



**ENGINEERING SPECIFICATION
FOR HORIZONTAL
OUTDOOR RESISTIVE LOAD BANK
(750, 1000 AND 1250KW)**

1.0 SCOPE

- 1.1 This specification contains the minimum requirements for the design, manufacture and testing of an outdoor weatherproof resistive load bank.
- 1.2 The load bank is required for periodic exercising and testing of the standby emergency power source. The load bank shall be permanently mounted in a weatherproof enclosure, forced air cooled with a remotely mounted control panel.
- 1.3 This specification shall apply if the load bank is supplied to the purchaser or as a part of other equipment.
- 1.4 Should the vendor take exception to any part of this specification, it shall be stated in the bid with item number referenced.

2.0 STANDARDS

- 2.1 The equipment covered by this specification shall be designed as it applies with the latest standard of NEMA, NEC, ISO and ANSI standards.

3.0 RATINGS

- 3.1 The total capacity of the load bank shall be _____KW at _____Volts, 3 Phase. 60 Hertz, with _____Amps per Phase with Unity Power Factor with 50KW minimum load step resolution.

KW	VOLTS	AMPS/PHASE
750	480	901
1000	480	1202
1250	480	1502

- 3.2 The duty cycle shall be continuous and the load bank shall operate in an ambient temperature of -28°C to 49°C (-20°F to 120°F).

4.0 CONSTRUCTION

- 4.1 The load bank shall be constructed of heavy gauge aluminized steel per ASTM A463 or coated mild steel that meets or exceeds physical and chemical performance of polyurethane enamel coatings. Galvanized steel has a low corrosion threshold and shall not be used for exterior load bank construction.
- 4.2 The main input load bus, load step relays, fuses and blower/control relays shall be located within the load bank enclosure. A thermostatically controlled heater shall be located within the control section to protect control devices from the effects of moisture and condensation.
- 4.3 The load bank shall be outdoor weatherproof construction. All exterior fasteners shall be stainless steel. The load bank shall include forklift channels in the base for lifting.
- 4.4 For maximum protection and reliability in an outdoor environment, airflow shall be horizontal screened air intake and fixed louver shall be provided at the exhaust.
- 4.5 The exterior of the load bank shall be painted with polyurethane enamel paint at a minimum 2 MILS dry film thickness with a spatter finish.
- 4.6 Load elements shall be contained in one or more resistor cases or trays. Each can be removed in their entirety as a unit if service becomes necessary.

5.0 RESISTIVE LOAD ELEMENTS

- 5.1 Load elements shall be Avtron Helidyne™, helically wound chromium alloy de-rated to operate at approximately ½ of maximum continuous rating of the wire. Elements must be fully supported across the entire length within the air stream by segmented ceramic insulators on a stainless steel rod. Element supports will be designed that should a wire break, it will not short to adjacent conductors or to ground.



5.2 The change in resistance due to temperature shall be minimized by maintaining conservative watt densities. The overall tolerance of the load bank shall be -0% to +5% KW at rated voltage. A -5%, +5% rating allows the load bank to deliver less than rated KW and shall not be used. The load bank must deliver rated KW at rated voltage.

6.0 COOLING

6.1 The load bank shall be cooled by an integral TEFC or TEAO motor which is direct coupled to the cooling fan blade. The fan motor must be electrically protected against overload using a motor overload device and short circuit protected using three (3) current limiting fuses with an interrupting rating of 200K A.I.C.

6.2 The fan motor must be rigidly supported by formed steel or structural members which attach to the frame of the load bank.

7.0 PROTECTIVE DEVICES

7.1 A differential pressure switch shall be provided to detect air loss. The switch shall be electrically interlocked with the load application controls to prevent load from being applied if cooling air is not present.

7.2 An overtemperature switch shall be provided to sense the load bank exhaust. The switch shall be electrically interlocked with the load application controls to prevent load from being applied.

7.3 To provide for major fault protection, branch fuses shall be provided on all three phases of switched load steps above 50KW. Branch fuses shall be current limiting type with an interrupting rating of 200K A.I.C.

7.4 The exterior of the load bank shall have appropriate warning/caution statements on access panels.

8.0 CONTROL PANEL

8.1 The control panel shall be a remote 19" rack mounted panel designed for indoor use. It shall contain a power ON/OFF switch, a power ON indication light, blower START/STOP pushbuttons, Blower ON light, and blower FAILURE light. Load selection shall include a master load ON/OFF switch and individual load step switches (one for each load step). **OPTIONAL:** NEMA-4 type wall mount enclosure for remote control panel with gasketed/pad-lockable access door to protect controls.

9.0 QUALITY CONTROL

9.1 The load bank shall be fully tested using a test specification written by the supplier. Tests shall include electrical functional testing, verifying conformance to assembly drawings and specifications. Each load step shall be cold resistance checked to verify proper calibration of resistive load steps and proper ohm value. Avtron LoadBank, Inc. shall maintain this data on file for inspection purposes by the purchaser. Tests using high potential equipment shall be performed to ensure isolation of the load circuits from the control circuits and to determine isolation of the load circuits from the load bank frame. Tests of all safety circuits shall be performed to verify conformance to the specification.

9.2 The Load Bank Shall Be U.L./ c U.L. Listed and the Company's quality system shall be ISO9001 Certified.

10.0 QUALIFICATIONS OF MANUFACTURER

10.1 The load bank shall be manufactured by a firm regularly engaged in the manufacture of load banks and who can demonstrate at least twenty five (25) years experience with at least twenty five (25) installations of load banks similar or equal to the ones specified herein. The manufacturer shall have a written Quality Control procedure available for review by the purchaser, which will document all phases of operations. Manufacturer must have a service organization with service personnel having a minimum of an Associate Degree in Electrical Engineering.

10.2 The load bank shall be as manufactured by
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Quality System Certified to **ISO9001**