596 Rectifier Retrofit

Overview
GE Energy has offered the 596 family of rectifiers from the early 1990s. 596 rectifiers can be found in the GPS4812, 2424, PXS Shelves, and OCS Cabinet applications. These power systems have a long history of service and through the evolution of technology have experienced a series of rectifier upgrades. To date, all changes have included the continued use of the original rectifier case. This new 596 replacement allows these legacy power systems to be upgraded with modern rectifiers, while leaving the distribution, shelves and frame in place.

To accommodate the GE Energy Infinity TE series of rectifiers, a host-carrier is installed in each rectifier slot for a seamless transition to the Total Efficiency™ (TE) rectifier technology. Functionally, the Infinity TE rectifiers are designed to work with all existing controllers where the 596 rectifier was used. This would include the Vector, Pulsar, Pulsar Plus, Millennium 1 & 2 as well as the Galaxy SC controllers.

Replacing all the rectifiers will gain the greatest system efficiency, however the existing 596 units can continue to work side by side with the new Infinity TE series of rectifiers. No change is needed to the output distribution, batteries, or LVD contactor of these plants with this upgrade.

The Infinity TE rectifiers provide a cost-effective means of modernization and growth to this installed base of 596 rectifiers. For most applications the upgrade process is no more than the removal of the 596, replacement with a carrier and the insertion of the new Infinity TE rectifier.

Infinity Rectifier
The Infinity TE rectifier series offers modules for use in +24V to -48V applications. Rectifiers are color coded to quickly identify voltage.

Rectifier Options:
- NE100AC24ATEZ Rectifier, 100A/24V Output
- NE050AC48ATEZ Rectifier, 50A/48V Output

Benefits
Reliability
- Distributed fault tolerance
- Proven field performance
- Controller continuity

Intelligence
- Industry leading controller features
- Ethernet interface for remote access
- Centralized network management

Investment Protection
- Module compatibility
- Power shelf growth
- Flexible upgrade options

On Time Delivery
- 4 - 6 week availability
- 24/7 emergency support
- Standard building blocks

Total Efficiency
The GE Energy Total Efficiency™ (TE) architecture reduces energy loss and lowers cooling costs by 50-70%. TE products will prioritize sustainable energy sources like solar, wind, water and fuel cells over traditional utility grid or diesel generator sources – and they will intelligently respond to smart grid information to reduce consumption during peak demand periods. Active Rectifier Management (ARM) and Battery Charging Optimization (BCO) features increase efficiency on current and legacy power infrastructures. The Total Efficiency architecture addresses issues end-to-end based on our proven experience and expertise in batteries, power distribution, DC energy systems, AC-DC power supplies, and DC-DC board mounted power to deliver a solution that is more safe, reliable and energy efficient than competitive alternatives.
Infinity TE Rectifiers

- **Compact** - 1RU form factor providing high power density (24 W/in3)
- **Plug and Play** – installation of the rectifier in a shelf connected to a compatible system controller initializes all set up parameters automatically. No adjustments are needed.
- **Extended service life** – parallel operation with automatic load sharing ensures that parallel units are not unduly stressed even when a unit fails or is removed.
- **Monitoring / control** – the built in microprocessor controls and monitors all critical rectifier functions and communicates with the system controller using the built in Galaxy Protocol serial interface.
- **Fail safe performance** – hot insertion capabilities allow for rectifier replacement without system shutdown; soft start and inrush current protection prevent nuisance tripping of upstream breakers.

### Applications
- Telecommunications networks
- Digital subscriber line (DSL)
- Indoor/outdoor wireless
- Routers/switches
- Fiber in the loop
- Transmission
- Data networks
- PBX
- Hot pluggable
- RoHS compliant

### Key Features
- Extended temperature range
- Redundant fan cooling
- Front panel LED indicators
- 1U height, hi power density
- +24 or -48V input
- Digital load sharing
- 1U height, hi power density
- Digital load sharing

### Specifications

#### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>NE100AC24ATEZ</th>
<th>NE050AC48ATEZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Range</td>
<td>95-275Vac</td>
<td>95-275Vac</td>
</tr>
<tr>
<td>Input Current</td>
<td>15-12A @100-120Vac</td>
<td>15-12A @100-120Vac</td>
</tr>
<tr>
<td></td>
<td>15A @200-240Vac</td>
<td>15A @200-240Vac</td>
</tr>
<tr>
<td>Input Frequency</td>
<td>45 – 66Hz</td>
<td>45 – 66Hz</td>
</tr>
<tr>
<td>Power Factor</td>
<td>0.98 at&gt;50% load</td>
<td>0.98 at&gt;50% load</td>
</tr>
<tr>
<td>Efficiency</td>
<td>&gt; 95% (Peak 95.6%)</td>
<td>&gt; 96% (Peak 96.9%)</td>
</tr>
<tr>
<td>Total Harmonic Distortion</td>
<td>&lt; 5% @loads over 50%</td>
<td>&lt; 5% @loads over 50%</td>
</tr>
</tbody>
</table>

#### Output

<table>
<thead>
<tr>
<th>Parameter</th>
<th>NE100AC24ATEZ</th>
<th>NE050AC48ATEZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Adjust Range</td>
<td>21-29Vdc</td>
<td>42-58Vdc</td>
</tr>
<tr>
<td>Voltage Nominal</td>
<td>27.25V</td>
<td>54.5V</td>
</tr>
<tr>
<td>Regulation(with controller)</td>
<td>±0.5%</td>
<td>±0.5%</td>
</tr>
<tr>
<td>Ripple</td>
<td>100mVrms</td>
<td>100mVrms</td>
</tr>
<tr>
<td>Output Current - High-Line</td>
<td>100A @27.25V</td>
<td>50A @54.5V</td>
</tr>
<tr>
<td></td>
<td>44A @27.25V</td>
<td>22A @54.5V</td>
</tr>
<tr>
<td>- Low-Line</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heat Dissipation @ max out</td>
<td>174W / 594 BTU/hr</td>
<td>158W / 539 BTU/hr</td>
</tr>
</tbody>
</table>
## TECHNICAL SPECIFICATIONS – RECTIFIERS

**Environmental**
- **Operating Temperature**: -40°C to +75°C (-40 to 167°F)
- **Storage Temperature**: -40°C to +85°C (-40 to 185°F)
- **Humidity**: < 95% non-condensing
- **Altitude**: 2000M max

**Mechanical**
- **Length (inch/mm)**: 13.85 / 352
- **Width (inch/mm)**: 5.23 / 133
- **Height (inch/mm)**: 1.63 / 42
- **Weight (lb/Kg)**: 5.05 / 2.2

**Safety and Standards Compliance**
- **NEBs**: Evaluated by independent NRTL test lab to Telcordia GR63, Issue 3 & GR 1089, Issue 5
- **Safety**: UL 60950-1, 2nd Ed. Recognized
  - CSA C22.2 No. 60950-1-03 Certified
- **RoHS**: Compliant to RoHS EU Directive 2002/95/EC; RoHS 6/6
- **EMC**: European Directive 2004/108/EC; EN55022, Class A; EN55024; FCC, Class A; GR1089-CORE, Issue 5

**Outline Drawing**

[Outline Drawing Image]
To accommodate the GE Energy Infinity TE series of rectifiers, a host-carrier is installed in each rectifier slot for a seamless transition to the Total Efficiency™ (TE) rectifier technology. Functionally, the Infinity TE rectifiers are designed to work with all existing controllers where the 596 rectifier was used. This would include the Vector, Pulsar, Pulsar Plus, Millennium 1 & 2 as well as the Galaxy SC controllers.

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Key Features
- Replace discontinued 596 product with Plug-and-Play module
- Saved distribution and cabling infrastructure
- NEBS and CEus Certified Infinity TE Rectifiers
- Efficiency approaching 97%

Conversion Chart:

Match the existing rectifier in column 1-3 with the appropriate solution found in either columns 4-5 or 6-8. The associated comcode will match one of the depicted solutions found in step 1.
Step 1: Select Rectifier Carrier

Selections in item 1 include all the necessary components to convert the 596 rectifier slot to accept the Infinity TE rectifier. Regardless of the chosen solution, existing 596 rectifiers (596A2, 596D, 596B4, 596B5, 596B6) remain compatible with the upgrade solution. Where growth may occur, the user may apply the upgrade solution including a 596 carrier and the Infinity TE type rectifier or continue to use the appropriate 596 rectifier if available.

<table>
<thead>
<tr>
<th>Output</th>
<th>Ordering Code</th>
<th>Description</th>
<th>Photo</th>
</tr>
</thead>
<tbody>
<tr>
<td>100A</td>
<td>CC109167573</td>
<td>(1) Carrier 596D, (2) NE050AC48ATEZ replaces 596D rectifiers</td>
<td><img src="image1" alt="Photo" /></td>
</tr>
<tr>
<td>50A</td>
<td>CC109167581</td>
<td>(1) Carrier 596D, (1) NE050AC48ATEZ replaces 596A and 596A2 rectifiers</td>
<td><img src="image2" alt="Photo" /></td>
</tr>
<tr>
<td>100A</td>
<td>CC109167598</td>
<td>(1) Carrier 596B, (1) NE100AC24ATEZ replaces 596B2, B3, B4, B5 and B6</td>
<td><img src="image3" alt="Photo" /></td>
</tr>
<tr>
<td>100A</td>
<td>CC109168927</td>
<td>(1) Carrier 596D for (1) 48v rectifier no rectifier include</td>
<td><img src="image4" alt="Photo" /></td>
</tr>
<tr>
<td>100A</td>
<td>CC109159918</td>
<td>(1) Carrier 596D for (2) 48v rectifiers no rectifiers included</td>
<td><img src="image5" alt="Photo" /></td>
</tr>
<tr>
<td>100A</td>
<td>CC109159926</td>
<td>(1) Carrier 596D for 24v rectifier no rectifier included</td>
<td><img src="image6" alt="Photo" /></td>
</tr>
</tbody>
</table>
Step 2: Rectifiers

Each 24 volt rectifier carrier may be equipped with one 100 Amp Infinity TE rectifier. The two slot 48V carrier (CC109165573 or CC109159119) may only be used to replace 596D rectifiers. The single slot 48V carrier (CC109167581 or CC109168927) may be used with any 596A, A2 or D applications.

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<tr>
<td>100A</td>
<td>NE100AC24ATEZ</td>
<td>95 - 145Vac input, 24V, 44A Output, 175 - 275Vac input, 24V, 100A output; 145 - 175 linear output increase from 44A to 100A</td>
<td><img src="image1.png" alt="Photo" /></td>
</tr>
<tr>
<td>50A</td>
<td>NE050AC48ATEZ</td>
<td>95 - 145Vac input, 48V, 22A Output, 175 - 275Vac input, 48V, 50A output; 145 - 175 linear output increase from 22A to 50A</td>
<td><img src="image2.png" alt="Photo" /></td>
</tr>
</tbody>
</table>
GE Energy

Notes:

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Management Visibility
Galaxy Manager™ software is the centralized visibility and control component of a comprehensive power management system designed to meet engineering, operations and maintenance needs. The Galaxy Manager client-server architecture enables remote access to system controllers across the power network.

- Dashboard display with one-click access to management information database
- Trend analysis
- Scheduled or on demand reports
- Fault, configuration, asset, and performance management

Training
GE Energy offers on-site and classroom training options based on certification curriculum. Technical training can be tailored to individual customer needs. Training enables customers and partners to more effectively manage and support the power infrastructure. We have built our training program on practical learning objectives that are relevant to specific technologies or infrastructure design objectives.

Service & Support
GE Energy field service and support personnel are trusted advisors to our customers – always available to answer questions and help with any project, large or small. Our certified professional services team consists of experts in every aspect of power conversion with the resources and experience to handle large turnkey projects along with custom approaches to complex challenges. Proven systems engineering and installation best practices are designed to safely deliver results that exceed our customers’ expectations.

Warranty
GE Energy is committed to providing quality products and solutions. We have developed a comprehensive warranty that protects you and provides a simple way to get your products repaired or replaced as soon as possible.

For full warranty terms and conditions please go to www.ge.com/powerelectronics.