shall be used to identify each requirement not verified by a test or analysis, and shall be used to document the inspection results. Particular attention shall be given to materials, workmanship, dimensions, surface finishes, protective coatings and sealants and their application, welding, fastening, and markings. Proper operation of each load bank function shall be verified. Each production load bank shall be inspected to a Government-approved reduced version of the checklist.

4.5 Operational test. Each load bank shall be operated at rated full load for not less than 10 minutes, after complete assembly and prior to shipment, to ensure all parts are functioning according to the manufacturer's requirements.

5. PACKAGING.

5.1 Preservation, packing, and marking shall be as specified in the contract or order.

6. NOTES.

6.1 Source of documents.

6.1.1 Department of Defense and Federal documents may be obtained at https://assist.daps.dla.mil/online or from the Document Automation and Production Service, Bldg 4D (DPM-DODSSP), 700 Robbins Avenue, Philadelphia PA 19111-5094.

6.1.2 NFPA documents may be obtained at http://www.nfpa.org/index.asp or from NFPA, Batterymarch Park, Quincy MA 02269-9101.

6.1.3 National Electrical Manufacturers Association (NEMA) standards may be obtained from National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1752, Rosslyn, Virginia 22209. Electronic copies of NEMA standards may be obtained from http://www.nema.org/stds/ .

6.1.4 FAR and DFARS may be obtained from the Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. Electronic copies of the FAR may be obtained from http://www.arnet.gov/far Electronic copies of the DFARS may be obtained from http://www.acq.osd.mil/dpap/dars/dfars/index.htm .

6.1.5 ANSI/EIA standards may be obtained at http://www.ansi.org or http://www.eia.org or available from the Electronics Industry Association, Engineering Department, 2001 Pennsylvania Ave., N.W., Washington, D.C., 20006. Phone: 1-800-854-7179 (USA and Canada).

6.1.6 SAE documents may be obtained http://www.sae.org/servlets/index or from SAE, Inc., 400 Commonwealth Drive, Warrendale PA 15096

6.2 Ordering data. The contract or ordering data should specify the following:

a. CID document number, current version and date of CID.

b. Product Conformance provisions.

c. Packaging requirements

6.3 Key words.

Generator
Ground power supplies
Portable type

Custodian:
Air Force - 84

Preparing activity:
Air Force - 84

Review activity:
DLA - IS

Agent:
Air Force - 99

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