BICYCLE/ROWING TYPE ERGOMETER & CONTROLLERS

[ A.C. TRANSIENT DYNAMOMETER - GRID INTERACTIVE BASED ]

Introduction:
MEGM series of ergometers controllers are available in more than 25 routine models apart from occasional special requirement, virtually offering solutions to various applications like biomedical diagnostic, defense psychological studies, physiotherapy, sport fitness assessment, water sports exercise machines, and many other research & development applications. Ergometer controllers are cascade type feedback type control system and control the torque/power. These Ergometer displays principal parameter like power, rpm and torque as well as other inferential parameter like power/torque capacity, overload power/torque capacity, efficiency, plotting torque/speed and power/speed curve, desired phase trajectories on line. These fast responding ergometer passes least mechanical time constant, windage losses, least rheological problem, mechanical black-lash/dead band, and exhibits a repeatable and hysteresis less Torque/Power Vs Excitation current characteristics which guarantees accurate identification of parameters during steady state/transient conditions with high degree of stability and resolution. These ergometers are compact and, dynamically balanced & vibration-less motion, inherent self-braking action and thus less hunting with maximum torque/k.watts.

Operating Principle:
In ergometers, a special metal drag cup rotor rotate under the influence of time invariant magnetic field or a magnetic field rotor rotates inside a cup type special metal stator (driver). In either case, the magnetic field intensity is controlled by a high frequency magnetic field feedback controlled chopper, which ensures a time invariant ripple free magnetic field. Rotor rotating under the influence of magnetic field cuts the magnetic flux, by virtue of which there develops in it. This brake system may operate in constant power or torque mode. Power absorbed by ergometers and its Torque loading is as under:

\[ P = 0.438I^2f N^2 \] and \[ T = 0.438I^2f N \]

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**MEGM-100**

**MEGM-001**

**MEGM-003**

**ELECTRICAL SPECIFICATIONS OF ERGOMETERS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Power-range</th>
<th>R.P.M.</th>
<th>Torque</th>
<th>Volts</th>
<th>Amps</th>
<th>Tmax</th>
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<tbody>
<tr>
<td>MEGM-001</td>
<td>1000.0</td>
<td>30/15</td>
<td>3.1/6.2</td>
<td>220/440</td>
<td>2.0</td>
<td>60</td>
</tr>
<tr>
<td>MEGM-003</td>
<td>3000.0</td>
<td>30/15</td>
<td>9.3/16.6</td>
<td>220/440</td>
<td>4.0</td>
<td>60</td>
</tr>
<tr>
<td>MEGM-005</td>
<td>5000.0</td>
<td>15/09</td>
<td>31.8/53.0</td>
<td>220/440</td>
<td>6.0</td>
<td>70</td>
</tr>
<tr>
<td>MEGM-010</td>
<td>10000.0</td>
<td>15/09</td>
<td>63.6/106</td>
<td>220/440</td>
<td>10.0</td>
<td>70</td>
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<tr>
<td>MEGM-020</td>
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<td>09/03</td>
<td>127.3/381.4</td>
<td>220/440</td>
<td>15.0</td>
<td>70</td>
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<tr>
<td>MEGM-030</td>
<td>30000.0</td>
<td>09/03</td>
<td>190.8/574.4</td>
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<td>20.0</td>
<td>70</td>
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<tr>
<td>MEGM-050</td>
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<td>318.0/594.4</td>
<td>220/440</td>
<td>30.0</td>
<td>70</td>
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<tr>
<td>MEGM-100</td>
<td>100000.0</td>
<td>09/03</td>
<td>1075.2/3225.7</td>
<td>220/440</td>
<td>50.0</td>
<td>70</td>
</tr>
</tbody>
</table>

**ERGOMETERS CONTROLLERS SPECIFICATION:**

- Operating voltage: 220 volts/110/48 volts A.C.
- Chopping frequency: 50/400/1000 Hz (option)
- Excitation: 0.0–200.0 amps (max)
- Regulation: better than 0.5 % of set speed
- Accuracy: 99.5% of set point
- Repeatability: 100 percent
- Response time: 0.05–10.0 sec with soft start
- Interface Signal: 0.0-12.0 volts D.C. (proportional to torque)
- Step down ratio: 1:50 (1:100)
- Control option: constant torque/Power mode with tripping
- Display: RPM/POWER/TORQUE/JULES in 3½ digit red glow LED
- Protection: over/under voltage & r.p.m.

**MOTORON SEMICONDUCTORS CORPORATION**

11, Shri nagar colony, shakti nagar extension, DELHI-110052. Tel:011-23648181/23655454/23991188 fax:011-23585424  
e.mail: motoronenergy@hotmail.com