

Department of Energy

§ 431.196

by electromagnetic induction from 1 coil to another to change the original voltage or current value.

*Transformer with tap range of 20 percent or more* means a transformer with multiple voltage taps, the highest of which equals at least 20 percent more than the lowest, computed based on the sum of the deviations of the voltages of these taps from the transformer's nominal voltage.

*Underground mining distribution transformer* means a medium-voltage dry-type distribution transformer that is built only for installation in an underground mine or inside equipment for use in an underground mine, and that has a nameplate which identifies the transformer as being for this use only.

*Uninterruptible power supply transformer* means a transformer that is used within an uninterruptible power system, which in turn supplies power to loads that are sensitive to power failure, power sags, over voltage, switching transients, line noise, and other power quality factors.

*Waveform correction* means the adjustment(s) (mathematical correction(s)) of measurement data obtained with a test voltage that is non-sinusoidal, to a value(s) that would have been obtained with a sinusoidal voltage.

*Welding transformer* means a transformer designed for use in arc welding equipment or resistance welding equipment.

[70 FR 60416, Oct. 18, 2005, as amended at 71 FR 24995, Apr. 27, 2006; 71 FR 60662, Oct. 16, 2006; 72 FR 58239, Oct. 12, 2007]

TEST PROCEDURES

§ 431.193 Test procedures for measuring energy consumption of distribution transformers.

The test procedures for measuring the energy efficiency of distribution transformers for purposes of EPCA are specified in appendix A to this subpart.

[71 FR 24997, Apr. 27, 2006]

Single-phase		Three-phase	
kVA	Efficiency (%)	kVA	Efficiency (%)
10 .....	98.62	15 .....	98.36
15 .....	98.76	30 .....	98.62
25 .....	98.91	45 .....	98.76
37.5 .....	99.01	75 .....	98.91
50 .....	99.08	112.5 .....	99.01

ENERGY CONSERVATION STANDARDS

§ 431.196 Energy conservation standards and their effective dates.

(a) *Low-Voltage Dry-Type Distribution Transformers*. The efficiency of a low-voltage dry-type distribution transformer manufactured on or after January 1, 2007, shall be no less than that required for their kVA rating in the table below. Low-voltage dry-type distribution transformers with kVA ratings not appearing in the table shall have their minimum efficiency level determined by linear interpolation of the kVA and efficiency values immediately above and below that kVA rating.

Single phase		Three phase	
kVA	Efficiency (%) <sup>1</sup>	kVA	Efficiency (%) <sup>1</sup>
15 .....	97.7	15	97.0
25 .....	98.0	30	97.5
37.5 .....	98.2	45	97.7
50 .....	98.3	75	98.0
75 .....	98.5	112.5	98.2
100 .....	98.6	150	98.3
167 .....	98.7	225	98.5
250 .....	98.8	300	98.6
333 .....	98.9	500	98.7
		750	98.8
		1000	98.9

<sup>1</sup> Efficiencies are determined at the following reference conditions: (1) for no-load losses, at the temperature of 20 °C, and (2) for load-losses, at the temperature of 75 °C and 35 percent of nameplate load.

(Source: Table 4-2 of National Electrical Manufacturers Association (NEMA) Standard TP-1-2002, "Guide for Determining Energy Efficiency for Distribution Transformers.")

(b) *Liquid-Immersed Distribution Transformers*. The efficiency of a liquid-immersed distribution transformer manufactured on or after January 1, 2010, shall be no less than that required for their kVA rating in the table below. Liquid-immersed distribution transformers with kVA ratings not appearing in the table shall have their minimum efficiency level determined by linear interpolation of the kVA and efficiency values immediately above and below that kVA rating.