Energy Efficiency for Electric Heat Treatment Furnaces

VRT and Analog SCR Power Supply Upgrade Solution

**Benefits**

Installing an EPower™ advanced SCR power supply solution offers significant CAPEX and OPEX efficiency improvements, compared to legacy analog designs:

- Typical power factor > 0.9, helps to meet utility suppliers’ power factor limits
- Patented 'Predictive Load Management', helps to reduce demand charge penalties
- Typical energy savings ≈10%, with typical ROI < 2 years
- Helps to achieve a repeatable high performance process
- Condition monitoring for reducing maintenance time and cost
- IIoT ready thanks to multiple communication protocols
- Smaller footprint than a typical VRT

**Key Features**

- Standardized turnkey solution
- Predictive load management strategies
- Hybrid firing modes
- Load monitoring
- Industrial communication protocols
- High efficiency power transformers
- Customization available
- Supported by Eurotherm engineering service teams and Authorized Solution Provider Network

[ eurotherm.com/heattreat ](http://eurotherm.com/heattreat)
Cost Efficiency for Electric Furnaces

The rise in power factor and peak demand charge penalties is driving the need for better energy efficiency in electric heat treatment furnaces. Installing an EPower advanced SCR power controller with predictive load management offers a variety of efficiency benefits, compared to legacy analog SCR and variable reactance transformer (VRT) controlled designs.

Lower Energy Costs
Hybrid firing modes and predictive load management strategies offer energy saving efficiency improvements:

- Typical power factor (PF) better than 0.9 helps to meet the PF limits set by utility suppliers, reducing the risk of PF penalty charges
- Predictive load management can stabilize power demand, helping to reduce peak demand charge penalties
- Typical energy savings ≈10%
- Typical ROI < 2 years [1]

Improve Furnace Performance
High accuracy temperature measurement and precision power control help to improve workpiece throughput and quality:

- High quality heat treatment
- Repeatable performance throughout the furnace temperature range
- Achieve higher Nadcap furnace class temperature uniformity

Reduce Unplanned Downtime
Improved power efficiency combined with diagnostics and health condition monitoring, help to improve overall system robustness:

- Less equipment to maintain - no need for power filters, power factor correction devices or extra water cooling systems
- Monitoring and notification of key parameters provide simplified diagnostics of process fault conditions, for faster maintenance
- Advanced notification of heater deterioration enables pre-ordering and scheduling of replacement parts
- Predictive load management can keep the power demand within the capability of the power line, helping to reduce the risk of power outages

CAPEX Savings
An EPower controller based power supply solution often costs less than an analog SCR or VRT design:

- Expensive additional water cooling and power factor correction systems are not required. Transformers can be air cooled, or water cooled using the furnace cooling system.
- Digital SCR control allows space saving, due to a typically smaller footprint than analog designs
- Ethernet connectivity enables communication with other instruments and platforms, reducing wiring costs and allowing access to key parameters
- Greenfield electrical distribution systems can be a smaller size due to load sharing and shedding, which balances and limits the power demand on the supply

[1] Return on investment is dependent upon local energy rates
A Standardized Upgrade Solution

Data Driven Performance
Support for popular industrial protocols including EtherNet/IP and PROFINET allows easy integration into both new and existing applications, enabling valuable insights into your process, such as energy consumption, measurement tracking, fault detections, and more.

- Easily connects with optional EcoStruxure™ Power Monitoring Expert for an insight into electrical system health and energy efficiency, presented as meaningful actionable information via an intuitive web-interface. EcoStruxure™ is Schneider Electric’s IoT enabled system architecture and platform.

A Pre-designed Packaged Solution
The EPower SCR controlled power supply solution is available in three standard sizes to cover a wide range of furnaces, with customization available on request.

- Turnkey engineered solution, including transformer if required
- Available for single phase, or three phase 2-leg or 3-leg power control
- Engineered and supported by Eurotherm engineering teams and Authorized Solution Provider Network
- Customer FIRST service level agreements (SLAs) available

Specifications
Standard power supply cabinet enclosures are built to IP31 rating. IP53 rating is available as an option on request.

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>Power Control</th>
<th>Height</th>
<th>Width</th>
<th>Depth</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>160A Cubicle</td>
<td>120kW/480V[2]</td>
<td>800mm</td>
<td>750mm</td>
<td>400mm</td>
<td>65.1kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>31.5in</td>
<td>29.53in</td>
<td>15.75in</td>
<td>143.53lb</td>
</tr>
<tr>
<td>250A Cubicle</td>
<td>185kW/480V[2]</td>
<td>800mm</td>
<td>750mm</td>
<td>400mm</td>
<td>69.2kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>31.5in</td>
<td>29.53in</td>
<td>15.75in</td>
<td>152.56lb</td>
</tr>
<tr>
<td>400A Cubicle</td>
<td>300kW/480V[2]</td>
<td>1000mm</td>
<td>950mm</td>
<td>400mm</td>
<td>99.2kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>39.38in</td>
<td>37.41in</td>
<td>15.75in</td>
<td>218.7lb</td>
</tr>
</tbody>
</table>

[2] Power control shown is for a three phase configuration