



Dynamic Braking Resistors

DBR

APPLICATION

The purpose of a dynamic braking resistor is to slow down or to quickly stop a motor by draining excess voltage and keeping it within safe tolerances. This can help to lower the wear and tear of friction braking components. The braking resistor is temporarily connected across the motor's armature as an additional load.

When removed from a power supply, most DC motors will act as electrical generators due to their permanent magnets. If a resistor is then connected as a load, the energy produced by the rotational inertia of the DC motor will be dissipated by the resistor slowing down the motor.

While AC motors do not have permanent magnets in their rotors, they do have an induced magnetic field created by the rotating magnetic field in the stator. The energy lost in the stator will backfeed into the variable frequency drive (VFD), which will rise the voltage on the DC bus in the VFD. The greater the difference between the output of the VFD and the rotor's actual speed, the more energy will be fed into the VFD. If the VFD tries to brake the motor too quickly, the voltage will rise too much and damage the VFD. Most VFDs will shut down as a safety feature before this happens, and the motor will coast to a stop by friction alone. With appropriately sized braking resistors the motor can be stopped much more quickly without raising the voltage to unsafe levels.

Braking resistors with smaller ohmic values will help motors stop faster but will also dissipate more heat. This will require the use of more mass in the resistor or a heatsink to keep its temperature within a safe limit.

ADVANTAGES

- Faster braking of DC and AC motors.
- Lower wear and tear of friction braking components.
- Keep motor voltages within safe levels.
- Eliminate risk of a runaway due to overheated friction brakes in some motors.
- Reduce wasted time during braking.
- Increase life of the equipment.
- Improved service reliability.



FEATURES

- Very wide range of power and resistance ratings.
- Galvanized steel enclosures.
- Optional stainless steel and anodized aluminum covers.
- Silver plated connectors and internal connections for positive contact and reduced oxidation.
- For outdoor service optional louvered covers and screened bottom for protection against the entrance of rodents and birds or accidental contact by personnel.
- Continuous wirewound or stamped grid, corrosion resistant elements.
- Designed to absorb thermal expansions and contractions.
- High-temperature, humidity-resistant ceramic insulators.
- Optional normally open or normally closed thermal switches.
- Optional terminal block and junction box.
- Optional NEMA 3R (outdoor) and NEMA 4 (completely enclosed) enclosures .
- Rating, design, manufacturing and testing according to ANSI/IEEE-32 standards.
- Load tested.
- 24 month guarantee.

MODEL AND SUFFIX CODES

Models:

DBR*power-resistance* where **power** is the number of kilowatts that can be continuously dissipated by the resistor without exceeding the temperature limits set by the standards and **resistance** is the required ohmic value for the resistor., i.e. **DBR20-4.5** (20 KW continuous and 4.5 ohms)

Notes:

For overhauling load dynamic braking resistors to calculate the equivalent continuous watts for a given motor multiply the motor HP by 746 to obtain the motor wattage, then multiply the result by the duty cycle (i.e. 0.2 for 20% duty cycle).

For deceleration dynamic braking resistors divide the previous result by two.

Suffix codes:

/NC: Normally closed thermal switch

/NO: Normally open thermal switch

/SS: Stainless steel enclosure

/AL: Aluminum enclosure

/N3R: NEMA3R (outdoor use) enclosure

/N4: NEMA4 (completely closed) enclosure

/HA: High altitude