

1875 KVA Load bank

Trailer-Mounted 1.5 MW Load Bank

Characteristics

Manufacturer: PD Power Systems, LLC

Part No.: PDPS-LB-1875/RR

Rated: 1875 KVA at 0.8 pf 4160 V, 3-phase,
50/60 Hz Continuous Duty Rated

Compromising: 1500 KW at 480 V, 3-phase, 60 Hz
1125 KVAR at 4160 V, 3-phase, 60 Hz
0.8 power factor capability

Fan Motor & Control Circuit:

Dual 50/60 Hz 380-420 V, 3-phase; 440-480, 3-phase, 60 Hz

Dimensions (packaged):

Height (ft.) - 12

Width (ft.) - 8.5

Length (ft.) - 35

Weight (lbs.) - 28,900



Capabilities and Features

ISO Style containerized construction. Vertical discharge

Walk-in control room for easy access to control, switchgear, and optional power circuit breakers.

Air inlet covers provide protection from dirt and moisture during transport.

Polycarbonate screens in control and switchgear enclosures protect all live parts from accidental contact.

Four Lift Frame: Quantity Four (4) integral lifting holes plus Fork Pockets built into Container Base.

Load Bank Control System Module

Installed with voltage and current transformers to provide a control interface for all the functions within the load bank for individual or multi-unit control. It provides intelligent, fast, user-friendly, accurate control and instrumentation with outstanding test features and data acquisition capabilities.

Additional load banks can be linked together and operated using either the:

1. Optional Handheld Terminal
2. Other options available, including control via MODBUS from a separate system.

Construction

The frame of the load bank is constructed from 2mm "Zintec" steel, folded and welded to form a monocoque construction. Double-skinned recessed doors allow easy access to the separate enclosures for control, switchgear, and power connections. The double-skinned, horizontal discharge duct with a stainless steel heat shield contains the resistive load elements and cooling fan. Stainless steel mesh screen on the main air inlet and outlet provide protection against access to hazardous parts to IPIX. All electrical enclosures are to IP54. High quality two-pack industrial acrylic or electrostatically applied paint systems are applied to a prepped electro-plated zinc base and low bake finish.

Load Connections

The load bank is equipped with 200 A or 600 A IEEE 386, Interface 592, load break bushings to connect the generator set output 4160 VAC voltage to the trailer-mounted step-down 4160 VAC / 480 VAC transformer.

Load Elements

The load bank uses replaceable, non-finned sheathed elements. The outer sheath is made from stainless steel to give good corrosion resistance. The heating element is an 80/20 nickel-chrome wire embedded in compacted magnesium oxide powder, giving good thermal and insulation properties. The elements are conservatively rated, and there is no need for cooling fins to dissipate the heat into the airflow. This ensures that foreign matter or a loosely fitting fin will not cause hot spots and ensures high reliability.



1875 KVA Load bank (continued)

Load Elements (continued)

The elements are designed to operate continuously at up to 800°C (red/orange). The actual temperature is below 500°C (dull red). This gives a wide margin of safety and very long life. Load tolerance is within 2½ % of total capacity. Elements are continuously rated at the specific voltage. Short-term tests with fluctuations up to 10% above rated voltage are permissible. Tests at lower voltages, with a corresponding reduction in overall rating, may be carried out. Power is proportional to voltage squared.

Auxiliary Power

The fan and control circuit may be powered from an external auxiliary supply or from the supply on test, provided it is of the correct voltage and frequency. Lower voltages and other frequencies must be tested using the external supply. On static load banks, connection is by internal terminals. Trailer/mobile load banks include an IEC 60309-2 plug and socket with a three-position switch, enabling quick and easy connection. Dual 50/60Hz Fan & Control Circuit: 380/420V, 50Hz and 440/480V, 60Hz.

Safety Features:

- Emergency stop/disconnect switch gives full isolation of the fan and control supply.
- A 110 Volt AC control circuit transformer provides isolation and operator safety.
- Stop/start buttons ensure the load bank will not automatically restart. On static load banks, provisions are provided for the connection of remote stop/start buttons.
- The fan motor is fully protected with fuses and a thermal overload. Movable load banks are also fitted with phase-rotation detection, automatically providing correct airflow direction. Single-phase protection is integrated into the operating controls. Thermal detectors are fitted to protect against overheating in the resistive duct and switchgear enclosure.
- Overvoltage protection for the control and load circuit is provided by load control if specified.
- Individual load element group and associated contactors are fuse-protected.
- The load contactors and fan controls are interlocked to ensure the load can be applied only when the fan is running.
- Internal access is restricted by key-operated door catches. Polycarbonate screens behind the doors prevent accidental contact with live parts.

Transformer

Sized per load bank, transformers are ruggedized, heavy-duty, dry-type, aluminum-wound, VPI, special with load break (medium-voltage IEEE 386 quick-connects), 4160:480V, 3-phase, 60Hz, 150°C rise, enclosed in suitable outdoor steel, power-coated enclosure.

Trailer and Interconnect

Trailer for the packaged load bank, controls, and transformer is suitably sized for DOT-compliant operation and includes a suspension system for over-the-road use. The trailer includes integral brakes, DOT over-the-road lighting, markings, and a tongue-mounting jack. The trailer is primed and painted with high-gloss industrial black paint.



Trident 2500

Digital Load Bank with Data Acquisition
1500KW - 2500KW



Overview

- Integrated design, load module, trailer, reels, cam-lock style connections, digital control
- Very high capacity, 1500-2500kw
- Dual voltage: 208-240/416-480vAC
- Digital load control, 5 kw resolution
- Touchscreen operator interface
- Remote and/or local control
- Data acquisition and recording
- Network units to form large systems

Description

The Simplex Trident 2500 is a fully integrated design trailer load bank including:

- Resistive Load Bank, 1500-2500kw
- Heavy duty, purpose built, tandem axle highway trailer
- Cables reels
- CAM-LOCK style connection panel
- Storage locker
- Integrated digital controller suitable for local and/or remote control

The Trident Trailer Load Bank is ideal for field testing in the performance of start-up and commissioning activities, service contracts and engine generator maintenance. The Trident is the perfect addition to rental fleets and is in widespread use with Simplex' sister

Company, Simplex Onsite, providing nationwide load bank rentals.

Trident Load Bank Systems feature highly standardized digital controllers with data acquisition capability. Trident Load Banks can be networked to other Trident units or to any Simplex Load Bank (except Powerstar and Infinity product lines) for totalized, single point control and data acquisition. In fact, any number of Simplex Load Banks can be networked to form large, integrated aggregate systems. Operator interface is via touchscreen. Load control is via screen keypad. All electrical values display on-screen and are capable of being recorded for future data retrieval.

The Trident family comprises load modules from 600-1250kw integrated with trailers, cable storage and connection accessories and digital controls. The Trident 2500 is a dual load module product. The Trident 1250 is a single load module product, 600-1250kw rated. Refer to the Trident 1250 Brochure for further details.

Features

Trailer: NTM DOT Certification.

Digital Control: PLC based control with 8-inch color TFT touchscreen interface. MODBUS communication.

Instrumentation: Digital power transducer with Ethernet communication to digital controller. Data display on touchscreen. Data acquisition and recording.

Load Elements: Simplex "Powr-Web" chromium alloy, open wire, continuously supported, power resistor.

Load Control: 3-Pole contactors.

Load Element Circuit Protection: Branch circuit fuses. One set of fuses each 50KW branch. Fuses are current limiting type, 200KAIC, 600V.

Cooling System: 2 x 3-phase, direct-drive fan, 21,000 CFM.

Malfunction Detection System: Protection against fan failure, high exhaust air temperature, high intake air temperature, overvoltage and fan reversal. Exhaust air temperature displays on screen.

Control Power Supply: Dual voltage control power transformer with supply power switchable to internal (generator) or external.

Touch Screen: Easily removable from panel.

Connection: "Cam-Lock" type power connections.

ISO9001: 2008
registered company.



Trident 2500

Digital Load Bank with Data Acquisition

1500KW - 2500KW • Page 2

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Capacity Detail

Model	TOTAL KW (1.0pf)	KW DETAIL					
		480V	416V	380V	240V	208V	240V, 1-ph*
Trident 1500	1500	1500	1125	940	1000	750	300
Trident 1800	1800	1800	1350	1128	1000	750	300
Trident 2000	2000	2000	1500	1253	1000	750	300
Trident 2250	2250	2250	1688	1410	1000	750	300
Trident 2500	2500	2500	1875	1567	1000	750	300

*Requires external 3-phase fan/control power. Capacity limited to 1250 FLA.

Voltage: Dual Voltage: 240/480V AC, 3-phase Operational at any voltage to 480V AC maximum, single or 3-phase

Optional Voltages: Instead of 240/480v dual voltage:

- a. Any 50hz or 60hz single voltage to 690v
- b. 600v, single voltage
- c. 600/480v, dual voltage
- d. 600/300v, dual voltage
- e. 480/416v, dual voltage
- f. 208/416v, dual voltage

Frequency: 50, 60 Hertz standard

Connection: 3-wire plus ground

Time Rating: Continuous

Ambient Air Temperature: 120°F max

Airflow: 42,000 CFM

Temperature Rise: 180°F nominal

Control/Fan Power:

- 230/460V, 3-phase, 60 Hertz
- 190/380V, 3-phase, 50 Hertz
- Switchable internal (generator)-external
- External fan/control power requirements: 240/480vAC, 3-phase, 60 Hertz, 80 / 40 amps service (7.5HP motor)
- 230/460-115V control power transformer internal to Load Bank.

Net Weight: Approx. 12,500 lbs., including load module, trailer, three reels, 2000' 4/0 cable, cam-lock style connectors

Digital Load Control

Nominal 5.0 kw resolution: direct enter any load value and controller will apply load within nominal 5kw resolution

Digital Load Calibration Versus Voltage

Controller automatically calibrates loads for reduced voltage operation.

Available for rent at
simplexonsite.com

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Standard Cable Reels



**Cam-Lock Cable Style
Connection Panel**



**Standard Trident
Remoteable Digital
Touchscreen Controller**



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Trailers

Heavy-duty, purpose-built for the application, tandem axle trailer:

Construction: Structural steel chassis, steel deck, all welded, built to DOT specification, NTM DOT certification label

Capacity: 12,500-14,000 GVWR

Axles: Tandem

Hitch: 2-5/16" ball hitch OR 3" pintle ring

Tires: (4) ST235/80R16, load range E

Brakes: Electric with breakaway system or hydraulic surge, mechanical parking brake

Suspension: Leaf springs

Features: Safety chains, DOT LED lighting with connector, reflectors, tie down rings, rear stabilizers, front lift jack, mud deflectors

Standard Finish: Dark gray polyurethane with epoxy primer.

Optional Finishes: Customer selected color. Undercoating. LINE-X overall protective coating. Hot dip galvanizing.



Cable Connections

Cam-Lock style cable connectors behind hinged door. 4/0, 400A. Snap-back protective covers. Also available orange-brown-yellow.



Available for rent at
simplexonsite.com

Cable Storage

Trident 2500 Trailer Load Banks normally supplied with 3 cable reels:

Capacity:

- 900-feet x 4/0 (1" cable), perfect wrap
- 750-feet x 4/0 (1" cable), nominal wrap

Standard Reel Features:

- Manual, gear driven, crank rewind
- Pinion brake
- 2" steel channel frame, powder coated

Other Cable Storage Options: Cable storage racks or totes.

Cable Options

- 4/0, extra-flex, portable power cable
- Type W
- 2000v
- 90C EPDM insulation
- Polyester braid reinforcement between insulation and outer jacket
- 2062 strand copper
- "CAM-LOCK" type connector, each end, standard
- Crimp-on ring lugs on generator end option
- 5 foot "Pigtails" available with "CAM-LOCK" type connections on one end and opposite end lugged, bare or otherwise terminated

Top Photo: Standard manual cable reels.

Middle Photo: Optional 12 or 24vDC electric rewind reels.

Bottom Photo: Optional full enclosure with lockable doors for cable reels.



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Digital Controller

Trident Load Banks are digitally controlled via PLC.

Top Photo: Standard Trident equipped with local, on-board, 8-inch Touchscreen operator interface behind hinged, lockable door. Fan/control power circuit breakers with internal/external interlock and control power circuit breakers are conveniently located on the control panel.

Middle Photo: Local operator interface is removable for remote operation.

Bottom Photo: Optional "suitcase style" remote controller, with Cat-5/Ethernet remote control cable.



ISO9001: 2008
registered company.



Digital Control and Data Acquisition System

PLC based digital control with 8-inch color TFT touchscreen operator interface.

Functions

- Control power source and voltage level detection
- Malfunction detection and protection
- Direct access (keypad) load control
- Alternate mimic panel load control
- Basic automation of load control
- Field adjustable exhaust temperature limits with temperature display
- Built-in control from customer supplied computer

Instrumentation

Digital power transducer to digital controller and meter displays on touchscreen:

- 3-phase voltage (each, L-L)
- 3-phase current (each line)
- Frequency
- KW

Data Acquisition

- Captures and records all electrical values
- Start recording/stop recording screen buttons
- One second sample rate
- Exports text file to detachable flash drive which plugs into USB port

Outputs

MODBUS (standard) or BacNet (optional):

- Load applied
- Each electrical value as above



Main Screen



Monitoring Screen



Metering Trends Screen



Diagnostics Screen



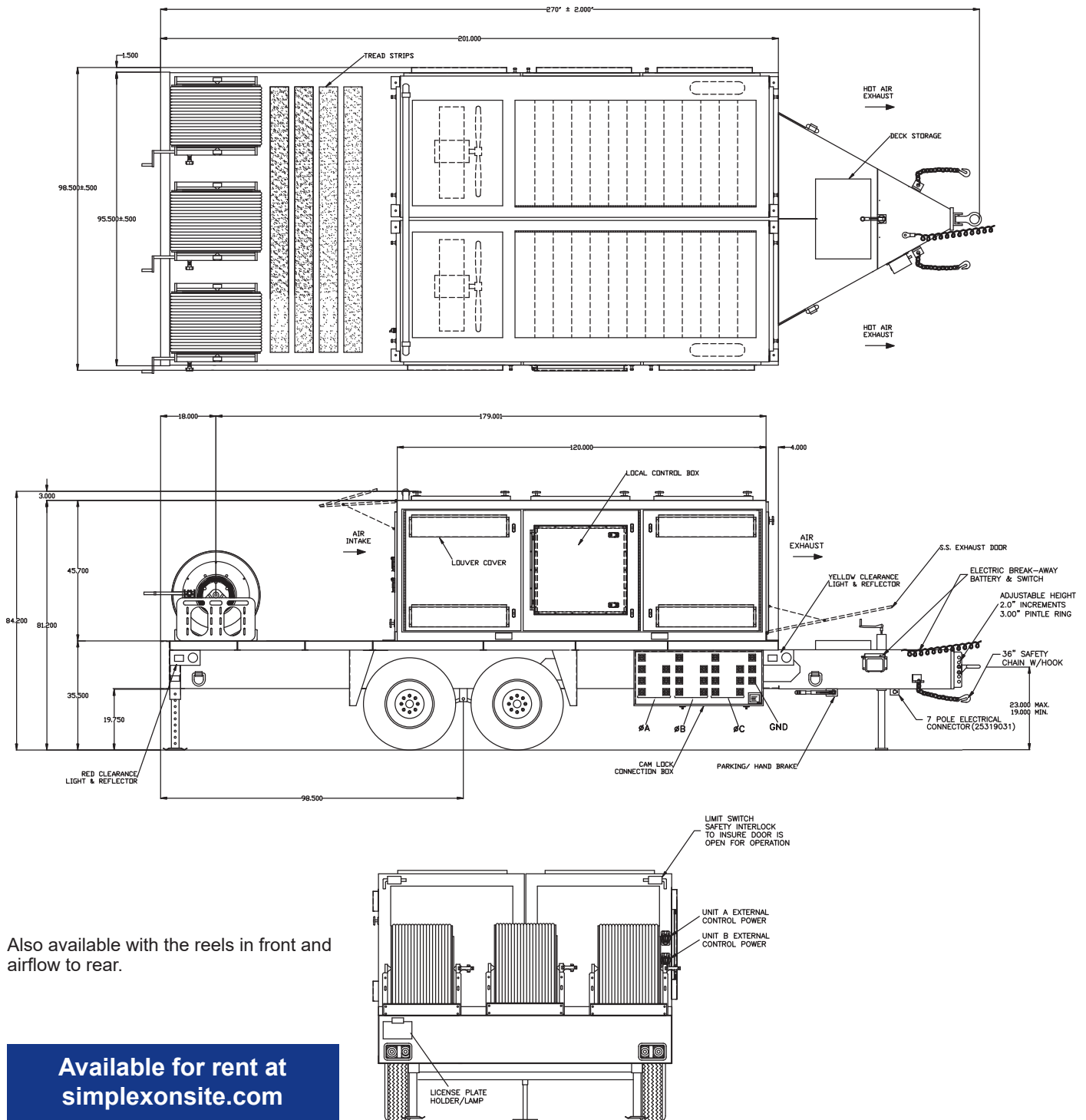
Maintenance Screen

Trident 2500

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Also available with the reels in front and airflow to rear.

Available for rent at
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The Avtron Model 5820 are resistive, AC trailer mounted or trailer ready load banks designed for outdoor use when up to 2000 kW of load is required.

LOAD BANK RATINGS

Standard capacity ratings

- 1500 kW
- 2000 kW

Standard load step resolution of either 5 or 50 kW.

Standard three phase voltage ratings

- 480-60Hz

Please consult factory for non-standard ratings.

Blower Motor Control

The blower motor(s) are factory wired to the main load bus. Provisions for an external power source are also provided.

An integral 120V, 1 Phase, 60 Hz control power transformer is provided for control circuit operation.

The control power transformer receives its power from the blower motor circuit.

Cooling System

Approximately 20,000 CFM cooling (per individual vertical frame) is provided by integral TEFC or TEAO motor which is direct coupled to the cooling fan blade.

The fan motor is fully protected with fuses, motor starter contractor, and overload relay.

Operator Controls

The standard load control for the 5820 is a local manual panel. Controls include: Power On/Off switch, Blower Start/Stop push buttons, Master Load On/Off switch, and Individual Load Step switches. Visual indicators include: Power On, Blower On, and Blower/Air Failure.

Digital Metering

Advanced Digital Monitoring System (ADMS) is provided for display of Volts, Amps, Frequency, and kW. ADMS also includes Data Logging Software.

Construction

The 5820 is constructed using heavy gauge aluminized steel per ASTM A463. It is designed for continuous outdoor weatherproof operation. Forklift channels are provided in the base for lifting.

All exterior fasteners are stainless steel. The main input bus, load step relays, fuses, and blower/control relays are located in the main enclosure. A vinyl storage cover is also provided.

Load Connections

Quick connect cable receptacles are securely mounted to the cool air intake side of the load bank. Each phase is equipped with 3 quick connect cable receptacles. 2 ground quick connects are also included.

Finish

The 5820 has a high quality baked polyester powder coated finish with a film thickness of 2.8 +/- 0.4 mils per coat. The standard color is gray (ANSI 61).

Two Year Warranty Included

The equipment is covered by an industry exclusive 24-month parts and labor warranty.

Model 5820 Specifications

Resistor Elements

Avtron load banks use helically wound chromium alloy Helidyne elements. Elements are fully supported across their entire length by segmented ceramic insulators on stainless steel rods. These elements are designed to operate at approximately 1/2 of their maximum continuous wire rating.

Elements are positioned within the cooling airstream for optimal performance. Changes in resistance due to temperature are minimized by maintaining conservative watt densities.

The overall load tolerance of the 5820 load bank is -0, +5%. This ensures that advertised kW is delivered at rated voltage.

The elements are continuously rated at the specific voltage. Tests at lower voltages, with a corresponding reduction in overall rating, may be carried out.

Safety Features

A differential pressure switch is interlocked with the load application controls to prevent load from being supplied if cooling air is not present.

An overtemperature switch is provided to sense the load bank exhaust. The switch is interlocked with the load application controls to disable load from being supplied if an over-temperature condition is present.

The fan motor is protected with fuses and overloads.

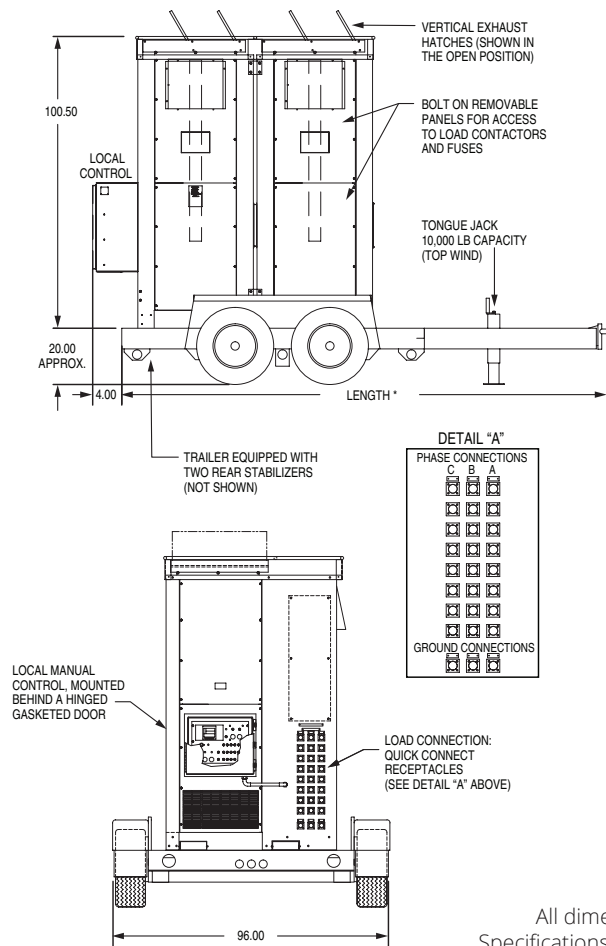
Major fault protection is provided by branch circuit fuse protection. Fuse protection is provided on all load steps.

The exterior of the load bank has appropriate warning and caution statements on access panels.

Internal access is restricted by bolt on exterior panels.

The air intake on the 5820 is designed to prevent objects greater than 0.50" diameter from being ingested into the unit.

Vertical air discharge is provided and exhaust air is directed upward away from personnel.



Load bank shown mounted on optional trailer.

Load cable connection quantity depends on kW capacity selected.

All dimensions are in inches [millimeters]. Specifications subject to change without notice.

Ambient Temperature

The 5820 load bank is designed for continuous duty cycle with no limitations. The ambient temperatures range is -20°F to 120°F (-28°C to 50°C).

Optional Trailer

If the trailer option is selected, the 5820 will be factory mounted and balanced on a DOT and ICC legal trailer. Electric brakes, stabilizer jacks and lunette eyes are provided as standard.

Optional Accessories

- Cable Reels (Manual or Electric)
- Cable Reel Security Cover(s)
- Lockable Storage Box
- SIGMA 2 Digital Controls
- Spare Tire
- Solar Battery Charger
- Hydraulic Brakes
- 2 5/16 Ball Hitch (3" Pintle Standard)
- Custom Powder Coat Paint Finish

Documentation - Operating Manual

A comprehensive operator's manual is supplied electronically via a USB drive.

Sections include: Safety, Installation, Operation, Maintenance, and Troubleshooting.

Testing and Standards

Avtron load banks comply with NEMA, NEC, and ANSI standards. Quality control system is certified to ISO9001 standards.

Weight and Dimensions

Load Bank System Dimensions (approx. in/mm)			Weight (approx. lb/kg)
Length	Width	Height	
*	96/ 2438.4	120.5/ 3162.3	*

*NOTE: Length & Weight are dependent on available option selection.