

S-VFI

(Smart vacuum fault interrupter)

Padmount and substation distribution transformer

COOPER POWER SERIES



Smart VFI (S-VFI) transformer

Enhanced functionality and intelligence for remote asset management, monitoring and control

Eaton's Cooper Power™ series S-VFI transformer pairs proven VFI technology with the superior control and monitoring capability of modern microprocessor-based relays for increased reliability and system longevity.

Utilizing a variety of feeder relays with Eaton E-Series as standard, the VFI control can now communicate directly to control rooms or within a system network over standard protocols such as Modbus® RTU/TCP, DNP RTU/TCP/UDP. Continuous diagnostic information from the transformer allows the asset to be controlled and monitored remotely for diagnostics and control decisions at the speed of information.

Overview

Eaton's S-VFI transformer enhances the legacy VFI transformer with a new level of technology. When originally designed, the legacy VFI transformer was a breakthrough in simplicity; combining the VFI switchgear and a liquid-filled transformer as a cost-effective, space-saving alternative to traditional transformer/switchgear packages.



Forward-thinking features for the smart grid of today—and tomorrow

- Serial, Ethernet or fiber communications for transformer diagnostics (liquid temp., pressure/vac alarms, liquid level, etc.)
- Logic-based ANSI devices programmable within integral relay control
- Remote trip over data cable
- Direct trip from overcurrent, or auxiliary discrete input (e.g., sudden pressure)
- Enhanced monitoring with discrete and analog inputs from auxiliary devices
- Manually resettable primary overcurrent protection
- Remote reset when paired with integral motor operator
- Increased ease of equipment maintenance and preservation
- Compartmental padmount or substation transformer designed per specification
- Integral (under-oil) VFI
- Integral primary CTs (accuracy class C200 or greater)
- Microprocessor-based feeder relay control system
- UL®-listed NEMA® 4X control cabinet with integral UPS system, CPT, test switches, heater and status lights
- Integral control power and UPS system for 24-hour data logging/sending/receiving
- Wider scope of transformer ratings as compared to legacy VFI transformer (75 °C AWR, and up to 900 A continuous at 35 kV)
- Transformer and VFI tested per IEEE® C57.12.00™
- Preprogrammed relay overcurrent settings
- Entire assembly factory tested and functionally verified prior to shipment
- Standardized package offering engineered for flexibility in any application
- No additional lead-time as compared to standard Eaton transformers

EATON

Powering Business Worldwide



Typical single-line/system setup shown

S-VFI ratings (transformer/interrupt)

- 150–12,000 kVA
- Primary voltage through 34.5 kV, 150 kV BIL
- 900 A continuous current on primary
- 16 kA rms interrupting at 15 kV
- 12.5 kA rms interrupting at 15/25/35 kV

Relay compatibility

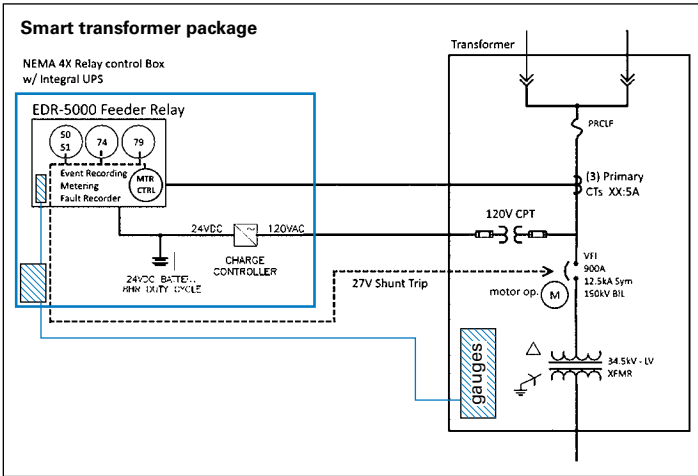
- Eaton E-Series feeder relays standard
- Schweitzer (SEL)
- Others as applicable

Standardized communications

- Ethernet, serial or fiber
- Modbus RTU/TCP, DNP RTU/TCP/UDP, IEC 61850, PROFIBUS®
- Power Xpert® compatible

Transformer discrete alarm signals

- Liquid temperature gauges
- Liquid level gauges
- Winding temperature indicators
- Pressure/vacuum gauges
- Rapid rise relay
- Cover-mounted pressure relief device



Smart transformer package includes:

Padmount or substation style transformer, integral primary vacuum fault interrupter (VFI) + PRCLFs, EDR-5000 Feeder Relay, under-oil primary CTs, under-oil integral control power transformer and 24-hour relay battery backup, Gauges/transducer diagnostics wired to relay. (Relay + test switches and space heater in NEMA 4X control box.)

Note: Refer to catalog for all internal logic options for EDR-5000 relay.



Power Xpert compatibility

Zone selective interlocking and Power Xpert compatibility built into Eaton E-Series relays network the S-VFI transformer with upstream mains, adjacent low-voltage assemblies and auxiliary control systems. (EDR-5000 and PX Dashboard shown.)

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