SEL-700 Series Protective Relays

Product Family

Rugged, comprehensive, and reliable protection for your power system

- Apply SEL-700 series devices for protection throughout your power system—from generators and transformers to lines, feeders, and motors.
- Integrate SEL-700 series devices into your systems using common communications and time protocols.
- Ensure reliable operation with rugged hardware that withstands extreme conditions.
- Simplify setup, configuration, commissioning, and maintenance by deploying products with a common platform architecture.
- Keep personnel and equipment safe with arc-flash mitigation.

SEL-700 Series—Reliable Protection

The SEL-700 series protective relays reliably protect and control your power system, from generators and transformers to lines, feeders, and motors.

SEL relays offer high-speed, secure, accurate, and dependable fault locating along with comprehensive automation and control functions. A wide variety of communications protocols and media enable communication with other devices and integration with automation and control systems.

Deploying devices that share the same platform architecture simplifies setup, configuration, commissioning, and maintenance throughout your power system.

Rugged and Reliable

SEL hardware is designed, tested, and proven to operate in extreme conditions, including in the presence of vibration, electromagnetic interference, and other adverse environmental conditions common in electric power systems. An optional conformal coating provides extra protection in caustic environments.

Unmatched Support

We back all our products with a ten-year warranty, free technical support for the life of every device, and worldwide customer support.

Generator Protection

SEL-700G Generator Protection Relay

The SEL-700G provides a comprehensive protection and synchronization solution for synchronous generators. With a built-in autosynchronizer, flexible I/O, and advanced communications, you can eliminate the complexity and cost of standalone synchronizer packages.

Unit Protection

Sensitive percentage-restrained current differential elements and an unrestrained element, along with synchronism check and volts-per-hertz elements, protect both the generator and the step-up transformer.

Automatic Generator Control

As part of the SEL POWERMAX® Power Management and Control System, the SEL-700G regulates generator power outputs and manages utility interties to maximize system stability, minimize electrical disturbances, and mitigate load-shedding requirements.

Learn more: selinc.com/products/700g

Feeder Protection

SEL-751 Feeder Protection Relay

Provide comprehensive protection for industrial and utility feeders—including time overcurrent, directional overcurrent, over-/undervoltage, autoreclosing, frequency, and more. The SEL-751 provides complete protection for radial and looped distribution circuits.

High-Impedance Fault Detection

SEL Arc Sense™ technology detects and clears high-impedance faults that may not be detected by conventional overcurrent elements, providing an additional layer of protection for workers and the public.

Arc-Flash Protection

Optional arc-flash protection uses light detection and high-speed overcurrent detection to mitigate arc-flash incidents, improving personnel safety and reducing damage to equipment.

Learn more: selinc.com/products/751

Substation Protection

SEL-787-2/-3/-4 Transformer Protection Relay

Protect and monitor most two-, three-, and four-winding transformers with the versatile SEL-787 platform. A wide range of communications protocols and media support integration with existing equipment and allow easy retrofits for electromechanical relays.

Multiwinding Protection

This relay provides standard dual-slope differential protection with harmonic blocking and restraint for most two-, three-, and four-winding transformers. It offers as many as three independent restricted earth fault (REF) elements for sensitive ground fault detection of grounded-wye transformers. Breaker failure protection for as many as four three-pole breakers is standard. The relay also comes with a variety of overcurrent elements for backup protection, including phase, negative-sequence, residual ground, and neutral ground elements.

Metering and Reporting

Built-in metering functions enable rapid commissioning, testing, and post-fault diagnostics as well as station-wide collection of binary Sequential Events Recorder (SER) messages.

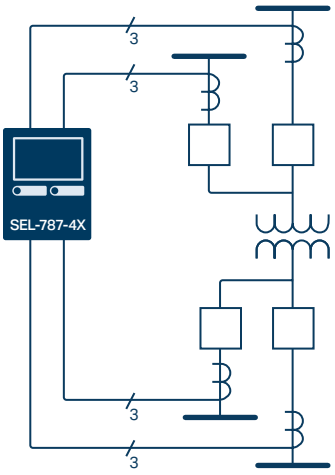
Frequency Tracking

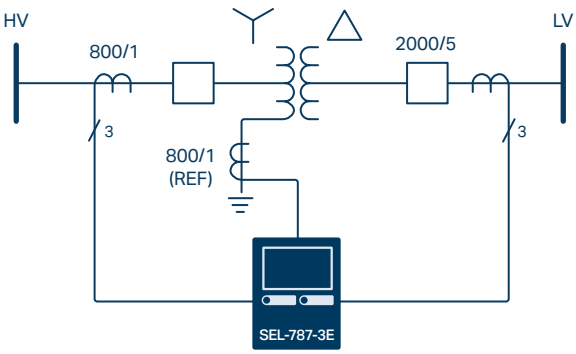
For generator step-up and variable-frequency applications, the SEL-787 provides volts/hertz protection with frequency tracking from 20 to 70 Hz. Use the over-/underfrequency and over-/undervoltage elements to implement load shedding and other control schemes.

Available models:

- SEL-787-2E/-21/-2X—Two-winding differential protection
- SEL-787-3E/-3S—Three-winding differential protection
- SEL-787-4X—Current-based four-winding differential protection

Learn more: selinc.com/products/787-3-4





SEL-787Z High-Impedance Differential Relay and SEL-HZM High-Impedance Module

The SEL-787Z combines high-impedance protection principles with advanced numerical technologies to provide high-impedance differential protection. Apply the SEL-787Z and SEL-HZM for comprehensive single-zone bus protection, motor protection, or REF applications on transformers with grounded-wye windings.

High-Impedance Differential Protection

Multiple resistor options in the SEL-HZM provide security against CT saturation during faults and allow you to customize the device to fit your application. An optional bypass relay and 7.8 kJ MOVs in the SEL-HZM protect the relay from fault currents. Overcurrent elements provide backup transformer protection.

Learn more: selinc.com/products/787z

Motor Protection

SEL-710-5 Motor Protection Relay

Protect a wide variety of induction (asynchronous) and synchronous motors with one SEL-710-5.

Flexible and Complete Protection

Features include broken rotor bar detection and variable-frequency drive support as well as options for arc-flash detection, differential protection, and synchronous motor protection. The synchronous option supports power factor regulation and includes, at no additional cost, a voltage divider accessory to interface with the motor excitation system.

Advanced Thermal Protection

The slip-dependent AccuTrack™ Thermal Model allows independent thermal protection of both the rotor and stator.

Learn more: selinc.com/products/710-5

SEL-700BT Motor Bus Transfer Relay

The SEL-700BT ensures process continuity by transferring critical loads from a primary source to an auxiliary feeder during faults in the primary feeder line.

Multifunction Bus Transfer

Choose the best transfer method for your application—fast, in-phase, residual, or fixed-time—to provide instantaneous load transfer that helps avoid costly shutdowns, keeps personnel safe, and keeps processes running without requiring a cold start.

Comprehensive Protection

Advanced features provide comprehensive system protection for motor bus transfer applications, including detection of islanding conditions and additional protection for distributed generators connected to the utility network. Use the breaker wear monitoring capabilities to facilitate proactive breaker maintenance and replacement.

Learn more: selinc.com/products/700bt

Line Protection

SEL-787L Line Current Differential Relay

With directional overcurrent protection, arc-flash mitigation, fault locating, high-impedance fault detection, broken conductor detection, and more, the SEL-787L provides an economical and dependable line current differential and feeder protection solution for a variety of two-terminal applications, including overhead lines, underground cables, and inverter-based resource tie-lines.

Economical Line Current Differential Protection

Apply the SEL-787L as primary protection for two-terminal lines, critical feeders, and distributed generation tie lines. Advanced logic enables the 87L function to operate with exceptional security and sensitivity and provides additional protection against CT saturation under heavy external fault conditions. Built-in charging current compensation improves the sensitivity and speed of differential protection for long lines.

Flexible 87L Communications

The SEL-787L supports IEEE C37.94-encoded 850 nm multimode fiber for 1 km point-to-point or MUX applications and 1,310 nm single-mode fiber for 25 km point-to-point applications. Choose the communications channel option that suits your application.

Learn more: selinc.com/products/787l

SEL-700 Series Family Comparison

Product/Application	SEL-700G Generator	SEL-751 Feeder	SEL-787-2/-3/-4 Transformer	SEL-787Z High-Impedance Grounded Bus	SEL-710-5 Motor	SEL-700BT Motor Bus Transfer	SEL-787L Line Current Differential
100 Percent Stator Ground Protection	•						
Generator Intertie Protection	•[1]	•					
Induction Motor Protection					•		
Synchronous Motor Protection					•		
Bus Protection		•		•			
Breaker Failure Protection	•[1]	•	•		•	•	
Distribution Feeder Protection	•[1]	•					•
Arc-Flash Mitigation		•		•	•		•
Synchronism Check	•[1]	•				•	•
Integrated Synchronizer	•[1]						
Motor Bus Transfer						•	
Broken Rotor Bar Detection					•		
Thermal Monitoring	•	•	•		•	•	•
Underfrequency Load Shedding		•	•				
Undervoltage Load Shedding		•	•				
Resistance Temperature Detector (RTD) Inputs	•	•	•		•	•	•
Low-Energy Analog (LEA) Inputs	•	•	•		•	•	•
Synchrophasors (IEEE C37.118)	•	•	•			•	•
Web Server	•	•	•	•	•	•	•
Communications	SEL (Fast Meter, Fast Operate, and Fast SER), Modbus TCP/IP, Rapid Spanning Tree Protocol (RSTP), Modbus RTU, EtherNet/IP, IEC 61850 Edition 2, IEC 60870-5-103, IEEE-1588 Precision Time Protocol (PTP) (firmware-based), Simple Network Time Protocol (SNTP), Parallel Redundancy Protocol (PRP), DNP3, and MIRRORED BITS® communications						
Display Options	5-inch color touchscreen display, 800 × 480 pixels; 2-line, 16-character LCD						
Monitoring and Reporting	Event reports (multicycle data) and SER						
Operating Temperature	−40° to +85°C (−40° to +185°F)						
Warranty	Ten years, no questions asked						

[1]Refer to SEL-700G product flyer for supported models.

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