MegaResistors

Braking Resistors and Load Banks

Our company specializes in the design, manufacture and application of power resistors. Our braking resistors are designed, manufactured and tested in Canada and are cULus and CE certified. If you are replacing a resistor, or purchasing one for a new application, please contact us:

e-mail: **sales@megaresistors.com**
Phone: **+1 (905) 908-2376**

Purpose and application of product

BRAKING RESISTORS take the regenerated power and dissipate it safely in the form of heat. They are often used in conjunction with variable frequency drives (VFD) used to control the speed of a motor. In a VFD, the AC input power is first rectified into DC current. This current is then stored and smoothed on the drive bus. This bus feeds an inverter that generates an AC output to control the speed and torque of the electric motor. When the motor is commanded to decelerate or experiences an overload situation, it becomes a generator and starts feeding power back to the bus, causing its voltage to rise. Many variable frequency drives come with built-in braking transistors (also known as “choppers”) that are responsible for sensing an overvoltage on the DC bus and shunting power to the braking resistor.

LOAD BANKS are used to mimic the operating or “real” load that a power supply will see. Highly durable and designed for optimum performance, our load banks are ideal for generators, uninterruptible power supplies (UPS) and power grids, ensuring they can withstand the designated load capacities. This vital process helps identify potential system failures, ensuring that your power sources are efficient, reliable and ready to go when you need them most. The difference between a braking resistor and a load bank is fuzzy. All braking resistors are technically load banks. From a pragmatic point of view, load banks often have more advanced functions, such as the staggered connection of electronically controlled loads, power measurement, communications and networking, etc. In addition, they may have capacitors or inductors to generate the power factor required for the application.

Certifications and Standards

c UL us LISTED

CE

AC156
Seismic Qualified

CERTIFIED ISO 9001:2015 COMPANY

Type	Standard
Electrical codes	CSA 22.1
	NFPA 70
	IEC 60364
	LVD 2006/95/EC
Enclosures	C22.2 No.94.2
	UL 50E
	IEC 60529
	NEMA 250
	NMX-J-235/2
Industrial controls	CSA 22 No. 14
	UL 508
	IEC 60947-4-1
Seismic codes	NBCC
	IEEE 693
	ICC-ES156

Working with MegaResistors

Competitive pricing	• Competitive in standard and custom products • Price matching policy for equivalent quotations
Superb sales and support	• Average response time less than 24 hours • Thorough documentation on installation and maintenance • Comunicación in your language
Exceptional engineering	• Thorough analysis of your requirements • 3D modeling and wiring schematics • Structural and thermal simulation capabilities
Quality Products	• Reliable products used by major companies all areound the world • Backed by a 2-year warranty, with extension options
Short lead times	• Just-in-time delivery • Rush options available

A solutions based approach

Industrial applications: DB Series

- Wirewound or edge-wound resistors in boxes or towers.
- Standard for the vast majority of industrial applications with variable frequency drives (VFD).
- Multiple units can be easily connected for higher total power.

Cranes and large motors: GR Series

- High power units with forced cooling options available to meet any demand required.
- Weatherproof cabinet with removable covers and ventilated bottom grille to protect against rodent entry and accidental personnel contact.

Marine applications: TB Series

- Available in type 4/4X (NEMA 4/4X) and type 12 for mounting on boat deck or in high rainfall locations.
- Superior protection against salt water and moisture.
- Designed for ease of assembly, handling and field installation.

Panel builders: MC Series

- Plug and play” design for easy panel mounting on existing or new equipment.
- Integrated thermal switch to protect equipment.
- Compact designs to save space
- Low power applications.

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A solutions based approach

Mining: GR Series

- Braking and starting resistors for three-phase wound rotor motors.
- Economical and low maintenance solution for large motors.
- Available with sequential control units.

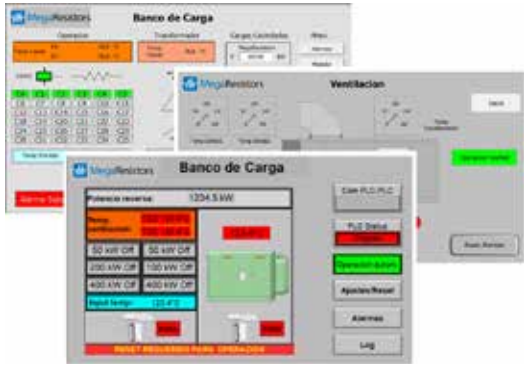
Shipyards and extraction: CF Series

- Forced cooling for continuous duty and high power applications.
- Intensive applications such as crane control in shipyards and oil extraction.
- Power ratings from hundreds of kW to multiple MW.

Turbine and genset testing: LB Series

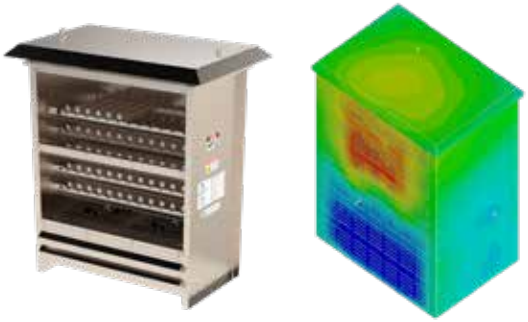
- Provide time-varying electrical loads.
- Used for optimization, balancing and load simulation.
- Removable heater drawers to simplify maintenance.
- Available with horizontal or vertical air flow.
- AC or DC in low and medium voltage, with or without step-down transformer.
- Power ratings available up to 20 MW.
- Power factor from 0 to 1.0
- SCADA operator interface with color touch screen.
- Modbus TCP/IP communication.
- Fixed load, programmed load, compensation load and reverse power.

User interface



- Touch screen operator interface
- SCADA control
- Local or remote operation

Laboratories and Universities



- We design and manufacture load benches with complex and specialized requirements.
- We have highly trained personnel and the most advanced design, simulation and testing tools.

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Braking Resistors and Load Banks

Information required to quote:

Braking Resistors

- Drive HP or Watts
- Drive input voltage
- Braking torque
- Minimum resistance
- Duty cycle

- **Resistance:** It is important that the resistance value is within the allowable limits of the drive or braking module (too low a value can damage the drive or chopper). Also, when the braking module is activated, the resistor value will produce a specific braking current. The maximum braking currents of each standard design are listed with each resistor design and should not exceed the rated limits of your drive or braking module.
- **Braking Torque:** Braking torque is normally specified as 100%, 150% or 200% which is a function of the ohmic value of the resistor. Higher braking torque means lower resistance, higher braking currents and faster motor stops, but as indicated, caution should be taken not to exceed the braking current of the drive. Braking torque can also be determined by the type of application, deceleration or regeneration (overhauling).
- **Minimum resistance:** Most variable frequency drives incorporate a braking transistor or braking chopper consisting of electronic components that function to shunt or redirect power to the braking resistor when the DC bus voltage exceeds a certain threshold. The transistor will have a minimum Ohms value that will be used to size the resistor. If the variable frequency drive does not have a built-in transistor, we can supply an external transistor based on the application specifications.
- **Duty Cycle:** The duty cycle determines the power rating of the braking resistor.

Load Banks

- Voltage: Low voltage (up to 690 VAC), medium voltage (up to 13.8 kV) or continuous voltage (12 VDC up to 1100 VDC).
- Location: Indoor or outdoor.
- Mounting: Stationary, transportable or trailer mounted.
- Cooling: Natural, forced vertical or forced horizontal.
- Control Voltage: 120 VAC, 240 VAC, 24 VDC or 125 VDC.
- User Interface: Switches and lamps or touch screen.
- Control: Communications, data logging, load scheduling, remote control, power metering, load compensation, reverse power.
- Safety: Safety switch, audible alarm, interlock.

- **Load scheduling:** The process of setting and controlling electrical load parameters during testing to evaluate the performance and capacity of the power source under different usage conditions. In a load bank, different load conditions are simulated to evaluate the performance and capacity of the generator, transformer or batteries. Load scheduling involves setting the load parameters, such as required power or current, test duration and other relevant factors. Through load scheduling, comprehensive tests can be performed to verify the generator's ability to supply power stably and efficiently under various conditions. This includes peak load, nominal load or partial load tests, among others.
- **Load Compensation:** The ability to adjust and balance the applied load. Load compensation helps to avoid unbalance and overloading of the generator, which can adversely affect its performance and cause damage to the equipment. In addition, by balancing the load, more accurate and reliable test results are obtained, allowing for a more accurate assessment of the generator's capacity. The balancing function is also used to adjust and balance the load applied to the generator to ensure that it remains at its minimum required generation level.
- **Reverse Power:** The ability of the load bank to dissipate power coming not from the generator, transformer, or battery bank, but from the motors, which although normally a load on the electrical system, in some circumstances can generate power. The load bank must dissipate this energy to avoid damage to the electrical system.

Our customers

ABB, SIEMENS, EATON, ExxonMobil, bp, Tractel, Schneider Electric, GE, TECO Westinghouse, Chevron, cenovus energy, Invertek Drives, ONTARIO POWER GENERATION, TEREX, SPACEX, Rolls-Royce, NASA, Peraton, Teck, ArcelorMittal, slb, U.S. AIR FORCE, BOMBARDIER, RioTinto, VALE, CLIFFS

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Feature	MC Series	DB Series	TB Series	MC Series	CF Series	LB Series
Power range	100 W to 500 W	300 W to 70 kW	1.8 kW to 80 kW	14 kW to 140 kW	10 kW to 1 MW	100 kW to 20 MW
Overload	Low to moderate	Moderate to high	Low to moderate	High to very high	Moderate to high	Moderate to high
Resistance range	25 to 1000 Ω	0.01 to 1000 Ω	0.06 Ω to 10 kΩ	0.02 Ω to 35 Ω	0.01 Ω to 1000 Ω	0.01 Ω to 1000 Ω
Protection	Type 4 (IP 65)	Type 1 (IP 20) Type 3R (IP23)	Type 4 (IP66)	Type 1 (IP20) Type 3R (IP23)	Type 1 (IP20) Type 3R (IP23)	Type 1 (IP20) Type 3R (IP23)
Enclosure material	Aluminum	Galvanized steel G90 Stainless steel	Stainless steel	Galvanized steel G90 Stainless steel	Galvanized steel G90 Stainless steel	Galvanized steel G90 Stainless steel
Voltage	Low voltage	Low voltage	Low voltage	Low voltage	Low voltage Medium voltage	Low voltage Medium voltage
Terminals	Cables	Terminal blocks	Bus bars	Bus bars	Bus bars	Bus bars
Thermal protection	Thermal switch	Thermal switch	Thermal switch	Thermal switch	Thermal switch Pressure switch	Thermal switch Pressure switch
Main applications	Dynamic braking Low power	Dynamic braking Medium power	Dynamic braking Medium power	Starting and braking High power	Variable load Manual control High power	Load compensation Load scheduling Reverse power High power

*We also offer custom-designed models.