

LISTEN.
THINK.
SOLVE.

E3+ to E300 Migration

Sept 2018



PUBLIC

 Allen-Bradley • Rockwell Software

**Rockwell
Automation**

Differences

E3+ / E300

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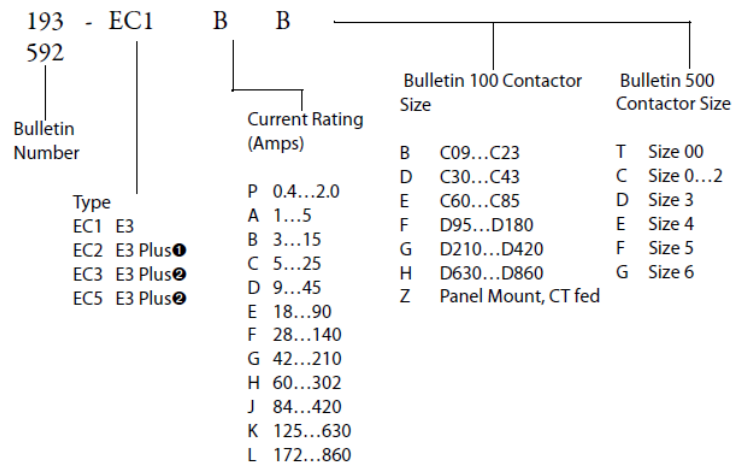
Feature		E3 Plus (EC2)	E3 Plus (EC3)	E300
Protection	Current Range (A)	0.4...5000	0.4...5000	0.5...65000
	Thermal Overload	✓	✓	✓
	Auto or Manual Reset	✓	✓	✓
	Mechanical Jam	✓	✓	✓
	Undercurrent	✓	✓	✓
	Phase Loss	✓	✓	✓
	Zero Sequence Ground Fault	✓	✓	✓
	Phase Reversal			✓
	Current Imbalance	✓	✓	✓
	PTC Thermistor Monitoring	✓	✓	✓
	RTD Over Temperature			✓
	Starts / Hour	✓	✓	✓
	Time Between Starts	✓	✓	✓
	Speed Switch Input	✓	✓	✓
	Undervoltage			✓
	Overvoltage			✓
	Power Factor			✓
	Underfrequency			✓
	Overfrequency			✓
	Underpower			✓
Reactive Power			✓	
I/O	Output Relays	2	2	3-11
	Digital Inputs	4	4	3-22
Misc	DeviceNet Communications	✓	✓	✓
	EtherNet/IP Communications	✓	✓	✓
	Logix Compatible	✓	✓	✓
	Local Control (DeviceLogix)	✓	✓	✓



Feature		E3 Plus (EC2)	E3 Plus (EC3)	E300
Metering	Phase Current Magnitudes	✓	✓	✓
	Three-Phase Average Current	✓	✓	✓
	Percent Motor Load	✓	✓	✓
	Current Imbalance Percentage	✓	✓	✓
	Ground Current Magnitude	✓	✓	✓
	System Frequency			✓
	Phase Voltage Magnitudes			✓
	Average Voltage			✓
	Voltage Imbalance Percentage			✓
	Real Power (kW)			✓
	Reactive Power (kVAR)			✓
	Apparent Power (kVA)			✓
	Power Factor			✓
	Energy (kWhr)			✓
	kVARhr			✓
	% Thermal Capacity Used (TCU)	✓	✓	✓
	Starts Available	✓	✓	✓

E3+ Sizing vs E300 Sizing

E3+



- ❶ (0.4...90 A) Provides 1...5 A internal core-balanced ground fault protection
- ❷ (0.4...5000 A) Provides 20 mA...5 A external core balanced ground fault protection. External ground fault sensor required (Cat. nos. 193-CBCT-1...4).

E300

I. Sensing Modules

	0.5...30	100-C09...C23 100-C30...C55 100-C30...C55 100-C60...100-C97 100-D115...100-D180	193-ESM-IG-30A-C23 193-ESM-IG-30A-C55 193-ESM-IG-60A-C55 193-ESM-IG-100A-C97 193-ESM-IG-200A-D180	
IEC Contactors	0.5...30 6...60 10...100 20...200			
DIN Rail / Panel Mount Power Terminals	0.5...30 6...60 10...100 20...200	All contactors	193-ESM-IG-30A-T 193-ESM-IG-60A-T 193-ESM-IG-100A-T 193-ESM-IG-200A-T 193-ESM-IG-30A-E3T 193-ESM-IG-60A-E3T 193-ESM-IG-100A-E3T	
DIN Rail / Panel Mount Power Terminals Directly replaces 193-ECPM_	0.5...30 6...60 10...100		193-ESM-IG-30A-P 193-ESM-IG-60A-P 193-ESM-IG-100A-P 193-ESM-IG-200A-P	
DIN Rail / Panel Mount Pass-thru	0.5...30 6...60 10...100 20...200			
NEMA Contactors	0.5...30 6...60 10...100 20...200		NEMA Size 0...2 NEMA Size 3 NEMA Size 4	592-ESM-IG-30A-S2 592-ESM-IG-60A-S2 592-ESM-IG-100A-S3 592-ESM-IG-200A-S4

II. Control Modules

Description	No. of Inputs/Outputs	Rated Control Voltage [V]	Cat. No.
I/O Module	6 In/3 out	24V DC	193-EIO-63-24D
	4 In/3 out	110...120V AC, 50/60 Hz	193-EIO-43-12D
	4 In/3 out	220...240V AC, 50/60 Hz	193-EIO-43-24D
I/O and Protection Module, Thermistor (PTC) and External Ground Fault Current ⁽¹⁾	4 In/2 out	24V DC	193-EIOGP-42-24D
	2 In/2 out	110...120V AC, 50/60 Hz	193-EIOGP-22-12D
	2 In/2 out	220...240V AC, 50/60 Hz	193-EIOGP-22-24D

(1) Requires Core Balanced Ground Fault Sensor Cat. No. 193-CBCT_.

III. Comm. Modules

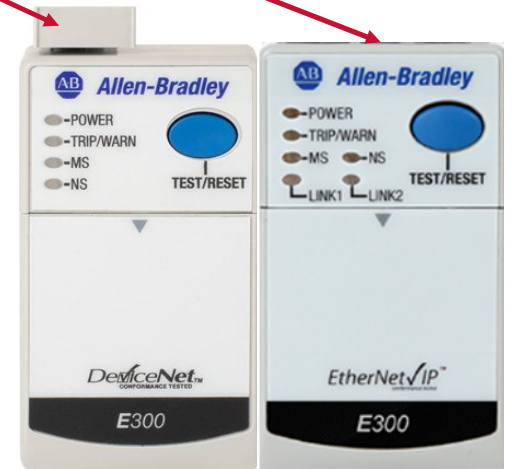
Devicenet Adapter 193-ECM-DNT
Ethernet/IP Adapter 193-ECM-ETR

Parts Samples - 1

193-EC2CD	E3 Plus Overload Relay, Electronic, Current Sensing, IEC Type, Internal Ground Fault Current Measurement, Positive Temperature Coefficient Thermistor Input, 5-25 A, 4 Inputs-2 outputs, DeviceLogix Enabled, Mounts to 100-C30 to 100-C43 Contactors, Adjustable Trip Cl	193-ESM-IG-30A-T	Current/Ground Fault Sensing Module (0.5...30 A) DIN Rail / Panel Mount with Line- and Load-side Power Conductor Terminals.
		193-EIOGP-42-24D	4 IN / 2 Out with PTC and External Ground Fault Sensing Control Module, 24V DC
		193-ECM-DNT or 193-ECM-ETR	DeviceNet Communication Module

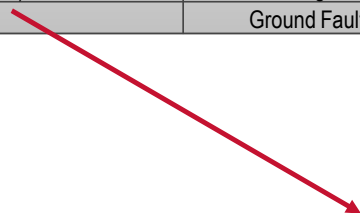
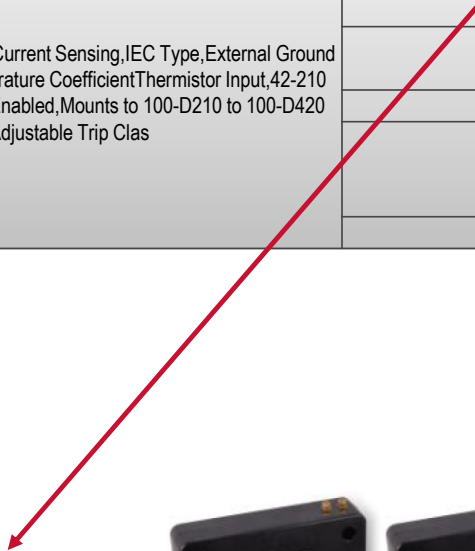


Base are different



Parts Samples - 2

193-EC3GG	E3 Plus Overload Relay, Electronic, Current Sensing, IEC Type, External Ground Fault Current Input, Positive Temperature Coefficient Thermistor Input, 42-210 A, 4 Inputs-2 outputs, DeviceLogix Enabled, Mounts to 100-D210 to 100-D420 Contactors, Adjustable Trip Clas	193-ESM-IG-30A-T	Current/Ground Fault Sensing Module (0.5..30 A) DIN Rail / Panel Mount with Line- and Load-side Power Conductor Terminals.
		193-EIOGP-42-24D	4 IN / 2 Out with PTC and External Ground Fault Sensing Control Module, 24V DC
		193-ECM-DNT	DeviceNet Communication Module
		1411-180RL-401(3pieces)	Bulletin 1411 - Current Transformer, 2.5" Inner Diameter, Round Outer Shape, 400 Amp Primary to 5A Secondary Ratio, Single Piece Current Transformer (solid-core)
		193-CBCT4	Ground Fault Sensor (82.3mm Inner Diameter)



E300 Expansion Modules

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- **Digital I/O** (4 In / 2 Out – Add up to 4)
 - AC (120V)
 - AC (240V)
 - DC (24V)
- **Universal Analog I/O**
(3 In / 1 Out – Add up to 4)
 - 0...10V DC
 - 0...20 mA DC
 - RTD Sensors
- **Power Supply**
 - Supplemental power for the expansion bus
- **Operator Stations**
 - Control Station
 - Diagnostic Station (multiple languages)

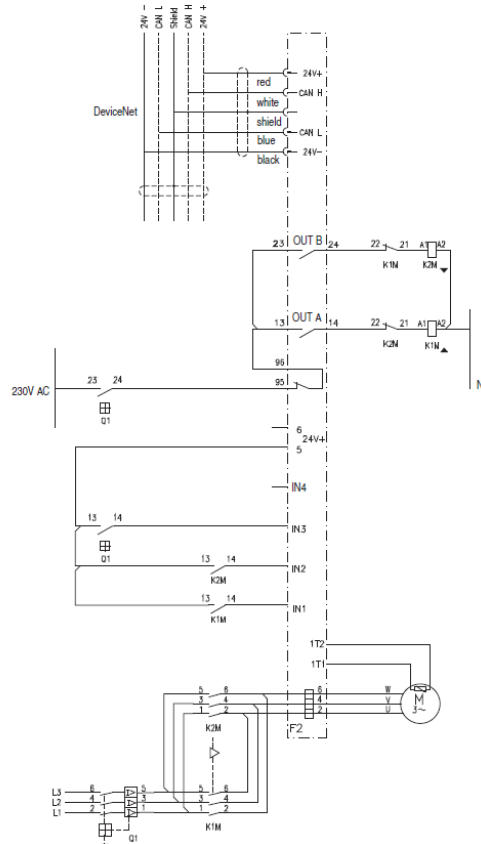


Wiring Diagram

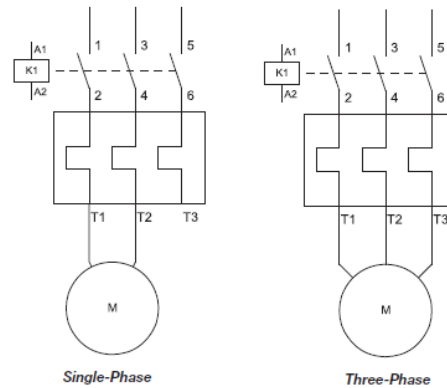
E3+

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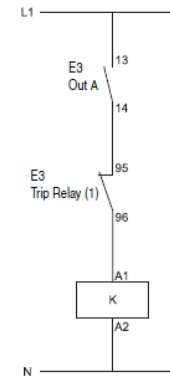
Typical Wiring Schematics – IEC
Reversing Starter Application



Typical Wiring Schematics – IEC



Terminal Designations



Control Terminals

Table 8 - Control Terminal Designation

Terminal	Reference	Description
1	IN 1	1
2	IN 2	General Purpose Sinking Input Number: 3 1 2 4 1 2
3	IN 3	
4	IN 4	
5	V+	
6	V+	+24V
7	IN 5	General Purpose Sinking Input Number: 5 2 6 2
8	IN 6	
⊕	END	Earth Ground 3
13/14	OUT A	Output A
23/24	OUT B	Output B 1 2
95/96	Trip Relay	Trip Relay
IT1/IT2	PTC	Thermistor (PTC) Input 1 2
S1/S2	—	External Ground Fault Sensor Input 2 3

- 1 Features are available only with the E3 Plus Overload Relay (Cat. No. 193/592-EC2 and 193/592-EC3).
- 2 Available only on Cat. Nos. 193/592-EC5_...
- 3 An earth ground connection to this terminal will assist in obtaining compliance with EMC requirements.
- 4 The use of shielded cable is recommended for the positive PTC thermistor circuit to assist in obtaining compliance with EMC requirements.
- 5 Available only on Cat. No. 193/592-EC3_... and 193/592-EC4_...

DeviceNet Terminals

Table 9 - DeviceNet Terminal Designation

Terminal	Signal	Function	Color
1	V-	Common	Black
2	CAN_L	Signal Low	Blue
3	Drain	Shield	Non-Insulated
4	CAN_H	Signal High	White
5	V+	PoWer Supply	Red

Wiring Diagram

E300

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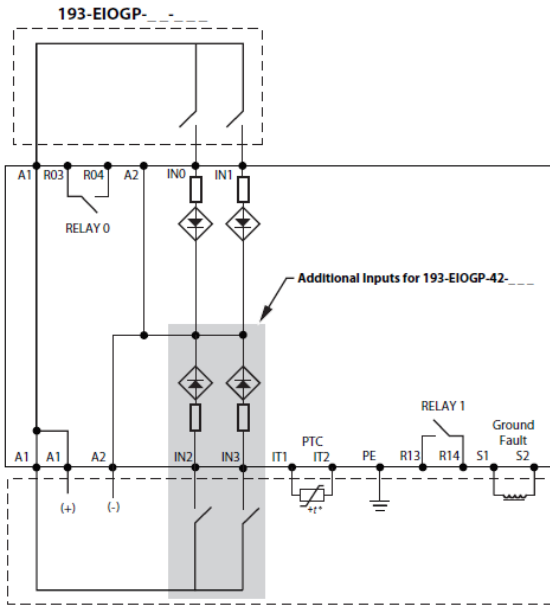
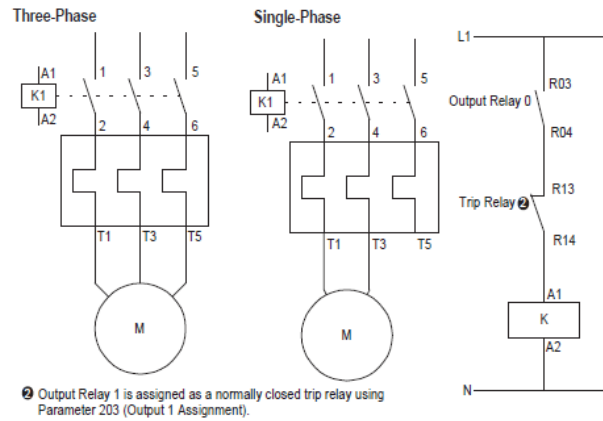


Figure 6 - E300 DOL and Single-Phase Full-voltage Connections (CENELEC Nomenclature)



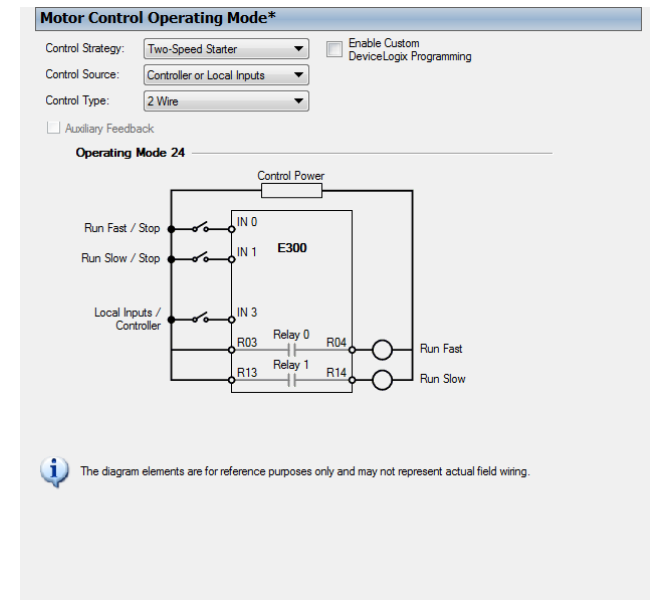
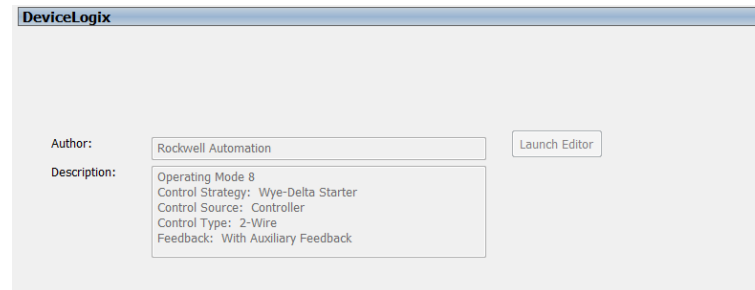
Terminals	Description
A1	+24V
A2	-24V
IN1	Input1
IN2	Input2
IN3	Input3
IN4	Input4
IT1/IT2	PTC Input
S1/S2	Ext Ground Fault Sensor Input
R03/R04	Relay0
R13/414	Relay1
PE	Ground

Wiring Diagram

E300 Operation Mode Feature

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- Wiring diagrams are similar. But 54 operation modes appear with E300. (parameter 159)
 - These are predefined instructions and Devicelogix templates which show which I/O of E300 should be used.
- Overload (Mode 2 – E3+)
 - Non-Reversing Starter
 - Reversing Starter
 - Wye/Delta (Star/Delta) Starter
 - Two-Speed Starter
 - Monitor



Devicenet Communication

E3+ vs E300

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E3+

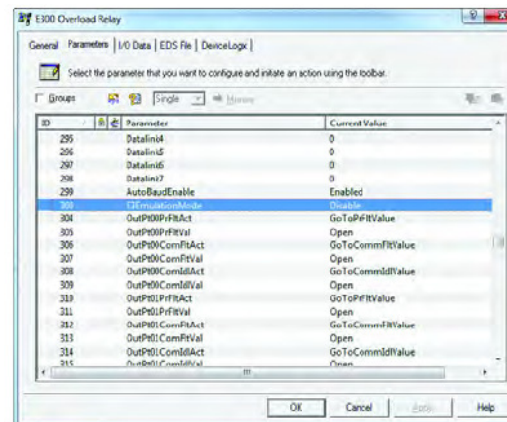
Message Type	Size	Data Description
Polled		
Input	8 Bytes	Parameter Based
	2 Byte(s)	Device Status
	2 Byte(s)	L1 Current
	2 Byte(s)	L2 Current
	2 Byte(s)	L3 Current
Output	1 Bytes	Command
	1 bit(s)	Output A
	1 bit(s)	Output B
	1 bit(s)	Trip Reset
	2 bit(s)	<Not Used>
	1 bit(s)	Remote Trip
	2 bit(s)	<Not Used>
Cos		
Input	8 Bytes	Parameter Based
Output	1 Bytes	Command
Cyclic		
Input	8 Bytes	Parameter Based
Output	1 Bytes	Command

Output Assembly	105
Input Assembly	100
Assy Word0 Param	21
Assy Word1 Param	1
Assy Word2 Param	2
Assy Word3 Param	3

- Important to know which input/output assembly are used
- Emulation mode will be available with 'Control Module Series B'

E3/E3 Plus Overload Emulation Mode

The E300 Overload Relay used with the Series B Control Module supports an E3 Plus* overload relay emulation mode when it is attached to a DeviceNet communication module. This lets you reuse configuration parameters from the E3 Plus overload relay when you use configuration tools like ADR, the DeviceNet Configuration Terminal (193-DNCT), and RSNetWorx for DeviceNet.



Dimensions

Panel / DIN Rail Mount



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	E3+	E300
	193-ECPM1 (FOR 193-EC_B)	193-ESM-IG-30A-T
H[mm]	159.3	135
W[mm]	45	45
D[mm]	115	124



	E3+	E300
	193-ECPM2 (FOR 193-EC_D/ZZ)	193-ESM-IG-60A-T
H[mm]	154	135
W[mm]	45	45
D[mm]	115	124

	E3+	E300*
	Separate Panel Adap. (FOR 193-EC_F/G/H)	193-ESM-IG-200A-T
H[mm]	182.6/188.1/262	135.7
W[mm]	120/154.7/255	120
D[mm]	180.9/204.7/297.5	151.4



	E3+	E300
	193-ECPM3 (FOR 193-EC_E)	193-ESM-IG-100A-T
H[mm]	151	120
W[mm]	72	71.6
D[mm]	131	141

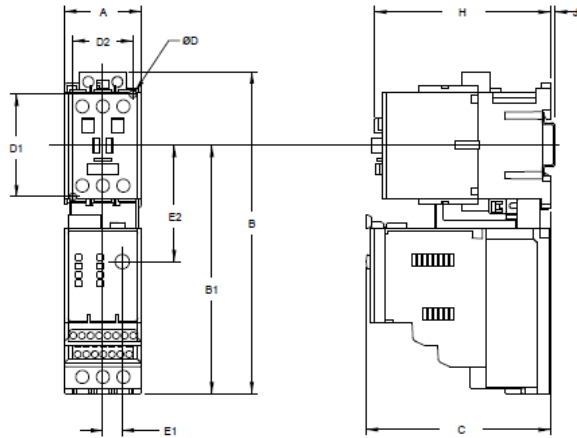
*Current Transformers have to be used for loads more than 200A with 193-ESM-IG-30A-T .

Dimensions

E3+ Contactor Mount

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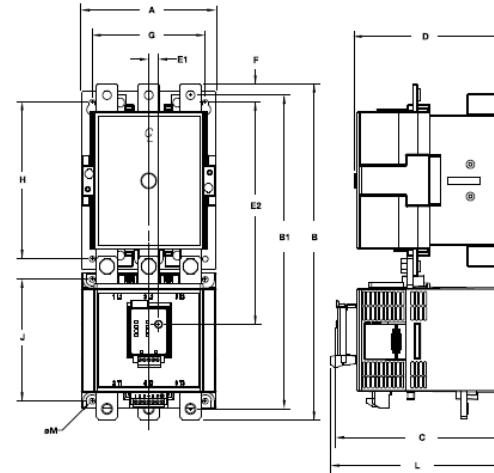
Bulletin 109 Starter Approximate Dimensions



Overload Cat. No.	Contactor Cat. No.	Width A	Height B		B1		Depth C	E1	E2
			without 193-EIMD	with 193-EIMD	without 193-EIMD	with 193-EIMD			
193-EC__B	100-C09, -C12 -C16, -C23	45 (1-25/32)	188.3 (7-13/32)	207.7 (8-11/64)	145.1 (5-23/32)	164.5 (6-15/32)	107 (4-7/32)	11.4 (29/64)	67.9 (2-43/64)
193-EC__D	100-C30, -C37	45 (1-25/32)	188.3 (7-13/32)	207.7 (8-11/64)	145.1 (5-23/32)	164.5 (6-15/32)	107 (4-7/32)	11.4 (29/64)	67.9 (2-43/64)
193-EC__D	100-C43	54 (2-1/8)	188.3 (7-13/32)	207.7 (8-11/64)	145.1 (5-23/32)	164.5 (6-15/32)	107 (4-7/32)	11.4 (29/64)	67.9 (2-43/64)
193-EC__E	100-C60, -C72, -C85	72 (2-53/64)	236.1 (9-19/64)	255.5 (10-1/16)	173.2 (6-13/16)	192.6 (7-37/64)	124.6 (4-29/32)	11.4 (29/64)	89.8 (3-17/32)

Overload Cat. No.	Contactor Cat. No.	D1	D2	H	J	ØD
193-EC__B	100-C09, -C12 -C16, -C23	60 (2-23/64)	35 (1-3/8)	85.1 (3-23/64)	2 (5/64)	Ø4.2 (11/64Ø)
193-EC__D	100-C30, -C37	60 (2-23/64)	35 (1-3/8)	104 (4-3/32)	2 (5/64)	Ø4.2 (11/64Ø)
193-EC__D	100-C43	60 (2-23/64)	45 (1-25/32)	107 (4-7/32)	2 (5/64)	Ø4.2 (11/64Ø)
193-EC__E	100-C60, -C72, -C85	100 (3-15/16)	55 (2-11/64)	125.5 (4-15/16)	2 (5/64)	Ø5.5 (7/32Ø)

Bulletin 109 Starter Approximate Dimensions, Continued

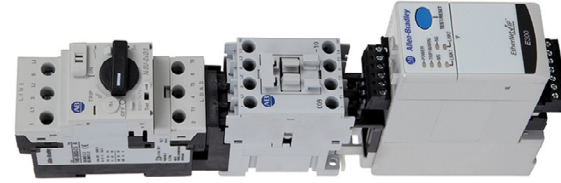


Overload Cat. No.	Contactor Cat. No.	A	Height B		B1	Depth C	D	E1	E2
			without Terminal Covers	with Terminal Covers					
193-EC__F	100-D95	120 (4.72)	336.3 (13.24)	418 (16.45)	311.8 (12.27)	175.1 (6.89)	156 (5.14)	11.4 (0.45)	216.1 (8.51)
	100-D110	120 (4.72)	339.8 (13.38)	418 (16.45)	317.8 (12.50)	175.1 (6.89)	156 (5.14)	11.4 (0.45)	216.1 (8.51)
	100-D182	120 (4.72)	339.8 (13.38)	418 (16.45)	317.8 (12.50)	175.1 (6.89)	156 (5.14)	11.4 (0.45)	216.1 (8.51)
193-EC__G	100-D210	155 (6.10)	385.8 (15.19)	487.4 (19.19)	360.8 (14.2)	198.9 (7.83)	180 (7.09)	11.4 (0.45)	255 (10.04)
	100-D250	155 (6.10)	385.8 (15.19)	487.4 (19.19)	360.8 (14.2)	198.9 (7.83)	180 (7.09)	11.4 (0.45)	255 (10.04)
	100-D300	155 (6.10)	385.8 (15.19)	487.4 (19.19)	360.8 (14.2)	198.9 (7.83)	180 (7.09)	11.4 (0.45)	255 (10.04)
193-EC__H	100-D630	255 (10.04)	552 (21.73)	915 (36.02)	508 (20)	291.7 (11.49)	270.7 (10.66)	11.4 (0.45)	373.9 (14.72)
	100-D850	255 (10.04)	552 (21.73)	915 (36.02)	508 (20)	291.7 (11.49)	270.7 (10.66)	11.4 (0.45)	373.9 (14.72)

Overload Cat. No.	Contactor Cat. No.	F	G	H	J	K	L	M
193-EC__F	100-D95	12.5 (0.49)	100 (3.94)	145 (5.71)	135 (5.31)	22.3 (0.88)	180.9 (7.12)	8 - 5.6 (8 - 0.22)
	100-D110	12.5 (0.49)	100 (3.94)	145 (5.71)	135 (5.31)	22.3 (0.88)	180.9 (7.12)	8 - 5.6 (8 - 0.22)
	100-D182	16 (0.63)	100 (3.94)	145 (5.71)	135 (5.31)	22.3 (0.88)	180.9 (7.12)	8 - 5.6 (8 - 0.22)
193-EC__G	100-D210	21 (0.83)	130 (5.12)	180 (7.09)	140 (5.51)	23.5 (0.93)	204.7 (8.06)	8 - 6.5 (8 - 0.20)
	100-D250	21 (0.83)	130 (5.12)	180 (7.09)	140 (5.51)	23.5 (0.93)	204.7 (8.06)	8 - 6.5 (8 - 0.20)
	100-D300	21 (0.83)	130 (5.12)	180 (7.09)	140 (5.51)	23.5 (0.93)	204.7 (8.06)	8 - 6.5 (8 - 0.20)
193-EC__H	100-D630	52.5 (2.07)	225 (8.90)	230 (9.06)	108 (4.25)	109 (4.29)	297.5 (11.71)	8 - 13 (8 - 0.51)
	100-D850	52.5 (2.07)	225 (8.90)	230 (9.06)	108 (4.25)	109 (4.29)	297.5 (11.71)	8 - 13 (8 - 0.51)

Dimensions

E300 Contactor Mount - 1



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Figure 5 - E300 Overload Relay Mounted on Bulletin 100-C09...-C23 Contactor

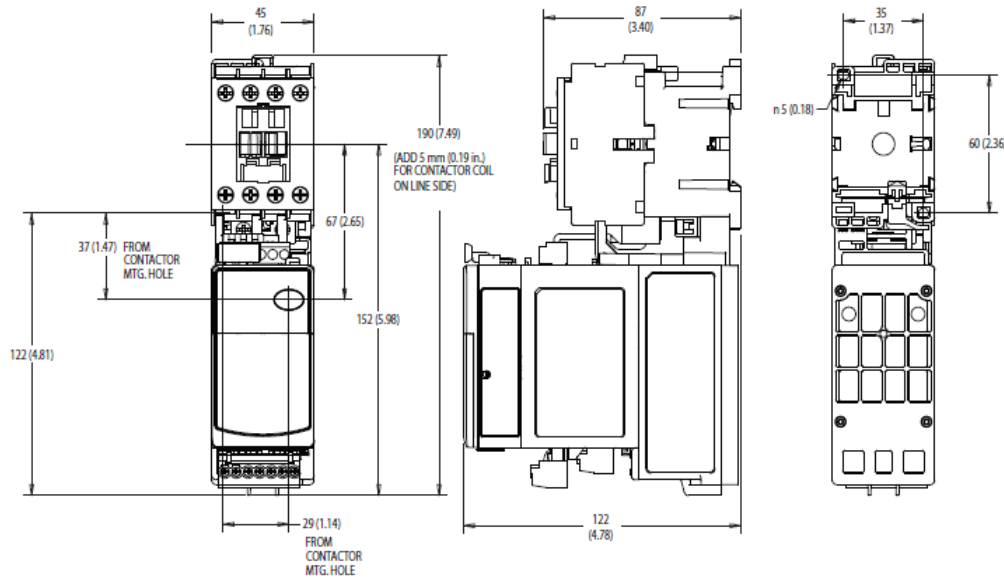
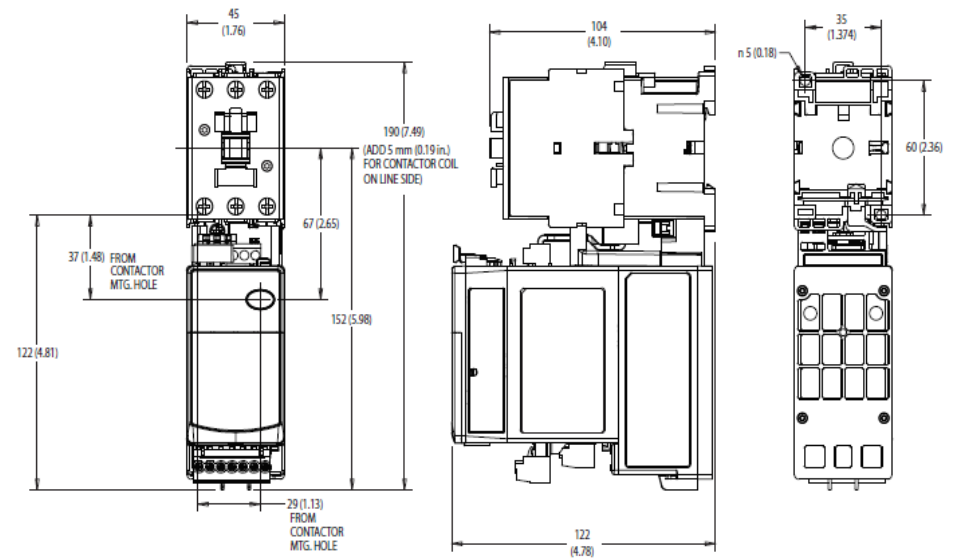
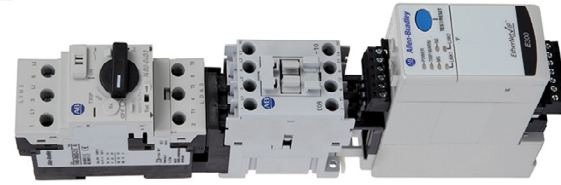


Figure 6 - E300 Overload Relay Mounted on Bulletin 100-C30...-C37 Contactor



Dimensions

E300 Contactor Mount - 2



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Figure 7 - E300 Overload Relay Mounted on Bulletin 100-C43...-C55 Contactor

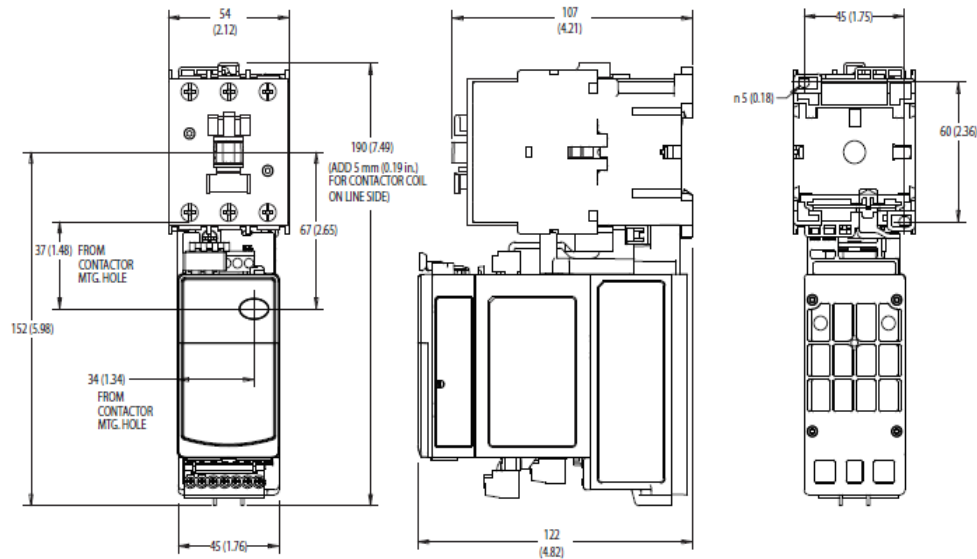
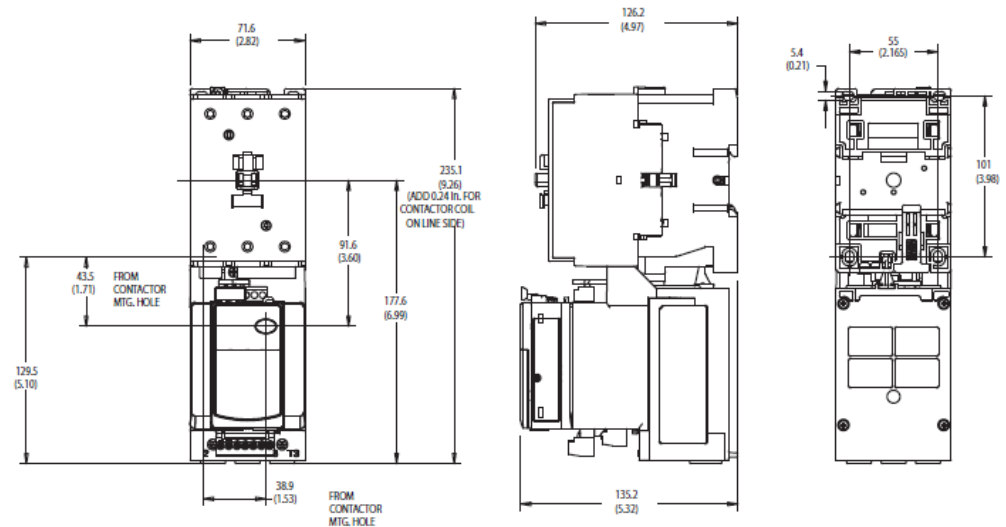
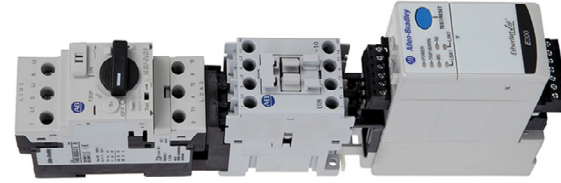


Figure 8 - E300 Overload Relay Mounted on Bulletin 100-C60...-C97 Contactor



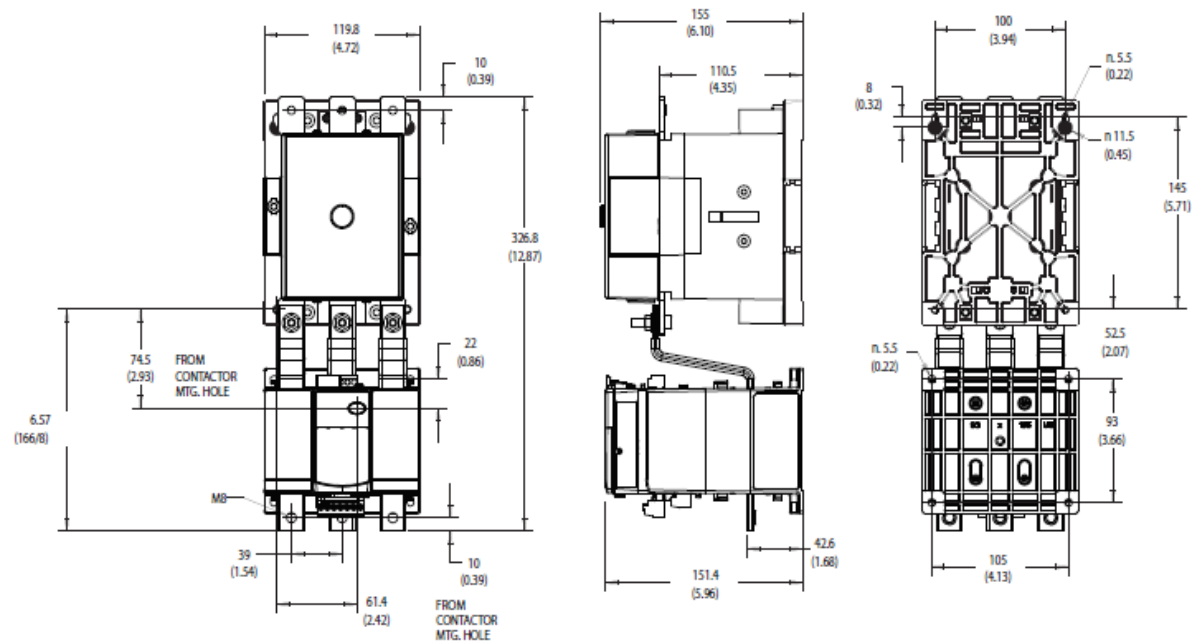
Dimensions

E300 Contactor Mount - 3



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Figure 9 - E300 Sensing Module 193-ESM-...-D180 with 100-D115...-D180 Contactor



Current Transformer Usage



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E3+

Figure 14 - Overload Relay Mounting Placement

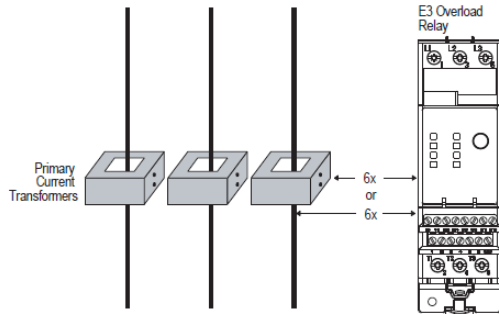
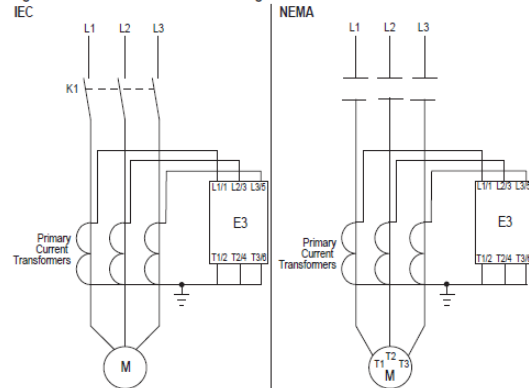


Figure 15 - External CT Connection Diagrams



E300

The following E300 relay sensing module catalog numbers can be used with step down current transformers:

- 193-ESM-IG-30A-E3T
- 193-ESM-IG-30A-T
- 193-ESM-IG-30A-P
- 193-ESM-I-30A-E3T
- 193-ESM-I-30A-T
- 193-ESM-I-30A-P
- 193-ESM-VIG-30A-CT

Motor Current[A] Ratio [Pri:Sec] Catalogue

30 to 150	150 to 5	1411-180RL-151 (3 required)
40 to 200	200 to 5	1411-180RL-201 (3 required)
60 to 300	300 to 5	1411-180RL-301 (3 required)
80 to 400	400 to 5	1411-180RL-401 (3 required)
100 to 500	500 to 5	No Rockwell Automation product offering
120 to 600	600 to 5	1411-180RL-601 (3 required)
160 to 800	800 to 5	No Rockwell Automation product offering

Figure 49 - External Current Transformer Connection

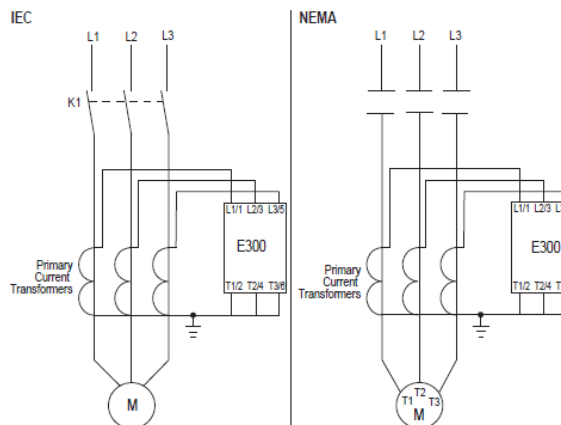


Table 20 - CT Primary (Parameter 263)

CT Primary (Parameter 263)	
Default Value	5
Minimum Value	1
Maximum Value	65535
Parameter Type	UINT
Size (Bytes)	2
Scaling Factor	1
Units	Amps

Table 21 - CT Secondary (Parameter 264)

CT Secondary (Parameter 264)	
Default Value	5
Minimum Value	1
Maximum Value	65535
Parameter Type	UINT
Size (Bytes)	2
Scaling Factor	1
Units	Amps

Ground Fault Sensor



**Rockwell
Automation**

Figure 16 - Core Balanced Ground Fault Sensor Mounting Placement

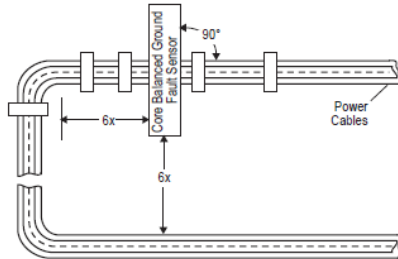
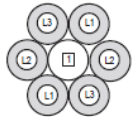


Figure 17 - Power Cable Configuration — Two Cables per Phase



1 The spacer is a short piece of cable, approximately ten times the cable diameter in length, without connections to any terminal.

Figure 18 - Ground Fault Sensor Wiring

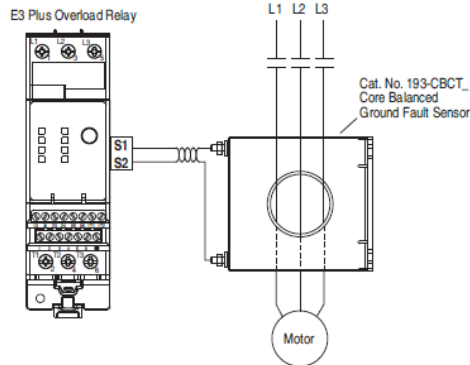




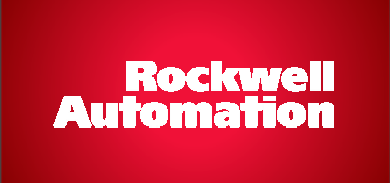


Table 17 - Control Wire Specifications

Cat. No. 193-	Max. Current [A]	Hz	Turns Ratio	Sensor Window I.D.	Max. Recommended Cable Size @ 600V	Cat. No. 100-C09 IEC Contactor	NEMA Contactor Size
CBCT1 	45	50/60	1000:1	19.1 mm (.75 in.)	#8 AWG (10 mm ²) 1	...-C37	00...2
CBCT2 	90				#2 AWG (350 mm ²) 1	...-C85	00...3
CBCT3 	180				#250 MCM (120 mm ²) 1	...-D180	00...4
CBCT4 	420				#350 MCM (185 mm ²) 2	...-D240	00...5

1 For a three-phase system with one cable per phase.
2 For a three-phase system with two cables per phase.

Ground Fault Sensor



E3+

Figure 32 - Ground Fault Capabilities

Catalog Number	Series	Ground Fault Method	Ground Fault Trip/Warning Range
193/592-EC2_ , & 193-EC2ZZ (<= 90A)	B & C	Internal 1...5 A	1...5 A
193-EC2_ , except for 193-EC2ZZ (> 90A)	B	External ❶	1...5 A
193/592-EC3_ , & 193-EC5_	C	External ❷❸	20mA...5 A

- ❶ A Catalog Number 825-CBCT Core Balance Ground Fault Sensor must be used.
- ❷ One of the following Catalog Number 193-CBCT_ Core Balance Ground Fault Sensors must be used:
 - 1 — Ø 20 mm window
 - 2 — Ø 40 mm window
 - 3 — Ø 65 mm window
 - 4 — Ø 85 mm window
- ❸ 20...100 mA for resistive loads only. For motor load information, consult your local Rockwell Automation sales office or Allen Bradley distributor.

For E3+ , it was required when it greater than 90A and ground fault detection less than 1A.

E300

Ground Fault Current		
Internal, 0.50...5.00 A	0.50 A	5.00 A
External, 0.02...0.10 A	0.02 A	0.10 A
External, 0.10...0.50 A	0.10 A	0.50 A
External, 0.20...1.00 A	0.20 A	1.00 A
External, 1.00...5.00 A	1.00 A	5.00 A

Differently, required for E300 greater than 200A and ground fault detection less than 0.5A .

Continue using the same sensors on site!!

Full List - 1

Rockwell Automation Catalogue Number	Description	E300 Catalogue If Connected Directly to Contactor	E300 Catalogue Number If Used with Panel Adapter	Description
193-EC2CD	E3 Plus Overload Relay, Electronic, Current Sensing, IEC Type, Internal Ground Fault Current Measurement, Positive Temperature Coefficient Thermistor Input, 5-25 A, 4 Inputs-2 outputs, DeviceLogix Enabled, Mounts to 100-C30 to 100-C43 Contactors, Adjustable TripCl		193-ESM-IG-30A-T	Current/Ground Fault Sensing Module (0.5...30 A) DIN Rail / Panel Mount with Line- and Load-side Power Conductor Terminals.
		193-ESM-IG-30A-C55		Current/Ground Fault Sensing Module (0.5...30 A) Mounts to 100-C30...C55 contactor
		193-EIOGP-42-24D		4 IN / 2 Out with PTC and External Ground Fault Sensing Control Module, 24V DC
		193-ECM-DNT		DeviceNet Communication Module
193-CBCT3	E3 Plus Ground Fault Sensor, 63 mm Core Balanced, Required When Using Either an E1 Plus Ground Fault Protection or Ground Fault-JamModule, Required For Ground Fault Protection With 193-EC3 and -EC5 Overload Relays, For Use With 100-C09-C97 and D105-180 IEC S		193-CBCT3	E3 Plus Ground Fault Sensor, 63 mm Core Balanced, Required When Using Either an E1 Plus Ground Fault Protection or Ground Fault-JamModule, Required For Ground Fault Protection With 193-EC3 and -EC5 Overload Relays, For Use With 100-C09-C97 and D105-180 IEC S
193-CBCT4	E3 Plus Ground Fault Sensor, 82 mm Core Balanced, Required When Using Either an E1 Plus Ground Fault Protection or Ground Fault-JamModule, Required For Ground Fault Protection With 193-EC3 and -EC5 Overload Relays, For Use With 100-C09-C97 and D105-420 IEC S		193-CBCT4	E3 Plus Ground Fault Sensor, 82 mm Core Balanced, Required When Using Either an E1 Plus Ground Fault Protection or Ground Fault-JamModule, Required For Ground Fault Protection With 193-EC3 and -EC5 Overload Relays, For Use With 100-C09-C97 and D105-420 IEC S
193-EC2AB	E3 Plus Overload Relay, Electronic, Current Sensing, IEC Type, Internal Ground Fault Current Measurement, Positive Temperature Coefficient Thermistor Input, 1-5 A, 4 Inputs-2 outputs, DeviceLogix Enabled, Mounts to 100-C09 to 100-C23 Contactors, Adjustable TripCl		193-ESM-IG-30A-T	Current/Ground Fault Sensing Module (0.5...30 A) DIN Rail / Panel Mount with Line- and Load-side Power Conductor Terminals.
		193-ESM-IG-30A-C23		Current/Ground Fault Sensing Module (0.5...30 A) Mounts to 100-C09...C23 contactor
		193-EIOGP-42-24D		4 IN / 2 Out with PTC and External Ground Fault Sensing Control Module, 24V DC
		193-ECM-DNT		DeviceNet Communication Module
193-EC2BB	E3 Plus Overload Relay, Electronic, Current Sensing, IEC Type, Internal Ground Fault Current Measurement, Positive Temperature Coefficient Thermistor Input, 3-15 A, 4 Inputs-2 outputs, DeviceLogix Enabled, Mounts to 100-C09 to 100-C23 Contactors, Adjustable TripCl		193-ESM-IG-30A-T	Current/Ground Fault Sensing Module (0.5...30 A) DIN Rail / Panel Mount with Line- and Load-side Power Conductor Terminals.
		193-ESM-IG-30A-C23		Current/Ground Fault Sensing Module (0.5...30 A) Mounts to 100-C09...C23 contactor
		193-EIOGP-42-24D		4 IN / 2 Out with PTC and External Ground Fault Sensing Control Module, 24V DC
		193-ECM-DNT		DeviceNet Communication Module
193-EC2CB	E3 Plus Overload Relay, Electronic, Current Sensing, IEC Type, Internal Ground Fault Current Measurement, Positive Temperature Coefficient Thermistor Input, 5-25 A, 4 Inputs-2 outputs, DeviceLogix Enabled, Mounts to 100-C09 to 100-C23 Contactors, Adjustable TripCl		193-ESM-IG-30A-T	Current/Ground Fault Sensing Module (0.5...30 A) DIN Rail / Panel Mount with Line- and Load-side Power Conductor Terminals.
		193-ESM-IG-30A-C23		Current/Ground Fault Sensing Module (0.5...30 A) Mounts to 100-C09...C23 contactor
		193-EIOGP-42-24D		4 IN / 2 Out with PTC and External Ground Fault Sensing Control Module, 24V DC
		193-ECM-DNT		DeviceNet Communication Module

Full List - 2

**Rockwell
Automation**

193-EC2DD	E3 Plus Overload Relay, Electronic, Current Sensing, IEC Type, Internal Ground Fault Current Measurement, Positive Temperature Coefficient Thermistor Input, 9-45 A, 4 Inputs-2 outputs, DeviceLogix Enabled, Mounts to 100-C30 to 100-C43 Contactors, Adjustable Trip Cl		193-ESM-IG-60A-T	Current/Ground Fault Sensing Module (0.5...30 A) DIN Rail / Panel Mount with Line- and Load-side Power Conductor Terminals.
		193-ESM-IG-30A-C55		Current/Ground Fault Sensing Module (0.5...30 A) Mounts to 100-C30...C55 contactor
		193-EIOGP-42-24D 193-ECM-DNT		4 IN / 2 Out with PTC and External Ground Fault Sensing Control Module, 24V DC DeviceNet Communication Module
193-EC2EE	E3 Plus Overload Relay, Electronic, Current Sensing, IEC Type, Internal Ground Fault Current Measurement, Positive Temperature Coefficient Thermistor Input, 18-90 A, 4 Inputs-2 outputs, DeviceLogix Enabled, Mounts to 100-C60 to 100-C97 Contactors, Adjustable Trip C		193-ESM-IG-100A-T	
		193-ESM-IG-100A-C97		
		193-EIOGP-42-24D 193-ECM-DNT		4 IN / 2 Out with PTC and External Ground Fault Sensing Control Module, 24V DC DeviceNet Communication Module
193-EC2PB	E3 Plus Overload Relay, Electronic, Current Sensing, IEC Type, Internal Ground Fault Current Measurement, Positive Temperature Coefficient Thermistor Input, 0.4-2.0 A, 4 Inputs-2 outputs, DeviceLogix Enabled, Mounts to 100-C09 to 100-C23 Contactors, Adjustable Trip		193-ESM-IG-30A-T	Current/Ground Fault Sensing Module (0.5...30 A) DIN Rail / Panel Mount with Line- and Load-side Power Conductor Terminals.
		193-ESM-IG-30A-C23		Current/Ground Fault Sensing Module (0.5...30 A) Mounts to 100-C09...C23 contactor
		193-EIOGP-42-24D 193-ECM-DNT		4 IN / 2 Out with PTC and External Ground Fault Sensing Control Module, 24V DC DeviceNet Communication Module
193-EC3FF	E3 Plus Overload Relay, Electronic, Current Sensing, IEC Type, External Ground Fault Current Input, Positive Temperature Coefficient Thermistor Input, 28-140 A, 4 Inputs-2 outputs, DeviceLogix Enabled, Mounts to 100-D115 to 100-D180 Contactors, Adjustable Trip Clas		193-ESM-IG-200A-T	
		193-ESM-IG-200A-D180		
		193-EIOGP-42-24D 193-ECM-DNT		4 IN / 2 Out with PTC and External Ground Fault Sensing Control Module, 24V DC DeviceNet Communication Module
193-EC3GG	E3 Plus Overload Relay, Electronic, Current Sensing, IEC Type, External Ground Fault Current Input, Positive Temperature Coefficient Thermistor Input, 42-210 A, 4 Inputs-2 outputs, DeviceLogix Enabled, Mounts to 100-D210 to 100-D420 Contactors, Adjustable Trip Clas		193-ESM-IG-30A-T	Current/Ground Fault Sensing Module (0.5...30 A) DIN Rail / Panel Mount with Line- and Load-side Power Conductor Terminals.
		193-EIOGP-42-24D 193-ECM-DNT		4 IN / 2 Out with PTC and External Ground Fault Sensing Control Module, 24V DC DeviceNet Communication Module
		1411-180RL-401(3pieces) 193-CBCT4		Bulletin 1411 - Current Tranformer, 2.5" Inner Diameter, Round Outer Shape, 400 Amp Primary to 5A Secondary Ratio, Single Piece Current Transformer (solid-core) Ground Fault Sensor (82.3mm Inner Diameter)
			193-ESM-IG-30A-T	Current/Ground Fault Sensing Module (0.5...30 A) DIN Rail / Panel Mount with Line- and Load-side Power Conductor Terminals.
193-EC3HG	E3 Plus Overload Relay, Electronic, Current Sensing, IEC Type, External Ground Fault Current Input, Positive Temperature Coefficient Thermistor Input, 60-302 A, 4 Inputs-2 outputs, DeviceLogix Enabled, Mounts to 100-D210 to 100-D420 Contactors, Adjustable Trip Clas	193-EIOGP-42-24D 193-ECM-DNT		4 IN / 2 Out with PTC and External Ground Fault Sensing Control Module, 24V DC DeviceNet Communication Module
		1411-180RL-401(3pieces) 193-CBCT4		Bulletin 1411 - Current Tranformer, 2.5" Inner Diameter, Round Outer Shape, 400 Amp Primary to 5A Secondary Ratio, Single Piece Current Transformer (solid-core) Ground Fault Sensor (82.3mm Inner Diameter)
			193-ESM-IG-30A-T	Current/Ground Fault Sensing Module (0.5...30 A) DIN Rail / Panel Mount with Line- and Load-side Power Conductor Terminals.

Full List - 3



193-EC3JG	E3 Plus Overload Relay, Electronic, Current Sensing, IEC Type, External Ground Fault Current Input, Positive Temperature Coefficient Thermistor Input, 84-420 A, 4 Inputs-2 outputs, DeviceLogix Enabled, Mounts to 100-D210 to 100-D420 Contactors, Adjustable Trip Clas		193-ESM-IG-30A-T	Current/Ground Fault Sensing Module (0.5...30 A) DIN Rail / Panel Mount with Line- and Load-side Power Conductor Terminals.
			193-EIOGP-42-24D	4 IN / 2 Out with PTC and External Ground Fault Sensing Control Module, 24V DC
			193-ECM-DNT	DeviceNet Communication Module
			1411-180RL-601(3pieces) 193-CBCT4	Bulletin 1411 - Current Transformer, 2.5" Inner Diameter, Round Outer Shape, 600 Amp Primary to 5A Secondary Ratio, Single Piece Current Transformer (solid-core) Ground Fault Sensor (82.3mm Inner Diameter)
193-EC3KH	Overload Relay, Electronic, External Ground Fault Current Measurement, Positive Temperature Coefficient Thermistor Protection, IEC, 125-630 A, 4 inputs, 2 outputs, DeviceLogix Enabled, Mounts to 100-D630 to 100-D860 Contactor, DeviceNet, EC3		193-ESM-IG-30A-T	Current/Ground Fault Sensing Module (0.5...30 A) DIN Rail / Panel Mount with Line- and Load-side Power Conductor Terminals.
			193-EIOGP-42-24D	4 IN / 2 Out with PTC and External Ground Fault Sensing Control Module, 24V DC
			193-ECM-DNT	DeviceNet Communication Module
			809S-CT4(3 pieces) 3RD PARTY	Current Transformer, Trip Current Range 100...1200A
193-ECPM1	E3 Plus Panel Mount Adaptor, For Use With 193-ECxB, Allows Overload Relay to Be Separately Mounted Directly to the Panel or to Top-Hat DIN Rail EN 50 022-35		Not Needed	
193-ECPM2	E3 Plus Panel Mount Adaptor, For DIN Rail Mounting, For Use With 193-ECxD, 193-ECxZZ, Allows Overload Relay to Be Separately Mounted Directly to the Panel or to Top-Hat DIN Rail EN 50 022-35		Not Needed	
193-ECPM3	E3 Plus Panel Mount Adaptor, For DIN Rail Mounting, For Use With 193-ECxE, Allows Overload Relay to Be Separately Mounted Directly to the Panel or to Top-Hat DIN Rail EN 50 022-35		Not Needed	
193-EC2AD	E3 Plus 1-5 A Overload Relay		193-ESM-IG-30A-T	Current/Ground Fault Sensing Module (0.5...30 A) DIN Rail / Panel Mount with Line- and Load-side Power Conductor Terminals.
			193-ESM-IG-30A-C23	Current/Ground Fault Sensing Module (0.5...30 A) Mounts to 100-C30...C55 contactor
			193-EIOGP-42-24D 193-ECM-DNT	4 IN / 2 Out with PTC and External Ground Fault Sensing Control Module, 24V DC DeviceNet Communication Module
193-EC2BD	E3 Plus 3-15 A OL		193-ESM-IG-30A-T	Current/Ground Fault Sensing Module (0.5...30 A) DIN Rail / Panel Mount with Line- and Load-side Power Conductor Terminals.
			193-ESM-IG-30A-C55	Current/Ground Fault Sensing Module (0.5...30 A) Mounts to 100-C30...C55 contactor
			193-EIOGP-42-24D 193-ECM-DNT	4 IN / 2 Out with PTC and External Ground Fault Sensing Control Module, 24V DC DeviceNet Communication Module
193-EC2DE	E3 Plus 9-45 A Overload Relay		193-ESM-IG-100A-C97 193-ESM-IG-60A-T	
			193-EIOGP-42-24D 193-ECM-DNT	4 IN / 2 Out with PTC and External Ground Fault Sensing Control Module, 24V DC DeviceNet Communication Module
193-DNENCAT	EtherNet/IP Communications Auxiliary			

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