Optimal Overcurrent Transformer Protection

COOPER POWER SERIES

Defend the backbone of your distribution system

Only Eaton's Cooper Power™ series fuses can provide a comprehensive, cost-effective, and easy-to-restore transformer overcurrent protection package. The package consists of transformer low-current protection devices and current-limiting fuses through 38 kV—plus the tool to easily coordinate the devices.

More than 50 years of experience designing and manufacturing transformers and fuses assures you of best-in-class products and the expertise for optimal overcurrent coordination.

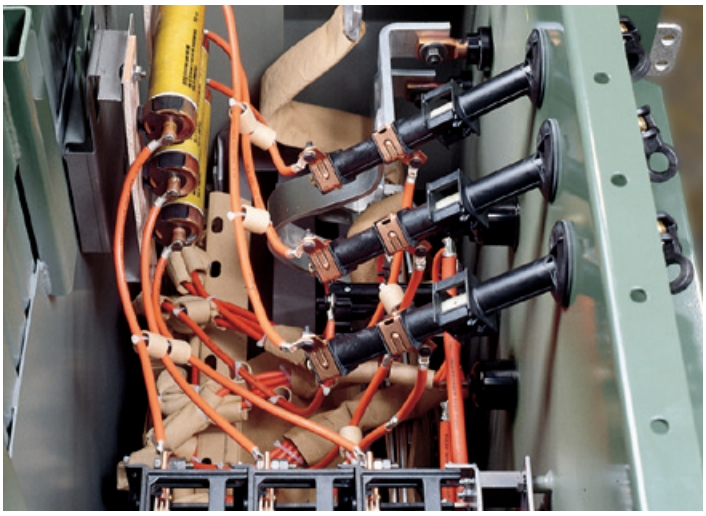
Defend the backbone of your distribution system from low- and high-current faults with the widest offering of coordinated primary and backup protection devices in the industry.

Proper selection and application of fuses in single- and three-phase, pad-mounted transformers is essential to provide a reliable system and minimize the harmful effects of overcurrents. There are many options available to provide overcurrent protection to distribution class transformers. The most widely accepted option is the Eaton's Cooper Power™ series two-part method which combines the use of a primary low-current protection device with a partial-range, backup current-limiting fuse.

Optimal transformer protection

With proper fuse coordination, this two-part, primary-with-backup package provides optimal transformer protection with easy and efficient serviceability, and greater flexibility than a full-range, under-oil fuse:

- Low-current protection devices guard against damaging overloads and secondary faults – which can cause premature transformer failure. In the event of a secondary fault, the low-current protection devices can be quickly and economically replaced or reset by field technicians from outside the tank. No tank dismantling is necessary.
  - Bay-O-Net (BON) fuses
  - MagneX™ interrupter
- The backup under-oil, current-limiting fuses guard against primary/high-fault current – which can cause catastrophic transformer failure, and protect apparatus downline
  - Energy Limiting Submersible Partial-range (ELSP) fuses



The Bay-O-Net and ELSP backup current-limiting fuses work together, now up to 38 kV, for optimal protection of a three-phase transformers.

EATON

Powering Business Worldwide

Low-Current Protection Devices

Bay-O-Net (BON) holder and replaceable fuse-link

- Widest breadth of fuse-link ratings available
  - Highest rated fuse-links in the industry, up to 38 kV
  - Provides economical solutions for a wide range of applications
- Quick and easy fuse-link replacement in the field
  - Reduced downtime and labor costs lessen customer impact
- Flapper™ valve on sidewall mounted BON fuse holder
  - Minimizes oil leakage and area contamination
- BON holder and replaceable fuse-link
  - Current-sensing link – senses secondary faults
  - Dual-sensing link – secondary fault and temperature protection
  - Dual-element link – enhanced device coordination options
  - High-amp link* – senses high oil temperature due to overloads
  - 38 kV Link - senses secondary faults

MagneX interrupter*

- Quick and easy field-resettable overcurrent protection
  - Easily reset by the operating handle
  - Quicker fault diagnosis and service restoration
  - Doubles as transformer on/off switch
- Overload sensing device
  - Protects transformers from increased oil temperatures and high-current
- Efficient, economical operation
  - Virtually eliminates load-losses associated with a secondary breaker – up to a 96% improvement in efficiency
- Environmental advantage
  - Transformer tank remains sealed at all times
  - Eliminates potential of oil dripping on cable accessories
  - Eliminates contamination of the surrounding environment

High-Current Current Protection

ELSP backup current-limiting fuse

- High-current current-limiting design
  - Minimizes the effects of high fault current stresses on equipment and the distribution system
  - Maximum interrupting rating (50,000A rms symmetrical) will quickly clear the highest fault currents likely to occur
  - Self contained design does not emit gas or debris into the transformer tank when operating
- Designed for use in series with BON or MagneX low-current protection devices
  - When coordinated properly, the ELSP fuse will operate only to prevent transformer failure from primary faults
  - Protects equipment down the line by stopping the fault at the affected transformer

Protect the backbone of your distribution system with the widest offering in the industry of transformer low-current protection devices and backup current-limiting fuses.

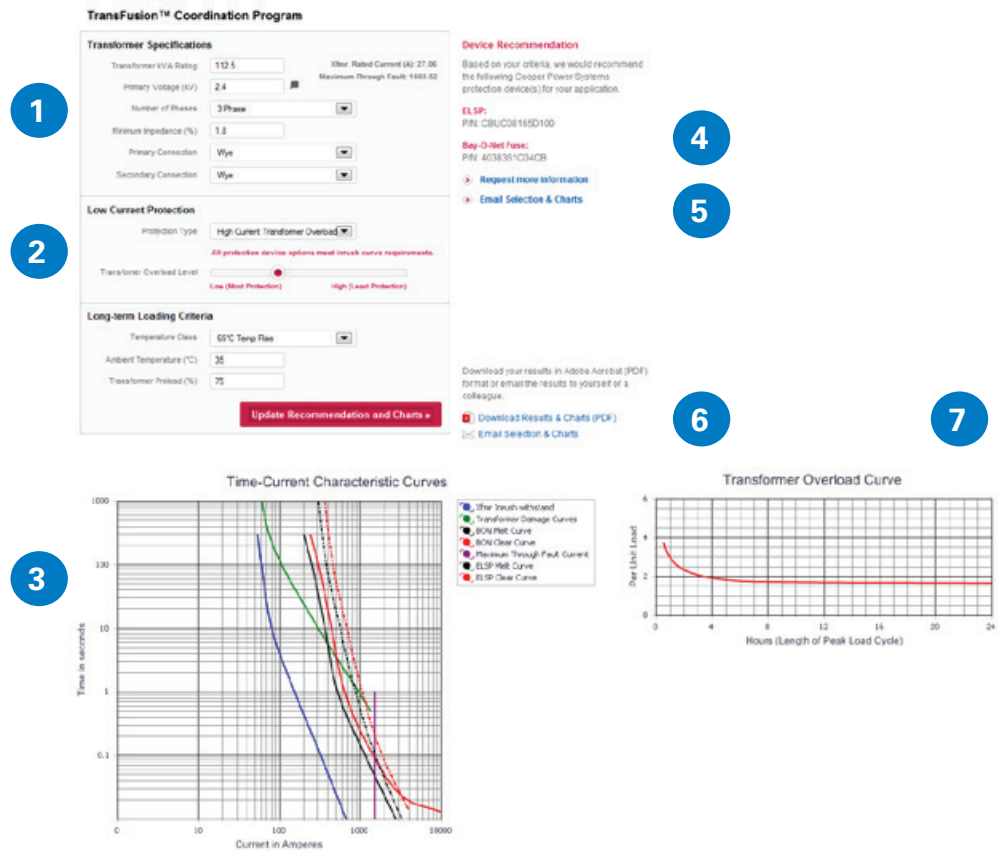
*Eaton's Cooper Power Systems Division innovation

Fuse coordination is made easy with TransFusion™ Coordination Program, a few simple inputs and the TCCs for your specific application can be printed, or emailed to yourself or a co-worker.

The free, web-based, easy-to-use coordination tool makes transformer fuse selection effortless. By simply inputting a few pieces of data and selecting the desired level of protection, you can quickly find the right Eaton's Cooper Power series ELSP and MagneX interrupter or BON fuses for your application. The TransFusion coordination program provides the flexibility of trying various combinations before deciding on the one that best fits your application needs. A simple click of the print button allows you to print your TCC curves and part numbers.

This program is the perfect tool for utility specification engineers, transformer designers, and transformer manufacturers.

www.coopertransfusion.com



1. Transformer specification: Specify the values for your particular application
2. Low current protection selection criteria: Select your desired level of protection
3. Characteristic curves: View coordination of transformer and protection devices
4. Device recommendation with part numbers: Order Eaton's Cooper Power series devices using the provided part numbers
5. Email results: Share your results with a co-worker for easy collaboration and coordination
6. Download results: Save a PDF copy of your device(s) and curves
7. Transformer overload curve: View the per-unit load allowed by selected fuse

When selecting low-current protection devices and backup fuses, proper fuse coordination is critical to insuring full-range transformer protection. Plotting the characteristics of each protective device using Time Current Curves (TCCs) is the ideal way to visualize proper coordination. This is best done through the use of electronic tools such as the TransFusion Coordination Program.

For a more information on fuse coordination, please reference the following documents:

TD132004EN Pad-Mounted Transformer Fusing Philosophies

W240-11018 BON & ELSP Coordination and Transformer Life

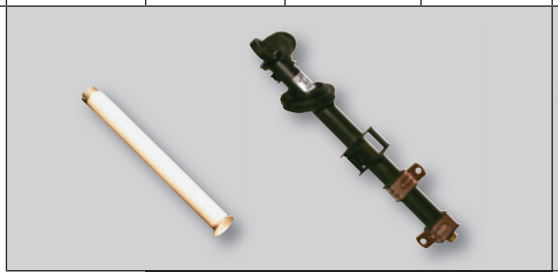
Optimal overcurrent protection

Proper selection and coordination of protection devices in single- and three-phase transformers is essential to:

- Provide a reliable system for power customers
- Protect the public or operator
- Protect the value of the transformer
- Minimize the effects of overcurrents, including protection from:
  - Extended overloads
  - Excessive current due to secondary faults
  - The effects of failures within transformer

With a full array of transformer protection devices and coordination tools that are engineered to work together, Eaton makes sourcing, selecting and coordinating your devices quick and easy. No other manufacturer can match our experience with protecting transformers from harmful overcurrents. Put our expertise to work for you by contacting Eaton today.

	Bay-O-Net Fuse Links						
	Current Sensing	**Dual Sensing**	**Dual Element**	**High Amp**	**38 kV**	**MagneX Interrupter**	**ELSP Backup Current-Limiting Fuse**
Continuous Ratings	6-140 A	3-140 A	5-65 A	135-185 A	10-65 A	0.5-42 A	30-250 A up to 500A paralleled
Interruption Ratings (RMS-Symetrical)	Up to 3,500 A	Up to 3,500 A	Up to 3,500 A	Up to 3,500 A	Up to 1,000 A	Up to 2,800 A	Up to 50,000 A
Overload Protection		X	X	X		X	
Secondary Fault Protection	X	X	X	X	X	X	
High Fault Current Protection							X
High Oil Temperature Protection		X	X	X		X	
Field Replaceable	X	X	X	X	X		
Field Resettable						X	
Emergency Overload Feature						X	
On/Off Switch						X	
Reference Catalog Section	CA132009EN	CA132010EN	CA132011EN	CA132007EN	CA132006EN	CA132017EN CA132016EN	CA132002EN



For Eaton's Cooper Power series product information, call **1-877-277-4636** or visit: **www.CooperPower.com**

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