

# Efficiency Products

Electrical Apparatus

215-10

## Envirotran® EF™ Overhead Transformers

### GENERAL

Cooper Power Systems manufactures a complete product line of Envirotran® EF™ 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 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 life (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 and its related components under a wide range of

operating conditions to assure optimal performance and extended life.

Envirotran EF overhead 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 to maximize Envirotran FR3 fluid benefits, and minimize the first cost impact of this new technology using advanced thermal modeling techniques and extensive heat run data to maintain ANSI® Standard Hot Spot Rise requirements.

### Product Scope

Envirotran EF transformers are manufactured in 10-50 kVA, in primary voltage classes of 15 kV, 25 kV and 35 kV. It is available in single- or double-bushing cover-mount configuration, with secondary voltages of 120/240, 240/480 or 277.

### Standard features

- Meets NEMA TP 1 efficiency and ANSI® Hot Spot 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".
- Interlaced core-type design, more resistant to low-side voltage surges
- Tank coating exceeds ANSI® C57.12.31
- Tin-plated high- and low-voltage bushing terminals to accommodate aluminum or copper conductors.
- Laser-engraved nameplate
- Cover-mount, wet process porcelain high-voltage bushings resistant to high-voltage corona
- Tank grounding provisions
- Heavy-duty lifting lugs and hanger brackets per ANSI® requirements
- Visible cover ground on units with cover-mounted bushings



Figure 1. Two bushing Envirotran EF transformer.



Figure 2. Single-bushing Envirotran EF transformer, shown with optional arrester and hand wheel bird guard.

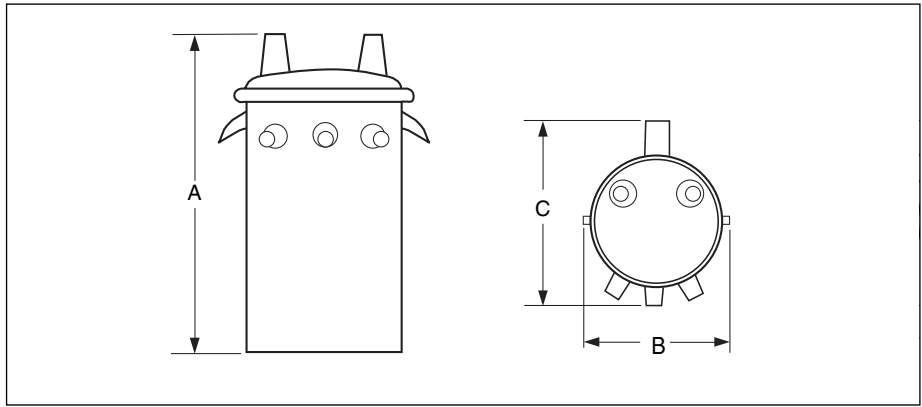
- Recessed tank bottom that offers protection when sliding over rough surfaces
- Automatic pressure-relief device
- Thermoset polyester low voltage bushings. More temperature resistant than standard polymer
- Arrester mounting and grounding provisions
- Internal mark indicates the proper fluid level
- Secondary leads stamped to ensure proper identification
- Corrosion-resistant cover band
- Quality System ISO-9001 certified
- Decal, "Filled with Envirotemp® FR3™ fluid, ultimate biodegradability" teardrop shape

**Protection Options**

- Surge Arresters: VariSTAR® or VariGAP®, Normal or Heavy Duty
- Low voltage arrester: External Storm Trapper® High Energy (HE) arrester
- MagneX® interrupter in combination with isolation link or current-limiting fuse\*\*\*\*.

**Optional Accessories**

- Taps: Two 2.5% above and below; Four 2.5% below, NEMA taps
- Multiple voltage primaries
- Externally-operable, tap changer switches for safe operation
- Stainless Steel 304 or 409: Complete unit, cover or bands
- Birdguard: standard or handwheel
- Non-PCB decal (white on blue)
- Tank ground connector and LV ground strap (standard on single-bushing units)



**Figure 3.**  
**Single-phase Overhead.**

**TABLE 1**  
**Dimensions and Weights**

KVA	Dimensions (in)*				Approx Weight (lbs.)*
	"A"***		"B"****	"C"****	
	95 kV BIL	125 kV BIL			
10	32	35	17	20	195
15	33	36	17	20	220
25	37	39	18	21	300
37.5	39	40	20	23	400
50	43	45	21	24	510

\* Dimensions and weights are for reference only, and not for construction. Please contact CPS for exact dimensions.

\*\* Add 4-6 inches for MagneX®-protected Envirotran EF transformer.

\*\*\* REA style (Single-bushing, double-hanger): Add 4 inches to "B"; subtract 4 inches from "C"

\*\*\*\* Subject to regional constraints

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