### Feature List

**Motor:**
- Brushless DC motor to minimise friction
- Vacuum-rated bearings

**Electronics:**
- 12-bit angular rate feedback
- Integrated electronics which includes drive circuitry and speed control algorithms
- I2C, UART, and CAN interfaces

**Mechanical:**
- Various sizes: Small, Medium, and Large
- Mountable in 3 axes
- Magnetically shielded using Mu-Metal

### Specifications

<table>
<thead>
<tr>
<th>CubeWheel</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage (V_{battery} = 6.5 V - 16 V)</td>
<td>3.3 V / V_{battery}</td>
<td>3.3 V / V_{battery}</td>
<td>3.3 V / V_{battery}</td>
</tr>
<tr>
<td>Speed range</td>
<td>±8000 rpm</td>
<td>±6000 rpm</td>
<td>±6000 rpm</td>
</tr>
<tr>
<td>Speed control accuracy</td>
<td>&lt; 5 rpm</td>
<td>&lt; 5 rpm</td>
<td>&lt; 5 rpm</td>
</tr>
<tr>
<td>Max torque (V_{battery} = 8 V)</td>
<td>0.23 mNm</td>
<td>1.0 mNm</td>
<td>2.3 mNm</td>
</tr>
<tr>
<td>Momentum storage (@ max rpm)</td>
<td>1.7 mNms</td>
<td>10 mNMs</td>
<td>30 mNMs</td>
</tr>
<tr>
<td>Peak power (@ max torque, V_{battery} = 8 V)</td>
<td>&lt; 0.6 W</td>
<td>&lt; 1.0 W</td>
<td>&lt; 2.2 W</td>
</tr>
<tr>
<td>Average power (@ 2000 rpm, V_{battery} = 8 V)</td>
<td>&lt; 0.18 W</td>
<td>&lt; 0.24 W</td>
<td>&lt; 0.27 W</td>
</tr>
<tr>
<td>Dimensions</td>
<td>28 x 31 x 26 mm</td>
<td>46 x 46 x 31.5 mm</td>
<td>57 x 57 x 31.5 mm</td>
</tr>
<tr>
<td>Mass</td>
<td>55 g</td>
<td>130 g</td>
<td>200 g</td>
</tr>
</tbody>
</table>

### Application

- Can be used to exchange angular momentum with satellite body
- Easily integrates with CubeADCS bundles

### Testing & Heritage

- Successful heated vacuum test
- Wheel design based on momentum wheels used for Q850 precursor satellites

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