



*"The Right Control  
for your Application"*

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## **SUBJECT: PLUG-IN-HORSEPOWER® RESISTOR VS. FIXED RESISTOR**

This technical note presents the reasons why KB Electronics uses our exclusive Plug-In-Horsepower® Resistor (PHR) while our competitors use a fixed, soldered-in resistor.

The PHR allows you to cover the widest possible horsepower range of motors with one DC Drive. For example, the KBMM-125 DC Drive will control motor's from 1/100 HP to 1-1/2 HP; the KBMM-225 DC Drive will control motor's from 1/50 HP to 3 HP.

By selecting the correct PHR, for your motor, you will not have to waste time calibrating the IR and CL compensation circuits. Our competitors' controls that have fixed horsepower resistors only have a range from 1/8 HP to 1 HP. With the fixed horsepower resistor (we believe) the control is calibrated at the factory for a 1 HP motor rating. With the control calibrated for a 1 HP (CL setting is usually at 150% of the motor rating), what would happen if you use this DC Drive on a 1/4 HP motor? Well, if you don't recalibrate the drive, the first time the motor stalls there is a good chance it will smoke. To prevent this you must recalibrate by installing an ammeter and voltmeter and readjust both the CL and IR Compensation adjustments. Most customers don't take the time to do this. Mainly, it's too time-consuming and secondly, they may or may not have the equipment.

Even if you do calibrate the controls before you use them, what will happen if one of your customers has a defective control, and you need to send a replacement? Are you going to pre-calibrate it before you send it to the field? If you don't you know what's going to happen. The first time the motor stalls, there is a very good possibility that the motor will smoke or demagnetize. There is also the possibility that the additional torque may cause damage to the machine or gearboxes.

The load regulation of the motor will be substantially reduced because the drive is under compensated. A typical 1 HP, 90Volt DC motor draws about 10 Amps at full load and requires about 3 volts of IR Compensation. If the control is not recalibrated, then only 3/4 of a volt of compensation will be produced at full load. This is far less than the motor's typical requirement.

With the Plug-In-Horsepower® Resistor, you select the correct resistor for the size motor you are using. You don't have to adjust the IR Comp or current limit trimpots. They are automatically preset for that size motor. Even if the calibration is off 10 or 20%, the effect on the motor will not be as dramatic as it would if the control were calibrated for 6 times the motor's rating.

If you have any questions, please give us a call.

Sincerely yours,

Alan Bueller