"The Right Control
for your Application"

KB ELECTRONICS, INC.
12095 NW 39th Street, Coral Springs, Florida 33065 USA
(954) 346-4900 FAX (954) 346-3377

SUBJECT: GENERAL PERFORMANCE SPECIFICATIONS - DC DRIVES

1. Speed Range (Ratio) 50:1 - This specification means that the DC Drive has the ability to reduce the base speed of the motor from full speed to 1/50th of that speed. For example, a 1750 RPM base speed motor can be reduced in speed to 35 RPM. The base speed of a motor is the nameplate speed at the rated voltage and full load.

2. Load Regulation (0 - Full Load, 50:1 Speed Range, % Base Speed) 1% - This specification pertains to the DC Drive's ability to maintain a set speed, as the load varies from no load to full load over the stated speed range. Example: 1% of base speed is 17.5 RPM. No matter what speed the motor is running at, from 1750 RPM to 35 RPM, as the load increases from no load to full load, the speed will not drop more than 17.5 RPM. On open loop systems (armature feedback), the percent of regulation is always related to the base speed of the motor. On closed loop systems (tachometer feedback), the percent of regulation is always based on the set speed of the motor.

3. Line Voltage Regulation (At Full Load; +/- 10% Line Variation) 1/2% - This specification relates to the ability of the DC Drive to maintain the set speed of the motor (as expressed in percentage of base speed of the motor, typically 1/2% of 1750 RPM) at full load, as the line voltage fluctuates from the rated voltage by +/- 10%. Example: If the motor is set at 900 RPM at full load and the line voltage fluctuates from 115 VAC down to 100VAC or up to 130 VAC, the speed of the motor will not change more than 9 RPM, or 1/2% of base speed.

4. DC Drive Linearity (% Speed vs. Dial Rotation) 2% - This specification indicates that the speed of the motor will be within 2% of the dial setting. For example, if the motor is set at 1750 RPM at 100% dial rotation, and the dial is rotated to 50%, the motor speed will drop to 875 RPM plus or minus 2%.

5. CL/Torque Range (% Full Load) 50-200% - This specification indicates that when the CL trimpot is rotated in the counterclockwise direction (turned down), the current the motor can draw is limited to no less than 50% of the nameplate rating of the motor. For example, a motor with a 5.0 Amp nameplate rating could be limited to 2.5 Amps. However, due to the tolerances in the DC Drive, the setting may actually go as low as 2.0 Amps.

We also specify that the CL trimpot can be set to a maximum of 200% of the motor's nameplate rating. Again, this is the minimum limit of the specification. In other words, a 5.0 Amp motor can have its current limit set as high as 10 Amps. Normally, if the CL trimpot is rotated fully in the clockwise direction (turned up), the DC Drive may exceed the 200% rating. You can assume that the trimpot range will meet 50-200% of the nameplate rating. However, the limits of the trimpot can exceed those settings.

6. Accel Time Period (0-Full Speed) (Secs.) .5-4.0 Secs. - Most interpret the Accel time to mean the time it takes to bring the motor up to full speed. However, it really means the time it takes for the DC Drive to come up to full or set voltage. For long Accel times, the DC Drive voltage and motor speed will follow closely, but for short Accel times of let's say 0.2 seconds, the motor torque and load inertia may not allow it to respond as quickly. In addition, the CL setting may limit the Accel time. The bottom line is that if the motor, with its load, does not have the capability to accelerate within the required time period, the DC Drive will not give it that capability. The Accel can be activated by rapidly turning the main speed pot to a higher setting or by turning the DC Drive on via the AC power.

7. Decel Time Period (0-Full Speed) (Secs.) .5-4.0 Secs. - The concept of Decel is similar, but opposite to that of Accel. When Decel is activated, it is the DC Drive voltage that changes from full (or set) voltage to zero volts in the Decel time period. If Decel is set for 10 seconds, the DC Drive voltage will take 10 seconds to go from full voltage to zero volts. As in Accel, the motor will tend to follow the Decel for long deceleration times. For shorter times, the Decel is limited by the coast time of the motor. That is, the Decel time can never be faster than the normal coast time.

For that reason, Decel is especially important on machines with high frictional loads where the motor would normally stop or slow down abruptly. The Decel would permit more gradual slowdown of the motor and prevent tearing of paper, film or fabric in winding type applications. It will also prevent overshoot when trying to slow down a heavy frictional load. The Decel can be activated only with the speed pot circuit, either by turning the pot from a high setting to a low setting rapidly, or by shorting P2 to P1. The Decel time setting has no effect when turning off the DC Drive via the AC power.

8. Min Speed Trimpot Range (% Full Speed) 0-30% - This specification indicates the range of speeds which can be selected when the Main Speed potentiometer is set at minimum. In this case the motor can be allowed to stop (0%) or made to rotate at up to 30% of base speed.

9. Max Speed Trimpot Range (% Full Speed) 50-110% - This specification indicates the range of speeds which can be selected by the operator by turning the Main Speed potentiometer at maximum. The maximum speed may be limited by the CL setting, if the motor is being overloaded as it tries to reach full speed.

10. IR Compensation Trimpot Range (at Specified Full Load) (Volts) 0-24VDC - This specification indicates that the IR Compensation circuit is capable of delivering a maximum of 24VDC of compensation with the IR Comp trimpot in the full clockwise position and the motor at full nameplate rating. The IR Comp for a

motor is normally calculated by multiplying the armature resistance by the nameplate armature current. For example, a 1/2 HP, 90VDC motor, with a nameplate rating of 5.0A, may have an armature resistance of 1.5 ohms. Therefore, the IR Compensation would be approximately 7.5V. This would be the nominal compensation in order to maintain the motor speed within 1% as the load varied from 0 to 100%.

11. Maximum Allowable Ambient Temperature at Full Rating (□C/□F 40/105) - This specification indicates that with the DC Drive operating at it maximum capacity, on a continuous basis, the ambient temperature around the DC Drive should not exceed 40□C or 105□F. If the DC Drive is used below its maximum rating, then the ambient temperature can be increased. If forced ventilation is introduced, then higher operating currents are possible. However, you should consult the factory for additional clarification.

If you have any comments or questions concerning this memo, please call for clarification.
Your comments are appreciated.

Sincerely,

Alan Bueller
Vice President Sales