

# INSTALLATION INSTRUCTIONS FOR POWEROHM BRAKING RESISTORS

**IMPORTANT:** These instructions should be read thoroughly before installation. All warnings and precautions should be observed for both personal safety and for proper equipment performance and longevity.

**CONSTRUCTION:** Powerohm braking resistors consist of smoothwound, wirewound or edgewound type resistor coils mounted in ventilated enclosures. All metal components used to manufacture our resistor coils including the elements, terminals and hardware are stainless steel for maximum corrosion resistance. Standard enclosures have either a yellow zinc plated or galvanized finish and are assembled with stainless hardware. Braking resistors are available with a variety of options such as special enclosure finishes, outdoor ratings, factory wired terminal blocks and thermal sensing switches.

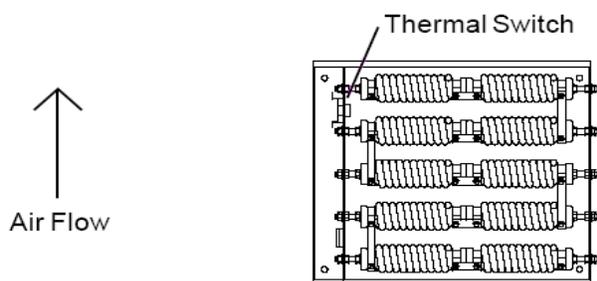
**INSPECTION:** Upon receipt of your Powerohm Braking Resistor, be sure to inspect the unit carefully for any shipping damage. After unpacking, check the unit for loose, broken, bent or otherwise damaged parts due to shipping. Report any shipping damage immediately to the freight carrier. Be sure to verify that the part number and ratings listed on the nameplate conform to the order specification. The ohm rating listed on the nameplate is critical (too low of an ohm value may cause damage to the drive).

## INSTALLATION:

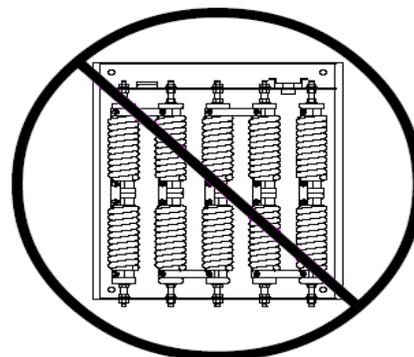
**IMPORTANT:** The National Electric Code (NEC) and local regulations govern the installation and wiring of electrical equipment such as braking resistors. DC power wiring, AC power wiring, control wiring and conduit must be installed in accordance with these codes.

Powerohm braking assemblies cool by natural convection causing hot air to rise vertically from the enclosure. Braking resistors should be mounted in a well ventilated location free of any combustible materials or equipment affected by heat. Units should be installed with at least 24 inches of free space above the enclosure top and 6 inches of free space surrounding the enclosure sides. If necessary, units can be mounted on spacers or channels to limit heat from conducting from the resistor enclosure to its mounting surface.

Braking resistor enclosures 28 inches or less in width, can be mounted vertically or horizontally. If the unit is mounted vertically, it is important that the resistor coils remain in a horizontal position. Also, if a thermal switch is included with the unit, position the equipment so the switch remains near the top of the enclosure. See below for vertical mounting details.



Correct Vertical Mounting  
(Front View)



Incorrect Vertical Mounting  
(Front View)

# INSTALLATION INSTRUCTIONS FOR POWEROHM DYNAMIC BRAKING RESISTORS

To install the unit, first remove the ventilated cover. Units 28 inches or less in width require a 5/16" wrench, while larger units require a 7/16" wrench to remove the cover hardware. Mounting holes are on the inside of the braking resistor enclosure. Mounting dimensions are listed on the following pages and also on the drawing included with the unit. Units that are 28 inches or smaller have 7/16" diameter mounting holes designed for 3/8" hardware. 30" wide units have 5/8" diameter mounting holes designed for 1/2" hardware. Be sure to fasten the unit securely in place. After installing and wiring to your Powerohm Braking Resistor, reinstall the ventilated cover. Securely tighten cover hardware to 20 inch-pounds of torque max. Units should not be installed on combustible surfaces. Units with solid or open bottoms do not require bottom ventilation. Screened bottoms shall be elevated above the mounting surface to allow ventilation. Units may be provided with elevating feet or the customer may elevate the unit during mounting.

Smaller 28 inch wide enclosures have convenient conduit knockouts for easy connection. Remove the proper knockout after determining a suitable entry point. Larger units require field punching for conduit entry. It is preferable to route conduit near the bottom of the resistor enclosure. After attaching conduit, pull wiring into the enclosure for connection to resistor. Braking amps are listed on the drawing for correct wire sizing. If connecting directly to the terminals on the resistor elements, it is necessary to use high temperature silicon or teflon wire rated 200°C. Try to route wiring along the bottom of the enclosure and avoid running the wiring across the top or near the resistor elements. Refer to the drawing to determine the size of the resistor hardware - units are supplied with either #10, 1/4, 5/16, 3/8 or 1/2 inch terminal hardware. If your braking resistor contains an optional factory wired terminal block, then you may connect to the unit with standard 90°C rated wire. More wiring terminal information can be seen below in Figure 1. Be sure to properly ground the resistor enclosure to prevent electrical shock.

Correct wire size may be determined by dividing the brake resistor wattage by the ohms and taking the square root of the result. The calculated value is the RMS current. For example a 5.1 ohm, 13,700 watt resistor calculates to approximately 52 amps  $\sqrt{(13,700/5.1)} \approx 52$ . The current allows the wire to be sized per National Electrical Code tables. The NEC table shows to use 8 awg THHN wire when installed in conduit.

If an optional thermal switch is included with the unit, then connect control wiring directly to the #8 terminals. Larger 30 inch wide units with the thermal switch option are pre-wired to a terminal block with #10 hardware, located in the bottom of the resistor enclosure. Thermal sensing switches are available with either normally closed or normally open contacts.

**MAINTENANCE:** Periodically check the unit for loose connections and an accumulation of dust or dirt on the inside and outside of the resistor enclosure. Be sure to allow the unit to cool before servicing (contact may result in burn injury). Remove all power before servicing unit to avoid electrical shock. Allow at least one minute after input power has been removed for the bus voltage to discharge. Electric shock can cause injury or death.

Resistor elements should not glow red under normal operating conditions. If the resistor elements glow red you may need a higher rated braking resistor.

**TECHNICAL SUPPORT:** If you have any questions about your braking resistor, contact the Powerohm Factory for assistance at 800-838-4694.

Customer Wiring Conductor	Copper
Minimum Temperature Rating	90°C
Terminal Tightening Torque	20 inch-pounds

Figure 1: Wiring Terminal Specifications