

KBAP Overload Protector and PWM DC Drives

This technical note provides details on a potential application problem when using the KBAP Overload Protector with any PWM DC drive, such as the KBWD or KBWS. This is because these PWM DC drives use a different size Plug-in Horsepower Resistor (PHR) than a comparable SCR drive. The problem occurs when using the KBAP in external sensing mode, as shown in diagram *ii*, on page 6 of the KBAP manual. When used in this mode, the KBAP gets its indication of motor load from the PHR of the drive.

As a review, the KBAP Overload Protector is designed to provide Timed Current Limit (TCL) for DC drives which do not already have this circuit. Examples of DC drives that could use this function would include KBIC, KBMM, KBMD, KBWM, KBWD and KBWS. The KBAP operates by sensing motor armature current. When a preset level of current is reached, a timer starts timing. After a time delay, the relay on the KBAP changes state. When an overload occurs, the KBAP-240D can be used to shut down the drive, or sound an alarm so the operator can initiate corrective action before machine damage occurs.

As you know, the PHR provides feedback to the motor speed control on how much current (load) the motor is drawing. The KBWD and KBWS series of DC drives require more feedback than an SCR drive; therefore the PHR is a larger value. If the KBAP is sensing current from the PHR on a PWM drive, it thinks more current is flowing than actually is, causing it to “trip” prematurely. This is only a problem with sub-fractional motors, requiring trip points of less than 2 amps. Higher values of current can be protected using the internal sensing method, with settings from 2.5 - 20 amps.

For sub-fractional motors on PWM DC drives, we can still provide overload protection using the KBAP. Wire the drive using the external sensing method shown in the manual. The current sensing jumper setting would be the motor’s full load rating times 3. For example, to provide protection for a 0.8 amp motor, the 2.5 amp setting is used. For a 1.7 amp motor, the 5 amp setting is used. For values in between, use the current setting trimpot as discussed in the manual.

Please call me if you have any questions.

Sincerely,

Richard Fritts
National Sales Manager