GE
Industrial Solutions

2016 Energy Efficiency Change for Low-Voltage Transformers

FAQ

Frequently Asked Questions

1. What is changing?

As of January 1, 2016, the US Department of Energy will require that distribution transformers meet new energy efficiency standards.

2. What is a distribution transformer?

A distribution transformer, as defined by the US Department of Energy, is a transformer that:

- has an input voltage of 34.5kV or less,
- has an output voltage of 600V or less,
- is rated for operation at a frequency of 60Hz, and
- has a capacity of 10kV to 2,500kVA for liquid-immersed transformers and 15kVA to 2,500 kVA for dry-type transformers.

A distribution transformer is **not** one of the following types, which means that the transformers listed below are excluded from the new 2016 DOE efficiency standards:

- autotransformer
- drive isolation (DIT)
- grounding
- machine-tool (control power)
- non-ventilated
- rectifier
- regulating
- sealed
- special-impedance
- testing
- transformer with tap range of 20% or more
- UPS
- welding transformer

3. Which types of distribution transformers do the new energy efficiency standards apply to?

Distribution transformer types include:

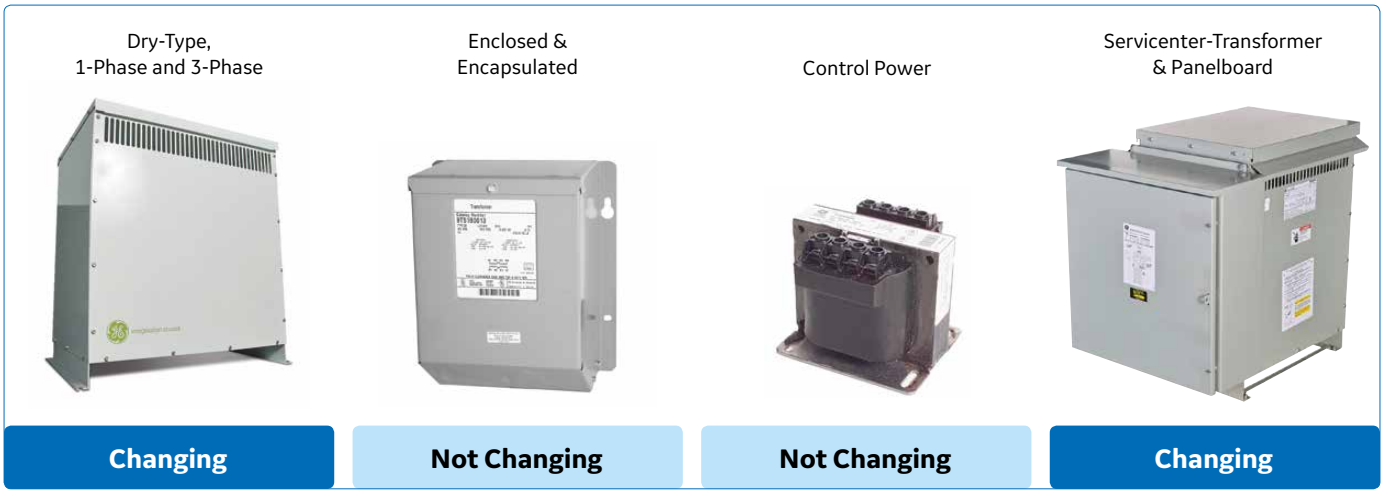
- liquid-immersed
- low-voltage dry-type (LVDT)
- medium voltage dry-type (MVDT)

4. Which types of low-voltage dry-type (LVDT) transformers are affected by the new law?

Under the category of LVDT transformers, those impacted by the new law include:

- 1-phase, 15kVA through 333kVA
- 3-phase, 15kVA through 1000kVA

The law applies to transformers manufactured in the United States or imported into the United States. The graphic below shows the types of transformers that must meet the new energy efficiency standards.



5. Was there a similar change to LVDT transformers in 2007?

Yes, on January 1, 2007 manufacturers of low-voltage dry-type transformers were required to meet the NEMA TP-1 minimum energy efficiency standard. NEMA TP-1 has been in effect for the past 8 years. The US Department of Energy has taken steps to increase the standard again.

6. When does the new, revised standard go into effect?

Manufacturers must begin building distribution transformers that are compliant with the new efficiency standards **no later than January 1, 2016.**

7. Who determines and directs the change in these energy efficiency standards?

The initial standards date back to 1975 when the Energy Policy and Conservation Act (EPCA) established the Energy Conservation Program for Consumer Products. Part C, Title III of the EPCA created a similar program for certain types of industrial equipment, including distribution transformers. The US Department of Energy publishes a document titled *10 CFR part 431 Energy Conservation Program: Energy Conservation Standards for Distribution Transformers*. The DOE has amended this document to increase the energy efficiency standards for distribution transformers beginning January 1, 2016.

8. Why is the Department of Energy making this new change?

The Department of Energy has determined that higher energy efficiency standards for low voltage distribution transformers will result in **significant** energy conservation. They believe that the new energy efficiency standards are technologically feasible and economically justified.

9. What is the name of the new energy efficiency standard that will replace the 2007 NEMA TP-1?

The new energy efficiency standard is called *DOE 2016 Efficiency.*

10. What is the new energy efficiency requirement, by kVA size, for low-voltage, dry-type transformers?

The chart below shows the comparison of the current NEMA TP-1 standard verses the new 2016 DOE standard for single-phase and three-phase transformers in standard kVA sizes.

Single-Phase			Three-Phase		
	Efficiency %			Efficiency %	
kVA	TP-1	2016	kVA	TP-1	2016
15	97.7%	97.70%	15	97.0%	97.89%
25	98.0%	98.00%	30	97.5%	98.23%
37.5	98.2%	98.20%	45	97.7%	98.40%
50	98.3%	98.30%	75	98.0%	98.60%
75	98.5%	98.50%	112.5	98.2%	98.74%
100	98.6%	98.60%	150	98.3%	98.83%
167	98.7%	98.70%	225	98.5%	98.94%
250	98.8%	98.80%	300	98.6%	99.02%
333	98.9%	98.90%	500	98.7%	99.14%
			750	98.8%	99.23%
			1000	98.9%	99.28%

11. It appears that there is no change in efficiencies for the single-phase transformers when comparing the 2007 and 2016 standards. Is this accurate?

Although the efficiencies appear to be equivalent, they are now published to two decimal places. Manufacturers should verify their design data to ensure that their new designs are compliant with the two decimal place efficiency standard.

12. I am familiar with NEMA Premium transformers which meet an energy efficiency standard that exceeds TP-1. The new DOE 2016 energy efficiency levels look very similar to "NEMA Premium" efficiency levels. Are they the same?

See the chart below. The new 2016 efficiency levels for single-phase transformers are lower than NEMA Premium levels. In fact, they are virtually the same as NEMA TP-1 levels. The only difference is that the efficiency is now written with two decimal places. For three-phase transformers the efficiency levels are almost identical, however there are some slight differences.

Single-Phase			Three-Phase		
	Efficiency %			Efficiency %	
kVA	NEMA Premium	2016	kVA	NEMA Premium	2016
15	98.39%	97.70%	15	97.90%	97.89%
25	98.60%	98.00%	30	98.25%	98.23%
37.5	98.74%	98.20%	45	98.39%	98.40%
50	98.81%	98.30%	75	98.60%	98.60%
75	98.95%	98.50%	112.5	98.74%	98.74%
100	99.02%	98.60%	150	98.81%	98.83%
167	99.09%	98.70%	225	98.95%	98.94%
250	99.16%	98.80%	300	99.02%	99.02%
333	99.23%	98.90%	500	99.09%	99.14%
			750	99.16%	99.23%
			1000	99.23%	99.28%

13. How should I proceed if I need to quote a project now that won't ship until 2016?

You should quote the new 2016 design for any products that will not ship until 2016.

TP-1 transformers may not be widely available in early 2016. Manufacturers must build the new, high-efficiency transformers in order to be compliant with the new standards.

14. What are the physical and technical changes in the new 2016 transformer designs?

Catalog numbers will change because the transformer designs are completely new. There will not be significant differences in the physical appearance of the transformers. The transformer weights may increase and there may be some small dimensional changes.

15. How does the new efficiency standard impact manufacturers?

The impact of the change is significant for GE. We have invested millions of dollars in new, sophisticated factory machinery to enable us to build transformer cores in new and exciting ways. We've reorganized our factory to accommodate the new machines, and the entire GE transformer product line will be redesigned to meet the new efficiency standard. In addition, we're incorporating new contractor-friendly features into all of our transformers. **Bottom line – GE's 2016 transformer design will be the best GE transformer yet.**

16. I have some transformers in my warehouse that were built in 2015 or earlier. Can I sell them after January 1, 2016?

Yes, any transformers that are currently in your inventory or on a job site may still be sold and installed in 2016. There is no expiration date for any transformer built prior to 2016. It is the responsibility of the **manufacturers** to comply with the new Department of Energy law. They must cease building their old designs by the end of 2015 and begin building the new high efficiency designs as of January 1, 2016.

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