







Overload Relays

					
Bulletin No.	193-ED	193-EE	193-M	193-CT	
Type	E1 Plus Electronic Overload Relay		Bimetallic Overload Relay	Bimetallic Overload Relay	
Rated Current (Range)	0.1...27 A	0.1... 90 A	0.1...12.5 A	0.1... 17.5 A	
Operating Voltage, Nominal	600V	600V	600V	600V	
Overload Type	Solid State	Solid State	Bimetallic	Bimetallic	
Trip Class (Fixed)	10	—	10	10	
Trip Class (Adjustable)	—	10, 15, 20 or 30	—	—	
Ambient Compensated	✓	✓	✓	✓	
Reset Type	Manual	Manual / Auto-Manual	Manual	Manual	
Adjustment Range	5:1	5:1	1.5:1	1.5:1	
Phase Loss	✓	✓	Normal Sensing	Normal Sensing	
Ground (Earth) Fault	—	—	—	—	
Overcurrent (Jam) Detection	—	—	—	—	
N.C. Trip Contact	✓	✓	✓	✓	
N.O. Alarm Contact	✓	✓	✓ (Optional)	✓ (Optional)	
Mounts to Contactor	100-C	100-C	100-M	100-C	
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Motor Protection

Quick Selection Table

Overload Relays

			
Bulletin No.	193-EF1/EF2	193-EC1/EC2	825-P
Type	Solid-State Overload Relay	E3 and E3 Plus Electronic Overload Relay	Modular Protection System
Rated Current (Range)	20...630 A	0.4...5000 A	0.5...5000 A
Operating Voltage, Nominal	1 000V	690V	690V/1 000V
Overload Type	Solid-State	Microprocessor Based	Microprocessor Based
Trip Class (Fixed)	—	—	—
Trip Class (Adjustable)	2...30	5...30	1...600
Ambient Compensated	✓	✓	✓
Reset Type	Manual with Option for Automatic or Remote	Automatic, Manual and Remote	Automatic, Manual and Remote
Adjustment Range	4:1	5:1	4:1
Phase Loss	Enhanced Sensing, Load Independent	Adjustable Delay	Imbalance Sensing
Phase Reversal	—	—	✓
Ground (Earth) Fault	—	E3 Plus: Sensitive	Residual or Sensitive
Overcurrent (Jam) Detection	✓ (EF2) Indication only	✓	✓
Stall Detection	—	✓	✓
Starts/Hour Monitoring	—	—	✓
Underload Detection	—	✓	✓
Current Imbalance	✓	✓	✓
Short Circuit Protection	—	—	✓
PTC Thermistor Monitoring	✓ (EF2)	✓ (E3 Plus)	✓
RTD Monitoring	—	—	(12-Channel Optional Scanner)
Warning Settings	—	✓	✓
N.C. Trip Contact	✓	✓	✓
N.O. Alarm Contact	✓	—	✓
Number of Outputs	—	E3: 1/E3 Plus: 2	3 (Basic)/7 (with I/O Expansion)
Number of Inputs	—	E3: 2/E3 Plus: 4	2 (Basic)/5 (with I/O Expansion)
Number of Analog Outputs	—	—	1 (with I/O Expansion)
ODVA (DeviceNet) Conformance	—	✓	✓
Atex Certification	—	In Preparation	—
Variable Frequency (VFD) Compatible	—	✓	—
Mounts to Contactor	100-D	100-C, 100-D	100-D
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Motor Protection**Quick Selection Table****Dedicated Function Motor Protection Relays**

								
Bulletin No.	809S			813S	817		819	
Type	E1	E2	E3	E2	E1	E2	E1	E2
	Current Monitors			Phase Monitors	Thermistor Monitors		Motor Rotation Monitors	
Under- and overcurrent protection	✓	✓	—	—	—	—	—	—
Under- and overvoltage protection	✓	—	—	✓	—	—	—	—
Phase imbalance and phase loss protection	—	—	Current based	Voltage based	—	—	—	—
Overtemperature protection	—	—	—	—	✓	✓	—	—
Speed detection via frequency input	—	—	—	—	—	—	✓	—
Speed detection evaluation of motor feedback voltage	—	—	—	—	—	—	✓	✓
Operating Range	0.5...5 A 2.0...24.9V 20...249V	2.0... 15.0 A	0.5...5 A (3-phase) (AC only)	109.5 109.5 500V AC or 690V AC	—	—	IEC 400V AC CSA/UL 300V AC	IEC 690V AC CSA/UL 600V AC
Case size H: (mm)	110	109.5	109.5	109.5	89	89	110	109.5
W: (mm)	22.5	45	45	45	22.5	22.5	22.5	45
D: (mm)	75	75	75	75	98.8	98.8	75	75
LCD / Keypad	✓	✓	✓	✓	—	—	✓	✓
LED Status Indicator	—	—	—	—	✓	✓	—	—
Automatic reset	✓	✓	✓	✓	✓	✓	✓	✓
Manual reset	—	—	—	—	—	✓	—	—
Remote reset	—	—	—	—	—	✓	—	—
Changeover contacts (SPDT)	1	1	1	1	—	—	—	1
N.O. contacts	—	1	1	1	2	2 (independent)	2 (independent)	1
No setting required	—	—	—	—	✓	✓	—	—
Programmable trip level, reset level and time delay settings	✓	✓	✓	✓	—	—	✓	✓
Trip cause identification	—	—	—	✓	✓	✓	—	—
Measuring Circuit Monitoring (open, short)	—	—	—	—	✓	✓	✓	✓
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Motor Protection

Product Selection: 193-ED, 193-EE

E1 Plus Electronic Overload Relays



- Bulletin 100-C Contactor Compatible
- Self-Powered
- Phase Loss Protection
- Wide Adjustment Range (5:1)
- Insert-Molded Power Connections
- 1 N.O. and 1 N.C. Isolated Auxiliary Contacts
- Low Energy Consumption (150 mW)
- Ambient Temperature Compensation
- Visible Trip Indication

193-ED:

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

193-EE:

- 0.1...90 A Current Range
- Selectable Trip Class (10, 15, 20 or 30)
- Selectable Manual/Auto-Manual Reset
- Single- and Three-Phase Devices
- Remote Reset Module Accessory

Bulletin 193-ED — Three-Phase Devices

Mounts to Contactor	Adjustment Range (A)	Cat. No. ❶	PQ
100-C09...100-C23	0.1...0.5	193-ED1AB	1
	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 — Three-Phase Devices

Mounts to Contactor	Adjustment Range (A)	Cat. No. ❶	PQ
100-C09...100-C23	0.1...0.5	193-EEAB	1
	0.2...1.0	193-EEBB	
	1.0...5.0	193-EECB	
	3.2...16	193-EEDB	
	5.4...27	193-EEEB	
100-C30...100-C43	5.4...27	193-EEED	
	9.0...45	193-EEFD	
100-C60...100-C85	18...90	193-EEGE	

Accessories

	Description	For Use with	Cat. No.	PQ
	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	1
		193-EE_D	193-EPD	
		193-EE_E	193-EPE	
	External Reset Adapter For enclosed, through-the-door reset applications, use with External Reset Button 800ES-R611WTR08.	193-ED (all) 193-EE (all)	193-ERA	1

❶ Please check product availability

PQ = Package Quantity

Overload Relay 193-M, 193-CT



193-M



193-CT

- Bimetallic overload relay
- Directly mounts to 100-C contactors (193-CT) or 100-M (193-M)
- Phase loss sensitivity (trips at maximum 125% of current setting)
- Trip class 10
- Optional normally open auxiliary contact
- Manual reset only
- Trip indication

Mounts on:		Adjustment Range [A]	Cat. No	PQ
100-M Contactor	M05...M12	0.10...0.15	193-M-A15	1
		0.15...0.23	193-M-A23	
		0.23...0.35	193-M-A35	
		0.35...0.55	193-M-A55	
		0.55...0.8	193-M-A80	
		0.8...1.2	193-M-B12	
		1.2...1.8	193-M-B18	
		1.8...2.7	193-M-B27	
		2.7...4	193-M-B40	
	4...6	193-M-B60		
	M09...M12	6...7.7	193-M-B77	
		7.5...9	193-M-B90	
	M12	8.8...10.5	193-M-C10	
10.4...12.5		193-M-C12		
100-C Contactor	C09...C23	0.10...0.15	193-CT-A15	1
		0.15...0.23	193-CT-A23	
		0.23...0.35	193-CT-A35	
		0.35...0.55	193-CT-A55	
		0.55...0.8	193-CT-A80	
		0.8...1.2	193-CT-B12	
		1.2...1.8	193-CT-B18	
		1.8...2.7	193-CT-B27	
		2.7...4	193-CT-B40	
		4...6	193-CT-B60	
	6...9	193-CT-B90		
	C12...C23	9...12.5	193-CT-C12	
	C16	12.5...17.5	193-CT-C17	
C23				
193-M, 193-CT Overload Relay (Optional N.O. auxiliary contact)		—	193-M-F10	1

See Publication 193-PP011B-EN-P/193-PP012B-EN-P for complete product information
 PQ = Package Quantity

Motor Protection

Product Selection/Accessories: 193-EF

Electronic Motor Protection Relays 193-EF



193-EF1:

- 0.5...400 A Current Range
- Phase Loss/Current Imbalance Protection
- LED Indicators
- Digital (DIP Switch) Adjustments
- Adjustable Trip Class (2...30)

193-EF2 also includes:

- 0.5...630 A Current Range
- Overcurrent Indication
- PTC Thermistor Monitoring

AC-Control

Description	Adjustment Range (A)	Cat. No.	PQ
193-EF1	20...180 ① ②	193-EF1A⊗	1
	160...400	193-EF1B⊗	
193-EF2	20...180 ① ②	193-EF2A⊗	
	160...400	193-EF2B⊗	
	160...630	193-EF2C⊗	

DC-Control

Description	Adjustment Range (A)	Cat. No.	PQ
193-EF1	20...180 ① ②	193-EF1A⊗	1
	160...400	193-EF1B⊗	
193-EF2	20...180 ① ②	193-EF2A⊗	
	160...400	193-EF2B⊗	
	160...630	193-EF2C⊗	

⊗ Voltage Selection Codes

The catalog number as listed is incomplete. Select a Voltage Selection Code from the table below for completion.

Example: Cat. No. 193-EF1A⊗ becomes Cat. No. 193-EF1AKP

V AC										
[V]	24	36	48	110	120	230	240	400	415	440
50/60 Hz	KJ	KV	KY	KD	KP	KF	KA	KN	KG	KB
V DC										
DC	ZJ	—	ZY	—	—	—	—	—	—	—




Factory Modification Options

Description	Suffix Code ⊗
Automatic Reset of overload and thermistor overtemperature protection	-R
Remote Reset (Device ships with the Remote Reset Module accessory (Cat. No. 193-RB1) included.)	-F
External Indication (Device ships with the External Indication Module accessory (Cat. No. 193-CB1) included.)	-L




- ① 0.5...20 A can be achieved by looping the motor supply cables.
- ② Order busbars separately, see Page 48.
- ⊗ Refer to the Catalog Number Identification section for the proper suffix code sequence.

See Publication 100-SG003D-EN-P for complete product information
PQ = Package Quantity

Add-On Modules


	Description	Version	Cat. No.	PQ
	External Indication Module <ul style="list-style-type: none"> For front mounting on a control panel or MCC 3 m connection cable with plug Function status indication Trips and alarms can be reset IP54 protection 		193-LB1	10
	Remote Reset Module <ul style="list-style-type: none"> Trip reset from any location 	Operating voltage 24...48V AC/DC with external burden resistor -8.2 kΩ, 4 W 110...230V AD/DC -22 kΩ, 10 W 240...440V AD/DC	193-RB1	1
	Adapter for Remote Reset Module <ul style="list-style-type: none"> For easy mounting of remote reset module on standard DIN Rail (EN 50 022-35) and G-Rail 		196-MTM	1

Mounting Materials

	Description	Version	Cat. No.	PQ
	Transparent Front Cover		193-PA	1
	Main Terminal Cover <ul style="list-style-type: none"> Set of 2 Includes mounting materials IP 10 Protection Class 	for 825-MVM/825-MVS for 825-MVS2 for 193-EF2C	100-DTS110 100-DTS180 100-DTS420	1
	Terminal Lug <ul style="list-style-type: none"> Set of 6 Includes terminal and fixing screws 	for 193-EF1A for 193-EF2A	193-HD	1
	Terminal Blocks <ul style="list-style-type: none"> Set of 2 IP 10 Protection Class 	for 825-MVM, 825-MVS for 825-MVM2, 825-MVS2 for 193-EF2C ①	100-DTB110 100-DTB180 100-DTB420	1

① Only Motor connection side, on supply side use 100-DTC420.

Connecting Components

	Description	Version	Cat. No.	PQ
	Terminal Lugs (UL/CSA) <ul style="list-style-type: none"> Set of 3 	for 193-EF_A for 193-EF_A for 193-EF_B	100-DL110 100-DL180 100-DL420	1



See Publication 100-SG003D-EN-P for complete product information
PQ = Package Quantity

Motor Protection

Accessories: 193-EF




Mounting Materials — Bus Bars

Set of 3 busbars, includes terminal and fixing screws. Suitable for use with 193-EF1A and 193-EF2A overload relays.

	Description	Cat. No.	PQ
	M8 connections <ul style="list-style-type: none"> Set of 3 4 x 16 x 100 mm (0...125 A) Universally applicable 	825-MVM	1
	M8 connections <ul style="list-style-type: none"> Set of 3 4 x 20 x 117 mm (0...180 A) Universally applicable 	825-MVM2	
	M6 lower connections <ul style="list-style-type: none"> Set of 3 For mounting on 100-D95 and 100-D110 contactors 	825-MVS	
	M8 lower connections <ul style="list-style-type: none"> Set of 3 For mounting on 100-D140 and 100-D180 contactors 	825-MVS2	

Labeling Materials

Uniform labeling materials for contactors, motor starting equipment, timing relays and circuit breakers

	Description	Cat. No.	PQ
	Label Sheet) <ul style="list-style-type: none"> 105 self-adhesive paper labels per sheet, 6 x 17 mm 	100-FMS	10
	Marking Tag Sheet <ul style="list-style-type: none"> 160 perforated paper labels per sheet, 6 x 17 mm To be used with a transparent cover 	100-FMP	10
	Transparent Cover <ul style="list-style-type: none"> To be used with marking tag sheets 	100-FMC	100
	Marking Tag Adapters <ul style="list-style-type: none"> To be used with System Bulletin 1492W marking tag 	100-FMA2	100

See Publication 100-SG003D-EN-P for complete product information
 PQ = Package Quantity

Electronic Overload Relays E3 and E3 Plus, Bulletin 193-EC



- DeviceNet™ Communication integrated
- LED Indicators
- Test / Reset Button
- Adjustable Trip Class (5...30)
- Integrated I/O's E3: 2 Inputs / 1 Output
E3 Plus: 4 Inputs / 2 Outputs
- Low-Level Ground (Earth) Fault Protection (E3 Plus)
Ground Fault Range 1...5 A
- PTC Thermistor Input (E3 Plus)
- Programmable Trip and Warning Settings
- Diagnostic Functions (History of Last 5 Trips)

Electronic Overload Relays 193-EC1/193E2 - Direct Mounted to Contactor 100-C

Mounts to Contactor ①	Adjustment Range [A]	193-EC1 2 inputs, 1 output		193-EC2 4 inputs, 2 outputs, Built-in Ground Fault Sensor, PTC Thermistor Input	
		Cat. No.	PQ	Cat. No.	PQ
100-C09...100-C23	0.4...2	193-EC1PB	1	193-EC2PB	1
	1...5	193-EC1AB		193-EC2AB	
	3...15	193-EC1BB		193-EC2BB	
	5...25	193-EC1CB		193-EC2CB	
100-C30...100-C43	1...5	193-EC1AD		193-EC2AD	
	3...15	193-EC1BD		193-EC2BD	
	5...25	193-EC1CD		193-EC2CD	
	9...45	193-EC1DD		193-EC2DD	
100-C60...100-C85	9...45	193-EC1DE		193-EC2DE	
	18...90	193-EC1EE		193-EC2EE	
100-D95...100-D180	28...140	193-EC1FF ②		193-EC2FF ②	
	42...210	193-EC1GF ②		193-EC2GF ②	
100-D210...100-D420	42...210	193-EC1GG ②	193-EC2GG ②		
	60...302	193-EC1HG ②	193-EC2HG ②		
	84...420	193-EC1JG ②	193-EC2JG ②		
100-D630...100-D860	125...630	193-EC1KH ②	193-EC2KH ②		
	172...860	193-EC1LH ②	193-EC2LH ②		

- ① For applications requiring trip class settings greater than class 20, consult your local Allen-Bradley sales office for contactor selection details.
② Does not include terminal lugs.

Panel Mount Devices for use with External Current Transformers ③ ④

Description	Adjustment Range [A] ⑤	Cat. No.	PQ
2 Inputs, 1 Output	9...5000	193-EC1ZZ	1
4 Inputs, 2 Output, Ground Fault Sensor input, PTC Thermistor Input	9...5000	193-EC2ZZ	

- ③ Current transformers supplied by customer.
④ Order panel adapter, Cat. No. 193-ECPM2, separately.
⑤ CT Ratio to FLA setting range correlation.









CT Ratio	FLA Setting Range (A)	CT Ratio	FLA Setting Range (A)	CT Ratio	FLA Setting Range (A)
50:5	9...45	300:5	60...302	1200:5	240...1215
100:5	18...90	500:5	84...420	2500:5	450...2250
150:5	28...140	600:5	125...630	5000:5	1000...5000
200:5	42...210	800:5	172...860	—	—

See Publication 100-SG003D-EN-P for complete product information
PQ = Package Quantity

Motor Protection

Accessories: 193-EC

Add-on Accessories

	Description	For Use With	Cat. No.	PQ
	DIN Rail/Panel Adapter ①	193-EC_B	193-ECPM1	1
		193-EC_D, 193-EC_Z	193-ECPM2	
		193-EC_H	193-ECPM3	
	Programming and Control Terminal ②	193-EC_all, 592-EC_all	193-PCT	1
	1 m communication cable with bare leads	193-PCT	2707-NC13	
	3 m communication cable with bare leads ③		193-C30	
	10 m communication cable with bare leads ③		193-C100	
	1 m communication cable with microconnector (female) ④		2707-NC14	
	1 m communication cable with microconnector (male) ④		2707-NC15	
	Door Mount Bezel Kit		2707-MVMNT	
	AC Input Interface Module • Rated 110/120V AC, 50/60 Hz		193-EC_all 592-EC_all	193-EIMD
	Core Balance Ground Fault Sensor	193-EC2_F, 193-EC2_G 193-EC2_H, 193-EC2_Z	825-CBCT	1
	3-Pole Terminal Blocks • Set of 2 • IP 20 Protection Class	193-EC_F	100-DTB180	1
		193-EC_G	100-DTB420	
	Terminal Lugs (UL/CSA) • Set of 3	193-EC_F	100-DL110	1
		193-EC_G	100-DL180	
		193-EC_H	100-DL420	
		193-EC_H	100-DL630	
	Terminal Covers • Set of 2 • IP 20 Protection Class	193-EC_G	100-DL860	1
		193-EC_H	100-DTC180	
	Phase Barrier	193-EC_H	100-DTC420	4

① The electronic motor protection relay can be mounted separately to top-hat rail EN 50 02-35.

② Cat. No. 193-PCT ships complete with a 1 m communication cable.

③ Intended only for point-to-point configurations.

④ Used to make physical connections to other DeviceNet products.

See Publication 100-SG003D-EN-P for complete product information

PQ = Package Quantity

Bulletin 825-P Modular Protection System



- 0.5 ... 5000A Current Range
- Suitable for Low- and Medium-Voltage Applications
- Built-in Keypad and Backlit 2-Line LCD
- Test / Reset Button
- Status LEDs
- Wide Supply Voltage Range (110...240V AC/DC)
- Three Output Relays
- Two Configurable Inputs
- PTC thermistor Input
- Core Balance Current Transformer Input
- Fiber Optic Port for Remote RTD Scanner
- Three option card slots
- NEMA 12 (IP65) Housing

Basic Unit

Description	Cat. No.	PQ
Basic Unit	825-PD	1

Converter Modules



825-MCM2



825-MCM630

- Compact Three-Phase current transformer modules
- Provides electrical isolation
- Current ranges 0.5 ... 630 A
- Compatibility with MCS PLUS Bulletin 100-D contactors

Description	Current Ranges	Cat. No.	PQ
Converter Modules	0.5 ... 2.5 A	825-MCM2	1
	2.5 ... 20 A	825-MCM20	
	20 ... 180 A	825-MCM180	
	160 ... 630 A	825-MCM630N	

Accessories



825-P...



825-PR12D



825-CBCT

Description	Cat. No.	PQ	
Option Card	Voltage Input	825-PVS	1
	Expansion I/O (120V Inputs)	825-PIOD	
	Expansion I/O (24V Inputs)	825-PIOR	
	DeviceNet Communications	825-PDN	
Core Balance Current Transformer (100:1)	825-CBCT		
RTD Scanner Module	825-PR12D		

See Publication 825-PP011A-EN-P for complete product information

PQ = Package Quantity

Motor Protection

Product Selection: 809S, 813S

Bulletin 809S Current Monitors



- Three versions available
- Programmable relay trip and reset level settings
- Programmable relay trip and reset delay settings
- Automatic reset
- Three-phase version includes current imbalance and phase loss monitoring

Description		Control Voltage [V]	Cat. No.	PQ
809S Current Monitors • Undercurrent, overcurrent, current imbalance, phase loss	0.5...5 A AC/DC 50/60 Hz, 2...24.9 or 20...249V AC/DC (1-phase)	24V DC 115V AC 230V AC	809S-E1ZJ 809S-E1D 809S-E1A	1
	2...15 A AC/DC (1-phase)	24V DC 115V AC, 50 Hz 230V AC, 50 Hz	809S-E2ZJ50 809S-E2D50 809S-E2A50	
	0.5...5 A AC (3-phase)	24V DC 115V AC, 50 Hz 230V AC, 50 Hz	809S-E3ZJ50 809S-E3D50 809S-E3A50	

Bulletin 813S Phase Monitors



- Independent programmable trip settings for undervoltage, overvoltage, and phase imbalance
- Programmable relay trip and reset delay settings
- RMS voltage monitoring up-to 690V AC
- Pre-start as well as running protection
- Automatic reset
- (1) N.O. and (1) changeover contact

Description		Control Voltage [V]	Cat. No.	PQ
813S Phase Monitors • Phase loss, under / overvoltage, phase imbalance, phase sequence	Monitoring Range 200...500V AC	24V DC 115V AC, 50 Hz 230V AC, 50 Hz	813S-E2BZJ50 813S-E2BD50 813S-E2BA50	1
	Monitoring Range 480...690V AC	24V DC 115V AC, 50 Hz 230V AC, 50 Hz	813S-E2CZJ50 813S-E2CD50 813S-E2CA50	

See Publication 809-SG001A-EN-P for complete product information
 PQ = Package Quantity

Bulletin 817 Thermistor Monitors



- Connection of up-to six PTC thermistors in series
- Open and short circuit detection
- Short circuit protected signal input
- Automatic, manual and remote reset options available
- Status indication LEDs

Description		Control Voltage [V]	Cat. No.	PQ
817 Thermistor Monitors • Overtemperature	Automatic Reset	Rated supply voltage of 24...240V AC/DC	817-E1	1
	Automatic, manual or remote reset		817-E2	

Bulletin 819 Motor Rotation Monitors



- Zero speed monitoring through evaluation of the feedback voltage of a decelerating motor
- Standstill monitoring by means of a pulse generator, tachometer, etc.
- Frequency monitoring for signals of any curve form in the range of 16...100V p-p
- Programmable relay trip and reset settings
- Programmable time delay settings

Description		Control Voltage [V]	Cat. No.	PQ
819 Motor Rotation Monitors • Zero speed detection	Max. Monitored Voltage 400V AC max (IEC), 300V AC max (CSA/UL)	24V DC 115V AC 230V AC	819-E1ZJ 819-E1D 819-E2A	1
	Max. Monitored Voltage 690V AC max (IEC), 600V AC max (CSA/UL)	24V DC 115V AC 230V AC	819-E2ZJ 819-E2D 819-E2A	

See Publication 809-SG001A-EN-P for complete product information
 PQ = Package Quantity