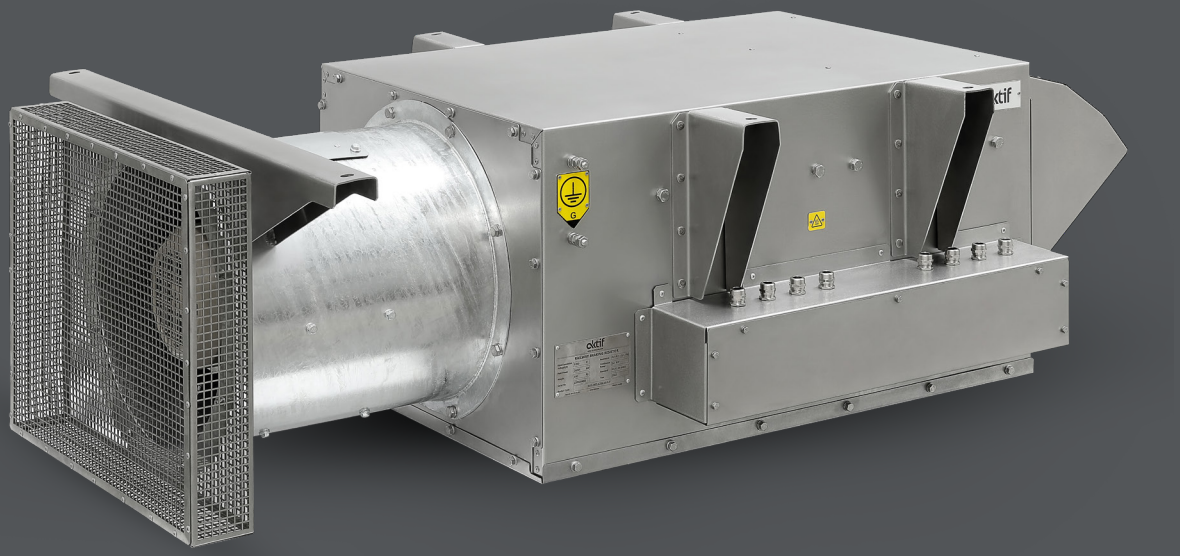
Railway and Marine Resistors



TR Series

TRR B | TRR C | TRR H | TRR L | TRR D | TRM B | TRR F

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Railway and Marine Resistors

TR Series

Power resistors are used in all railway vehicles such as high-speed trains, trams, locomotives, wagons. Braking resistors, crowbar resistors, charge-discharge resistors, line test resistors and damping resistors that call Railway Resistors are used in each vehicle.

Marine braking resistors are used to ensure fast stopping or reduce the speed of AC & DC electric motors controlled by speed control drives at Onshore & Offshore applications.

Railway Braking Resistors

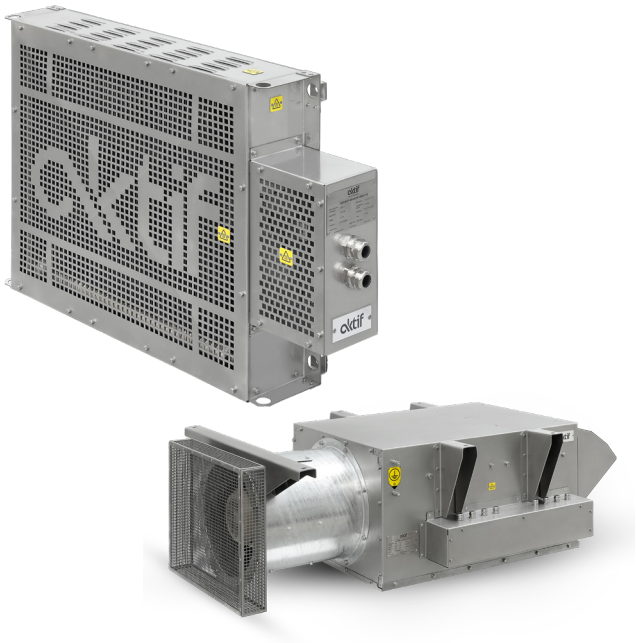
Railway vehicles need a brake system to operate safely and to control the speed easily and quickly. The braking system is classified as mechanical braking, which converts kinetic energy into heat, and electrical braking, which converts power energy into heat.

When kinetic energy is converted back into electrical energy, it can slow down or stop an electric motor and this energy is dissipated using a power resistor. Braking resistors have high power ratio and low ohmic values.

Railway vehicle motors work like generators during braking such generate regenerative energy and this energy damages the driver, other electrical equipments. A regenerative braking system radiates the regenerative energy onto the resistors and enables the voltage of the power electronics system to be reduced. This system is necessary to control the speed of the train and to dissipate the regenerative power produced by reducing the speed of high-speed trains. Railway Braking Resistors are used ort he absence of mechanical wear in railway vehicles, to suppress voltage fluctuations and to absorb regenerative power.

Application Areas

- High-Speed Trains
- Locomotives
- Wagons
- Electrical Busses



Advantages

- Fast cooling
- Lighter in weight per kilowatt
- Low inductive characteristic
- Mechanical structure extremely resistant to vibrations
- High flexibility for shock absorption

Standards

- IEC 60322
- IEC 60077-1
- IEC 61373
- IEC 62497-1
- IEC 62497-2
- IEC 60529

Technical Specifications

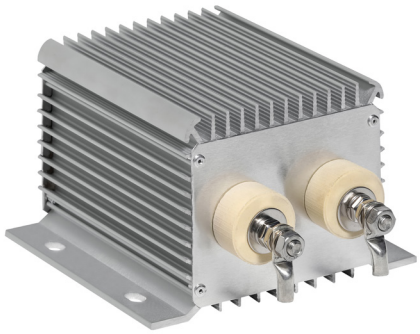
- Max. Operating Voltage : 25 kV
- Resistance Tolerance @20°C : -5/+7%
- Isolation : 70 kV 1 min. (Umax = 25 kV)
- Overvoltage Categories : OV1, OV2, OV3, OV4
- Pollution Class : PD1, PD2, PD3, PD3A, PD4, PD4A, PD4B
- Protection Class : IP20
- Resistor Material : Stainless Steel
- Enclosure Material : Stainless Steel
- Cooling : Natural or Forced

Crowbar Resistors

Crowbar Resistors are used to protect the outputs of power sources in railway systems against the short-time (transient) and long-time overvoltage failures.

Charge-Discharge Resistors

Charge-Discharge Resistor is used to charge and discharge the dc capacitors inside the inverters in a controlled manner so that the semiconductors are not damaged.



Line Test Resistors

Line Test Resistors are used to detect if there is any malfunction before energizing the catenary lines. Before the high-speed circuit breakers are switched, the resistor is activated, and the circuit breakers are safely activated if there is no fault current on the line.

Filter & Damping Resistors

Filter Resistors are used to improve the quality of the power grid and Damping Resistors are used to prevent any damage to electronic components by limiting any current and voltage peaks.

Marine Braking Resistors

Marine Braking Resistors are designed and manufactured with electrical double insulation and suitable for high corrosive environments.

Application Areas

- Ships & Vessels
- Oil Rigs
- Crane Barges

Technical Specifications

- Max. Operating Voltage: 1000 V
- Max. Power : 660 kW
- Insulation Level : Double
- Frame Material : AISI 316L Stainless steel
- Resistance Tolerance @ 20°C : ±5 %

Advantages

- Suitable for marine (offshore) and harbour (onshore) applications
- Compact and elegant frames with a high cooling performance are specially designed for high power loads
- All connector elements are manufactured of non-corrosive materials.
- Special structure resistant
- High corrosion resistance

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