



NEMA Space Saving Contactors and Starters

Bulletin Numbers 300, 300S, 305, 309

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Summary of Changes

This publication contains new and updated information:

Product selection information and new series devices were added. Older (series D) information was moved to the end of the publication.

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Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.rockwellautomation.com/global/certification/overview.page	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at <http://www.rockwellautomation.com/global/literature-library/overview.page>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Product Description

Bulletin 300

Bulletin 300 modular line of NEMA contactors, when combined with Bulletin 193 solid-state overload relays, auxiliary contacts, interlocks, suppressors, and DIN Rail mounting provides compact and flexible starter component systems.

- NEMA sizes 0...8
- Compact size (space-saving design)
- Guarded terminals
- Complete range of accessories
- Solid-state overload relays
- Electronic and conventional coils
- Panel or DIN Rail mounts available

Bulletin 305/309

Bulletin 305 reversing starters are most commonly used for full-voltage starting and reversing of polyphase squirrel-cage motors. Factory-assembled starter sizes 0...4 are electrically and mechanically interlocked to avoid both contactors being closed simultaneously.

Bulletin 309 starters are designed for full-voltage starting of polyphase squirrel-cage motors. You can operate these starters by remote control with push buttons, float switches, thermostats, pressure switches, snap switches, limit switches, or any other suitable 2- or 3-wire pilot device. Starters are available in factory-assembled sizes 0...4 and current transformer kits for sizes 5...7.

- NEMA sizes 0...4 (factory assembled)
- NEMA sizes 5...7 (user assembled)
- Non-combination with NEMA contactor and electronic overload relay with optional communication module

Product Selection

3-Pole AC/DC Operated Contactors and Starters

NEMA Size	I_e [A]	Switching of 3-phase Motors — AC-2, AC-3									Auxiliary Contacts Each Contactor		Bulletin 300 Direct On-line Contactor	Bulletin 305 Reversing Starter	Bulletin 309 Starter
	60 °C	Hp (60 Hz)				kW (50 Hz)					N.O.	N.C.	Cat No.	Cat No.	Cat No.
	AC-3 (400V)	200 V	230 V	460 V	575 V	220... 240V	380... 400V	415 V	500 V	690 V					
0	16	3	3	5	5	5.5	7.5	7.5	7.5	7.5	1	—	300-A0⊗930	305-A0⊗930	309-A0⊗930
1	37	7.5	7.5	10	10	11	20	20	20	18.5	1	—	300-B0⊗930	305-B0⊗930	309-B0⊗930
2	43	10	15	25	25	13	22	22	25	22	1	—	300-C0⊗930	305-C0⊗930	309-C0⊗930
3	85	25	30	50	50	25	45	45	55	45	1	1	300-D0⊗930	305-D0⊗930	309-D0⊗930
4	146	40	50	100	125	45	75	75	90	90	1	1	300-E0⊗9311 ⁽¹⁾	305-E0⊗930	309-E0⊗930
5	265	75	100	200	250	75	132	132	160	200	1	1	300-F0⊗9311		
6	460	150	200	400	500	132	250	250	315	355	1	1	300-G0⊗9311		
7	750	250	300	600	700	220	400	425	530	600	1	1	300-H0⊗9311		
8	—	—	—	—	—	—	—	—	—	—	1	1	300-J0⊗9311		

(1) To order with built-in terminal lugs, add the letter "L" to the end of the catalog number (for example, **300-E0⊗9311L**).

⊗ Coil Voltage Codes and Terminal Position (NEMA Sizes 0...3)

The cat. no. as listed is incomplete. To complete the cat. no., select a coil voltage code from the following table and insert into the cat. no.

Example: 120V, 60 Hz: **Cat. No. 300-A0⊗930** becomes **Cat. No. 300-AOD930**.

	[V]	24	110	120	220	240	277	440	480	550	600
NEMA Size 0...3	AC, 50 Hz	K ⁽¹⁾	D	P ⁽¹⁾	A	T ⁽¹⁾	—	B	—	C	—
	AC, 60 Hz	J ⁽¹⁾	—	D	—	A	T ⁽¹⁾	—	B	—	C
	AC, 50/60 Hz	KJ	—	—	—	KA ⁽¹⁾	—	—	—	—	—
NEMA Size 0...2	DC	EJ	—	—	—	—	—	—	—	—	—
NEMA Size 3	DC	DJ ⁽¹⁾	—	—	—	—	—	—	—	—	—

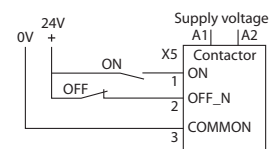
(1) Bulletin 300 contactors only.

⊗ Coil Voltage Codes and (NEMA sizes 4...8)

Electronic Coils with PLC Interface	[V]	24...60	48...130	100...250	250...500
NEMA Size 4...5	AC/DC	KJ	KY	KD	KN
NEMA Size 4...5	AC/DC with PLC Input	—	—	ED	EN
NEMA Size 6...7		EJ ⁽¹⁾	EY	ED	EN
NEMA Size 8		—	—	ED	—

(1) 24...60V DC only.

PLC Interface



Coil Terminal Position

All contactors are delivered with the coil terminals that are located on the line side.



Cat. No. 300-A0⊗930 Line Side

⚙ Overload Relay Codes (Bulletin 305 or 309, NEMA Sizes 0...3)

The cat. no. as listed is incomplete. Select an overload relay code from the following table to complete the cat. no.

Example: **Cat. No. 305-AOD-⚙** becomes **Cat. No. 305-AOD-EEC**. For other voltages, contact your local Rockwell Automation sales office or Allen-Bradley distributor.

NEMA Size	Adjustment Range [A]	Overload Relay Code
0	1.0...5	EEC
0, 1	5.4...27	EEE
2	9...45	EEF
3	18...90	EEG

⚙ Overload Options (Bulletin 305 or 309, NEMA Size 4)

Relay	Option	Cat. No. Suffix
none	No overload option - reverser	-23
193-EE_	—	-AZM
193-ESM_	200 A Current Sense Module	-I-200A
	200 A Current Sense w/ ground fault module	-IG-200A
	200 A Voltage and Current Sense w/ ground fault module	-VIG-200A

Bulletin 193-EE – Three-Phase Devices (Bulletin 300, NEMA Sizes 0...4)

- Selectable trip class (10, 15, 20, 30)
- Selectable manual/auto-manual reset
- Screw-type control terminals
- Direct mount

Mounts to NEMA Contactor Size	Adjustment Range [A]	Cat. No.
0	1.0...5.0	193-EECB
	5.4...27	193-EEEB
1	5.4...27	193-EEED
2	9...45	193-EEFD
3	18...90	193-EEGE
4	30...150	193-EEHJ
	60...300	193-EEJJ

E3 Solid-State Overload Relay (Bulletin 300, NEMA Sizes 0...3)

- 0.4...5000 A current range
- Adjustable trip class 5...30
- Integrated I/O

NEMA Size	Adjustment Range [A]	E3	E3 Plus	
			Internal Ground	External Ground
		Cat. No.	Cat. No.	Cat. No.
0	1...5	193-EC1AB	193-EC2AB	193-EC3AB
	3...15	193-EC1BB	193-EC2BB	193-EC3BB
	5...25	193-EC1CB	193-EC2CB	193-EC3CB
1...2	9...45	193-EC1DD	193-EC2DD	193-EC3DD
3	18...90	193-EC1EE	193-EC2EE	193-EC3EE

E3 and E3 Plus Solid-State Overload Relays (Bulletin 300, NEMA Sizes 0...3)**Panel Mount Devices for Use with External Current Transformers ⁽¹⁾ ⁽²⁾**

Description	Adjustment Range [A] ⁽³⁾	Cat. No.
• 2 Inputs • 1 Output	9...5000	193-EC1ZZ
• 4 Inputs • 2 Outputs • External Ground Fault Sensor Input • PTC Thermistor Input • DeviceLogix	9...5000	193-EC2ZZ

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	—	—

(1) Current transformers that are supplied by customer. See Specifications, External Current Transformers (for use with Cat. Nos. 193-EC1ZZ1, 193-EC3ZZ, 193-EC4ZZ, and 193-EC5ZZ) for proper current transformer selection.

(2) Order panel adapter, Cat. No. 193-ECPM2, separately.

(3) CT Ratio to FLA setting range correlation.

3-Pole AC/DC Operated Safety Contactors

NEMA Size	I_e [A]		Switching of 3-phase Motors — AC-2, AC-3											Auxiliary Contacts Each Contactor		Bulletin 300S Direct On-line Safety Contactor
	60 °C	40 °C	Hp (60 Hz)				kW (50 Hz)							N.O.	N.C.	
	AC-3 (400V)	AC-1 (690V)	200V	230V	460V	575V	220...240V	380...400V	415V	440V	500V	690V	1000V			Cat No.
4	146	225	40	50	100	125	45	75	75	90	90	90	75	1	1	300S-E0⊗9312C ⁽¹⁾
5	265	400	75	100	200	250	75	132	132	160	160	200	132	1	1	300S-F0⊗9312C
6	460	700	150	200	400	500	132	250	250	250	315	355	280	1	1	300S-G0⊗9312C
7	750	1050	250	300	600	700	220	400	425	450	530	600	400	1	1	300S-H0⊗9312C

(1) To order with built-in terminal lugs, add the letter "L" to the end of the catalog number (for example, **300S-E0⊗9312CL**).

⊗ Coil Voltage Codes

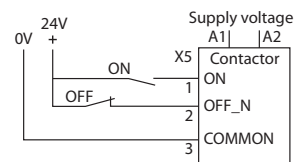
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Example: 120V, 60 Hz: **Cat. No. 300S-E0⊗9312C** becomes **Cat. No. 300S-EOD9312C**.

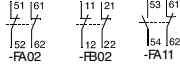
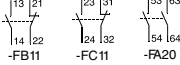
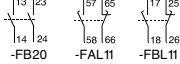
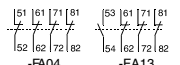
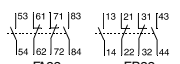
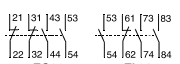
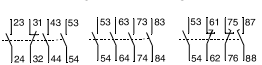
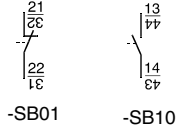
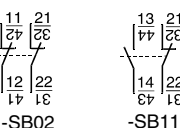
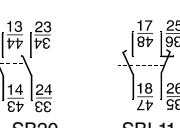
Conventional Coil	[V]	24	110	120	220	240	277	440	480	550	600
NEMA Size 4	AC, 50 Hz	K	D	—	A	—	—	B	—	C	—
	AC, 60 Hz	J	—	D	—	A	T	—	B	—	C
Electronic Coil with EI	[V]	24	110	120	220	240	277	440	480	550	600
NEMA Size 4...5	AC, 50/60 Hz	K	D	—	A	—	—	B	—	C	—
NEMA Size 4...5	DC	J	—	D	—	A	T	—	B	—	C
Electronic Coils with PLC Interface	[V]	24...60	48...130	100...250	250...500						
NEMA Size 4...5	AC/DC	KJ	KY	KD	KN						
NEMA Size 4...5	AC/DC with PLC Input	—	—	ED	EN						
NEMA Size 6...7		EJ ⁽¹⁾	EY	ED	EN						
NEMA Size 8		—	—	ED	—						

(1) 24...60V DC only.

PLC Interface



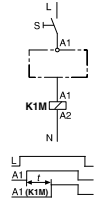
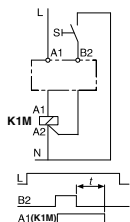
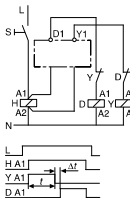
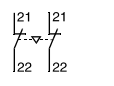
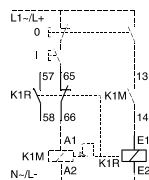
Accessories (NEMA Sizes 0...3)

	Description	 N.O.	 N.C.	Connection Diagrams	For Use with NEMA Size	Cat. No.
	Auxiliary Contact Blocks for Front Mounting⁽¹⁾ • 2- and 4-pole • Quick and easy mounting without tools • Electronic-compatible contacts down to 17V, 5 mA • Mirror contact performance to the main contactor poles (except for L types) • Models with equal function with several terminal numbering choices • L = Late break N.C./early make N.O.	0	2		0...3	100-FA02 100-FB02
		1	1			100-FA11 100-FB11 100-FC11
		2	0			100-FA20 100-FB20
		1L	1L			100-FAL11 100-FBL11
		0	4			100-FA04
		1	3			100-FA13
		2	2			100-FA22 100-FB22 100-FC22
		3	1			100-FA31 100-FC31
		4	0			100-FA40
		1+1L	1+1L			100-FAL22
	Auxiliary Contact Blocks for Side Mounting with Sequence Terminal Designations⁽¹⁾ • 1- and 2-pole • Two-way numbering for right or left mounting on the contactor • Quick and easy mounting without tools • Electronic compatible contacts down to 17V, 10 mA • Mirror contact performance to the main contactor poles, L = Late break N.C./early make N.O.	0	1		0...3	100-SB01
		1	0			100-SB10
		0	2			100-SB02
		1	1			100-SB11
		2	0			100-SB20
		1L	1L			100-SBL11

(1) Maximum number of auxiliary contacts that can be mounted:

AC coil contactors — max. 4 N.O. contacts on the front of the contactor, 2 N.O. contacts on the side, 4 N.C. front or side, 6 total.

DC coil contactors — max. 4 N.O. contacts on the front of the contactor or max 2 N.O. contacts on the side, 4 N.C. front or side, 4 total.

	Description		Connection Diagrams	For Use with NEMA Sizes	Cat. No.
	Pneumatic Timing Modules Pneumatic timing element contacts switch after the delay time. The contacts on the main contactor continue to operate without delay.	On-delay 0.3...30 s 1.8...180 s		0...3 with AC coils	100-FPTA30 100-FPTA180
		OFF-Delay 0.3...30 s 1.8...180 s		0...3	100-FPTB30 100-FPTB180
	Electronic Timing Modules — on-delay Delay of the contactor or control relay solenoid. The contactor is energized at the end of the delay time.	On-delay 0.1...3 s 1...30 s 10...180 s		0...3 with AC coils 110...240V, 50/60 Hz 110...250VDC	100-ETA3 100-ETA30 100-ETA180
	Electronic Timing Modules — OFF-Delay Delay of the contactor or control relay solenoid. After interruption of the control signal, the contactor is de-energized at the end of the delay time.	OFF-Delay 0.3...3 s 1...30 s 10...180 s		0...3 with AC coils 110...240V, 50/60 Hz	100-ETB3 100-ETB30 100-ETB180
		Transition Time Y Contactor 1...30 s		0...3 with AC coils 110...240V, 50/60 Hz	100-ETY30
	Mechanical Interlocks For interlocking of two contactors. - Common interlock for NEMA size 0...3 contactors - Interlocking of different sizes possible - Mechanical and electrical interlocking possible in one module through integrated auxiliary contacts 9 mm dovetail connector is included	Mechanical only, without auxiliary contacts		0...3	100-MCA00
		Mechanical/ electrical interlock with 2 N.C. auxiliary contacts		0...3	100-MCA02
	Mechanical Latch After the contactor latches, the contactor coil is immediately de-energized (off) by the N.C. auxiliary contact (65-66). - Electrical or manual release 1 N.O. + 1 N.C. auxiliary contacts - Suitable for NEMA size 0...3 contactors	Maximum command duration 0.03...10 s		0...3 with AC coils	100-FL11⊗

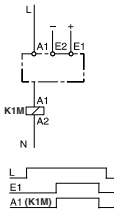
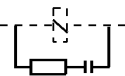
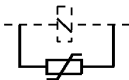
⊗ Voltage Suffix Code

The cat. no. as listed is incomplete. Select a voltage suffix code from the following table to complete the cat. no.

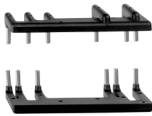
Example: 120V, 60 Hz: Cat. No. 100-FL11⊗ becomes Cat. No. 100-FL11D.

Voltage ⁽¹⁾	24V	48V	100V	110V	120V	230-240V	240V	277V	380-400V	400-415V	440V	480V
50 Hz	K	Y	KP	D	—	VA	T	—	N	G	B	—
60 Hz	J	—	—	—	D	—	A	T	—	—	N	B

(1) For special voltages, consult your local Allen-Bradley distributor.

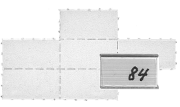
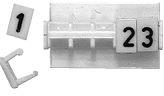
	Description			Connection Diagrams	For Use with NEMA Size	Cat. No.
	DC Interface (electronic) Interface between the DC control signal (PLC) and the AC operating mechanism of the contactor. - Control (input) voltage: 18...30V DC (24V nominal) - Requires no additional surge suppression on the contactor coils				0...3 with AC coils 110...240V AC	100-JE12 100-JE 100-JE48
	Surge Suppressors For limitation of coil switching transients. - Plug-in, coil mounted - Suitable for NEMA size 0...3 contactors - RC, Varistor, and Diode Versions	RC Module AC operating mechanism	Voltage Range 24...48V 50/60 Hz		0...3 with AC coils	100-FSC48
			110...280V 50/60 Hz			100-FSC280
			380...480V 50/60 Hz			100-FSC480
	Varistor Module AC/DC operating mechanism	12...55V AC/ 12...77V DC		0...3	100-FSV55	
		56...136V AC/ 78...180V DC			100-FSV136	
		137...277V AC/ 181...350V DC			100-FSV277	
		278...575V AC			100-FSV575	

Assembly Components (NEMA Size 0...3 Contactors)

	Description	For Use with NEMA Size	Pkg. Qty. (1)	Cat. No.
 Cat. No. 100-S0	Dovetail Connectors For use in contactor and starter assemblies. Single Connector 0 mm Spacing Dual Connector 9 mm Spacing	0...3	10 10	100-S0 100-S9
 Cat. No. 100-SCCA  Cat. No. 100-SCFA	Protective Covers - Provides protection against unintended manual operation - For contactors and front-mounted auxiliary contacts, pneumatic timers and latches	0...3	1	100-SCCA
		Auxiliary Contact Blocks: 100-FA, FB, FC, FP, FL	10	100-SCFA
 Cat. No. 105-PW23	Reversing Power Wiring Kits For Reversing Connection with a solid-state or thermal overload relay	0 1 2 3	1	105-PW23 105-PW37 105-PW43 105-PW85
	35 x 7.5 mm DIN Rail (1 m)	0...2	10	199-DR1

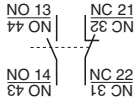
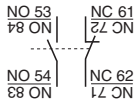
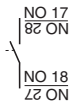
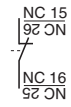
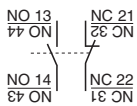
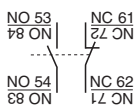
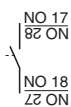
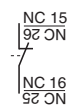
(1) Must be ordered in multiples of package quantities.

Marking Systems (NEMA Size 0...3 Contactors)

	Description	Pkg. Qty. (1)	Cat. No.
	Label Sheet 105 self-adhesive paper labels each, 6 x 17 mm	10	100-FMS
	Marking Tag Sheet 160 perforated paper labels each, 6 x 17 mm, to be used with a transparent cover	10	100-FMP
	Transparent Cover To be used with marking tag sheets	100	100-FMC
	Marking Tag Adapters To be used with marking tag: - System V4 / V5 - System Bul. 1492W	100 100	100-FMA1 100-FMA2

(1) Must be ordered in multiples of package quantities.

Accessories (NEMA Sizes 4...8)

	Description			Connection Diagrams	For Use with NEMA Size	Standard Auxiliary Contact
		N.O.	N.C.			Cat. No.
	Auxiliary Contact Blocks for Side Mounting with Sequence Terminal Designations 2-pole - Two-way numbering for right or left mounting on the contactor - Quick and easy mounting without tools - Mirror contact performance to the main contactor poles - Low-power switching down to 24V 50 mA	1	1		4...5, left or right inside mounting	100-ES1-11
		1	1		4...5, left or right outside mounting	100-ES2-11
	Low-power Auxiliary Contact Blocks for Side Mounting with Sequence Terminal Designations (1) 1-pole - Two-way numbering for right or left mounting on the contactor - Quick and easy mounting without tools - Mirror contact performance to the main contactor poles - Electronic compatible, 3V 1 mA	1	0		4...5, left or right inside mounting	100-ES1-B10
		0	1		4...5, left or right inside mounting	100-ES1-B01
	Auxiliary Contact Blocks for Side Mounting with Sequence Terminal Designations 2-pole - Two-way numbering for right or left mounting on the contactor - Quick and easy mounting without tools - Mirror contact performance to the main contactor poles - Low power switching down to 24V 50 mA	1	1		6...8, left or right inside mounting	100-ES3-11
		1	1		6...8, left or right outside mounting	100-ES4-11
	Low Power Auxiliary Contact Blocks for Side Mounting with Sequence Terminal Designations (1) 1-pole - Two-way numbering for right or left mounting on the contactor - Quick and easy mounting without tools - Mirror contact performance to the main contactor poles - Electronic compatible, 3V 1 mA	1	0		6...8, left or right inside mounting	100-ES3-B10
		0	1		6...8, left or right inside mounting	100-ES3-B01

(1) No auxiliary contacts blocks can be mounted on the outside of the 100-ES1-10-B* or 100-ES3-B*.

	Description		Connection Diagrams	For Use with NEMA Size	Cat. No.
	Mechanical Interlocks - For interlocking of two contactors. - Interlocking of different sizes possible	Mechanical only, without auxiliary contacts		4	100-EM1-00
				5	
				4	100-EM4-00
				5	100-EM5-00
				6...7 ⁽¹⁾	100-EM2-00
				8 ⁽²⁾	100-EM3-00
				Rod for vertical mounting 6...7 reversing contactors	100-EVR750

(1) Mounting plate ordered separately

(2) Mounting plate included

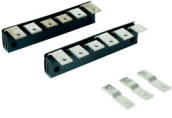
Terminal Lugs (NEMA Size 4...8 Contactors)

	Description	Wire Sizes	For Use with NEMA Size	Cat. No.
	Terminal Lug Kit Standard on 100-E116*L...100-E146*L contactors	2 x 6 AWG...3/0 AWG	4	100-ECL146
	Terminal Lugs	4 AWG...400 MCM	5	100-ETL370
		(2x) 4 AWG...500 MCM		100-ETL370B
		(3x) 2/0 AWG...500 MCM	6	100-ETL580
		(3x) 2/0 AWG...500 MCM	7	100-ETL750

Terminal Shrouds (NEMA Size 4...8 Contactors)

	Description	Contactor with Terminal Lugs	Wires with Compression Lugs	For Use with NEMA Size	Cat. No.
	Terminal Shrouds		X	4	100-ETS146L
			X	5	100-ETS370L
		X			100-ETS370C
			X	6	100-ETS460L
		X			100-ETS460C
			X	7	100-ETS750L
		X			100-ETS750C
	IP20 terminal shield between contactor and 193-E overload relay on an assembled direct on-line starter			4	100-ETC146
	IP20 terminal shield between contactor and 193-E overload relay on an assembled reversing starter			4	100-ETCR146

Wiring Kits (NEMA Size 4...8 Contactors)

	Description		For Use with NEMA Size	Cat. No.
	Reversing Power Wiring Kits		4	105-PW146
			5	105-PW370 ⁽¹⁾
			6	105-PW460 ⁽¹⁾
			7	105-PW750 ⁽¹⁾
	Wye-delta Power Wiring Kits	Delta Contactor	Wye Contactor	Cat. No.
		4	4	170-PW146
		5	5	170-PW370
		6	6	170-PW460
		7	6	170-PW580
		7	7	170-PW750
	Shorting Bars		4	170-PWY146
			5	170-PWY370
			6	170-PWY460
			7	170-PWY750

(1) If 100-ETL* terminal lugs are to be used on line and load side of reversing contactor, two sets of 100-ETX terminal extensions are also required.

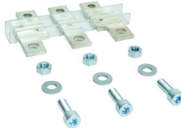
Mounting Plates (NEMA Size 4...8 Contactors)

	Description	For Use with NEMA Size	Cat. No.
	For Direct On-line Starters	4	100-EMS146
	For Reversing Contactors	4	100-EMR146
		5	100-EMR370
		6	100-EMR460
		7	100-EMR750
	For Reversing Starters	4	100-EMRS146

Connection Bars between 100-E Contactors and 140G MCCBs (NEMA Size 4...8 Contactors)

	Description	For Use with Circuit Breaker	For Use with NEMA Size	Cat. No.
	For Connection to 140G or 140MG - Connection between contactors/starters and molded case circuit breakers. - These connection sets are solid copper bars.	140G-H, 140MG-H	4	100-PCE1
		140G-I, 140MG-I		100-PCE2
		140G-J, 140MG-J		100-PCE3
		140G-K, 140MG-K	5	100-PCE5
		140G-M, 140MG-M	6...7	100-PCE6
		140G-K, 140MG-K	6...7	100-PCE7

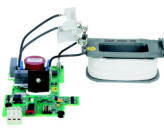
Terminal Enlargements

	Description	For Use with NEMA Size	Cat. No.
	Terminal Enlargements Enlargement pieces that are designed to increase the width of the contactor terminal pads so larger connections can be mounted.	4	100-ETE146
		5	100-ETE370
		6	100-ETE460
		7	100-ETE750

Terminal Extensions

	Description	For Use with Contactor	Cat. No.
	Terminal Extensions Extension pieces that are designed to extend the main terminals of contactors for combined mounting of contactors and connection sets	4	100-ETX146
		5	100-ETX370
		6	100-ETX460
		7	100-ETX750

Renewal Coils (NEMA Size 4...8 Contactors)

	Description	For Use with NEMA Size	Voltage	Cat. No.
	Renewal Coil Modules	4	24-60V AC/DC	TG901
			48-130V AC/DC	TG902
			100-250V AC/DC	TG903
			250-500V AC/DC	TG904
			100-250V AC/DC w/ PLC Interface	TGE903
			250-500V AC/DC w/ PLC Interface	TGE904
		5	24-60V AC/DC	TG909
			48-130V AC/DC	TG910
			100-250V AC/DC	TG911
			250-500V AC/DC	TG912
			100-250V AC/DC w/ PLC Interface	TGE917
			250-500V AC/DC w/ PLC Interface	TGE918
		6	24-60V DC	THE901
			48-130V AC/DC	THE902
			100-250V AC/DC	THE903
			250-500V AC/DC	THE904
		7	24-60V DC	TJE901
			48-130V AC/DC	TJE902
			100-250V AC/DC	TJE903
			250-500V AC/DC	TJE904
		8	100-250V AC/DC	TKE903 ⁽¹⁾
				TKE904 ⁽²⁾

(1) One set of two coils

(2) Printed circuit board

Renewal Contact Kit (NEMA Size 4...8 Contactors)

	Description	For Use with NEMA Size	Cat. No.
	Renewal Contact Kits	4	100-EA146
		5	100-EA265
		6	100-EA460
		7	100-EA750
		8	100-EA2050
	Renewal Arc Chutes	6	100-EC460
		7	100-EC750
		8	100-EC1060

Specifications (NEMA Sizes 0...3)

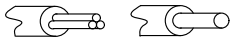
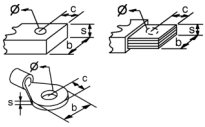
Technical Specifications

		NEMA Size			
		0	1	2	3
Coil Type:	Conventional	X	X	X	X
Resistance and Power Dissipation					
Main current circuit resistance	[mΩ]	2.7	2	1.5	0.9
Power dissipation by all circuits at I_e AC-3/400V	[W]	2.1	8.2	8.3	19.5
Total Power Dissipation					
At I_e AC-3/400V	AC [W]	4.7	11.2	11.5	17.5
	DC [W]	8.1	17.4	18.4	17.5
Life Span					
Mechanical AC control	[Mil. operations]	13	13	12	10
Mechanical DC control	[Mil. operations]	13	13	13	10
Electrical AC-3 (400 V)	[Mil. operations]	1.3	1.3	1	1

Coil Data

			NEMA Size			
			0	1	2	3
Coil Type:	Conventional		X	X	X	X
Operating Limits						
50 Hz, 60 Hz, 50/60 Hz	pick up	[x Us]	0.85...1.1		0.85...1.1	
	drop out	[x Us]	0.3...0.6		0.3...0.6	
DC (conventional)	pick up	[x Us]	0.8...1.1		0.8...1.1	
	drop out	[x Us]	0.1...0.6		0.1...0.6	
DC (electronic)	pick up	[x Us]	0.7...1.25			—
	drop out	[x Us]	0.4			—
Coil Consumption						
50 Hz, 60 Hz, 50/60 Hz	pick up	[VA/W]	70/50	80/60	130/90	200/110
	hold in	[VA/W]	8/2.6	9/3	10/3.2	16/4.5
DC (conventional)	pick up	[W]	6.5	9.2	10.1	200
	hold in	[W]	6.5	9.2	10.1	4.5
DC (electronic)	pick up	[W]	17	17	10.1	—
	hold in	[W]	1.7	1.7	10.1	—
Operating Times						
AC	closing delay	[ms]	15...30	15...30	15...30	20...40
	opening delay	[ms]	10...60	10...60	10...60	10...60
with RC module	opening delay	[ms]	10...60	10...60	10...60	10...60
	closing delay	[ms]	40...70	50...80	50...80	20...40
DC (conventional)	opening delay	[ms]	7...15	7...15	7...15	—
	opening delay	[ms]	14...20	17...23	17...23	≤ 220V, 20...35
with integrated diode with external diode	opening delay	[ms]	70...95	80...125	80...125	—
	closing delay	[ms]	—	20...40		—
DC (electronic)	opening delay	[ms]	—	20...40		—
Maximum Ripple			± 15%			—
Minimum OFF Time			200			—

Conductor Cross Sections

			NEMA Size			
			0	1	2	3
Coil Type: Conventional			X	X	X	X
Conductor Cross Sections - Main Contacts Terminal Type			(1) 	(2) 	(3) 	
	1 conductor	[mm ²]	1...4	2.5...10	2.5...16	2.5...35
	2 conductors	[mm ²]	1...4	2.5...10	2.5...10	2.5...25
	1 conductor	[mm ²]	1.5...6	2.5...16	2.5...25	2.5...50
	2 conductors	[mm ²]	1.5...6	2.5...16	2.5...16	2.5...35
	b max.	[mm]	—	—	—	—
	c max.	[mm]	—	—	—	—
	s max.	[mm]	—	—	—	—
	Ø min.	[mm]	—	—	—	—
Cross section per UL/CSA		[AWG]	16...10	14...4	14...4	14...1
Recommended torque		[lb•in.]	13.3...22	22...31	22...31	31...53
Recommended torque		[N•m]	1.5...2.5	2.5...3.5	2.5...3.5	3.5...6

(1) Pozidriv No. 2/Blade No. 3 screw.

(2) Pozidriv No. 2/Blade No. 4 screw.

(3) Hexagonal socket screw.

Specifications (NEMA Sizes 4...8)

Technical Specifications

		Bulletin 300, 300S
		NEMA Sizes 4...8
Rated Isolation Voltage U_i		
IEC	[V]	1000
UL, CSA	[V]	600
Rated Impulse Voltage Withstand U_{imp}	[kV]	8
Rated Voltage U_e		
AC 50/60 Hz	[V]	115, 200, 230, 240, 400, 415, 460 500, 575, 690, 1000
DC	[V]	24, 48, 110, 220, 440
Electromagnetic compatibility		IEC 60947-1 - Environment A
Insulation Class of the Coil		Class F per IEC 60947-4-1
Rated coil frequency		AC 50/60 Hz, DC

Specifications, Main Circuits

NEMA Size		4	5	6	7	8
Coil Type:	Electronic	X	X	X	X	X

AC-1 Active Power Load (50/60 Hz);
Ambient Temperature 40°C

	690V	[A]	225	400	700	1050	2050
	1000V	[A]	225	350	700	1000	2050
	230V	[kW]	90	159	279	418	817
	240V	[kW]	94	166	291	436	852
	400V	[kW]	156	277	485	727	1420
	415V	[kW]	162	288	503	755	1474
	500V	[kW]	195	346	606	909	1775
	690V	[kW]	269	478	837	1255	2450
	1000V	[kW]	390	606	1212	1732	3551

Ambient Temperature 60°C

	690V	[A]	200	350	600	875	1750
	1000V	[A]	200	300	600	875	1750
	230V	[kW]	80	139	239	349	697
	240V	[kW]	83	145	249	364	727
	400V	[kW]	139	242	416	606	1212
	415V	[kW]	144	252	431	629	1258
	500V	[kW]	173	303	520	758	1516
	690V	[kW]	239	418	717	1046	2091
	1000V	[kW]	346	520	1039	1516	3031

Ambient Temperature 70°C

	690V	[A]	175	290	480	720	1500
	1000V	[A]	175	240	480	720	1500
	230V	[kW]	70	116	191	287	598
	240V	[kW]	73	121	200	299	624
	400V	[kW]	121	201	333	499	1039
	415V	[kW]	126	208	345	518	1078
	500V	[kW]	152	251	416	624	1299
	690V	[kW]	209	347	574	860	1793
	1000V	[kW]	303	416	831	1247	2598
With conductor sizes		[mm ²]	95	240	2x240	800 ⁽¹⁾	2000

(1) Maximum connection bar width 50 mm.

Specifications, Main Circuits, Continued

NEMA Size		4	5	6	7	8	
Coil Type:	Electronic	X	X	X	X	X	
Switching of 3-phase Motors; (50 Hz) Ambient Temperature 60°C, AC-2, AC-3							
	220-240V	[A]	146	265	460	750	—
	380-400V	[A]	146	265	460	750	—
	415V	[A]	146	265	460	750	—
	440V	[A]	146	265	460	750	—
	500V	[A]	130	250	460	750	—
	690V	[A]	93	250	400	650	—
	1000V	[A]	60	100	200	300	—
	220-240V	[kW]	45	75	132	220	—
	380-400V	[kW]	75	132	250	400	—
	415V	[kW]	75	132	250	425	—
	440V	[kW]	90	160	250	450	—
	500V	[kW]	90	200	315	530	—
	690V	[kW]	90	200	355	600	—
	1000V	[kW]	75	132	280	400	—
Load Carrying Capacity Per UL/CSA							
General Purpose Current (enclosed)							
	[A]	200	350	650	900	2100	
Rated Power (enclosed)							
3-phase	200V	[A]	120	221	414	692	—
	230V	[A]	130	248	480	722	—
	460V	[A]	124	240	477	722	—
	575V	[A]	125	242	472	672	—
	200V	[Hp]	40	75	150	250	—
	230V	[Hp]	50	100	200	300	—
	460V	[Hp]	100	200	400	600	—
	575V	[Hp]	125	250	500	700	—
With 3 poles in series	260V DC	[A]	200	—	—	—	—
	300V DC	[A]	—	—	—	—	—
	340V DC	[A]	—	350	—	—	—
	600V DC	[A]	—	—	650	900	1900

NEMA Size		4	5	6	7	8	
Coil Type:	Electronic	X	X	X	X	X	
Switching of 3-phase Motors, (50Hz); Ambient Temperature 60°C, AC-4							
	230V	[A]	103	195	377	—	—
	240V	[A]	103	195	377	—	—
	400V	[A]	103	195	377	—	—
	415V	[A]	103	195	377	—	—
	500V	[A]	103	195	377	—	—
	690V	[A]	80	153	350	—	—
	1000V	[A]	48	90	155	—	—
	230V	[kW]	32	55	110	—	—
	240V	[kW]	32	63	125	—	—
	400V	[kW]	55	110	200	—	—
	415V	[kW]	55	110	220	—	—
	500V	[kW]	63	132	250	—	—
	690V	[kW]	75	150	335	—	—
	1000V	[kW]	63	125	220	—	—
AC-4 at Approximately 200'000 Operations							
	230V	[A]	38	73	135	—	—
	240V	[A]	38	73	135	—	—
	400/415V	[A]	38	73	135	—	—
	500V	[A]	33	53	89	—	—
	690V	[A]	33	53	89	—	—
	1000V	[A]	—	—	—	—	—
	230V	[kW]	11	22	40	—	—
	240V	[kW]	11	22	45	—	—
	400V	[kW]	20	40	75	—	—
	415V	[kW]	20	40	75	—	—
	500V	[kW]	22	37	63	—	—
	690V	[kW]	30	50	80	—	—
	1000V	[kW]	—	—	—	—	—
Max. switching frequency		Ops/h	150	150	60	—	—
Wye-delta (60 Hz)							
	200V	[Hp]	75	150	300	450	—
	230V	[Hp]	75	150	350	500	—
	460V	[Hp]	150	350	700	1000	—
	575V	[Hp]	200	450	800	1250	—

Specifications, Main Circuits, Continued

NEMA Size			4	5	6	7	8
Coil Type:	Electronic		X	X	X	X	X
UL/CSA Elevator Duty							
	200V	[A]	54	—	—	—	—
	230V	[A]	54	—	—	—	—
	460V	[A]	54	—	—	—	—
	575V	[A]	54	—	—	—	—
	200V	[Hp]	15	—	—	—	—
	230V	[Hp]	20	—	—	—	—
	460V	[Hp]	40	—	—	—	—
	575V	[Hp]	50	—	—	—	—
UL/CSA HVAC Applications							
Definite purpose rating (3-phase)							
FLA		[A]	160	300	—	—	—
LRA	230V	[A]	960	1800	—	—	—
	460V	[A]	800	1500	—	—	—
	575V	[A]	640	1200	—	—	—
AC resistance heating	600V	[A]	200	400	—	—	—
Star-delta Starting (50 Hz)							
	≥ 230V	[A]	252	458	796	1299	—
	≥ 240V	[A]	252	458	796	1299	—
	400V	[A]	252	458	796	1299	—
	415V	[A]	252	458	796	1299	—
	500V	[A]	225	433	796	1299	—
	690V	[A]	161	433	692	1125	—
	1000V	[A]	103	173	346	519	—
	230V ⁽¹⁾	[kW]	75	132	250	400	—
	240V ⁽¹⁾	[kW]	75	132	250	400	—
	400V ⁽¹⁾	[kW]	132	250	400	710	—
	415V ⁽¹⁾	[kW]	132	250	400	800	—
	500V ⁽¹⁾	[kW]	160	315	500	800	—
	690V ⁽¹⁾	[kW]	132	400	710	1100	—
	1000V ⁽¹⁾	[kW]	132	250	500	710	—

(1) Power ratings at 50 Hz: Preferred values according to IEC 60947-4-1

Specifications, Main Circuits, Continued

NEMA Size		4	5	6	7	8
Coil Type:	Electronic	X	X	X	X	X

Switching of Power Transformers, AC-6a (50 Hz)

Inrush Current
Rated transformer current = n

n = 30	≥ 230V	[A]	79	143	252	286	—
	≥ 240V	[A]	79	143	252	286	—
	≥ 400V	[A]	79	143	252	286	—
	≥ 415V	[A]	79	143	252	286	—
	≥ 500V	[A]	79	143	252	286	—
	≥ 690V	[A]	79	143	252	286	—
	≥ 1000V	[A]	—	—	—	—	—
	230V	[kVA]	31	57	100	114	—
	240V	[kVA]	33	59	105	119	—
	400V	[kVA]	55	99	175	198	—
	415V	[kVA]	56	102	179	203	—
	500V	[kVA]	68	124	218	248	—
	690V	[kVA]	94	171	301	342	—
	1000V	[kVA]	—	—	—	—	—
n = 20	≥ 690V	[A]	119	215	378	429	—
n = 15	≥ 690V	[A]	158	286	504	572	—

60 Hz Peak Inrush/peak Rated Transformer Current

n = 30	≥ 660V	[A]	79	143	252	286	—
	200V	[kVA]	27	50	87	99	—
	208V	[kVA]	28	52	91	103	—
	240V	[kVA]	33	59	105	119	—
	480V	[kVA]	66	119	210	238	—
	600V	[kVA]	82	149	262	297	—
	660V	[kVA]	90	163	288	327	—
n = 20	≥ 660V	[A]	119	215	378	429	—
	200V	[kVA]	41	74	131	149	—
	208V	[kVA]	43	77	136	155	—
	240V	[kVA]	49	89	157	178	—
	480V	[kVA]	99	179	314	357	—
	600V	[kVA]	124	223	393	446	—
	660V	[kVA]	136	246	432	490	—
n = 15	≥ 660V	[A]	158	286	504	572	—
	200V	[kVA]	55	99	175	198	—
	208V	[kVA]	57	103	182	206	—
	240V	[kVA]	66	119	210	238	—
	480V	[kVA]	131	238	419	476	—
	600V	[kVA]	164	297	524	594	—
	660V	[kVA]	181	327	576	654	—

Specifications, Main Circuits, Continued

NEMA Size			4	5	6	7	8
Coil Type:	Electronic		X	X	X	X	X
Switching of 3-phase Capacitors, AC-6b (50 Hz)							
Single capacitor 40 °C	230V	[kVar]	50	85	140	220	—
	240V	[kVar]	50	85	140	220	—
	400V	[kVar]	90	145	240	400	—
	415V	[kVar]	90	145	240	400	—
	500V	[kVar]	110	180	325	490	—
	690V	[kVar]	110	200	325	600	—
	1000V	[kVar]	100	155	300	450	—
Single capacitor 55 °C	230V	[kVar]	50	85	140	220	—
	240V	[kVar]	50	85	140	220	—
	400V	[kVar]	90	145	240	400	—
	415V	[kVar]	90	145	240	400	—
	500V	[kVar]	110	180	325	490	—
	690V	[kVar]	110	200	325	600	—
	1000V	[kVar]	100	155	300	450	—
Single capacitor 70 °C	230V	[kVar]	42	70	120	190	—
	240V	[kVar]	42	70	120	190	—
	400V	[kVar]	74	135	225	370	—
	415V	[kVar]	74	135	225	370	—
	500V	[kVar]	96	165	300	435	—
	690V	[kVar]	110	200	325	600	—
	1000V	[kVar]	95	140	270	400	—
60 Hz Single Capacitor							
Single capacitor 40 °C	200V	[kVar]	41.569	83	137	205	—
	230V	[kVar]	47.804	95	157	236	—
	460V	[kVar]	100	200	329	494	—
	600V	[kVar]	125	250	410	618	—
Switching of Lamps							
Gas discharge lamps AC-5a	open	[A]	146	265	460	750	1332
UL Ballast ratings		[A]	200	400	—	—	—
Filament AC-5b	230/240V	[A]	146	265	460	750	1332

Specifications, Main Circuits, Continued

	NEMA Size	4	5	6	7	8
Coil Type:	Electronic	X	X	X	X	X

Switching of DC loads

Non-inductive or slightly inductive loads or resistance furnaces DC-1 at 60 °C

1 pole	24V	[A]	200	400	700	1050	2050
	48/60V	[A]	200	400	700	1050	2050
	110V	[A]	—	400	700	1050	2050
	220V	[A]	—	—	—	—	—
	440V	[A]	—	—	—	—	—
2 poles in series	24V	[A]	200	400	700	1050	2050
	48/60V	[A]	200	400	700	1050	2050
	110V	[A]	200	400	700	1050	2050
	220V	[A]	—	400	700	1050	—
	440V	[A]	—	—	—	—	—
3 poles in series	24V	[A]	200	400	700	1050	2050
	48/60V	[A]	200	400	700	1050	2050
	110V	[A]	200	400	700	1050	2050
	220V	[A]	200	400	700	1050	2050
	440V	[A]	—	—	700	1050	2050

Shunt-wound Motors

Starting, reverse current breaking, reversing, stepping DC-3, 60 °C

3 poles in series	24V	[A]	160	350	700	1050	—
	48/60V	[A]	160	350	700	1050	—
	110V	[A]	160	350	700	1050	—
	220V	[A]	160	350	700	1050	—
	440V	[A]	—	—	700	1050	—

Series-wound Motors

Starting, reverse current breaking, reversing, stepping DC-5, 60 °C

3 poles in series	24V	[A]	160	350	700	1050	—
	48/60V	[A]	160	350	700	1050	—
	110V	[A]	160	350	700	1050	—
	220V	[A]	160	350	700	1050	—
	440V	[A]	—	—	700	1050	—

Short Time Withstand I_{CW} 40 °C

	1 s	[A]	1460	2650	4600	7000	12000
	10 s	[A]	1168	2120	4400	6400	10000
	30 s	[A]	674	1224	3100	4500	7500
	1 min	[A]	477	865	2500	3500	5500
	15 min	[A]	225	400	840	1300	2200

NEMA Size		4	5	6	7	8
Resistance and Power Dissipation						
Main current circuit resistance	[mΩ]	0.454	0.200	0.086	0.045	0.030
Power dissipation per pole at I_e AC-1, 400V	[W]	23	32	42	50	125
Power dissipation per pole at I_e AC-3/400V	[W]	10	14	21	28	—
Total power dissipation at:						
I_e AC-3, 400V; AC/DC control (120-250V)	[W]	33	46.5	68	89	—
Maximum Switching Frequency						
AC-1	ops /hr	300	300	300	300	60
AC-3	ops /hr	300	300	300	300	—
AC-2, AC-4	ops /hr	150	150	60	60	—
Weight						
AC/DC (Electronic) with bar connections	kg (lbs.)	1.50 (3.3)	4.64 (10.2)	12 (26.4)	15 (33)	35 (77)
with built-in cable clamps	kg (lbs.)	1.75 (3.85)	—	—	—	—

Specifications, Main Circuits, Continued

NEMA Size		4	5	6	7	8
Coil Type:	Electronic	X	X	X	X	X
Short Circuit Coordination (Max. Fuse or Circuit Breaker Rating) Per IEC 60947-4-1						
DIN Fuses - gG		100 kA available fault current				
Type "2" (400V)	[A]	250	400	630	800	—
DIN Fuses - gG		80 kA available fault current				
Type "2" (690V)	[A]	200	400	630	800	—
MCCB		70 kA available fault current				
Type "2" (400V)	[A]	160	400	630	1000	—
Short Circuit Current Rating (Max. Fuse or Circuit Breaker Rating) Per UL 60947 and CSA 22.2 No. 14 (Contactor and Fuses or Circuit Breaker Only)						
UL Class RK5 Fuses		10 kA available fault current				
Type 1 Combination (600V)	[A]	250	—	—	—	—
UL Class L Fuses		18 kA available fault current				
Type 1 Combination (600V)	[A]	—	800	—	—	—
UL Class L Fuses		30 kA available fault current				
Type 1 Combination (600V)	[A]	—	—	1000	—	—
UL Class L Fuses		85 kA available fault current				
Type 1 Combination (600V)	[A]	—	—	—	—	—
UL Class J and CSA HRCI-J Fuses		100 kA available fault current				
Type 1 Combination (600V)	[A]	250	600	600	—	—
Type 2 Combination (600V)	[A]	200	600	600	—	—
UL Class L Fuses		100 kA available fault current				
Type 1 Combination (600V)	[A]	—	—	800	1200	—
Type 2 Combination (600V)	[A]	—	—	—	1200	—
UL Inverse-Time Circuit		42 kA available fault current				
Type 1 Combination (480V)	[A]	—	—	—	1200	—
UL Inverse-Time Circuit		65 kA available fault current				
Type 2 Combination (480V)	[A]	250	800	800	800	—
UL Inverse-Time Circuit		84 kA available fault current				
Type 1 Combination (480V)	[A]	—	—	800	—	—
UL Inverse-Time Circuit		89 kA available fault current				
Type 1 Combination (480V)	[A]	—	—	—	800	—
UL Inverse-Time Circuit		100 kA available fault current				
Type 1 Combination (480V)	[A]	250	800	—	—	—
UL Inverse-Time Circuit		25 kA available fault current				
Type 2 Combination (600V)	[A]	250	—	—	—	—
UL Inverse-Time Circuit		35 kA available fault current				
Type 2 Combination (600V)	[A]	—	800	800	800	—
UL Inverse-Time Circuit		42 kA available fault current				
Type 1 Combination (600V)	[A]	—	800	800	800	—
UL Inverse-Time Circuit		50 kA available fault current				
Type 1 Combination (600V)	[A]	250	—	—	—	—
UL Inverse-Time Circuit		65 kA available fault current				
Type 1 Combination (600V)	[A]	—	400	—	—	—

Coil Data

	NEMA Size	4	5	6	7	8
Coil Type:	Electronic	X	X	X	X	X

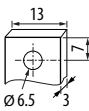
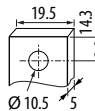
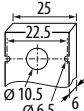
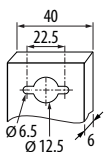
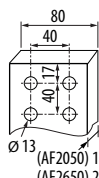
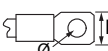
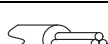
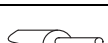
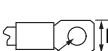
Operating Limits

50/60 Hz	pick-up	[x U_s]	0.85...1.1				
	dropout	[x U_s]	0.55				
DC control	pick-up	[x U_s]	0.80...1.1				
	dropout	[x U_s]	0.55				
24...60V AC	pick-up	[VA]	225	475	—	—	—
	hold-in	[VA]	5.5	8.5	—	—	—
48...130V AC	pick-up	[VA]	170	340	1215	1100	—
	hold-in	[VA]	4	17	12	12	—
100...250V AC	pick-up	[VA]	130	385	955	880	2450
	hold-in	[VA]	6	17.5	12	12	48
250...500V AC	pick-up	[VA]	205	420	950	985	—
	hold-in	[VA]	16	21	12	12	—
24...60V DC	pick-up	[W]	210	400	900	785	—
	hold-in	[W]	2.5	3.5	5	5.5	—
48...130V DC	pick-up	[W]	130	360	1150	1020	—
	hold-in	[W]	2.5	2.5	5	5	—
100...250V DC	pick-up	[W]	135	410	895	880	2290
	hold-in	[W]	3	4.5	5	5	20.5
250...500V DC	pick-up	[W]	205	600	885	910	—
	hold-in	[W]	4	4.7	7.5	7.5	—

Operating Times

AC or DC	closing delay	[ms]	20...55	30...60	50...120	50...120	50...80
	opening delay	[ms]	40...70	45...80	33...70	33...70	35...55
With PLC Interface	closing delay	[ms]	20...31	25...45	40...60	40...90	40...65
	opening delay	[ms]	24...34	25...45	10...30	10...30	10...30

Cross Sections, Screw Type Terminals

NEMA Size			4	5	6	7	8
Coil Type:	Electronic		X	X	X	X	X
Main Terminals							
Conductor Cross Sections — Main Contacts (Terminal Type)							
	(1) conductor	[mm ²]	10...95	16...400	—	—	—
	Clamp Type		100-ECL146	100-ETL370	—	—	—
Recommended torque		[Nm]	8	42	—	—	—
	(2) conductors	[mm ²]	10...95	16...500	70...500	70...500	—
	Clamp Type		100-ECL146	100-ETL370B	100-ETL580	100-ETL750	—
Recommended torque		[Nm]	8	42	31	43	—
	(3) conductors	[mm ²]	—	—	—	70...500	—
	Clamp Type		—	—	—	100-ETL750	—
Recommended torque		[Nm]	—	—	—	43	—
	L max.	[mm]	22	32	47	50	100
	Ø min.	[mm]	6	10	10	12	12
Recommended torque		[Nm]	9	28	35	45	45
Cross Section Per UL/CSA							
	(1) conductor	[AWG]	3...3/0	4...400 ⁽¹⁾	—	—	—
	Clamp Type		100-ECL146	100-ETL370	—	—	—
Recommended torque		[lb-in]	80	375	—	—	—
	(2) conductors	[AWG]	6...3/0	4...500 ⁽¹⁾	2/0...500 ⁽¹⁾	2/0...500 ⁽¹⁾	—
	Clamp Type		100-ECL146	100-ETL370B	100-ETL580	100-ETL750	—
Recommended torque		[lb-in]	80	375	275	375	—
	(3) conductors	[AWG]	—	—	—	2/0...500 ⁽¹⁾	—
	Clamp Type		—	—	—	100-ETL750	—
Recommended torque		[lb-in]	—	—	—	375	—
	L max.	[in]	0.866	1.26	1.85	1.97	3.94
	Ø min.	[in]	0.236	0.394	0.394	0.472	0.472
Recommended torque		[lb-in]	80	248	310	398	398
Conductor Cross Sections — Coil Terminals (Terminal Type)							
	(1) conductor	[mm ²]	0.75...2.5				
	(2) conductors	[mm ²]	0.75...2.5				
	(1) conductor	[mm ²]	1...4				
	(2) conductors	[mm ²]	1...4				
Recommended torque		[Nm]	1...1.2				
Cross section per UL/CSA		[AWG]	18...14				
Recommended torque		[lb-in]	8.9...10.6				

(1) MCM

Specifications, Auxiliary Contacts

			Auxiliary Contact for 100/104-E, 100S-E		
			Standard 100-ES1/2*	Standard 100-ES3/4*	Low Power 100-ES*-B*
Switching of AC Loads					
Rated Insulation voltage U_i			690V	690V	250V
Rated operating voltage U_e			690V	690V	125V
Rated impulse withstand voltage U_{imp}			6kV	6kV	1.5kV
AC-12 I_{th}	at 40 °C	[A]	16	16	0.1
	at 60 °C	[A]	—	—	—
AC-14 at rated voltage of	24V	[A]	—	—	0.1
	42/48V	[A]	—	—	0.1
	120V	[A]	—	—	0.1
AC-15 at rated voltage of	24V	[A]	6	6	—
	42/48V	[A]	6	6	—
	120V	[A]	6	6	—
	230V	[A]	4	4	—
	240V	[A]	4	4	—
	400V	[A]	3	3	—
	415V	[A]	3	3	—
	500V	[A]	2	2	—
	690V	[A]	2	2	—
Switching of DC Loads					
DC-12 L/R < 1 ms resistive loads at	24V DC	[A]	—	—	0.1
	48V DC	[A]	—	—	0.1
	110V DC	[A]	—	—	0.1
	220V DC	[A]	—	—	—
	440V DC	[A]	—	—	—
DC-14 L/R < 15 ms inductive loads with economy resistor in series at	24V DC	[A]	—	—	—
	48V DC	[A]	—	—	—
	110V DC	[A]	—	—	—
	220V DC	[A]	—	—	—
	440V DC	[A]	—	—	—
DC-13 switching electromagnets at	24V DC	[A]	3	6	—
	48V DC	[A]	1.5	2.8	—
	110V DC	[A]	0.55	0.55	—
	220V DC	[A]	0.3	0.3	—
	440V DC	[A]	—	—	—
Fuse gG					
Short circuit protection with no welding of contacts per IEC 60947-5-2		[A]	10	10	0.1
		[A]	10	10	0.1
Protective Separation per IEC 60947-1, Annex N					
Min. switching capacity at 24V IEC 60947-5-4		[mA]	50	50	—
Min. switching capacity at 3V IEC 60947-5-4		[mA]	—	—	1
Load Carrying Capacity Per UL/CSA					
Rated voltage	AC	[V]	600	600	125
Continuous rating	40 °C	[A]	10	10	0.1
Switching capacity	AC		A 600	A 600	—
Rated voltage	DC	[V]	250	250	125
Continuous rating	40 °C	[A]	2.5	2.5	0.1
Switching capacity	DC		P 600	Q 300	—

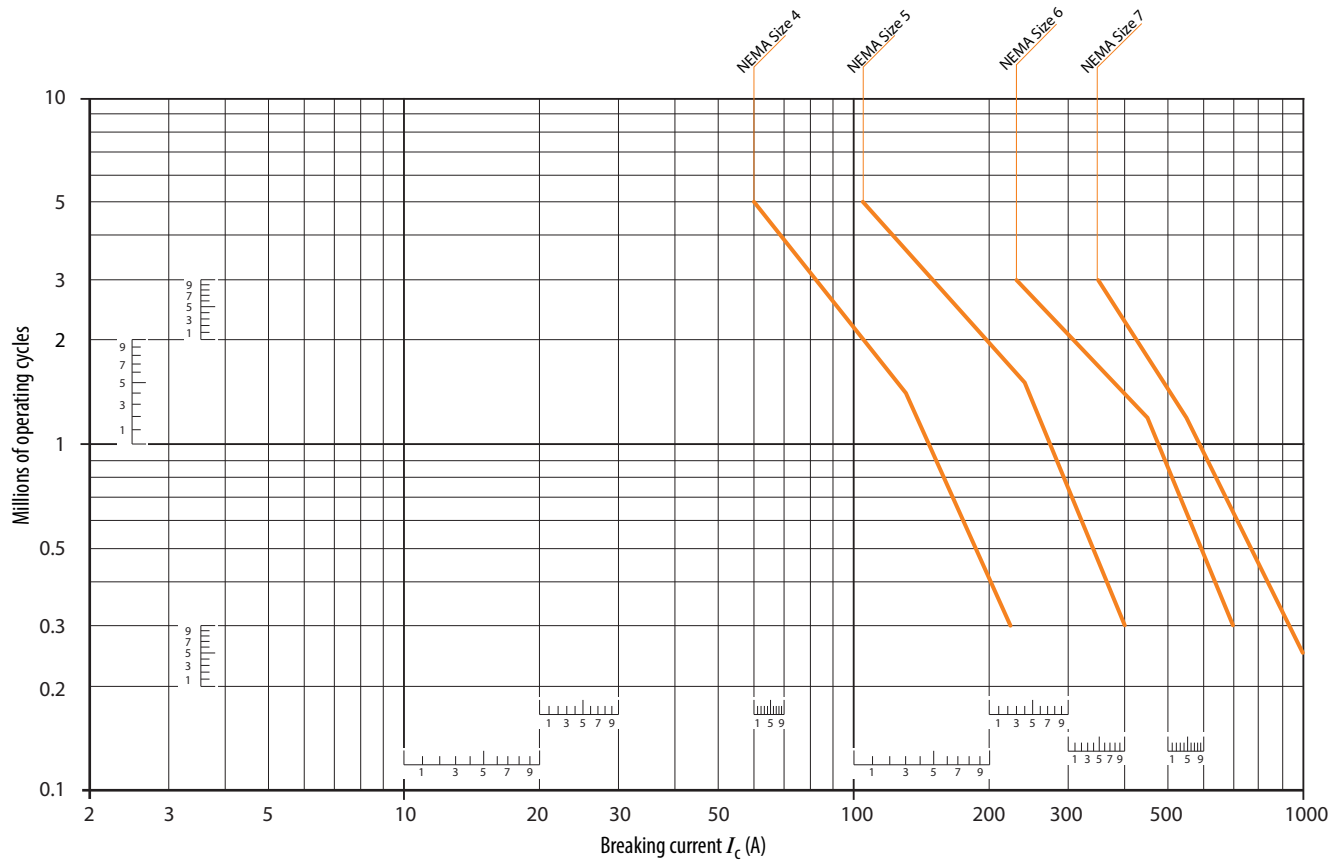
Life-load Curves

3-pole Contactors — Electrical Durability

Electrical Durability for AC-1 Utilization Category - $U_e \leq 690V$

Switching non-inductive or slightly inductive loads. The breaking current I_c for AC-1 is equal to the rated operating current of the load.

Ambient temperature (see [page 19](#)) and maximum electrical switching frequency (see [page 26](#)).

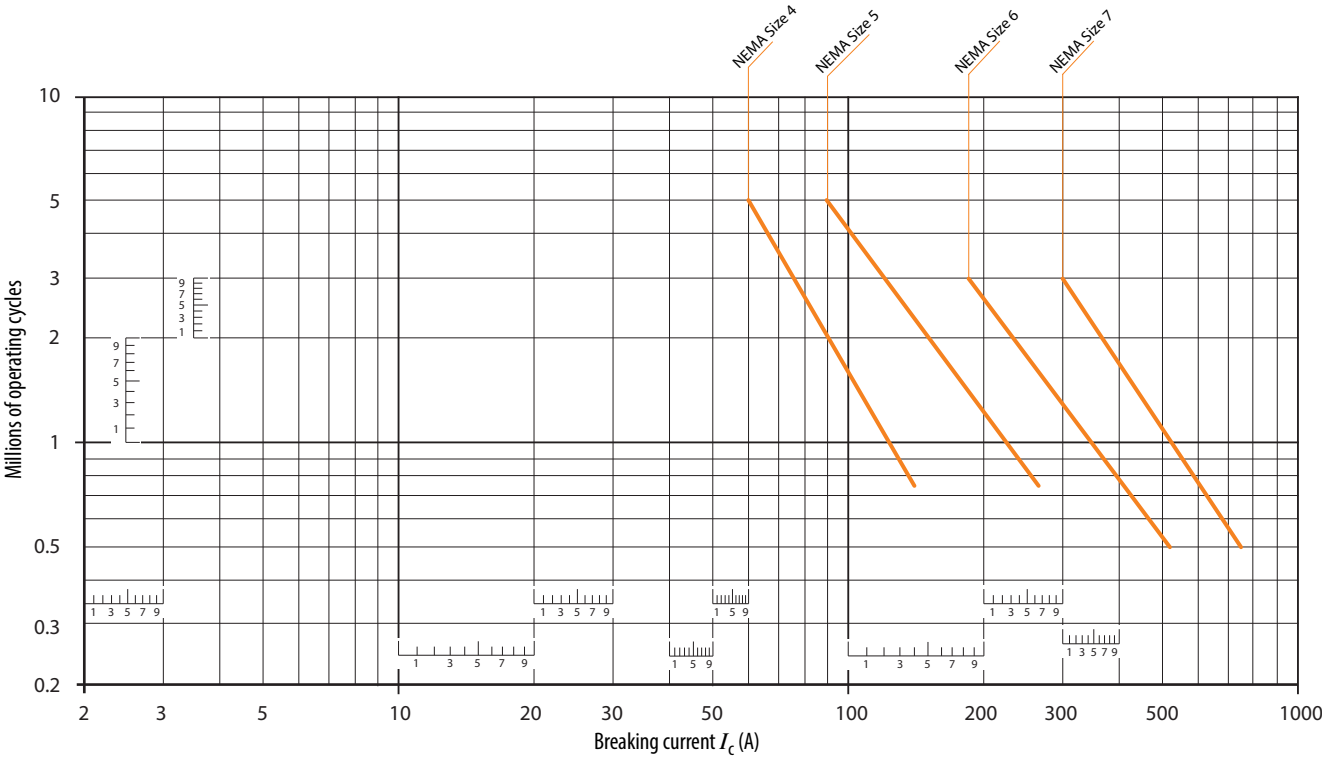


E860, E1060: The electrical durability at the rated current is 50 000 operating cycles.

Electrical Durability for AC-3 Utilization Category - $U_e \leq 440V$

Switching cage motors: starting and switching off running motors. The breaking current I_c for AC-3 is equal to the rated operating current I_e (I_e = motor full load current).

For ambient temperature (see [page 19](#)) and maximum electrical switching frequency (see [page 26](#)).

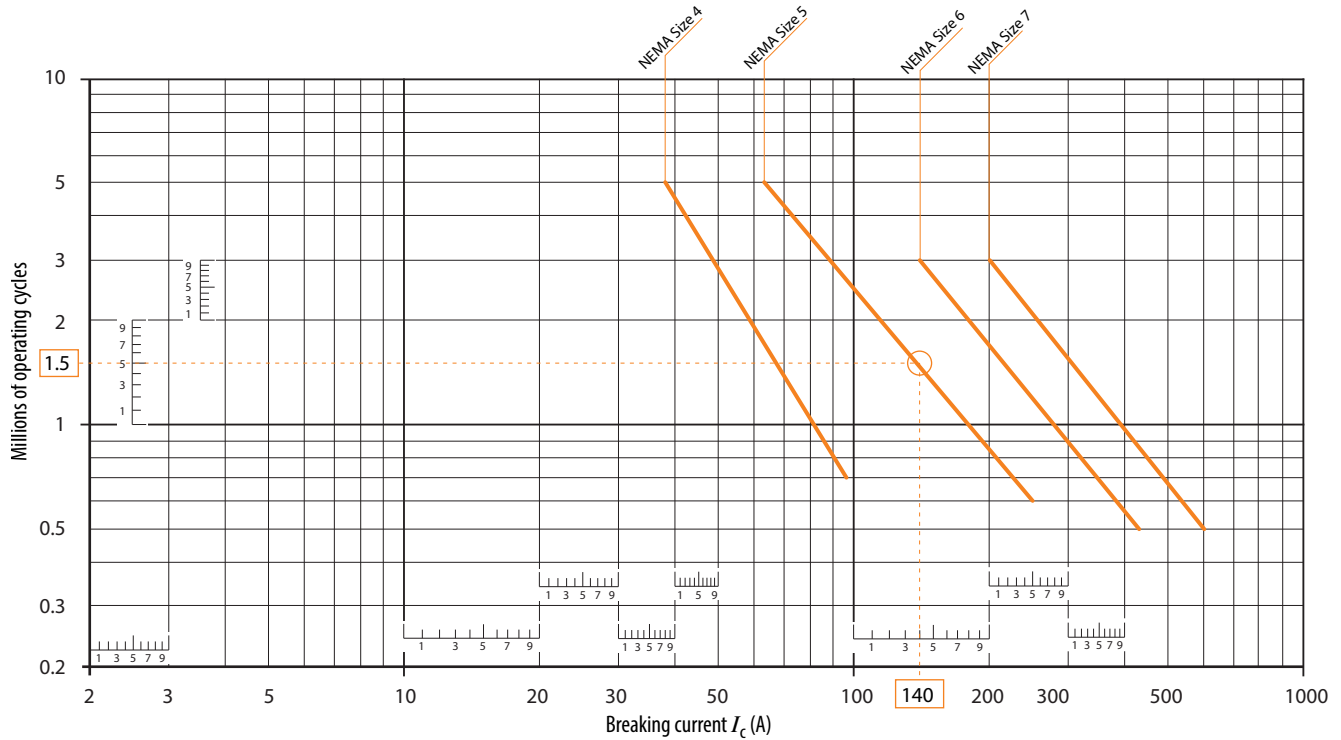


E860, E1060: The electrical durability at the rated current is 50 000 operating cycles.

Electrical Durability for AC-3 Utilization Category - $440V < U_e \leq 690V$

Switching cage motors: starting and switching off running motors. The breaking current I_c for AC-3 is equal to the rated operating current I_e (I_e = motor full load current).

For ambient temperature (see [page 19](#)) and maximum electrical switching frequency (see [page 26](#)).



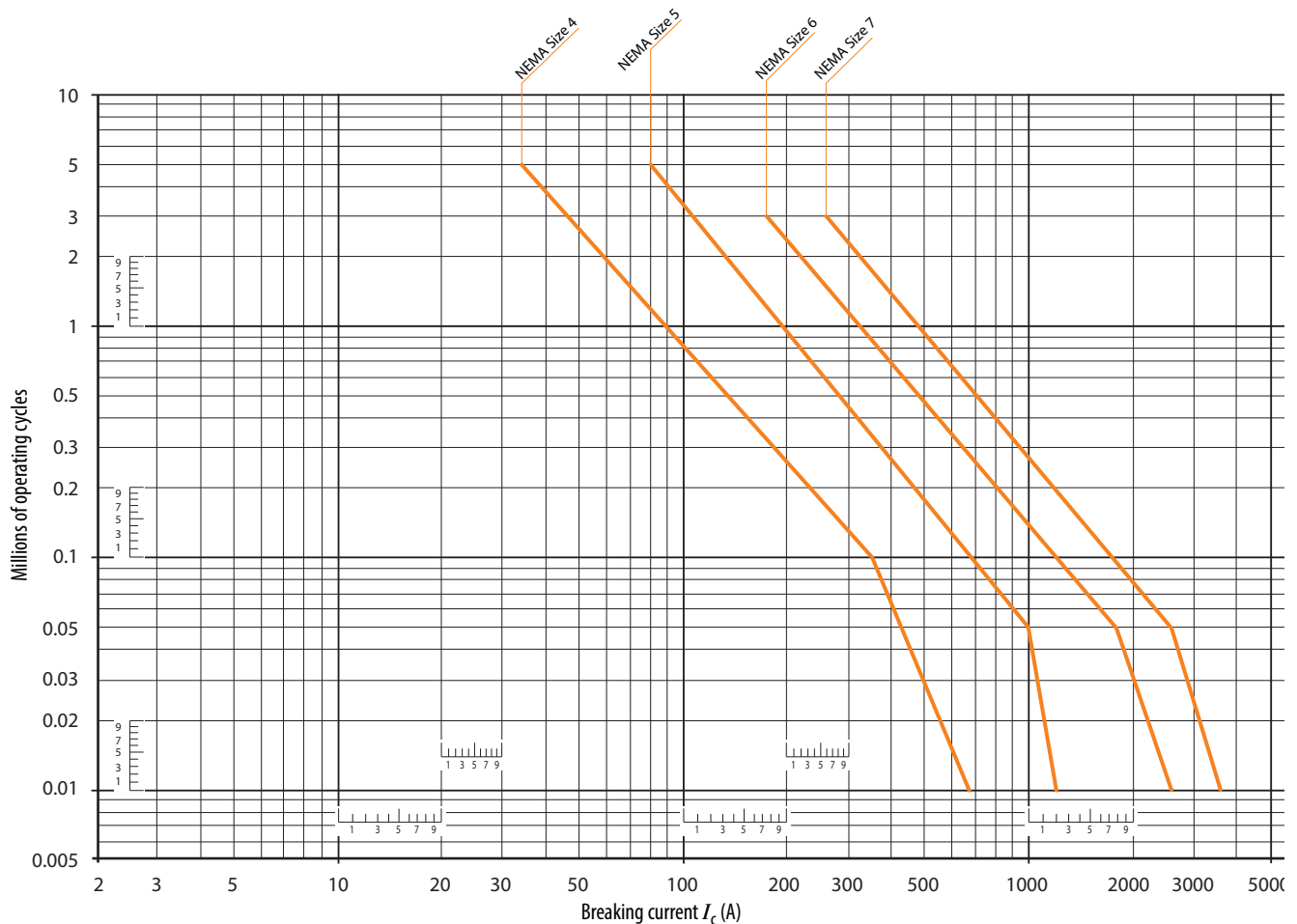
E860, E1060: The electrical durability at the rated current is 50 000 operating cycles.

Electrical Durability for AC-2 or AC-4 Utilization Category - $U_e \leq 440V$

Ambient temperature $\leq 60^\circ\text{C}$ for AF09...AF370, $\leq 55^\circ\text{C}$ for AF400...AF1650

Switching cage motors: starting, reverse operation and step-by-step operation. The breaking current I_c is equal to $2.5 \times I_e$ for AC-2 and $6 \times I_e$ for AC-4, keeping in mind that I_e is the motor rated operating current (I_e = motor full-load current).

For maximum electrical switching frequency (see [page 26](#)).

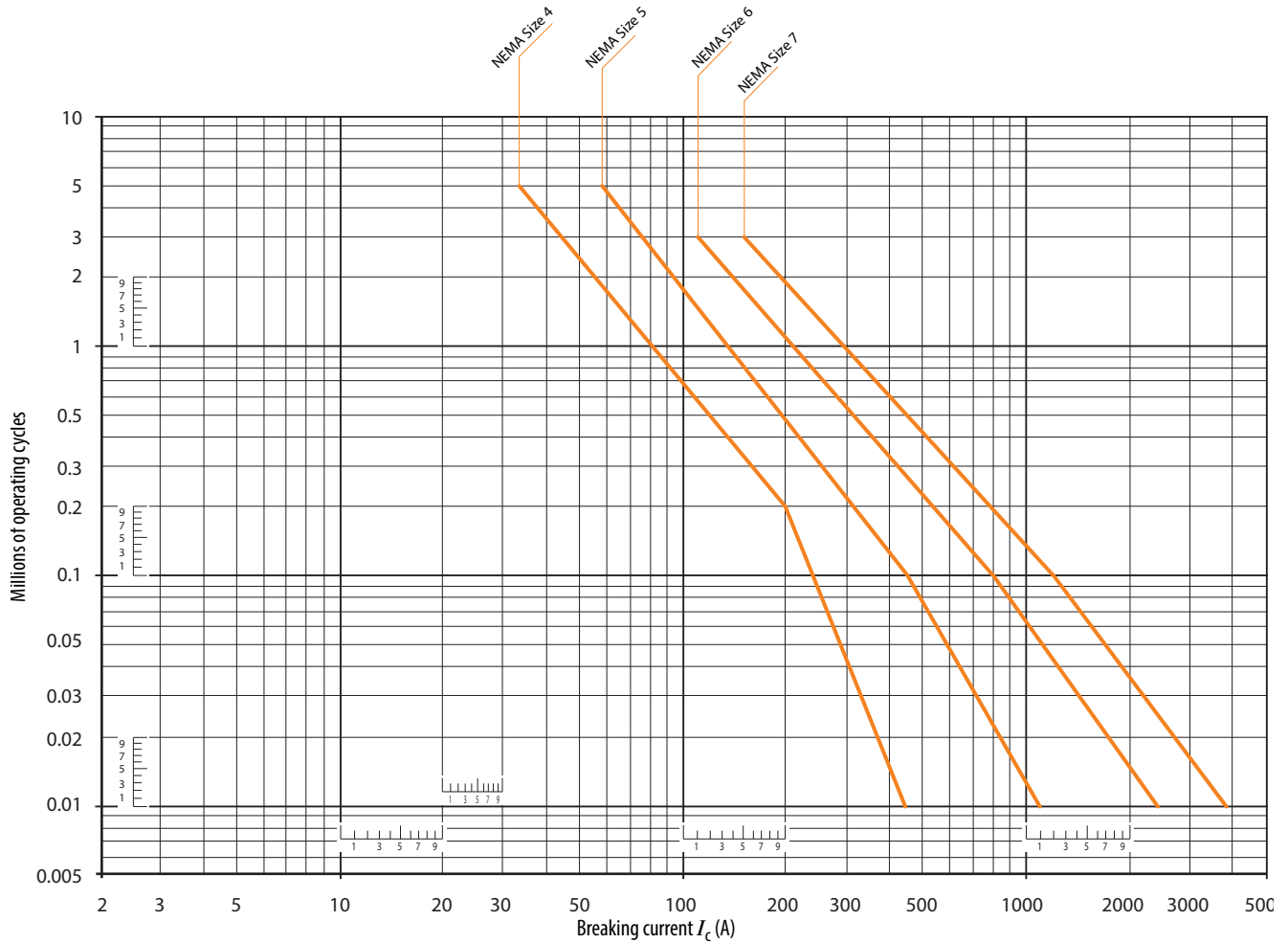


Electrical Durability for AC-2 or AC-4 Utilization Category - $440V < U_e \leq 690V$

Ambient temperature $\leq 60^\circ\text{C}$ for AF09...AF370, $\leq 55^\circ\text{C}$ for AF400...AF750

Switching cage motors: starting, reverse operation and step-by-step operation. The breaking current I_c is equal to $2.5 \times I_e$ for AC-2 and $6 \times I_e$ for AC-4, keeping in mind that I_e is the motor rated operating current (I_e = motor full load current).

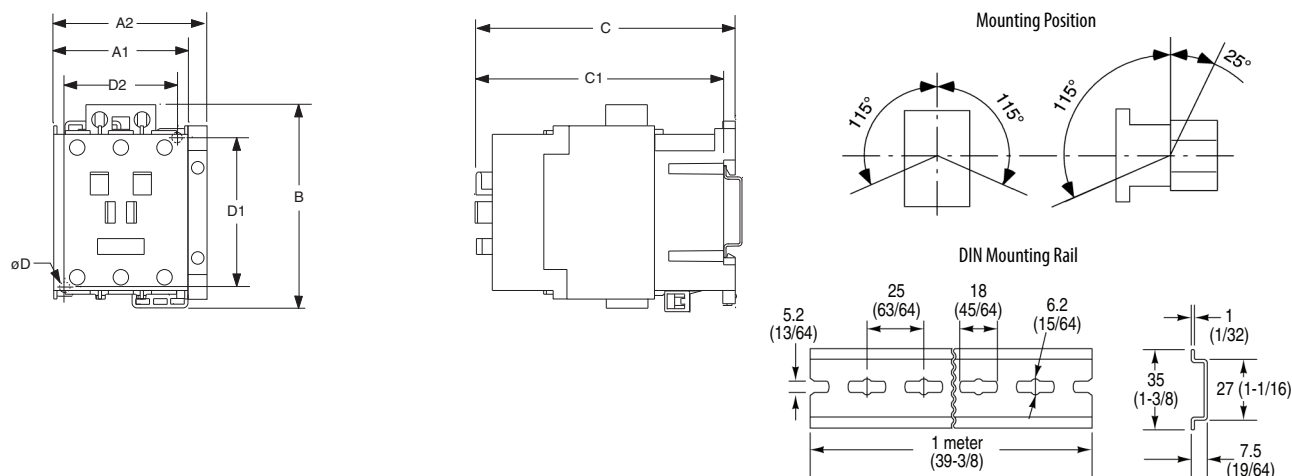
For maximum electrical switching frequency (see [page 26](#)).



Approximate Dimensions

Approximate dimensions are shown in inches (millimeters). Dimensions are not intended for manufacturing purposes.

Bulletin 300 Contactors and Accessories (NEMA Sizes 0...3)



AC Contactors

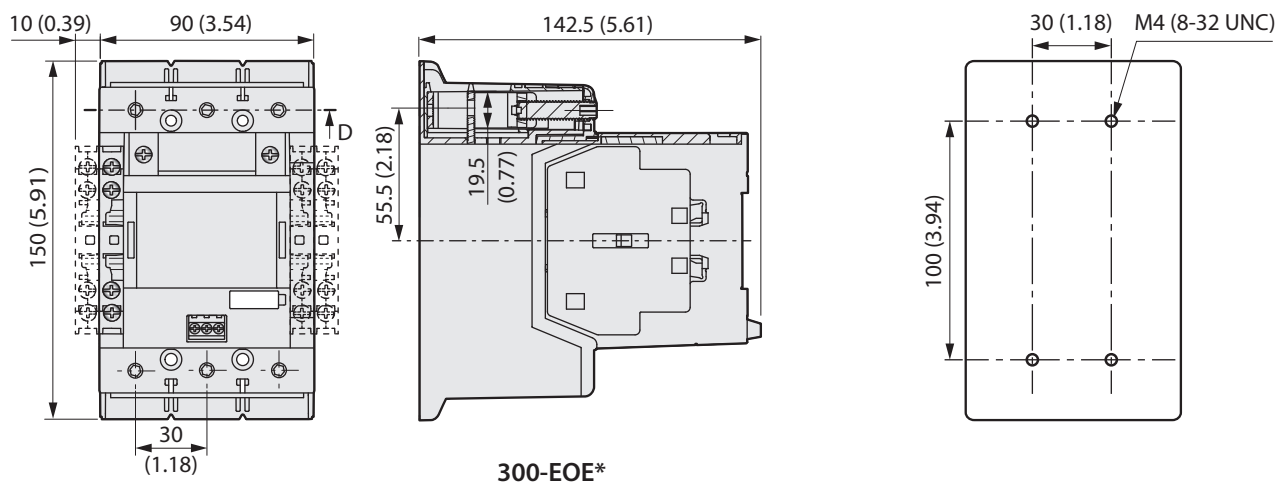
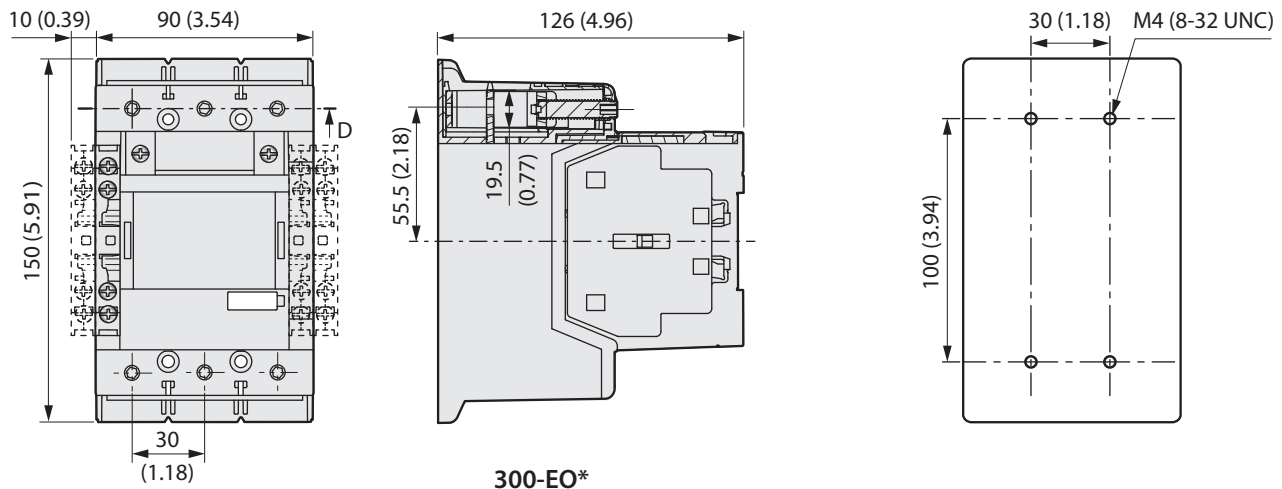
Cat. No.	NEMA Size	A1	A2	B	C	C1	Mounting Dimensions		
							Ø D	D1	D2
300-A0_	0	1.76 (45)	—	3.19 (81)	3.39 (86)	3.19 (81)	0.17 (4.5)	2.36 (60)	1.38 (35)
300-B0_	1	—	2.12 (54)	3.19 (81)	4.06 (103)	3.86 (98)	0.17 (4.5)	2.36 (60)	1.38 (35)
300-C0_	2	—	2.48 (63)	3.19 (81)	4.17 (106)	3.98 (101)	0.17 (4.5)	2.36 (60)	1.77 (45)
300-D0_	3	—	3.19 (81)	4.80 (122)	4.80 (122)	4.61 (117)	0.22 (5.4)	3.94 (100)	2.17 (55)

Accessories

Contactors with		in. (mm)
Auxiliary contact block for front mounting	2- or 4-pole	C/C1 + 1.54 (39)
Auxiliary contact block for side mounting	1- or 2-pole	A + 0.35 (9)
Pneumatic Timing Module		C/C1 + 2.28 (58)
Electronic Timing Module	on coil terminal side	B + 0.94 (24)
Mechanical Interlock	on side of contactor	A + 0.35 (9)
Mechanical Latch		C/C1 + 2.40 (61)
Interface Module	on coil terminal side	B + 0.35 (9)
Surge Suppressor	on coil terminal side	B + 0.12 (3)
Labeling with:	label sheet	+ 0
	marking tag sheet with clear cover	+ 0
	marking tag adapter for System V4/V5	+ 0.22 (5.5)
	marking tag adapter for System Bulletin 1492W	+ 0.22 (5.5)

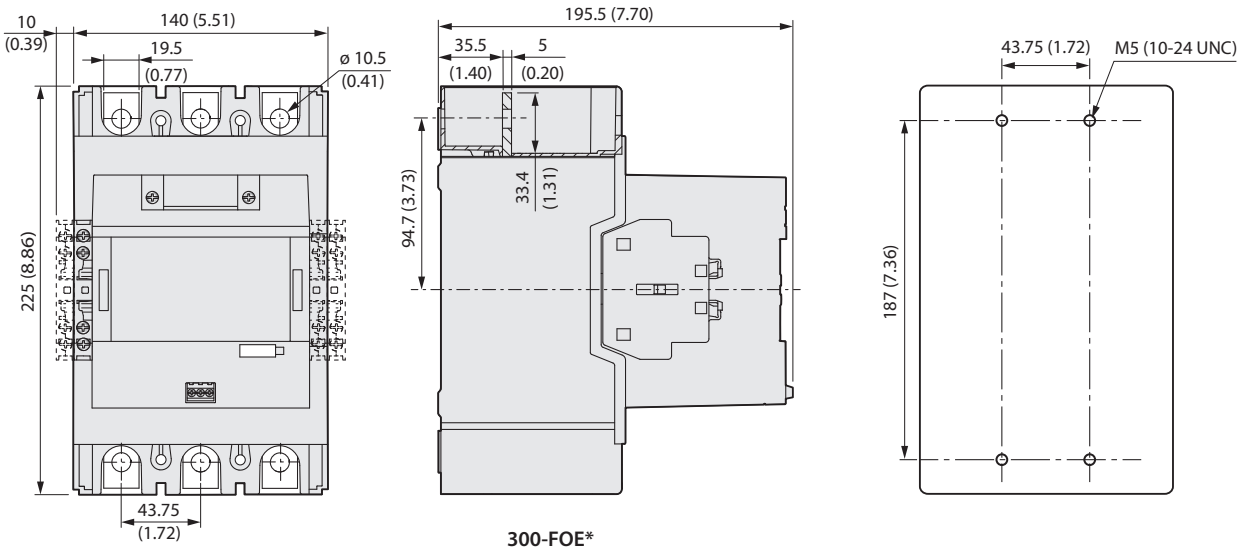
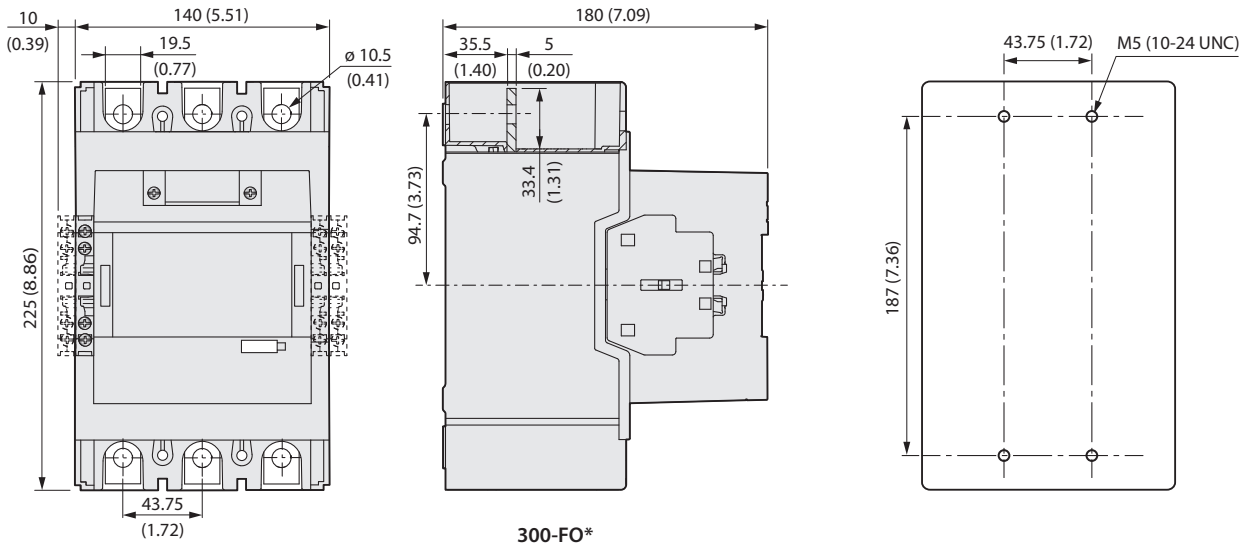
Approximate dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Bulletin 300 Contactor (NEMA size 4)



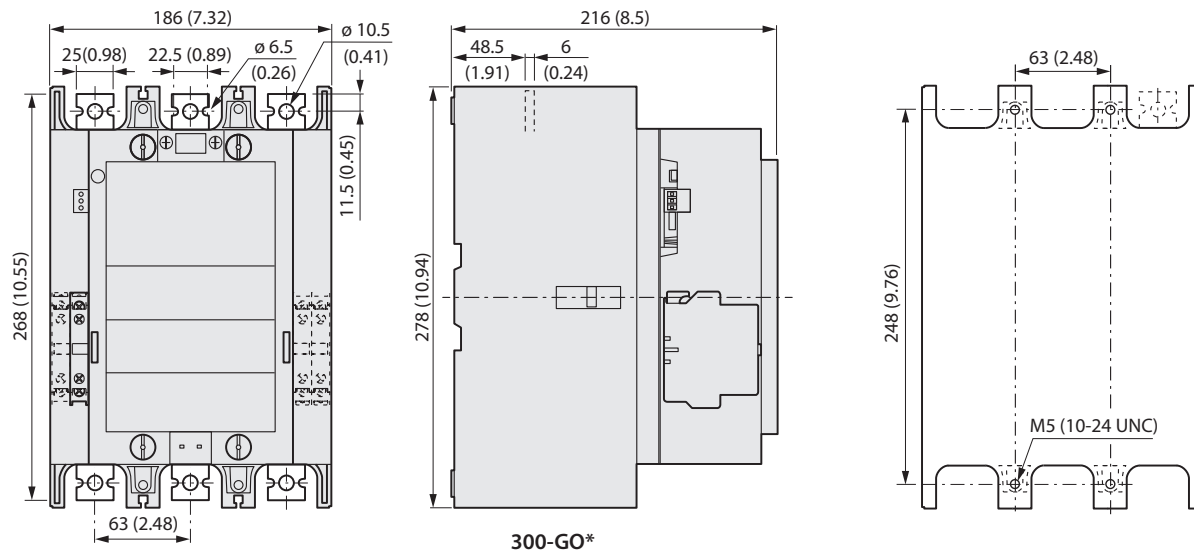
Approximate dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Bulletin 300 Contactor (NEMA size 5)



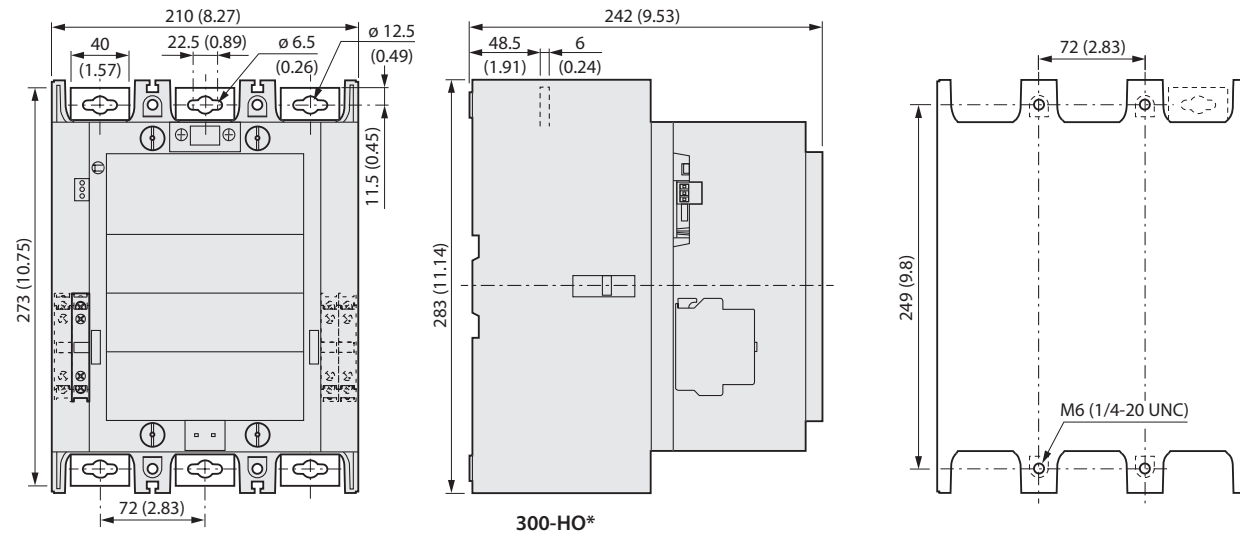
Approximate dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Bulletin 300 Contactor (NEMA size 6)



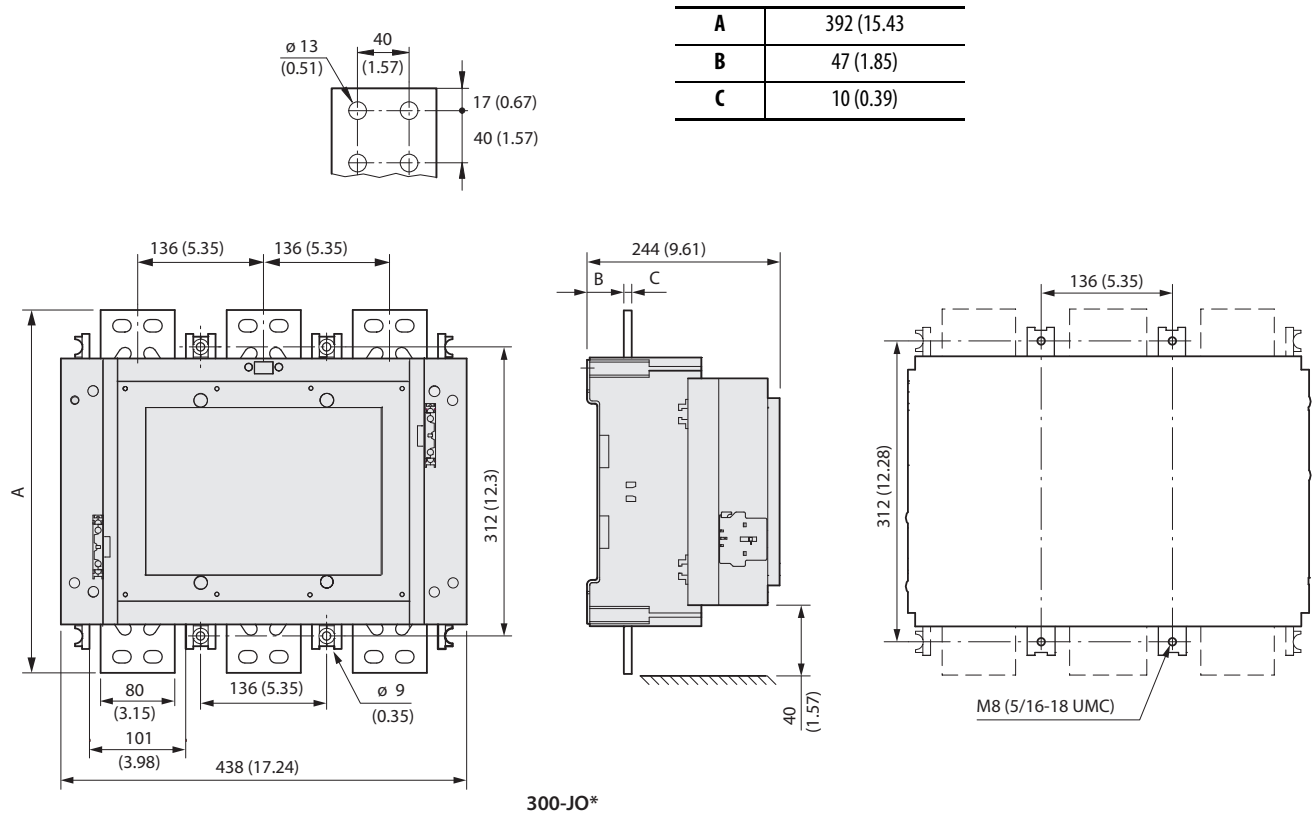
Approximate dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Bulletin 300 Contactor (NEMA size 7)



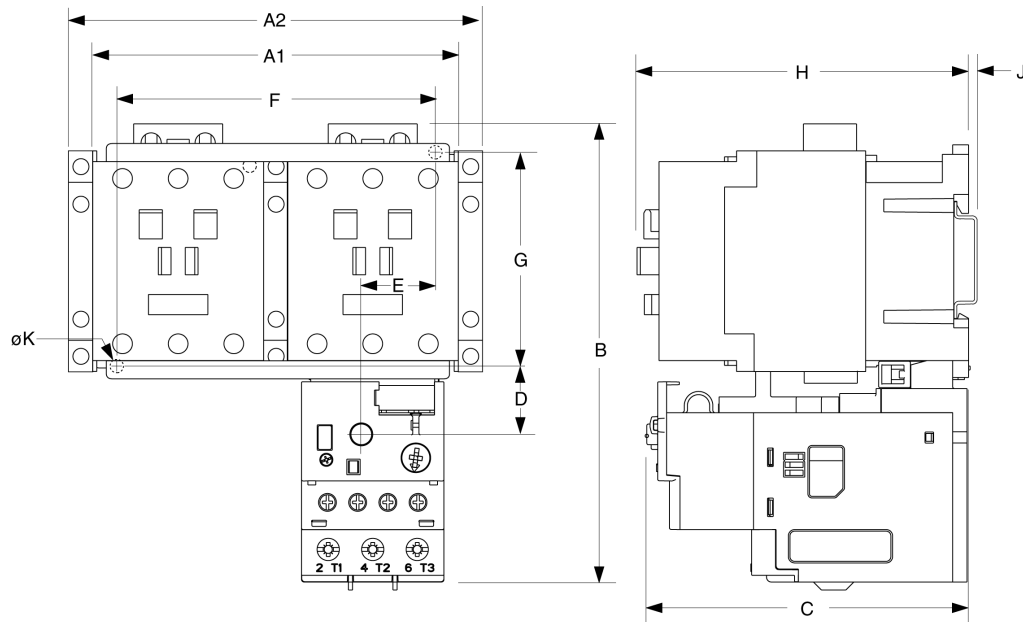
Approximate dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Bulletin 300 Contactor (NEMA size 8)



Approximate dimensions are shown in inches (millimeters). Dimensions are not intended for manufacturing purposes.

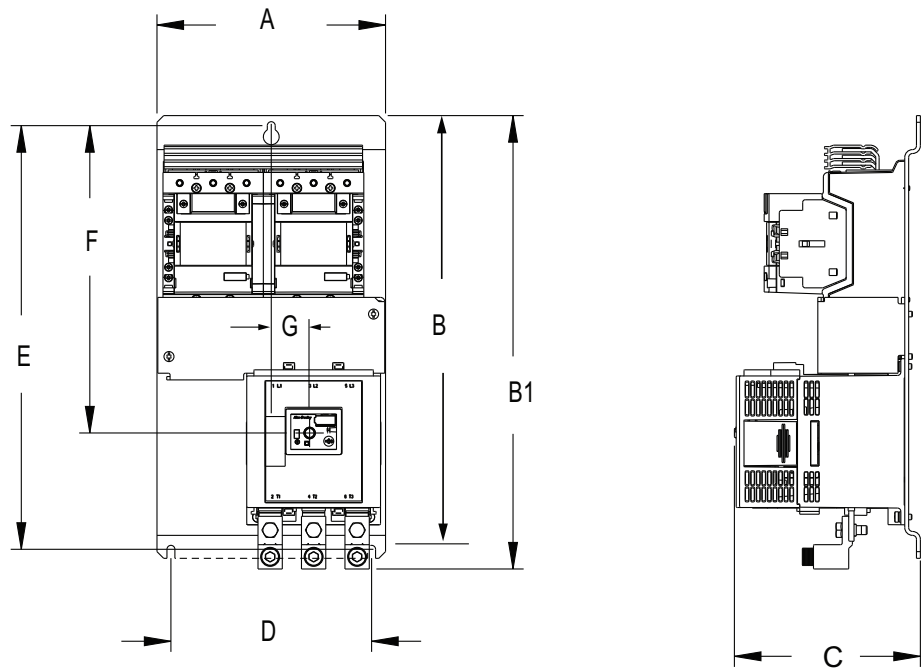
Bulletin 305 Reversing Starter with E1 Plus Solid-state Overload Relay (NEMA Sizes (0...3))



Cat. No.	NEMA Size	A1	A2	B	C	D	E	F	G	H	J	ØK
305-A0_	0	3.9 (99)	—	5.77 (147)	3.35 (85.2)	0.96 (24.5)	0.83 (21.1)	3.54 (90)	2.36 (60)	3.4 (86.5)	0.08 (2)	0.17 (4.5)
305-B0_	1	—	4.61 (117)	5.77 (147)	3.98 (101)	0.96 (24.5)	0.83 (21.1)	3.54 (90)	2.36 (60)	4.09 (104)	0.08 (2)	0.17 (4.5)
305-C0_	2	—	4.61 (117)	5.77 (147)	3.98 (101)	0.96 (24.5)	0.83 (21.1)	3.54 (90)	2.36 (60)	4.09 (104)	0.08 (2)	0.17 (4.5)
305-D0	3	—	6.74 (171)	7.58 (192.3)	4.75 (120.4)	1.14 (29)	1.23 (31.2)	5.35 (136)	3.94 (100)	4.94 (125.5)	0.08 (2)	0.39 (5.4)

Approximate dimensions are shown in inches (millimeters). Dimensions are not intended for manufacturing purposes.

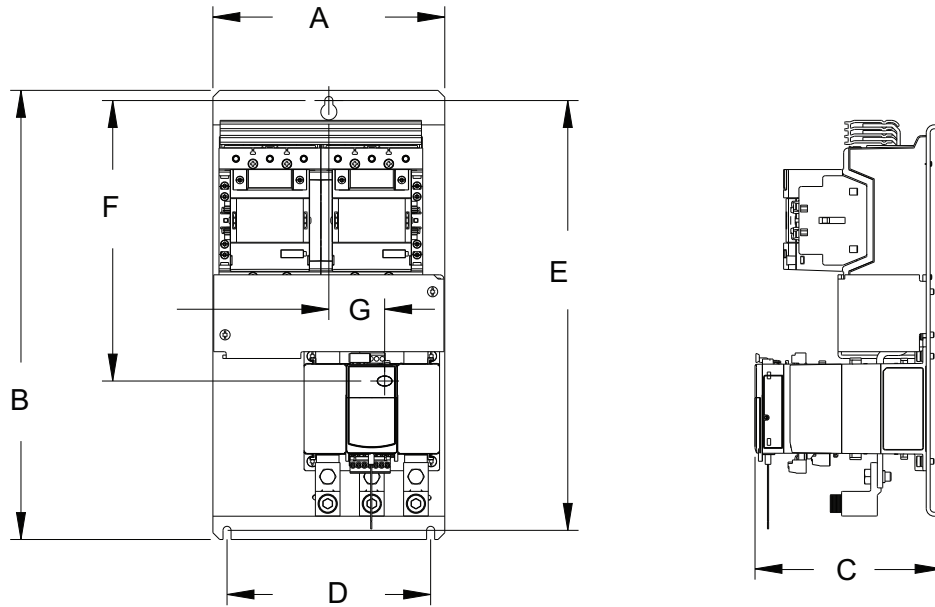
Bulletin 305 Reversing Starter with E1 Plus Solid-state Overload Relay (NEMA Size 4)



Cat. No.	NEMA Size	A	B	B1	C	D	E	F	G
305-E0_	4	8.07 (205)	15.2 (385)	16 (407)	6.57 (167)	7.09 (180)	15 (380)	10.9 (276)	1.36 (34.5)

Approximate dimensions are shown in inches (millimeters). Dimensions are not intended for manufacturing purposes.

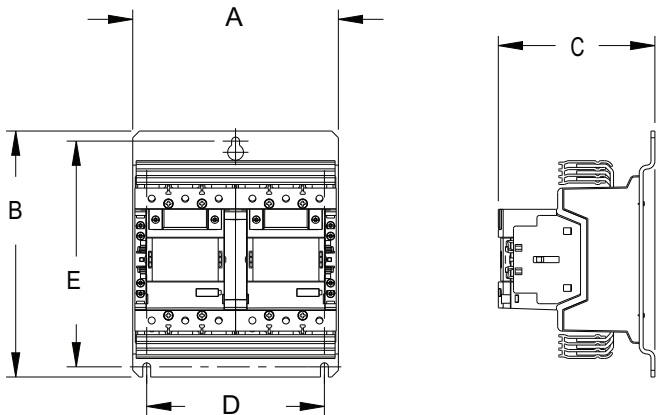
Bulletin 305 Reversing Starter with E300 Solid-state Overload Relay (NEMA Size 4)



Cat. No.	NEMA Size	A	B	C	D	E	F	G
305-E0_	4	8.07 (205)	15.6 (397)	6.51 (165)	7.09 (180)	15 (380)	9.76 (248)	2.41 (61.2)

Approximate dimensions are shown in inches (millimeters). Dimensions are not intended for manufacturing purposes.

Bulletin 305 Reversing Contactor (NEMA Sizes 4...7)

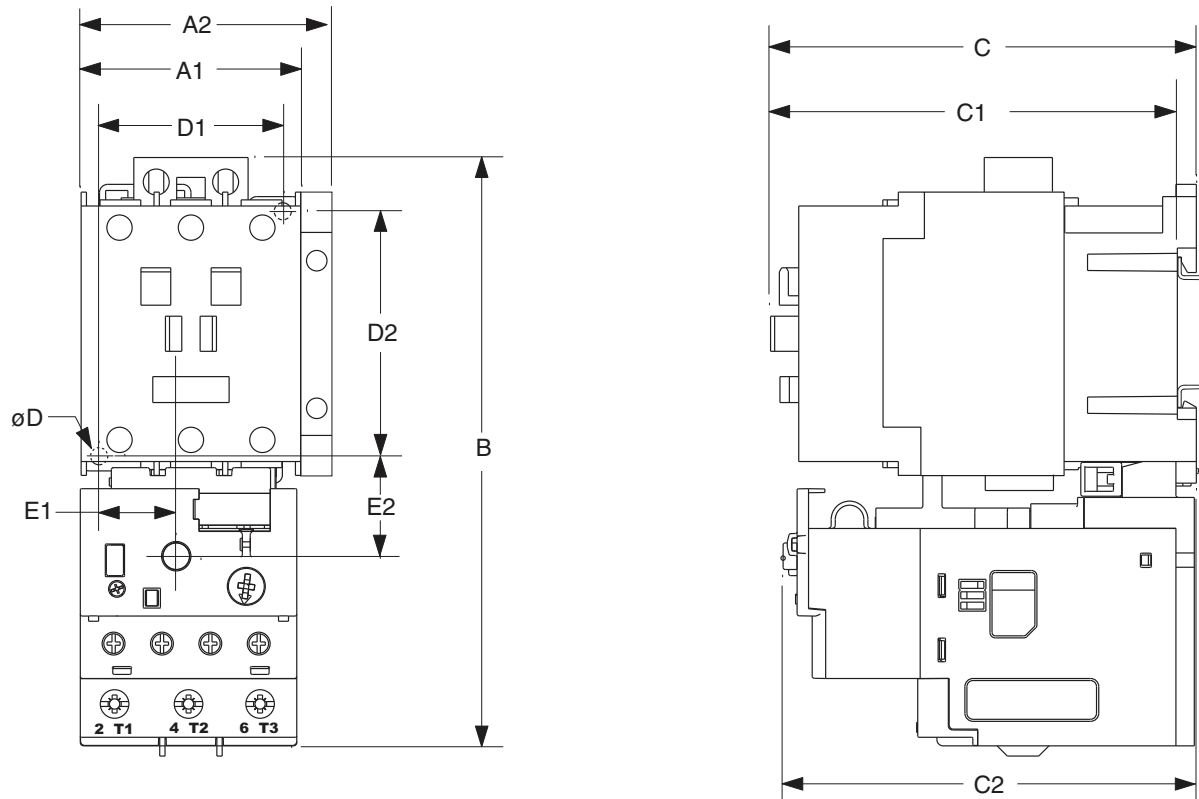


Cat. No.	NEMA Size	A	B	C	D	E
305-E0_	4	7.24 (184)	8.67 (220)	5.52/6.16 ⁽¹⁾ (140/157)	6.26 (159)	7.95 (202)
305-F0_	5	11.2 (285)	11.8 (299)	7.60/8.20 ⁽¹⁾ (193/209)	10 (255)	11.1 (281)
305-G0_	6	15.9 (404)	13.9 (354)	8.9 (226)	12.3 (313)	13.1 (332)
305-H0_	7	17.8 (452)	14.2 (369)	9.94 (252)	14.2 (360)	13.7 (347)

(1) Depth with PLC interface option.

Approximate dimensions are shown in inches (millimeters). Dimensions are not intended for manufacturing purposes.

Bulletin 309 Full Voltage Starter with E1 Plus Solid-State Overload Relay (NEMA Sizes 0...3)

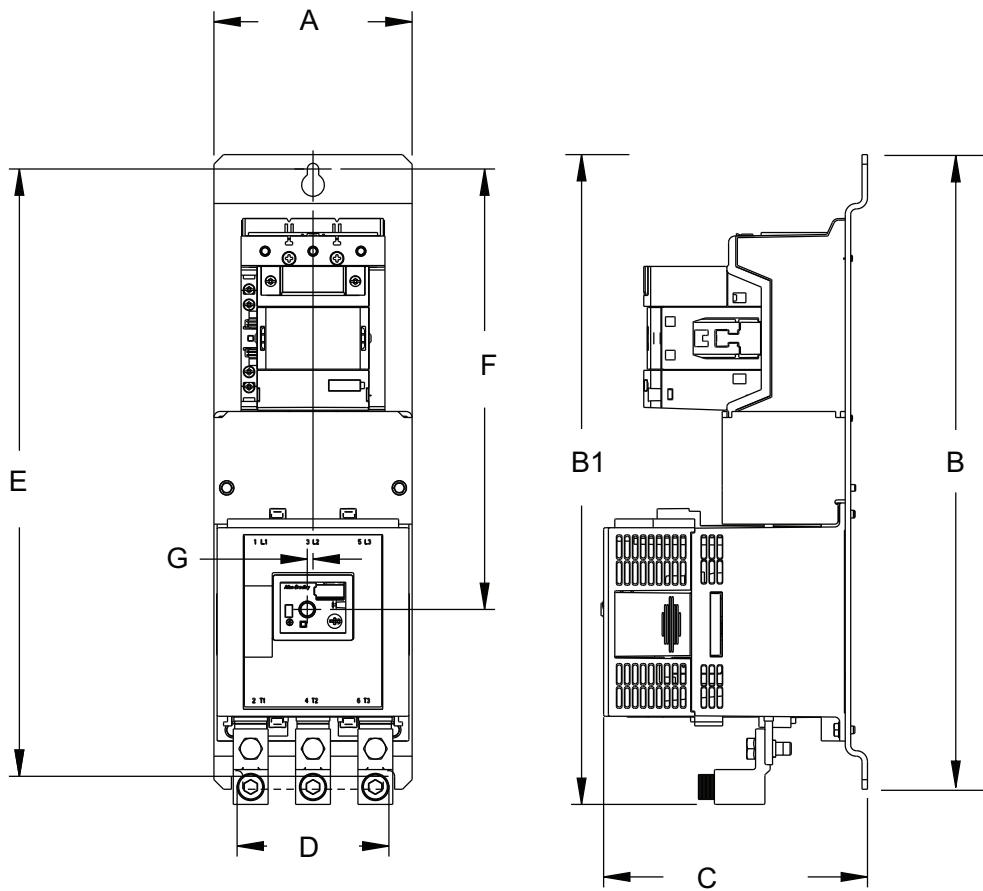


Cat. No.	NEMA Size	A1	A2	B	C	C1	C2	Mounting Dimensions			Resent Location	
								Ø D	D1	D2	E1	E2
193 ⁽¹⁾ _ EE_B	0	1.76 (45)	—	5.77 (147)	3.39 (86)	3.19 (81)	3.35 (85)	0.17 (4.5)	2.36 (60)	1.38 (35)	2.36 (60)	1.38 (35)
193 ⁽¹⁾ _ EE_D	1	—	2.12 (54)	5.77 (147)	4.06 (103)	3.86 (98)	3.98 (101)	0.17 (4.5)	2.36 (60)	1.38 (35)	2.36 (60)	1.38 (35)
193 ⁽¹⁾ _ EE_D	2	—	2.48 (63)	5.77 (147)	4.17 (106)	3.98 (101)	3.98 (101)	0.17 (4.5)	2.36 (60)	1.77 (45)	2.36 (60)	1.77 (45)
193 ⁽¹⁾ _ EE_E	3	—	3.19 (81)	7.58 (192)	4.80 (122)	4.61 (117)	4.74 (120)	0.22 (5.4)	3.94 (100)	2.17 (55)	3.94 (100)	2.17 (55)

(1) Valid for Bulletin Numbers 193, 193R, and 193S.

Approximate dimensions are shown in inches (millimeters). Dimensions are not intended for manufacturing purposes.

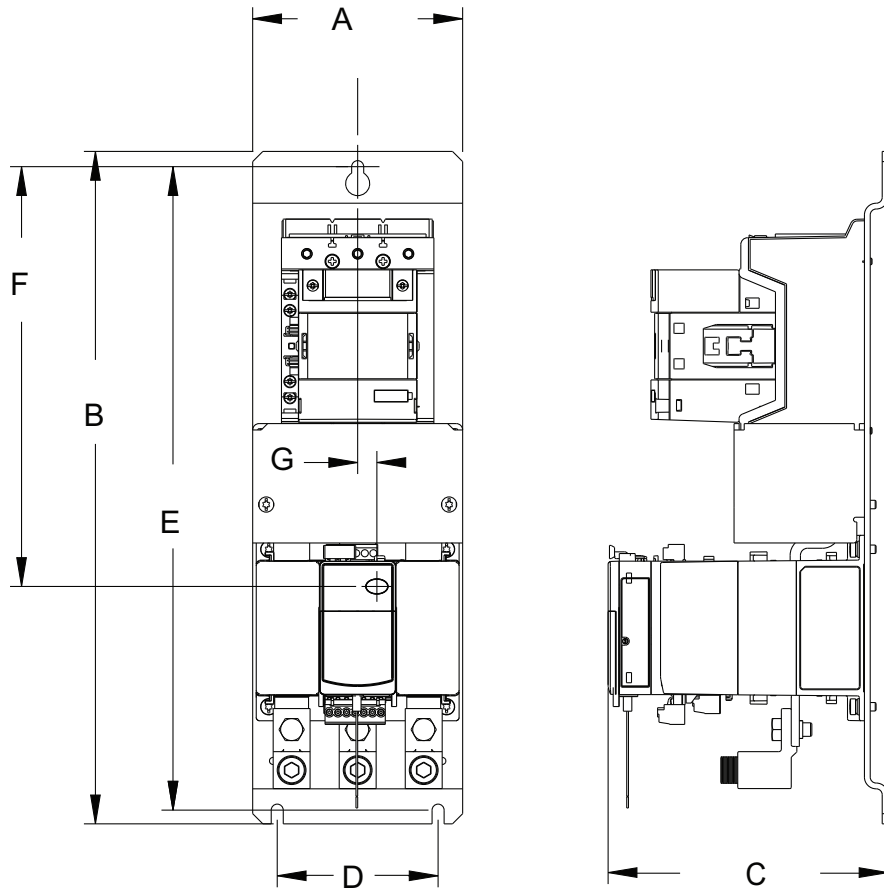
Bulletin 309 Full Voltage Starter with E1 Plus Solid-state Overload Relay (NEMA Size 4)



Cat. No.	NEMA Size	A	B	B1	C	D	E	F	G
193-EE_F	4	4.88 (124)	15.6 (397)	16 (407)	6.5 (165)	3.74 (95)	15 (380)	10.9 (276)	0.14 (3.6)

Approximate dimensions are shown in inches (millimeters). Dimensions are not intended for manufacturing purposes.

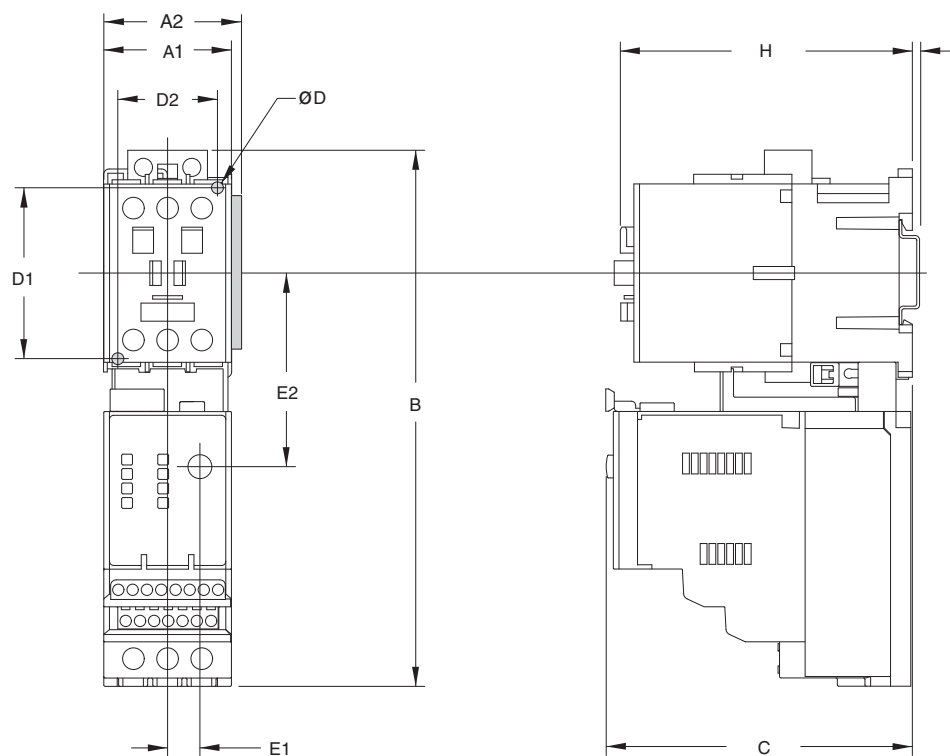
Bulletin 309 Full Voltage Starter with E300 Solid-state Overload Relay (NEMA Size 4)



Cat. No.	NEMA Size	A	B	C	D	E	F	G
193-ESM	4	4.88 (124)	15.6 (397)	6.51 (165)	3.74 (95)	15 (380)	9.76 (248)	0.45 (11.4)

Approximate dimensions are shown in inches (millimeters). Dimensions are not intended for manufacturing purposes.

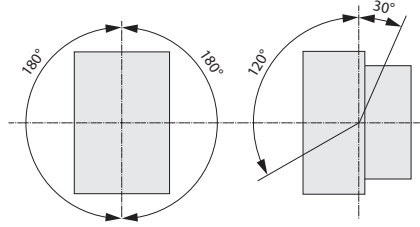
Bulletin 309 with E3, E3 Plus Solid-state Overload Relay (NEMA Sizes 0...3)



Overload Cat. No.	NEMA Size	A1	A2	B Height		B1	C Depth	Ø D	D1	D2	E1	E2	H	J
				without 193- EIMD	with 193- EIMD									
193-EC_B	0	1.76 (45)	—	7.40 (188)	8.19 (208)	5.71 (145)	4.21 (107)	0.17 (4.5)	2.36 (60)	1.38 (35)	2.36 (60)	1.38 (35)	3.35 (85)	0.08 (2)
193-EC_D	1	—	2.12 (54)	7.40 (188)	8.19 (208)	5.71 (145)	4.21 (107)	0.17 (4.5)	2.36 (60)	1.38 (35)	2.36 (60)	1.38 (35)	4.09 (104)	0.08 (2)
193-EC_D	2	—	2.48 (63)	7.40 (188)	8.19 (208)	5.71 (145)	4.21 (107)	0.17 (4.5)	2.36 (60)	1.77 (45)	2.36 (60)	1.77 (45)	4.09 (104)	0.08 (2)
193-EC_E	3	—	3.19 (81)	9.29 (236)	10.1 (256)	6.81 (173)	4.92 (125)	0.22 (5.4)	3.94 (100)	2.17 (55)	3.94 (100)	2.17 (55)	4.96 (126)	0.08 (2)

Mounting Position

AC/DC and AC/DC with PLC Input



Environmental Specifications

		Bulletin 300, 300S
		NEMA Sizes 4...8
Ambient Temperature		
Storage	[°C]	-40...+70
Operation at rated voltage	[°C]	-40...+70
Max. Altitude of Installation Site	[m]	3000
Climatic Withstand		100-E116-370: IEC 60068-2-30 Test Db & IEC 60068-2-2 test Bd & IEC 60068-2-1 test Ab (report 1314369) 100-E400-2650: IEC 60068-2-2 test Ba & Bb & IEC 60068-2-1 test Aa&Ab, IEC 60068-2-30
Resistance to Shock		IEC 60068-2-27
Resistance to Vibration		IEC 60068-2-6
Protection Class		
Contactor main contacts		IP00
Contactor coil terminals		P2X (in connected state)
Auxiliary contacts		P2X (in connected state)

Standards, Approvals, and Certifications

NEMA Sizes 0...3

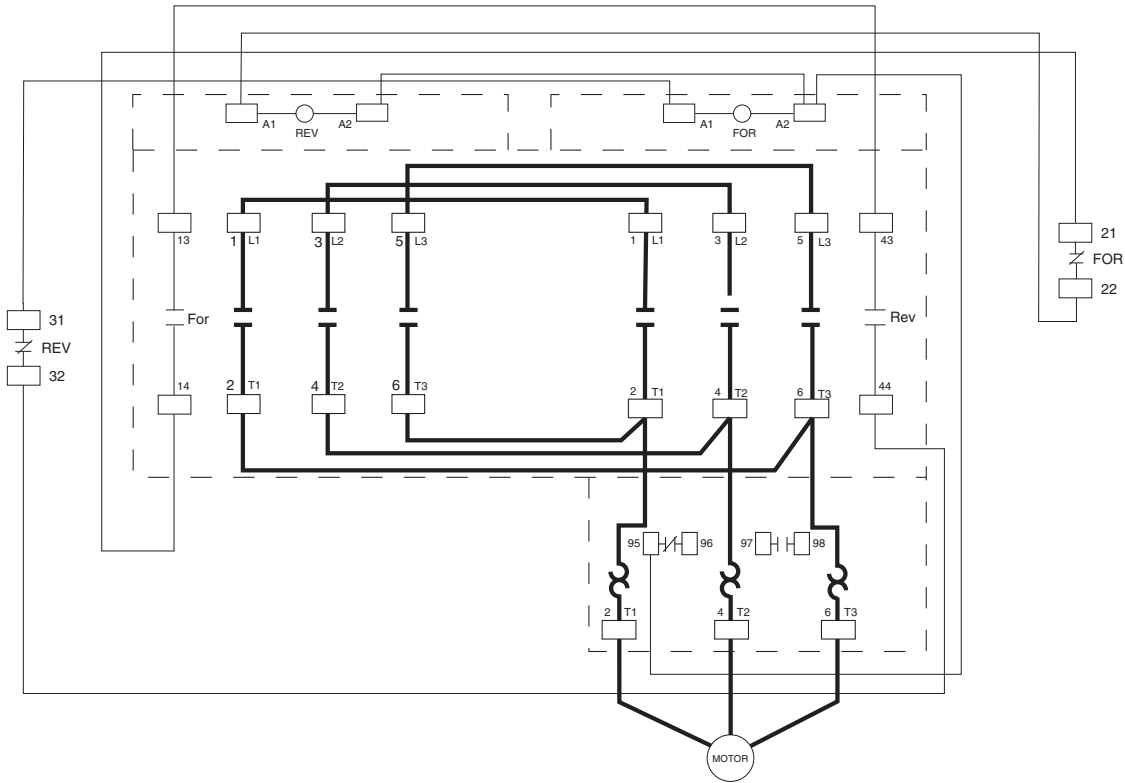
Standards	EN/IEC 60947-4-1 , Low-voltage switchgear and controlgear, Contactors and motor-starters; EN/IEC 60947-5-1 , Low-voltage switchgear and controlgear, Control circuit devices and switching elements; IEC 60947 , Type "2" Coordination; CSA C22.2 No. 14 , Industrial Control Equipment (Canada); UL 508 ; Meets the material restrictions for European Directive 2002/95/IEC-EU-RoHS	
Certifications	CE	✓
	CCC	✓
	c-UL-us Listed (File No. E3125; Guide NLDX, NLDX7)	

NEMA Sizes 4...8

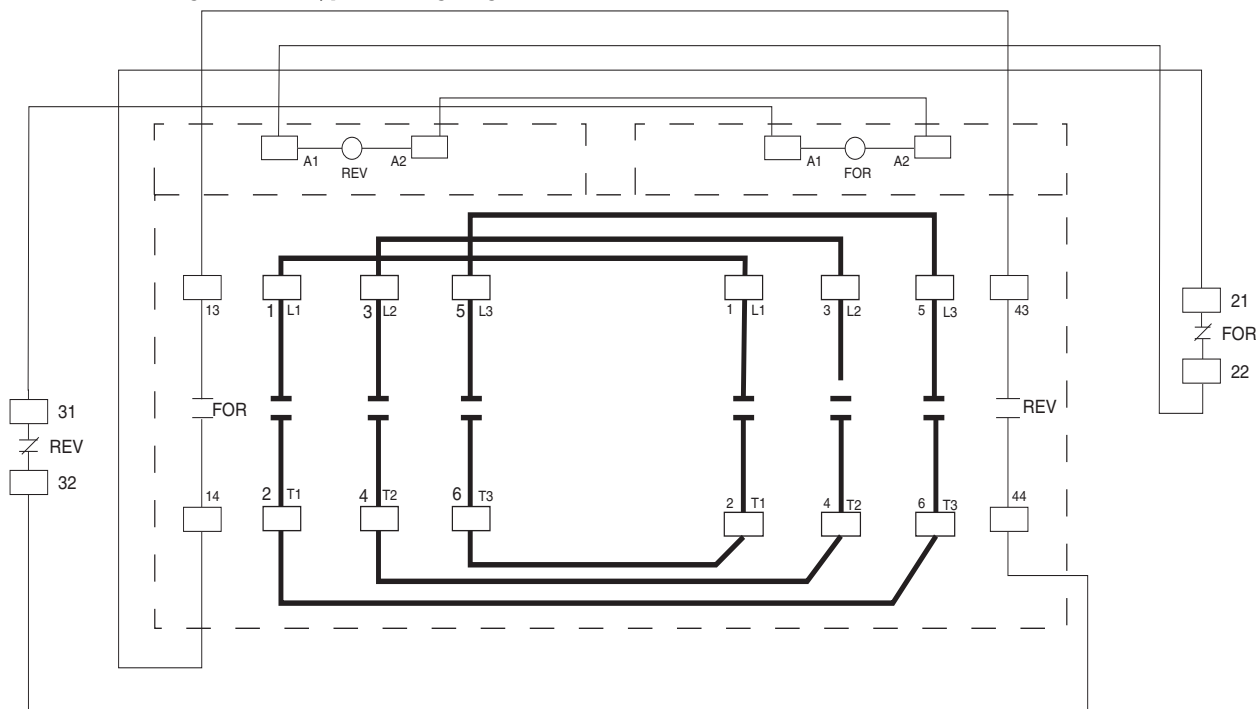
Standards	EN/IEC 60947-1 , Low-voltage switchgear and controlgear; EN/IEC 60947-4-1 , Low-voltage switchgear and controlgear, Contactors and motor-starters; EN/IEC 60947-5-1 , Low-voltage switchgear and controlgear, Control circuit devices and switching elements; UL 60947-4-1 , Industrial Control Equipment (USA); CSA C22.2 No. 14 , Industrial Control Equipment (Canada).	
	Mechanically Linked Contacts: IEC 60947-5-1, Annex L	
	Mirror Contacts: IEC 60947-4-1, Annex F	300/300S, NEMA sizes 4...8 with all side mounted N.C. auxiliary contacts
Approvals	UL	c-UL-us, File No. E41850 / E196120 (contactors, reversing contactors)
	CSA	
	CCC	✓
	EAC	✓
	C-Tick	✓
	RINA	✓
	ABS	✓
Certifications	CE	✓
	SUVA	✓
	SEMI-F47	conditions of use on request

Wiring Diagrams

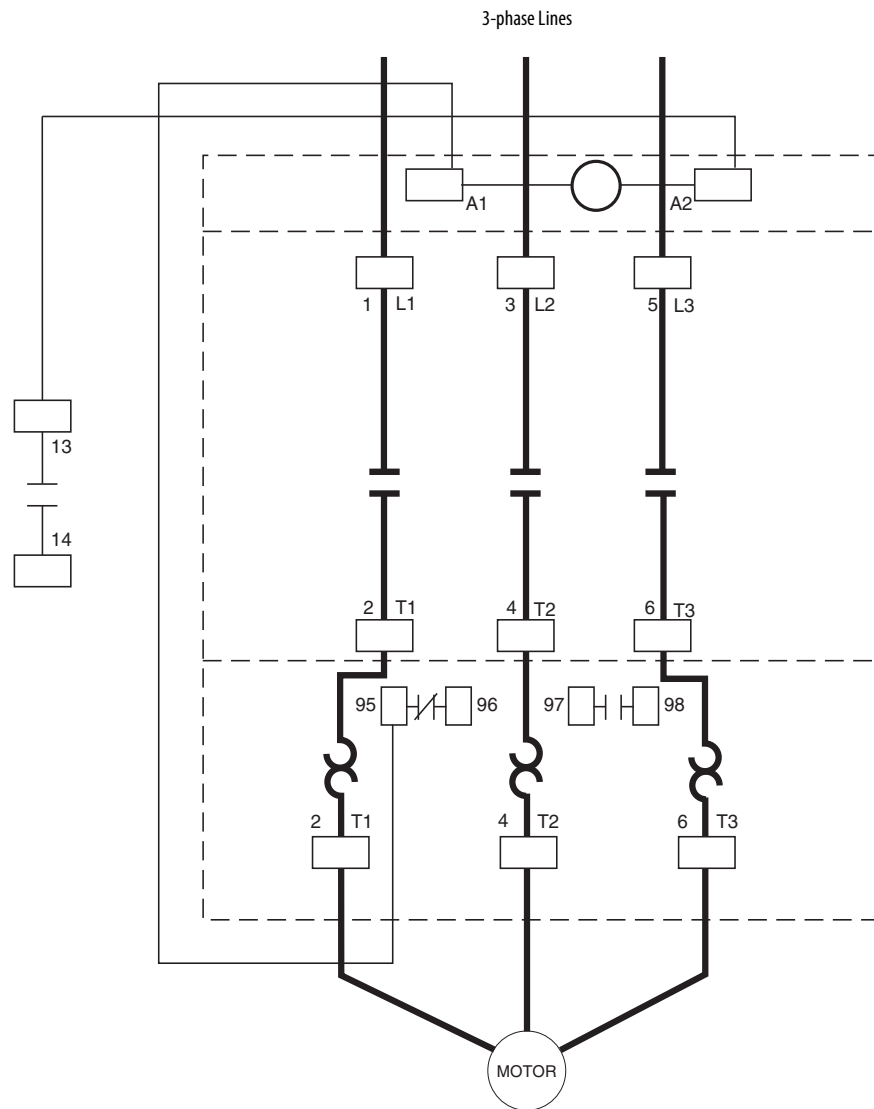
Bulletin 305 Reversing Starter Typical Wiring Diagram



Bulletin 305 Reversing Contactor Typical Wiring Diagram



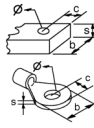
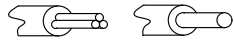
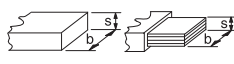
Bulletin 309 Full Voltage Starter Typical Wiring Diagram



D-series Specifications and Approximate Dimensions

D-series Specifications (NEMA Sizes 4 and 5)

		NEMA Size		
		4	5	
Coil Type:	Conventional	X	—	—
	Electronic - EI	—	X	X
Resistance and Power Dissipation				
Main current circuit resistance	[mΩ]	0.42	0.42	0.18
Power dissipation by all circuits at I_e AC-3/400V	[W]	40.8	40.8	48.6
Total Power Dissipation				
At I_e AC-3/400V	AC [W]	50.8	46.8	54.6
	DC [W]	48.8	46.8	54.6
Life Span				
Mechanical AC control	[Mil. operations]	10	10	10
Mechanical DC control	[Mil. operations]	10	10	10
Electrical AC-3 (400 V)	[Mil. operations]	1	1	1

			NEMA Size	
			4	5
Coil Type: Electronic - EI			X	X
Conductor Cross Sections - Main Contacts Terminal Type				
	b max.	[mm]	25	30
	c max.	[mm]	12.5	15
	s max.	[mm]	5	6
	Ø min.	[mm]	8.3	10.5
Recommended torque			195	380
Recommended torque			22	43
with Terminal Lug Kit			100-DL180 ⁽²⁾	100-DL420 ⁽²⁾
Cross section per UL/CSA			[AWG] 6...300 MCM	(2x) 4...350 MCM
Recommended torque			[lb·in.] 250	250
with Frame Terminal Block			100-DTB180 ⁽²⁾	100-DTB420 ⁽¹⁾
	top opening	[mm ²]	16...35	25...240 ⁽³⁾
	bottom opening	[mm ²]	16...95	25...240
	top opening	[mm ²]	16...50	25...300
	bottom opening	[mm ²]	16...120	25...300
	b max.		20	25
	s top	[mm ²]	3...9	4...20
	s bottom		3...14	4...20
Cross section per UL/CSA	top	[AWG]	6...1/0 AWG	4 AWG...600 MCM
	bottom	[AWG]	6 AWG...250 MCM	4 AWG...600 MCM
Recommended torque			[lb·in.] 124	220
			[N·m] 14	25

(1) Hexagonal screw.

(2) Hexagonal socket screw.

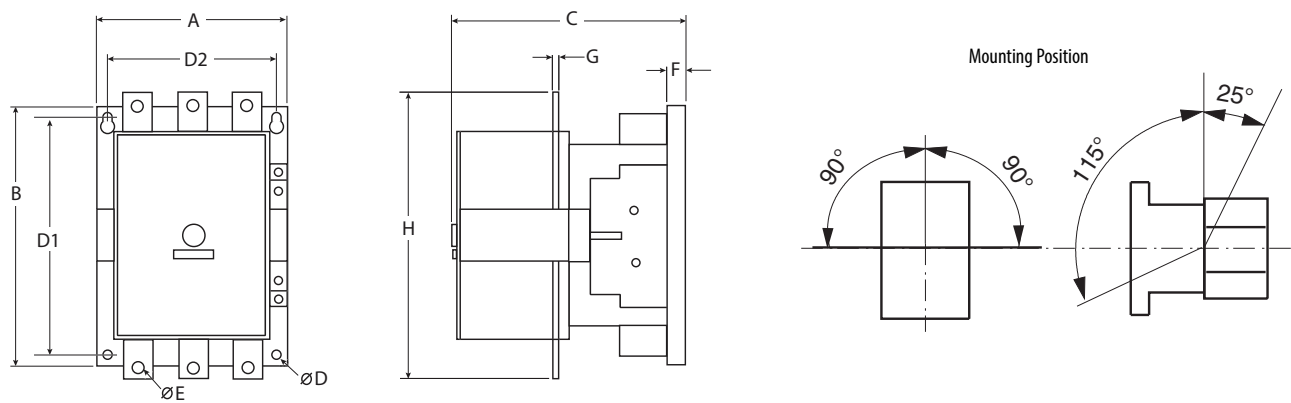
(3) 25...95 mm² with sleeve per DIN 46228.

			NEMA Size	
			4	5
Coil Type:	Electronic - EI		X	X
Operating Limits				
50 Hz, 60 Hz, 50/60 Hz	pick up	[x Us]	0.85...1.1	
	drop out	[x Us]	0.3...0.5	
DC (conventional)	pick up	[x Us]	0.85...1.1	
	drop out	[x Us]	0.85...1.1	
DC (electronic)	pick up	[x Us]	0.3...0.5	
	drop out	[x Us]	0.3...0.5	
Coil Consumption				
50 Hz, 60 Hz, 50/60 Hz	pick up	[VA/W]	380/240 ⁽¹⁾	
	hold in	[VA/W]	13/6	
DC (electronic)	pick up	[W]	265 ⁽¹⁾	
	hold in	[W]	6	
Operating Times				
AC	closing delay	[ms]	20...45	
	opening delay	[ms]	25...110	
with RC module	opening delay	[ms]	—	
DC (conventional)	closing delay	[ms]	25...50	
	opening delay	[ms]	35...110	
with integrated diode with external diode				
DC (electronic)	closing delay	[ms]	25...50	
	opening delay	[ms]	35...110	

- (1) Electronic coil drives are designed to minimize power requirements, but this control can exhibit a higher inrush (540 W, < 10 ms) when energizing. You must consider this higher inrush for the proper sizing of supply devices, all-or-nothing relays, and cross-sections of coil supply lines. Contact your local Rockwell Automation sales office or Allen-Bradley distributor for detailed information.

Approximate dimensions are shown in inches (millimeters). Dimensions are not intended for manufacturing purposes.

D-series Bulletin 300 Contactors and Accessories (NEMA Sizes 4 and 5)



AC Contactors

Cat. No.	NEMA Size	A	B	C	Mounting Dimensions			Ø E	F	G	H
					Ø D	D1	D2				
300-E0_	4	4.72 (120)	6.69 (170)	6.14 (156)	0.21 (5.4)	5.71 (145)	3.94 (100)	0.34 (8.5)	0.59 (15)	0.157 (4)	7.17 (182)
300-F0_	5	6.10 (155)	8.07 (205)	7.09 (180)	0.26 (6.5)	7.09 (180)	5.12 (130)	0.41 (10.4)	0.59 (15)	0.236 (6)	8.74 (222)

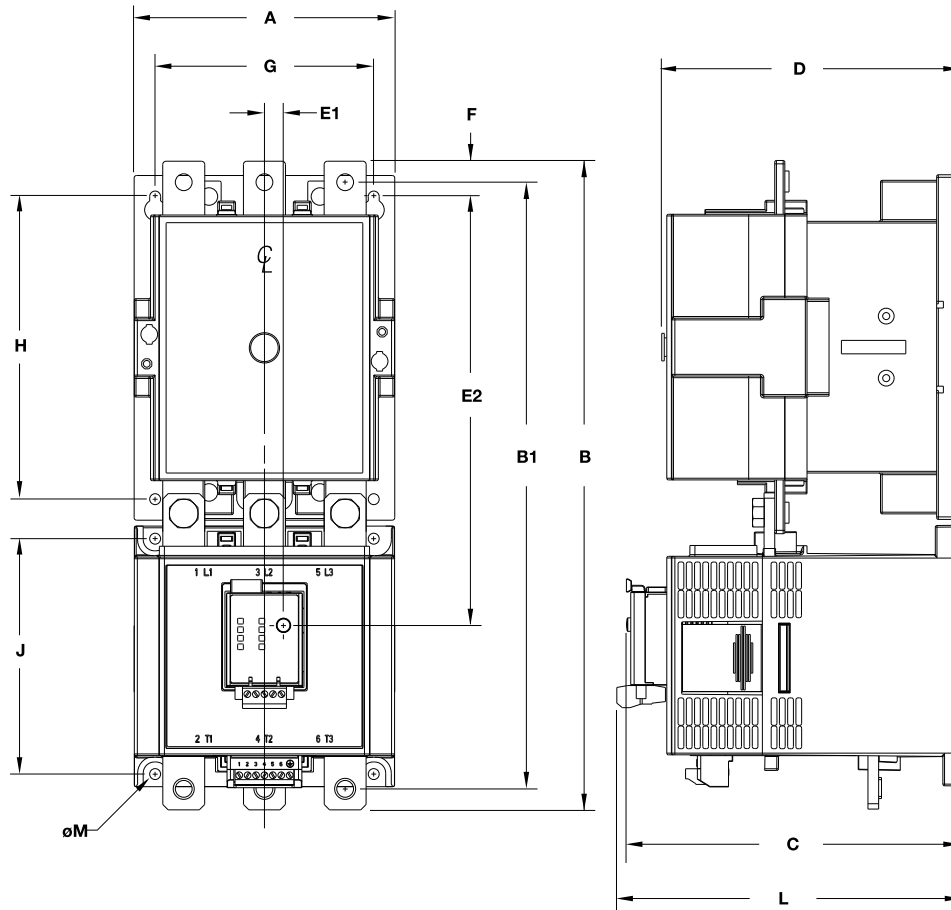
Accessories

Contactors with		in. (mm)
Auxiliary contact block ⁽¹⁾	100-DS1_	A
	100-DS2_	A + 0.53 (13.5) each
Mechanical Interlock	100-DM_	A + A
Frame terminal block	100-DTB110	B + 0.28 (7) each
	100-DTB180	B + 0.28 (7) each
	100-DTB420	B + 0.33 (8.5) each
Label holder	—	C + 0.20 (5) each

(1) Conventional DC coil contactors accept only Cat. No. 100-DS2_ auxiliary contacts.

Approximate dimensions are shown in inches (millimeters). Dimensions are not intended for manufacturing purposes.

D-series Bulletin 309 with E3, E3 Plus Solid-State Overload Relay (NEMA Sizes 4 and 5)



Overload Cat. No.	NEMA Size	A Width	B Height		B1	C Depth	D	E1	E2	F	G	H	J	L	M
			without Terminal Covers	with Terminal Covers											
193-EC_F	4	4.72 (120)	13.4 (340)	16.5 (418)	12.5 (318)	6.89 (175)	6.14 (156)	0.43 (11)	8.50 (216)	0.63 (16)	3.94 (100)	5.71 (145)	5.31 (135)	7.13 (181)	0.21 (5.2)
193-EE_F		4.72 (120)	13.4 (340)	16.5 (418)	12.5 (318)	6.01 (153)	6.14 (156)	0.14 (3.6)	8.91 (226)	0.63 (16)	3.94 (100)	5.71 (145)	5.31 (135)	7.13 (181)	0.21 (5.2)
193-EC_G	5	6.10 (155)	15.2 (386)	19.2 (487)	14.2 (361)	7.83 (199)	7.09 (180)	0.43 (11)	10.0 (255)	0.83 (21)	5.12 (130)	7.09 (180)	5.51 (140)	8.07 (205)	0.26 (6.5)
193-EE_G		6.10 (155)	15.2 (386)	19.2 (487)	14.2 (361)	6.95 (177)	7.09 (180)	0.14 (3.6)	10.44 (265)	0.83 (21)	5.12 (130)	7.09 (180)	5.51 (140)	8.07 (205)	0.26 (6.5)

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	www.rockwellautomation.com/knowledgebase
Local Technical Support Phone Numbers	Locate the phone number for your country.	www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	www.rockwellautomation.com/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	www.rockwellautomation.com/global/support/pcdc.page

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