

# Efficiency Products

Electrical Apparatus

215-12

## Envirotran® EF™ Three-Phase Pad-Mounted Transformers

### GENERAL

Cooper Power Systems manufactures a complete product line of Envirotran® EF™ distribution transformers optimized to take advantage of Envirotemp® FR3™ fluid's unique properties. Benefits include:

### ENVIRONMENTAL

Envirotemp FR3 fluid is non-toxic, non-bioaccumulating and readily and completely biodegradable per EPA OPPTS 835.3100. The base fluid is 100% derived from edible seed oils and food grade performance enhancing additives. The fluid results in zero mortality when tested on trout fry per OECD G.L. 203 and complies with the US EPA Environmental Technology Verification (ETV) requirements.

Use of the Envirotran EF transformer demonstrates commitment to the environment and limits potential liability when spills occur.

### FIRE SAFETY

Envirotemp FR3 fluid's high fire point (360°C) is more than twice as high as mineral oil, minimizing the risk of transformer fires and liability concerns. It is listed as a less-flammable fluid meeting the requirements of National Electrical Code Section 450-23 and the requirements of the National Electrical Safety Code (IEEE® C2-1997), Section 15. Envirotemp FR3 fluid is Factory Mutual Approved and UL® Classified.

Cooper Power Systems high fire-point fluid-filled transformers have had a flawless safety record for over 30 years.

### IMPROVED PERFORMANCE

Envirotemp FR3 fluid has been shown to dramatically extend transformer life and increase loadability. Insulating paper (the main factor in transformer life) aged in Envirotemp FR3 fluid has been shown to increase 5-8 times over that of paper aged in mineral oil. Cooper Power Systems is the

recognized leader in alternative dielectric coolant technology and has thoroughly tested the Envirotran EF transformer and its related components under a wide range of operating conditions to assure optimal performance and extended life.

Envirotran EF pad-mounted transformers are designed to meet NEMA® TP 1 efficiency standards. This nationally-recognized standard was developed by NEMA for the electrical industry to promote the use of high efficiency transformers. The Envirotran EF transformer coil design has been optimized around this standard to maximize Envirotemp FR3 fluid benefits, and minimize the first cost impact of this new technology using thermal modeling techniques.

### PRODUCT SCOPE

Envirotran EF pad-mounted transformers are manufactured in sizes from 45 to 10000 kVA, in primary voltage classes of 15 kV, 25 kV and 35 kV.

### STANDARD FEATURES

- Meets NEMA TP1 efficiency and ANSI® temperature requirements
- Fluid conforms to ASTM D6871-03 and to pending IEEE® PC57.147, "Guide for Acceptance and Maintenance of Natural Ester Fluids in Transformers".
- Tank coating exceeds ANSI® C57.12.28
- Full compliance with ANSI® C57.12.28 enclosure integrity requirements
- Interior decal, "Filled with Envirotemp® FR3™ fluid, ultimate biodegradability" teardrop shape
- Bolted cover for tank access (45-1000kVA)
- Welded cover with bolted hand-hole (1500-10000 kVA)



Figure 1.  
Envirotran EF Three-Phase  
Pad-Mounted Transformer.

- Three-point latching door for security
- Laser-scribed anodized aluminum nameplate
- Liquid level gauge
- Pressure vacuum gauge
- Dial type thermometer
- One-inch drain valve with sampling device in low-voltage compartment
- One-inch upper fill plug
- Automatic pressure relief device
- 20" Deep cabinet (45-2500 kVA)
- 30" Deep cabinet (34.5/19.92 kV)
- Removable sill for easy installation
- Steel divider between high-voltage and low-voltage compartments
- RTE® (15, 25 kV) 200 A (HTN) bushing wells
- Lifting lugs (4)
- Stainless steel ground pads (45-500 kVA)
- Stainless steel NEMA 2-hole ground pads (750-7500 kVA)
- Stainless steel cabinet hinges & mounting studs

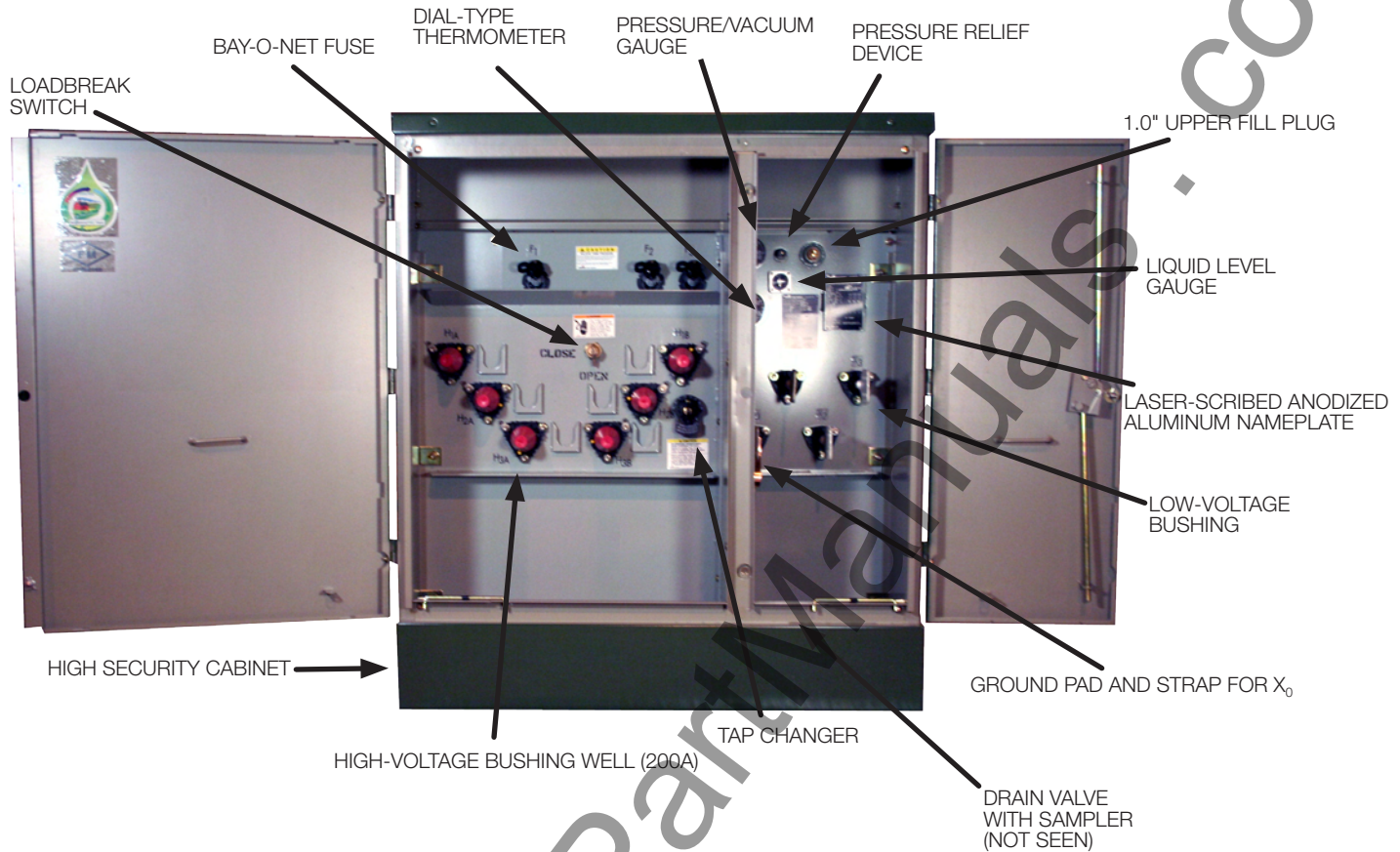


Figure 2.  
Envirotran EF Three-Phase Pad-Mounted Transformer.

#### PROTECTION OPTIONS:

- Bay-O-Net expulsion fuse with Flapper™ valve
- Bay-O-Net and partial range current-limiting fuse
- Magnex® interrupter in combination with isolation link or current-limiting fuse

#### OPTIONAL ACCESSORIES:

- Externally-operable, tap changer switches for safe operation

- Taps: Two 2.5% above and below; Four 2.5% below
- Multiple voltage primaries
- One, two, or three On/Off loadbreak switches
- 4-position loadbreak switch - V-blade switch, T-blade switch (MB4B option)
- Low-voltage 4-, 6-, 8-, 10-, 12-, 16- hole spade (45-300 kVA)
- Low-voltage 6-, 8-, 12-hole spade (500-750 kVA)

- Low-voltage 6-, 12-, 16-, 20-hole spade (1000-2500 kVA)
- Low-voltage bushing supports
- RTE® (15, 25 kV) high-voltage 200 A bushing inserts
- Factory Mutual approved transformer
- UL® Listed transformer

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