

Information needed to properly select a DC Motor

1. What type of control is required?

Open loop speed control

Closed loop torque control

Closed loop speed control

Closed loop position control

Other _____

2. What are the application requirements?

Speed _____ Torque _____

Other _____

3. Duty Cycle, continuous or intermittent (specify interval on time, off time, repeat duration).

Helpful Hint: Continuous torque value will determine the frame size. Required speed will determine if frame size will meet needed parameters.

4. What motor technology is required? Brushed DC Brushless DC (BLDC)

Helpful Hint: Performance requirements define which type of motor is best suited for the application. See following page for selection criteria.

5. What are the size constraints? _____

6. What voltage and power input is available? _____

7. Do you need an encoder? YES NO

8. Do you need a brake? YES NO

9. Are there any environmental considerations? YES NO If yes, specify: _____

Basic Rotary Power Output Equations

$$\text{Speed (rad/sec) x Torque (Nm) = Watts}$$

or

$$\text{Speed (RPM) x Torque (oz-in) x } 7.4 \times 10^{-4} = \text{Watts}$$

continued >

If life is **< 2000 Hours** consider **Brushed DC Motor**



Motor Frame Size	Torque Range	Speed Range	Power Range	Characteristics
0.866-in to 3.268-in 22 mm to 83 mm	0.8 to 225 oz-in 0.005 to 1.588 Nm	4,000 to 10,500 RPM	2.7 to 477 watts	<ul style="list-style-type: none"> • Permanent magnet • Ideal for servo systems • Compact design • Includes a wide range of rated torques and speeds • Can equally rotate bi-directionally with lower cogging and ripple torque • Optional winding configurations • Optional accessories: drives, gearboxes, encoders, brakes

If life is **> 2000 Hours** or **Speeds are higher than 10,000 RPM**, consider one of the following **BLDC Motors**



Motor Frame Size	Torque Range	Speed Range	Power Range	Characteristics
1.3-in to 4.72-in 33 mm to 120 mm	3 to 928 oz-in 0.021 to 6.553 Nm	4,500 to 15,000 RPM	9.1 to 1672 watts	<ul style="list-style-type: none"> • Slotted, compact design • Higher torque, power, speed, life and efficiencies • Low inertia for faster acceleration • Internal Hall effect feedback sensors • Optional accessories: drives, gearboxes, encoders, brakes



Motor Frame Size	Torque Range	Speed Range	Power Range	Characteristics
.375-in to 2.283-in 10 mm to 58 mm	0.3 to 43 oz-in 0.002 to 0.303 Nm	5,000 to 100,000 RPM	6 to 131 watts	<ul style="list-style-type: none"> • Slottless design • No cogging torque • Smooth, quiet operation • Internal Hall Effect feedback sensors • Optional accessories: drives, gearboxes, encoders, brakes

Optional Accessories

Spur and Planetary Gearboxes	Encoders	Brakes	Programmable & Non-Programmable Drives
<ul style="list-style-type: none"> • Maximize torque and optimize machine performance • Multiple configurations: sintered, cut steel, wide face or plastic gears, ball or sintered bearings, custom outputs and special lubrication 	<ul style="list-style-type: none"> • Provide parameters of reflective optical technology, transmissive optical technology with and without differential line drivers, and multitude of line counts • Factory installed 	<ul style="list-style-type: none"> • Power off, fail safe • Holds a load in position • Use with small frame servo and stepper motors 	<ul style="list-style-type: none"> • Programmable drives with simple-to-use software and GUI • Non-Programmable drive for simple speed control applications

Application Worksheet for DC Motors

Upon completion, email to: info.pittman-motors@ametek.com



Name _____ Company _____

Address _____ City _____ State _____ Zip _____

Country _____ Phone _____ Email _____

1. Application Description _____

2. Initial Quantity and Delivery _____ / _____, Annual Quantity and Delivery _____ / _____

3. Target Price Range _____

4. Mechanical

Load Speed	rpm	Load Inertia	oz-in-sec ²	Diameter	in max
Continuous Load Torque	oz-in rms	Acceleration Time	sec	Length (w/o Shaft)	in max
Peak Load Torque	oz-in pk	Duty Cycle		Weight	oz max

5. Electrical

Applied Voltage	VDC	Continuous Current	A	Peak Current	A
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6. Environmental

Ambient Temperature Range	°C	Ambient Humidity Range	°C
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7. Unusual Conditions _____

8. Additional Requirements _____

9. Physical Characteristics and Velocity Profiles _____

10. Other important information _____

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