PRODUCT PROFILE

BULLETIN 193 & 592 E1 PLUS ELECTRONIC OVER LOAD RELAYS

THE E1 PLUS ELECTRONIC OVERLOAD RELAYS SET A NEW STANDARD FOR ENTRY LEVEL SOLID-STATE MOTOR PROTECTION.

FEATURES

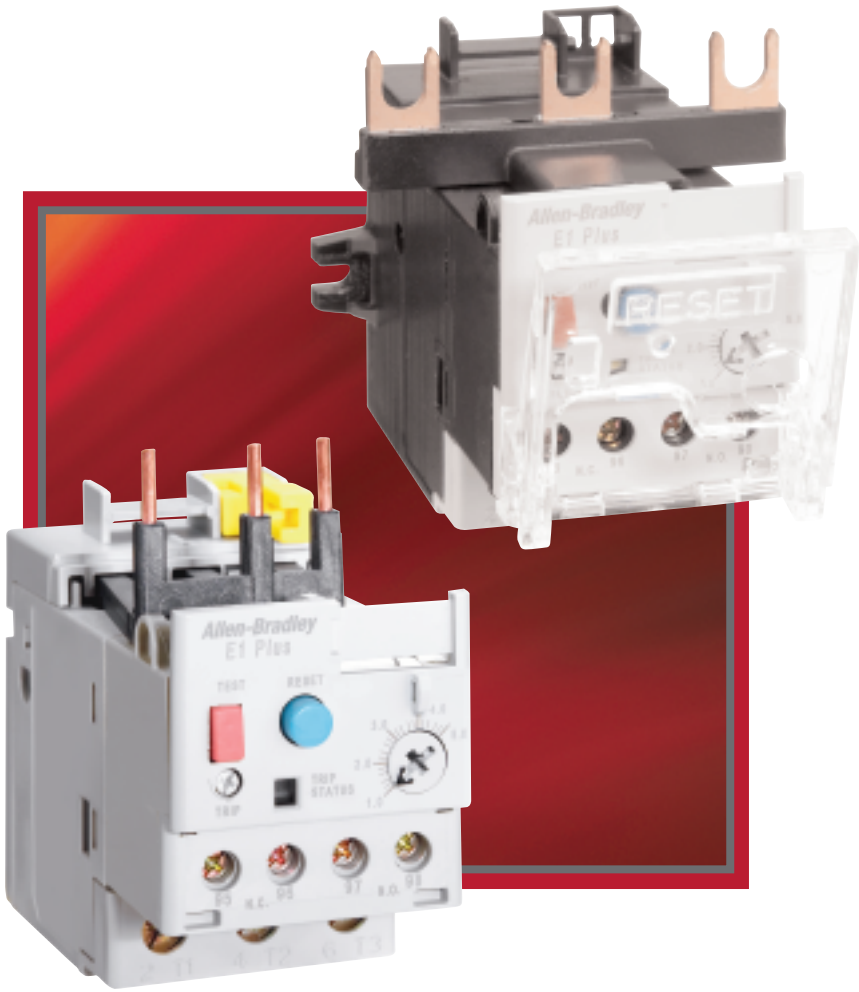
- IEC and NEMA configurations
- Self-Powered
- Phase Loss Protection
- Wide 5:1 Adjustment Range
- Over-Molded Power Connections
- 1 N.O. and 1 N.C. Isolated Auxiliary Contacts (AC15/B600 Rated)
- Low Energy Consumption (150mW)
- Ambient Temperature Compensation
- Visible Trip Indication

ED VERSION OFFERS:

- 0.1 … 27A Current Range
- Fixed Trip Class 10
- Manual Reset

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
- Optional Cage Clamp Control Terminals



- The solid-state design provides accurate, reliable and repeatable protection.
- Application flexibility is offered through a wide 5:1 adjustment range and DIP switch adjustments available on EE versions.
- Rockwell Automation exclusive over molded power stabs deliver unmatched robust connections in starter assemblies.
- The patented modular design allows for easy expansion of capabilities through side mount accessory modules to the EE versions.

ESSENTIAL COMPONENTS.
EXCEPTIONAL VALUE.

DESCRIPTION

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 set-up 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 set-up.

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 preformed power connections allow for 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 bipolar 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 allow the N.C. and N.O. contacts to be applied in circuits operating at different voltage levels and without polarity restrictions. The AC15/B600 contact rating affords application in circuits rated to 600V.

DIP SWITCH SETTINGS

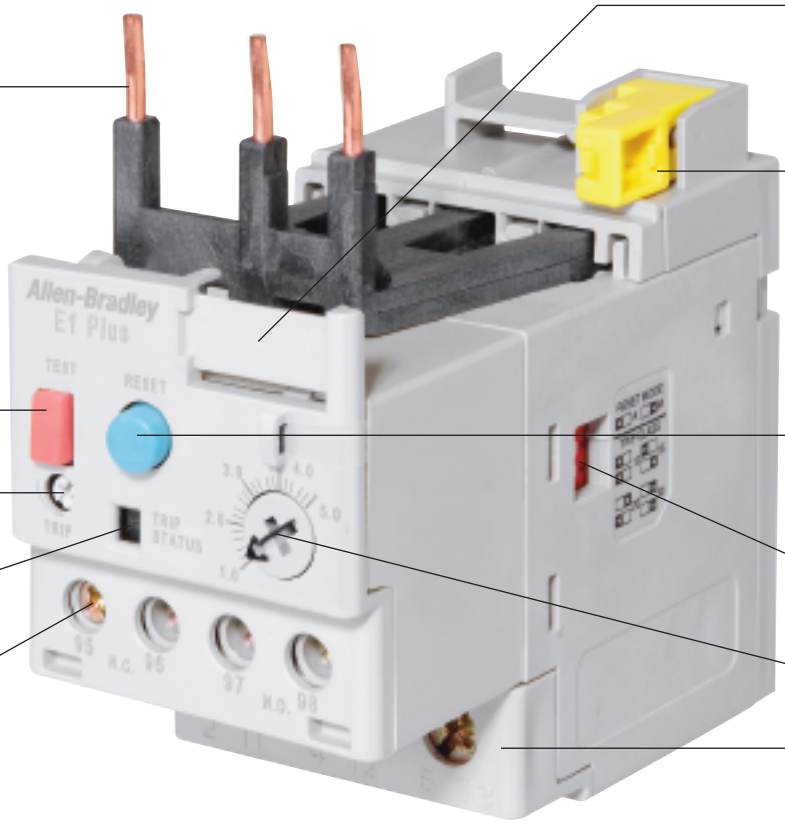
193-EE and 592-EE devices offer DIP switch settings to select the trip class (10, 15, 20 or 30) and the reset mode (manual or automatic), making these devices very versatile.

CAGE CLAMP TERMINALS

193-EE devices offer optional cage clamp control terminals that can reduce installation wiring time.

FEATURE

OVERVIEW

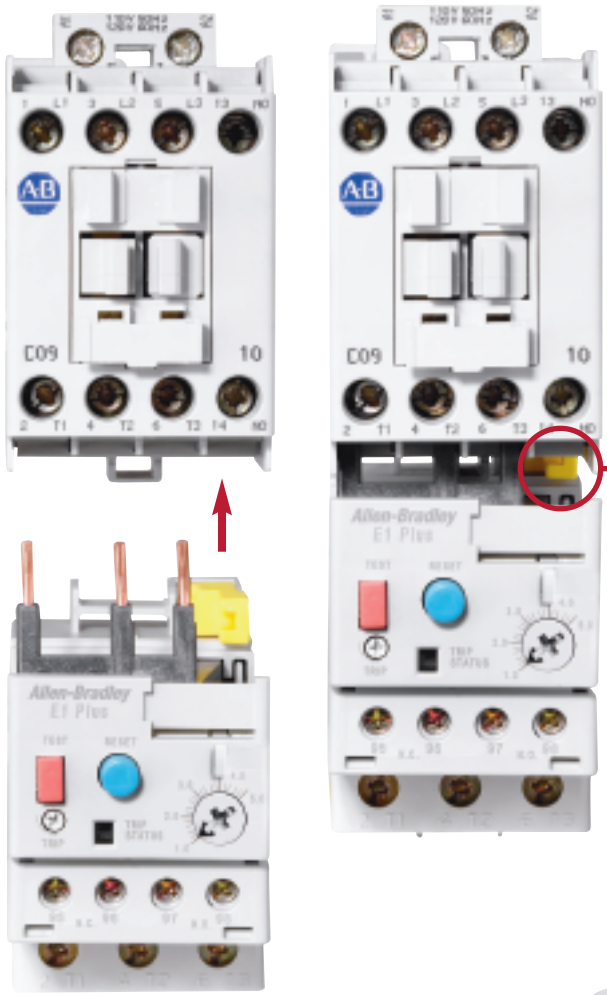


WIDE 5:1 ADJUSTMENT RANGE

- Ease in set-up with evenly spaced settings
- Simplified product selection with a minimized number of catalog devices, greater overlap
- Each device covers the range of nineteen heater elements or four bimetallic devices

ENHANCED

IEC STARTER ASSEMBLY



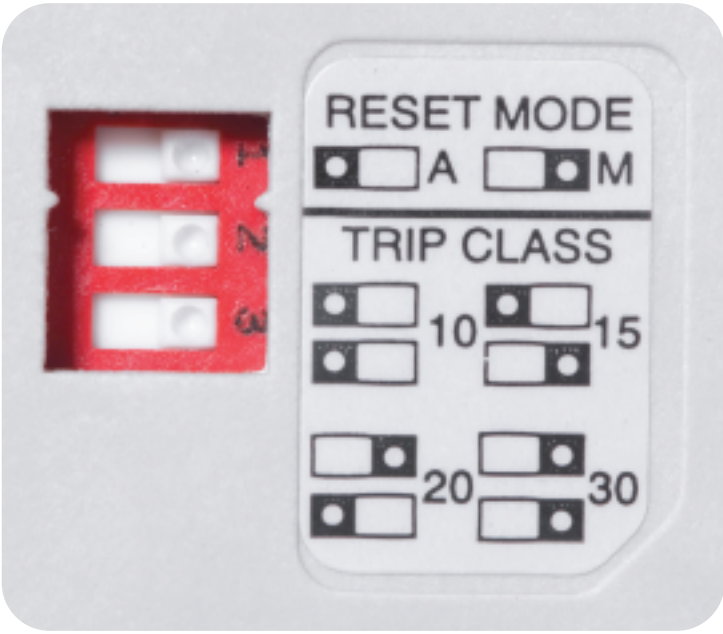
- Rockwell Automation exclusive over molded power stabs provides rigid interconnection with contactor and simplifies assembly of starter.
- Greater stability is afforded with the overload relay base being flush with the contactor base.

Latching Mechanism

- Dimensions proportional to the contactor give an integrated starter appearance and make control panel design and installation straightforward.
- Enhanced starter assembly durability is provided by the latching mechanism that mechanically locks the E1 Plus to the base of the contactor.

APPLICATION FLEXIBILITY

- EE versions offer DIP switch adjustments for selection of trip class and reset mode, allowing the use of one device for a broad range of application requirements.
- DIP switches are located on the side to limit accessibility once installed for improved security
- Trip class selections of 10, 15, 20 or 30.
- Reset mode selections include manual or manual/automatic.



PRODUCT SELECTION

BULLETIN 193-ED – IEC THREE-PHASE DEVICES

- Fixed Trip Class 10
- Manual Reset

Mounts to Contractor	Adjustment Range (A)	Cat. No.
100-C09...100-C23	0.1 ... 0.5	193-ED1AB
	0.2 ... 1.0	193-ED1BB
	1.0 ... 5.0	193-ED1CB
	3.2 ... 16	193-ED1DB
	5.4 ... 27	193-ED1EB

BULLETIN 193-EE – IEC THREE-PHASE DEVICES

- Selectable Trip Class (10, 15, 20, 30)
- Selectable Manual/Auto-Manual Reset
- Screw-Type Control Terminals

Mounts to Contractor	Adjustment Range (A)	Cat. No.
100-C09...100-C23	0.1 ... 0.5	193-EEAB ❶
	0.2 ... 1.0	193-EEBB ❶
	1.0 ... 5.0	193-EECB ❶
	3.2 ... 16	193-EEDB ❶
	5.4 ... 27	193-EEEB ❶
100-C30...100-C43	5.4 ... 27	193-EEED ❶
	9 ... 45	193-EEFD ❶
100-C60...100-C85	18 ... 90	193-EEGE ❶
100-D95...100-D180	30...150	193-EEHF
	40...200	193-EEJF
100-D210...100-D420	40...200	193-EEJG
	60...300	193-EEKG
	100...500	193-EELG
100-D630...100-D860	120...600	193-EEMH
	160...800	193-EENH

❶ **Cage Clamp Control Terminals –** To order, change the Bulletin number in the listed Cat. No. from **193** to **193R** (Example: **193R-EEFD**).

BULLETIN 592-EE – NEMA THREE-PHASE DEVICES

- Selectable Trip Class (10, 15, 20, 30)
- Selectable Manual/Auto-Manual Reset

Mounts to Contractor	Adjustment Range (A)	Cat. No.
00	0.1 ... 0.5	592-EEAT
	0.2 ... 1.0	592-EEBT
	1.0 ... 5.0	592-EECT
	3.2 ... 16	592-EEDT
0...2	0.2 ... 1.0	592-EEBC
	1.0 ... 5.0	592-EECC
	3.2 ... 16	592-EEDC
	5.4 ... 27	592-EEEC
	9 ... 45	592-EEFC
3	9 ... 45	592-EEFD
	18 ... 90	592-EEGD

ACCESSORIES

Description	For Use With	Cat. No.
DIN Rail/Panel Adapter For separate mounting – can be mounted to top-hat rail EN 50 02-35.	193-ED1_B, 193-EE_B	193-EPB
	193-EE_D	193-EPD
	193-EE_E	193-EPE
Current Adjustment Shield Prevents inadvertent adjustments of the current setting. (Package of 10 pieces)	193-ED (all)	193-BC8
	193-EE (all)	
	592-EE (all)	
External Reset Adapter For enclosed, through-the-door reset applications. Use with External Reset Button.	193-ED (all)	193-ERA
	193-EE_B, 193-EE_D, 193-EE_E	
External Reset Button For enclosed, through-the-door reset applications. Metal construction IP66, non-illuminated with rod (length: 142 mm, adjustable range 141 ... 159mm). Please consult the 800F catalog pages for additional types.	193-ED (all)	800FM-R611 Button
	193-EE_B, 193-EE_D, 193-EE_E	800F-ATR08 Rod
Jam Protection Module with Remote Reset	193-EE (all)	193-EJM
	592-EE (all)	

SPECIFICATIONS

MAIN CIRCUITS

Rated Insulation Voltage *U*i		690V AC
Rated Impulse Strength *U*imp		6 kV AC
Rated Operating Frequency		50 / 60 Hz
Rated Operating Voltage *U*e	193-*B, 193-*D, 193-*E, 592 (All)	690V AC (IEC)/ 600V AC (CSA/UL)
	193-*F, 193-*G, 193-*H	1000V AC (IEC)/ 600V AC (CSA/UL)

CONTROL CIRCUITS

Rated Insulation Voltage *U*i		600V AC
Rated Impulse Strength *U*imp		6 kV AC
Rated Designation		B600
Rated Operating Current *I*e		N.O. / N.C.
AC-15	12 ... 120V	3 / 2
	200 ... 240V	1.5 / 1.5
	380 ... 480V	0.75 / 0.75
	500 ... 600V	0.6 / 0.6
Thermal Current Ithe		5A
Contact Reliability		17V, 5mA

ENVIRONMENTAL RATINGS

Ambient Temperature	Storage	-40 ... 85°C (-40 ... 185°F)
	Operating	-20 ... 60° (-4 ... 140°F)
Humidity	Operating	5 ... 95%, non-condensing
	Damp Heat	per IEC 68-2-3 and IEC 68-2-30
Vibration (per IEC 68-2-6)		3G
Shock (per IEC 68-2-27)		30G
Maximum Altitude		2000m
Pollution Environment		Pollution Degree 3
Degree of Protection		IP20

PROTECTION

Type of Relay		Ambient Compensated, Time Delay, Phase Loss Sensitive
Nature of Relay		Solid-State
Trip Rating		120% FLA
Trip Class	Type ED	10
	Type EE	10, 15, 20, 30
Reset Mode	Type ED	Manual
	Type EE	Automatic or Manual

GENERAL

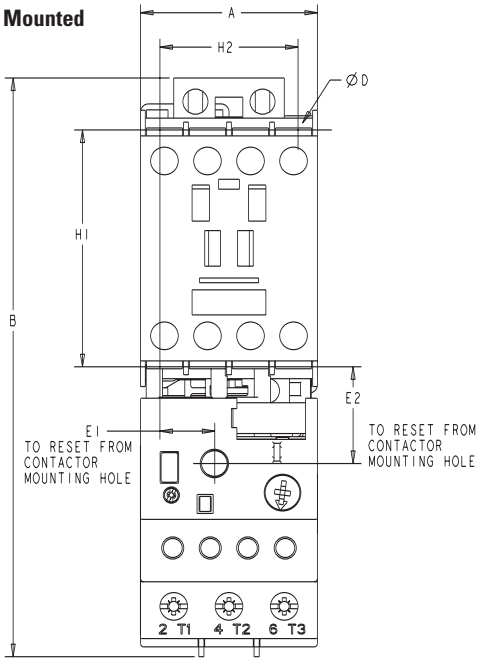
Standards	UL508, CSA C22.2 No. 14, NEMA ICS 2-1993 Part 4, EN 60947-4-1, EN 60947-5-1
Approvals	CE, C-tick, CSA, UL, ATEX (pending)

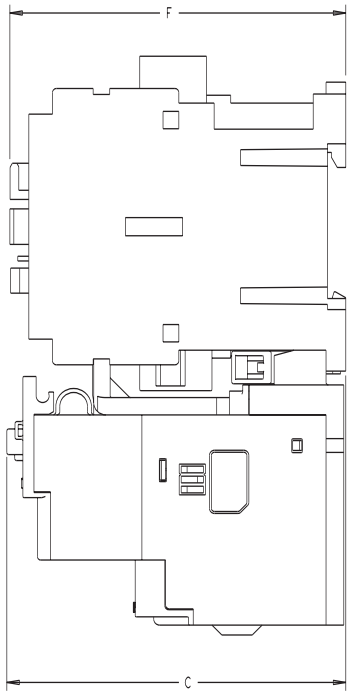
APPROXIMATE DIMENSIONS

Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

BULLETIN 193 **E1 Plus Solid-State Overload Relays**

100-C Mounted





Overload Cat. No.	Contactor Cat. No.	A Width	B Height	C Depth	D	E1	E2	F	H1	H2
193-ED__B 193-EE__B 193R-EE__B 193S-EE__B	100-C09 100-C12 100-C16 100-C23	45 (1-25/32)	146.6 (5-25/32)	85.2 (3-23/64)	4.5 (3/16)	13.9 (35/64)	24.5 (31/32)	86.5 (3-13/32)	60 (2-23/64)	35 (1-3/8)
193-EE__D 193R-EE__D 193S-EE__D	100-C30 100-C37	45 (1-25/32)	146.6 (5-25/32)	101.2 (3-63/64)	4.5 (3/16)	13.9 (35/64)	24.5 (31/32)	104 (4-3/32)	60 (2-23/64)	35 (1-3/8)
193-EE__D 193R-EE__D 193S-EE__D	100-C43	54 (2-1/8)	146.6 (5-25/32)	101.2 (3-63/64)	4.5 (3/16)	18.9 (3/4)	24.5 (31/32)	104 (4-3/32)	60 (2-23/64)	45 (1-25/32)
193-EE__E 193R-EE__E 193S-EE__E	100-C60 100-C72 100-C85	72 (2-53/64)	192.3 (7-37/64)	120.4 (4-3/4)	5.4 (7/32)	23.8 (15/16)	29 (1-9/64)	125.5 (4-15/16)	100 (3-15/16)	55 (2-11/64)

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