

Distribution Transformers

Reference Information

R210-80-5

Isolated vs. Solidly Grounded Core

At Issue:

When large transformers with round cores are transported, they may be vulnerable to shipping damage. If a round core is not tightly clamped or secured, it has the potential to shift and be damaged during shipment. An isolated core (versus a solidly grounded core) is sometimes requested to enable testing to detect such damage.

Recommendation:

A better alternative for reliability as well as cost savings is to specify transformers designed with solidly grounded rectangular cores.

Rationale:

Core Design

Cooper Power Systems manufactures a tightly clamped, solidly grounded rectangular core not prone to shipping damages. Cooper's rectangular cores use a single width of core steel. Competitor's round cores typically use about 12 widths of core steel, making it more difficult to hold the laminations in place.

Lower First Cost/Long-Term Savings

Isolating the core for on-site testing adds to the initial cost of the transformer. It requires mounting the ground lead in a place for convenient access, such as near a manhole or brought out of the tank through a bushing. In the first case, opening the tank via the manhole cover introduces the possibility of contamination, as well as the risk that the tank will not be tightly re-sealed after testing. In the latter case, the cost of the bushing increases the total transformer cost.

Conclusion:

Cooper's tightly clamped rectangular core is solidly mounted inside the transformer tank, and is highly resistant to damage or shifting during transport. Specifying Cooper rectangular cores eliminates the unnecessary added expense of core isolation provisions.

The Cooper Connection:

Cooper Power Systems offers three-phase pad-mounted transformers in the following ratings:

- KVA Range: 45-7500 kVA
- Primary Voltage: 2,400 - 46,000 volts (with or without taps, dual voltages available)
- Secondary Voltage: 208Y/120 - 14,400 volts

Cooper Power Systems offers three-phase substation transformers in the following ratings:

- KVA Range: 75 kVA through 10,000 kVA (With temperature rise and fans, capacity of up to 14,000 kVA is possible.)
- Primary Voltage: 2400 - 46,000, with or without taps; dual voltages available
- Secondary Voltage: 208Y/120 (through 1500 kVA only) through 14,400 Volts
- Temperature Rise: 55°, 55/65°, 65° (Optional: special temp rise)
- Basic Insulation Level: 30 kV BIL through 250 kV BIL
- SUSS - Secondary unit substation
- PUSS - Primary unit substation
- SOSS - Secondary open substation
- POSS - Primary open substation

Cooper Power Systems offers single-phase substation transformers in the following ratings:

- KVA Range: 333 kVA through 4000 kVA
- Primary Voltage: 2400 - 46,000, with or without taps; dual voltages available
- Secondary Voltage: 208Y/120 (through 1500 kVA only) through 14,400 Volts
- SOSS
- POSS

Units meet all applicable ANSI, NEMA, and IEEE standards. The primary ANSI standard that governs substation transformers built by Cooper Power Systems is C57.12.10. Several other ANSI standards that govern the construction, loading and testing of pad-mounted and substation transformers are C57.12.00, C57.12.70, C57.12.80, C57.92, and C57.105.



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