

E1 Plus Electronic Overload Relays

Product Overview

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E1 Plus Solid-State Overload Relays

193-ED/EE versions offer:

- Self-powered
- Phase loss protection
- Wide adjustment range (5:1)
- Over-molded power connections
- 1 N.O. and 1 N.C. isolated auxiliary contacts (B600 Rated)
- Low energy consumption (150 mW)
- Ambient temperature compensation
- Visible trip indication

193-ED version offers:

- 0.1...45 A current range
- Fixed Trip Class 10
- Manual reset

193-EE version offers:

- 0.1...800 A current range
- Selectable Trip Class (10, 15, 20, or 30)
- Selectable manual/auto-manual reset
- Single- and three-phase devices

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Standards Compliance

IEC/EN 60947-4-1
 IEC/EN 60947-5-1
 CSA 22.2 No. 14
 UL 508

Certifications

CE
 cULus Listed
 C-Tick
 CCC

Your order must include 1) the Cat. No. of overload relay selected, and 2) if required, Cat. No. of any accessories.

Product Overview

Accurate, Reliable Performance

Current measurement-based protection

While electromechanical overload relays pass motor current through heating elements to provide an indirect simulation of motor heating, the E1 Plus Overload Relay directly measures motor current. Current measurement-based overload protection more accurately models a motor's thermal condition. Furthermore, ambient temperature does not impact the performance of current measurement-based designs over the specified temperature operating range.

Electronic design

Thermal modeling is performed electronically with precision solid-state components, where at the heart of the E1 Plus Overload Relay is an application-specific integrated circuit (ASIC). The ASIC continually processes motor current data to accurately maintain the time-current status of the motor thermal capacity utilization value.

Thermal memory

A thermal memory circuit allows the E1 Plus Overload Relay to model the heating and cooling effects of motor on and off periods. This ensures accurate protection for both hot and cold motors.

Enhanced phase loss protection

A separate phase loss detection circuit incorporated into the E1 Plus Overload Relay allows it to respond quickly to phase loss conditions; typical reaction time is 3 seconds.

Easy to Select and Apply

Straightforward installation

The self-powered design means that the E1 Plus Overload Relay installs in the same manner as traditional overload relays. Device setup is accomplished by simply dialing the setting potentiometer to the motor FLA rating. The low energy consumption of the electronic design minimizes temperature rise issues inside control cabinets.

Wide adjustment range

A wide 5:1 adjustment range results in the need for half as many catalog numbers as the bimetallic alternative in order to cover the same current range. This helps to reduce inventory carrying costs and affords greater installation flexibility for dual voltage machines. Evenly spaced setting tick marks enhance the ease of installation setup.

Rugged Construction

Over-molded power connections

The unique line-side over-molded power connections make for a sturdy two-component starter assembly that is unmatched in the industry. The pre-formed power connections allow easy starter assembly — every time.

Current transformers

The current transformers are secured separately in the overload housing to ensure the greatest degree of resistance to shock and vibration conditions. Varnished laminations ensure consistent performance and provide additional protection against corrosion.

Latching relay

The robust design of the bi-polar latching relay provides reliable trip and reset performance for the most demanding of applications. The self-enclosed relay offers additional environmental protection for use in industrial applications.

Application Flexibility

Isolated Contacts

The isolated contact configuration allows the N.C. and N.O. contacts to be applied in circuits operating at different voltage levels and without polarity restrictions. The B600 contact rating affords application in circuits rated to 600V.

DIP switch settings

Bul. 193-EE devices offer DIP switch settings to select the trip class (10, 15, 20 or 30) and the reset mode (manual or automatic), making these devices extremely versatile.

Pass-Thru Option

The E1 Plus Pass-Thru consumes 48% less panel space compared to a standard E1 Plus mounted in a panel mount adapter. The design provides an integrated DIN Rail mount and panel mounting holes and is intended for the following applications: DIN Rail and Panel Mount Applications, Bulletin 100-K mini contactor, external current transformers, and for use with non Allen-Bradley Contactors. The E1 Plus Pass-Thru Electronic Overload Relay provides all of the same expandable protection & communication capabilities as a standard E1 Plus, and eliminates the need for a separate panel mount adapter, which saves money and valuable panel space.



Side-Mount Expansion Modules

Through the use of optional side-mount expansion modules, functionality of the E1 Plus overload relays can be cost effectively expanded and machine operation and protection enhanced. Direct mounting to the left side of the 193-EE and 592-EE E1 Plus overload relays means that only 18 mm is added to the overall product width. The side-mounted accessory modules electronically interface with the E1 Plus overload relay so that all control circuit connections are made at the E1 Plus overload relay terminals.

E1 Plus DeviceNet™ Communication Module

The Bul. 193-EDN DeviceNet Communication Side-Mount Module provides a cost-effective, seamless deployment of motor starters onto the Integrated Architecture™ as an accessory for the E1 Plus electronic overload relay. The DeviceNet module provides Integrated I/O (2 inputs and 1 output) providing local connection of motor starter-related I/O. The DeviceNet module offers expanded protective functions including overload warning, jam protection, and underload warning. The DeviceNet module also allows access to average motor current (percentage of FLA setting), percentage of thermal capacity usage, device status, trip & warning identification, and trip history which allows continual monitoring of motor performance.

E1 Plus Remote Reset Module

The Bul. 193-ERR Remote Reset Module is available for applications that require remote reset of the E1 Plus overload relays after a trip occurs.

E1 Plus Jam Protection Module with Remote Reset

The Bul. 193-EJM Jam Protection Module provides front-accessible DIP switches which offers flexibility to provide jam protection to match application requirements. Selections are available for enabling or disabling the jam protection function and remote reset operation. Jam trip level settings are available at 150%, 200%, 300%, and 400% of full load current setting. Trip delay settings of 1/2, 1, 2, and 4 seconds are available to minimize nuisance tripping in applications where intermittent short-duration overloading is permissible.

E1 Plus Ground Fault Module with Remote Reset

The Bul. 193-EGF Ground Fault Protection Module offers front-accessible DIP switches providing flexibility to configure ground fault protection to match application requirements. Selections are available for enabling or disabling the ground fault protection function and remote reset operation. Ground fault trip level settings are available in four ranges: 20...100 mA (resistive loads only, for motor loads consult your local Rockwell Automation sales office or Allen-Bradley distributor), 100...500 mA, 0.2...1 A, and 1...5 A. Within each range, the specific ground fault trip level can be set (20%, 35%, 50%, 65%, 80%, 90%, or 100% of the maximum ground fault setting). Trip delay is fixed at 50 ms ± 20 ms.

E1 Plus Ground Fault/Jam Module with Remote Reset

The Bul. 193-EGJ Ground Fault/Jam Protection Module offers front-accessible DIP switches to provide flexibility to configure ground fault and jam protection to match application requirements. The ground fault selections are the same as the Bul. 193-EGF Ground Fault Protection Module. In addition to ground fault, this module offers selectable fixed jam protection. The user can enable or disable jam protection from the DIP switches. The jam protection is fixed at 400% of the full load current setting with a 0.5 second trip delay.

E1 Plus PTC Module with Remote Reset

The Bul. 193-EPT PTC Side-Mount Module provides two terminals for the connection of positive temperature coefficient (PTC) thermistor sensors. PTC sensors are commonly embedded in the motor stator windings to monitor winding temperature. PTC sensors react to actual temperature, so enhanced motor protection can be provided to address conditions like obstructed cooling and high ambient temperature.

E1 Plus EtherNet/IP Module

The Bul. 193-ETN EtherNet/IP network communication module delivers seamless control and direct access to motor performance and diagnostic data on an Ethernet-based network. It supports I/O and explicit messaging for data access by a programmable automation controller, and contains predefined ControlLogix® style tags for direct software access. The integrated web and e-mail server contains a web server to allow users to read information and configure parameters via a web browser. The device also uses a simple mail transfer protocol (SMTP) server to send e-mail or text messages in the event of a warning or trip condition.

E1 Plus Profibus Module

The Bul. 193-EPRB PROFIBUS network communication module delivers direct access to motor performance and diagnostic data on a field bus based network in addition to seamless control. The PROFIBUS communication module supports both PROFIBUS DP-V0 and DP-V1. Protective functions include overload warning, jam protection, and underload warning. The PROFIBUS network communication module monitors the motor current by electronically interfacing to the E1 Plus overload relay's current-sensing circuit. As a result, the side-mount module is able to identify the cause of the trip and provides warnings for overload, underload, phase loss, and jam. The module continuously monitors the motor's performance for average motor current, thermal capacity usage, and device status, and also provides a trip history for the five previous trips. Integrated I/O provides convenient local termination of motor-related inputs and outputs, simplifying the control architecture.