Power Supply Sizing for Tritex II DC Actuators

To achieve the desired performance from your Tritex II DC actuator you will need to select the appropriate power supply. The following are guidelines for power supply sizing and selection.

1. The power supply voltage should be selected to achieve the maximum speed required in the application. Tritex II speed ratings are based on a 48 VDC supply.

2. The power supply must be sized to handle both the peak and continuous force or torque requirements of the application. In most cases, if the power supply is sized to accommodate the peak force or torque, there will not be an issue supplying the power for the continuous rating.

The simplest way to arrive at this number is to calculate the peak output power required in Watts and divide by system efficiency to get input power required. For an Amp rating, divide the input power by the power supply voltage. Many power supply manufacturers do not specify peak ratings, and you should not assume that a peak is available. You will want to look over the power supply specs carefully for this detail. Please also read the power supply section of the Tritex II DC Installation Manual beginning on page 20 for information on power supply selection, including regulated and non-regulated supplies.

For rotary applications the combined efficiency of the drive and motor is about 85% at rated speed so use 80% as a general efficiency number. As the speed is reduced the efficiency of the motor is also reduced, for applications using <20% of rated speed use 60% as the efficiency.

You can extrapolate for speeds in between if necessary.

Motor output power (Watts) = RPM x 2π/60 x Torque (Nm)

For linear applications the roller screw efficiency must also be considered, so generally 80% x 80% = 64% as the efficiency number.

Linear output power (Watts) = Speed (In/s) x Force (lbf)/8.85 or Speed (m/sec) x Force (N).

Make sure you do not under-size the power supply. You will want to consider the duty cycle of the application and also allow for headroom.