

ENGINEER'S SPECIFICATIONS FOR LBS-SERIES LOAD BANKS
(FREESTANDING, FORCED AIR COOLED)

Options in the specifications are in parenthesis. Blanks indicated by "xxxx" are for the addition of specific values.

1. GENERATOR LOAD BANK

1.1 General: A UL listed, air-cooled, resistive Load Bank is required for permanent, on site installation as a component of a standby/emergency power engine gen

1.2 Installation: The Load Bank shall be installed (outdoors or indoors) on a concrete pad. (The indoor Load Bank installation shall include an air duct for the

1.3 Load Bank Rating:

1.3.1 Load Capacity: xxxx KW, 1.0 p.f.

1.3.2 Load steps as a minimum: 1/4, 1/2, 3/4, full.

1.3.3 Voltage: xxxx V AC, (1 phase, 2-wire or 3 phase, 3-wire)

1.3.4 Frequency: (60, 50 or 400) Hertz

1.3.5 Ambient Temperature: 120°F maximum

1.3.6 Duty Cycle: Continuous

1.4 Load Bank Design

1.4.1 General: The Load Bank shall be a completely self-contained, freestanding unit which includes all resistive load elements, load control devices, load elem

1.4.2 The Load Bank shall be the manufacturer's standard product that has been investigated, tested and listed by Underwriters Laboratories as a system for the

1.4.3 Enclosure: The Load Bank enclosure shall be NEMA type (3R or 1), designed for (outdoor or indoor) installation on a concrete pad.

1.4.3.1 (Load Banks installed indoors shall include a duct flange adaptor or accept an exhaust duct supplied by the installing contractor. The indoor installati

1.4.3.2 The Load Bank enclosure shall be of double wall construction for cool exterior and thermal isolation of the load elements.

1.4.3.3 Cooling airflow through the enclosure shall be vertical with cold air intake at the bottom and hot air exhaust out the top. Intake and exhaust openings

1.4.3.4 All interior spaces of the enclosure shall be accessible by hinged, lockable doors. Bolt-on panels shall not be acceptable.

1.4.3.5 The enclosure shall be painted with an industrial enamel using a UL listed material and process.

1.4.3.6 The enclosure shall include forklift channels and lifting eyes.

1.4.4 Load Elements: Open, helically wound chromium alloy electrical resistance wire derated to operate at 60% of the maximum continuous temperature rating of w

1.4.4.1 Load elements are to be individually serviceable and replaceable in the field without major disassembly of the Load Bank. An acceptable design to satisf

1.4.4.2 All materials used in the mounting and installation of the load elements shall be suitable for the temperatures encountered, both in normal operation and
a. Materials in direct contact with the element wire shall be ceramic. These ceramics shall be installed upon and reinforced and supported by stainless steel st
b. Other materials which structurally support the load elements and/or form the hot air duct within which the elements are mounted shall be steel, stainless ste
c. Plastics and glass reinforced plastic materials and flammable materials are not acceptable materials of construction for installation, support and mounting o

1.4.4.3 Load elements shall be Simplex "Powr-Web" Brand.

1.4.5 Load Element Short Circuit Protection: The resistive load shall be fused in branch circuits of not more than 50 KW each.

1.4.5.1 Load circuit fuses shall be 200,000 A.I.C. current limiting type, extremely fast acting 600V rated.

1.4.6 Load Control: One magnetic contactor per each fused branch circuit.

1.4.7 Load Bank Power Wiring: 150°C insulated.

1.4.8 Main Terminals: Copper, 1000A per square inch.

1.4.9 Cooling System: Forced air cooled by motor drive propeller fan. Motors shall be (TEFC or ODP), 1800 RPM maximum and controlled by a circuit breaker combin

1.4.10 Cooling Fan and Control Power: Shall be derived internally from the main load bus. The cooling fan shall operate at AC line voltage. Load control circuit

1.4.11 Load Bank Controller: The Load Bank shall include both a local, unit mounted controller and control panel, plus, if required, a remote control panel. The

1.4.11.1 Power supply for Load Bank control circuits.

1.4.11.2 Malfunction detection system consisting of sensors within the Load Bank, Load Bank enable/disable permissive circuit, and alarms. Malfunction detection

1.4.11.3 Cooling fan start-stop control.

1.4.11.4 Remote load dump circuit to trip Load Bank off-line from remote contacts. A manual bypass switch shall be provided to override the remote contacts.

1.4.11.5 Input/output devices and control circuits for operation of Load Bank from remote devices when in "automatic" mode or "remote" mode.

1.4.11.6 Auxiliary dry contacts for field use to indicate Load Bank "operating normally" and "Load Bank failure."

1.4.11.7 Local, manual control panel consisting of:

a. Mode selector switch to select the following: "Off," "Local-Manual," "Local-Auto," or "Remote"

b. Manual "Run" and "Stop" buttons

c. Switch to bypass remote load dump contacts

d. Master load control switch

e. Load step control switches, one for each load step

f. Lamp rest pushbutton

1.4.11.8 Status annunciator with visual indicators for the following:

a. Power connected to Load Bank

b. Load Bank running in local-manual mode

c. Load Bank running in local-auto mode

d. Load Bank running in remote mode

e. Remote load dump activated

- f. Load dump bypassed
- g. Load Bank operating normally
- h. Load Bank disabled due to cooling failure
- i. Master load switch on
- j. Load step on (one for each load step)

1.5 Warranty: The Load Bank shall be supplied with a two-year manufacturer's warranty which covers all materials and service labor. The manufacturer shall demon

1.6 Start-Up Service: The Load Bank manufacturer is to provide one day start-up service of the Load Bank, on site, after the Load Bank has been installed and co

1.7 Qualifications of Load Bank Manufacturer

1.7.1 The Load Bank shall be a product of a firm regularly engaged in the design and manufacture of generator Load Banks.

1.7.2 The Load Bank manufacturer shall demonstrate at least five years experience with at least twenty-five successful installations of Load Banks similar or eq

1.7.3 The load Bank for this application shall be a Simplex Neptune/Mars/Saturn Series as manufactured by Simplex, Inc. 1139 N. MacArthur Blvd., Springfield, IL

Add the following section in order to include a remote control panel.

1.8 Load Bank Remote Control Panel

1.8.1 Enclosure shall be NEMA type (1 or 3R), wall mounting, with hinge-open front.

1.8.2 Terminal blocks shall be provided for connection.

1.8.3 The following functions shall be included:

- a. Mode selector switch to select the following: "Remote-Manual," "Remote-Auto," and "Off."
- b. Manual "Run" and "Stop" pushbuttons
- c. Switch to bypass load dump contacts
- d. Master load control switch
- e. Load step control switches, one for each load step
- f. Lamp test pushbutton

1.8.4 Status annunciator with visual indicators for the following:

- a. Power connected to Load Bank
- b. Load Bank running in remote-manual mode
- c. Load Bank running in remote-auto mode
- d. Remote load dump activated
- e. Load dump bypass switch activated
- f. Load Bank operating normally
- g. Load Bank disabled due to cooling failure
- h. Master load switch on
- i. Load step on (one for each load step)

1.8.5 Remote control panel shall be UL listed.

Add the following section to provide for Load Bank operation as an automatic load regulator to maintain a preset load level.

1.9 Automatic Load Bank Controller

1.9.1 The Load Bank is to be equipped with an automatic controller which will be activated when the Load Bank mode control selector switch is placed in the "aut

1.9.2 In Automatic mode, the Load Bank is to be on-line and continuously operative whenever the power source runs. The Load Bank shall provide a component of th

1.9.3 The automatic controller shall include control logic, solid-state sensors and time delays which shall act to apply/remove Load Bank component in multiple

1.9.4 The automatic controller shall function to maintain total load upon the power source within a preset bandwidth by adding Load Bank load component as exter

1.9.5 The automatic controller shall sense load (amperes or kilowatts).

1.9.6 Full manual control of the Load Bank shall be restored when the mode selector switch is placed in the "manual" position.

1.9.7 The automatic controller shall include a solid-state load sensor with level and time delay adjustment and output contacts for each load step. A current tr