Neutral Current Reduction Module:  
**Triplen Trap**  
ADVANCED SYSTEM PROTECTION FROM NEUTRAL CURRENTS

Harmonic Heating:  
**A Smoking Gun**  
Harmonics in today’s office power systems burn contacts, melt insulation, corrupt digital signals with electrical noise and cause intermittent surges and interruptions that plague data center managers and facility engineers alike.

The electrical systems of yesterday’s office buildings were not designed to support today’s ever growing electronic office. Most of the plug loads contain switch mode power supplies (SMPS) drawing non-sinusoidal current, which overload building wiring and cause premature transformer failure. PDI’s Triplen Trap reduces the negative effects of non-sinusoidal current.

Reduce Neutral Currents to Withstand Non-Linear Loads  
Phase currents in a three phase system combine on the neutral conductor where the current can be as high as 1.73 times the phase current. If the phase currents are close to full load, the neutral conductor will be overloaded. This is especially true in older buildings where the neutral conductor was rated for the same ampacity as the phase conductors.

Triplens are the third order harmonics (3rd, 9th, 15th, 21st…) generated by SMPS. Triplens flow between the neutral conductor and the distribution transformer in search of a low impedance return path.

PDI’s Neutral Current Reduction Module provides the triplen currents with a new return path through the Triplen Trap. Connected to the three phases and the neutral conductors in the building wiring, the Triplen Trap becomes the low impedance return path for the triplen currents in the neutral conductor.

Designed for retrofits or upgrades to existing buildings, the Triplen Trap does not require removal of transformers or disconnection of power to the loads. Connected in parallel with the building’s electrical system, the Triplen Trap reduces neutral harmonic currents by at least 67% (see table, reverse side).
Neutral Current Reduction Module: Triplen Trap

SPECIFICATIONS

Ratings
- 40 - 750 Amps
- K Factor Rating: K20
- 150°C Temperature Rise
- Class R 220°C Insulation
- Noise Level: per NEMA ST20 standards
- Input: 3-phase, 4 wire plus ground
- Applied Voltage: 208/120V, 60 Hz
(consult factory for other ratings)

Features
- Copper Wound Construction
- Natural Convection Cooling
- Operating Efficiency: 98% typical
- Common Mode Noise Protection
- Transverse Mode Noise Protection
- UL Listed, CSA Certified

Enclosure
- Drip-proof NEMA 1
- Removable Front and Rear Panels

Operating Conditions
- 60 Hz Operating Range: 57-63 Hz
- 50 Hz Operating Range: 47-53 Hz
- Operating Temperature: ambient 0°C to 40°C
- Storage Temperature: ambient -10°C to +40°C
- Relative Operating Humidity: 90% non-condensing

Triplen Trap Options

Transient Suppression Network (TSN)
This feature provides an integrated system designed and engineered to meet ANSI/IEEE category C standards for transient voltages and surge currents.

Lightning Arrestor/Surge Suppressor
The lightning arrestor protects the major insulation of the magnetics from high energy surges that are associated with lightning discharges. The suppressor increases the effectiveness of the lightning arrestor by reducing the rate of rise of high energy transient voltages.

Adjustable Attenuation Taps
To prevent overloading due to future expansion, add additional taps. One tap increases the zero sequence impedance by 15%, two taps increase it by 20%. The tap configuration must be specified at time of system purchase.

Triplen Trap Installation Data

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Neutral Rating (Amps)</th>
<th>Feeder Xfmr Max KVA</th>
<th>Feeder Xfmr Max Wire Size</th>
<th>Feeder Xfmr Min Wire Size</th>
<th>Min Phase Wire Size</th>
<th>Min Neutral Wire Size</th>
<th>Max Wire Size</th>
<th>Accommodate Input Circuit Breaker Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>TT - 040</td>
<td>40</td>
<td>50</td>
<td>1/0</td>
<td>100</td>
<td>#8</td>
<td>#6</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>TT - 060</td>
<td>60</td>
<td>50</td>
<td>1/0</td>
<td>100</td>
<td>#8</td>
<td>#4</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>TT - 100</td>
<td>100</td>
<td>50</td>
<td>1/0</td>
<td>100</td>
<td>#8</td>
<td>#4</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>TT - 150</td>
<td>150</td>
<td>50</td>
<td>1/0</td>
<td>100</td>
<td>#8</td>
<td>#4</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>TT - 175</td>
<td>175</td>
<td>50</td>
<td>1/0</td>
<td>100</td>
<td>#8</td>
<td>#4</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>TT - 200</td>
<td>200</td>
<td>75</td>
<td>4/0</td>
<td>100</td>
<td>#8</td>
<td>#4</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>TT - 250</td>
<td>250</td>
<td>75</td>
<td>4/0</td>
<td>100</td>
<td>#8</td>
<td>#4</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>TT - 300</td>
<td>300</td>
<td>75</td>
<td>4/0</td>
<td>100</td>
<td>#8</td>
<td>#4</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>TT - 350</td>
<td>350</td>
<td>75</td>
<td>4/0</td>
<td>100</td>
<td>#8</td>
<td>#4</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>TT - 400</td>
<td>400</td>
<td>75</td>
<td>4/0</td>
<td>100</td>
<td>#8</td>
<td>#4</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>TT - 500</td>
<td>500</td>
<td>125</td>
<td>500MCM</td>
<td>100</td>
<td>QTY=2, #1</td>
<td>QTY=3, 20</td>
<td>50</td>
<td>225</td>
</tr>
<tr>
<td>TT - 600</td>
<td>600</td>
<td>125</td>
<td>500MCM</td>
<td>100</td>
<td>QTY=2, 20</td>
<td>QTY=3, 30</td>
<td>50</td>
<td>225</td>
</tr>
<tr>
<td>TT - 750</td>
<td>750</td>
<td>125</td>
<td>500MCM</td>
<td>100</td>
<td>QTY=3, #1</td>
<td>QTY=4, 30</td>
<td>50</td>
<td>300</td>
</tr>
</tbody>
</table>

©PDI TTSALESB, 9/97  Product specifications subject to change without notice.