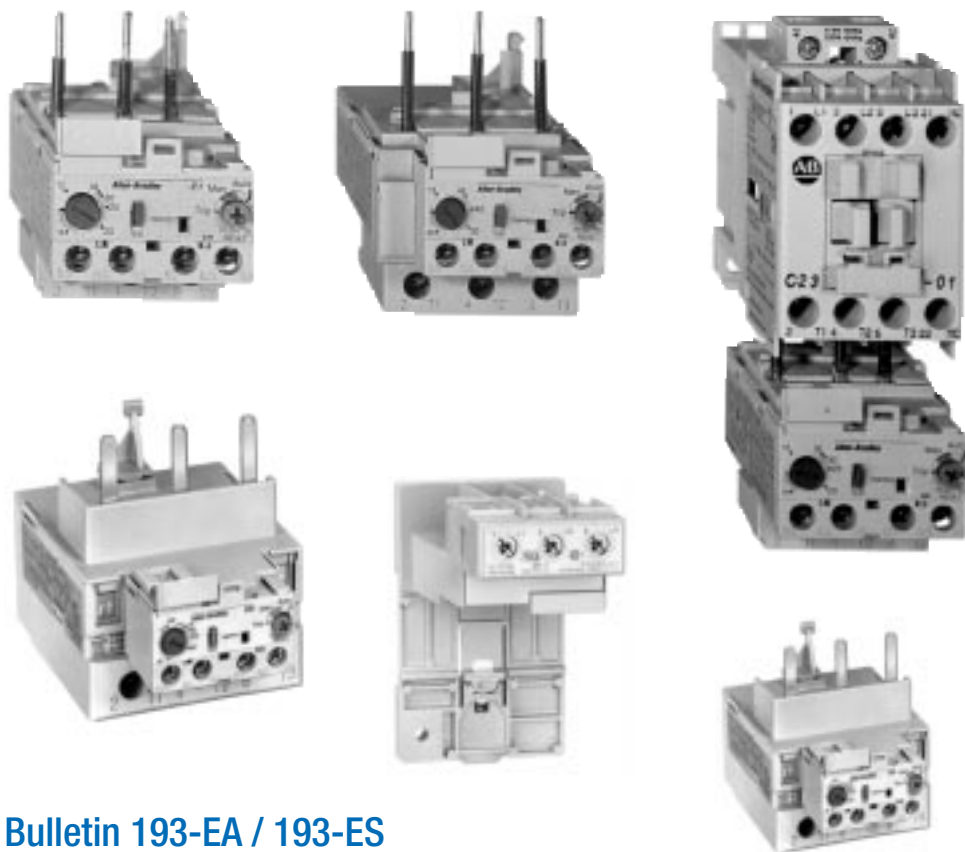


Electronic Motor Protection Relays Bulletin 193-E



Bulletin 193-EA / 193-ES

- Self Powered
- Phase Loss Protection
- Wide Adjustment Range (3.2:1)
- 1 N.O. and 1 N.C. Isolated Auxiliary Contacts
- Choice of Tripping Classes - Class 10 or 20
- Compact Size
- Low Energy Consumption (150mW)

193-EB also includes:

- Trip Class 10, 15 or 20 selectable
- Ground Fault Protection
- Jam/Stall Protection

Product Selection 5-3

Accessories

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Specifications

Performance Data / Characteristics 5-6

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Dimensions 5-8

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Cat. No. 193-EA1GB



Cat. No. 193-EA1JD



Cat. No. 193-EA1KE

Manual Reset

Mounts to contactor	Reset	Adjustment range [A]	Trip class 10		Trip class 20	
			Cat. No.	Index	Cat. No.	Index
Manual Reset for 3-phase Applications						
100-M05...100-M09, 100-C09...100-C23	M	0.1...0.32	193-EA1AB	1	193-EA2AB	2
100-M05...100-M09, 100-C09...100-C23	M	0.32...1.0	193-EA1CB	3	193-EA2CB	4
100-M05...100-M09, 100-C09...100-C23	M	1.0...2.9	193-EA1DB	5	193-EA2DB	6
100-M05...100-M09, 100-C09...100-C23	M	1.6...5.0	193-EA1EB	7	193-EA2EB	8
100-M05...100-M09, 100-C09...100-C23	M	3.7...12	193-EA1FB	9	193-EA2FB	10
100-M09, 100-C09...100-C23	M	12...32	193-EA1GB	11	193-EA2GB	12
100-C30...100-C37	M	12...37	193-EA1HC	13	193-EA2HC	14
100-C43	M	14...45	193-EA1JD	15	193-EA2JD	16
100-C60...100-C85	M	26...85	193-EA1KE	17	193-EA2KE	18
Manual Reset for 1-phase Applications						
100-M05...100-M09, 100-C09...100-C23	M	2.0...7.0	193-ES1AB	19	193-ES2AB	20
100-M05...100-M09, 100-C09...100-C23	M	5.0...15	193-ES1BB	21	193-ES2BB	22
100-M09, 100-C09...100-C23	M	12...32	193-ES1CB	23	193-ES2CB	24
100-C30...100-C37	M	12...37	193-ES1DC	25	193-ES2DC	26
100-C43	M	14...45	193-ES1FD	27	193-ES2FD	28
100-C60...100-C85	M	26...85	193-ES1HE	29	193-ES2HE	30



Cat. No. 193-EA4GB



Cat. No. 193-EA4JD



Cat. No. 193-EA4KE

Automatic/Manual Reset

Mounts to contactor	Reset	Adjustment range [A]	Trip class 10		Trip class 20	
			Cat. No.	Index	Cat. No.	Index
Automatic/Manual Reset for 3-phase Applications						
100-M05...100-M09, 100-C09...100-C23	A	0.1...0.32	193-EA4AB	31	193-EA5AB	32
100-M05...100-M09, 100-C09...100-C23	A	0.32...1.0	193-EA4CB	33	193-EA5CB	34
100-M05...100-M09, 100-C09...100-C23	A	1.0...2.9	193-EA4DB	35	193-EA5DB	36
100-M05...100-M09, 100-C09...100-C23	A	1.6...5.0	193-EA4EB	37	193-EA5EB	38
100-M05...100-M09, 100-C09...100-C23	A	3.7...12	193-EA4FB	39	193-EA5FB	40
100-M09, 100-C09...100-C23	A	12...32	193-EA4GB	41	193-EA5GB	42
100-C30...100-C37	A	12...37	193-EA4HC	43	193-EA5HC	44
100-C43	A	14...45	193-EA4JD	45	193-EA5JD	46
100-C60...100-C85	A	26...85	193-EA4KE	47	193-EA5KE	48
Automatic/Manual Reset for 1-phase Applications						
100-M05...100-M09, 100-C09...100-C23	A	2.0...7.0	193-ES4AB	49	193-ES5AB	50
100-M05...100-M09, 100-C09...100-C23	A	5.0...15	193-ES4BB	51	193-ES5BB	52
100-M09, 100-C09...100-C23	A	12...32	193-ES4CB	53	193-ES5CB	54
100-C30...100-C37	A	12...37	193-ES4DC	55	193-ES5DC	56
100-C43	A	14...45	193-ES4FD	57	193-ES5FD	58
100-C60...100-C85	A	26...85	193-ES4HE	59	193-ES5HE	60

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Automatic/Manual Reset, Adjustable Trip Class 10, 15 or 20, Jam/Stall and Ground Fault Protection



Cat. No. 193-EB1AB



Cat. No. 193-EB1NE

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Mounts to contactor	Reset ①	Adjustment range [A]	Cat. No.	Index
100-M05...100-M09, 100-C09...100-C23	A	0.1...0.32	193-EB1AB	61
100-M05...100-M09, 100-C09...100-C23	A	0.32...1.0	193-EB1CB	62
100-M05...100-M09, 100-C09...100-C23	A	1.0...2.9	193-EB1DB	63
100-M05...100-M09, 100-C09...100-C23	A	1.6...5.0	193-EB1EB	64
100-M05...100-M09, 100-C09...100-C23	A	3.7...12	193-EB1FB	65
100-M09, 100-C09...100-C23	A	12...32	193-EB1GB	66
100-C30...100-C37	A	14...45	193-EB1JC	67
100-C43	A	5.0...15	193-EB1SD	68
100-C43	A	14...45	193-EB1JD	69
100-C60...100-C85	A	23...75	193-EB1ME	70
100-C60...100-C85	A	60...85	193-EB1NE	71

Add-on Accessories

	Description	For use with	PL*	Cat. No.	Index
	DIN rail/panel adapter For separate mounting of the electronic motor protection relay, can be mounted to top-hat rail EN 50 02-35	193-EA__B		193-EPM1	72
		193-ES__B		193-EPM2	73
		193-EB__B		193-EPM1	74
		193-EA__C		193-EPM1	75
		193-ES__C		193-EPM1	76
		193-EB__C		193-EPM2	77
		193-E__D		193-EPM2	78
		193-E__E		193-EPM3	79
	Anti-tamper shield Provides protection against inadvertent adjustment of mode selector and full load current settings.	193-E all		193-BC4	80
	Current adjustment shield Provides protection against inadvertent adjustment of the current setting.	193-E all		193-BC5	81
	Anti-tamper shield for DIP switches	193-EB__D 193-EB__E	40 pcs.	193-BC6	82
	Anti-tamper shield for DIP switches	193-EB__B 193-EB__C	40 pcs.	193-BC7	83
	Remote reset solenoid For remote reset of electronic overload relays	193-E all		193-ER1⊗	84
	External reset button for enclosed devices Metal construction IP 66, non-illuminated with rod (Length: 142 mm, adjustment range 141...159 mm) Please consult push-button catalog 800E for additional types.	193-E all		800EP-R611WTR08	85
	Labeling materials Uniform labeling material for contactors, motor protection devices, timing relays and circuit breakers. For Product Information and Ordering Information, see Chapter 3.				

* Packing Lots (units)

⊗ Control Voltage Identification

Available coil Voltages 12 ... 600 V 50 Hz / 12 ... 600 V 60 Hz

Standard Coil Voltages

[V] [Hz]	24	48	110	115	120	220	220-230	240										
50	J	—	D	—	—	A	F	—										
60	J	—	—	—	D	—	—	A										
DC	Z24	Z48	—	Z01	—	—	—	—										

Surcharge for special control voltages up to 20 pcs. (no surcharge for quantities greater than 20 pcs.)

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Electronic Motor Protection Relays

Main Circuits

Cat. No.	193- E__B	193- E__C	193- E__D	193- E__E
Rated Insulation voltage U_i [V]	690			
Rated Impulse strength U_{imp} [kV]	6			
Rated Operating voltage U_e [V]	690			

Cat. No.	193- E__B	193- E__C	193- E__D	193- E__E
Cat. No.	–	193-EB__B, -EB__C, -EB__D		193- EB__E
Terminal cross-sections				
Terminal type				
Terminal screws	M 4	M 5		M 8
	[mm ²] 1 x (1 ... 4) [mm ²] 2 x (1 ... 4)	1 x (2.5 ... 16) 2 x (2.5 ... 10)		1 x (4 ... 35) 2 x (4 ... 25)
	[mm ²] 1 x (1.5 ... 6) [mm ²] 2 x (1.5 ... 6)	1 x (2.5 ... 25) 2 x (2.5 ... 10)		1 x (4 ... 50) 2 x (4 ... 35)
	[AWG] 14 ... 8	14 ... 6		2
Recommended torque	[Nm] [lb-in] 1.8 (16)	1.4 (12)	1.6 (14)	4 (35)
Pozidriv screwdriver	Size	2		2
Slotted screwdriver	mm	1 x 6		–
Hexagon socket size	SW [mm]	–		4

Control Circuits

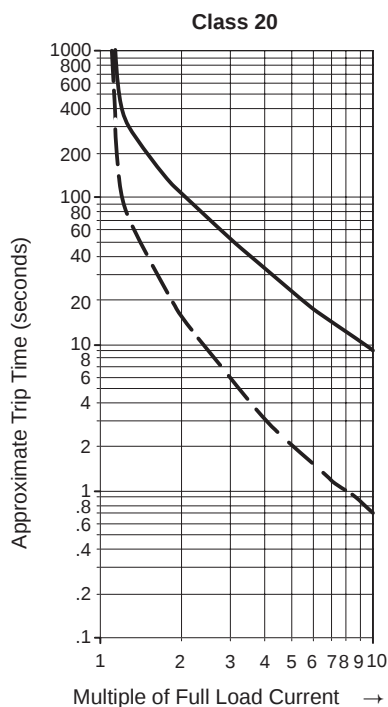
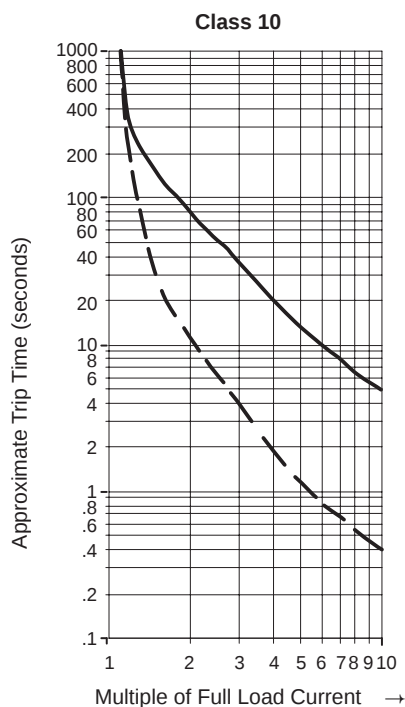
Cat. No.	193- E__B	193- E__C	193- E__D	193- E__E
Rated Insulation voltage U_i [V]	600			
Rated Impulse strength U_{imp} [kV]	6			
Rated operating voltage U_e [V]	600			
Rated operating current I_e				
AC-15	12...120 V [A] 220...240 V [A] 380...480 V [A] 500...600 V [A]	3 / 2 1.5 / 1.5 0.75 / 0.75 0.6 / 0.6		
DC-13, at L / R ≤ 15 ms	24 V [A] 110 V [A] 220 V [A] 440 V [A]	1.1 / 1.1 0.4 / 0.4 0.2 / 0.2 0.08 / 0.08		

Cat. No.	193- E__B	193- E__C	193- E__D	193- E__E
Conventional Thermal current I_{th} [A]	5			
Terminal cross-sections				
Terminal type				
Terminal screws	M 3.5			
	2 x (0.75 ... 2.5)			
	2 x (0.75 ... 4)			
	18 ... 12			
Recommended torque	[N · m] [lb-in] 1.4 (12)			
Pozidriv screwdriver	Size	2		
Slotted screwdriver	mm	1 x 6		

General

Cat. No.	193-E__B	193-E__C	193-E__D	193-E__E
Weight [kg (lb)]	0.14 (0.31)	0.17 (0.37)	0.21 (0.46)	0.36 (0.84)
Standards	IEC 947, EN 60 947, DIN VDE 0660			
Approvals	CE, UL, CSA, PTB			
Corrosion resistance	95% relative humidity, without condensation, 30...60°C			
Ambient temperature				
open	–20 ... +60 °C (–4 ... 122 °F)			
enclosed	–20 ... +40 °C (–4 ... 104 °F)			
Temperature compensation	Continuous			
Shock Resistance (10 ms sinusoidal shock) [G]	10			
Type of protection (in connected state)	IP2LX			

Trip Curves for 1-Phase Applications (193-ES)

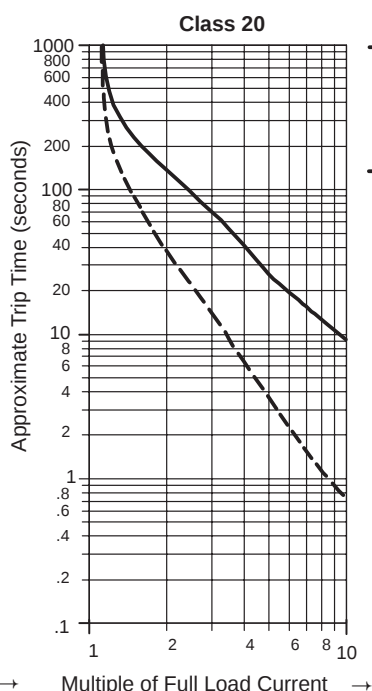
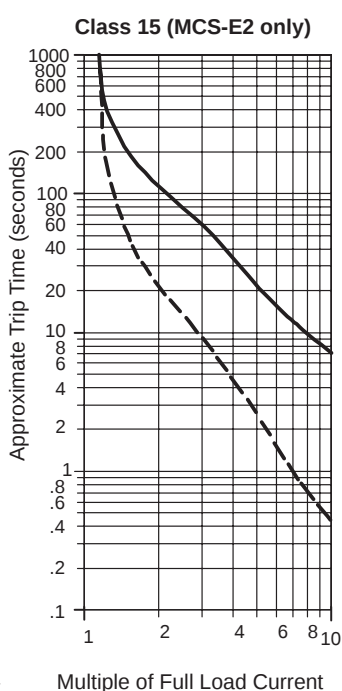
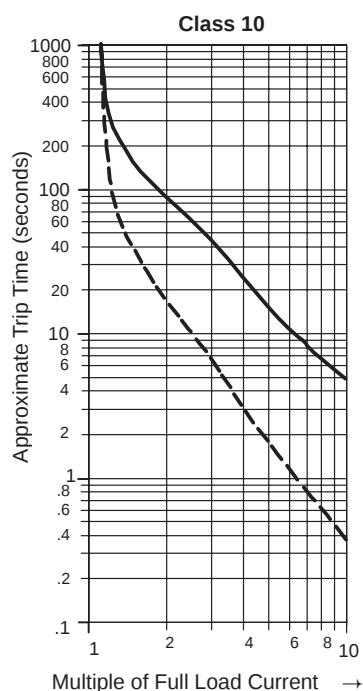


— Approximate trip time for 3-phase balanced condition from cold start.

- - - Approximate trip time for 3-phase balanced condition from hot start.

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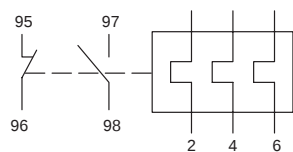
Trip Curves for 3-phase Applications (193-EA/EB)



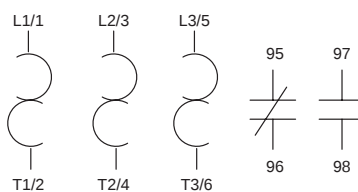
— Approximate trip time for 3-phase balanced condition from cold start.

- - - Approximate trip time for 3-phase balanced condition from hot start.

Wiring Schematic



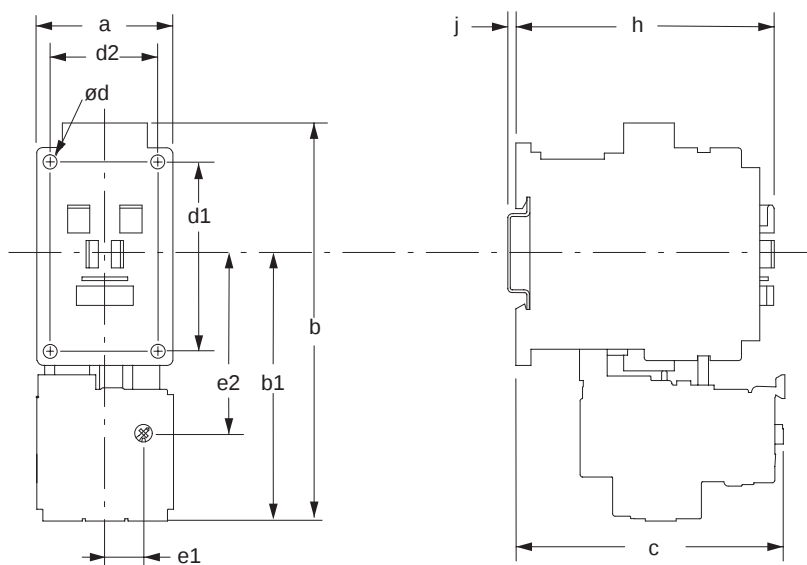
Typical IEC Wiring Schematic



Typical NEMA Wiring Schematic

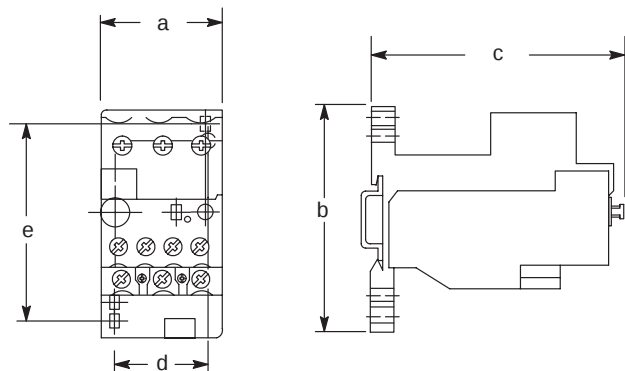
Dimensions in mm (inches)

Directly mounted on contactor 100-C



Cat. No.	a Width	b Height	b1	c Depth	e1	e2	d1	d2	h	j	ød
100-M05 with 193-EA or -ES	45 (1-25/32)	107 (4-13/64)	83 (3-17/64)	66.6 (2-5/8)	—	50 (1-61/64)	50 (1-61/64)	—	48.2 (1-29/32)	2 (5/64)	Two – Ø 4.2 (Two – 11/64 Ø)
100-C09, -C12, -C16, -C23 with 193-EA or -ES	45 (1-25/32)	131 (5-11/64)	86 (3-25/64)	88.5 (3-1/2)	16.5 (21/32)	69 (3-25/32)	60 (2-23/64)	35 (1-3/8)	86.5 (3-13/32)	2 (5/64)	Two – Ø 4.2 (Two – 11/64 Ø)
100-C09, -C12, -C16, -C23 with 193-EB	54 (2-1/8)	137 (5-3/8)	97 (3-13/16)	90.7 (3-37/64)	5.1 (13-64)	59 (2-23/64)	60 (2-23/64)	35 (1-3/8)	85.1 (3-23/64)	2 (5/64)	Two – Ø 4.2 (Two – 11/64 Ø)
100-C30, -C37 with 193-EA or -ES	45 (1-25/32)	136.5 (5-3/8)	91.5 (3-39/64)	92 (3-39/64)	16.5 (21/32)	69 (2-23/32)	60 (2-23/64)	35 (1-3/8)	104 (4-1/8)	2 (5/64)	Two – Ø 4.2 (Two – 11/64 Ø)
100-C30, -C37 with 193-EB	54 (2-1/8)	137 (5-3/8)	97 (3-13/16)	92.1 (3-5/8)	5.2 (13-64)	59 (2-23/64)	60 (2-23/64)	35 (1-3/8)	104.7 (4-1/8)	2 (5/64)	Two – Ø 4.2 (Two – 11/64 Ø)
100-C43 with 193-EA, -ES, or -EB	54 (2-1/8)	136.5 (5-3/8)	91.5 (3-39/64)	93 (3-21/32)	22 (7/8)	69 (2-23/32)	60 (2-23/64)	45 (1-49/64)	107 (4-7/32)	2 (5/64)	Two – Ø 4.2 (Two – 11/64 Ø)
100-C60, -C72, -C85 with 193-EA, -ES, -EB	72 (2-53/64)	188.5 (7-27/64)	120 (4-23/32)	120 (4-23/32)	18 (23/32)	84.5 (3-21/64)	100 (3-15/16)	55 (2-11/64)	125.5 (4-15/16)	2 (5/64)	Four – Ø 5.5 (Four – 7/32 Ø)

Individual mounting with relay base



Cat. No.	a Width	b Height	c Depth	d	e
193-EPM1	45 (1-25/32)	90 (3-35/64)	75 (2-61/64)	30 (1-3/16)	75 (2-61/64)
193-EPM2	55 (2-11/64)	90 (3-35/64)	96.5 (4-29/32)	40 (1-37/64)	75 (2-61/64)
193-EPM3	70 (2-49/64)	115 (4-17/32)	110 (4-11/32)	55 (2-11/64)	105 (4-9/64)