

Distribution Transformers

Reference Information

R210-80-4

Bolt-On vs. Weld-On Radiators

At Issue:

The use of radiators to reduce operating temperatures of distribution transformers is a standard design practice. Most transformer radiators are attached by welding the radiator header to the tank wall. However, a more efficient alternate design may call for radiators bolted to a valve assembly which, in turn, is welded to the tank wall.

The design decisions—first, whether or not to utilize radiators, and then, when needed, how to attach the radiators to the tank—are normally made by the manufacturer. It is important to review all special requirements, for transformer cooling as well as dimensional constraints, with the manufacturer.

Recommendation:

Transformer manufacturers choose the best means for attaching the radiators, based on a number of factors including the overall size and weight of the transformer—factors that also affect manufacturing and shipping.

Rationale:

Site-Ready

Typically, the weld-on radiator design results in the lowest installation cost. When a transformer with welded-on radiators arrives at the job site, it is fully sealed and ready to be installed. However, job site situations may dictate the need for radiators that are bolted on after the transformer has been set in place, such as when there is limited space at the installation site (often the case with retrofit units) or when delivery must be made through a constricted area.

Job-Specific Design

When the transformer is designed with a specific job site environment in mind, maintenance costs necessitated by that environment can be minimized. Custom designs, both bolt-on and weld-on, with unique spacing to facilitate cleaning between the flat cooling panels, are also available. Radiators can be mild steel or stainless steel. All radiator coatings meet ANSI C57.12.28 specifications (or ANSI C57.12.29, when required).

Lowest Cost/Best Value

First cost savings will depend on customer specifications. Issues of handling, shipping, installation and the environment should be addressed along with performance criteria. Cooper Power Systems Apparatus Engineering and Field Service personnel are available to review specific needs.

Conclusion:

Allow the transformer manufacturer to choose the best cooling provisions for your transformer, based on your specified requirements. When special needs arise, talk with your Cooper Power Systems' representative for the best possible solution.

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: 2,400 - 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: 2,400 - 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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