DC Brushed Motors
\[ \tau = K_t i \]

\[ V_{emf} = K_e \dot{\theta} \]

\[ K_t (\text{mNm/A}) = 9.55 K_e (\text{V/krpm}) \]
Why have numerous industries depended on Danaher Motion's Permanent Magnet DC Motor for over 30 years? Pacific Scientific's PMDC motors can be tailored to match their exact needs, providing its customers with high performance, efficiency, and DC-powered generators.

Danaher Motion is committed to helping you build a better machine through its PMDC Motors. Pacific Scientific brand Danaher Motion delivers high value and performance motor and drive technology and engineering expertise. In addition to its high-inertia servomotors and drives, Danaher Motion's major product lines include hybrid stepper motors and brushless servomotors and drives.

Pacific Scientific demag capacity and dynamic braking without low speed operation. Tentative anti-cog magnets for smooth transitions.

Commutator: 2 year warranty. High overcurrent protection. Fused commutator. Constant force brush springs with field replaceable insert. Shoulder springs with field replaceable insert.

Magnetic Stator: Explosion Proof and Environmentally protected models - TEFC and TENV configurations.

Conduit box (gasketed) - large wiring compartment for easy termination.

Brushes: Rugged, quality construction, welded, long life.

Shaft: Ash Down Duty. Faster, with the highest level of support.
\[ V_{\text{supply}} = Ri + L \frac{di}{dt} + V_{\text{emf}} \]
Inductive Effects: Transient Behavior

\[ V_{\text{supply}} = Ri + L \frac{di}{dt} \]

\[ i = \frac{V_{\text{supply}}}{R} \left( 1 - e^{-tR/L} \right) \]
\[
\dot{\theta} = \frac{V_{\text{supply}}}{K_e} - \tau \frac{R}{K_e K_t}
\]

or

\[
\dot{\theta} = \dot{\theta}_{nl} - \tau R_m
\]
\[ \tau = K_t i \]
\[ P_m = \tau \dot{\theta} \]
\[ = \tau \dot{\theta}_{nl} - \tau^2 R_m \]
\[
\eta = \frac{P_m}{P_e} = \frac{\tau \dot{\theta}}{V_i} = \left(1 - \frac{\tau_{\text{friction}}}{\tau}\right) \left(1 - \frac{\tau}{\tau_{\text{stall}}}\right)
\]
Operating Range

<table>
<thead>
<tr>
<th>n [rpm]</th>
<th>M [mNm]</th>
<th>I [A]</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>0,5</td>
<td>1</td>
</tr>
<tr>
<td>40</td>
<td>1,0</td>
<td>2</td>
</tr>
<tr>
<td>60</td>
<td>1,5</td>
<td>3</td>
</tr>
<tr>
<td>80</td>
<td>2,0</td>
<td>4</td>
</tr>
</tbody>
</table>

10 Watt

**Recommended operating range**

**Continuous operation**
In observation of above listed thermal resistances (lines 19 and 20) the maximum permissible rotor temperature will be reached during continuous operation at 25°C ambient.

= Thermal limit.

**Short term operation**
The motor may be briefly overloaded (recurring).

118746 Motor with high resistance winding
118742 Motor with low resistance winding

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Comments

Details on page 49
Faulhaber encoded right-angle DC gearmotor

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal operating voltage</td>
<td>6 V</td>
</tr>
<tr>
<td>Gearhead</td>
<td>141:1</td>
</tr>
<tr>
<td>Shaft diameter</td>
<td>3 mm “D”</td>
</tr>
</tbody>
</table>