



## e-Rated® Transformer

### Ultra-Efficient Power Transformer

Exceeds NEMA TP1-2002, CSA C802.2-00 and US DOE Candidate Standard Level 3 Requirements

#### PRODUCT BENEFITS

- Exceeds existing and proposed efficiency standards
- Maximum efficiency can be matched to predicted loading
- Ultra-low excitation (no-load) losses
- Reduced transformer heating and A/C loading
- Reduced operating costs
- Provides an attractive 'payback' and return-on-investment
- Financial benefit increases with rising energy rates
- Reduces environmental impact



#### PRODUCT DESCRIPTION

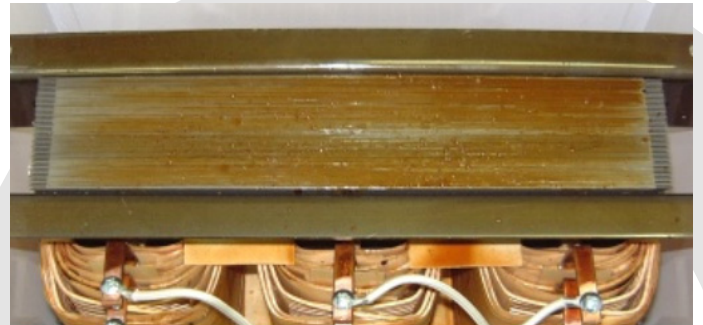
Type PE *e-Rated® Transformers* are highly efficient power transformers that exceed the energy efficiency requirements of NEMA Standard Publication TP1-2002, CSA Standard C802.2-00 and the US Department of Energy's Candidate Standard Level 3.

All of the foregoing standards require the determination of efficiency at 35% of a transformer's full load rating. This requirement is based on average transformer loading in North America. To be competitive, manufacturers generally optimize their transformers' efficiency at this load level.

Unlike excitation (no-load) losses, which are constant, impedance (load) losses increase rapidly with loading. As a consequence, the resulting degradation of efficiency may be unacceptable at higher load levels. To maintain energy efficiency, *e-Rated® Transformers* can be optimized for any predicted load level above 35%.

Under no-load or light-load conditions, ultra-low excitation losses will reduce power consumption. This benefit is achieved by using higher quality grain oriented silicon core steel, reducing the number of laminations per group and by using a *full and step-lap miter-cut core*. An example of this core design may be seen in Figure 1. Unlike a conventional *butt-lap-cut core* or *scrap-less miter-cut core*, the three vertical legs of the *full and step-lap miter-cut core* are not exposed at the upper surface of the top horizontal laminations.

*e-Rated®* core and coil designs have been refined to achieve minimum losses and maximum energy efficiency under any specified loading conditions.



*e-Rated® Full and Step-Lap Miter-Cut Core*  
Figure 1

The reduction of losses results in a reduction of heat, A/C loading and power consumption. PQI is able to calculate total losses, annual energy savings, including A/C costs, payback, return-on-investment and annual reduction of greenhouse gases, under any load profile and power quality condition. *e-Rated® Transformers* provide the most attractive payback and return-on-investment in the industry.





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#### SELECTION TABLES

##### Weights & Dimensions

15kV Class, 60kV BIL

Other Ratings, Dimensions & Weights Available Upon Request

kVA	Enclosure Size (Inches)	Weight (lbs.) *
750	80.00W x 48.00D x 91.50H	6050
1000	80.00W x 48.00D x 91.50H	7250
1500	90.00W x 60.00D x 91.50H	9250
2000	90.00W x 60.00D x 91.50H	10750
2500	100.00W x 60.00D x 110.00H	11950
3000	100.00W x 60.00D x 110.00H	13550
3750	110.00W x 72.00D x 110.00H	18600
5000	120.00W x 72.00D x 120.00H	21400

Other kVA Ratings Available

Other Ratings up to 35kV Available

\* = Approx

The above weights and measures apply to single output configurations with a NEMA 1 enclosure and a standard temperature rise (150°). Multiple output units and some options may change the enclosure size and weights. Consult PQI for detailed product information for these and other configurations. Enclosure provided will be determined by PQI unless otherwise specified.

##### Technical Specifications

UL Listed

CSA Approved

Related Standards: UL-506, ANSI C57.110

NEMA ST-20, NEMA TP1-2002

CSA C9-M1981, CSA 22.2 No.47-1977

CSA C802.2-00

Voltage Class: 15kV [Standards to 45kV]

BIL Rating: 60kV [Standard for Class]

Low Voltage: 120/208 [All Standards to 45kV]

Frequency: 60Hz [50Hz][400Hz][Other]

Type: ANN (Other)

Temp. Rise: 150°C [130°C][115°C][80°C][Other]

Insulation Class: 220°C

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##### Definitions

Type:	PE (Delta : Wye)
ANN:	Cooling Medium – Air, Internal & External Circulation - Natural
Hz:	Frequency
kVA:	Power Rating of Transformer
PV:	Primary Voltage
SV:	Secondary Voltage
Temp:	Temperature Rise: 150°C (Standard) [130°C][115°C][80°C][Other]

##### Options

Pri./Sec. Coils	Cast
Phase Shift:	30° [Other]
Enclosure NEMA 1:	N1 (Standard)
NEMA 3R:	N3R (Optional)
Other:	(Optional)
Electrostatic Shield:	ES – Single 2ES – Dual 3ES – Triple (Ultra)
Thermal Sensors:	TS
Color:	PQI White [ASA 61 Gray][Other]

##### Catalogue Number Configuration

Type & Phase Shift(s)–Hz–kVA–PV:SV–Temp–Options

##### Sample Catalogue Number

PE30–60–1500–12470:120/208–150–N3R–ES–TS



PQI Warranty - 10 years pro-rated.

All specifications are subject to change without notice. Revision 5, January 2008

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