Eaton’s Cutler-Hammer business now offers Active Harmonic Filters to provide active harmonic control. The Active Harmonic Filter will monitor the distorted electrical signal, determine the frequency and magnitude of the harmonic content, and then cancel those harmonics with the dynamic injection of opposing current. Active harmonic control provides the benefit of traditional passive filters with simpler engineering requirements, easier and less expensive installation, comprehensive control, and assured compliance with the IEEE 519-1992 standard.

**Active Harmonic Filter Benefits:**
- Decreases excess heating of electrical cable switchgear and transformers.
- Can reduce downtime caused by nuisance thermal tripping of protective devices.
- Compensates each phase independently.
- Costly harmonic studies are minimized.
- Increases network reliability and reduces operating costs.
- Power factor correction capacitors can be left in place, as the active filter stabilizes the system by providing a perfect source for the load.

- Harmonic Compensation
- 2-50th Harmonic
- Capacity can be added as needed.

Cutler-Hammer Active Harmonic Filters are available in 50, 100 and 300-amp sizes, for up to 600V, 3-phase, 50/60Hz systems. In addition to harmonics cancellation, they also provide dynamic correction for other power quality events:
- Resonance Prevention.
- Power Factor Correction.
- Dynamic VAR Compensation.

The Active Harmonic Filter is available as an independent structure, ideal for a retrofit, or as an integral component in the Cutler-Hammer Clean Control Center MCC, improving electrical network reliability, reducing operating costs and increasing equipment uptime.

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**Figure 1 - 50 Amp and 300 Amp Active Harmonic Correction Unit in NEMA 1 Enclosure.**
Table 1. Harmonic Correction Unit Ratings – NEMA 1 Enclosure Unit Specifications

<table>
<thead>
<tr>
<th>Safety Agency</th>
<th>UL: Approved</th>
<th>CSA: Approved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical</td>
<td>Voltage: 208 – 480V +/- 10% 50/60 Hz, +/- 3 Hz</td>
<td></td>
</tr>
<tr>
<td>Environment</td>
<td>Ambient Temperature: 0º to 50ºC NEMA 1 Storage Temperature: -40º to 65ºC Relative Humidity: to 95% Non-condensing Altitude: to 2000 Meters Vibration: Seismic Zone 4</td>
<td></td>
</tr>
<tr>
<td>Packaging</td>
<td>Standard Enclosure: NEMA 1 (NEMA 12, 3R also available)</td>
<td></td>
</tr>
<tr>
<td>Protection</td>
<td>Input Fuses Surge Withstand Capacity: 600V, 200,000 AIC, Class T IEEE C62.41-1991 Logic Ride-Through: 30 Seconds Upon Full Loss of Input Voltage Output Capacity: Self-limited to 100% Rated</td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>Corrective Capability: &lt;5% TDD and Near Unity Displacement Power Factor ①</td>
<td></td>
</tr>
</tbody>
</table>

① Requires series input line reactor of DC bus choke in each AC drive for optimum performance.

Sizing and Selection

Table 2. Harmonic Control Units – NEMA 1 Models

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Voltage</th>
<th>Frequency</th>
<th>Total Current Amperes (rms)</th>
<th>Watt Losses (kW)</th>
<th>Exterior Dimensions in Inches (H x W x D)</th>
<th>Unit Weight Lbs.</th>
<th>Enclosure Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>PQAF40500N1</td>
<td>208 – 480</td>
<td>50/60</td>
<td>50</td>
<td>1.8</td>
<td>52 x 21 x 19 (1320.8x533.4x482.6 mm)</td>
<td>250 (113.4 kg)</td>
<td>NEMA 1</td>
</tr>
<tr>
<td>PQAF41000N1</td>
<td>208 – 480</td>
<td>50/60</td>
<td>100</td>
<td>3.0</td>
<td>69 x 21 x 19 (1752.6x533.4x482.6 mm)</td>
<td>350 (158.76 kg)</td>
<td>NEMA 1</td>
</tr>
<tr>
<td>PQAF43000N1</td>
<td>208 – 480</td>
<td>50/60</td>
<td>300</td>
<td>8.0</td>
<td>75 x 33 x 20 (1905x838.2x508 mm)</td>
<td>775 (351.54 kg)</td>
<td>NEMA 1</td>
</tr>
</tbody>
</table>

Note: Consult factory for other enclosure options.
Note: For 600V AC applications, auto transformer is supplied. Contact the Cutler-Hammer business.
Note: Dimensions and weights are approximate. Do not use this table for construction planning. Contact the Cutler-Hammer business.

Other Power Quality Products
- Fixed Capacitors Banks (Low and Medium Voltage)
- Automatically Switched Capacitor Banks (Low and Medium Voltage)
- Passive Harmonic Filters (Low and Medium Voltage)
- 3rd Harmonic Blocking Filters
- Surge Protection
- Phase Shifting Transformers
- K-Factor Transformers
- Rotary UPS

Total Solutions for Maximizing Uptime
Eaton’s Cutler-Hammer Engineering Services and Systems (CHESS) provides a full range of on-site services including: Installation, Start-Up/Commissioning, Preventive and Predictive Maintenance, Systems Integration, Power Systems Studies, Turnkey Solutions and Equipment Life Extension. And, by choosing our Start-Up/Commissioning services on your Cutler-Hammer product, you will receive a one-year extension to the factory warranty.

Cutler-Hammer Power Quality Hotline
Having trouble understanding a problem related to power quality, reliability or energy management? Confused about what technology to apply to improve facility uptime or cut energy costs? Call our Power Quality Hotline at 1-800-809-2772 (Option 1, SubOption 2) to talk to our power quality experts, or e-mail us at Pq hotline@eaton.com.

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